Esso Petroleum Company Ltd

CHESTERFIELD EXPRESS SERVICE STATION

Environmental Report on Site Redevelopment

70102251_ERSR
FEBRUARY 2024

CONFIDENTIAL

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APPENDICES

1 INTRODUCTION

1.1 CONEXT

1.1.1. WSP UK Ltd (WSP) was commissioned by Artelia UK Ltd (Artelia) acting on behalf of Esso Petroleum Company Ltd (Esso) to provide environmental services during the tank and fuel infrastructure replacement works at Chesterfield Express Service Station, Newbold Road, Chesterfield, S41 7AL (hereinafter referred to **as 'the Site').**

1.1.2. The Location of the Site is presented in Figure 1 (**Appendix A**).

1.2 BACKGROUND AND PLANNING STATUS

1.2.1. The proposed works are subject to conditions imposed through the planning permission reference CHE/23/00220/FUL, granted on the 28th June 2023. The full text of the conditions is included in **Appendix B**. Conditions 6 and 7 of the conditions relate to an intrusive investigation and any remedial measures being undertaken as presented below:

06. No development shall commence until;

> *a) a scheme of intrusive investigations has been carried out on site to establish the risks posed to the development by past coal mining activity, and;*
> *b) any remediation works and/or mitigation measures to address land instability arising from coal mining legacy, as may be necessary, have been implemented on site in full in order to ensure that the site is safe and stable for the development proposed.*

The intrusive site investigations and remedial works shall be carried out in accordance with authoritative UK guidance.

Reason: The undertaking of remedial measures, prior to the commencement of development, is considered to be necessary. This is in order to ensure the safety and stability of the development, in accordance with Policies CLP14 and CLP20 of the adopted Chesterfield Local Plan and paragraphs 183 and 184 of the National Planning Policy Framework.

07. Prior to the occupation of the development, or it being taken into beneficial use, a signed statement or declaration prepared by a suitably competent person confirming that the site is, or has been made, safe and stable for the approved development shall be submitted to the Local Planning Authority for approval in writing. This document shall confirm the methods and findings of the intrusive site investigations and the completion of any remedial works and/or mitigation necessary to address the risks posed by past coal mining activity.

Reason: The undertaking of remedial measures, prior to the commencement of development, is considered to be necessary. This is in order to ensure the safety and stability of the development, in accordance with Policies CLP14 and CLP20 of the adopted Chesterfield Local Plan and paragraphs 183 and 184 of the National Planning Policy Framework.

1.3 SUMMARY OF PREVIOUS REPORTS

1.3.1. The following technical reports have previously been produced by WSP for the Site:

- Phase 1 Environmental Site Assessment. WSP ref: 70102251-001, dated December 2022;
- Ground Investigation Report and Generic Quantitative Risk Assessment. WSP ref: 70102251-002, dated June 2023; and,
- Coal Mining Risk Assessment. WSP ref: 70102251-CMRA, dated June 2023.

1.3.2. The aforementioned reports include a Phase 2 Preliminary Risk Assessment including the production of an outline Conceptual Site Model (CSM) and a Phase 2 Intrusive Ground Investigation report including a Generic Quantitative Risk Assessment (GQRA). This sequence of reporting is consistent with Environment Agency 'Land Contamination Risk Management (LCRM)' and represents best practice in the assessment of potentially contaminated land. A summary of the previous reports is presented below.

PHASE 1 REPORT

1.3.3. The Phase 1 Preliminary Risk Assessment included production of an outline Conceptual Site Model (CSM) which identified potential pollutant linkages between sources and receptors. The information utilised desk-based information including environmental database searches, consultation with the contaminated land officer and petroleum officer, review of historical maps and reviews of available geological information. The potential sources, pathways and receptors identified are detailed below:

Potential Sources

- Made Ground associated with developed nature of the Site;
- Leaks/spills of fuels/oils to the ground associated with the storage at the Site and its current/historical use as a filling station;
- Site drainage network and associated interceptor; and,
- Historical disused Colliery.

Pathways

- Direct contact pathways dermal contact, dust inhalation/ingestion and exposure to volatile vapours where hardstanding is not present, either in soft standing or during the proposed redevelopment works;
- Accumulation of volatile vapours from potentially impacted soils and groundwater within existing buildings/structures and subsequent exposure (inhalation) to building occupants;
- Leaching and vertical migration of any source material from soils to groundwater;
- Lateral and vertical migration of source material within the underlying groundwater to down gradient receptors;
- Direct contact with corrosive substances (e.g. sulphates and hydrocarbons) in the soil and shallow groundwater; and,
- Accumulation of hazardous gases within structures (explosive risk).

Receptors

- Current site users (visitors and workers);

- Future site users (visitor and workers);
- Neighbouring Site users (residents);
- Groundwater within the Lower Coal Measures (Secondary A Aquifer);
- Below ground structures and services (existing and future); and,
- Confined spaces (e.g. built structures).

PHASE 2 GQRA

1.3.4. Three boreholes (BH101, BH103B and BH104A) were advanced using vacuum excavation followed by percussive and rotary drilling techniques. Soil samples were collected as part of the drilling works and groundwater monitoring wells installed in all boreholes.

1.3.5. Ground conditions comprised Made Ground to a maximum proven depth of 1.5 m below ground level (bgl) although likely to be considerably deeper surrounding the petroleum infrastructure. The underlying geology comprised a firm yellowish brown gravelly clay with a low cobble content of sub-angular to subrounded sandstone, gravel is sub-angular to subrounded fine to coarse of sandstone. This was followed by grey orangish brown and black interlaminated mudstone and siltstone.

1.3.6. Representative soil samples were collected during drilling works and analysed for potential contaminants of concern.

1.3.7. During a subsequent monitoring round, groundwater was encountered between 1.38 m and 2.28 m bgl.

Contamination Status

Field Observations

1.3.8. No visual or olfactory evidence of gross contamination of soils was encountered during the ground investigation.

Soil Analytical Results

- Asbestos was present in BH101 at 0.5 m bgl comprising loose fibres of chrysotile quantified at <0.001%;
- Concentrations of metal compounds (arsenic, beryllium, cadmium, chromium, copper, lead, nickel, vanadium and zinc) were above the LOD in all samples;
- TPH was recorded above LOD in one sample (BH102, 0.5 m bgl);
- Total poly-aromatic hydrocarbons (PAH) was recorded above LOD in six samples with the highest concentration recorded within BH103 at 1.5 m bgl;
- Methyl tertiary butyl ether (MTBE) and total benzene, toluene, ethylbenzene and xylene (BTEX) recorded all below LOD;
- Dichloromethane was recorded at trace concentrations in one sample (BH103B at 4.6 m bgl). All other volatile organic compounds (VOCs) are recorded below the LOD; and,
- Semi-volatile organic compounds (SVOCs) all recorded below LOD.

Groundwater Analytical Results

- Marginally elevated pH was recorded in BH101;

- Concentrations of heavy metals were recorded above the LOD for all samples, with locally elevated barium in BH103B and chromium and copper in BH101;
- Significantly elevated concentrations were reported in BH101 comprising heavy range aliphatic hydrocarbons (C21-C35);
- Total PAH was recorded above the LOD in BH101 comprising a range of PAH determinands; and,
- MTBE was detected above the LOD in two of the three sample (BH103B (18.8 µg/l) and BH104A (18.1 µg/l)).

Risk Assessment

Human Health

1.3.9. Following the analysis of soil samples from across the site, no chemical exceedances of the GAC for a continued commercial land use were identified. As such, the overall human health risks to on-Site and off-Site receptors were considered low risk. It should be noted that asbestos was identified in one location at a quantification of <0.001%. However, the hardstanding cover across the site is considered to remove the exposure pathway.

1.3.10. Based on the identification of trace quantities of asbestos within one exploratory location, it is considered that asbestos may be present in other areas of Made Ground not investigated to date.

1.3.11. Potential temporary exposure risks during planned excavation works should be managed using appropriate work control measures and personal protective equipment (PPE) during redevelopment works when hardstanding cover is removed from site.

Controlled Waters

1.3.12. All groundwater analytical results were screened against relative vapour screening criteria for a commercial exposure scenario for a sand soil type. Upon review of the results the majority of exceedances are considered marginal and within the same order of magnitude as the adopted screening criteria. Exceptions for this are noted for aliphatic C12-16 and aromatics C21-35 which were identified in elevated concentrations in BH101. There were no proximal sources for the elevated concentrations identified and the location is considered to be on the upgradient boundary, based on the anticipated groundwater flow. Any significant impact from current or historical petroleum infrastructure would likely be picked up in the other exploratory locations (BH103B and BH104A), as such it is anticipated that the elevated concentrations represent a discrete localised source.

Conclusions

1.3.13. The GQRA results indicate that soil and groundwater condition beneath the Site present a low risk to identified human health receptors and a low/moderate risk to identified controlled waters.

1.3.14. Although there are data gaps surrounding the petroleum infrastructure, the overall condition of the Site suggests that any additional unidentified contamination may be limited in extent, low mobility in nature and unlikely to modify the overall risk profile set out. However further works would be required to confirm absence of significant contamination.

1.3.15. The site benefits from being within an area where the geological profile is well established, and where 1:10,000 scale mapping has been published which shows the location of seam outcrops and outcrops of higher strength sandstone units in some detail. In addition, there are abandonment plans which help to locate workings at depth to some accuracy. The data shows there is a 66 cm thick seam at 44 m depth and dipping gently away to the south-east. The next coal seam is a further 40 m beneath the higher seam and this is more than adequate to not produce cumulative settlement risk at the site.

1.3.16. It was noted that a mining claim has been lodged with the Coal Authority for two land parcels on the west side of Newbold Road. The location of these claims matches an old air shaft and the shaft of former Home Close Colliery. Geological mapping indicates that these two features will have been sunk through the Parkgate Sandstone and this will provide a stable rock zone around the necks of the shafts. This suggests that, even in the untreated scenario, any settlement effects would likely arise from collapse of near surface Made Ground and completely weathered Coal Measures materials. In this setting, and with a bedrock depth of 3.5m, lateral effects should be limited to 10.5 m. This means that possible settlement effects will not pass across Newbold Road and will be located away from the Site's closest edge.

1.3.17. The above assessment shows that placing foundations of the type already designed to configurations and depth stated in the CMRA report should result in stable foundations. For the reasons set out in the CMRA it is concluded that no mitigation measures are necessary to address any coal mining legacy issues affecting the Site. The CMRA was prepared to meet the requirements of national planning policy with regard to development on unstable land.

1.4 OBJECTIVES AND SCOPE OF WORK

1.4.1. The objectives of the phase of work described hereafter in this report were to:

- Investigate and assess the quality of soil below and around the tanks and fuel distribution lines, prior to the installation of the new infrastructure, in support of discharge of the aforementioned planning conditions; and,
- To assist the contractor with their duties to characterise waste soil arisings for appropriate off-Site disposal.

1.4.2. On the basis of the Phase 2 data and the subsequent assessment, no specific remediation measures were identified as being required as part of the works. In order to meet the objectives described above, the following scope of work was completed:

- Excavation of trial pits in the areas to target soils within areas of potential concern (existing USTs, fuel lines and fuel dispensing areas), and areas of the new proposed infrastructure for waste characterisation purposes;
- Provision of advice regarding removal of waste soils;
- Periodic attendance during the decommissioning and excavation works;
- Collection of soil samples from the base and sides of the decommissioned tank farm;
- Collection of soil samples from beneath the removed fuel lines on the forecourt;
- Collection of soil samples from the base and sides of the decommissioned interceptor;

- Screening of soil contaminant concentrations obtained through the additional works against Generic Assessment Criteria (GAC) to further assess potential risks; and,
- Completion of an updated CSM incorporating all data obtained over the various phases of investigation.

1.5 LIMITATIONS, RELIANCE AND ACCREDITATIONS

1.5.1. The report may be relied upon by Esso, as “the Client” within the meaning given to that phrase within the agreement and subject to the terms and conditions contained therein.

1.5.2. This report has been completed with regard to generally accepted consulting practices and may not be relied upon by another party without the explicit written agreement of WSP. No other third-party warranty, expressed or implied, is made as to the professional advice included in this report. This report must be used in its entirety. Unless otherwise stated in this report, the assessments made herein assume that the current land use will be maintained and no account has been taken for change of use requirements.

1.5.3. In production of this report, WSP has used data, information and reports provided by and third-party consultants. WSP has used the data in good faith to enable an assessment of the site in its current condition.

1.5.4. Unless WSP has actual knowledge to the contrary, WSP shall assume the correctness and completeness of, and shall have no liability in respect of any inaccuracy, defect or omission in any information or materials provided, anecdotally or otherwise, by the Client or any other third party to WSP. WSP does not assume any liability for misrepresentation of information or for items not visible, accessible, present or supplied at any time of the study.

1.5.5. Further Information is presented in **Appendix G**.

2 REDEVELOPMENT INVESTIGATION: METHODOLOGY

2.1 SUMMARY OF REDEVELOPMENT WORKS

2.1.1. The tank and fuel distribution replacement works were undertaken by Fox Construction commencing in August 2023 and completed on 30th November 2023; and comprised the following works:

- Dismantling and removal of the canopy, and refurbishment;
- In-situ decommissioning and subsequent removal of three underground storage tanks (USTs) comprising five compartments;
- Removal of fuel distribution lines and fuel dispensing islands;
- Removal of offset fill and stack;
- Installation of two new 60,000 Litre new double-skinned multi-compartment USTs;
- Installation of new secondary contained fuel lines and dispensing pumps; and,
- Installation of new below ground offset fill point and vent stack.

2.2 SUMMARY OF ENVIRONMENTAL WORKS

2.2.1. Key features of the environmental works undertaken in support of the tank and fuel line distribution replacement are shown in Figure 2 (Appendix A), and comprised:

- Excavation of five trial pits (TP01 – TP05) on the 22nd of August 2023, prior to the main excavation works to allow for soil sampling for preliminary environmental and waste classification purposes (total of 21 No. samples);
- Collection of 16 No. tank farm validation soil samples on the 8th of September 2023; and,
- Collection of eight fuel line validation soil samples on the 5th of October 2023.

2.2.2. Validation soil samples were scheduled for the contaminants of concern (CoC) identified in the Phase 2 Site Investigation report. In addition, soil samples collected from the trial pits were scheduled for a general suite of analysis and Waste Acceptance Criteria (WAC) testing.

2.2.3. The trial pits were logged in general accordance with the requirements of BS5930: 2015 and BS EN ISO 14688 Pt 1&2. Detailed logs are provided in **Appendix C.**

2.3 SOIL SAMPLING METHODOLOGY

2.3.1. Soil samples were collected by excavator and sub-sampled by hand (using designated nitrile gloves for each sampling location) during the following phases of works:

- Trial Pit samples were collected from a variety of depths ranging between 0.4 m bgl to 2.9 m bgl from TP01-TP05;
- Tank farm excavation samples (VS01-VS16) were taken from a depth of 4.0 m bgl in the base of excavation following tank removal; and,
- Fuel line samples (L1-L8) were collected from between 0.5 m- 1.0 m bgl.

2.3.2. Headspace screening using a photo ionisation detector (PID) to measure the presence of volatile organic compounds (VOCs) within soil arisings were undertaken periodically. The PID was calibrated

at the beginning of each sampling day using 100 ppm isobutylene gas. PID readings are discussed where appropriate.

2.3.3. Visual and olfactory evidence of contamination was also recorded during works where present. These observations were used to aid the selection of targeted sampling depths where appropriate, the requirement for some source removal (contaminated soils), and, in association with the results of the headspace screening, the schedule of soil sample analysis.

2.3.4. Samples collected for laboratory analysis were placed immediately in laboratory supplied sampling containers, specific to the anticipated type of analysis required.

2.3.5. Sample containers were sealed and labelled with a unique identity, depth (where relevant) and date of sampling. Soil samples were transported in cool boxes to the laboratory at the end of each working day under chain of custody documentation.

2.4 LABORATORY ANALYSIS

2.4.1. All chemical testing of soil and groundwater was carried out by ALS Laboratories in Hawarden (ALS); a UKAS accredited laboratory. Analysis was conducted to MCERTS standards where applicable and available.

2.4.2. Samples were tested for a range of analytes as summarised in Table 2-1. Full details of the samples collected and schedules of testing are presented in **Appendix D.**

Table 2-1 – Chemical Analytical Suite and Sample Numbers – Soil Analysis

Analyte	Trial Pit Samples	Tank Farm Samples	Fuel Line Samples
Total Petroleum Hydrocarbons Criteria Working Group (TPH CWG)	18	16	8
Polyaromatic Hydrocarbons (PAHs)	18	16	8
Hexavalent Chromium (Cr VI)	18	16	8
Total Organic Carbon (TOC)	18	-	8
Gasoline Range Organics (GRO)	18	16	8
CLEA Metals – Arsenic, Beryllium, Cadmium, Chromium, Copper, Nickel, Zinc, Lead, Mercury and Vanadium	18	16	8
Asbestos Identification	18	16	8
Waste Acceptance Criteria (WAC)	18	-	-
Volatile Organic Compounds (VOCs)	18	16	8
Semi-Volatile Organic Compounds (SVOCs)	18	16	8
pH	18	-	8

2.5 QUALITY CONTROL

2.5.1. Analytical quality control (QC) of soil samples were analysed by ALS in accordance with the relevant methods of analysis. The purpose of this QC testing is to verify that the repeat analysis returns data within the acceptable percentage (control limits). Testing is listed as surrogate/recovery percentages, all of which should fall within the acceptable range of 70% to 130%.

2.5.2. WSP has reviewed the results and have noted that some of these recovery values for soils fall outside of the acceptable limits stated above, exclusively for GRO compounds as can be seen on the screening assessment tables included within **Appendix D**. The reasoning for the values falling outside of the acceptable range has been attributed to matrix interference (elevated levels of organic matter) by the laboratory.

3 GROUND CONDITIONS

3.1.1. Ground conditions encountered during the tank ad fuel distribution line replacement works were broadly consistent with those recorded (BH101 – BH104) during the previous Phase 2 investigation. A summary of ground conditions encountered to date is provided in Table 3-1 and the exploratory hole logs associated with the trial pits presented in **Appendix C**.

Table 3-1 – Summary of Site Geology

Strata	Base of Strata (m bgl)	Thickness of Strata (m)	Comments
Surface covering	0.20 – 0.25	0.20 – 0.25	Tarmac
	0.16 – 0.20	0.16 – 0.20	Reinforced concrete
Made Ground (Granular)	0.90 – 1.50	0.90 – 1.30	Reddish brown very sandy gravel with a high cobble content of sub-angular brick. Gravel comprises sub-angular brick, concrete and tarmac.
			Dark grey slightly gravelly slightly sandy clay. Gravel is sub-angular brick.
Lower Coal Measures	1.20	0.30	Yellowish brown clayey sub-angular to sub-rounded gravel of sandstone.
	3.00	1.50	Firm yellowing-brown gravelly clay. Gravel is sub-angular to sub-rounded fine to coarse of Sandstone and Mudstone.
	3.50	0.50	Yellowish-brown fine-grained sandstone
	Not proven (>5.16)	Not proven (>1.66)	Grey mottled orangish brown and black interlaminated mudstone and siltstone.

3.2 VISUAL AND OLFACTORY EVIDENCE OF CONTAMINATION

ASBESTOS

3.2.1. No asbestos or suspected asbestos containing materials were visually identified during the site works.

PETROLEUM HYDROCARBONS

3.2.2. No visual or olfactory evidence of petroleum hydrocarbon contamination was identified during the trial pit investigation or tank farm sampling.

3.2.3. Trial pit TP05 was excavated in close proximity to BH101, where previously elevated concentrations of hydrocarbon determinands were noted during the ground investigation. With the exception of a small amount of perched water which was present in some granular made ground deposits which recorded a slight hydrocarbon odour, no further evidence of contamination was noted. The excavation

was extended to surround BH101to confirm the absence of potential source material which may impact groundwater. No evidence of contamination as encountered during the excavation, with laboratory results (see Section 3.3, TPH <LOD) further confirming this. No further remedial / exploratory works were deemed necessary following this.

3.2.4. During the fuel line sampling, mild to moderate hydrocarbon odours were identified in sample L3 obtained of loose soil/clay removed from excavation adjacent to Newbold Road and sample L4 obtained from adjacent to the fuel dispensers in the middle of the Site. The PID readings for these samples were 31.8 ppm and 4.3 ppm respectively.

3.3 LABORATORY RESULTS

3.3.1. Full laboratory certificates for all samples collected as part of the validation exercise are presented in **Appendix D**.

TRIAL PIT LABORATORY RESULTS (TP01 – TP05)

- No asbestos was detected in any of the samples however non-asbestos fibres were detected in TP03 at a depth of 0.5 m bgl.
- Concentrations of metals were typically within the same order of magnitude across the samples analysed;

  Hexavalent chromium and mercury were below the LOD in all samples;
- TPH concentrations were detected above the LOD in five of the eighteen samples analysed, with a further four samples less than 100 mg/kg. Maximum concentration of 1,710 mg/kg recorded at TP01 0.5 m bgl;
- Total PAH was recorded above the LOD is seven of the eighteen samples;

  Where above LOD, total PAH concentrations were recorded between 0.326 mg/kg in TP02 at 0.5 m bgl and 2.00 mg/kg in TP04 at 0.5 m bgl; and,
- MTBE and BTEX were recorded below the LOD in all samples.

TANK FARM VALIDATION LABORATORY RESULTS (VS01 – VS16)

- No asbestos or non-asbestos fibres were detected in the samples.

  TPH concentrations are below LOD in all samples. Low to trace concentrations of individual hydrocarbon bands were recorded in eight of the 16 No. samples.
- Total PAH was detected above the LOD in five of the 16 No. validation samples.

  Where above the LOD concentrations were recorded between 0.19 mg/kg (VS04) and 0.405 mg/kg (VS13);

  No individual species of PAH dominated detected concentrations.
- MTBE and BTEX

  MTBE was detected above the LOD in four of the 16 No. samples. Where there were elevated concentrations, they ranged from 0.0121 mg/kg (VS10) to 0.0474mg/kg (VS04); and,

  BTEX concentrations were recorded over the LOD in one sample at 0.088 mg/kg within VS10.

FUEL LINE VALIDATION LABORATORY RESULTS (L1 – L8)

- No asbestos or non-asbestos fibres were detected in the samples;
- TPH concentrations were detected above LOD in five of the eight samples;

  TPH recorded a maximum concentration of 85.5 mg/kg (L5);

  The highest concentrations determinands were detected within heavy range aromatics;
- Total PAH was detected above LOD in seven of the eight samples, with concentrations ranging between 0.191 mg/kg (L3) and 7.97 mg/kg (L7);

  No individual species of PAH dominated detected concentrations;
- Carbon disulphide was detected above the LOD in six of the eight samples (L2, L4, L5, L6, L7 and L8) with a maximum concentration of 0.0557 mg/kg in L6. All other VOC concentrations are below the LOD;
- SVOCs were detected above LOD in four of the eight samples (L5,L6, L7 and L8). Maximum concentration was detected in L7 (pyrene at 0.948 mg/kg); and,
- MTBE and BTEX compounds were recorded as being below LOD in all samples.

SUMMARY OF RESIDUAL HYDROCARBON IMPACT

3.3.2. The results of the trial pitting and tank farm sampling has shown an absence of elevated concentrations of petroleum hydrocarbons in the majority of locations, with the exception of shallow soils (0.5 m) at TP01 in the west of the site adjacent to a former fuel dispenser. It should be noted that deeper samples from TP01 do not indicate a significant impact with samples below 2 m bgl report as less than the LOD indicating a localised, shallow impact. Whilst the results of the fuel line validation sampling has indicated low concentrations of hydrocarbons in a number of shallow samples adjacent to former fuel dispensers, the concentrations do not indicate gross contamination and are not considered to pose an ongoing risk.

3.3.3. TP01 was undertaken prior to the removal of any infrastructure or soils. It is understood that material at this depth would have been removed as part of the redevelopment in the former fuel dispensers. This represents a betterment of soils achieved through the source removal works.

3.3.4. Localised groundwater impact previously identified in BH101 was investigated through the excavation of TP05 in close proximity to the borehole, encompassing the area to delineate any residual source material. With the exception of a small amount of perched groundwater, no evidence of hydrocarbon contamination was encountered in the sub-surface and further investigation or assessment works were not warranted.

3.3.5. On the basis of the above, the residual impact following the completion of the source removal and infrastructure replacement works is considered to be low.

4 RISK ASSESSMENT

4.1 OVERVIEW

4.1.1. This section presents the findings of the risk assessment undertaken to assess potential risks to human health and controlled water receptors associated with the residual concentrations of CoC in soil and groundwater at the site. The assessment has been undertaken in accordance with guidance issued by the Environment Agency.

4.1.2. This assessment defines the potential risks to human health receptors through comparisons of the soil quality data against Generic Assessment Criteria (GAC) for a commercial end use.

4.1.3. A qualitative risk assessment with respect to controlled water receptor has also been undertaken as part of this report as outlined below.

4.2 GENERIC QUANTITATIVE RISK ASSESSMENT

4.2.1. The analytical results for the validation soil samples collected during the tank, fuel distribution line and forecourt interceptor replacement works. As well as the validation samples taken around the area of potentially impacted soils have been compared against the selected assessment criteria for human health. In addition, although the primary objective of the trial pit sampling was for waste classification, these samples have also been used as part of the screening exercises to ensure completeness.

HUMAN HEALTH

4.2.2. Detailed descriptions and supporting information for the derivation of human heath GAC are presented in **Appendix E**, however the following describe a number of critical aspects in the GAC selection:

- Based on the continued petroleum usage of the site, the reported soil concentrations were compared against the GAC for a commercial end use;
- GACs for hydrocarbon compounds are typically sensitive to the degree of soil organic matter (SOM) present in the environment. The Phase 2 Report used site specific results to determine the average SOM. An average soil organic matter (SOM) of 1.94% was calculated based the range between 0.344% and 22.6%. a 1% SOM was considered to be the most conservative.
- In the case of asbestos, the GAC is a simple pass or fail on the basis of the absence or presence of the substance (respectively) in the sample assessed.

4.2.3. For a number of contaminants, direct contact is the dominant potential pathway for exposure. As a conservative measure, human exposure to all unsaturated soils, irrespective of depth, was assumed. Should any exceedances of GAC be identified, potential pathways will be discussed.

Soil Results

4.2.4. Reported concentrations of CoCs were below the adopted GAC for all validation soil samples collected at the site. Asbestos was not positively identified in any sample collected. The full screening exercise is presented in **Appendix E.**

4.2.5. Furthermore, the risk of direct exposure of current and future site users and workers is considered negligible due to the reinstatement of the forecourt with imported quarried ‘Type 1’ aggregate and site wide hardstanding. Whilst the potential risk of the inhalation of volatile compounds cannot be discounted, based on the absence of a significant source and the outdoor nature of the site this risk

is considered to be low. On this basis, these reinstatement works are considered to result in a low risk to human health receptors based on the continued use as a service station.

Summary

4.2.6. Based on the information gathered from the site during all phases of investigation, the potential risk to human health is considered to be low.

4.2.7. On the basis of the above, there is not considered to be any additional work required to define the residual and ongoing risk to human health at the site.

CONTROLLED WATERS

4.2.8. Risks to controlled waters have not been quantitively assessed as part of this report.

4.2.9. Underlying groundwater within the Lower Coal Measures (Secondary A Aquifer) and nearby watercourses within a hundred metre radius, were identified as potential controlled water receptors.

4.2.10. Laboratory analysis of soil samples collected as part of validation works confirmed the general absence of elevated concentrations of highly soluble or mobile risk driver compounds (such as light end TPH fractions of BTEX compounds) that could represent a potential risk to the identified controlled waters receptors.

4.2.11. The removal of Made Ground and identified contaminated soils across the site (and particularly TP01) and the replacement of fuel infrastructure alongside soils in the immediate vicinity of the infrastructure has allowed for an improvement in site conditions with less potential source material available to leach to the underlying aquifer and migrate to the identified receptors. The presence of new hardstanding reduces surface infiltration or rainwater and vertical leaching of potential contaminants within shallow soils and overall mass flux to groundwater.

Summary

4.2.12. The overall risk to controlled water receptors posed by the site condition on the basis of the available site data is considered to be low. As such, further assessment of risk posed to controlled waters is not considered to be necessary.

5 REVISED CONCEPTUAL SITE MODEL

5.1 INTRODUCTION

5.1.1. The CSM presented in Section 8 of the Phase 2 Site Investigation Report (ref. 70102251–002, dated June 2023) has been reviewed based on the results of the validation works and outcome of the quantitative risk assessment.

5.2 REVIEW OF CSM

5.2.1. A review of the potential pollutant linkages is provided in Table 5-1. Risk rating is based upon CIRIA C552 classifications, included in **Appendix F**.

Table 5-1 – Risk Appraisal Matrix

Source	Pathway	Receptor	Risk	Comments
Current and historic site use – Petroleum Retail Service Station Made Ground of unknown provenance	Soil ingestion, dermal contact and inhalation of dust	On site commercial workers	Severity: Medium Probability: Unlikely Risk: **Low**	The laboratory results of the validation sampling have shown that tested contaminant concentrations are below the GAC considered protective of a commercial end use. Furthermore, site wide hardstanding further prevents a viable pathway from being present. Results are considered to support findings of the Phase 2 investigation.
		Construction / maintenance workers Nearby residents during ground disturbance	Severity: Mild Probability: Unlikely Risk: **Very Low**	The laboratory results of the validation sampling have shown that tested contaminant concentrations are below the GAC considered protective of a commercial end use. Results are considered to support findings of the Phase 2 investigation. Any residual risk during future excavation works to be managed through appropriate work control procedures and PPE.
	Inhalation of asbestos fibres	On site commercial workers	Severity: Medium Probability: Unlikely Risk: **Low**	No viable pathway between potential asbestos in Made Ground soils and current site users due to the presence of site wide hardstanding.
		Construction / maintenance workers Nearby residents during ground disturbance	Severity: Mild Probability: Unlikely Risk: **Very Low**	Asbestos fibres were not identified during the redevelopment works but were previously identified during the Phase 2 ground investigation. The potential presence of unidentified asbestos containing materials cannot be discounted; however, the majority of shallow soils at the Site have been replaced with quarried Type 1 aggregate and/or pea shingle around infrastructure. Any residual risk during future excavation works to be managed through appropriate work control procedures and PPE. This report should form part of the Health and Safety file for the site.
	Volatilisation and migration of vapours leading to vapour	On site commercial workers	Severity: Medium Probability: Unlikely Risk: **Low**	None of the soil concentrations exceeded the appropriate GAC, with the volatile contaminants (VOCs and light range hydrocarbons) detected at low concentrations or below LOD. There is no identified viable source present capable of generating volatile vapours.

Source	Pathway	Receptor	Risk	Comments
	inhalation within buildings			
	Leaching to deep groundwater and lateral migration to surface water	Bedrock, (Lower Coal Measures) *Secondary A Aquifer*	Severity: Medium Probability: Unlikely Risk: **Low**	Infrastructure replacement works confirmed the absence of gross hydrocarbon impact or significant concentrations of highly soluble or mobile risk driver compounds (e.g. light end TPH fractions or BTEX compounds) in the soil with the potential to leach into underlying groundwater. The findings of the Phase 2, which included a quantitative assessment of controlled waters receptors have been verified with source removal works and replacement infrastructure reducing the risk of impact to the identified receptors.
	Lateral migration to surface water	Un-named watercourses culverted in sections, located to the west and south-east of the Site	Severity: Medium Probability: Unlikely Risk: **Low**	

6 SUMMARY AND CONCLUSIONS

6.1 SUMMARY

6.1.1. The redevelopment works at Chesterfield Express Service Station were undertaken by Fox Construction commencing in August 2023 and completed on 31st November 2023.

6.1.2. The redevelopment works comprised the replacement of existing fuel tanks, pumps, fills, fuel lines, forecourt surfacing with minor alterations to pedestrian access and parking around the Site.

6.1.3. WSP attended Site periodically through August, September and October 2023 to collect soil samples for waste classification purpose and to obtain validation samples from the final excavation limits associated with the removal of the below ground fuel infrastructure and any identified contaminated soils.

HUMAN HEALTH RISK ASSESSMENT

6.1.4. Residual soil concentrations assessed as part of the validation works, were below the adopted assessment criteria, protective of the identified human heath receptors based on the continued petroleum use. As such, subsurface soils are not considered to present an unacceptable risk to the identified on and offsite human receptors.

CONTROLLED WATERS RISK ASSESSMENT

6.1.5. The findings of the previous Phase 2 Investigation Works (2023) identified elevated hydrocarbons in BH101 at concentrations with the potential to impact wider groundwater. During the infrastructure replacement and validation sampling works, a trial pit (TP05) was undertaken in proximity to BH101. The laboratory results at this location confirmed the absence of gross hydrocarbon in this area and absence of elevated concentrations of highly soluble or mobile risk driver compounds (e.g., light end TPH fractions or BTEX compounds) in the soil with the potential to leach into the underlying aquifer.

6.2 CONCLUSIONS

6.2.1. Based on the available data, the site is not considered to pose an unacceptable risk to the identified receptors.

6.2.2. Should any of the conditions on which the risk assessment has been based alter in the future, then the risk assessment should be updated accordingly to reflect these factors.

7 DISCHARGE OF CONDITIONS

7.1.1. The client submitted an Application for the Discharge of Conditions ref: CHE/23/00414/DOC (for planning application CHE/23/00220/FUL) on 5th July 2023. This aimed to discharge condition 3, Condition 6 and Condition 7. Please note Condition 3 lies outside the scope of this report and is not discussed further. As mentioned in Section 1.3 WSP produced a CMRA (dated June 2023) to inform the application.

7.1.2. As previously stated in Section 1.2, Condition 6 and Condition 7 are:

06. No development shall commence until;

a) a scheme of intrusive investigations has been carried out on site to establish the risks posed to the development by past coal mining activity, and;

b) any remediation works and/or mitigation measures to address land instability arising from coal mining legacy, as may be necessary, have been implemented on site in full in order to ensure that the site is safe and stable for the development proposed.

07. Prior to the occupation of the development, or it being taken into beneficial use, a signed statement or declaration prepared by a suitably competent person confirming that the site is, or has been made, safe and stable for the approved development shall be submitted to the Local Planning Authority for approval in writing. This document shall confirm the methods and findings of the intrusive site investigations and the completion of any remedial works and/or mitigation necessary to address the risks posed by past coal mining activity.

7.1.3. A response to the application for discharge to conditions was issued by Chesterfield Borough Council, dated 7th November 2023. This confirmed the discharge of Part A of Condition 6 namely *"no development shall commence until: a) a scheme of intrusive investigation has been carried out on site to establish the risks posed to any development by past coal mining activity".*

7.1.4. However, this response confirms that Condition 6B and Condition 7 remained and *"cannot be discharged until work on site has been completed".*

7.2 CONDITION 6B

7.2.1. As summarised in Section 1.3, the CMRA produced by WSP (June 2023) concluded that no remedial or mitigation measures are necessary to address any coal mining legacy issues affecting the site for the following reasons:

- The site is located in an area where the geology is well established, including mapping of seam outcrops. The sequence of bedrock is comprised of a sequent of mudstone, siltstones and sandstone underlain by the Parkgate Rock sandstone unit between 0m and 12m thickness;
- Abandonment plans are available which help location working depths to some accuracy. Based on available information the shallowest coal seam on site is at the base of the Parkgate Rock Sandstone at a depth of 44m and thickness of 66cm known as the Low Main/ Thorncliffe/ 1st pipe seam. Another coal seam underlying the site is the Blackshale at a depth of 84m/85m and thickness of 256cm.
- Calculations undertaken within the CMRA show that void migration would stall or choke tens of metres beneath the stress bulb of new foundations (proposed foundation depth of 2m bgl).
- Whilst Coal Authority mapping shows two mining claims in proximity to the site, the two features identified (old air shaft and shaft of former colliery) will have been sunk through the Parkgate

sandstone which provides a stable rock zone around the neck of the shafts, restricting settlement effects on site.

7.2.2. The key structure identified to be at risk from any ground instability, would be the canopy and associated infrastructure. Design drawings and site investigation records assessing the bearing capacity of the sub-surface strata are included in **Appendix H**.

7.2.3. Based on the information above, the report concluded that no mitigation measures were required. The redevelopment works at the site have been undertaken on this basis and as such the site considered safe and stable for the development. It is therefore satisfactory for Condition 6B to be discharged.

7.3 CONDITION 7

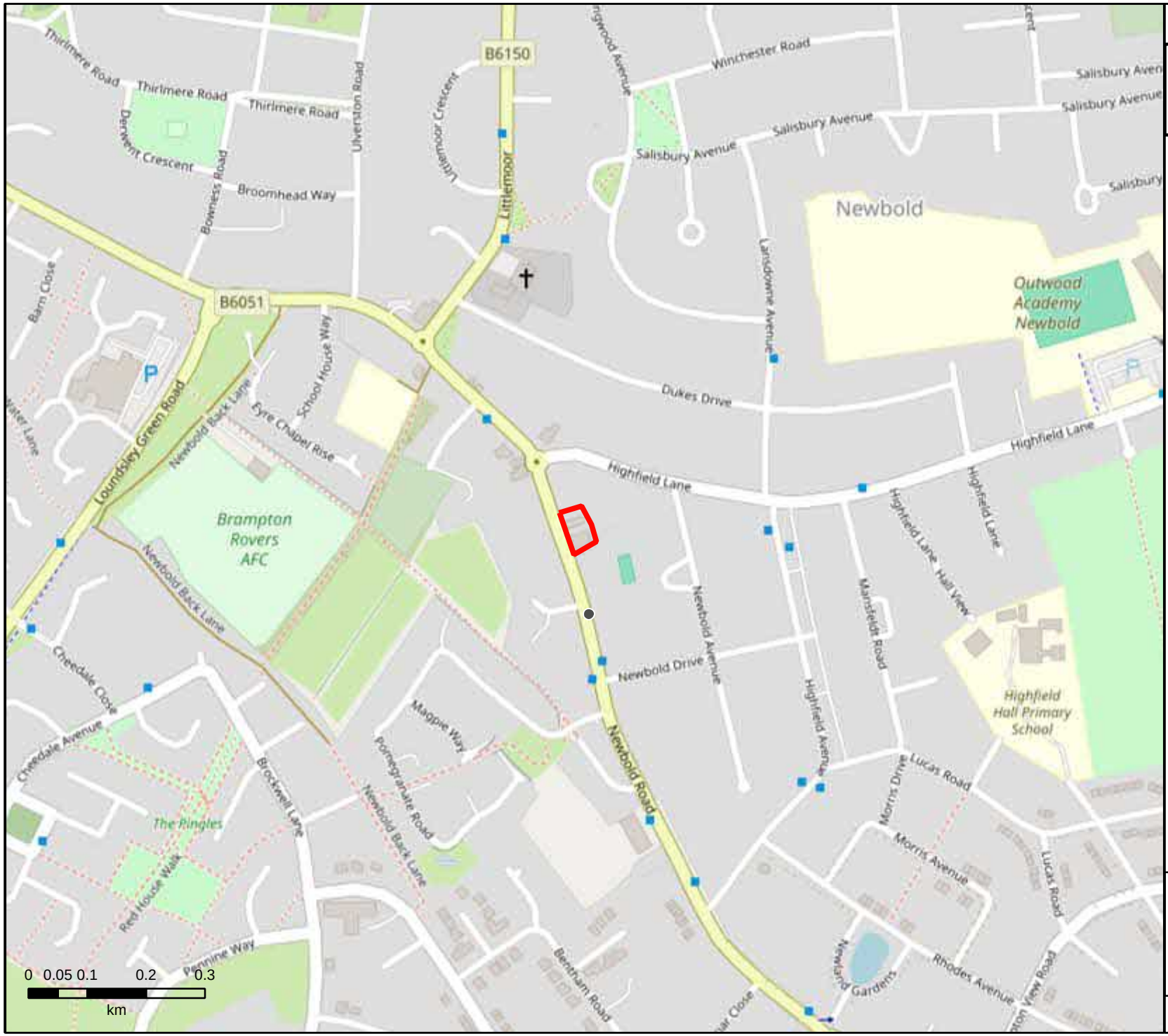
7.3.1. The information contained within this report states that on the basis of the geo-environmental works undertaken prior to and during the redevelopment works the site has been safe and stable and is suitable for the redevelopment.

7.3.2. As per the information above, the CMRA has stated that remedial/mitigation measures are not required for the site development and that the potential risk associated with past coal mining activity is considered to be low.

7.3.3. On the basis of the information above, this report is considered sufficient to discharge Condition 7.

Appendix A

FIGURES



DO NOT SCALE

Information Classification:

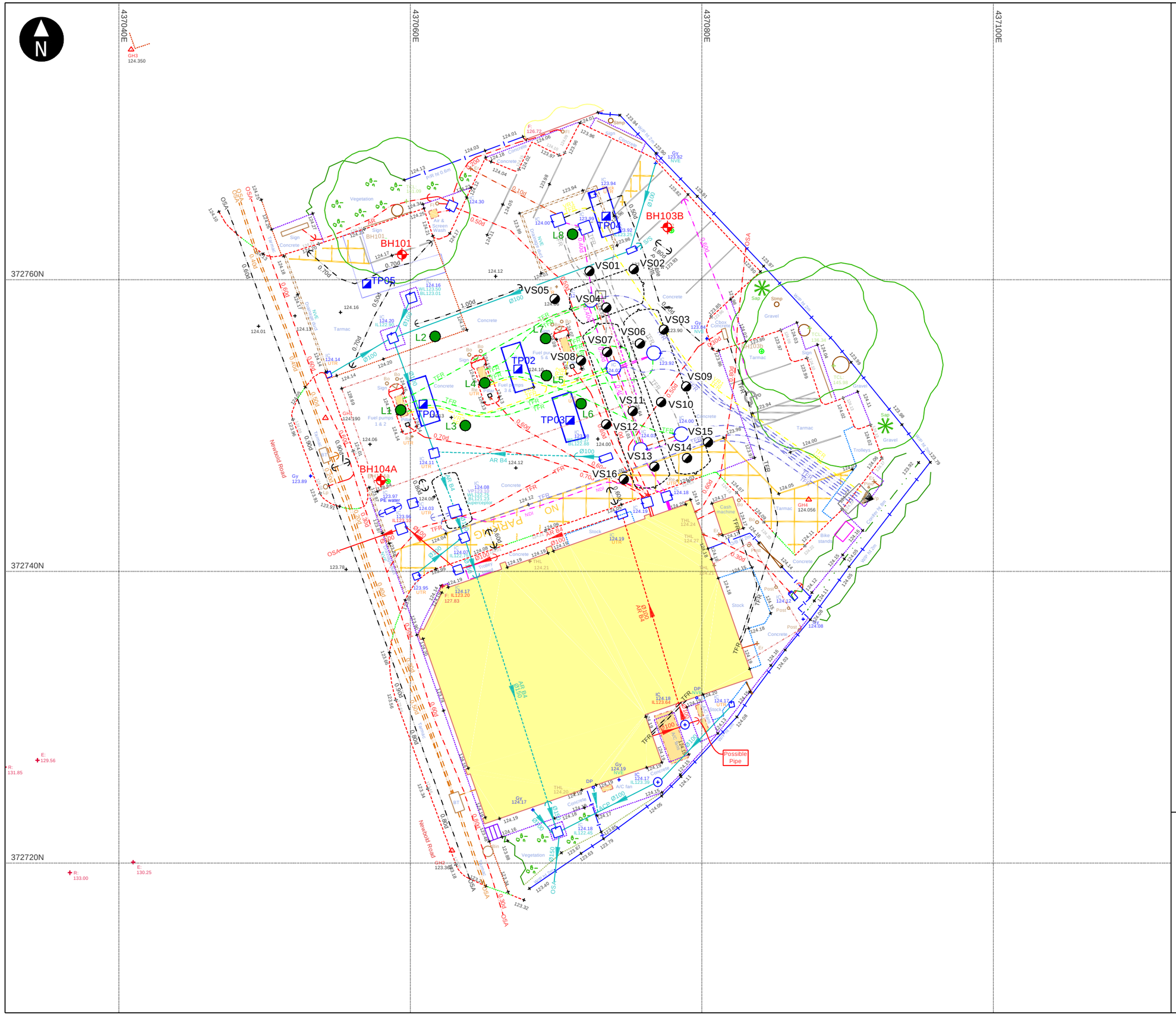
INTERNAL

Information that is only intended for internal distribution among WSP employees, independent consultants, contractors, sub-contractors, clients and authorised third parties.

Legend :

Site boundary

Title : Figure 1 - Site Location
Author : ArcGIS Web AppBuilder
Scale : 1:9,028
Layout : WSP A4 Landscape
Current Time : 16/01/2024 13:43



Drawing based on "45874_T_UG_REV0.dwg" Dated "4.12.23"
Courtesy of "Greenhatch Group"

Chesterfield Express Service Station

Figure 2
Sample location plan

February 2024

\\uk.wspgroup.com\Central Data\Projects\70102xxx\70102251 - Chesterfield Express SS - Tank and Line\Drawings\ACAD\70102251-WSPE-FG-OC-00001_P01.1.dwg Originator: UKBLB775

Appendix B

PLANNING DOCUMENTS

File No. 2/ **CHESTERFIELD BOROUGH COUNCIL** Form TCP3

Town and Country Planning Act 1990
Town and Country Planning (Development Management Procedure) (England) Order 2010

Bowman Riley Architects
Mr Colin Ruddock
Wellington House
Otley Street
Skipton
BD23 1EL

Planning Service
Town Hall
Chesterfield
S40 1LP

In pursuance of the powers vested in the Chesterfield Borough Council under the above Act and Orders, and with reference to your application **(Office Code No. CHE/23/00220/FUL)** submitted on the **5th April 2023** and validated on the **13th April 2023** for **Replacement of existing canopy, fuel tanks, fills, pipework, forecourt and alterations to existing parking arrangement** at **Chesterfield Express, Newbold Road, Newbold, Chesterfield, Derbyshire,** for **Esso Petroleum Company Limited**

In the manner described on the application and shown on the accompanying plan(s) and drawing(s) **NOTICE IS HEREBY GIVEN** that permission for the proposed development is **GRANTED subject to the following condition(s):-**

01. The development hereby permitted shall be begun before the expiration of three years from the date of this permission.

Reason: The condition is imposed in accordance with section 51 of the Planning and Compulsory Purchase Act 2004.

02. The development hereby approved shall only be carried out in full accordance with the approved plans:

DWG No. 001P 'Site Location Plan'	(Published 05.04.2023)
DWG No. 025P 'Proposed Tank Details'	(Published 05.04.2023)
DWG No. 070P 'Proposed Surface Details'	(Published 05.04.2023)
DWG No. EXX-PMR14-WV-001 'Wave Spreader'	(Published 05.04.2023)
DWG No. 015P Rev. P1 'Existing Site Features Removed'	(Published 13.04.2023)
DWG No. 020P Rev. P1 'Proposed General Arrangement'	(Published 13.04.2023)
DWG No. 031P Rev. P1 'Proposed Elevations'	(Published 13.04.2023)

Reason: In order to clarify the extent of the planning permission in the light of guidance set out in "Greater Flexibility for planning permissions" by CLG November 2009

03. Prior to commencement of the development hereby permitted details of a construction management plan shall be submitted to and approved in writing by the Local Planning Authority. The approved plan shall be adhered to throughout the demolition/construction period. The plan/statement shall include but not be restricted to:

Parking of vehicle of site operatives and visitors (including measures taken to ensure satisfactory access and movement for existing occupiers of neighbouring properties during construction).
Locations for loading/unloading and storage of plant, waste and construction materials.
Arrangements for turning vehicles.
Arrangements to receive abnormal loads or unusually large vehicles.

Reason: In the interests of safe operation of the adopted highway in the lead into development both during the demolition and construction phase of the development, in accordance with Local Plan Policies CLP20 and CLP22

04. The parking and turning facilities shall be provided as shown on drawing – Drawing No. 020P Rev. P1 'Proposed General Arrangement' – and shall be maintained free from any impediment to its designated use.

Reason: In the interests of highway safety and in accordance with Local Plan Policies CLP20 and CLP22

05. The proposed signs shall have a luminosity not exceeding 800 candelas per square metre.

Reason: In the interests of the amenity of locality and highway safety and in accordance with Local Plan Policies CLP14, CLP20 and CLP22

06. No development shall commence until;

a) a scheme of intrusive investigations has been carried out on site to establish the risks posed to the development by past coal mining activity, and;
b) any remediation works and/or mitigation measures to address land instability arising from coal mining legacy, as may be necessary, have been implemented on site in full in order to ensure that the site is safe and stable for the development proposed.

The intrusive site investigations and remedial works shall be carried out in accordance with authoritative UK guidance.

Reason: The undertaking of remedial measures, prior to the commencement of development, is considered to be necessary. This is in order to ensure the safety and stability of the development, in accordance with Policies CLP14 and CLP20 of the adopted Chesterfield Local Plan and paragraphs 183 and 184 of the National Planning Policy Framework.

07. Prior to the occupation of the development, or it being taken into beneficial use, a signed statement or declaration prepared by a suitably competent person confirming that the site is, or has been made, safe and stable for the approved development shall be submitted to the Local Planning Authority for approval in writing. This document shall confirm the methods and findings of the intrusive site investigations and the completion of any remedial works and/or mitigation necessary to address the risks posed by past coal mining activity.

Reason: The undertaking of remedial measures, prior to the commencement of development, is considered to be necessary. This is in order to ensure the safety and stability of the development, in accordance with Policies CLP14 and CLP20 of the adopted Chesterfield Local Plan and paragraphs 183 and 184 of the National Planning Policy Framework.

Statement of Positive and Pro-active Working with Applicant

In accordance with the requirements of the Town and Country Planning (Development Management Procedure) (England) (Amendment No. 2) Order 2015 and paragraph 38 of 2021 National Planning Policy Framework (NPPF) as the proposed development does not conflict with the NPPF or with 'up-to-date' policies of the Local Plan, it is considered 'sustainable development' to which the presumption in favour of the development applies. The Local Planning Authority have considered this application in a positive and proactive way to achieve a positive outcome for the application.

Note(s)

01. The Local Planning Authority have, during the consideration of this application, engaged in a positive and proactive dialogue with the applicant in order to achieve a positive outcome for the application.

02. If work is carried out other than in complete accordance with the approved plans, the whole development may be rendered unauthorised, as it will not have the benefit of the original planning permission. Any proposed amendments to that which is approved will require the submission of a further application.

03. Pursuant to Sections 149 and 151 of the Highways Act 1980, steps shall be taken to ensure that mud or other extraneous material is not carried out of the site and deposited on the public highway. Should such deposits occur, it is the applicant's responsibility to ensure that all reasonable steps (e.g. street sweeping) are taken to maintain the roads in the vicinity of the site to a satisfactory level of cleanliness.

Dated 28th June 2023 Signed…… ……

TOWN AND COUNTRY PLANNING ACT 1990

Appeals to the Secretary of State

If you are aggrieved by the decision of your local planning authority to refuse permission for the proposed development or to grant it subject to conditions, then you can appeal to the Secretary of State under section 78 of the Town and Country Planning Act 1990.

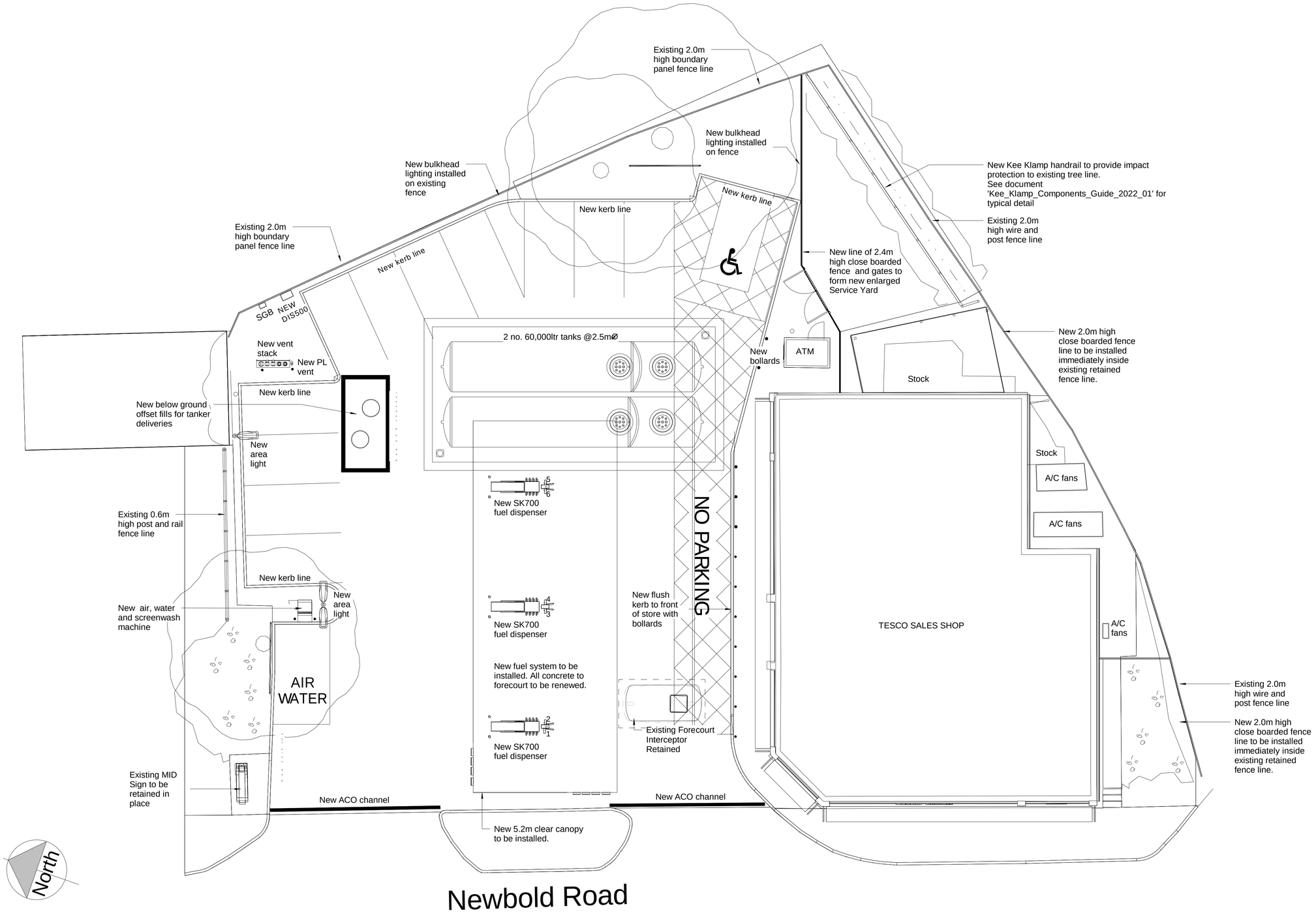
If you want to appeal against your local planning authority's decision then you must do so within 6 months of the date of this notice.

Appeals can be made online at: https://www.gov.uk/planning-inspectorate. If you are unable to access the online appeal form, please contact the Planning Inspectorate to obtain a paper copy of the appeal form on tel: 0303 444 5000.

The Secretary of State can allow a longer period for giving notice of an appeal but will not normally be prepared to use this power unless there are special circumstances which excuse the delay in giving notice of appeal.

The Secretary of State need not consider an appeal if it seems to the Secretary of State that the local planning authority could not have granted planning permission for the proposed development or could not have granted it without the conditions they imposed, having regard to the statutory requirements, to the provisions of any development order and to any directions given under a development order.

If you intend to submit an appeal that you would like examined by inquiry then you must notify the Local Planning Authority and Planning Inspectorate (inquiryappeals@planninginspectorate.gov.uk) at least 10 days before submitting the appeal. Further details are on GOV.UK.



Proposed Site Layout

1 : 100

P1	Revised to capture planning validation comments	13.04.23	CJR	CJR
	Revision	Date	By	Chk

All dimensions to be verified on site, and the Architect informed of any discrepancy. All drawings and specifications should be read in conjunction with the Health and Safety Plan; all conflicts should be reported to the appointed Principal Designer.

Esso Petroleum Company Limited
Chesterfield Express
Newbold Rd, Chesterfield S41 7AL

Sheet Name: Proposed General Arrangement

Purpose of issue: Planning **Status:**

Date: 03/31/23 **Checked by:** CJR

Drawn by: JB **Scale @ A1:** 1 : 100

Project No: 8763

ESSO pbl No: 200266 **Revision:** P1

Drawing No : 020P

BOWMANRILEY
ARCHITECTS • BUILDING CONSULTANTS • INTERIORS

G:_P\8763 - Esso - Chesterfield Express T&L\8763 - 07 Revit\8763-BOW-A0-XX-M3-A-0001_Chesterfield Express Site.rvt

Appendix C

TRIAL PIT LOGS

WSP

Telephone:
Fax:

TRIAL PIT LOG

Hole No. **TP01**

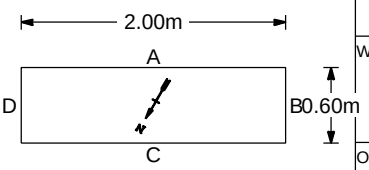
Project: Chesterfield express service station

Sheet: 1 of 1

Job No	Client	Date
70102252	Fox construction	Start: 22-08-23 End: 22-08-23

Contractor / Driller	Method/Plant Used	Logged By	Co-Ordinates ()	Ground Level (m)
Apex Drilling Services Ltd	Excavator (Tracked 360°)	Dan Hoyle	E 437060.802 N 372750.849	

SAMPLES & TESTS						STRATA					
Depth	Type	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (m)	Depth (Thick-ness)	Description	Legend	Geology	Install / Backfill
							0.15	CONCRETE. (CONCRETE)		CONC	
0.50-0.50	ES	5.245					(1.55)	Yellowish brown gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of various lithologies.		Made Ground Granular	
1.00-1.00	ES	1.742					1.70				
2.00-2.00	ES	0.159					(0.60)	Highly weathered gravelly SANDSTONE recovered as very gravelly clay. Gravel is subangular fine to coarse of mudstone, sandstone, siltstone and. Gravel is angular to subangular fine to coarse of mudstone, sandstone, siltstone and.		PLCM	
2.50-2.50	ES	0.107					2.30				



Length: 2.00m

Width: 0.60m

Orientation: 330 degrees from north

Shoring/Support:

Stability:

Water Strikes

Date	Time	Strike	Minutes	Standing	Remarks

General Remarks

Scale 1:31.25

Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.

WSP

Telephone:
Fax:

TRIAL PIT LOG

Hole No. **TP02**

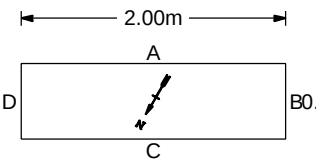
Project: Chesterfield express service station

Sheet: 1 of 1

Job No	Client	Date
70102252	Fox construction	Start: 22-08-23 End: 22-08-23

Contractor / Driller	Method/Plant Used	Logged By	Co-Ordinates ()	Ground Level (m)
AB2K	Excavator (Tracked 360°)	Dan Hoyle	E 437066.093 N 372754.438	

SAMPLES & TESTS						STRATA					
Depth	Type	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (m)	Depth (Thick-ness)	Description	Legend	Geology	Install / Backfill
							0.15	CONCRETE. (CONCRETE)		CONC	
0.50-0.50	ES	0.724					(0.75) 0.90	Yellowish brown gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of various lithologies.		Made Ground Granular	
1.00-1.00	ES	0.246			▼1		(0.60) 1.50	Firm orangish brown mottled very dark grey gravelly CLAY. Gravel is subangular to subrounded fine to coarse of mudstone, sandstone and siltstone. Clay pipe at 1.5.		Made Ground Cohesive	
2.00-2.00	ES	3.377					(1.00) 2.50	Firm orangish brown mottled grey gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse of mudstone, sandstone and siltstone.		PLCM	
2.50-2.50	ES	0.947									



Length: 2.00m

Width: 0.60m

Orientation: 330 degrees from north

Shoring/Support:

Stability:

Water Strikes

Date	Time	Strike	Minutes	Standing	Remarks
22-08-23	11.44	1.50			Fast ingress

General Remarks

Scale 1:31.25

Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.

WSP

Telephone:
Fax:

TRIAL PIT LOG

Hole No. **TP03**

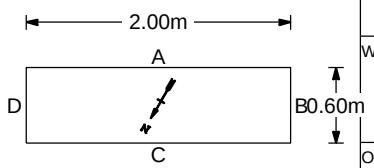
Project: Chesterfield express service station

Sheet: 1 of 1

Job No	Client	Date
70102252	Fox construction	Start: 22-08-23 End: 22-08-23

Contractor / Driller	Method/Plant Used	Logged By	Co-Ordinates ()	Ground Level (m)
Apex Drilling Services Ltd	Excavator (Tracked 360°)	Dan Hoyle	E 437075.346 N 372751.074	

SAMPLES & TESTS						STRATA					
Depth	Type	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (m)	Depth (Thick-ness)	Description	Legend	Geology	Install / Backfill
							0.15	CONCRETE. (CONCRETE)		CONC	
0.50-0.50	ES	0.147					(0.85) 1.00	Reddish brown gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of various lithologies.		Made Ground Granular	
1.00-1.00	ES	1.317					(1.50) 2.50	Stiff dark yellowish brown gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse of mudstone, sandstone and siltstone.		PLCM	
2.00-2.00	ES	1402					(0.30) 2.80	Gravelly MUDSTONE recovered as gravelly cobbles. Gravel is angular fine to coarse of mudstone, sandstone, siltstone and. Gravel is angular fine to coarse of mudstone, sandstone, siltstone and. Weathering Grade II.		PLCM	
2.80-2.80	ES	<0.497									



Length: 2.00m

Width: 0.60m

Orientation: 330 degrees from north

Shoring/Support:

Stability:

Water Strikes

Date	Time	Strike	Minutes	Standing	Remarks

General Remarks
Couldn't excavate any further due to rock

Scale 1:31.25

Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.

20 WSP TP LOG STANDARD CHESTERFIELD.GPJ WSPETEMPLATE8.00.GDT 13/2/24

WSP

Telephone:
Fax:

TRIAL PIT LOG

Hole No. **TP04**

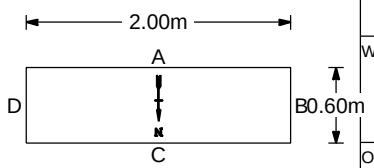
Project: Chesterfield express service station

Sheet: 1 of 1

Job No	Client	Date
70102252	Fox construction	Start: 22-08-23 End: 22-08-23

Contractor / Driller	Method/Plant Used	Logged By	Co-Ordinates ()	Ground Level (m)
AB2K	Excavator (Tracked 360°)	Dan Hoyle	E 437085.640 N 372757.761	

SAMPLES & TESTS						STRATA					
Depth	Type	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (m)	Depth (Thick-ness)	Description	Legend	Geology	Install / Backfill
							0.15	CONCRETE. (CONCRETE)		CONC	
							0.30	Dark yellowish brown slightly sandy subangular to subrounded fine to coarse GRAVEL of various lithologies and Pea gravek.		Made Ground Granular	
							0.50	Firm dark greyish brown slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of brick, mudstone, sandstone and siltstone.		Made Ground Cohesive	
0.50-0.50	ES	0.107					(0.50)	Firm dark yellowish brown slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of mudstone, sandstone and siltstone.		Made Ground Cohesive	
							1.00				
1.00-1.00	ES	0.122					(0.80)	Firm dark greyish brown slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of brick, mudstone, sandstone and siltstone.		Made Ground Cohesive	
					▼		1.80				
2.00-2.00	ES	0.068					(1.20)	Highly weathered gravelly MUDSTONE recovered as clayey angular fine to coarse gravel of mudstone, siltstone. Gravel is angular fine to coarse of mudstone, sandstone, siltstone and. Weathering Grade II.		PLCM	
2.90-2.90	ES	0.015					3.00				



Length	Shoring/Support:
2.00m	
Width	
0.60m	Stability:
Orientation	
360 degrees from north	

Water Strikes

Date	Time	Strike	Minutes	Standing	Remarks
22-08-23	14.08	1.80			Slight seepage

General Remarks

Scale 1:31.25

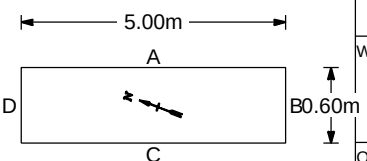
Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.

20 WSP TP LOG STANDARD CHESTERFIELD.GPJ WSPETEMPLATE8.00.GDT 13/2/24

WSP Telephone: Fax:	**TRIAL PIT LOG**	Hole No. **TP05**
	Project Chesterfield express service station	Sheet 1 of 1
Job No 70102252	Client Fox construction	Date Start: 22-08-23 End: 22-08-23

Contractor / Driller	Method/Plant Used	Logged By	Co-Ordinates ()	Ground Level (m)
AB2K	Excavator (Tracked 360°)	Dan Hoyle	E 437056.060 N 372760.204	

SAMPLES & TESTS						STRATA					
Depth	Type	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (m)	Depth (Thick-ness)	Description	Legend	Geology	Install / Backfill
							(0.30) 0.30	ASPHALT. (TARMAC)		TARMAC	
0.40-0.40	ES	0.163					(0.50) 0.80	Reddish brown gravelly fine to coarse SAND with low cobble content. Cobbles are angular to subangular of brick. Gravel is subangular to subrounded fine to coarse of brick and limestone. (Made Ground)		Made Ground Granular	
0.90-0.90	ES	0.036						Dark reddish brown gravelly sandy cobbles. Gravel is sub-angular of brick, sandstone and concrete, Cobbles are sub-angular to angular of brick, concrete and sandstonne. Made Ground *0.80 - 2.30 Yellowish brown gravelly clay in east of the pit.*			
1.50-1.50	ES	0.115					(1.50)			MG	
					1		2.30				
2.30-2.30	ES	0.068					(0.30)	Yellowish brown gravelly clay. Gravel is sub-angular fine to coarse of mudstone, sandstone and siltstone.		PLCM	
2.50-2.50	ES	0.033					2.60				
							2.60	end		END	



Length	Shoring/Support:
5.00m	
Width	
0.60m	Stability:
Orientation	
250 degrees from north	

Water Strikes					
Date	Time	Strike	Minutes	Standing	Remarks
		2.30			

General Remarks
Bedrock

Scale 1:31.25	Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.

Appendix D

LABORATORY CERTIFICATES

Units 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528777
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

WSP UK Limited
8 First Street
Manchester
Lancashire
M15 4RP

Attention: Rhys Evans

CERTIFICATE OF ANALYSIS

Date of report Generation:	02 March 2023
Customer:	WSP UK Limited
Sample Delivery Group (SDG):	230218-44
Your Reference:	70102251
Location:	Chesterfield Express SS
Report No:	680528
Order Number:	70102251-GW2

We received 5 samples on Saturday February 18, 2023 and 5 of these samples were scheduled for analysis whi on Thursday March 02, 2023. Accredited laboratory tests are defined within the report, but opinions, interpretations expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the ba correct.
Incorrect sampling dates and/or sample information will affect the validity of results.

Approved Bv:

Sonia McWhan
Operations Manager

1291

CERTIFICATE OF ANALYSIS

SDG: 230218-44 **Report Number:** 680528 **Superseded Report:**
Client Ref.: 70102251 **Location** Chesterfield Express SS

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
27574627	BH101	EW	0.00 - 0.00	16/02/2023
27574633	BH104a	EW	0.00 - 0.00	16/02/2023
27574639	BH103b	EW	0.00 - 0.00	16/02/2023
27574645	Duplicate	EW	0.00 - 0.00	16/02/2023
27574651	Trip Blank	EW	0.00 - 0.00	16/02/2023

Only received samples which have had analysis scheduled will be shown on the following pages.

Validated

CERTIFICATE OF ANALYSIS

SDG: 230218-44 **Report Number:** 680528 **Superseded Report:**
Client Ref.: 70102251 **Location** Chesterfield Express SS

Results Legend
X Test
N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

			Lab Sample No(s)	27574627				27574633				27574639				27574645				27574651			
			Customer Sample Reference	BH101				BH104a				BH103b				Duplicate				Trip Blank			
			AGS Reference	EW				EW				EW				EW				EW			
			Depth (m)	0.00 - 0.00				0.00 - 0.00				0.00 - 0.00				0.00 - 0.00				0.00 - 0.00			
			Container	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	HNO3 Filtered (ALE204)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	HNO3 Filtered (ALE204)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	HNO3 Filtered (ALE204)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	HNO3 Filtered (ALE204)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	Vial (ALE297)
			Sample Type	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 5				X				X				X				X				X	
EPH CWG (Aliphatic) Aqueous GC (W)	All	NDPs: 0 Tests: 5	X				X				X					X				X			
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 5	X				X				X					X				X			
GRO by GC-FID (W)	All	NDPs: 0 Tests: 5				X				X				X				X					X
Mercury Dissolved	All	NDPs: 0 Tests: 5			X				X					X				X				X	
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 5	X				X				X					X				X			
pH Value of Filtered Water	All	NDPs: 0 Tests: 5		X				X				X				X					X		
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 5	X				X				X				X					X			
Total Organic and Inorganic Carbon	All	NDPs: 1 Tests: 4		N				X				X				X					X		
TPH CWG (W)	All	NDPs: 0 Tests: 5	X				X				X					X				X			
VOC MS (W)	All	NDPs: 0 Tests: 5				X				X				X				X					X

CERTIFICATE OF ANALYSIS

SDG:	230218-44	**Report Number:**	680528	**Superseded Report:**	
Client Ref.:	70102251	**Location**	Chesterfield Express SS		

CERTIFICATE OF ANALYSIS

SDG: 230218-44 **Report Number:** 680528 **Superseded Report:**
Client Ref.: 70102251 **Location** Chesterfield Express SS

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1+1+1@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.					
			Depth (m)					
			Sample Type					
			Date Sampled					
			Sampled Time					
			Date Received					
			SDG Ref					
			Lab Sample No.(s)					
			AGS Reference					

11:16:34 02/03/2023

CERTIFICATE OF ANALYSIS

SDG: 230218-44 **Report Number:** 680528 **Superseded Report:**
Client Ref.: 70102251 **Location** Chesterfield Express SS

			BH101 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44	BH104a 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44	BH103b 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44	Duplicate 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44	Trip Blank 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44
Organic Carbon, Total	<3000 ug/l	TM090		<3000 2 #	111000 2 #	115000 2 #	<3000 2 #
Arsenic (diss.filt)	<0.5 ug/l	TM152	6.18 #	<0.5 #	5.36 #	5.22 #	<0.5 2 #
Barium (diss.filt)	<0.2 ug/l	TM152	17.2 #	59.3 #	209 #	204 #	<0.2 2 #
Beryllium (diss.filt)	<0.1 ug/l	TM152	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 2 #
Boron (diss.filt)	<10 ug/l	TM152	35.1 #	81 #	103 #	100 #	<10 2 #
Cadmium (diss.filt)	<0.08 ug/l	TM152	<0.08 #	0.373 #	<0.08 #	<0.08 #	<0.08 2 #
Chromium (diss.filt)	<1 ug/l	TM152	22 #	7.16 #	<1 #	<1 #	<1 2 #
Copper (diss.filt)	<0.3 ug/l	TM152	19.1 #	1.86 #	<0.3 #	<0.3 #	<0.3 2 #
Lead (diss.filt)	<0.2 ug/l	TM152	0.482 #	0.795 #	<0.2 #	<0.2 #	<0.2 2 #
Nickel (diss.filt)	<0.4 ug/l	TM152	3.77 #	34 #	10 #	10.1 #	<0.4 2 #
Selenium (diss.filt)	<1 ug/l	TM152	3.94 #	<1 #	<1 #	<1 #	<1 2 #
Vanadium (diss.filt)	<1 ug/l	TM152	6.09 #	<1 #	<1 #	<1 #	<1 2 #
Zinc (diss.filt)	<1 ug/l	TM152	4.3 #	9.22 #	4.28 #	3.63 #	2.3 2 #
Mercury (diss.filt)	<0.01 ug/l	TM183	<0.01 #	0.0178 #	<0.01 #	<0.01 #	<0.01 2 #
pH (diss.filt)	<1 pH Units	TM256	10.2	6.89	7.03	7.21	6.15

PAH Spec MS - Aqueous (W)

Validated

CERTIFICATE OF ANALYSIS

SDG: 230218-44 **Report Number:** 680528 **Superseded Report:**
Client Ref.: 70102251 **Location** Chesterfield Express SS

PAH Spec MS - Aqueous (W)

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1,4-SG	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.					
			Depth (m)					
			Sample Type					
			Date Sampled					
			Sampled Time					
			Date Received					
			SDG Ref					
			Lab Sample No.(s)					
			AGS Reference					

11:16:34 02/03/2023

CERTIFICATE OF ANALYSIS

SDG: 230218-44 **Report Number:** 680528 **Superseded Report:**
Client Ref.: 70102251 **Location** Chesterfield Express SS

PAH Spec MS - Aqueous (W)

			BH101 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44	BH104a 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44	BH103b 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44	Duplicate 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44	Trip Blank 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44
Naphthalene (aq)	<0.01 ug/l	TM178	<0.2 #	<0.01 #	0.0302 #	0.0174 #	<0.01 #
Acenaphthene (aq)	<0.005 ug/l	TM178	0.564 #	<0.005 #	0.0054 #	<0.005 #	<0.005 #
Acenaphthylene (aq)	<0.005 ug/l	TM178	<0.1 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #
Fluoranthene (aq)	<0.005 ug/l	TM178	0.528 #	0.0138 #	0.00806 #	<0.005 #	<0.005 #
Anthracene (aq)	<0.005 ug/l	TM178	<0.1 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #
Phenanthrene (aq)	<0.005 ug/l	TM178	0.408 #	0.00908 #	0.0163 #	<0.005 #	<0.005 #
Fluorene (aq)	<0.005 ug/l	TM178	<0.1 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #
Chrysene (aq)	<0.005 ug/l	TM178	0.219 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #
Pyrene (aq)	<0.005 ug/l	TM178	0.603 #	0.0233 #	0.0081 #	<0.005 #	<0.005 #
Benzo(a)anthracene (aq)	<0.005 ug/l	TM178	0.152 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #
Benzo(b)fluoranthene (aq)	<0.005 ug/l	TM178	<0.1 #	0.0132 #	<0.005 #	<0.005 #	<0.005 #
Benzo(k)fluoranthene (aq)	<0.005 ug/l	TM178	<0.1 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #
Benzo(a)pyrene (aq)	<0.002 ug/l	TM178	<0.04 #	<0.002 #	<0.002 #	<0.002 #	<0.002 #
Dibenzo(a,h)anthracene (aq)	<0.005 ug/l	TM178	<0.1 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #
Benzo(g,h,i)perylene (aq)	<0.005 ug/l	TM178	<0.1 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #
Indeno(1,2,3-cd)pyrene (aq)	<0.005 ug/l	TM178	<0.1 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #
PAH, Total Detected USEPA 16 (aq)	<0.082 ug/l	TM178	2.47 #	<0.082 #	<0.082 #	<0.082 #	<0.082 #

SVOC MS (W) - Aqueous

Validated

CERTIFICATE OF ANALYSIS

SDG: 230218-44 **Report Number:** 680528 **Superseded Report:**
Client Ref.: 70102251 **Location** Chesterfield Express SS

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1,4-5@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.					
			Depth (m)					
			Sample Type					
			Date Sampled					
			Sampled Time					
			Date Received					
			SDG Ref					
			Lab Sample No.(s)					
			AGS Reference					

CERTIFICATE OF ANALYSIS

SDG: 230218-44 **Report Number:** 680528 **Superseded Report:**
Client Ref.: 70102251 **Location** Chesterfield Express SS

SVOC MS (W) - Aqueous

			BH101 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44	BH104a 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44	BH103b 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44	Duplicate 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44	Trip Blank 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44
1,2,4-Trichlorobenzene (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
1,2-Dichlorobenzene (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
1,3-Dichlorobenzene (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
1,4-Dichlorobenzene (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
2,4,5-Trichlorophenol (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
2,4,6-Trichlorophenol (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
2,4-Dichlorophenol (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
2,4-Dimethylphenol (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
2,4-Dinitrotoluene (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
2,6-Dinitrotoluene (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
2-Chloronaphthalene (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
2-Chlorophenol (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
2-Methylnaphthalene (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
2-Methylphenol (aq)	<1 ug/l	TM176	<40 #	<2 #	1.17 #	<2 #	<1 #
2-Nitroaniline (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
2-Nitrophenol (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
3-Nitroaniline (aq)	<1 ug/l	TM176	<40	<2	<1	<2	<1
4-Bromophenylphenylether (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
4-Chloro-3-methylphenol (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
4-Chloroaniline (aq)	<1 ug/l	TM176	<40	<2	<1	<2	<1
4-Chlorophenylphenylether (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
4-Methylphenol (aq)	<1 ug/l	TM176	<40 #	<2 #	8.83 #	7.84 #	<1 #
4-Nitroaniline (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
4-Nitrophenol (aq)	<1 ug/l	TM176	<40	<2	<1	<2	<1
Azobenzene (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
Acenaphthylene (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
Acenaphthene (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
Anthracene (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
bis(2-Chloroethyl)ether (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
bis(2-Chloroethoxy)methane (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
bis(2-Ethylhexyl) phthalate (aq)	<2 ug/l	TM176	<80 #	<4 #	<2 #	<4 #	<2 #
Butylbenzyl phthalate (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #

CERTIFICATE OF ANALYSIS

SDG: 230218-44 **Report Number:** 680528 **Superseded Report:**
Client Ref.: 70102251 **Location** Chesterfield Express SS

			BH101 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44	BH104a 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44	BH103b 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44	Duplicate 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44	Trip Blank 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44
Benzo(a)anthracene (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
Benzo(b)fluoranthene (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
Benzo(k)fluoranthene (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
Benzo(a)pyrene (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
Benzo(g,h,i)perylene (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
Carbazole (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
Chrysene (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
Dibenzofuran (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
n-Dibutyl phthalate (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
Diethyl phthalate (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
Dibenzo(a,h)anthracene (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
Dimethyl phthalate (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
n-Dioctyl phthalate (aq)	<5 ug/l	TM176	<200 #	<10 #	<5 #	<10 #	<5 #
Fluoranthene (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
Fluorene (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
Hexachlorobenzene (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
Hexachlorobutadiene (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
Pentachlorophenol (aq)	<1 ug/l	TM176	<40	<2	<1	<2	<1
Phenol (aq)	<1 ug/l	TM176	<40	<2	<1	<2	<1
n-Nitroso-n-dipropylamine (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
Hexachloroethane (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
Nitrobenzene (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
Naphthalene (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
Isophorone (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
Hexachlorocyclopentadiene (aq)	<1 ug/l	TM176	<40	<2	<1	<2	<1
Phenanthrene (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
Indeno(1,2,3-cd)pyrene (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #
Pyrene (aq)	<1 ug/l	TM176	<40 #	<2 #	<1 #	<2 #	<1 #

TPH CWG (W)

CERTIFICATE OF ANALYSIS

SDG: 230218-44 **Report Number:** 680528 **Superseded Report:**
Client Ref.: 70102251 **Location** Chesterfield Express SS

TPH CWG (W)

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1+1+1@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.					
			Depth (m)					
			Sample Type					
			Date Sampled					
			Sampled Time					
			Date Received					
			SDG Ref					
			Lab Sample No.(s)					
			AGS Reference					

CERTIFICATE OF ANALYSIS

SDG: 230218-44 **Report Number:** 680528 **Superseded Report:**
Client Ref.: 70102251 **Location** Chesterfield Express SS

TPH CWG (W)

			BH101 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44	BH104a 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44	BH103b 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44	Duplicate 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44	Trip Blank 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44
GRO Surrogate % recovery**	%	TM245	94 3	96	95	93	94
GRO >C5-C12	<50 ug/l	TM245	<50 3 #	<50 #	<50 #	<50 #	<50 #
Aliphatics >C5-C6	<10 ug/l	TM245	<10 3	<10	<10	<10	<10
Aliphatics >C6-C8	<10 ug/l	TM245	<10 3	<10	<10	<10	<10
Aliphatics >C8-C10	<10 ug/l	TM245	<10 3	<10	<10	<10	<10
Aliphatics >C10-C12	<10 ug/l	TM245	<10 3	<10	<10	<10	<10
Aliphatics >C12-C16 (aq)	<10 ug/l	TM174	1760	<10	<10	<10	<10
Aliphatics >C16-C21 (aq)	<10 ug/l	TM174	538	<10	<10	<10	<10
Aliphatics >C21-C35 (aq)	<10 ug/l	TM174	19500	<10	<10	<10	<10
Total Aliphatics >C12-C35 (aq)	<10 ug/l	TM174	21800	<10	<10	<10	<10
Aromatics >EC5-EC7	<10 ug/l	TM245	<10 3	<10	<10	<10	<10
Aromatics >EC7-EC8	<10 ug/l	TM245	<10 3	<10	<10	<10	<10
Aromatics >EC8-EC10	<10 ug/l	TM245	<10 3	<10	<10	<10	<10
Aromatics >EC10-EC12	<10 ug/l	TM245	<10 3	<10	<10	<10	<10
Aromatics >EC12-EC16 (aq)	<10 ug/l	TM174	95	<10	<10	<10	<10
Aromatics >EC16-EC21 (aq)	<10 ug/l	TM174	107	<10	<10	<10	<10
Aromatics >EC21-EC35 (aq)	<10 ug/l	TM174	900	<10	<10	<10	<10
Total Aromatics >EC12-EC35 (aq)	<10 ug/l	TM174	1100	<10	<10	<10	<10
Total Aliphatics & Aromatics >C5-35 (aq)	<10 ug/l	TM174	22900	<10	<10	<10	<10
Aliphatics >C16-C35 Aqueous	<10 ug/l	TM174	20100	<10	<10	<10	<10

CERTIFICATE OF ANALYSIS

SDG:	230218-44	**Report Number:**	680528	**Superseded Report:**	
Client Ref.:	70102251	**Location**	Chesterfield Express SS		

VOC MS (W)

CERTIFICATE OF ANALYSIS

SDG: 230218-44 **Report Number:** 680528 **Superseded Report:**
Client Ref.: 70102251 **Location** Chesterfield Express SS

VOC MS (W)

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1 4+ 5@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.					
			Depth (m)					
			Sample Type					
			Date Sampled					
			Sampled Time					
			Date Received					
			SDG Ref					
			Lab Sample No.(s)					
			AGS Reference					

11:16:34 02/03/2023

CERTIFICATE OF ANALYSIS

SDG: 230218-44 **Report Number:** 680528 **Superseded Report:**
Client Ref.: 70102251 **Location** Chesterfield Express SS

VOC MS (W)

			BH101 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44	BH104a 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44	BH103b 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44	Duplicate 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44	Trip Blank 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44
Dibromofluoromethane**	%	TM208	82.4	119	119	109	117
Toluene-d8**	%	TM208	98.5	101	100	100	99.6
4-Bromofluorobenzene**	%	TM208	93.8	97.3	97.5	97.3	90.8
Dichlorodifluoromethane	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
Chloromethane	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
Vinyl chloride	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
Bromomethane	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
Chloroethane	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
Trichlorofluoromethane	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloroethene	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
Carbon disulphide	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
Dichloromethane	<3 ug/l	TM208	<3 #	<3 #	<3 #	<3 #	<3 #
Methyl tertiary butyl ether (MTBE)	<1 ug/l	TM208	<1 #	18.1 #	18.8 #	16.4 #	<1 #
trans-1,2-Dichloroethene	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloroethane	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
cis-1,2-Dichloroethene	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
2,2-Dichloropropane	<1 ug/l	TM208	<1	<1	<1	<1	<1
Bromochloromethane	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
Chloroform	<1 ug/l	TM208	10.4 #	4.01 #	<1 #	<1 #	<1 #
1,1,1-Trichloroethane	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloropropene	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
Carbontetrachloride	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichloroethane	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
Benzene	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
Trichloroethene	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichloropropane	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
Dibromomethane	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
Bromodichloromethane	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
cis-1,3-Dichloropropene	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
Toluene	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
trans-1,3-Dichloropropene	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
1,1,2-Trichloroethane	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #

CERTIFICATE OF ANALYSIS

SDG: 230218-44 **Report Number:** 680528 **Superseded Report:**
Client Ref.: 70102251 **Location** Chesterfield Express SS

			BH101 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44	BH104a 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44	BH103b 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44	Duplicate 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44	Trip Blank 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44
1,3-Dichloropropane	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
Tetrachloroethene	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
Dibromochloromethane	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dibromoethane	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
Chlorobenzene	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
1,1,1,2-Tetrachloroethane	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
Ethylbenzene	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
m,p-Xylene	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
o-Xylene	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
Styrene	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
Bromoform	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
Isopropylbenzene	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
1,1,2,2-Tetrachloroethane	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
1,2,3-Trichloropropane	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
Bromobenzene	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
Propylbenzene	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
2-Chlorotoluene	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
1,3,5-Trimethylbenzene	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
4-Chlorotoluene	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
tert-Butylbenzene	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
1,2,4-Trimethylbenzene	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
sec-Butylbenzene	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
4-iso-Propyltoluene	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
1,3-Dichlorobenzene	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
1,4-Dichlorobenzene	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
n-Butylbenzene	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichlorobenzene	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dibromo-3-chloropropane	<1 ug/l	TM208	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
Hexachlorobutadiene	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
tert-Amyl methyl ether (TAME)	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
Naphthalene	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #

CERTIFICATE OF ANALYSIS

SDG: 230218-44 **Report Number:** 680528 **Superseded Report:**
Client Ref.: 70102251 **Location** Chesterfield Express SS

			BH101 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44	BH104a 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44	BH103b 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44	Duplicate 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44	Trip Blank 0.00 - 0.00 Ground Water (GW) 16/02/2023 . 18/02/2023 230218-44
1,2,3-Trichlorobenzene	<1 ug/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #
1,3,5-Trichlorobenzene	<1 ug/l	TM208	<1	<1	<1	<1	<1
Sum of detected Xylenes	<2 ug/l	TM208	<2	<2	<2	<2	<2
Sum of BTEX	<5 ug/l	TM208	<5	<5	<5	<5	<5

CERTIFICATE OF ANALYSIS

SDG:	230218-44	**Report Number:**	680528	**Superseded Report:**	
Client Ref.:	70102251	**Location**	Chesterfield Express SS		

CERTIFICATE OF ANALYSIS

SDG:	230218-44	**Report Number:**	680528	**Superseded Report:**	
Client Ref.:	70102251	**Location**	Chesterfield Express SS		

CERTIFICATE OF ANALYSIS

SDG:	230218-44	**Report Number:**	680528	**Superseded Report:**	
Client Ref.:	70102251	**Location**	Chesterfield Express SS		

CERTIFICATE OF ANALYSIS

SDG:	230218-44	**Report Number:**	680528	**Superseded Report:**	
Client Ref.:	70102251	**Location**	Chesterfield Express SS		

CERTIFICATE OF ANALYSIS

SDG:	230218-44	**Report Number:**	680528	**Superseded Report:**	
Client Ref.:	70102251	**Location**	Chesterfield Express SS		

CERTIFICATE OF ANALYSIS

SDG: 230218-44 **Report Number:** 680528 **Superseded Report:**
Client Ref.: 70102251 **Location** Chesterfield Express SS

Notification of NDPs (No determination possible)

Date Received : 18/02/2023 09:07:27

Sample No	Customer Sample Ref.	Depth (m)	Test	Comment
27574627	BH101 EWZ	0.00 - 0.00	Total Organic and Inorganic Carbon	Unsuitable sample for analysis

CERTIFICATE OF ANALYSIS

SDG: 230218-44 **Report Number:** 680528 **Superseded Report:**
Client Ref.: 70102251 **Location** Chesterfield Express SS

Table of Results - Appendix

Method No	Description
TM090	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM152	Analysis of Aqueous Samples by ICP-MS
TM174	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID
TM176	Determination of SVOCs in Water by GCMS
TM178	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM183	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM208	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM245	Determination of GRO by Headspace in waters
TM256	Determination of pH, EC, TDS and Alkalinity in Aqueous samples

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden (Method codes TM).

CERTIFICATE OF ANALYSIS

SDG: 230218-44 **Report Number:** 680528 **Superseded Report:**
Client Ref.: 70102251 **Location** Chesterfield Express SS

Test Completion Dates

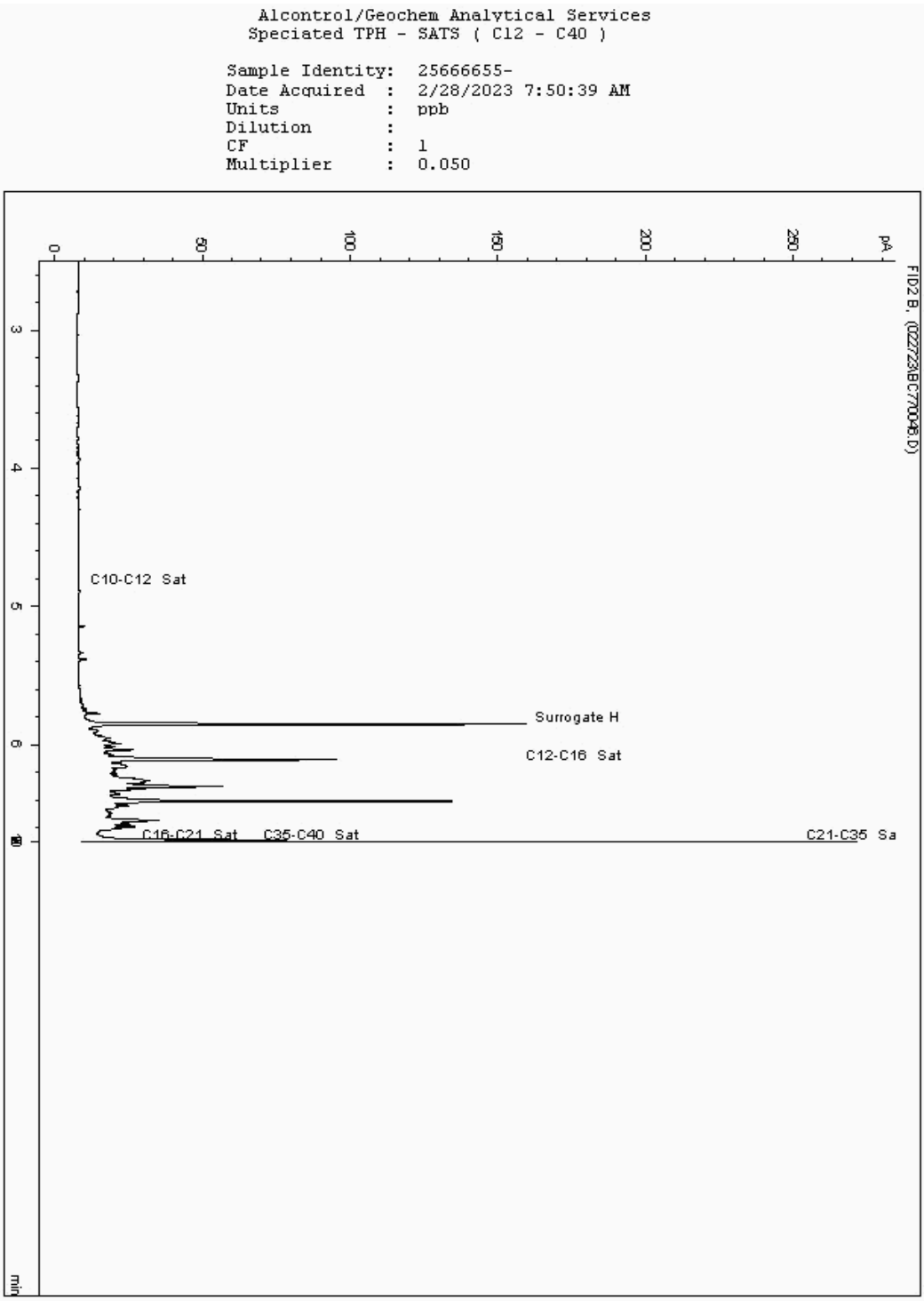
Lab Sample No(s)	27574627	27574633	27574639	27574645	27574651
Customer Sample Ref	BH101	BH104a	BH103b	Duplicate	Trip Blank
AGS Ref.	EW	EW	EW	EW	EW
Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Dissolved Metals by ICP-MS	23-Feb-2023	23-Feb-2023	23-Feb-2023	23-Feb-2023	23-Feb-2023
EPH CWG (Aliphatic) Aqueous GC (W)	28-Feb-2023	28-Feb-2023	02-Mar-2023	02-Mar-2023	02-Mar-2023
EPH CWG (Aromatic) Aqueous GC (W)	28-Feb-2023	28-Feb-2023	02-Mar-2023	02-Mar-2023	02-Mar-2023
GRO by GC-FID (W)	24-Feb-2023	24-Feb-2023	24-Feb-2023	24-Feb-2023	24-Feb-2023
Mercury Dissolved	23-Feb-2023	23-Feb-2023	23-Feb-2023	23-Feb-2023	23-Feb-2023
PAH Spec MS - Aqueous (W)	27-Feb-2023	27-Feb-2023	24-Feb-2023	27-Feb-2023	24-Feb-2023
pH Value of Filtered Water	23-Feb-2023	24-Feb-2023	24-Feb-2023	24-Feb-2023	24-Feb-2023
SVOC MS (W) - Aqueous	27-Feb-2023	27-Feb-2023	27-Feb-2023	27-Feb-2023	27-Feb-2023
Total Organic and Inorganic Carbon		22-Feb-2023	23-Feb-2023	23-Feb-2023	22-Feb-2023
TPH CWG (W)	28-Feb-2023	28-Feb-2023	02-Mar-2023	02-Mar-2023	02-Mar-2023
VOC MS (W)	23-Feb-2023	22-Feb-2023	22-Feb-2023	22-Feb-2023	22-Feb-2023

CERTIFICATE OF ANALYSIS

SDG: 230218-44 **Report Number:** 680528 **Superseded Report:**
Client Ref.: 70102251 **Location** Chesterfield Express SS

Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) **Sample No :** 27584133 **Depth :** 0.00 - 0.00
Sample ID : BH101

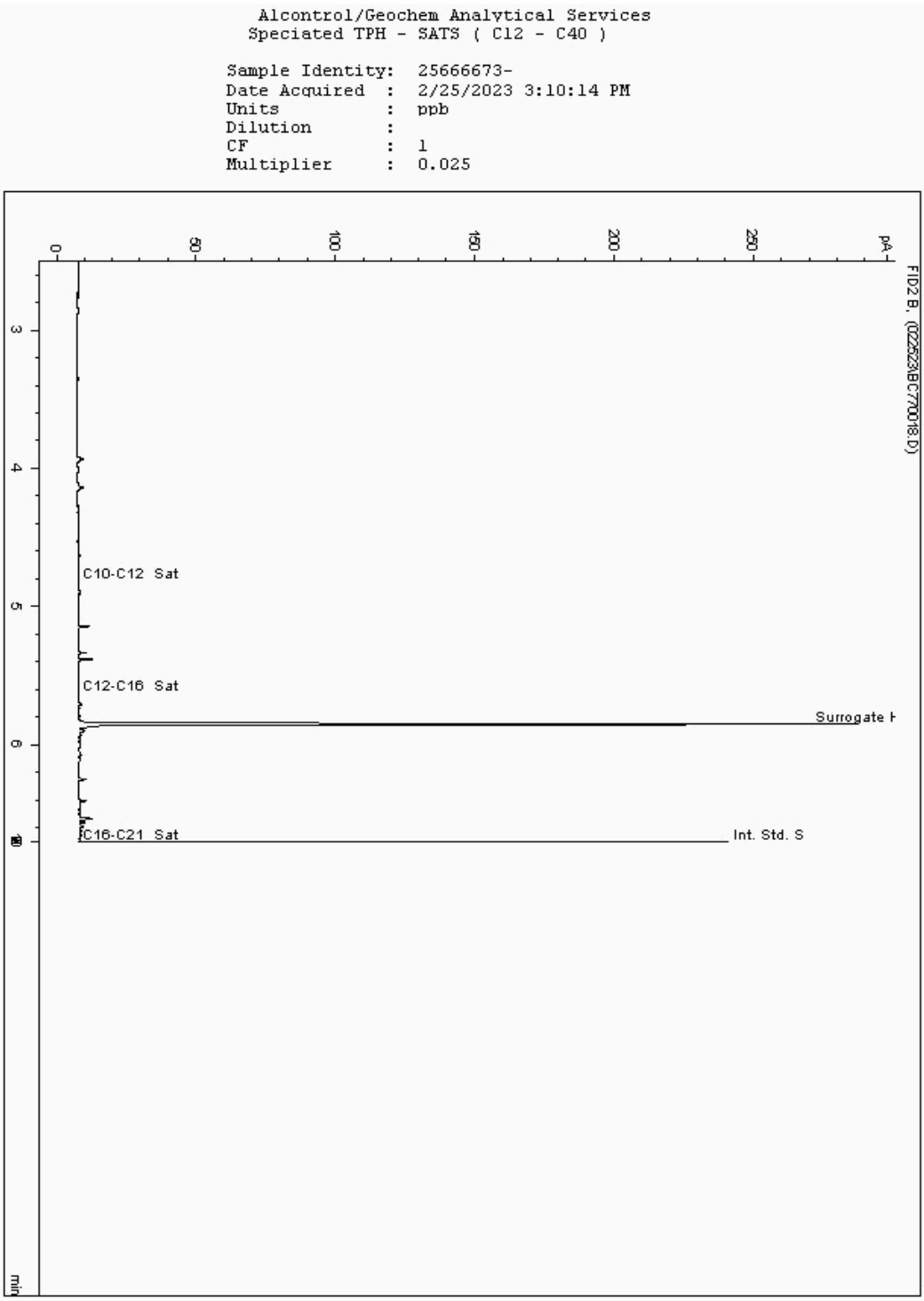


CERTIFICATE OF ANALYSIS

SDG: 230218-44 **Report Number:** 680528 **Superseded Report:**
Client Ref.: 70102251 **Location** Chesterfield Express SS

Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) **Sample No :** 27584142 **Depth :** 0.00 - 0.00
Sample ID : BH104a



CERTIFICATE OF ANALYSIS

SDG: 230218-44 **Report Number:** 680528 **Superseded Report:**
Client Ref.: 70102251 **Location** Chesterfield Express SS

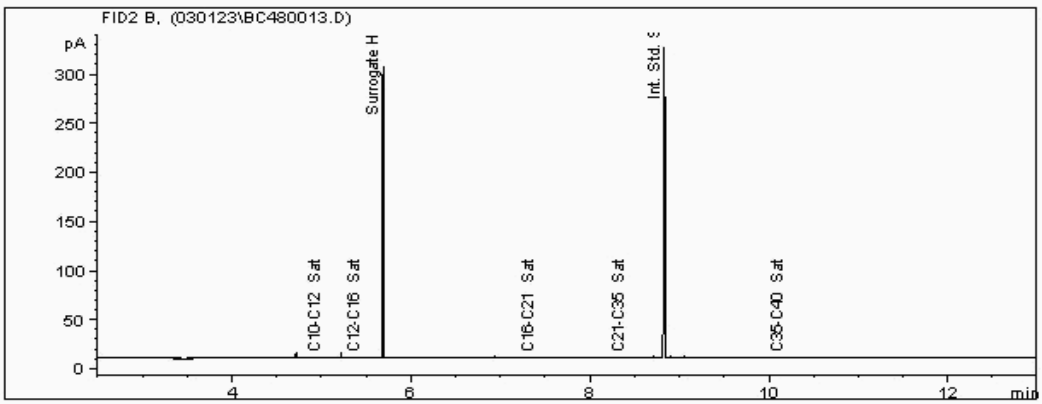
Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) **Sample No :** 27615763 **Depth :** 0.00 - 0.00
Sample ID : Duplicate

Speciated TPH - SATS (C12 - C40)

Sample Identity: 25702098-
Date Acquired : 01/03/2023 19:17:59 PM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.026

#	Compound Name	Main Peak Area	Amount
1	C10-C12 Sat	0.0	0.000
2	C12-C16 Sat	0.0	0.000
3	Surrogate H	192.6	0.182
4	C16-C21 Sat	0.0	0.000
5	C21-C35 Sat	0.0	0.000
6	Int. Std. S	254.0	0.262
7	C35-C40 Sat	0.0	0.000
	Total Peak Area	446.6	



CERTIFICATE OF ANALYSIS

SDG: 230218-44 **Report Number:** 680528 **Superseded Report:**
Client Ref.: 70102251 **Location** Chesterfield Express SS

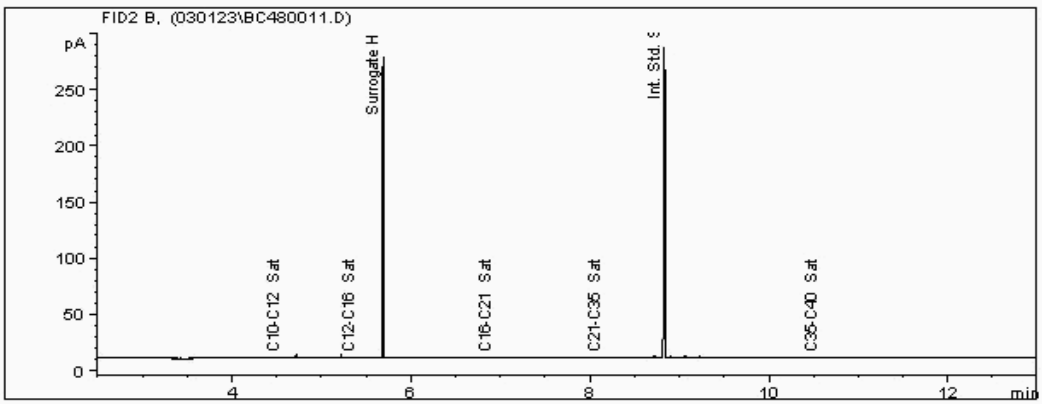
Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) **Sample No :** 27615771 **Depth :** 0.00 - 0.00
Sample ID : BH103b

Speciated TPH - SATS (C12 - C40)

Sample Identity: 25702145-
Date Acquired : 01/03/2023 18:31:51 PM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.028

#	Compound Name	Main Peak Area	Amount
1	C10-C12 Sat	0.0	0.000
2	C12-C16 Sat	0.0	0.000
3	Surrogate H	178.4	0.193
4	C16-C21 Sat	0.0	0.000
5	C21-C35 Sat	0.0	0.000
6	Int. Std. S	237.5	0.279
7	C35-C40 Sat	0.0	0.000
	Total Peak Area	415.9	



CERTIFICATE OF ANALYSIS

SDG: 230218-44 **Report Number:** 680528 **Superseded Report:**
Client Ref.: 70102251 **Location** Chesterfield Express SS

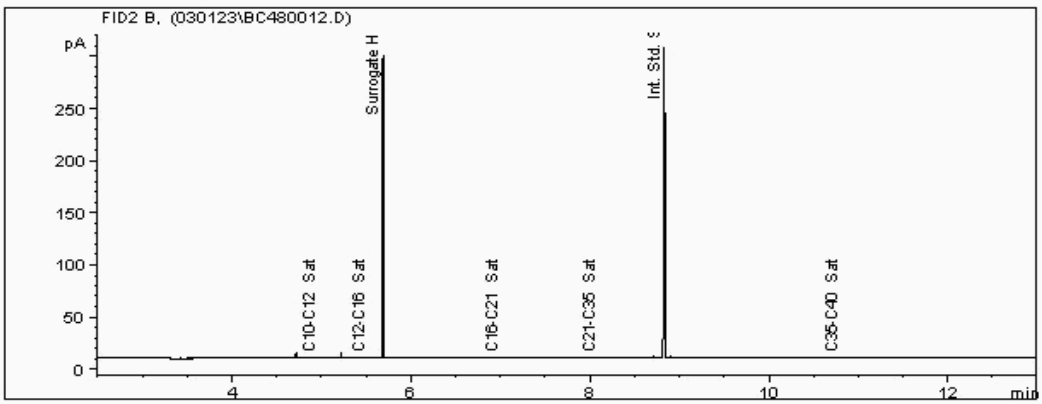
Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) **Sample No :** 27615776 **Depth :** 0.00 - 0.00
Sample ID : Trip Blank

Speciated TPH - SATS (C12 - C40)

Sample Identity: 25702137-
Date Acquired : 01/03/2023 18:55:02 PM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.026

#	Compound Name	Main Peak Area	Amount
1	C10-C12 Sat	0.0	0.000
2	C12-C16 Sat	0.0	0.000
3	Surrogate H	192.9	0.193
4	C16-C21 Sat	0.0	0.000
5	C21-C35 Sat	0.0	0.000
6	Int. Std. S	241.8	0.263
7	C35-C40 Sat	0.0	0.000
	Total Peak Area	434.8	

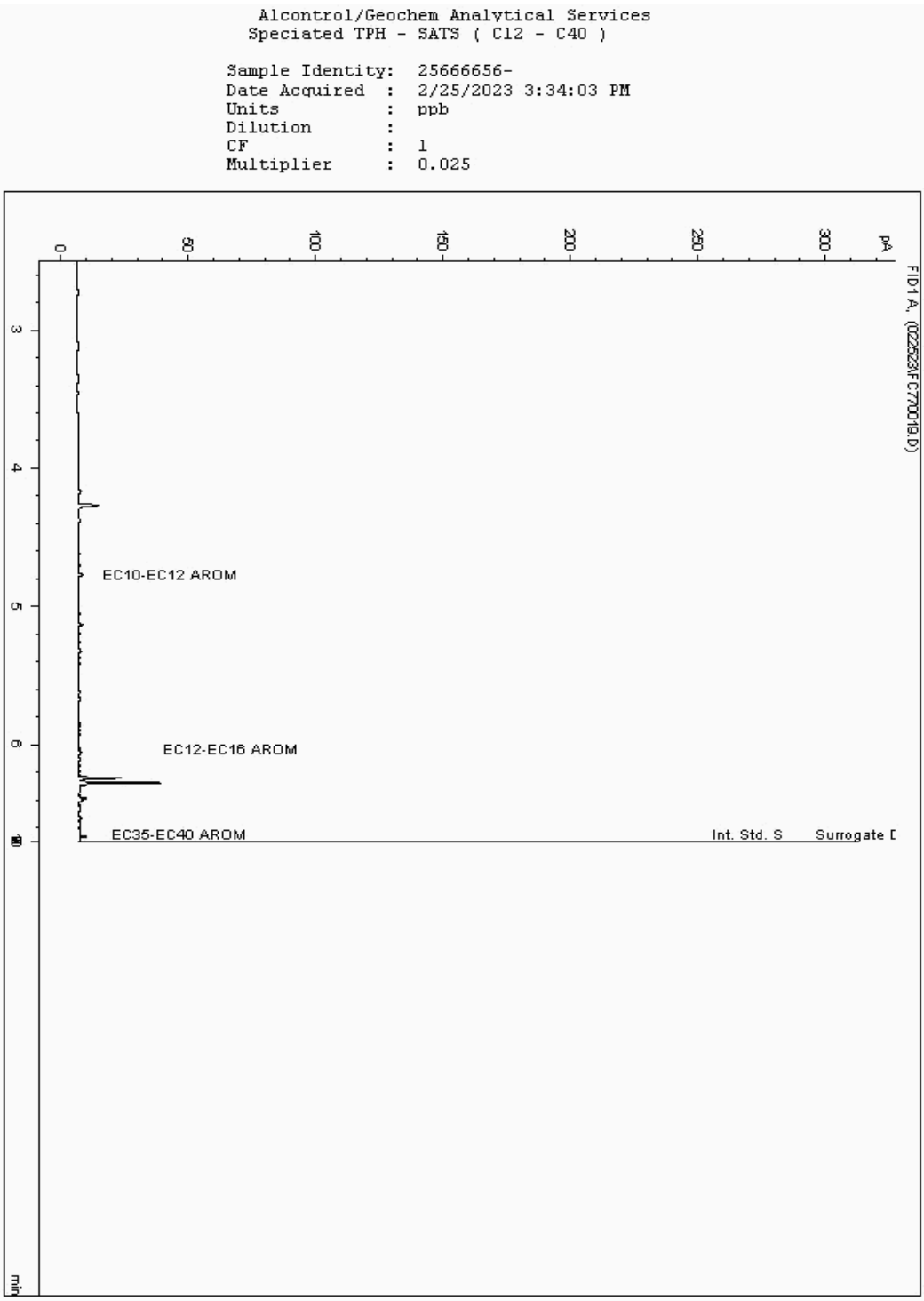


CERTIFICATE OF ANALYSIS

SDG: 230218-44 **Report Number:** 680528 **Superseded Report:**
Client Ref.: 70102251 **Location** Chesterfield Express SS

Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) **Sample No :** 27584133 **Depth :** 0.00 - 0.00
Sample ID : BH101



CERTIFICATE OF ANALYSIS

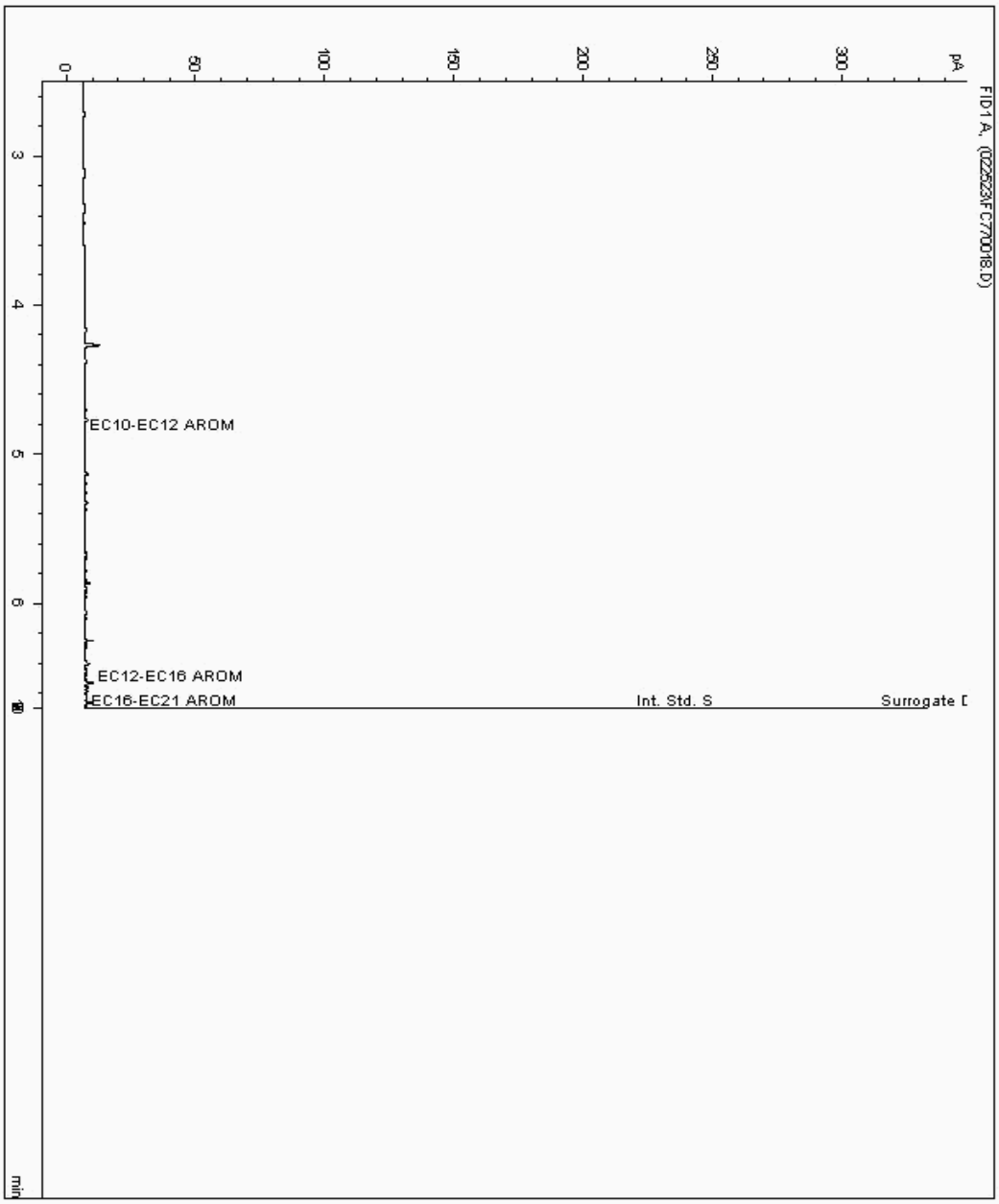
SDG: 230218-44 **Report Number:** 680528 **Superseded Report:**
Client Ref.: 70102251 **Location** Chesterfield Express SS

Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) **Sample No :** 27584142 **Depth :** 0.00 - 0.00
Sample ID : BH104a

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS (C12 - C40)

Sample Identity: 25666674-
Date Acquired : 2/25/2023 3:10:14 PM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025



CERTIFICATE OF ANALYSIS

SDG: 230218-44 **Report Number:** 680528 **Superseded Report:**
Client Ref.: 70102251 **Location** Chesterfield Express SS

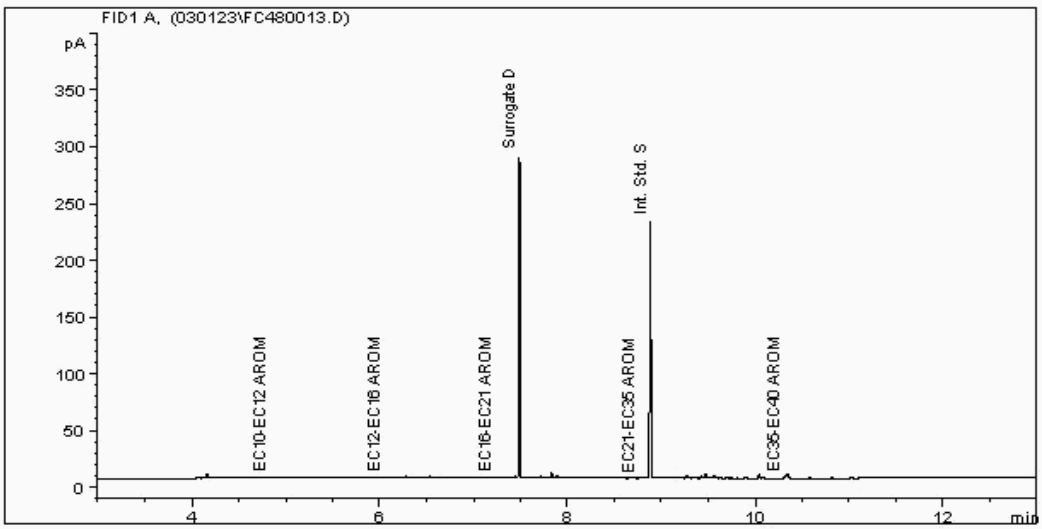
Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) **Sample No :** 27615763 **Depth :** 0.00 - 0.00
Sample ID : Duplicate

Speciated TPH - AROM (C12 - C40)

Sample Identity: 25702099-
Date Acquired : 01/03/2023 19:17:59 PM
Units : ppb
Dilution:

#	Compound Name	Main Peak Area	Amount
1	EC10-EC12 AROM	0.0	0.000
2	EC12-EC16 AROM	0.0	0.000
3	EC16-EC21 AROM	0.0	0.000
4	Surrogate D	176.4	0.205
5	EC21-EC35 AROM	0.0	0.000
6	Int. Std. S	196.3	0.262
7	EC35-EC40 AROM	0.0	0.000
	Total Peak Area	372.8	



CERTIFICATE OF ANALYSIS

SDG: 230218-44 **Report Number:** 680528 **Superseded Report:**
Client Ref.: 70102251 **Location** Chesterfield Express SS

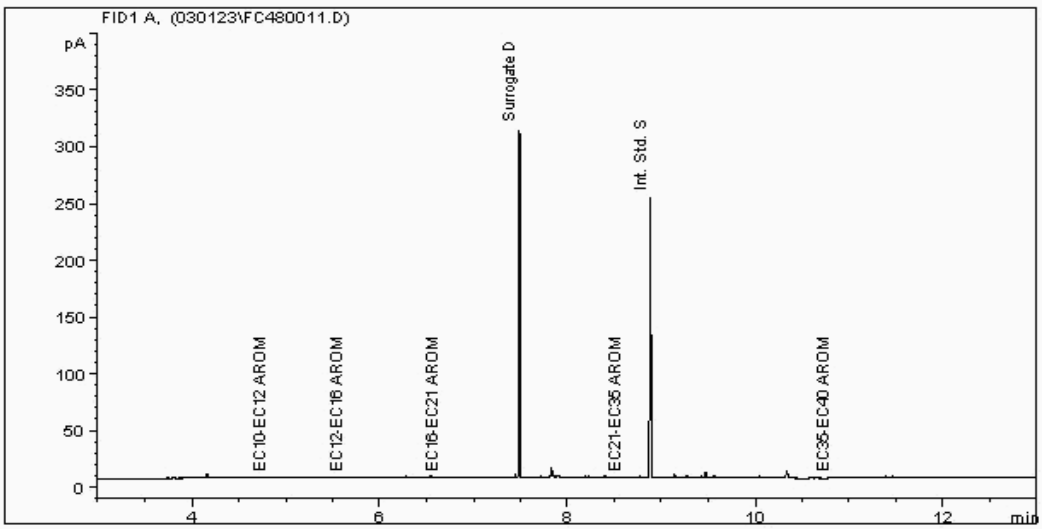
Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) **Sample No :** 27615771 **Depth :** 0.00 - 0.00
Sample ID : BH103b

Speciated TPH - AROM (C12 - C40)

Sample Identity: 25702148-
Date Acquired : 01/03/2023 18:31:51 PM
Units : ppb
Dilution:

#	Compound Name	Main Peak Area	Amount
1	EC10-EC12 AROM	0.0	0.000
2	EC12-EC16 AROM	0.0	0.000
3	EC16-EC21 AROM	0.0	0.000
4	Surrogate D	180.4	0.226
5	EC21-EC35 AROM	0.0	0.000
6	Int. Std. S	194.3	0.279
7	EC35-EC40 AROM	0.0	0.000
	Total Peak Area	374.7	



CERTIFICATE OF ANALYSIS

SDG: 230218-44 **Report Number:** 680528 **Superseded Report:**
Client Ref.: 70102251 **Location** Chesterfield Express SS

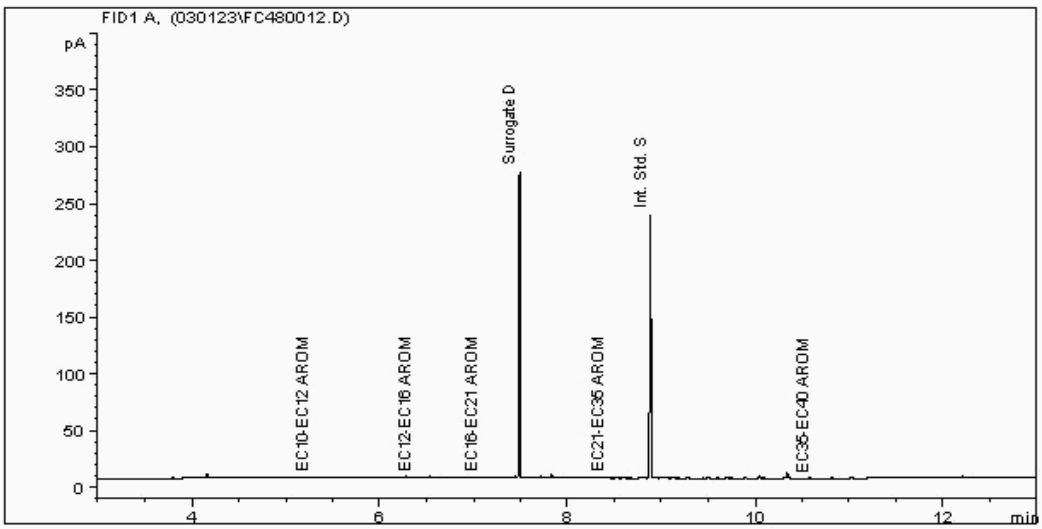
Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) **Sample No :** 27615776 **Depth :** 0.00 - 0.00
Sample ID : Trip Blank

Speciated TPH - AROM (C12 - C40)

Sample Identity: 25702138-
Date Acquired : 01/03/2023 18:55:02 PM
Units : ppb
Dilution:

#	Compound Name	Main Peak Area	Amount
1	EC10-EC12 AROM	0.0	0.000
2	EC12-EC16 AROM	0.0	0.000
3	EC16-EC21 AROM	0.0	0.000
4	Surrogate D	181.9	0.209
5	EC21-EC35 AROM	0.0	0.000
6	Int. Std. S	199.3	0.263
7	EC35-EC40 AROM	0.0	0.000
	Total Peak Area	381.2	

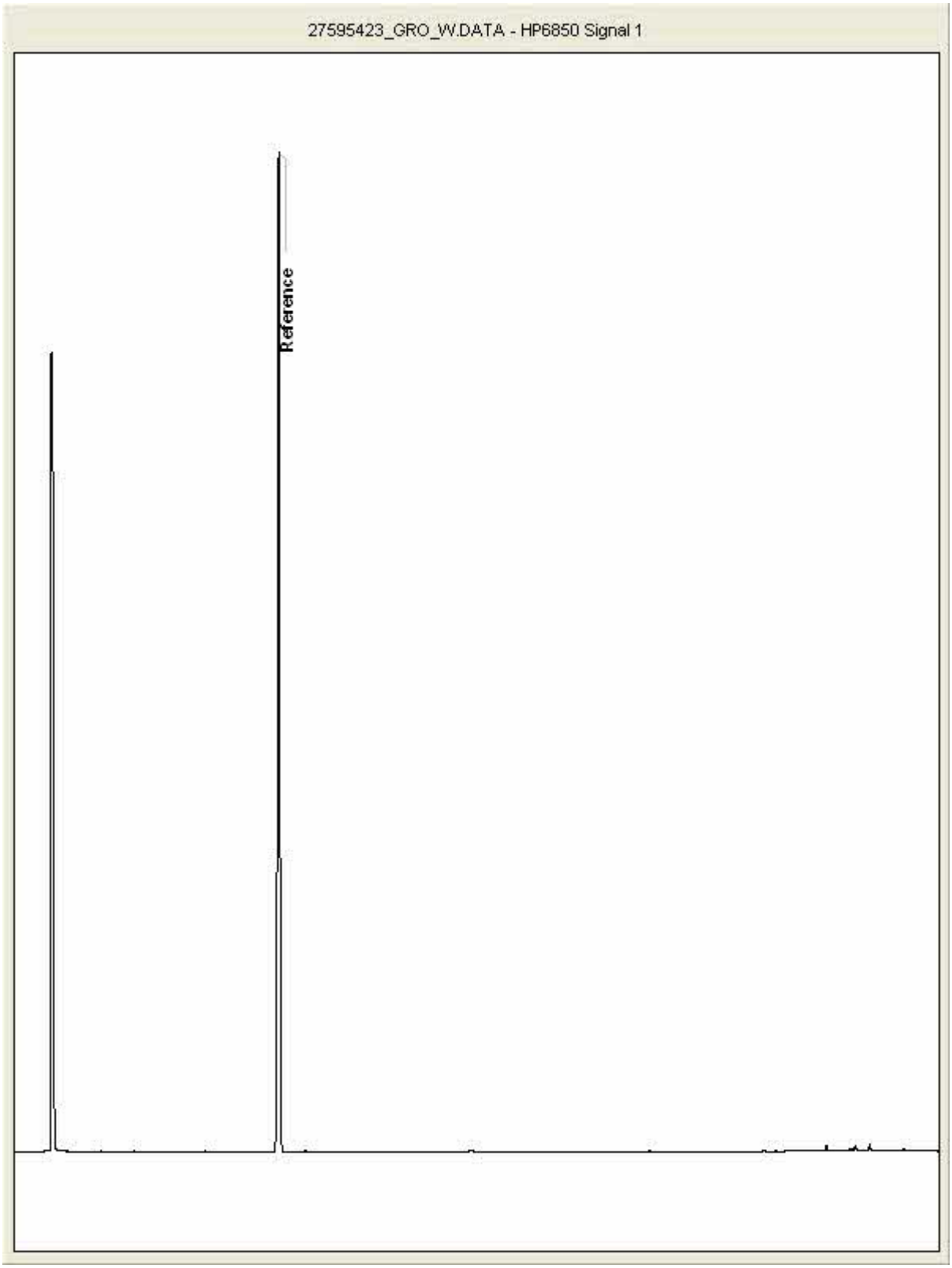


CERTIFICATE OF ANALYSIS

SDG: 230218-44 **Report Number:** 680528 **Superseded Report:**
Client Ref.: 70102251 **Location** Chesterfield Express SS

Chromatogram

Analysis: GRO by GC-FID (W) **Sample No :** 27595423 **Depth :** 0.00 - 0.00
Sample ID : BH101

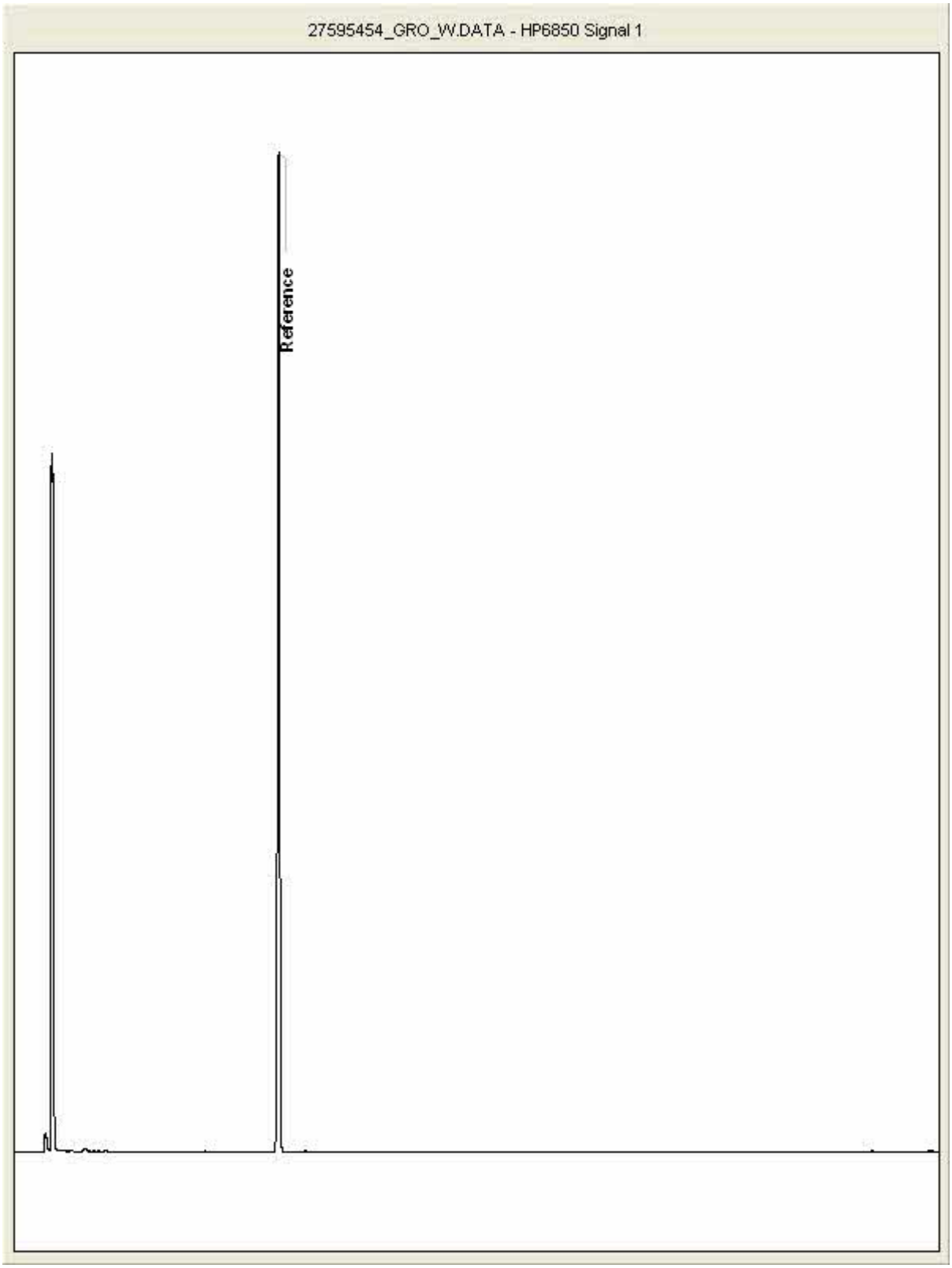


CERTIFICATE OF ANALYSIS

SDG: 230218-44 **Report Number:** 680528 **Superseded Report:**
Client Ref.: 70102251 **Location** Chesterfield Express SS

Chromatogram

Analysis: GRO by GC-FID (W) **Sample No :** 27595454 **Depth :** 0.00 - 0.00
Sample ID : Duplicate

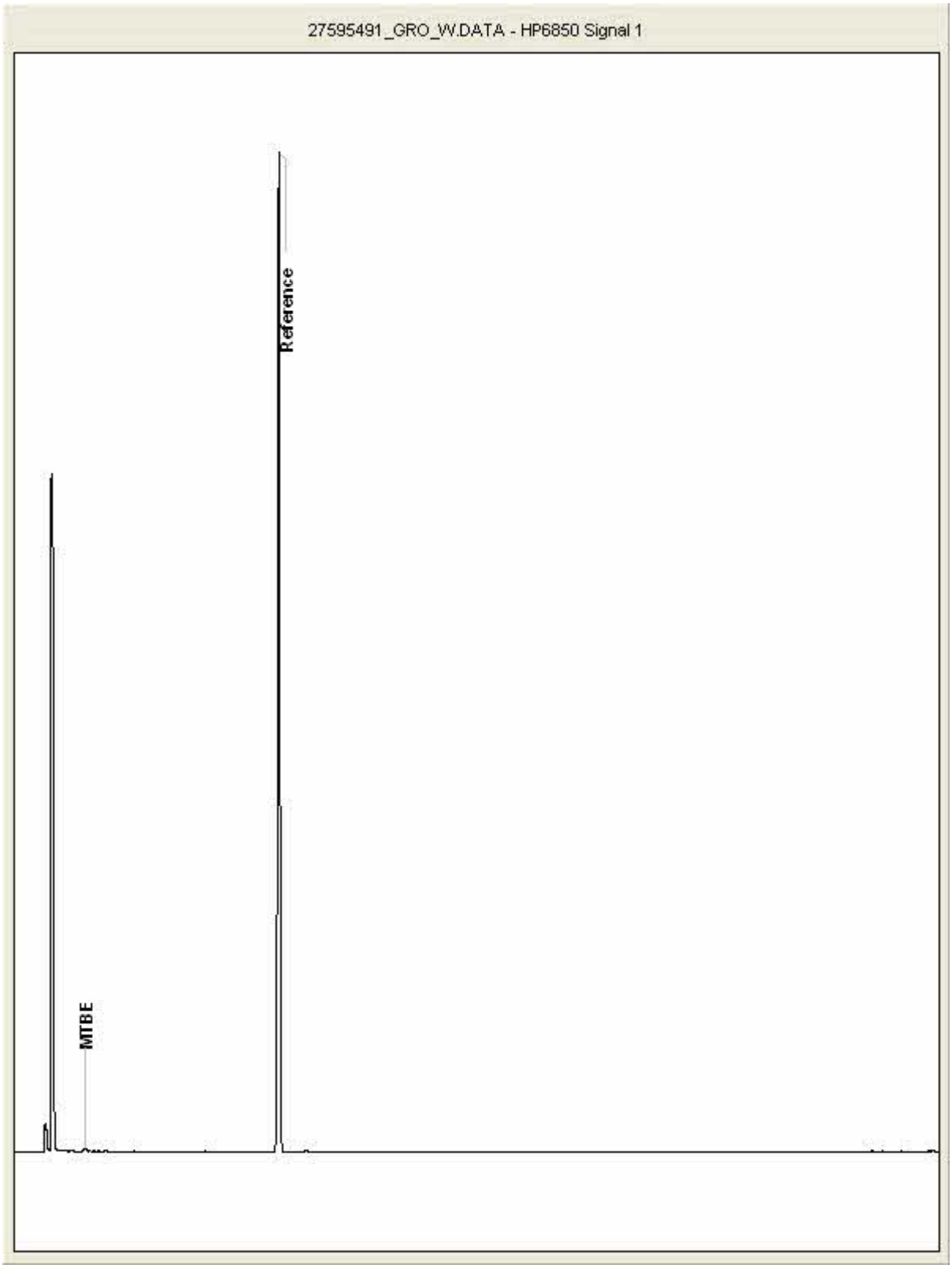


CERTIFICATE OF ANALYSIS

SDG: 230218-44 **Report Number:** 680528 **Superseded Report:**
Client Ref.: 70102251 **Location** Chesterfield Express SS

Chromatogram

Analysis: GRO by GC-FID (W) **Sample No :** 27595491 **Depth :** 0.00 - 0.00
Sample ID : BH103b

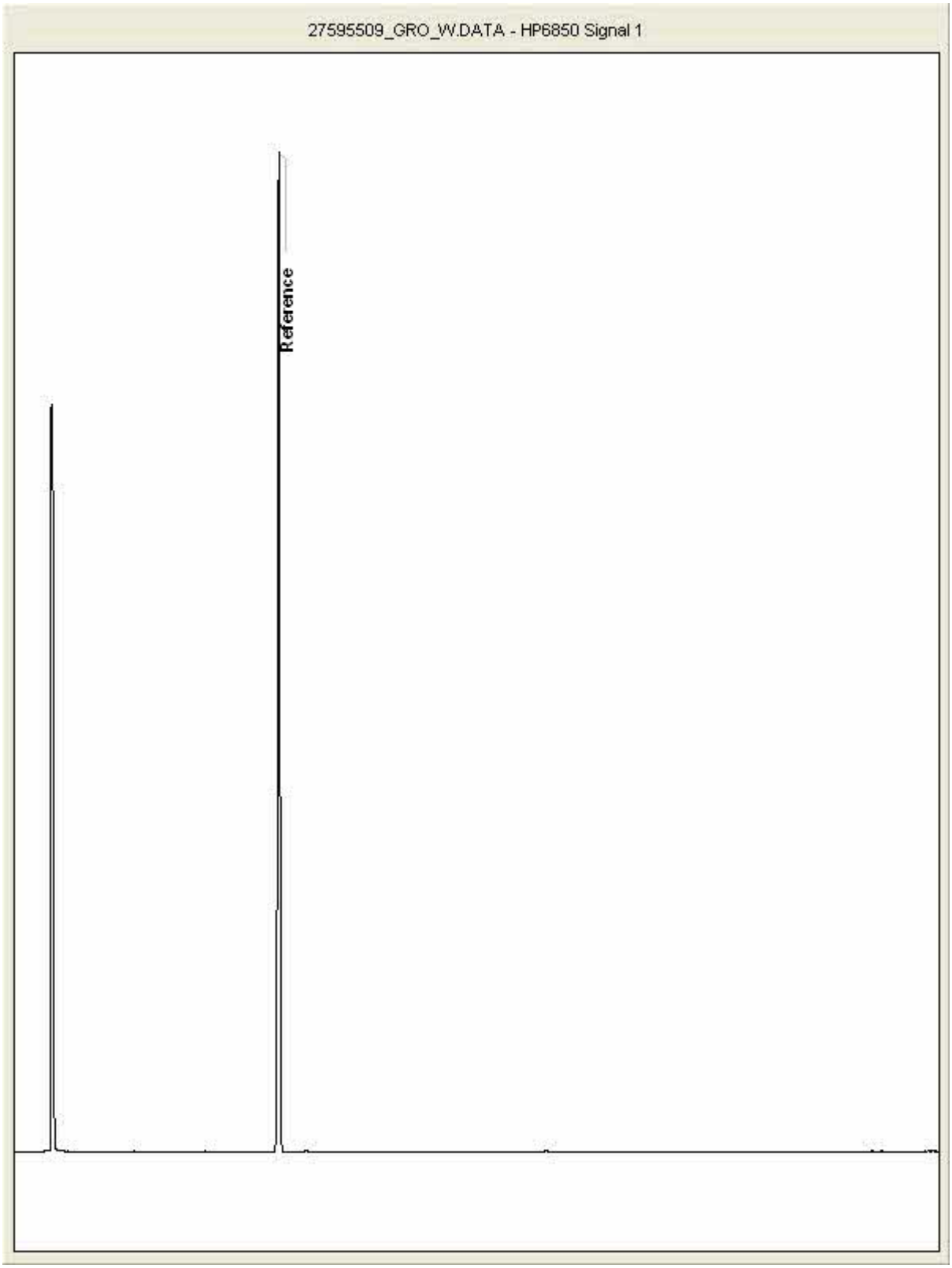


CERTIFICATE OF ANALYSIS

SDG: 230218-44 **Report Number:** 680528 **Superseded Report:**
Client Ref.: 70102251 **Location** Chesterfield Express SS

Chromatogram

Analysis: GRO by GC-FID (W) **Sample No :** 27595509 **Depth :** 0.00 - 0.00
Sample ID : Trip Blank

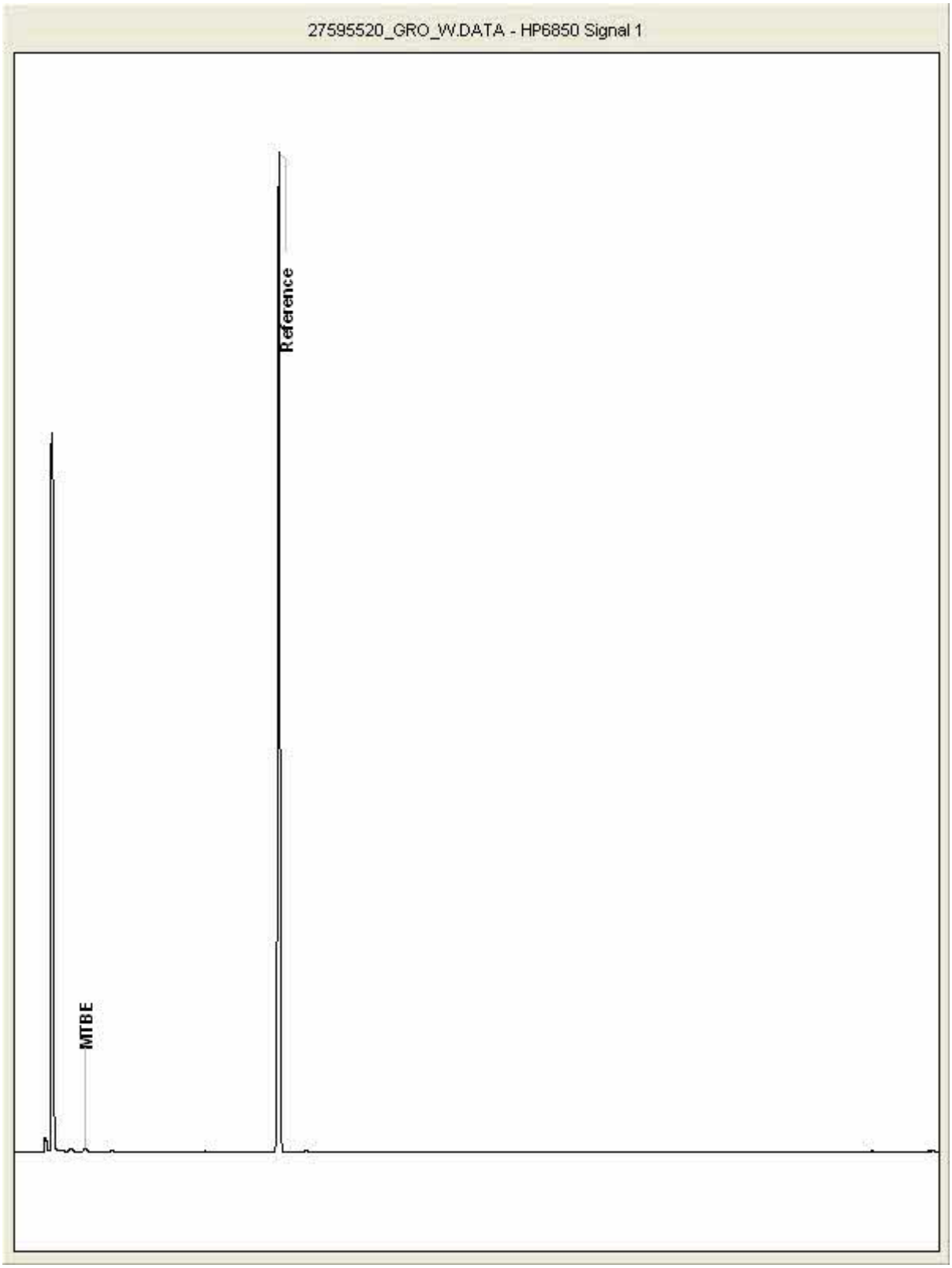


CERTIFICATE OF ANALYSIS

SDG: 230218-44 **Report Number:** 680528 **Superseded Report:**
Client Ref.: 70102251 **Location** Chesterfield Express SS

Chromatogram

Analysis: GRO by GC-FID (W) **Sample No :** 27595520 **Depth :** 0.00 - 0.00
Sample ID : BH104a



SDG:	230218-44	**Report Number:**	680528	**Superseded Report:**	
Client Ref:	70102251	**Location:**	Chesterfield Express SS		

Appendix

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analy for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NI BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge f days after analysis is completed (e-mailed) for all sample types unless the sample is on testing. The prepared soil sub sample that is analysed for asbestos will be retai period of 6 months after the analysis date. All bulk samples will be retained for a p months after the analysis date. All samples received and not scheduled will be dis one month after the date of receipt unless we are instructed to the contrary. Once t period has expired, a storage charge will be applied for each month or part thereof client cancels the request for sample storage. ALS reserve the right to charge fo received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinan are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or s present in the volatile sample, the integrity of the data may be compromised. flagged up as an invalid VOC on the test schedule and the result marked as d the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are no for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to th being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. **Sample Deviations**

If a sample is classed as deviated then the associated results may be compromised.

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Matrix interference**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to late arrival of instructions or samples**
§	**Sampled on date not provided**

20. **Asbestos**

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are ol supplied bulk materials andd soils which have been examined to determine the p of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarisec microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homog sample which has been examined to determine the presence of asbestos ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredit than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Units 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528777
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

WSP UK Limited
8 First Street
Manchester
Lancashire
M15 4RP

Attention: Daniel Hoyle

CERTIFICATE OF ANALYSIS

Date of report Generation:	13 September 2023
Customer:	WSP UK Limited
Sample Delivery Group (SDG):	230824-55
Your Reference:	70102251
Location:	Esso Express Chesterfield
Report No:	703740
Order Number:	

This report has been revised and directly supersedes 703483 in its entirety.

We received 21 samples on Thursday August 24, 2023 and 18 of these samples were scheduled for analy completed on Wednesday September 13, 2023. Accredited laboratory tests are defined within the repor interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not sir sections alone.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and o this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager

1291

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
28530539	TP01	ES	0.50 - 0.50	22/08/2023
28530598	TP01	ES	1.00 - 1.00	22/08/2023
28530614	TP01	ES	2.00 - 2.00	22/08/2023
28530619	TP01	ES	2.30 - 2.50	22/08/2023
28530625	TP02	ES	0.50 - 0.50	22/08/2023
28530632	TP02	ES	1.00 - 1.00	22/08/2023
28530638	TP02	ES	2.00 - 2.00	22/08/2023
28530643	TP02	ES	2.50 - 2.50	22/08/2023
28530648	TP03	ES	0.50 - 0.50	22/08/2023
28530544	TP03	ES	1.00 - 1.00	22/08/2023
28530551	TP03	ES	2.00 - 2.00	22/08/2023
28530556	TP03	ES	2.80 - 2.80	22/08/2023
28530561	TP04	ES	0.50 - 0.50	22/08/2023
28530566	TP04	ES	1.00 - 1.00	22/08/2023
28530571	TP04	ES	2.00 - 2.00	22/08/2023
28530578	TP04	ES	2.90 - 2.90	22/08/2023
28530583	TP05	ES	0.40 - 0.40	22/08/2023
28530588	TP05	ES	0.90 - 0.90	22/08/2023
28530593	TP05	ES	1.50 - 1.50	22/08/2023
28530603	TP05	ES	2.30 - 2.30	22/08/2023
28530609	TP05	ES	2.50 - 2.50	22/08/2023

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

Validated

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Results Legend
X Test
N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water
Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

			Lab Sample No(s)	28530539	28530598	28530614	28530619	28530625	28530632	28530638
			Customer Sample Reference	TP01	TP01	TP01	TP01	TP02	TP02	TP02
			AGS Reference	ES	ES	ES	ES	ES	ES	ES
			Depth (m)	0.50 - 0.50	1.00 - 1.00	2.00 - 2.00	2.30 - 2.50	0.50 - 0.50	1.00 - 1.00	2.00 - 2.00
			Container	1kg TUB with Handle (ALE205)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE205)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE205)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE205)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE205)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE205)	250g Amber Jar (ALE210)	60g VOC (ALE215)
			Sample Type	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
ANC at pH4 and ANC at pH 6	All	NDPs: 0 Tests: 18			X			X			X			X			X			X			X	
Anions by Kone (w)	All	NDPs: 0 Tests: 18		X			X			X			X			X			X			X		
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 18		X			X			X			X			X			X			X		
Boron Water Soluble	All	NDPs: 0 Tests: 18			X			X			X			X			X			X			X	
CEN Readings	All	NDPs: 0 Tests: 18		X			X			X			X			X			X			X		
Coronene	All	NDPs: 0 Tests: 18			X			X			X			X			X			X			X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 18		X			X			X			X			X			X			X		
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 18		X			X			X			X			X			X			X		
EPH by GCxGC-FID	All	NDPs: 0 Tests: 18			X			X			X			X			X			X			X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 18			X			X			X			X			X			X			X	
Fluoride	All	NDPs: 0 Tests: 18		X			X			X			X			X			X			X		
GRO by GC-FID (S)	All	NDPs: 0 Tests: 18				X			X			X			X			X			X			X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 18			X			X			X			X			X			X			X	
Loss on Ignition in soils	All	NDPs: 0 Tests: 18			X			X			X			X			X			X			X	
Mercury Dissolved	All	NDPs: 0 Tests: 18		X			X			X			X			X			X			X		

28530566	TP04	ES	1.00 - 1.00	1kg TUB with Handle	S		X	X		X		X	X			X					X		
28530561	TP04	ES	0.50 - 0.50	60g VOC (ALE215)	S													X					
				250g Amber Jar (ALE210)	S	X			X		X			X	X			X		X			
				1kg TUB with Handle	S		X	X		X		X	X			X					X		
28530556	TP03	ES	2.80 - 2.80	60g VOC (ALE215)	S													X					
				250g Amber Jar (ALE210)	S	X			X		X			X	X			X		X			
				1kg TUB with Handle	S		X	X		X		X	X			X					X		
28530551	TP03	ES	2.00 - 2.00	60g VOC (ALE215)	S													X					
				250g Amber Jar (ALE210)	S	X	X		X	X	X	X	X	X	X	X		X	X		X		
				1kg TUB with Handle	S			X															
28530544	TP03	ES	1.00 - 1.00	60g VOC (ALE215)	S													X					
				250g Amber Jar (ALE210)	S	X			X		X			X	X			X		X			
				1kg TUB with Handle	S		X	X		X		X	X			X					X		
28530648	TP03	ES	0.50 - 0.50	60g VOC (ALE215)	S													X					
				250g Amber Jar (ALE210)	S	X			X		X			X	X			X		X			
				1kg TUB with Handle	S		X	X		X		X	X			X					X		
28530643	TP02	ES	2.50 - 2.50	60g VOC (ALE215)	S													X					
				250g Amber Jar (ALE210)	S	X			X		X			X	X			X		X			
				1kg TUB with Handle	S		X	X		X		X	X			X					X		

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Results Legend
X Test
N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water
Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

			Lab Sample No(s)	28530539	28530598	28530614	28530619	28530625	28530632	28530638
			Customer Sample Reference	TP01	TP01	TP01	TP01	TP02	TP02	TP02
			AGS Reference	ES	ES	ES	ES	ES	ES	ES
			Depth (m)	0.50 - 0.50	1.00 - 1.00	2.00 - 2.00	2.30 - 2.50	0.50 - 0.50	1.00 - 1.00	2.00 - 2.00
			Container	1kg TUB with Handle (ALE230)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE230)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE230)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE230)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE230)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE230)	250g Amber Jar (ALE210)	60g VOC (ALE215)
			Sample Type	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Metals in solid samples by OES	All	NDPs: 0 Tests: 18		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
PAH 16 & 17 Calc	All	NDPs: 0 Tests: 18		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
PAH by GCMS	All	NDPs: 0 Tests: 18		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
PCBs by GCMS	All	NDPs: 0 Tests: 18		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
pH	All	NDPs: 0 Tests: 18		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
pH Value of Filtered Water	All	NDPs: 0 Tests: 18	X		X		X		X	X		X	X		X		X	X		X	X		X	X	
Phenols by HPLC (W)	All	NDPs: 0 Tests: 18	X		X		X		X	X		X	X		X		X	X		X	X		X	X	
Sample description	All	NDPs: 0 Tests: 18		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Semi Volatile Organic Compounds	All	NDPs: 0 Tests: 18		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Total Organic Carbon	All	NDPs: 0 Tests: 18		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TPH CWG GC (S)	All	NDPs: 0 Tests: 18		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
VOC MS (S)	All	NDPs: 0 Tests: 18			X			X			X			X			X			X			X			X

28530566	TP04	ES	1.00 - 1.00	1kg TUB with Handle	S						X	X					
28530561	TP04	ES	0.50 - 0.50	60g VOC (ALE215)	S												X
				250g Amber Jar (ALE210)	S	X	X	X	X	X			X	X	X	X	
				1kg TUB with Handle	S						X	X					
28530556	TP03	ES	2.80 - 2.80	60g VOC (ALE215)	S												X
				250g Amber Jar (ALE210)	S	X	X	X	X	X			X	X	X	X	
				1kg TUB with Handle	S						X	X					
28530551	TP03	ES	2.00 - 2.00	60g VOC (ALE215)	S												X
				250g Amber Jar (ALE210)	S	X	X	X	X	X	X	X	X	X	X	X	
				1kg TUB with Handle	S												
28530544	TP03	ES	1.00 - 1.00	60g VOC (ALE215)	S												X
				250g Amber Jar (ALE210)	S	X	X	X	X	X			X	X	X	X	
				1kg TUB with Handle	S						X	X					
28530648	TP03	ES	0.50 - 0.50	60g VOC (ALE215)	S												X
				250g Amber Jar (ALE210)	S	X	X	X	X	X			X	X	X	X	
				1kg TUB with Handle	S						X	X					
28530643	TP02	ES	2.50 - 2.50	60g VOC (ALE215)	S												X
				250g Amber Jar (ALE210)	S	X	X	X	X	X			X	X	X	X	
				1kg TUB with Handle	S						X	X					

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Results Legend
X Test
N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water
Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

			Lab Sample No(s)	28530566	28530571	28530578	28530603	28530609
			Customer Sample Reference	TP04	TP04	TP04	TP05	TP05
			AGS Reference	ES	ES	ES	ES	ES
			Depth (m)	1.00 - 1.00	2.00 - 2.00	2.90 - 2.90	2.30 - 2.30	2.50 - 2.50
			Container	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE200)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE200)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE200)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE200)	250g Amber Jar (ALE210)	60g VOC (ALE215)
			Sample Type	S	S	S	S	S	S	S	S	S	S	S	S	S	S
ANC at pH4 and ANC at pH 6	All	NDPs: 0 Tests: 18		X			X			X			X			X	
Anions by Kone (w)	All	NDPs: 0 Tests: 18				X			X			X			X		
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 18				X			X			X			X		
Boron Water Soluble	All	NDPs: 0 Tests: 18		X			X			X			X			X	
CEN Readings	All	NDPs: 0 Tests: 18				X			X			X			X		
Coronene	All	NDPs: 0 Tests: 18		X			X			X			X			X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 18				X			X			X			X		
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 18				X			X			X			X		
EPH by GCxGC-FID	All	NDPs: 0 Tests: 18		X			X			X			X			X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 18		X			X			X			X			X	
Fluoride	All	NDPs: 0 Tests: 18				X			X			X			X		
GRO by GC-FID (S)	All	NDPs: 0 Tests: 18			X			X			X			X			X	
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 18		X			X			X			X			X	
Loss on Ignition in soils	All	NDPs: 0 Tests: 18		X			X			X			X			X	
Mercury Dissolved	All	NDPs: 0 Tests: 18				X			X			X			X		

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Results Legend
X Test
N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water
Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

			Lab Sample No(s)	28530566	28530571	28530578	28530603	28530609
			Customer Sample Reference	TP04	TP04	TP04	TP05	TP05
			AGS Reference	ES	ES	ES	ES	ES
			Depth (m)	1.00 - 1.00	2.00 - 2.00	2.90 - 2.90	2.30 - 2.30	2.50 - 2.50
			Container	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE200)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE200)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE200)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE200)	250g Amber Jar (ALE210)	60g VOC (ALE215)
			Sample Type	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Metals in solid samples by OES	All	NDPs: 0 Tests: 18		X			X			X			X			X	
PAH 16 & 17 Calc	All	NDPs: 0 Tests: 18		X			X			X			X			X	
PAH by GCMS	All	NDPs: 0 Tests: 18		X			X			X			X			X	
PCBs by GCMS	All	NDPs: 0 Tests: 18		X			X			X			X			X	
pH	All	NDPs: 0 Tests: 18		X			X			X			X			X	
pH Value of Filtered Water	All	NDPs: 0 Tests: 18				X			X			X			X		
Phenols by HPLC (W)	All	NDPs: 0 Tests: 18				X			X			X			X		
Sample description	All	NDPs: 0 Tests: 18		X			X			X			X			X	
Semi Volatile Organic Compounds	All	NDPs: 0 Tests: 18		X			X			X			X			X	
Total Organic Carbon	All	NDPs: 0 Tests: 18		X			X			X			X			X	
TPH CWG GC (S)	All	NDPs: 0 Tests: 18		X			X			X			X			X	
VOC MS (S)	All	NDPs: 0 Tests: 18			X			X			X			X			X

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Sample Descriptions

Grain Sizes

very fine	< 0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	> 10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
28530539	TP01	0.50 - 0.50	Light Brown	Sand	Stones	Crushed Brick
28530598	TP01	1.00 - 1.00	Light Brown	Sand	Stones	None
28530614	TP01	2.00 - 2.00	Light Brown	Sandy Clay Loam	Stones	None
28530619	TP01	2.30 - 2.50	Light Brown	Sandy Clay Loam	None	None
28530625	TP02	0.50 - 0.50	Light Brown	Sand	Stones	Stones
28530632	TP02	1.00 - 1.00	Dark Brown	Sandy Clay Loam	Stones	None
28530638	TP02	2.00 - 2.00	Light Brown	Sandy Clay Loam	Stones	None
28530643	TP02	2.50 - 2.50	Light Brown	Sandy Clay Loam	None	None
28530544	TP03	1.00 - 1.00	Light Brown	Sand	Stones	Stones
28530551	TP03	2.00 - 2.00	Grey	Sandy Silt Loam	Vegetation	None
28530556	TP03	2.80 - 2.80	Dark Brown	Shale	Stones	None
28530648	TP03	0.50 - 0.50	Light Brown	Sand	Stones	None
28530561	TP04	0.50 - 0.50	Dark Brown	Sandy Clay	Stones	Vegetation
28530566	TP04	1.00 - 1.00	Dark Brown	Sandy Clay Loam	Stones	Vegetation
28530571	TP04	2.00 - 2.00	Light Brown	Sandy Silt Loam	Stones	None
28530578	TP04	2.90 - 2.90	Light Brown	Sandy Clay	None	None
28530603	TP05	2.30 - 2.30	Light Brown	Sandy Clay Loam	Stones	None
28530609	TP05	2.50 - 2.50	Light Brown	Sandy Clay	None	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provid sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are c naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major pa

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the n sample.

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Results Legend												
#	ISO17025 accredited.	Customer Sample Ref.	TP01	TP01	TP01	TP01	TP02	TP02
M	MCERTS accredited.							
aq	Aqueous / settled sample.	Depth (m)	0.50 - 0.50	1.00 - 1.00	2.00 - 2.00	2.30 - 2.50	0.50 - 0.50	1.00 - 1.00
diss.filt	Dissolved / filtered sample.	Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
tot.unfilt	Total / unfiltered sample.	Date Sampled	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023
*	Subcontracted - refer to subcontractor report for accreditation status.	Sampled Time	.	.	.	.	.	.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	Date Received	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023
		SDG Ref	230824-55	230824-55	230824-55	230824-55	230824-55	230824-55
(F)	Trigger breach confirmed	Lab Sample No.(s)	28530539	28530598	28530614	28530619	28530625	28530632
1-4+ §@	Sample deviation (see appendix)	AGS Reference	ES	ES	ES	ES	ES	ES

Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	5.2	4.5	17	24	2.9	20
Loss on ignition	<0.7 %	TM018	<0.7 M	1.93 M	1.69 M	2.73 M	1.38 M	8.16 M
Organic Carbon, Total	<0.2 %	TM132	0.459 M	1.24 M	<0.2 M	0.345 M	<0.2 M	3 M
pH	1 pH Units	TM133	9.9 M	11.3 M	8.01 M	7.87 M	11.5 M	8.05 M
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6 M	<0.6 M	<0.6 M	<0.6 M	<0.6 M	<0.6 M
PCB congener 28	<0.003 mg/kg	TM168	<0.015 M	<0.03 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 52	<0.003 mg/kg	TM168	<0.015 M	<0.03 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 101	<0.003 mg/kg	TM168	<0.015 M	<0.03 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 118	<0.003 mg/kg	TM168	<0.015 M	<0.03 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 138	<0.003 mg/kg	TM168	<0.015 M	<0.03 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 153	<0.003 mg/kg	TM168	<0.015 M	<0.03 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 180	<0.003 mg/kg	TM168	<0.015 M	<0.03 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
Sum of detected PCB 7 Congeners	<0.021 mg/kg	TM168	<0.105	<0.21	<0.021	<0.021	<0.021	<0.021
Arsenic	<0.6 mg/kg	TM181	2.65 M	4.37 M	7.33 M	11.1 M	2.61 M	18.4 M
Barium	<0.6 mg/kg	TM181	73.8 #	275 #	28.9 #	30.1 #	213 #	87.6 #
Beryllium	<0.01 mg/kg	TM181	0.167 M	0.195 M	0.356 M	0.253 M	0.173 M	0.754 M
Cadmium	<0.02 mg/kg	TM181	0.476 M	0.981 M	<0.02 M	<0.02 M	0.667 M	<0.02 M
Chromium	<0.9 mg/kg	TM181	4 M	3.01 M	9.06 M	9.94 M	4.63 M	8.58 M
Copper	<1.4 mg/kg	TM181	4.92 M	5.13 M	13.4 M	9.9 M	6.25 M	36.3 M
Lead	<0.7 mg/kg	TM181	39.9 M	189 M	11.6 M	14.9 M	44.4 M	58.6 M
Mercury	<0.1 mg/kg	TM181	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M
Nickel	<0.2 mg/kg	TM181	4.32 M	4.02 M	12.9 M	9.74 M	5.25 M	14.5 M
Selenium	<1 mg/kg	TM181	1.06 #	1.2 #	<1 #	<1 #	1.46 #	<1 #
Vanadium	<0.2 mg/kg	TM181	5.38 #	5.93 #	22.2 #	23 #	6.82 #	30.2 #
Zinc	<1.9 mg/kg	TM181	69.7 M	97.5 M	42.9 M	32.8 M	105 M	58.6 M
ANC @ pH 4	<0.03 mol/kg	TM182	0.207	0.156	0.102	0.0751	0.878	0.0791
ANC @ pH 6	<0.03 mol/kg	TM182	0.109	0.112	<0.03	0.0373	0.356	<0.03
Boron, water soluble	<1 mg/kg	TM222	<1 M	<1 M	<1 M	<1 M	<1 M	<1 M
PAH Total 17 (inc Coronene) Moisture Corrected	<10 mg/kg	TM410	<10	<10	<10	<10	<10	<10
Coronene	<0.2 mg/kg	TM410	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
EPH Surrogate % recovery**	%	TM415	103	105	93	100	91.4	93.3
Mineral Oil >C10-C40 (EH_2D_AL)	<5 mg/kg	TM415	866	14	<5	<5	67.6	6.38

Results Legend	Customer Sample Ref.	TP02	TP02	TP03	TP03	TP03	TP03
# ISO17025 accredited.	Depth (m)	2.00 - 2.00	2.50 - 2.50	0.50 - 0.50	1.00 - 1.00	2.00 - 2.00	2.80 - 2.80
M MCERTS accredited.	Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
aq Aqueous / settled sample.	Date Sampled	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023
diss.filt Dissolved / filtered sample.	Sampled Time	.	.	.	.	.	.
tot.unfilt Total / unfiltered sample.	Date Received	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023
* Subcontracted - refer to subcontractor report for accreditation status.	SDG Ref	230824-55	230824-55	230824-55	230824-55	230824-55	230824-55
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	Lab Sample No.(s)	28530638	28530643	28530648	28530544	28530551	28530556
(F) Trigger breach confirmed	AGS Reference	ES	ES	ES	ES	ES	ES
1-4+ §@ Sample deviation (see appendix)							

Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	15	17	6.9	4.5	19	5.7
Loss on ignition	<0.7 %	TM018	2.26 M	2.08 M	1.56 M	<0.7 M	2.36 M	1.32 #
Organic Carbon, Total	<0.2 %	TM132	0.398 M	<0.2 M	0.34 M	<0.2 M	0.248 M	<0.2 #
pH	1 pH Units	TM133	7.38 M	8 M	11.2 M	11.1 M	7.87 M	8.02 #
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6 M	<0.6 M	<0.6 M	<0.6 M	<0.6 M	<0.6 #
PCB congener 28	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 #
PCB congener 52	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 #
PCB congener 101	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 #
PCB congener 118	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 #
PCB congener 138	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 #
PCB congener 153	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 #
PCB congener 180	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 #
Sum of detected PCB 7 Congeners	<0.021 mg/kg	TM168	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021
Arsenic	<0.6 mg/kg	TM181	5.7 M	2.24 M	2.91 M	2.09 M	3.77 M	5.69 #
Barium	<0.6 mg/kg	TM181	26.8 #	27.5 #	66.7 #	78.2 #	40.5 #	22.7 #
Beryllium	<0.01 mg/kg	TM181	0.57 M	0.224 M	0.137 M	0.0962 M	0.456 M	0.532 #
Cadmium	<0.02 mg/kg	TM181	<0.02 M	<0.02 M	0.811 M	0.681 M	<0.02 M	<0.02 #
Chromium	<0.9 mg/kg	TM181	9.59 M	10.8 M	4.64 M	3.09 M	10.7 M	4.93 #
Copper	<1.4 mg/kg	TM181	15.8 M	6.28 M	4.31 M	5.55 M	11.7 M	14.3 #
Lead	<0.7 mg/kg	TM181	17.9 M	6.38 M	138 M	97.6 M	8.52 M	11.5 #
Mercury	<0.1 mg/kg	TM181	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 #
Nickel	<0.2 mg/kg	TM181	12.4 M	9.11 M	4.43 M	3.24 M	9.84 M	21 #
Selenium	<1 mg/kg	TM181	<1 #	<1 #	1.01 #	1.11 #	<1 #	<1 #
Vanadium	<0.2 mg/kg	TM181	17.9 #	12 #	6.27 #	5.27 #	14.2 #	9.39 #
Zinc	<1.9 mg/kg	TM181	46.8 M	52.5 M	194 M	150 M	34.8 M	63.7 #
ANC @ pH 4	<0.03 mol/kg	TM182	0.0557	0.066	0.141	0.304	0.0918	0.042
ANC @ pH 6	<0.03 mol/kg	TM182	<0.03	<0.03	0.0975	0.145	<0.03	<0.03
Boron, water soluble	<1 mg/kg	TM222	<1 M	<1 M	<1 M	<1 M	<1 M	<1 #
PAH Total 17 (inc Coronene) Moisture Corrected	<10 mg/kg	TM410	<10	<10	<10	<10	<10	<10
Coronene	<0.2 mg/kg	TM410	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
EPH Surrogate % recovery**	%	TM415	90.4	96.8	96	99.3	96.3	98.8
Mineral Oil >C10-C40 (EH_2D_AL)	<5 mg/kg	TM415	6.01	<5	15.6	<5	<5	<5

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Results Legend	Customer Sample Ref.	TP04	TP04	TP04	TP04	TP05	TP05
# ISO17025 accredited.	Depth (m)	0.50 - 0.50	1.00 - 1.00	2.00 - 2.00	2.90 - 2.90	2.30 - 2.30	2.50 - 2.50
M MCERTS accredited.	Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
aq Aqueous / settled sample.	Date Sampled	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023
diss.filt Dissolved / filtered sample.	Sampled Time	.	.	.	.	.	.
tot.unfilt Total / unfiltered sample.	Date Received	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023
* Subcontracted - refer to subcontractor report for accreditation status.	SDG Ref	230824-55	230824-55	230824-55	230824-55	230824-55	230824-55
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	Lab Sample No.(s)	28530561	28530566	28530571	28530578	28530603	28530609
(F) Trigger breach confirmed	AGS Reference	ES	ES	ES	ES	ES	ES
1-4+ §@ Sample deviation (see appendix)							

Component	LOD/Units	Method											
Moisture Content Ratio (% of as received sample)	%	PM024	19		26		15		5.3		14		19	
Loss on ignition	<0.7 %	TM018	3.54	M	12.2	M	3	M	1.9	M	3.38	M	3.41	M
Organic Carbon, Total	<0.2 %	TM132	0.887	M	6.83	M	1.52	M	0.226	M	0.372	M	0.212	M
pH	1 pH Units	TM133	8.01	M	7.96	M	8.41	M	7.63	M	8.3	M	8.19	M
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	M	<0.6	M	<0.6	M	<0.6	M	<0.6	M	<0.6	M
PCB congener 28	<0.003 mg/kg	TM168	<0.003	M	<0.003	M	<0.003	M	<0.003	M	<0.003	M	<0.003	M
PCB congener 52	<0.003 mg/kg	TM168	<0.003	M	<0.003	M	<0.003	M	<0.003	M	<0.003	M	<0.003	M
PCB congener 101	<0.003 mg/kg	TM168	<0.003	M	<0.003	M	<0.003	M	<0.003	M	<0.003	M	<0.003	M
PCB congener 118	<0.003 mg/kg	TM168	<0.003	M	<0.003	M	<0.003	M	<0.003	M	<0.003	M	<0.003	M
PCB congener 138	<0.003 mg/kg	TM168	<0.003	M	<0.003	M	<0.003	M	<0.003	M	<0.003	M	<0.003	M
PCB congener 153	<0.003 mg/kg	TM168	<0.003	M	<0.003	M	<0.003	M	<0.003	M	<0.003	M	<0.003	M
PCB congener 180	<0.003 mg/kg	TM168	<0.003	M	<0.003	M	<0.003	M	<0.003	M	<0.003	M	<0.003	M
Sum of detected PCB 7 Congeners	<0.021 mg/kg	TM168	<0.021		<0.021		<0.021		<0.021		<0.021		<0.021	
Arsenic	<0.6 mg/kg	TM181	12.7	M	24.5	M	8.11	M	5.4	M	5.09	M	6.83	M
Barium	<0.6 mg/kg	TM181	39.5	#	144	#	56.7	#	32.5	#	45.4	#	25	#
Beryllium	<0.01 mg/kg	TM181	0.744	M	1.67	M	0.741	M	0.454	M	0.92	M	0.226	M
Cadmium	<0.02 mg/kg	TM181	<0.02	M	<0.02	M	<0.02	M	<0.02	M	<0.02	M	<0.02	M
Chromium	<0.9 mg/kg	TM181	6.64	M	10.8	M	5.56	M	4.85	M	8.28	M	3.57	M
Copper	<1.4 mg/kg	TM181	17.6	M	45.5	M	18.4	M	14.8	M	22	M	12.1	M
Lead	<0.7 mg/kg	TM181	27.6	M	118	M	31.1	M	10.1	M	16.1	M	12.9	M
Mercury	<0.1 mg/kg	TM181	<0.1	M	0.386	M	<0.1	M	<0.1	M	<0.1	M	<0.1	M
Nickel	<0.2 mg/kg	TM181	11.7	M	26.3	M	20.3	M	27.2	M	38.7	M	9.21	M
Selenium	<1 mg/kg	TM181	<1	#	1.35	#	<1	#	<1	#	<1	#	<1	#
Vanadium	<0.2 mg/kg	TM181	19.5	#	37.5	#	13	#	11.3	#	20.3	#	16.3	#
Zinc	<1.9 mg/kg	TM181	46.1	M	69.4	M	65.4	M	67.7	M	84.7	M	32.6	M
ANC @ pH 4	<0.03 mol/kg	TM182	0.0636		0.0857		0.0759		0.0692		0.0506		0.081	
ANC @ pH 6	<0.03 mol/kg	TM182	<0.03		<0.03		<0.03		<0.03		<0.03		<0.03	
Boron, water soluble	<1 mg/kg	TM222	<1	M	<1	M	<1	M	<1	M	<1	M	<1	M
PAH Total 17 (inc Coronene) Moisture Corrected	<10 mg/kg	TM410	<10		<10		<10		<10		<10		<10	
Coronene	<0.2 mg/kg	TM410	<0.2		<0.2		<0.2		<0.2		<0.2		<0.2	
EPH Surrogate % recovery**	%	TM415	93.6		95.5		91.8		96.7		99.5		92.9	
Mineral Oil >C10-C40 (EH_2D_AL)	<5 mg/kg	TM415	<5		5.57		<5		<5		<5		<5	

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

PAH by GCMS

Results Legend	
#	ISO17025 accredited.
M	MCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+ §@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP01	TP01	TP01	TP01	TP02	TP02
			Depth (m)	0.50 - 0.50	1.00 - 1.00	2.00 - 2.00	2.30 - 2.50	0.50 - 0.50	1.00 - 1.00
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023
			SDG Ref	230824-55	230824-55	230824-55	230824-55	230824-55	230824-55
			Lab Sample No.(s)	28530539	28530598	28530614	28530619	28530625	28530632
			AGS Reference	ES	ES	ES	ES	ES	ES
Naphthalene-d8 % recovery**	%	TM218		87.8	87.1	90.2	86.9	88	89.1
Acenaphthene-d10 % recovery**	%	TM218		93.1	84.6	88.5	86.7	88.9	87.9
Phenanthrene-d10 % recovery**	%	TM218		92.6	87.1	83.3	88.7	88.3	85.2
Chrysene-d12 % recovery**	%	TM218		98.4	75.6	86.8	73.7	88.9	87.9
Perylene-d12 % recovery**	%	TM218		97.5	70.8	88.5	71.1	88.6	88.3
Naphthalene	<0.009 mg/kg	TM218		<0.009 M	0.155 M	<0.009 M	<0.009 M	<0.009 M	0.303 M
Acenaphthylene	<0.012 mg/kg	TM218		0.0169 M	<0.12 M	<0.012 M	<0.012 M	<0.012 M	<0.012 M
Acenaphthene	<0.008 mg/kg	TM218		<0.008 M	<0.08 M	<0.008 M	<0.008 M	<0.008 M	<0.008 M
Fluorene	<0.01 mg/kg	TM218		<0.01 M	<0.1 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Phenanthrene	<0.015 mg/kg	TM218		0.116 M	<0.15 M	<0.015 M	<0.015 M	0.0275 M	0.0395 M
Anthracene	<0.016 mg/kg	TM218		<0.016 M	<0.16 M	<0.016 M	<0.016 M	<0.016 M	<0.016 M
Fluoranthene	<0.017 mg/kg	TM218		0.126 M	<0.17 M	<0.017 M	<0.017 M	0.0432 M	0.0225 M
Pyrene	<0.015 mg/kg	TM218		0.151 M	0.181 M	<0.015 M	<0.015 M	0.0504 M	0.0219 M
Benz(a)anthracene	<0.014 mg/kg	TM218		0.0803 M	<0.14 M	<0.014 M	<0.014 M	0.0278 M	<0.014 M
Chrysene	<0.01 mg/kg	TM218		0.0863 M	<0.1 M	<0.01 M	<0.01 M	0.0268 M	0.0174 M
Benzo(b)fluoranthene	<0.015 mg/kg	TM218		0.117 M	<0.15 M	<0.015 M	<0.015 M	0.0402 M	0.024 M
Benzo(k)fluoranthene	<0.014 mg/kg	TM218		0.048 M	<0.14 M	<0.014 M	<0.014 M	0.017 M	<0.014 M
Benzo(a)pyrene	<0.015 mg/kg	TM218		0.125 M	<0.15 M	<0.015 M	<0.015 M	0.036 M	<0.015 M
Indeno(1,2,3-cd)pyrene	<0.018 mg/kg	TM218		0.103 M	<0.18 M	<0.018 M	<0.018 M	0.0258 M	<0.018 M
Dibenzo(a,h)anthracene	<0.023 mg/kg	TM218		<0.023 M	<0.23 M	<0.023 M	<0.023 M	<0.023 M	<0.023 M
Benzo(g,h,i)perylene	<0.024 mg/kg	TM218		0.135 M	<0.24 M	<0.024 M	<0.024 M	0.0313 M	<0.024 M
PAH, Total Detected USEPA 16	<0.118 mg/kg	TM218		1.1	<1.18	<0.118	<0.118	0.326	0.429

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

PAH by GCMS

Results Legend	
#	ISO17025 accredited.
M	MCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+ §@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP02	TP02	TP03	TP03	TP03	TP03
			Depth (m)	2.00 - 2.00	2.50 - 2.50	0.50 - 0.50	1.00 - 1.00	2.00 - 2.00	2.80 - 2.80
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023
			SDG Ref	230824-55	230824-55	230824-55	230824-55	230824-55	230824-55
			Lab Sample No.(s)	28530638	28530643	28530648	28530544	28530551	28530556
			AGS Reference	ES	ES	ES	ES	ES	ES
Naphthalene-d8 % recovery**	%	TM218		90.3	90.9	87.9	87.6	87.6	88.9
Acenaphthene-d10 % recovery**	%	TM218		88.2	89	87.9	86.5	86.4	88.6
Phenanthrene-d10 % recovery**	%	TM218		86.4	86.6	86.5	85	89.2	89.6
Chrysene-d12 % recovery**	%	TM218		95.7	90.6	87	86.7	71.8	74.9
Perylene-d12 % recovery**	%	TM218		96.6	91.9	89.1	87.1	70.5	70.7
Naphthalene	<0.009 mg/kg	TM218		<0.009 M	<0.009 M	<0.009 M	<0.009 M	<0.009 M	<0.009 #
Acenaphthylene	<0.012 mg/kg	TM218		<0.012 M	<0.012 M	<0.012 M	<0.012 M	<0.012 M	<0.012 #
Acenaphthene	<0.008 mg/kg	TM218		<0.008 M	<0.008 M	<0.008 M	<0.008 M	<0.008 M	<0.008 #
Fluorene	<0.01 mg/kg	TM218		0.0147 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 #
Phenanthrene	<0.015 mg/kg	TM218		<0.015 M	<0.015 M	0.0561 M	<0.015 M	<0.015 M	<0.015 #
Anthracene	<0.016 mg/kg	TM218		<0.016 M	<0.016 M	<0.016 M	<0.016 M	<0.016 M	<0.016 #
Fluoranthene	<0.017 mg/kg	TM218		<0.017 M	<0.017 M	0.104 M	<0.017 M	<0.017 M	<0.017 #
Pyrene	<0.015 mg/kg	TM218		<0.015 M	<0.015 M	0.0951 M	<0.015 M	<0.015 M	<0.015 #
Benz(a)anthracene	<0.014 mg/kg	TM218		<0.014 M	<0.014 M	0.0556 M	<0.014 M	<0.014 M	<0.014 #
Chrysene	<0.01 mg/kg	TM218		<0.01 M	<0.01 M	0.0457 M	<0.01 M	<0.01 M	<0.01 #
Benzo(b)fluoranthene	<0.015 mg/kg	TM218		<0.015 M	<0.015 M	0.06 M	<0.015 M	<0.015 M	<0.015 #
Benzo(k)fluoranthene	<0.014 mg/kg	TM218		<0.014 M	<0.014 M	0.0251 M	<0.014 M	<0.014 M	<0.014 #
Benzo(a)pyrene	<0.015 mg/kg	TM218		<0.015 M	<0.015 M	0.0609 M	<0.015 M	<0.015 M	<0.015 #
Indeno(1,2,3-cd)pyrene	<0.018 mg/kg	TM218		<0.018 M	<0.018 M	0.0424 M	<0.018 M	<0.018 M	<0.018 #
Dibenzo(a,h)anthracene	<0.023 mg/kg	TM218		<0.023 M	<0.023 M	<0.023 M	<0.023 M	<0.023 M	<0.023 #
Benzo(g,h,i)perylene	<0.024 mg/kg	TM218		<0.024 M	<0.024 M	0.0508 M	<0.024 M	<0.024 M	<0.024 #
PAH, Total Detected USEPA 16	<0.118 mg/kg	TM218		<0.118	<0.118	0.595	<0.118	<0.118	<0.118

CERTIFICATE OF ANALYSIS

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PAH by GCMS

Results Legend	
#	ISO17025 accredited.
M	MCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+ §@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP04	TP04	TP04	TP04	TP05	TP05
			Depth (m)	0.50 - 0.50	1.00 - 1.00	2.00 - 2.00	2.90 - 2.90	2.30 - 2.30	2.50 - 2.50
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023
			SDG Ref	230824-55	230824-55	230824-55	230824-55	230824-55	230824-55
			Lab Sample No.(s)	28530561	28530566	28530571	28530578	28530603	28530609
			AGS Reference	ES	ES	ES	ES	ES	ES
Naphthalene-d8 % recovery**	%	TM218		88	88.1	86.7	86.6	91.7	91.3
Acenaphthene-d10 % recovery**	%	TM218		87.9	78.9	86.2	86.4	94.4	93.4
Phenanthrene-d10 % recovery**	%	TM218		89	73.1	88.8	85.4	97.2	98.1
Chrysene-d12 % recovery**	%	TM218		75.1	72.5	75.8	85.5	99.6	100
Perylene-d12 % recovery**	%	TM218		70	76.7	70.6	85.1	87.5	91
Naphthalene	<0.009 mg/kg	TM218		0.0134 M	0.0227 M	0.0105 M	<0.009 M	<0.009 M	<0.009 M
Acenaphthylene	<0.012 mg/kg	TM218		<0.012 M	<0.012 M	<0.012 M	<0.012 M	<0.012 M	<0.012 M
Acenaphthene	<0.008 mg/kg	TM218		<0.008 M	<0.008 M	<0.008 M	<0.008 M	<0.008 M	<0.008 M
Fluorene	<0.01 mg/kg	TM218		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Phenanthrene	<0.015 mg/kg	TM218		0.0594 M	0.167 M	0.0643 M	<0.015 M	<0.015 M	<0.015 M
Anthracene	<0.016 mg/kg	TM218		<0.016 M	0.0319 M	<0.016 M	<0.016 M	<0.016 M	<0.016 M
Fluoranthene	<0.017 mg/kg	TM218		0.114 M	0.36 M	0.112 M	<0.017 M	<0.017 M	<0.017 M
Pyrene	<0.015 mg/kg	TM218		0.101 M	0.301 M	0.0929 M	<0.015 M	<0.015 M	<0.015 M
Benz(a)anthracene	<0.014 mg/kg	TM218		0.0565 M	0.18 M	0.0442 M	<0.014 M	<0.014 M	<0.014 M
Chrysene	<0.01 mg/kg	TM218		0.0634 M	0.207 M	0.0545 M	<0.01 M	<0.01 M	<0.01 M
Benzo(b)fluoranthene	<0.015 mg/kg	TM218		0.0479 M	0.235 M	0.0428 M	<0.015 M	<0.015 M	<0.015 M
Benzo(k)fluoranthene	<0.014 mg/kg	TM218		0.0295 M	0.114 M	0.0187 M	<0.014 M	<0.014 M	<0.014 M
Benzo(a)pyrene	<0.015 mg/kg	TM218		0.0463 M	0.175 M	0.03 M	<0.015 M	<0.015 M	<0.015 M
Indeno(1,2,3-cd)pyrene	<0.018 mg/kg	TM218		0.0326 M	0.104 M	0.0222 M	<0.018 M	<0.018 M	<0.018 M
Dibenzo(a,h)anthracene	<0.023 mg/kg	TM218		<0.023 M	<0.023 M	<0.023 M	<0.023 M	<0.023 M	<0.023 M
Benzo(g,h,i)perylene	<0.024 mg/kg	TM218		0.0349 M	0.101 M	<0.024 M	<0.024 M	<0.024 M	<0.024 M
PAH, Total Detected USEPA 16	<0.118 mg/kg	TM218		0.599	2	0.492	<0.118	<0.118	<0.118

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Semi Volatile Organic Compounds

Results Legend
ISO17025 accredited.
M MCERTS accredited.
aq Aqueous / settled sample.
diss.filt Dissolved / filtered sample.
tot.unfilt Total / unfiltered sample.
* Subcontracted - refer to subcontractor report for accreditation status.
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F) Trigger breach confirmed
1-4+ §@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP01	TP01	TP01	TP01	TP02	TP02
			Depth (m)	0.50 - 0.50	1.00 - 1.00	2.00 - 2.00	2.30 - 2.50	0.50 - 0.50	1.00 - 1.00
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023
			SDG Ref	230824-55	230824-55	230824-55	230824-55	230824-55	230824-55
			Lab Sample No.(s)	28530539	28530598	28530614	28530619	28530625	28530632
			AGS Reference	ES	ES	ES	ES	ES	ES
Phenol	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
Pentachlorophenol	<0.1 mg/kg	TM157		<0.2	<0.2	<0.1	<0.1	<0.1	<0.1
n-Nitroso-n-dipropylamine	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrobenzene	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
Isophorone	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
Hexachloroethane	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
Hexachlorocyclopentadiene	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
Hexachlorobutadiene	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
Hexachlorobenzene	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
n-Dioctyl phthalate	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethyl phthalate	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
Diethyl phthalate	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
n-Dibutyl phthalate	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzofuran	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
Carbazole	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
Butylbenzyl phthalate	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
bis(2-Ethylhexyl) phthalate	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
bis(2-Chloroethoxy)methane	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
bis(2-Chloroethyl)ether	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
Azobenzene	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
4-Nitrophenol	<0.1 mg/kg	TM157		<0.2	<0.2	<0.1	<0.1	<0.1	<0.1
4-Nitroaniline	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
4-Methylphenol	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
4-Chlorophenylphenylether	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
4-Chloroaniline	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
4-Chloro-3-methylphenol	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
4-Bromophenylphenylether	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
3-Nitroaniline	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
2-Nitrophenol	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
2-Nitroaniline	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
2-Methylphenol	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
1,2,4-Trichlorobenzene	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Semi Volatile Organic Compounds

Results Legend
ISO17025 accredited.
M MCERTS accredited.
aq Aqueous / settled sample.
diss.filt Dissolved / filtered sample.
tot.unfilt Total / unfiltered sample.
* Subcontracted - refer to subcontractor report for accreditation status.
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F) Trigger breach confirmed
1-4+ §@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP01	TP01	TP01	TP01	TP02	TP02
			Depth (m)	0.50 - 0.50	1.00 - 1.00	2.00 - 2.00	2.30 - 2.50	0.50 - 0.50	1.00 - 1.00
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023
			SDG Ref	230824-55	230824-55	230824-55	230824-55	230824-55	230824-55
			Lab Sample No.(s)	28530539	28530598	28530614	28530619	28530625	28530632
			AGS Reference	ES	ES	ES	ES	ES	ES
2-Chlorophenol	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
2,6-Dinitrotoluene	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
2,4-Dinitrotoluene	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
2,4-Dimethylphenol	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
2,4-Dichlorophenol	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
2,4,6-Trichlorophenol	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
2,4,5-Trichlorophenol	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
1,4-Dichlorobenzene	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
1,3-Dichlorobenzene	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
1,2-Dichlorobenzene	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
2-Chloronaphthalene	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
2-Methylnaphthalene	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	0.261
Acenaphthylene	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b)fluoranthene	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	<0.1 mg/kg	TM157		0.354	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	<0.1 mg/kg	TM157		0.36	<0.1	<0.1	<0.1	<0.1	<0.1
Naphthalene	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	0.347
Dibenzo(a,h)anthracene	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
Bis(2-chloroisopropyl) ether	<0.1 mg/kg	TM157		<0.2	<0.1	<0.1	<0.1	<0.1	<0.1

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Semi Volatile Organic Compounds

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+ §@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP02	TP02	TP03	TP03	TP03	TP03
			Depth (m)	2.00 - 2.00	2.50 - 2.50	0.50 - 0.50	1.00 - 1.00	2.00 - 2.00	2.80 - 2.80
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023
			SDG Ref	230824-55	230824-55	230824-55	230824-55	230824-55	230824-55
			Lab Sample No.(s)	28530638	28530643	28530648	28530544	28530551	28530556
			AGS Reference	ES	ES	ES	ES	ES	ES
Phenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pentachlorophenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
n-Nitroso-n-dipropylamine	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrobenzene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isophorone	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Hexachloroethane	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Hexachlorocyclopentadiene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Hexachlorobutadiene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Hexachlorobenzene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
n-Dioctyl phthalate	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethyl phthalate	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Diethyl phthalate	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
n-Dibutyl phthalate	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzofuran	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Carbazole	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Butylbenzyl phthalate	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
bis(2-Ethylhexyl) phthalate	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
bis(2-Chloroethoxy)methane	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
bis(2-Chloroethyl)ether	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Azobenzene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4-Nitrophenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4-Nitroaniline	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4-Methylphenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4-Chlorophenylphenylether	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4-Chloroaniline	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4-Chloro-3-methylphenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4-Bromophenylphenylether	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
3-Nitroaniline	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-Nitrophenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-Nitroaniline	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-Methylphenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1,2,4-Trichlorobenzene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Semi Volatile Organic Compounds

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+ §@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP02	TP02	TP03	TP03	TP03	TP03
			Depth (m)	2.00 - 2.00	2.50 - 2.50	0.50 - 0.50	1.00 - 1.00	2.00 - 2.00	2.80 - 2.80
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023
			SDG Ref	230824-55	230824-55	230824-55	230824-55	230824-55	230824-55
			Lab Sample No.(s)	28530638	28530643	28530648	28530544	28530551	28530556
			AGS Reference	ES	ES	ES	ES	ES	ES
2-Chlorophenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,6-Dinitrotoluene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,4-Dinitrotoluene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,4-Dimethylphenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,4-Dichlorophenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,4,6-Trichlorophenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,4,5-Trichlorophenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1,4-Dichlorobenzene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1,3-Dichlorobenzene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1,2-Dichlorobenzene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-Chloronaphthalene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-Methylnaphthalene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b)fluoranthene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Naphthalene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Bis(2-chloroisopropyl) ether	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Semi Volatile Organic Compounds

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+ §@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP04	TP04	TP04	TP04	TP05	TP05
			Depth (m)	0.50 - 0.50	1.00 - 1.00	2.00 - 2.00	2.90 - 2.90	2.30 - 2.30	2.50 - 2.50
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023
			SDG Ref	230824-55	230824-55	230824-55	230824-55	230824-55	230824-55
			Lab Sample No.(s)	28530561	28530566	28530571	28530578	28530603	28530609
			AGS Reference	ES	ES	ES	ES	ES	ES
Phenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pentachlorophenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
n-Nitroso-n-dipropylamine	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrobenzene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isophorone	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Hexachloroethane	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Hexachlorocyclopentadiene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Hexachlorobutadiene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Hexachlorobenzene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
n-Dioctyl phthalate	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethyl phthalate	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Diethyl phthalate	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
n-Dibutyl phthalate	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzofuran	<0.1 mg/kg	TM157		<0.1	0.41	<0.1	<0.1	<0.1	<0.1
Carbazole	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Butylbenzyl phthalate	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
bis(2-Ethylhexyl) phthalate	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
bis(2-Chloroethoxy)methane	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
bis(2-Chloroethyl)ether	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Azobenzene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4-Nitrophenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4-Nitroaniline	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4-Methylphenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4-Chlorophenylphenylether	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4-Chloroaniline	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4-Chloro-3-methylphenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4-Bromophenylphenylether	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
3-Nitroaniline	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-Nitrophenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-Nitroaniline	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-Methylphenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1,2,4-Trichlorobenzene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Semi Volatile Organic Compounds

Results Legend	Customer Sample Ref.	TP04	TP04	TP04	TP04	TP05	TP05
# ISO17025 accredited.	Depth (m)	0.50 - 0.50	1.00 - 1.00	2.00 - 2.00	2.90 - 2.90	2.30 - 2.30	2.50 - 2.50
M MCERTS accredited.	Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
aq Aqueous / settled sample.	Date Sampled	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023
diss.filt Dissolved / filtered sample.	Sampled Time	.	.	.	.	.	.
tot.unfilt Total / unfiltered sample.	Date Received	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023
* Subcontracted - refer to subcontractor report for accreditation status.	SDG Ref	230824-55	230824-55	230824-55	230824-55	230824-55	230824-55
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	Lab Sample No.(s)	28530561	28530566	28530571	28530578	28530603	28530609
(F) Trigger breach confirmed	AGS Reference	ES	ES	ES	ES	ES	ES
1-4+ §@ Sample deviation (see appendix)							

Component	LOD/Units	Method						
2-Chlorophenol	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,6-Dinitrotoluene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,4-Dinitrotoluene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,4-Dimethylphenol	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,4-Dichlorophenol	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,4,6-Trichlorophenol	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,4,5-Trichlorophenol	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1,4-Dichlorobenzene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1,3-Dichlorobenzene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1,2-Dichlorobenzene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-Chloronaphthalene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-Methylnaphthalene	<0.1 mg/kg	TM157	<0.1	0.362	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	<0.1 mg/kg	TM157	<0.1	0.156	<0.1	<0.1	<0.1	<0.1
Benzo(b)fluoranthene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	<0.1 mg/kg	TM157	<0.1	0.158	<0.1	<0.1	<0.1	<0.1
Fluoranthene	<0.1 mg/kg	TM157	<0.1	0.217	<0.1	<0.1	<0.1	<0.1
Fluorene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	<0.1 mg/kg	TM157	<0.1	0.42	<0.1	<0.1	<0.1	<0.1
Pyrene	<0.1 mg/kg	TM157	<0.1	0.232	<0.1	<0.1	<0.1	<0.1
Naphthalene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Bis(2-chloroisopropyl) ether	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

TPH CWG (S)

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+ §@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP01	TP01	TP01	TP01	TP02	TP02
			Depth (m)	0.50 - 0.50	1.00 - 1.00	2.00 - 2.00	2.30 - 2.50	0.50 - 0.50	1.00 - 1.00
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023
			SDG Ref	230824-55	230824-55	230824-55	230824-55	230824-55	230824-55
			Lab Sample No.(s)	28530539	28530598	28530614	28530619	28530625	28530632
			AGS Reference	ES	ES	ES	ES	ES	ES
GRO Surrogate % recovery**	%	TM089		103	96.3	105	96.5	99.8	109
Aliphatics >C5-C6 (HS_1D_AL)	<0.01 mg/kg	TM089		<0.01	<0.01	<0.01	<0.01	0.0206	<0.01
Aliphatics >C6-C8 (HS_1D_AL)	<0.01 mg/kg	TM089		0.0179	<0.01	<0.01	<0.01	0.0505	<0.01
Aliphatics >C8-C10 (HS_1D_AL)	<0.01 mg/kg	TM089		0.0179	<0.01	<0.01	<0.01	0.0608	<0.01
Aliphatics >C10-C12 (EH_2D_AL_#1)	<1 mg/kg	TM414		2.29 #	<1 #	<1 #	<1 #	<1 #	<1 #
Aliphatics >C12-C16 (EH_2D_AL_#1)	<1 mg/kg	TM414		359 #	1.81 #	<1 #	<1 #	17 #	<1 #
Aliphatics >C16-C21 (EH_2D_AL_#1)	<1 mg/kg	TM414		961 #	4.21 #	<1 #	<1 #	55.9 #	<1 #
Aliphatics >C21-C35 (EH_2D_AL_#1)	<1 mg/kg	TM414		250 #	<1 #	<1 #	<1 #	20.8 #	1.07 #
Aliphatics >C35-C44 (EH_2D_AL_#1)	<1 mg/kg	TM414		1.36	<1	<1	<1	<1	<1
Total Aliphatics >C10-C44 (EH_2D_AR_#1)	<5 mg/kg	TM414		1570	7.01	<5	<5	94	<5
Total Aliphatics & Aromatics >C10-C44 (EH_2D_Total_#1)	<10 mg/kg	TM414		1710	55.2	<10	<10	102	<10
Aromatics >EC5-EC7 (HS_1D_AR)	<0.01 mg/kg	TM089		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC7-EC8 (HS_1D_AR)	<0.01 mg/kg	TM089		<0.01	<0.01	<0.01	<0.01	0.0134	<0.01
Aromatics >EC8-EC10 (HS_1D_AR)	<0.01 mg/kg	TM089		0.0127	<0.01	<0.01	<0.01	0.0402	<0.01
Aromatics > EC10-EC12 (EH_2D_AR_#1)	<1 mg/kg	TM414		<1 #	<1 #	<1 #	<1 #	<1 #	2.02 #
Aromatics > EC12-EC16 (EH_2D_AR_#1)	<1 mg/kg	TM414		50.7 #	1.33 #	<1 #	<1 #	<1 #	<1 #
Aromatics > EC16-EC21 (EH_2D_AR_#1)	<1 mg/kg	TM414		3.48 #	1.52 #	<1 #	<1 #	1.13 #	<1 #
Aromatics > EC21-EC35 (EH_2D_AR_#1)	<1 mg/kg	TM414		56.2 #	27.1 #	<1 #	<1 #	5.31 #	1.46 #
Aromatics >EC35-EC44 (EH_2D_AR_#1)	<1 mg/kg	TM414		25.5	18.2	<1	<1	<1	<1
Aromatics > EC40-EC44 (EH_2D_AR_#1)	<1 mg/kg	TM414		5.94	4.12	<1	<1	<1	<1
Total Aromatics > EC10-EC44 (EH_2D_AR_#1)	<5 mg/kg	TM414		136	48.2	<5	<5	8.07	<5
Total Aliphatics & Aromatics >C5-C44 (EH_2D_Total_#1+HS_1D_Total)	<10 mg/kg	TM414		1710	55.2	<10	<10	102	<10
Total Aliphatics >C5-C10 (HS_1D_AL_TOTAL)	<0.05 mg/kg	TM089		<0.05	<0.05	<0.05	<0.05	0.132	<0.05
Total Aromatics >EC5-EC10 (HS_1D_AR_TOTAL)	<0.05 mg/kg	TM089		<0.05	<0.05	<0.05	<0.05	0.0536	<0.05
GRO >C5-C10 (HS_1D_TOTAL)	<0.02 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	0.185	<0.02

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

TPH CWG (S)

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+ §@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP02	TP02	TP03	TP03	TP03	TP03
			Depth (m)	2.00 - 2.00	2.50 - 2.50	0.50 - 0.50	1.00 - 1.00	2.00 - 2.00	2.80 - 2.80
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023
			SDG Ref	230824-55	230824-55	230824-55	230824-55	230824-55	230824-55
			Lab Sample No.(s)	28530638	28530643	28530648	28530544	28530551	28530556
			AGS Reference	ES	ES	ES	ES	ES	ES
GRO Surrogate % recovery**	%	TM089		105	107	106	103	99.2	125
Aliphatics >C5-C6 (HS_1D_AL)	<0.01 mg/kg	TM089		0.013	0.012	<0.01	<0.01	<0.01	<0.01
Aliphatics >C6-C8 (HS_1D_AL)	<0.01 mg/kg	TM089		0.306	0.12	<0.01	0.0251	0.0209	0.0202
Aliphatics >C8-C10 (HS_1D_AL)	<0.01 mg/kg	TM089		0.971	0.292	<0.01	0.0314	0.0504	0.0276
Aliphatics >C10-C12 (EH_2D_AL_#1)	<1 mg/kg	TM414		1.22 #	<1 #	<1 #	<1 #	<1 #	<1 #
Aliphatics >C12-C16 (EH_2D_AL_#1)	<1 mg/kg	TM414		<1 #	<1 #	9.97 #	<1 #	<1 #	<1 #
Aliphatics >C16-C21 (EH_2D_AL_#1)	<1 mg/kg	TM414		<1 #	<1 #	13.1 #	5.43 #	<1 #	<1 #
Aliphatics >C21-C35 (EH_2D_AL_#1)	<1 mg/kg	TM414		<1 #	<1 #	3.73 #	1.45 #	<1 #	<1 #
Aliphatics >C35-C44 (EH_2D_AL_#1)	<1 mg/kg	TM414		<1	<1	<1	<1	<1	<1
Total Aliphatics >C10-C44 (EH_2D_AR_#1)	<5 mg/kg	TM414		<5	<5	27.5	7.87	<5	<5
Total Aliphatics & Aromatics >C10-C44 (EH_2D_Total_#1)	<10 mg/kg	TM414		<10	<10	30.8	<10	<10	<10
Aromatics >EC5-EC7 (HS_1D_AR)	<0.01 mg/kg	TM089		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC7-EC8 (HS_1D_AR)	<0.01 mg/kg	TM089		0.0389	0.0264	<0.01	<0.01	<0.01	<0.01
Aromatics >EC8-EC10 (HS_1D_AR)	<0.01 mg/kg	TM089		0.647	0.194	<0.01	0.0209	0.0332	0.018
Aromatics > EC10-EC12 (EH_2D_AR_#1)	<1 mg/kg	TM414		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Aromatics > EC12-EC16 (EH_2D_AR_#1)	<1 mg/kg	TM414		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Aromatics > EC16-EC21 (EH_2D_AR_#1)	<1 mg/kg	TM414		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Aromatics > EC21-EC35 (EH_2D_AR_#1)	<1 mg/kg	TM414		<1 #	<1 #	1.17 #	<1 #	<1 #	1.26 #
Aromatics >EC35-EC44 (EH_2D_AR_#1)	<1 mg/kg	TM414		<1	<1	<1	<1	<1	<1
Aromatics > EC40-EC44 (EH_2D_AR_#1)	<1 mg/kg	TM414		<1	<1	<1	<1	<1	<1
Total Aromatics > EC10-EC44 (EH_2D_AR_#1)	<5 mg/kg	TM414		<5	<5	<5	<5	<5	<5
Total Aliphatics & Aromatics >C5-C44 (EH_2D_Total_#1+HS_1D_Total)	<10 mg/kg	TM414		<10	<10	27.5	<10	<10	<10
Total Aliphatics >C5-C10 (HS_1D_AL_TOTAL)	<0.05 mg/kg	TM089		1.29	0.424	<0.05	0.0565	0.0713	<0.05
Total Aromatics >EC5-EC10 (HS_1D_AR_TOTAL)	<0.05 mg/kg	TM089		0.686	0.221	<0.05	<0.05	<0.05	<0.05
GRO >C5-C10 (HS_1D_TOTAL)	<0.02 mg/kg	TM089		1.98	0.644	<0.02	0.0565	0.0713	<0.02

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

TPH CWG (S)

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+ §@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP04	TP04	TP04	TP04	TP05	TP05
			Depth (m)	0.50 - 0.50	1.00 - 1.00	2.00 - 2.00	2.90 - 2.90	2.30 - 2.30	2.50 - 2.50
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023
			SDG Ref	230824-55	230824-55	230824-55	230824-55	230824-55	230824-55
			Lab Sample No.(s)	28530561	28530566	28530571	28530578	28530603	28530609
			AGS Reference	ES	ES	ES	ES	ES	ES
GRO Surrogate % recovery**	%	TM089		97.8	73	120	107	99.4	102
Aliphatics >C5-C6 (HS_1D_AL)	<0.01 mg/kg	TM089		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatics >C6-C8 (HS_1D_AL)	<0.01 mg/kg	TM089		<0.01	<0.01	0.0152	<0.01	<0.01	<0.01
Aliphatics >C8-C10 (HS_1D_AL)	<0.01 mg/kg	TM089		<0.01	<0.01	0.0105	<0.01	<0.01	<0.01
Aliphatics >C10-C12 (EH_2D_AL_#1)	<1 mg/kg	TM414		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Aliphatics >C12-C16 (EH_2D_AL_#1)	<1 mg/kg	TM414		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Aliphatics >C16-C21 (EH_2D_AL_#1)	<1 mg/kg	TM414		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Aliphatics >C21-C35 (EH_2D_AL_#1)	<1 mg/kg	TM414		<1 #	3.51 #	<1 #	<1 #	<1 #	<1 #
Aliphatics >C35-C44 (EH_2D_AL_#1)	<1 mg/kg	TM414		<1	1.73	<1	<1	<1	<1
Total Aliphatics >C10-C44 (EH_2D_AR_#1)	<5 mg/kg	TM414		<5	6.4	<5	<5	<5	<5
Total Aliphatics & Aromatics >C10-C44 (EH_2D_Total_#1)	<10 mg/kg	TM414		<10	11.9	<10	<10	<10	<10
Aromatics >EC5-EC7 (HS_1D_AR)	<0.01 mg/kg	TM089		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC7-EC8 (HS_1D_AR)	<0.01 mg/kg	TM089		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC8-EC10 (HS_1D_AR)	<0.01 mg/kg	TM089		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics > EC10-EC12 (EH_2D_AR_#1)	<1 mg/kg	TM414		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Aromatics > EC12-EC16 (EH_2D_AR_#1)	<1 mg/kg	TM414		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Aromatics > EC16-EC21 (EH_2D_AR_#1)	<1 mg/kg	TM414		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Aromatics > EC21-EC35 (EH_2D_AR_#1)	<1 mg/kg	TM414		<1 #	3.41 #	<1 #	<1 #	<1 #	<1 #
Aromatics >EC35-EC44 (EH_2D_AR_#1)	<1 mg/kg	TM414		<1	<1	<1	<1	<1	<1
Aromatics > EC40-EC44 (EH_2D_AR_#1)	<1 mg/kg	TM414		<1	<1	<1	<1	<1	<1
Total Aromatics > EC10-EC44 (EH_2D_AR_#1)	<5 mg/kg	TM414		<5	5.5	<5	<5	<5	<5
Total Aliphatics & Aromatics >C5-C44 (EH_2D_Total_#1+HS_1D_Total)	<10 mg/kg	TM414		<10	11.9	<10	<10	<10	<10
Total Aliphatics >C5-C10 (HS_1D_AL_TOTAL)	<0.05 mg/kg	TM089		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Total Aromatics >EC5-EC10 (HS_1D_AR_TOTAL)	<0.05 mg/kg	TM089		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
GRO >C5-C10 (HS_1D_TOTAL)	<0.02 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

VOC MS (S)

Results Legend
- # ISO17025 accredited.
- M MCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+ §@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP01	TP01	TP01	TP01	TP02	TP02
			Depth (m)	0.50 - 0.50	1.00 - 1.00	2.00 - 2.00	2.30 - 2.50	0.50 - 0.50	1.00 - 1.00
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023
			SDG Ref	230824-55	230824-55	230824-55	230824-55	230824-55	230824-55
			Lab Sample No.(s)	28530539	28530598	28530614	28530619	28530625	28530632
			AGS Reference	ES	ES	ES	ES	ES	ES
Dibromofluoromethane**	%	TM116		115	113	108	112	114	111
Toluene-d8**	%	TM116		97.6	98.1	99.8	100	96.5	99.7
4-Bromofluorobenzene**	%	TM116		94.3	94	101	98.5	93	98.3
Dichlorodifluoromethane	<0.0005 mg/kg	TM116		<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #
Chloromethane	<0.002 mg/kg	TM116		<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #
Vinyl Chloride	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M
Bromomethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Chloroethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Trichlorofluorormethane	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M
1,1-Dichloroethene	<0.0005 mg/kg	TM116		<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #
Carbon Disulphide	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Dichloromethane	<0.005 mg/kg	TM116		<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #
Methyl Tertiary Butyl Ether	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M
trans-1,2-Dichloroethene	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
1,1-Dichloroethane	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M
cis-1,2-Dichloroethene	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M
2,2-Dichloropropane	<0.001 mg/kg	TM116		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Bromochloromethane	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
Chloroform	<0.003 mg/kg	TM116		<0.03 M	<0.03 M	<0.03 M	<0.03 M	<0.03 M	<0.03 M
1,1,1-Trichloroethane	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M
1,1-Dichloropropene	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M
Carbontetrachloride	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M
1,2-Dichloroethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Benzene	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	0.0143 M	<0.01 M
Trichloroethene	<0.001 mg/kg	TM116		<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #
1,2-Dichloropropane	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M
Dibromomethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Bromodichloromethane	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
cis-1,3-Dichloropropene	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M
Toluene	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	0.0235 M	<0.01 M
trans-1,3-Dichloropropene	<0.001 mg/kg	TM116		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,1,2-Trichloroethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M

VOC MS (S)

Results Legend
ISO17025 accredited.
M MCERTS accredited.
aq Aqueous / settled sample.
diss.filt Dissolved / filtered sample.
tot.unfilt Total / unfiltered sample.
* Subcontracted - refer to subcontractor report for accreditation status.
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F) Trigger breach confirmed
1-4+ §@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP01	TP01	TP01	TP01	TP02	TP02
			Depth (m)	0.50 - 0.50	1.00 - 1.00	2.00 - 2.00	2.30 - 2.50	0.50 - 0.50	1.00 - 1.00
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023
			SDG Ref	230824-55	230824-55	230824-55	230824-55	230824-55	230824-55
			Lab Sample No.(s)	28530539	28530598	28530614	28530619	28530625	28530632
			AGS Reference	ES	ES	ES	ES	ES	ES
1,3-Dichloropropane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Tetrachloroethene	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
Dibromochloromethane	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
1,2-Dibromoethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Chlorobenzene	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
1,1,1,2-Tetrachloroethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Ethylbenzene	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
p/m-Xylene	<0.002 mg/kg	TM116		<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #
o-Xylene	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
Styrene	<0.002 mg/kg	TM116		<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #
Bromoform	<0.002 mg/kg	TM116		<0.05 M	<0.06 M	<0.05 M	<0.05 M	<0.05 M	<0.05 M
Isopropylbenzene	<0.002 mg/kg	TM116		<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #
1,1,2,2-Tetrachloroethane	<0.002 mg/kg	TM116		<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #
1,2,3-Trichloropropane	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
Bromobenzene	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
Propylbenzene	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
2-Chlorotoluene	<0.003 mg/kg	TM116		<0.03 M	<0.03 M	<0.03 M	<0.03 M	<0.03 M	<0.03 M
1,3,5-Trimethylbenzene	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
4-Chlorotoluene	<0.003 mg/kg	TM116		<0.03 M	<0.03 M	<0.03 M	<0.03 M	<0.03 M	<0.03 M
tert-Butylbenzene	<0.002 mg/kg	TM116		<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #
1,2,4-Trimethylbenzene	<0.003 mg/kg	TM116		<0.03 #	<0.03 #	<0.03 #	<0.03 #	<0.03 #	<0.03 #
sec-Butylbenzene	<0.001 mg/kg	TM116		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
4-Isopropyltoluene	<0.002 mg/kg	TM116		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
1,3-Dichlorobenzene	<0.005 mg/kg	TM116		<0.05 M	<0.05 M	<0.05 M	<0.05 M	<0.05 M	<0.05 M
1,4-Dichlorobenzene	<0.005 mg/kg	TM116		<0.05 M	<0.05 M	<0.05 M	<0.05 M	<0.05 M	<0.05 M
n-Butylbenzene	<0.003 mg/kg	TM116		<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
1,2-Dichlorobenzene	<0.005 mg/kg	TM116		<0.05 M	<0.05 M	<0.05 M	<0.05 M	<0.05 M	<0.05 M
1,2-Dibromo-3-chloropropane	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
Tert-amyl methyl ether	<0.001 mg/kg	TM116		<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #
1,2,4-Trichlorobenzene	<0.007 mg/kg	TM116		<0.07	<0.07	<0.07	<0.07	<0.07	<0.07
Hexachlorobutadiene	<0.004 mg/kg	TM116		<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Naphthalene	<0.008 mg/kg	TM116		<0.08 M	<0.08 M	<0.08 M	<0.08 M	<0.08 M	<0.08 M

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

VOC MS (S)

Results Legend	Customer Sample Ref.	TP01	TP01	TP01	TP01	TP02	TP02
# ISO17025 accredited.	Depth (m)	0.50 - 0.50	1.00 - 1.00	2.00 - 2.00	2.30 - 2.50	0.50 - 0.50	1.00 - 1.00
M MCERTS accredited.	Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
aq Aqueous / settled sample.	Date Sampled	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023
diss.filt Dissolved / filtered sample.	Sampled Time	.	.	.	.	.	.
tot.unfilt Total / unfiltered sample.	Date Received	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023
* Subcontracted - refer to subcontractor report for accreditation status.	SDG Ref	230824-55	230824-55	230824-55	230824-55	230824-55	230824-55
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	Lab Sample No.(s)	28530539	28530598	28530614	28530619	28530625	28530632
(F) Trigger breach confirmed	AGS Reference	ES	ES	ES	ES	ES	ES
1-4+ §@ Sample deviation (see appendix)							

Component	LOD/Units	Method						
1,2,3-Trichlorobenzene	<0.01 mg/kg	TM116	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #
1,3,5-Trichlorobenzene	<0.007 mg/kg	TM116	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07
Sum of Detected Xylenes	<0.02 mg/kg	TM116	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Sum of BTEX	<0.007 mg/kg	TM116	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07

VOC MS (S)

Results Legend
- # ISO17025 accredited.
- M MCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+ §@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP02	TP02	TP03	TP03	TP03	TP03
			Depth (m)	2.00 - 2.00	2.50 - 2.50	0.50 - 0.50	1.00 - 1.00	2.00 - 2.00	2.80 - 2.80
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023
			SDG Ref	230824-55	230824-55	230824-55	230824-55	230824-55	230824-55
			Lab Sample No.(s)	28530638	28530643	28530648	28530544	28530551	28530556
			AGS Reference	ES	ES	ES	ES	ES	ES
Dibromofluoromethane**	%	TM116		110	111	116	112	115	117
Toluene-d8**	%	TM116		98.7	100	98.8	98.6	103	102
4-Bromofluorobenzene**	%	TM116		100	99.3	99.8	98.8	96.9	96.7
Dichlorodifluoromethane	<0.0005 mg/kg	TM116		<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #
Chloromethane	<0.002 mg/kg	TM116		<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #
Vinyl Chloride	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 #
Bromomethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 #
Chloroethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 #
Trichlorofluorormethane	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 #
1,1-Dichloroethene	<0.0005 mg/kg	TM116		<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #
Carbon Disulphide	<0.001 mg/kg	TM116		0.0122 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 #
Dichloromethane	<0.005 mg/kg	TM116		<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #
Methyl Tertiary Butyl Ether	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 #
trans-1,2-Dichloroethene	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 #
1,1-Dichloroethane	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 #
cis-1,2-Dichloroethene	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 #
2,2-Dichloropropane	<0.001 mg/kg	TM116		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Bromochloromethane	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 #
Chloroform	<0.003 mg/kg	TM116		<0.03 M	<0.03 M	<0.03 M	<0.03 M	<0.03 M	<0.03 #
1,1,1-Trichloroethane	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 #
1,1-Dichloropropene	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 #
Carbontetrachloride	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 #
1,2-Dichloroethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 #
Benzene	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 #
Trichloroethene	<0.001 mg/kg	TM116		<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #
1,2-Dichloropropane	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 #
Dibromomethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 #
Bromodichloromethane	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 #
cis-1,3-Dichloropropene	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 #
Toluene	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 #
trans-1,3-Dichloropropene	<0.001 mg/kg	TM116		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,1,2-Trichloroethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 #

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

VOC MS (S)

Results Legend
ISO17025 accredited.
M MCERTS accredited.
aq Aqueous / settled sample.
diss.filt Dissolved / filtered sample.
tot.unfilt Total / unfiltered sample.
* Subcontracted - refer to subcontractor report for accreditation status.
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F) Trigger breach confirmed
1-4+ §@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP02	TP02	TP03	TP03	TP03	TP03
			Depth (m)	2.00 - 2.00	2.50 - 2.50	0.50 - 0.50	1.00 - 1.00	2.00 - 2.00	2.80 - 2.80
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023
			SDG Ref	230824-55	230824-55	230824-55	230824-55	230824-55	230824-55
			Lab Sample No.(s)	28530638	28530643	28530648	28530544	28530551	28530556
			AGS Reference	ES	ES	ES	ES	ES	ES
1,3-Dichloropropane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 #
Tetrachloroethene	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 #
Dibromochloromethane	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 #
1,2-Dibromoethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 #
Chlorobenzene	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 #
1,1,1,2-Tetrachloroethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 #
Ethylbenzene	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 #
p/m-Xylene	<0.002 mg/kg	TM116		<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #
o-Xylene	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 #
Styrene	<0.002 mg/kg	TM116		<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #
Bromoform	<0.002 mg/kg	TM116		<0.05 M	<0.05 M	<0.05 M	<0.05 M	<0.05 M	<0.05 #
Isopropylbenzene	<0.002 mg/kg	TM116		<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #
1,1,2,2-Tetrachloroethane	<0.002 mg/kg	TM116		<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #
1,2,3-Trichloropropane	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 #
Bromobenzene	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 #
Propylbenzene	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 #
2-Chlorotoluene	<0.003 mg/kg	TM116		<0.03 M	<0.03 M	<0.03 M	<0.03 M	<0.03 M	<0.03 #
1,3,5-Trimethylbenzene	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 #
4-Chlorotoluene	<0.003 mg/kg	TM116		<0.03 M	<0.03 M	<0.03 M	<0.03 M	<0.03 M	<0.03 #
tert-Butylbenzene	<0.002 mg/kg	TM116		<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #
1,2,4-Trimethylbenzene	<0.003 mg/kg	TM116		<0.03 #	<0.03 #	<0.03 #	<0.03 #	<0.03 #	<0.03 #
sec-Butylbenzene	<0.001 mg/kg	TM116		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
4-Isopropyltoluene	<0.002 mg/kg	TM116		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
1,3-Dichlorobenzene	<0.005 mg/kg	TM116		<0.05 M	<0.05 M	<0.05 M	<0.05 M	<0.05 M	<0.05 #
1,4-Dichlorobenzene	<0.005 mg/kg	TM116		<0.05 M	<0.05 M	<0.05 M	<0.05 M	<0.05 M	<0.05 #
n-Butylbenzene	<0.003 mg/kg	TM116		<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
1,2-Dichlorobenzene	<0.005 mg/kg	TM116		<0.05 M	<0.05 M	<0.05 M	<0.05 M	<0.05 M	<0.05 #
1,2-Dibromo-3-chloropropane	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 #
Tert-amyl methyl ether	<0.001 mg/kg	TM116		<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #
1,2,4-Trichlorobenzene	<0.007 mg/kg	TM116		<0.07	<0.07	<0.07	<0.07	<0.07	<0.07
Hexachlorobutadiene	<0.004 mg/kg	TM116		<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Naphthalene	<0.008 mg/kg	TM116		<0.08 M	<0.08 M	<0.08 M	<0.08 M	<0.08 M	<0.08 #

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

VOC MS (S)

Results Legend	Customer Sample Ref.	TP02	TP02	TP03	TP03	TP03	TP03
# ISO17025 accredited.	Depth (m)	2.00 - 2.00	2.50 - 2.50	0.50 - 0.50	1.00 - 1.00	2.00 - 2.00	2.80 - 2.80
M MCERTS accredited.	Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
aq Aqueous / settled sample.	Date Sampled	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023
diss.filt Dissolved / filtered sample.	Sampled Time	.	.	.	.	.	.
tot.unfilt Total / unfiltered sample.	Date Received	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023
* Subcontracted - refer to subcontractor report for accreditation status.	SDG Ref	230824-55	230824-55	230824-55	230824-55	230824-55	230824-55
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	Lab Sample No.(s)	28530638	28530643	28530648	28530544	28530551	28530556
(F) Trigger breach confirmed	AGS Reference	ES	ES	ES	ES	ES	ES
1-4+ §@ Sample deviation (see appendix)							

Component	LOD/Units	Method						
1,2,3-Trichlorobenzene	<0.01 mg/kg	TM116	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #
1,3,5-Trichlorobenzene	<0.007 mg/kg	TM116	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07
Sum of Detected Xylenes	<0.02 mg/kg	TM116	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Sum of BTEX	<0.007 mg/kg	TM116	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07

VOC MS (S)

Results Legend

#	ISO17025 accredited.
M	MCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+ §@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP04	TP04	TP04	TP04	TP05	TP05
			Depth (m)	0.50 - 0.50	1.00 - 1.00	2.00 - 2.00	2.90 - 2.90	2.30 - 2.30	2.50 - 2.50
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023
			SDG Ref	230824-55	230824-55	230824-55	230824-55	230824-55	230824-55
			Lab Sample No.(s)	28530561	28530566	28530571	28530578	28530603	28530609
			AGS Reference	ES	ES	ES	ES	ES	ES
Dibromofluoromethane**	%	TM116		117	119	113	117	108	110
Toluene-d8**	%	TM116		103	100	98.3	103	96.4	102
4-Bromofluorobenzene**	%	TM116		96.1	82.9	90.9	94.5	94.6	100
Dichlorodifluoromethane	<0.0005 mg/kg	TM116		<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #
Chloromethane	<0.002 mg/kg	TM116		<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #
Vinyl Chloride	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M
Bromomethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Chloroethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Trichlorofluorormethane	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M
1,1-Dichloroethene	<0.0005 mg/kg	TM116		<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #
Carbon Disulphide	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Dichloromethane	<0.005 mg/kg	TM116		<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #
Methyl Tertiary Butyl Ether	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M
trans-1,2-Dichloroethene	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
1,1-Dichloroethane	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M
cis-1,2-Dichloroethene	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M
2,2-Dichloropropane	<0.001 mg/kg	TM116		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Bromochloromethane	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
Chloroform	<0.003 mg/kg	TM116		<0.03 M	<0.03 M	<0.03 M	<0.03 M	<0.03 M	<0.03 M
1,1,1-Trichloroethane	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M
1,1-Dichloropropene	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M
Carbontetrachloride	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M
1,2-Dichloroethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Benzene	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Trichloroethene	<0.001 mg/kg	TM116		<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #
1,2-Dichloropropane	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M
Dibromomethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Bromodichloromethane	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
cis-1,3-Dichloropropene	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M
Toluene	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
trans-1,3-Dichloropropene	<0.001 mg/kg	TM116		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,1,2-Trichloroethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

VOC MS (S)

Results Legend
ISO17025 accredited.
M MCERTS accredited.
aq Aqueous / settled sample.
diss.filt Dissolved / filtered sample.
tot.unfilt Total / unfiltered sample.
* Subcontracted - refer to subcontractor report for accreditation status.
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F) Trigger breach confirmed
1-4+ §@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP04	TP04	TP04	TP04	TP05	TP05
			Depth (m)	0.50 - 0.50	1.00 - 1.00	2.00 - 2.00	2.90 - 2.90	2.30 - 2.30	2.50 - 2.50
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023
			SDG Ref	230824-55	230824-55	230824-55	230824-55	230824-55	230824-55
			Lab Sample No.(s)	28530561	28530566	28530571	28530578	28530603	28530609
			AGS Reference	ES	ES	ES	ES	ES	ES
1,3-Dichloropropane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Tetrachloroethene	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
Dibromochloromethane	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
1,2-Dibromoethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Chlorobenzene	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
1,1,1,2-Tetrachloroethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Ethylbenzene	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
p/m-Xylene	<0.002 mg/kg	TM116		<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #
o-Xylene	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
Styrene	<0.002 mg/kg	TM116		<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #
Bromoform	<0.002 mg/kg	TM116		<0.05 M	<0.08 M	<0.06 M	<0.05 M	<0.05 M	<0.05 M
Isopropylbenzene	<0.002 mg/kg	TM116		<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #
1,1,2,2-Tetrachloroethane	<0.002 mg/kg	TM116		<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #
1,2,3-Trichloropropane	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
Bromobenzene	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
Propylbenzene	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
2-Chlorotoluene	<0.003 mg/kg	TM116		<0.03 M	<0.03 M	<0.03 M	<0.03 M	<0.03 M	<0.03 M
1,3,5-Trimethylbenzene	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
4-Chlorotoluene	<0.003 mg/kg	TM116		<0.03 M	<0.03 M	<0.03 M	<0.03 M	<0.03 M	<0.03 M
tert-Butylbenzene	<0.002 mg/kg	TM116		<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #
1,2,4-Trimethylbenzene	<0.003 mg/kg	TM116		<0.03 #	<0.03 #	<0.03 #	<0.03 #	<0.03 #	<0.03 #
sec-Butylbenzene	<0.001 mg/kg	TM116		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
4-Isopropyltoluene	<0.002 mg/kg	TM116		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
1,3-Dichlorobenzene	<0.005 mg/kg	TM116		<0.05 M	<0.05 M	<0.05 M	<0.05 M	<0.05 M	<0.05 M
1,4-Dichlorobenzene	<0.005 mg/kg	TM116		<0.05 M	<0.05 M	<0.05 M	<0.05 M	<0.05 M	<0.05 M
n-Butylbenzene	<0.003 mg/kg	TM116		<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
1,2-Dichlorobenzene	<0.005 mg/kg	TM116		<0.05 M	<0.05 M	<0.05 M	<0.05 M	<0.05 M	<0.05 M
1,2-Dibromo-3-chloropropane	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
Tert-amyl methyl ether	<0.001 mg/kg	TM116		<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #
1,2,4-Trichlorobenzene	<0.007 mg/kg	TM116		<0.07	<0.07	<0.07	<0.07	<0.07	<0.07
Hexachlorobutadiene	<0.004 mg/kg	TM116		<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Naphthalene	<0.008 mg/kg	TM116		<0.08 M	<0.08 M	<0.08 M	<0.08 M	<0.08 M	<0.08 M

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

VOC MS (S)

Results Legend		Customer Sample Ref.	TP04	TP04	TP04	TP04	TP05	TP05
#	ISO17025 accredited.	Depth (m)	0.50 - 0.50	1.00 - 1.00	2.00 - 2.00	2.90 - 2.90	2.30 - 2.30	2.50 - 2.50
M	mCERTS accredited.	Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
aq	Aqueous / settled sample.	Date Sampled	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023
diss.filt	Dissolved / filtered sample.	Sampled Time	.	.	.	.	.	.
tot.unfilt	Total / unfiltered sample.	Date Received	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023	24/08/2023
*	Subcontracted - refer to subcontractor report for accreditation status.	SDG Ref	230824-55	230824-55	230824-55	230824-55	230824-55	230824-55
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	Lab Sample No.(s)	28530561	28530566	28530571	28530578	28530603	28530609
(F)	Trigger breach confirmed	AGS Reference	ES	ES	ES	ES	ES	ES
1-4+ §@	Sample deviation (see appendix)							

Component	LOD/Units	Method						
1,2,3-Trichlorobenzene	<0.01 mg/kg	TM116	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #
1,3,5-Trichlorobenzene	<0.007 mg/kg	TM116	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07
Sum of Detected Xylenes	<0.02 mg/kg	TM116	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Sum of BTEX	<0.007 mg/kg	TM116	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Asbestos Identification - Solid Samples

Results Legend
ISO17025 accredited.
M MCERTS accredited.
* Subcontracted test.
(F) Trigger breach confirmed
1-5&+§@ Sample deviation (see appendix)

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Asbestos Actinolite	Asbestos Anthophyllite	Asbestos Tremolite	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP01ES 0.50 - 0.50 SOLID 22/08/2023 00:00:00 24/08/2023 05:00:00 230824-55 28530539 TM048	04/09/2023	Alex Horner	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP01ES 1.00 - 1.00 SOLID 22/08/2023 00:00:00 24/08/2023 05:00:00 230824-55 28530598 TM048	04/09/2023	Alex Horner	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP01ES 2.00 - 2.00 SOLID 22/08/2023 00:00:00 24/08/2023 05:00:00 230824-55 28530614 TM048	04/09/2023	Alex Horner	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP01ES 2.30 - 2.50 SOLID 22/08/2023 00:00:00 24/08/2023 05:00:00 230824-55 28530619 TM048	04/09/2023	Alex Horner	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP02ES 0.50 - 0.50 SOLID 22/08/2023 00:00:00 24/08/2023 05:00:00 230824-55 28530625 TM048	04/09/2023	Alex Horner	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP02ES 1.00 - 1.00 SOLID 22/08/2023 00:00:00 24/08/2023 05:00:00 230824-55 28530632 TM048	04/09/2023	Alex Horner	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP02ES 2.00 - 2.00 SOLID 22/08/2023 00:00:00 24/08/2023 05:00:00 230824-55 28530638 TM048	04/09/2023	Alex Horner	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP02ES 2.50 - 2.50 SOLID 22/08/2023 00:00:00 24/08/2023 05:00:00 230824-55 28530643 TM048	04/09/2023	Alex Horner	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Asbestos Actinolite	Asbestos Anthophyllite	Asbestos Tremolite	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP03ES 0.50 - 0.50 SOLID 22/08/2023 00:00:00 24/08/2023 05:00:00 230824-55 28530648 TM048	04/09/2023	Alex Horner	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP03ES 1.00 - 1.00 SOLID 22/08/2023 00:00:00 24/08/2023 05:00:00 230824-55 28530544 TM048	04/09/2023	Alex Horner	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP03ES 2.00 - 2.00 SOLID 22/08/2023 00:00:00 24/08/2023 05:00:00 230824-55 28530551 TM048	04/09/2023	Alex Horner	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP03ES 2.80 - 2.80 SOLID 22/08/2023 00:00:00 24/08/2023 05:00:00 230824-55 28530556 TM048	04/09/2023	Alex Horner	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP04ES 0.50 - 0.50 SOLID 22/08/2023 00:00:00 24/08/2023 05:00:00 230824-55 28530561 TM048	04/09/2023	Alex Horner	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP04ES 1.00 - 1.00 SOLID 22/08/2023 00:00:00 24/08/2023 05:00:00 230824-55 28530566 TM048	04/09/2023	Alex Horner	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP04ES 2.00 - 2.00 SOLID 22/08/2023 00:00:00 24/08/2023 05:00:00 230824-55 28530571 TM048	04/09/2023	Alex Horner	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP04ES 2.90 - 2.90 SOLID 22/08/2023 00:00:00 24/08/2023 05:00:00 230824-55 28530578 TM048	04/09/2023	Alex Horner	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP05ES 2.30 - 2.30 SOLID 22/08/2023 00:00:00 24/08/2023 05:00:00 230824-55 28530603 TM048	04/09/2023	Alex Horner	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Asbestos Actinolite	Asbestos Anthophyllite	Asbestos Tremolite	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	TP05ES 2.50 - 2.50 SOLID 22/08/2023 00:00:00 24/08/2023 05:00:00 230824-55 28530609 TM048	04/09/2023	Alex Horner	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

Validated

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Esso Express Chesterfield
Mass Sample taken (kg)	0.092	**Natural Moisture Content (%)**	2.33
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	97.7
Particle Size <4mm	>95%		

Case	
SDG	230824-55
Lab Sample Number(s)	28530539
Sampled Date	22-Aug-2023
Customer Sample Ref.	TP01 ESZ
Depth (m)	0.50 - 0.50

Solid Waste Analysis	Result	Landfill Waste Acceptance Criteria Limits: Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Total Organic Carbon (%)	0.459	3	5	6
Loss on Ignition (%)	<0.7	-	-	10
Sum of BTEX (mg/kg)	<0.07	6	-	-
Sum of 7 PCBs (mg/kg)	<0.105	1	-	-
Mineral Oil (mg/kg) (EH_2D_AL)	866	500	-	-
PAH Sum of 17 (mg/kg)	<10	100	-	-
pH (pH Units)	9.9	-	>6	-
ANC to pH 6 (mol/kg)	0.109	-	-	-
ANC to pH 4 (mol/kg)	0.207	-	-	-

Eluate Analysis	C_2 Concⁿ in 10:1 eluate (mg/l)		A_2 10:1 concⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.000855	<0.0005	0.00855	<0.005	0.5	2	25
Barium	0.0551	<0.0002	0.551	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	0.0078	<0.001	0.078	<0.01	0.5	10	70
Copper	0.00676	<0.0003	0.0676	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	0.000782	<0.0004	0.00782	<0.004	0.4	10	40
Lead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.00633	<0.001	0.0633	<0.01	4	50	200
Chloride	16.1	<2	161	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	11.8	<2	118	<20	1000	20000	50000
Total Dissolved Solids	275	<10	2750	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	6.57	<3	65.7	<30	500	800	1000

Leach Test Information

Date Prepared	25-Aug-2023
pH (pH Units)	11.22
Conductivity (µS/cm)	376
Volume Leachant (Litres)	0.898

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)
Stated limits are for guidance only and ALS Laboratories (UK) Limited cannot be held responsible for any discrepancies with current legislation

13/09/2023 15:53:56

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Esso Express Chesterfield
Mass Sample taken (kg)	0.095	**Natural Moisture Content (%)**	5.67
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	94.6
Particle Size <4mm	>95%		

Case	
SDG	230824-55
Lab Sample Number(s)	28530544
Sampled Date	22-Aug-2023
Customer Sample Ref.	TP03 ESZ
Depth (m)	1.00 - 1.00

Solid Waste Analysis	Result	Landfill Waste Acceptance Criteria Limits: Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Total Organic Carbon (%)	<0.2	3	5	6
Loss on Ignition (%)	<0.7	-	-	10
Sum of BTEX (mg/kg)	<0.07	6	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg) (EH_2D_AL)	<5	500	-	-
PAH Sum of 17 (mg/kg)	<10	100	-	-
pH (pH Units)	11.1	-	>6	-
ANC to pH 6 (mol/kg)	0.145	-	-	-
ANC to pH 4 (mol/kg)	0.304	-	-	-

Eluate Analysis	C_2 Concⁿ in 10:1 eluate (mg/l)		A_2 10:1 concⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.000769	<0.0005	0.00769	<0.005	0.5	2	25
Barium	0.0401	<0.0002	0.401	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	0.00456	<0.001	0.0456	<0.01	0.5	10	70
Copper	0.0111	<0.0003	0.111	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	0.00168	<0.0004	0.0168	<0.004	0.4	10	40
Lead	0.000496	<0.0002	0.00496	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.00564	<0.001	0.0564	<0.01	4	50	200
Chloride	12	<2	120	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	5.3	<2	53	<20	1000	20000	50000
Total Dissolved Solids	158	<10	1580	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	4.63	<3	46.3	<30	500	800	1000

Leach Test Information

Date Prepared	25-Aug-2023
pH (pH Units)	11.08
Conductivity (µS/cm)	217
Volume Leachant (Litres)	0.895

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)
Stated limits are for guidance only and ALS Laboratories (UK) Limited cannot be held responsible for any discrepancies with current legislation

13/09/2023 15:53:56

Validated

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Esso Express Chesterfield
Mass Sample taken (kg)	0.106	**Natural Moisture Content (%)**	17.2
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	85.3
Particle Size <4mm	>95%		

Case	
SDG	230824-55
Lab Sample Number(s)	28530551
Sampled Date	22-Aug-2023
Customer Sample Ref.	TP03 ESZ
Depth (m)	2.00 - 2.00

Solid Waste Analysis	Result	Landfill Waste Acceptance Criteria Limits: Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Total Organic Carbon (%)	0.248	3	5	6
Loss on Ignition (%)	2.36	-	-	10
Sum of BTEX (mg/kg)	<0.07	6	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg) (EH_2D_AL)	<5	500	-	-
PAH Sum of 17 (mg/kg)	<10	100	-	-
pH (pH Units)	7.87	-	>6	-
ANC to pH 6 (mol/kg)	<0.03	-	-	-
ANC to pH 4 (mol/kg)	0.0918	-	-	-

Eluate Analysis	C_2 Concⁿ in 10:1 eluate (mg/l)		A_2 10:1 concⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	<0.0005	<0.0005	<0.005	<0.005	0.5	2	25
Barium	0.452	<0.0002	4.52	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.00161	<0.0003	0.0161	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	0.00046	<0.0004	0.0046	<0.004	0.4	10	40
Lead	0.000545	<0.0002	0.00545	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.0231	<0.001	0.231	<0.01	4	50	200
Chloride	11.8	<2	118	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	83.5	<10	835	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	4.89	<3	48.9	<30	500	800	1000

Leach Test Information

Date Prepared	25-Aug-2023
pH (pH Units)	8.22
Conductivity (µS/cm)	107
Volume Leachant (Litres)	0.884

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)
Stated limits are for guidance only and ALS Laboratories (UK) Limited cannot be held responsible for any discrepancies with current legislation

13/09/2023 15:53:56

Validated

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Esso Express Chesterfield
Mass Sample taken (kg)	0.092	**Natural Moisture Content (%)**	2.51
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	97.5
Particle Size <4mm	>95%		

Case	
SDG	230824-55
Lab Sample Number(s)	28530556
Sampled Date	22-Aug-2023
Customer Sample Ref.	TP03 ESZ
Depth (m)	2.80 - 2.80

Solid Waste Analysis	Result	Landfill Waste Acceptance Criteria Limits: Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Total Organic Carbon (%)	<0.2	3	5	6
Loss on Ignition (%)	1.32	-	-	10
Sum of BTEX (mg/kg)	<0.07	6	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg) (EH_2D_AL)	<5	500	-	-
PAH Sum of 17 (mg/kg)	<10	100	-	-
pH (pH Units)	8.02	-	>6	-
ANC to pH 6 (mol/kg)	<0.03	-	-	-
ANC to pH 4 (mol/kg)	0.042	-	-	-

Eluate Analysis	C_2 Concⁿ in 10:1 eluate (mg/l)		A_2 10:1 concⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.000718	<0.0005	0.00718	<0.005	0.5	2	25
Barium	0.262	<0.0002	2.62	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.000824	<0.0003	0.00824	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	0.00408	<0.003	0.0408	<0.03	0.5	10	30
Nickel	0.000624	<0.0004	0.00624	<0.004	0.4	10	40
Lead	0.000266	<0.0002	0.00266	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.00901	<0.001	0.0901	<0.01	4	50	200
Chloride	4.8	<2	48	<20	800	15000	25000
Fluoride	0.68	<0.5	6.8	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	66.1	<10	661	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	3.57	<3	35.7	<30	500	800	1000

Leach Test Information

Date Prepared	25-Aug-2023
pH (pH Units)	8.36
Conductivity (µS/cm)	86
Volume Leachant (Litres)	0.898

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)
Stated limits are for guidance only and ALS Laboratories (UK) Limited cannot be held responsible for any discrepancies with current legislation

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CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Esso Express Chesterfield
Mass Sample taken (kg)	0.094	**Natural Moisture Content (%)**	3.89
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	96.3
Particle Size <4mm	>95%		

Case	
SDG	230824-55
Lab Sample Number(s)	28530561
Sampled Date	22-Aug-2023
Customer Sample Ref.	TP04 ESZ
Depth (m)	0.50 - 0.50

Solid Waste Analysis	Result	Landfill Waste Acceptance Criteria Limits: Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Total Organic Carbon (%)	0.887	3	5	6
Loss on Ignition (%)	3.54	-	-	10
Sum of BTEX (mg/kg)	<0.07	6	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg) (EH_2D_AL)	<5	500	-	-
PAH Sum of 17 (mg/kg)	<10	100	-	-
pH (pH Units)	8.01	-	>6	-
ANC to pH 6 (mol/kg)	<0.03	-	-	-
ANC to pH 4 (mol/kg)	0.0636	-	-	-

Eluate Analysis	C_2 Concⁿ in 10:1 eluate (mg/l)		A_2 10:1 concⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.00281	<0.0005	0.0281	<0.005	0.5	2	25
Barium	0.273	<0.0002	2.73	<0.002	20	100	300
Cadmium	0.000105	<0.00008	0.00105	<0.0008	0.04	1	5
Chromium	0.0024	<0.001	0.024	<0.01	0.5	10	70
Copper	0.00451	<0.0003	0.0451	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	0.0122	<0.003	0.122	<0.03	0.5	10	30
Nickel	0.000958	<0.0004	0.00958	<0.004	0.4	10	40
Lead	0.00255	<0.0002	0.0255	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.0519	<0.001	0.519	<0.01	4	50	200
Chloride	26.1	<2	261	<20	800	15000	25000
Fluoride	1.5	<0.5	15	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	105	<10	1050	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	4.83	<3	48.3	<30	500	800	1000

Leach Test Information

Date Prepared	25-Aug-2023
pH (pH Units)	7.78
Conductivity (µS/cm)	135
Volume Leachant (Litres)	0.897

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)
Stated limits are for guidance only and ALS Laboratories (UK) Limited cannot be held responsible for any discrepancies with current legislation

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CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Esso Express Chesterfield
Mass Sample taken (kg)	0.108	**Natural Moisture Content (%)**	20.8
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	82.8
Particle Size <4mm	>95%		

Case	
SDG	230824-55
Lab Sample Number(s)	28530566
Sampled Date	22-Aug-2023
Customer Sample Ref.	TP04 ESZ
Depth (m)	1.00 - 1.00

Solid Waste Analysis	Result	Landfill Waste Acceptance Criteria Limits: Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Total Organic Carbon (%)	6.83	3	5	6
Loss on Ignition (%)	12.2	-	-	10
Sum of BTEX (mg/kg)	<0.07	6	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg) (EH_2D_AL)	5.57	500	-	-
PAH Sum of 17 (mg/kg)	<10	100	-	-
pH (pH Units)	7.96	-	>6	-
ANC to pH 6 (mol/kg)	<0.03	-	-	-
ANC to pH 4 (mol/kg)	0.0857	-	-	-

Eluate Analysis	C_2 Concⁿ in 10:1 eluate (mg/l)		A_2 10:1 concⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.00413	<0.0005	0.0413	<0.005	0.5	2	25
Barium	0.00341	<0.0002	0.0341	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.00295	<0.0003	0.0295	<0.003	2	50	100
Mercury Dissolved (CVAF)	0.0000117	<0.00001	0.000117	<0.0001	0.01	0.2	2
Molybdenum	0.00822	<0.003	0.0822	<0.03	0.5	10	30
Nickel	0.00083	<0.0004	0.0083	<0.004	0.4	10	40
Lead	0.000695	<0.0002	0.00695	<0.002	0.5	10	50
Antimony	0.00128	<0.001	0.0128	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.00474	<0.001	0.0474	<0.01	4	50	200
Chloride	16.8	<2	168	<20	800	15000	25000
Fluoride	1.13	<0.5	11.3	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	118	<10	1180	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	4.89	<3	48.9	<30	500	800	1000

Leach Test Information

Date Prepared	25-Aug-2023
pH (pH Units)	8.22
Conductivity (µS/cm)	151
Volume Leachant (Litres)	0.882

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)
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CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Esso Express Chesterfield
Mass Sample taken (kg)	0.096	**Natural Moisture Content (%)**	6.64
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	93.8
Particle Size <4mm	>95%		

Case	
SDG	230824-55
Lab Sample Number(s)	28530571
Sampled Date	22-Aug-2023
Customer Sample Ref.	TP04 ESZ
Depth (m)	2.00 - 2.00

Solid Waste Analysis	Result	Landfill Waste Acceptance Criteria Limits: Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Total Organic Carbon (%)	1.52	3	5	6
Loss on Ignition (%)	3	-	-	10
Sum of BTEX (mg/kg)	<0.07	6	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg) (EH_2D_AL)	<5	500	-	-
PAH Sum of 17 (mg/kg)	<10	100	-	-
pH (pH Units)	8.41	-	>6	-
ANC to pH 6 (mol/kg)	<0.03	-	-	-
ANC to pH 4 (mol/kg)	0.0759	-	-	-

Eluate Analysis	C_2 Concⁿ in 10:1 eluate (mg/l)		A_2 10:1 concⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.00109	<0.0005	0.0109	<0.005	0.5	2	25
Barium	0.0581	<0.0002	0.581	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.00138	<0.0003	0.0138	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	0.0101	<0.003	0.101	<0.03	0.5	10	30
Nickel	0.00277	<0.0004	0.0277	<0.004	0.4	10	40
Lead	0.00107	<0.0002	0.0107	<0.002	0.5	10	50
Antimony	0.00109	<0.001	0.0109	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.431	<0.001	4.31	<0.01	4	50	200
Chloride	11.9	<2	119	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	7.2	<2	72	<20	1000	20000	50000
Total Dissolved Solids	60.8	<10	608	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	12.6	<3	126	<30	500	800	1000

Leach Test Information

Date Prepared	25-Aug-2023
pH (pH Units)	8.47
Conductivity (µS/cm)	78
Volume Leachant (Litres)	0.894

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)
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CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Esso Express Chesterfield
Mass Sample taken (kg)	0.094	**Natural Moisture Content (%)**	4.05
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	96.1
Particle Size <4mm	>95%		

Case	
SDG	230824-55
Lab Sample Number(s)	28530578
Sampled Date	22-Aug-2023
Customer Sample Ref.	TP04 ESZ
Depth (m)	2.90 - 2.90

Solid Waste Analysis	Result	Landfill Waste Acceptance Criteria Limits: Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Total Organic Carbon (%)	0.226	3	5	6
Loss on Ignition (%)	1.9	-	-	10
Sum of BTEX (mg/kg)	<0.07	6	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg) (EH_2D_AL)	<5	500	-	-
PAH Sum of 17 (mg/kg)	<10	100	-	-
pH (pH Units)	7.63	-	>6	-
ANC to pH 6 (mol/kg)	<0.03	-	-	-
ANC to pH 4 (mol/kg)	0.0692	-	-	-

Eluate Analysis	C_2 Concⁿ in 10:1 eluate (mg/l)		A_2 10:1 concⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	<0.0005	<0.0005	<0.005	<0.005	0.5	2	25
Barium	0.0574	<0.0002	0.574	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.000899	<0.0003	0.00899	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	0.00154	<0.0004	0.0154	<0.004	0.4	10	40
Lead	0.000745	<0.0002	0.00745	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.0141	<0.001	0.141	<0.01	4	50	200
Chloride	3.4	<2	34	<20	800	15000	25000
Fluoride	0.717	<0.5	7.17	<5	10	150	500
Sulphate (soluble)	2.3	<2	23	<20	1000	20000	50000
Total Dissolved Solids	35.6	<10	356	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	3.43	<3	34.3	<30	500	800	1000

Leach Test Information

Date Prepared	25-Aug-2023
pH (pH Units)	7.47
Conductivity (µS/cm)	45
Volume Leachant (Litres)	0.896

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)
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CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Esso Express Chesterfield
Mass Sample taken (kg)	0.095	**Natural Moisture Content (%)**	5.52
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	94.8
Particle Size <4mm	>95%		

Case	
SDG	230824-55
Lab Sample Number(s)	28530598
Sampled Date	22-Aug-2023
Customer Sample Ref.	TP01 ESZ
Depth (m)	1.00 - 1.00

Solid Waste Analysis	Result	Landfill Waste Acceptance Criteria Limits: Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Total Organic Carbon (%)	1.24	3	5	6
Loss on Ignition (%)	1.93	-	-	10
Sum of BTEX (mg/kg)	<0.07	6	-	-
Sum of 7 PCBs (mg/kg)	<0.21	1	-	-
Mineral Oil (mg/kg) (EH_2D_AL)	14	500	-	-
PAH Sum of 17 (mg/kg)	<10	100	-	-
pH (pH Units)	11.3	-	>6	-
ANC to pH 6 (mol/kg)	0.112	-	-	-
ANC to pH 4 (mol/kg)	0.156	-	-	-

Eluate Analysis	C_2 Concⁿ in 10:1 eluate (mg/l)		A_2 10:1 concⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.00641	<0.0005	0.0641	<0.005	0.5	2	25
Barium	0.0265	<0.0002	0.265	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.00388	<0.0003	0.0388	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	0.000418	<0.0004	0.00418	<0.004	0.4	10	40
Lead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.00364	<0.001	0.0364	<0.01	4	50	200
Chloride	5.3	<2	53	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	4	<2	40	<20	1000	20000	50000
Total Dissolved Solids	88.6	<10	886	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	3.86	<3	38.6	<30	500	800	1000

Leach Test Information

Date Prepared	25-Aug-2023
pH (pH Units)	9.62
Conductivity (µS/cm)	116
Volume Leachant (Litres)	0.895

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)
Stated limits are for guidance only and ALS Laboratories (UK) Limited cannot be held responsible for any discrepancies with current legislation

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CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Esso Express Chesterfield
Mass Sample taken (kg)	0.109	**Natural Moisture Content (%)**	20.7
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	82.8
Particle Size <4mm	>95%		

Case	
SDG	230824-55
Lab Sample Number(s)	28530603
Sampled Date	22-Aug-2023
Customer Sample Ref.	TP05 ESZ
Depth (m)	2.30 - 2.30

Solid Waste Analysis	Result	Landfill Waste Acceptance Criteria Limits: Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Total Organic Carbon (%)	0.372	3	5	6
Loss on Ignition (%)	3.38	-	-	10
Sum of BTEX (mg/kg)	<0.07	6	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg) (EH_2D_AL)	<5	500	-	-
PAH Sum of 17 (mg/kg)	<10	100	-	-
pH (pH Units)	8.3	-	>6	-
ANC to pH 6 (mol/kg)	<0.03	-	-	-
ANC to pH 4 (mol/kg)	0.0506	-	-	-

Eluate Analysis	C_2 Concⁿ in 10:1 eluate (mg/l)		A_2 10:1 concⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	<0.0005	<0.0005	<0.005	<0.005	0.5	2	25
Barium	0.00269	<0.0002	0.0269	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.000648	<0.0003	0.00648	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	0.000712	<0.0004	0.00712	<0.004	0.4	10	40
Lead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	<0.001	<0.001	<0.01	<0.01	4	50	200
Chloride	17.6	<2	176	<20	800	15000	25000
Fluoride	1.39	<0.5	13.9	<5	10	150	500
Sulphate (soluble)	13.5	<2	135	<20	1000	20000	50000
Total Dissolved Solids	159	<10	1590	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	4.21	<3	42.1	<30	500	800	1000

Leach Test Information

Date Prepared	29-Aug-2023
pH (pH Units)	8.37
Conductivity (µS/cm)	207
Volume Leachant (Litres)	0.882

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)
Stated limits are for guidance only and ALS Laboratories (UK) Limited cannot be held responsible for any discrepancies with current legislation

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CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Esso Express Chesterfield
Mass Sample taken (kg)	0.111	**Natural Moisture Content (%)**	23.4
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	81
Particle Size <4mm	>95%		

Case	
SDG	230824-55
Lab Sample Number(s)	28530609
Sampled Date	22-Aug-2023
Customer Sample Ref.	TP05 ESZ
Depth (m)	2.50 - 2.50

Solid Waste Analysis	Result	Landfill Waste Acceptance Criteria Limits: Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Total Organic Carbon (%)	0.212	3	5	6
Loss on Ignition (%)	3.41	-	-	10
Sum of BTEX (mg/kg)	<0.07	6	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg) (EH_2D_AL)	<5	500	-	-
PAH Sum of 17 (mg/kg)	<10	100	-	-
pH (pH Units)	8.19	-	>6	-
ANC to pH 6 (mol/kg)	<0.03	-	-	-
ANC to pH 4 (mol/kg)	0.081	-	-	-

Eluate Analysis	C_2 Concⁿ in 10:1 eluate (mg/l)		A_2 10:1 concⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.000551	<0.0005	0.00551	<0.005	0.5	2	25
Barium	0.00273	<0.0002	0.0273	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.00227	<0.0003	0.0227	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	0.0066	<0.003	0.066	<0.03	0.5	10	30
Nickel	0.000694	<0.0004	0.00694	<0.004	0.4	10	40
Lead	0.000295	<0.0002	0.00295	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.00159	<0.001	0.0159	<0.01	4	50	200
Chloride	64.9	<2	649	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	23.1	<2	231	<20	1000	20000	50000
Total Dissolved Solids	227	<10	2270	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	7.3	<3	73	<30	500	800	1000

Leach Test Information

Date Prepared	29-Aug-2023
pH (pH Units)	7.87
Conductivity (µS/cm)	296
Volume Leachant (Litres)	0.879

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)
Stated limits are for guidance only and ALS Laboratories (UK) Limited cannot be held responsible for any discrepancies with current legislation

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CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Esso Express Chesterfield
Mass Sample taken (kg)	0.093	**Natural Moisture Content (%)**	3
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	97.1
Particle Size <4mm	>95%		

Case	
SDG	230824-55
Lab Sample Number(s)	28530614
Sampled Date	22-Aug-2023
Customer Sample Ref.	TP01 ESZ
Depth (m)	2.00 - 2.00

Solid Waste Analysis	Result	Landfill Waste Acceptance Criteria Limits: Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Total Organic Carbon (%)	<0.2	3	5	6
Loss on Ignition (%)	1.69	-	-	10
Sum of BTEX (mg/kg)	<0.07	6	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg) (EH_2D_AL)	<5	500	-	-
PAH Sum of 17 (mg/kg)	<10	100	-	-
pH (pH Units)	8.01	-	>6	-
ANC to pH 6 (mol/kg)	<0.03	-	-	-
ANC to pH 4 (mol/kg)	0.102	-	-	-

Eluate Analysis	C_2 Concⁿ in 10:1 eluate (mg/l)		A_2 10:1 concⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.000518	<0.0005	0.00518	<0.005	0.5	2	25
Barium	0.00105	<0.0002	0.0105	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.00215	<0.0003	0.0215	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	0.000604	<0.0004	0.00604	<0.004	0.4	10	40
Lead	0.000494	<0.0002	0.00494	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.00444	<0.001	0.0444	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	31.1	<10	311	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	5.75	<3	57.5	<30	500	800	1000

Leach Test Information

Date Prepared	25-Aug-2023
pH (pH Units)	7.42
Conductivity (µS/cm)	39
Volume Leachant (Litres)	0.897

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)
Stated limits are for guidance only and ALS Laboratories (UK) Limited cannot be held responsible for any discrepancies with current legislation

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CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Esso Express Chesterfield
Mass Sample taken (kg)	0.110	**Natural Moisture Content (%)**	21.4
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	82.4
Particle Size <4mm	>95%		

Case	
SDG	230824-55
Lab Sample Number(s)	28530619
Sampled Date	22-Aug-2023
Customer Sample Ref.	TP01 ESZ
Depth (m)	2.30 - 2.50

Solid Waste Analysis	Result	Landfill Waste Acceptance Criteria Limits: Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Total Organic Carbon (%)	0.345	3	5	6
Loss on Ignition (%)	2.73	-	-	10
Sum of BTEX (mg/kg)	<0.07	6	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg) (EH_2D_AL)	<5	500	-	-
PAH Sum of 17 (mg/kg)	<10	100	-	-
pH (pH Units)	7.87	-	>6	-
ANC to pH 6 (mol/kg)	0.0373	-	-	-
ANC to pH 4 (mol/kg)	0.0751	-	-	-

Eluate Analysis	C_2 Concⁿ in 10:1 eluate (mg/l)		A_2 10:1 concⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.0032	<0.0005	0.032	<0.005	0.5	2	25
Barium	0.00408	<0.0002	0.0408	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	0.00186	<0.001	0.0186	<0.01	0.5	10	70
Copper	0.00557	<0.0003	0.0557	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	0.0188	<0.003	0.188	<0.03	0.5	10	30
Nickel	0.00125	<0.0004	0.0125	<0.004	0.4	10	40
Lead	0.00145	<0.0002	0.0145	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.00831	<0.001	0.0831	<0.01	4	50	200
Chloride	14.8	<2	148	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	144	<10	1440	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	12.3	<3	123	<30	500	800	1000

Leach Test Information

Date Prepared	25-Aug-2023
pH (pH Units)	8.41
Conductivity (µS/cm)	188
Volume Leachant (Litres)	0.880

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)
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CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Esso Express Chesterfield
Mass Sample taken (kg)	0.090	**Natural Moisture Content (%)**	0
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	100
Particle Size <4mm	>95%		

Case	
SDG	230824-55
Lab Sample Number(s)	28530625
Sampled Date	22-Aug-2023
Customer Sample Ref.	TP02 ESZ
Depth (m)	0.50 - 0.50

Solid Waste Analysis	Result	Landfill Waste Acceptance Criteria Limits: Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Total Organic Carbon (%)	<0.2	3	5	6
Loss on Ignition (%)	1.38	-	-	10
Sum of BTEX (mg/kg)	<0.07	6	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg) (EH_2D_AL)	67.6	500	-	-
PAH Sum of 17 (mg/kg)	<10	100	-	-
pH (pH Units)	11.5	-	>6	-
ANC to pH 6 (mol/kg)	0.356	-	-	-
ANC to pH 4 (mol/kg)	0.878	-	-	-

Eluate Analysis	C_2 Concⁿ in 10:1 eluate (mg/l)		A_2 10:1 concⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.000716	<0.0005	0.00716	<0.005	0.5	2	25
Barium	0.102	<0.0002	1.02	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	0.00876	<0.001	0.0876	<0.01	0.5	10	70
Copper	0.00777	<0.0003	0.0777	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	0.00155	<0.0004	0.0155	<0.004	0.4	10	40
Lead	0.000306	<0.0002	0.00306	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.0175	<0.001	0.175	<0.01	4	50	200
Chloride	13.7	<2	137	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	12.5	<2	125	<20	1000	20000	50000
Total Dissolved Solids	441	<10	4410	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	4.47	<3	44.7	<30	500	800	1000

Leach Test Information

Date Prepared	25-Aug-2023
pH (pH Units)	11.61
Conductivity (µS/cm)	566
Volume Leachant (Litres)	0.900

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Esso Express Chesterfield
Mass Sample taken (kg)	0.093	**Natural Moisture Content (%)**	2.69
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	97.4
Particle Size <4mm	>95%		

Case	
SDG	230824-55
Lab Sample Number(s)	28530632
Sampled Date	22-Aug-2023
Customer Sample Ref.	TP02 ESZ
Depth (m)	1.00 - 1.00

Solid Waste Analysis	**Result**	**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	3	3	5	6
Loss on Ignition (%)	8.16	-	-	10
Sum of BTEX (mg/kg)	<0.07	6	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg) (EH_2D_AL)	6.38	500	-	-
PAH Sum of 17 (mg/kg)	<10	100	-	-
pH (pH Units)	8.05	-	>6	-
ANC to pH 6 (mol/kg)	<0.03	-	-	-
ANC to pH 4 (mol/kg)	0.0791	-	-	-

Eluate Analysis	C_2 Concⁿ in 10:1 eluate (mg/l)		A_2 10:1 concⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Arsenic	0.009	<0.0005	0.09	<0.005	0.5	2	25
Barium	0.00645	<0.0002	0.0645	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	0.00828	<0.001	0.0828	<0.01	0.5	10	70
Copper	0.00806	<0.0003	0.0806	<0.003	2	50	100
Mercury Dissolved (CVAF)	0.0000198	<0.00001	0.000198	<0.0001	0.01	0.2	2
Molybdenum	0.00659	<0.003	0.0659	<0.03	0.5	10	30
Nickel	0.0012	<0.0004	0.012	<0.004	0.4	10	40
Lead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.00125	<0.001	0.0125	<0.01	4	50	200
Chloride	10.1	<2	101	<20	800	15000	25000
Fluoride	0.557	<0.5	5.57	<5	10	150	500
Sulphate (soluble)	19	<2	190	<20	1000	20000	50000
Total Dissolved Solids	279	<10	2790	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	5.59	<3	55.9	<30	500	800	1000

Leach Test Information

Date Prepared	25-Aug-2023
pH (pH Units)	11.35
Conductivity (µS/cm)	381
Volume Leachant (Litres)	0.898

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)
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CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Esso Express Chesterfield
Mass Sample taken (kg)	0.094	**Natural Moisture Content (%)**	4.18
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	96
Particle Size <4mm	>95%		

Case	
SDG	230824-55
Lab Sample Number(s)	28530638
Sampled Date	22-Aug-2023
Customer Sample Ref.	TP02 ESZ
Depth (m)	2.00 - 2.00

Solid Waste Analysis	Result	Landfill Waste Acceptance Criteria Limits: Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Total Organic Carbon (%)	0.398	3	5	6
Loss on Ignition (%)	2.26	-	-	10
Sum of BTEX (mg/kg)	<0.07	6	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg) (EH_2D_AL)	6.01	500	-	-
PAH Sum of 17 (mg/kg)	<10	100	-	-
pH (pH Units)	7.38	-	>6	-
ANC to pH 6 (mol/kg)	<0.03	-	-	-
ANC to pH 4 (mol/kg)	0.0557	-	-	-

Eluate Analysis	C_2 Concⁿ in 10:1 eluate (mg/l)		A_2 10:1 concⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.000534	<0.0005	0.00534	<0.005	0.5	2	25
Barium	0.237	<0.0002	2.37	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.00136	<0.0003	0.0136	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	0.000559	<0.0004	0.00559	<0.004	0.4	10	40
Lead	0.000539	<0.0002	0.00539	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.0257	<0.001	0.257	<0.01	4	50	200
Chloride	4.6	<2	46	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	13.8	<2	138	<20	1000	20000	50000
Total Dissolved Solids	96.9	<10	969	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	5.37	<3	53.7	<30	500	800	1000

Leach Test Information

Date Prepared	25-Aug-2023
pH (pH Units)	8.10
Conductivity (µS/cm)	125
Volume Leachant (Litres)	0.896

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)
Stated limits are for guidance only and ALS Laboratories (UK) Limited cannot be held responsible for any discrepancies with current legislation

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Validated

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Esso Express Chesterfield
Mass Sample taken (kg)	0.094	**Natural Moisture Content (%)**	4.51
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	95.7
Particle Size <4mm	>95%		

Case	
SDG	230824-55
Lab Sample Number(s)	28530643
Sampled Date	22-Aug-2023
Customer Sample Ref.	TP02 ESZ
Depth (m)	2.50 - 2.50

Solid Waste Analysis	Result	Landfill Waste Acceptance Criteria Limits: Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Total Organic Carbon (%)	<0.2	3	5	6
Loss on Ignition (%)	2.08	-	-	10
Sum of BTEX (mg/kg)	<0.07	6	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg) (EH_2D_AL)	<5	500	-	-
PAH Sum of 17 (mg/kg)	<10	100	-	-
pH (pH Units)	8	-	>6	-
ANC to pH 6 (mol/kg)	<0.03	-	-	-
ANC to pH 4 (mol/kg)	0.066	-	-	-

Eluate Analysis	C_2 Concⁿ in 10:1 eluate (mg/l)		A_2 10:1 concⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.000886	<0.0005	0.00886	<0.005	0.5	2	25
Barium	0.103	<0.0002	1.03	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.00207	<0.0003	0.0207	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	0.000688	<0.0004	0.00688	<0.004	0.4	10	40
Lead	0.000714	<0.0002	0.00714	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.0154	<0.001	0.154	<0.01	4	50	200
Chloride	3.4	<2	34	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	39.1	<10	391	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	4.49	<3	44.9	<30	500	800	1000

Leach Test Information

Date Prepared	25-Aug-2023
pH (pH Units)	7.51
Conductivity (µS/cm)	51
Volume Leachant (Litres)	0.896

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)
Stated limits are for guidance only and ALS Laboratories (UK) Limited cannot be held responsible for any discrepancies with current legislation

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Validated

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Esso Express Chesterfield
Mass Sample taken (kg)	0.095	**Natural Moisture Content (%)**	5.28
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	95
Particle Size <4mm	>95%		

Case	
SDG	230824-55
Lab Sample Number(s)	28530648
Sampled Date	22-Aug-2023
Customer Sample Ref.	TP03 ESZ
Depth (m)	0.50 - 0.50

Solid Waste Analysis	Result	Landfill Waste Acceptance Criteria Limits: Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Total Organic Carbon (%)	0.34	3	5	6
Loss on Ignition (%)	1.56	-	-	10
Sum of BTEX (mg/kg)	<0.07	6	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg) (EH_2D_AL)	15.6	500	-	-
PAH Sum of 17 (mg/kg)	<10	100	-	-
pH (pH Units)	11.2	-	>6	-
ANC to pH 6 (mol/kg)	0.0975	-	-	-
ANC to pH 4 (mol/kg)	0.141	-	-	-

Eluate Analysis	C_2 Concⁿ in 10:1 eluate (mg/l)		A_2 10:1 concⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.000629	<0.0005	0.00629	<0.005	0.5	2	25
Barium	0.0942	<0.0002	0.942	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	0.0121	<0.001	0.121	<0.01	0.5	10	70
Copper	0.0103	<0.0003	0.103	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	0.00129	<0.0004	0.0129	<0.004	0.4	10	40
Lead	0.0016	<0.0002	0.016	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.00446	<0.001	0.0446	<0.01	4	50	200
Chloride	14.3	<2	143	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	10.6	<2	106	<20	1000	20000	50000
Total Dissolved Solids	639	<10	6390	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	3.83	<3	38.3	<30	500	800	1000

Leach Test Information

Date Prepared	25-Aug-2023
pH (pH Units)	11.78
Conductivity (µS/cm)	836
Volume Leachant (Litres)	0.895

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)
Stated limits are for guidance only and ALS Laboratories (UK) Limited cannot be held responsible for any discrepancies with current legislation

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Table of Results - Appendix

Method No	Description
PM024	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM089	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM151	Determination of Hexavalent Chromium using Kone analyser
TM181	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM048	Identification of Asbestos in Bulk Material
TM152	Analysis of Aqueous Samples by ICP-MS
TM168	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM218	The determination of PAH in soil samples by GC-MS
TM222	Determination of Hot Water Soluble Boron in Soils (10:1 Water:Soil) by ICP OES.
TM256	Determination of pH, EC, TDS and Alkalinity in Aqueous samples
TM415	Determination of Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID
PM115	Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM018	Determination of Loss on Ignition
TM090	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM116	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	ELTRA CS800 Operators Guide
TM133	Determination of pH in Soil and Water using the GLpH pH Meter
TM259	Determination of Phenols in Waters and Leachates by HPLC
TM410	Determination of Coronene in soils by GCMS
TM104	Determination of Fluoride using the Kone Analyser
TM157	Determination of SVOC in Soils by GC-MS extracted by sonication in DCM/Acetone
TM182	Determination of Acid Neutralisation Capacity (ANC) Using Autotitration in Soils
TM183	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM414	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden (Method codes TM).

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Test Completion Dates

Lab Sample No(s)	28530539	28530598	28530614	28530619	28530625	28530632	28530638	28530643	28530544	28530551
Customer Sample Ref	TP01	TP01	TP01	TP01	TP02	TP02	TP02	TP02	TP03	TP03
AGS Ref.	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
Depth	0.50 - 0.50	1.00 - 1.00	2.00 - 2.00	2.30 - 2.50	0.50 - 0.50	1.00 - 1.00	2.00 - 2.00	2.50 - 2.50	1.00 - 1.00	2.00 - 2.00
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
ANC at pH4 and ANC at pH 6	29-Aug-2023	31-Aug-2023	29-Aug-2023	31-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	31-Aug-2023
Anions by Kone (w)	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023
Asbestos ID in Solid Samples	04-Sep-2023	04-Sep-2023	04-Sep-2023	04-Sep-2023	04-Sep-2023	04-Sep-2023	04-Sep-2023	04-Sep-2023	04-Sep-2023	04-Sep-2023
Boron Water Soluble	30-Aug-2023	30-Aug-2023	30-Aug-2023	31-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023
CEN 10:1 Leachate (1 Stage)	25-Aug-2023	25-Aug-2023	25-Aug-2023	25-Aug-2023	25-Aug-2023	25-Aug-2023	25-Aug-2023	25-Aug-2023	25-Aug-2023	25-Aug-2023
CEN Readings	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023
Coronene	29-Aug-2023	30-Aug-2023	29-Aug-2023	30-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	30-Aug-2023
Dissolved Metals by ICP-MS	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023
Dissolved Organic/Inorganic Carbon	11-Sep-2023	11-Sep-2023	11-Sep-2023	12-Sep-2023	11-Sep-2023	11-Sep-2023	12-Sep-2023	12-Sep-2023	11-Sep-2023	11-Sep-2023
EPH by GCxGC-FID	29-Aug-2023	30-Aug-2023	29-Aug-2023	30-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	30-Aug-2023
EPH CWG GC (S)	29-Aug-2023	30-Aug-2023	29-Aug-2023	30-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	30-Aug-2023
Fluoride	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023
GRO by GC-FID (S)	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023
Hexavalent Chromium (s)	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	25-Aug-2023	25-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023
Loss on Ignition in soils	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	29-Aug-2023	30-Aug-2023	29-Aug-2023	29-Aug-2023	30-Aug-2023	30-Aug-2023
Mercury Dissolved	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023
Metals in solid samples by OES	30-Aug-2023	31-Aug-2023	30-Aug-2023	31-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	31-Aug-2023
Moisture at 105C	25-Aug-2023	25-Aug-2023	25-Aug-2023	25-Aug-2023	25-Aug-2023	25-Aug-2023	25-Aug-2023	25-Aug-2023	25-Aug-2023	25-Aug-2023
PAH 16 & 17 Calc	29-Aug-2023	30-Aug-2023	29-Aug-2023	30-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	30-Aug-2023
PAH by GCMS	29-Aug-2023	30-Aug-2023	29-Aug-2023	30-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023
PCBs by GCMS	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023
pH	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023
pH Value of Filtered Water	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023
Phenols by HPLC (W)	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023
Sample description	24-Aug-2023	25-Aug-2023	24-Aug-2023	25-Aug-2023	24-Aug-2023	24-Aug-2023	24-Aug-2023	24-Aug-2023	24-Aug-2023	25-Aug-2023
Semi Volatile Organic Compounds	29-Aug-2023	01-Sep-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023
Total Organic Carbon	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	29-Aug-2023	30-Aug-2023	29-Aug-2023	29-Aug-2023	30-Aug-2023
TPH CWG GC (S)	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023
VOC MS (S)	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023

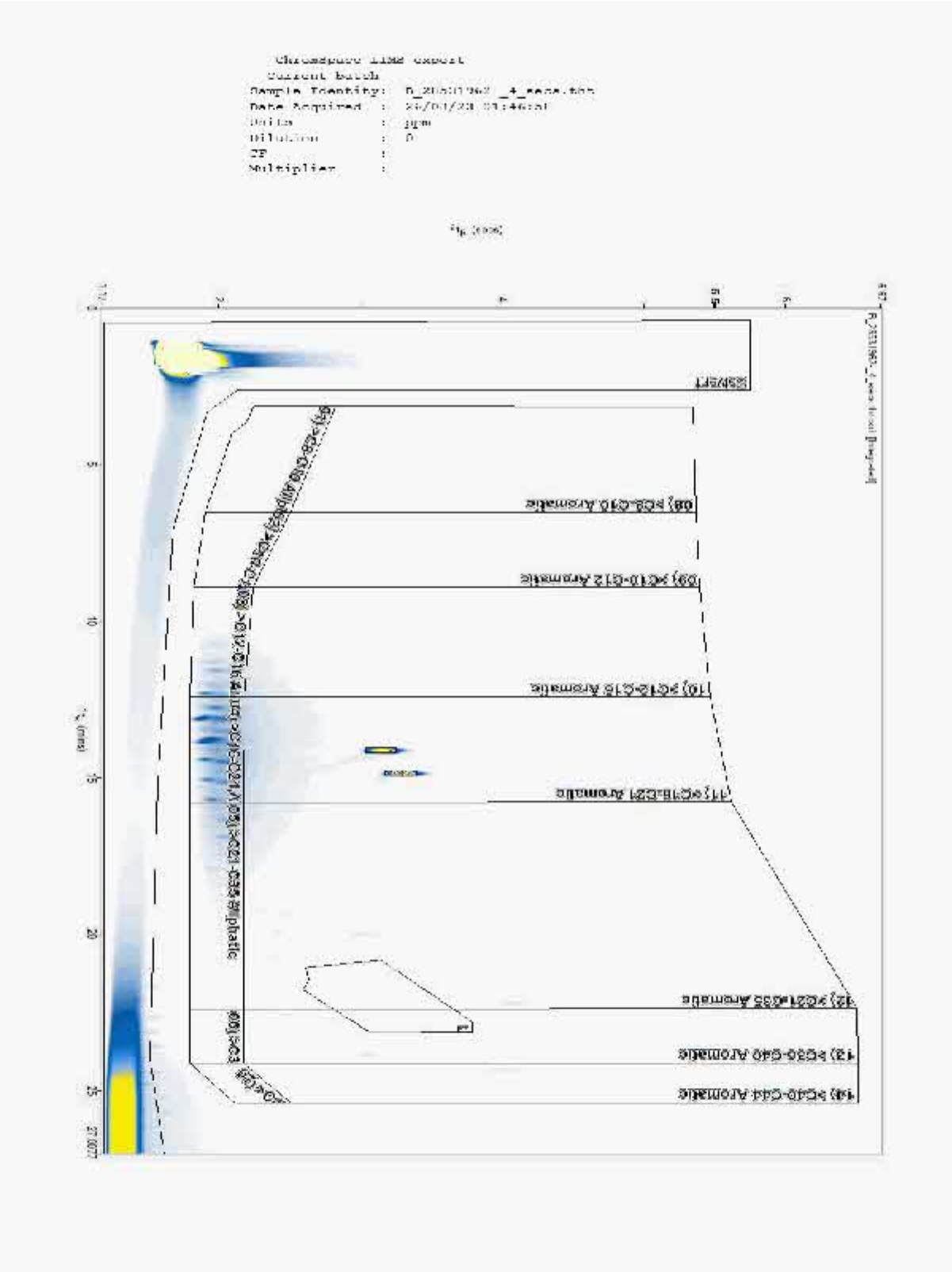
Lab Sample No(s)	28530556	28530648	28530561	28530566	28530571	28530578	28530603	28530609
Customer Sample Ref	TP03	TP03	TP04	TP04	TP04	TP04	TP05	TP05
AGS Ref.	ES	ES	ES	ES	ES	ES	ES	ES
Depth	2.80 - 2.80	0.50 - 0.50	0.50 - 0.50	1.00 - 1.00	2.00 - 2.00	2.90 - 2.90	2.30 - 2.30	2.50 - 2.50
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
ANC at pH4 and ANC at pH 6	31-Aug-2023	29-Aug-2023	31-Aug-2023	31-Aug-2023	31-Aug-2023	31-Aug-2023	02-Sep-2023	02-Sep-2023
Anions by Kone (w)	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	01-Sep-2023	01-Sep-2023
Asbestos ID in Solid Samples	04-Sep-2023	04-Sep-2023	04-Sep-2023	04-Sep-2023	04-Sep-2023	04-Sep-2023	04-Sep-2023	04-Sep-2023
Boron Water Soluble	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	31-Aug-2023	31-Aug-2023	30-Aug-2023	31-Aug-2023
CEN 10:1 Leachate (1 Stage)	25-Aug-2023	25-Aug-2023	25-Aug-2023	25-Aug-2023	25-Aug-2023	25-Aug-2023	30-Aug-2023	30-Aug-2023
CEN Readings	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	04-Sep-2023	04-Sep-2023
Coronene	30-Aug-2023	29-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	29-Aug-2023	04-Sep-2023	04-Sep-2023
Dissolved Metals by ICP-MS	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	04-Sep-2023	04-Sep-2023
Dissolved Organic/Inorganic Carbon	12-Sep-2023	11-Sep-2023	12-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	13-Sep-2023	13-Sep-2023
EPH by GCxGC-FID	30-Aug-2023	29-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	29-Aug-2023	04-Sep-2023	01-Sep-2023
EPH CWG GC (S)	30-Aug-2023	29-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023
Fluoride	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	01-Sep-2023	01-Sep-2023
GRO by GC-FID (S)	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	29-Aug-2023	30-Aug-2023	30-Aug-2023
Hexavalent Chromium (s)	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	25-Aug-2023	30-Aug-2023
Loss on Ignition in soils	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	31-Aug-2023	01-Sep-2023	01-Sep-2023
Mercury Dissolved	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	05-Sep-2023	05-Sep-2023
Metals in solid samples by OES	31-Aug-2023	30-Aug-2023	31-Aug-2023	31-Aug-2023	31-Aug-2023	31-Aug-2023	30-Aug-2023	31-Aug-2023
Moisture at 105C	25-Aug-2023	25-Aug-2023	25-Aug-2023	25-Aug-2023	25-Aug-2023	25-Aug-2023	29-Aug-2023	29-Aug-2023
PAH 16 & 17 Calc	30-Aug-2023	29-Aug-2023	30-Aug-2023	01-Sep-2023	30-Aug-2023	29-Aug-2023	04-Sep-2023	04-Sep-2023
PAH by GCMS	29-Aug-2023	29-Aug-2023	29-Aug-2023	01-Sep-2023	30-Aug-2023	29-Aug-2023	01-Sep-2023	01-Sep-2023
PCBs by GCMS	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	05-Sep-2023	05-Sep-2023
pH	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	31-Aug-2023	31-Aug-2023
pH Value of Filtered Water	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	04-Sep-2023	04-Sep-2023
Phenols by HPLC (W)	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	04-Sep-2023	04-Sep-2023
Sample description	25-Aug-2023	24-Aug-2023	25-Aug-2023	25-Aug-2023	25-Aug-2023	24-Aug-2023	24-Aug-2023	24-Aug-2023
Semi Volatile Organic Compounds	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023
Total Organic Carbon	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	31-Aug-2023	01-Sep-2023	01-Sep-2023
TPH CWG GC (S)	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	30-Aug-2023	29-Aug-2023	30-Aug-2023	30-Aug-2023
VOC MS (S)	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023	29-Aug-2023

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28531962 **Depth :** 0.50 - 0.50
Sample ID : TP02

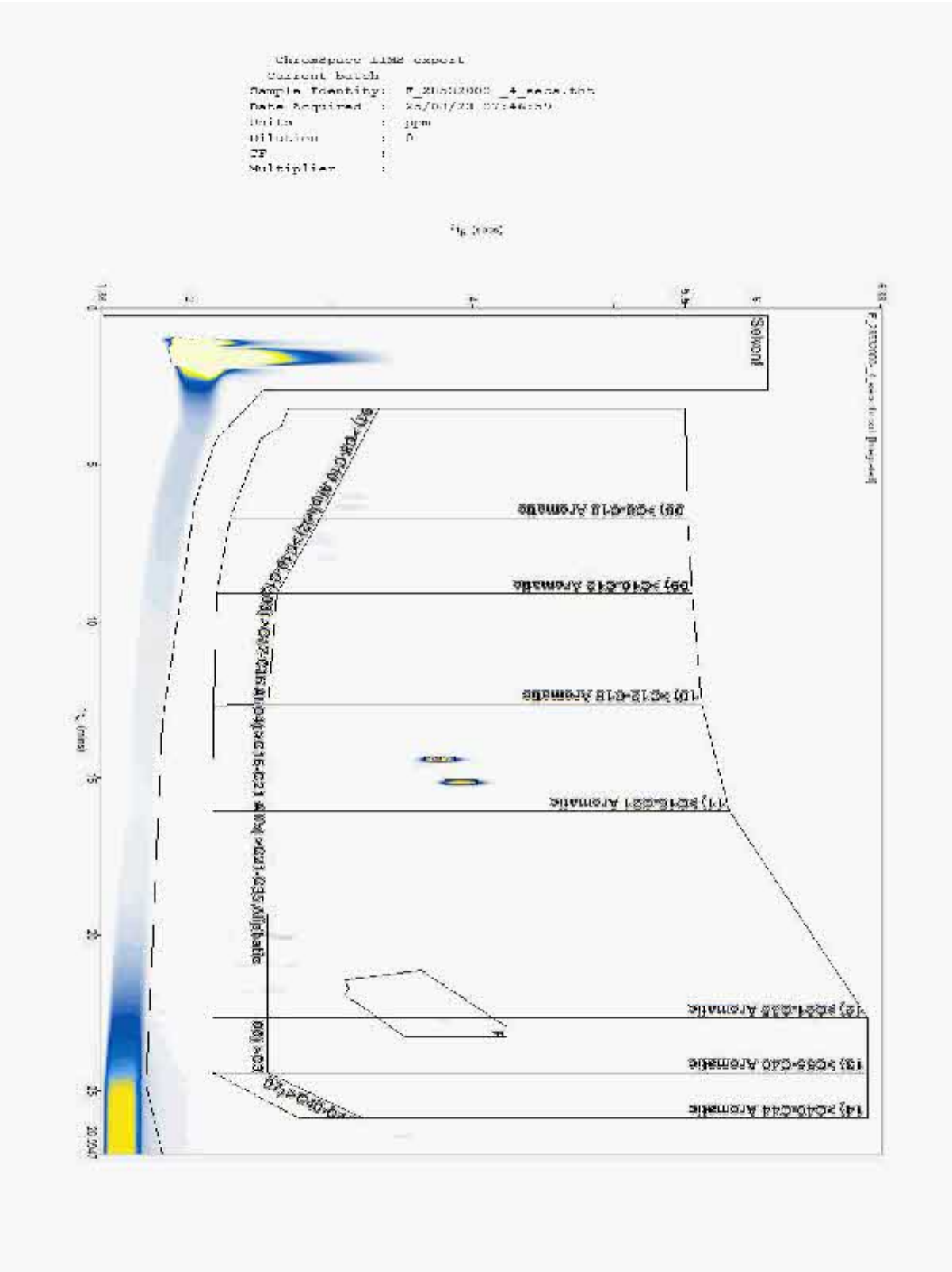


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28532000 **Depth :** 1.00 - 1.00
Sample ID : TP02

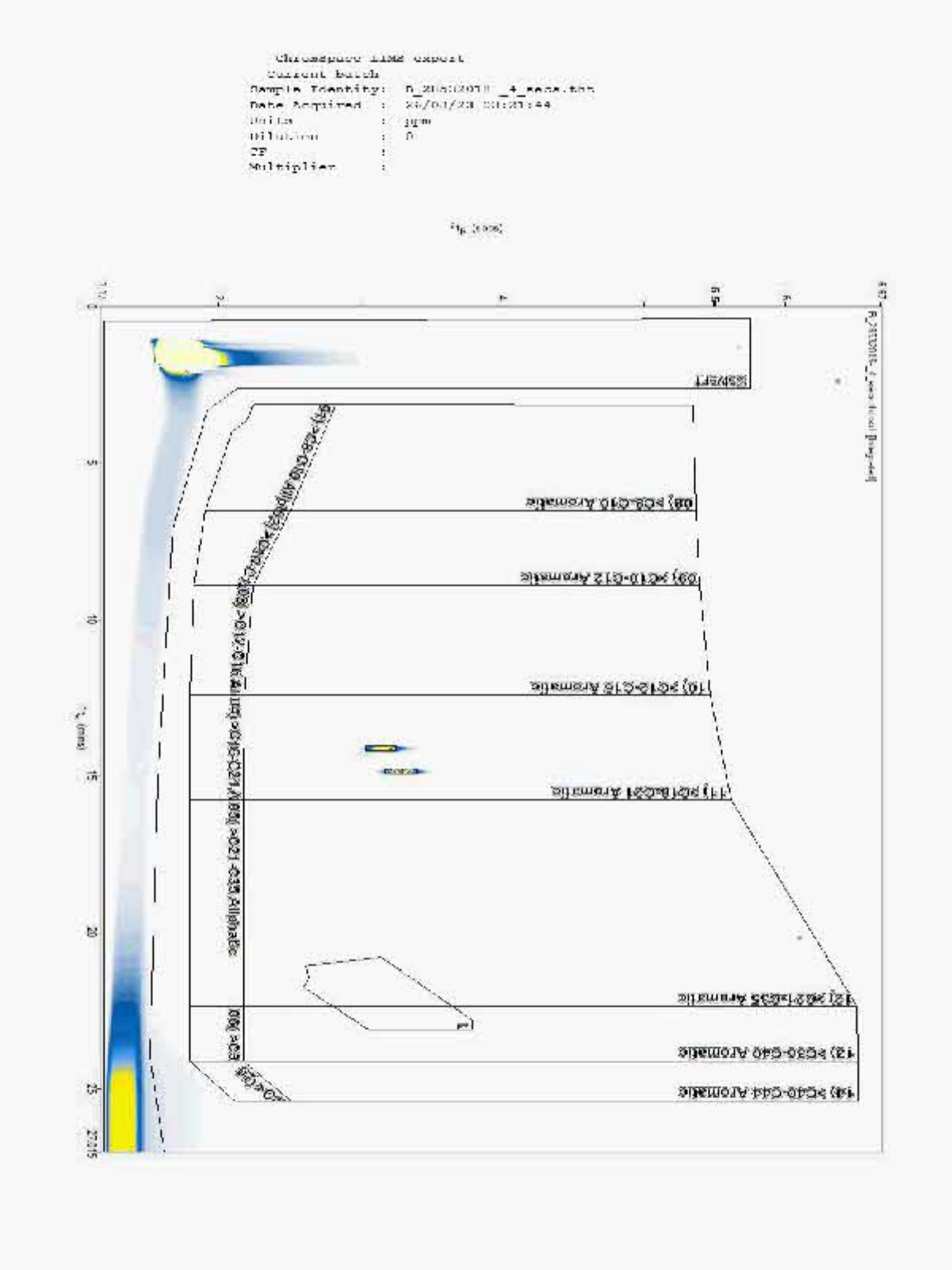


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28532018 **Depth :** 2.00 - 2.00
Sample ID : TP02

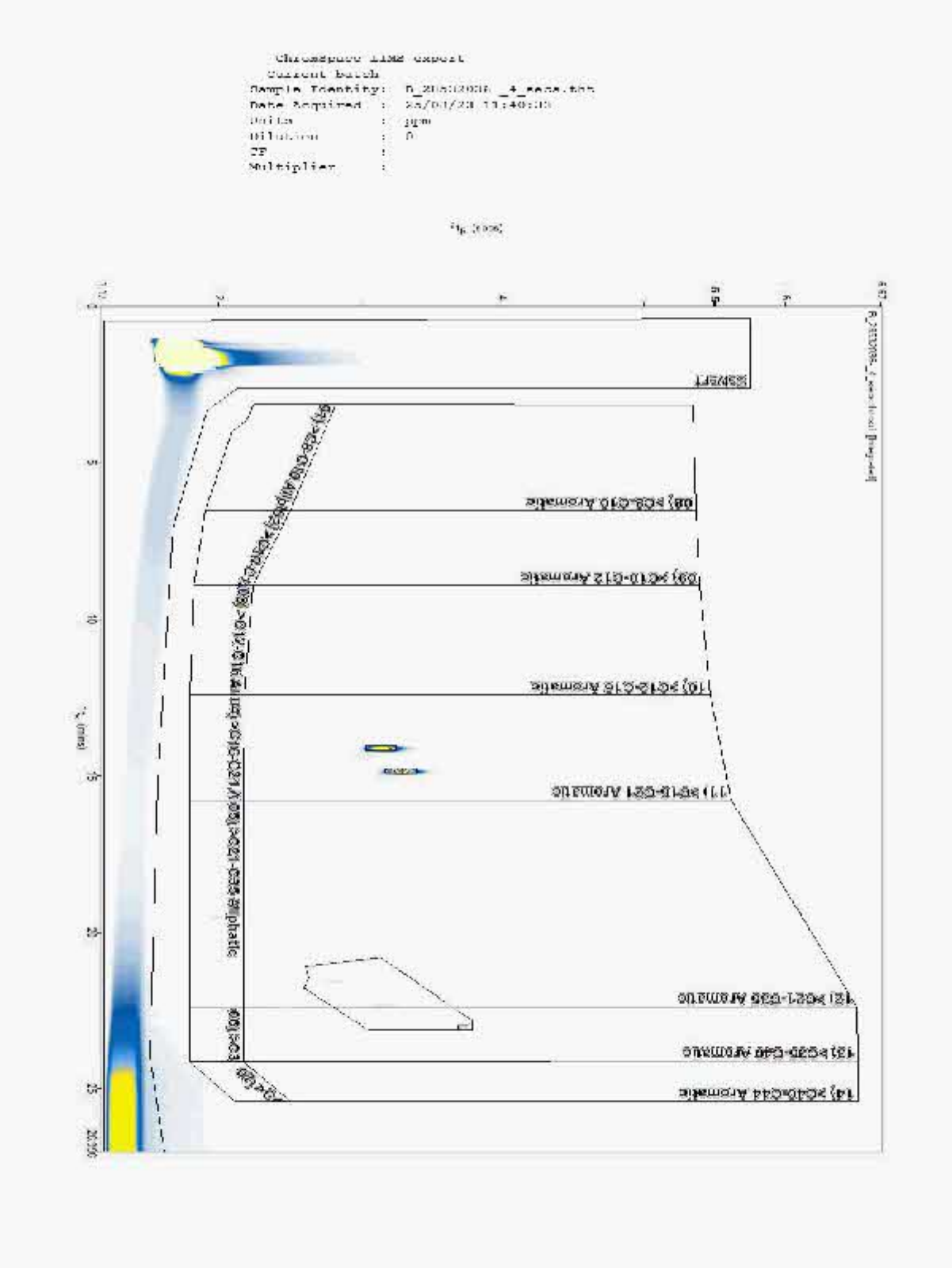


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28532036 **Depth :** 2.50 - 2.50
Sample ID : TP05

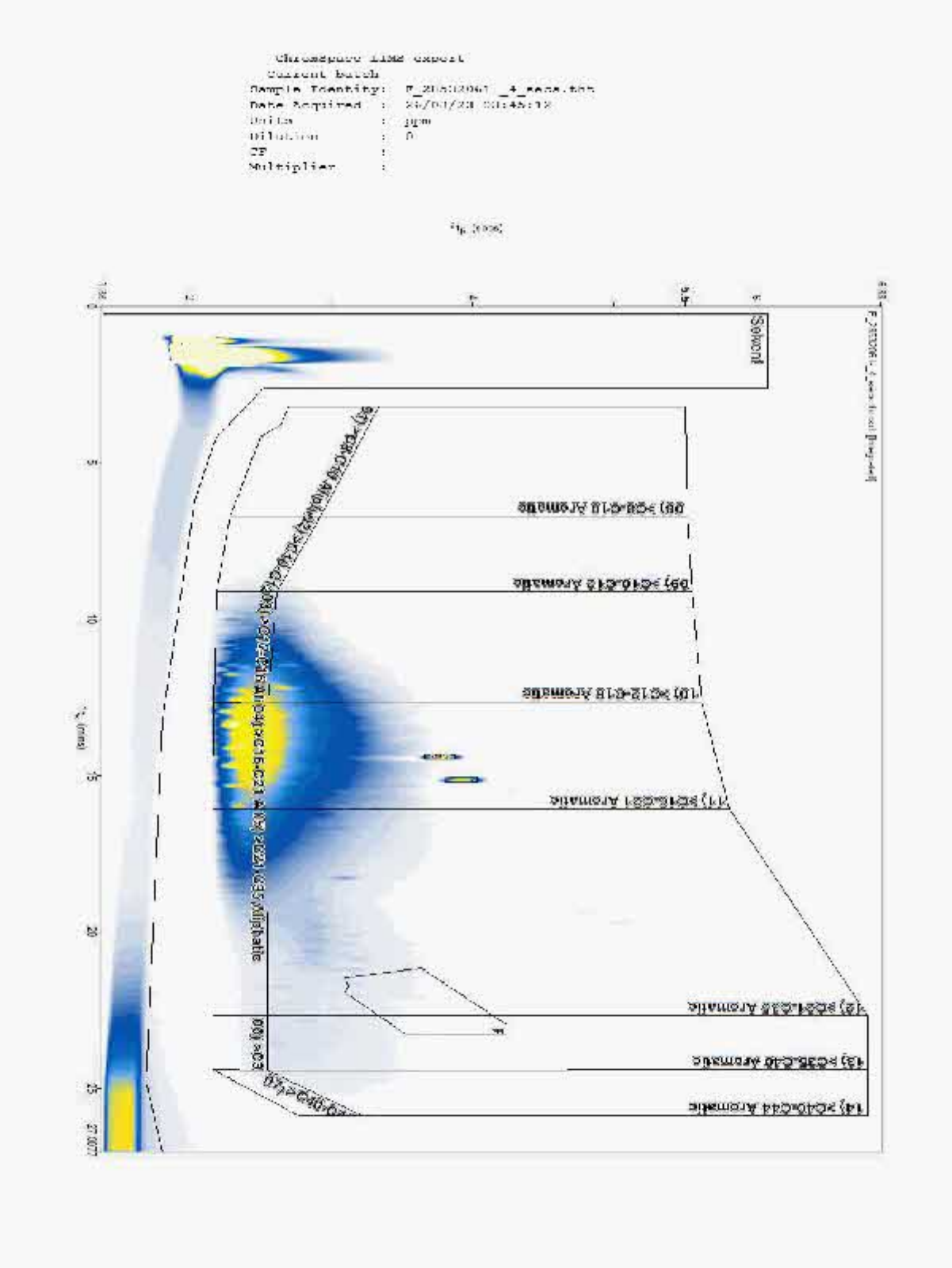


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28532061 **Depth :** 0.50 - 0.50
Sample ID : TP01

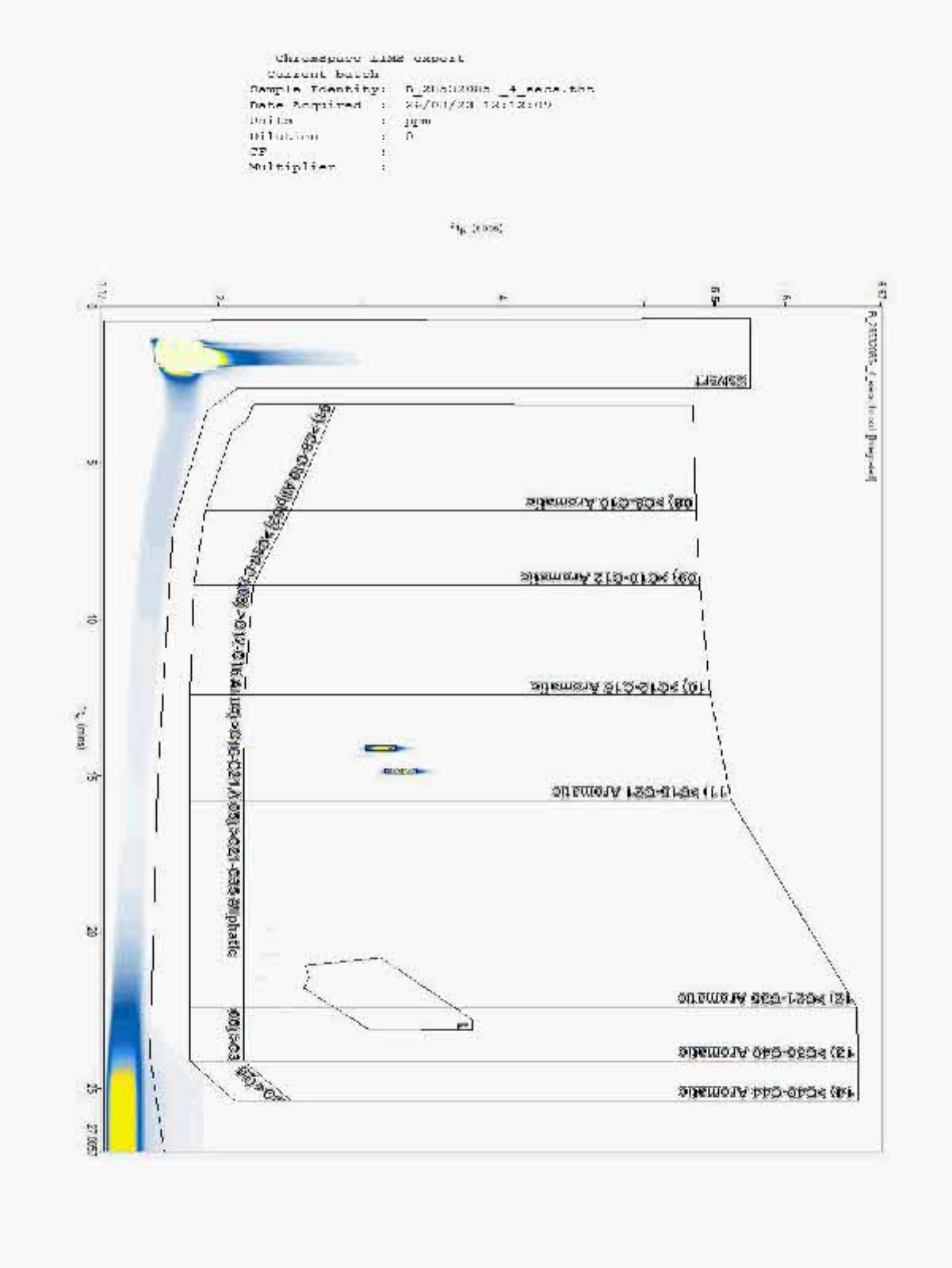


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28532085 **Depth :** 2.90 - 2.90
Sample ID : TP04

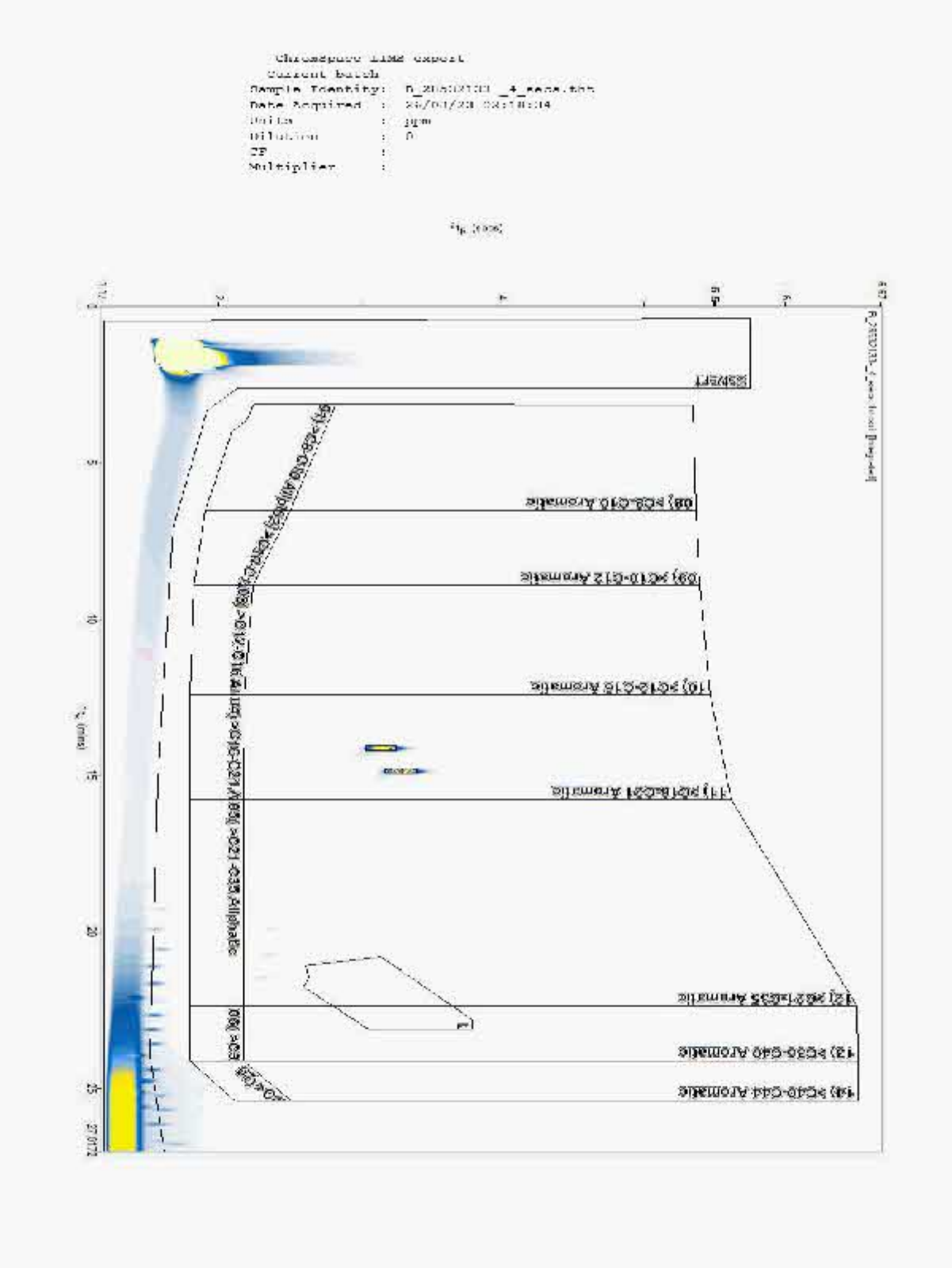


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28532133 **Depth :** 2.30 - 2.30
Sample ID : TP05

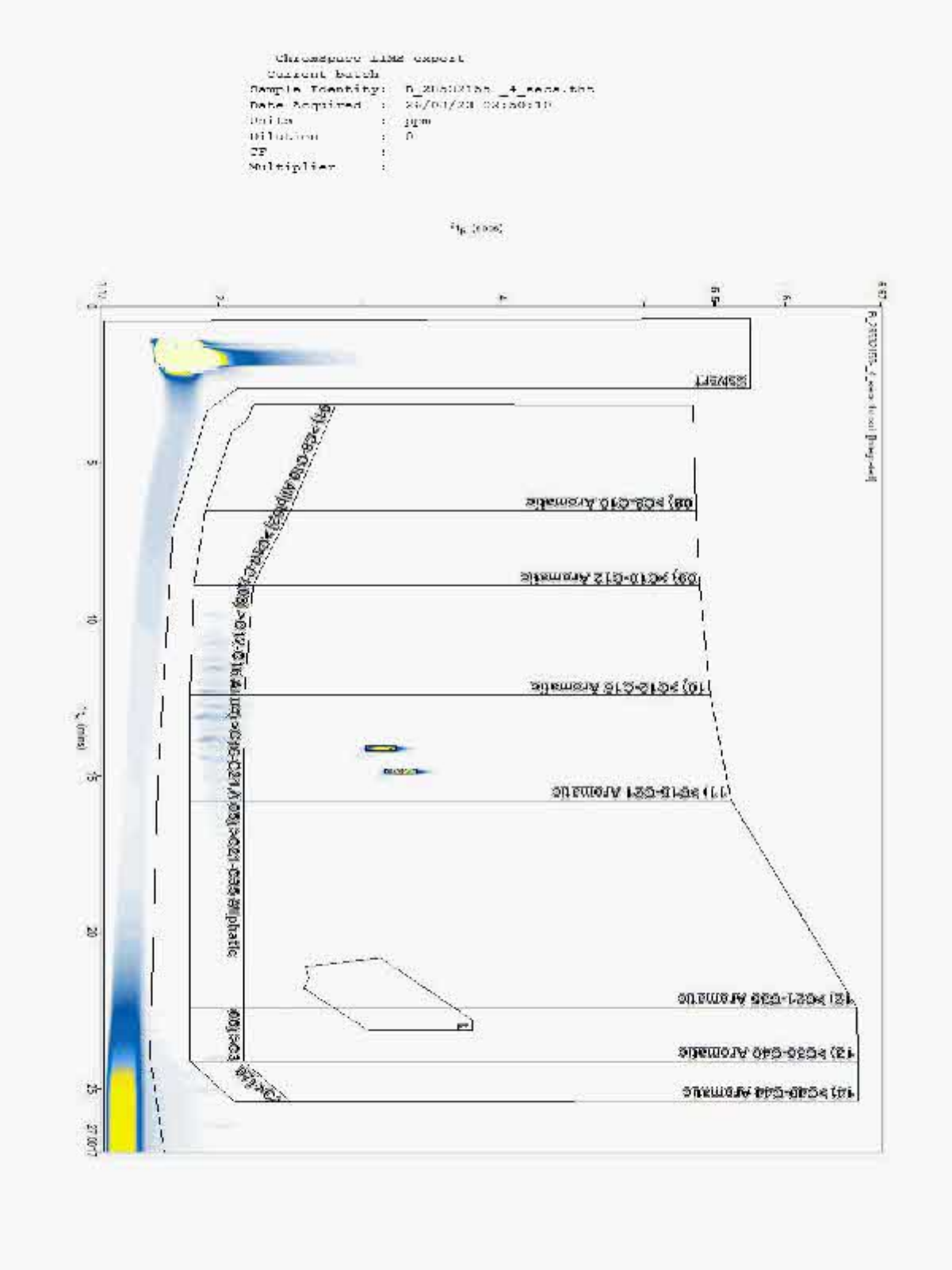


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28532155 **Depth :** 0.50 - 0.50
Sample ID : TP03

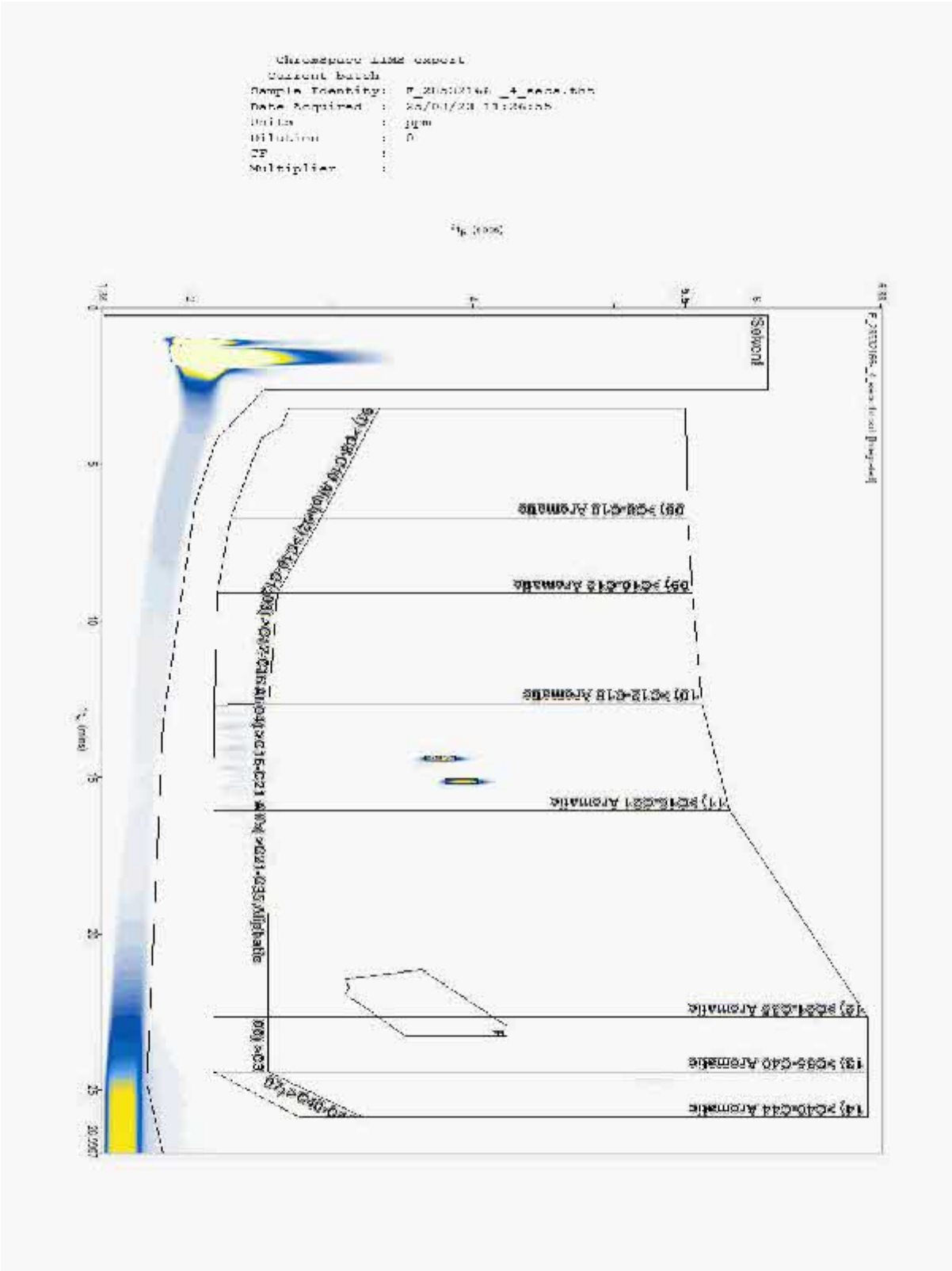


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28532166 **Depth :** 1.00 - 1.00
Sample ID : TP03

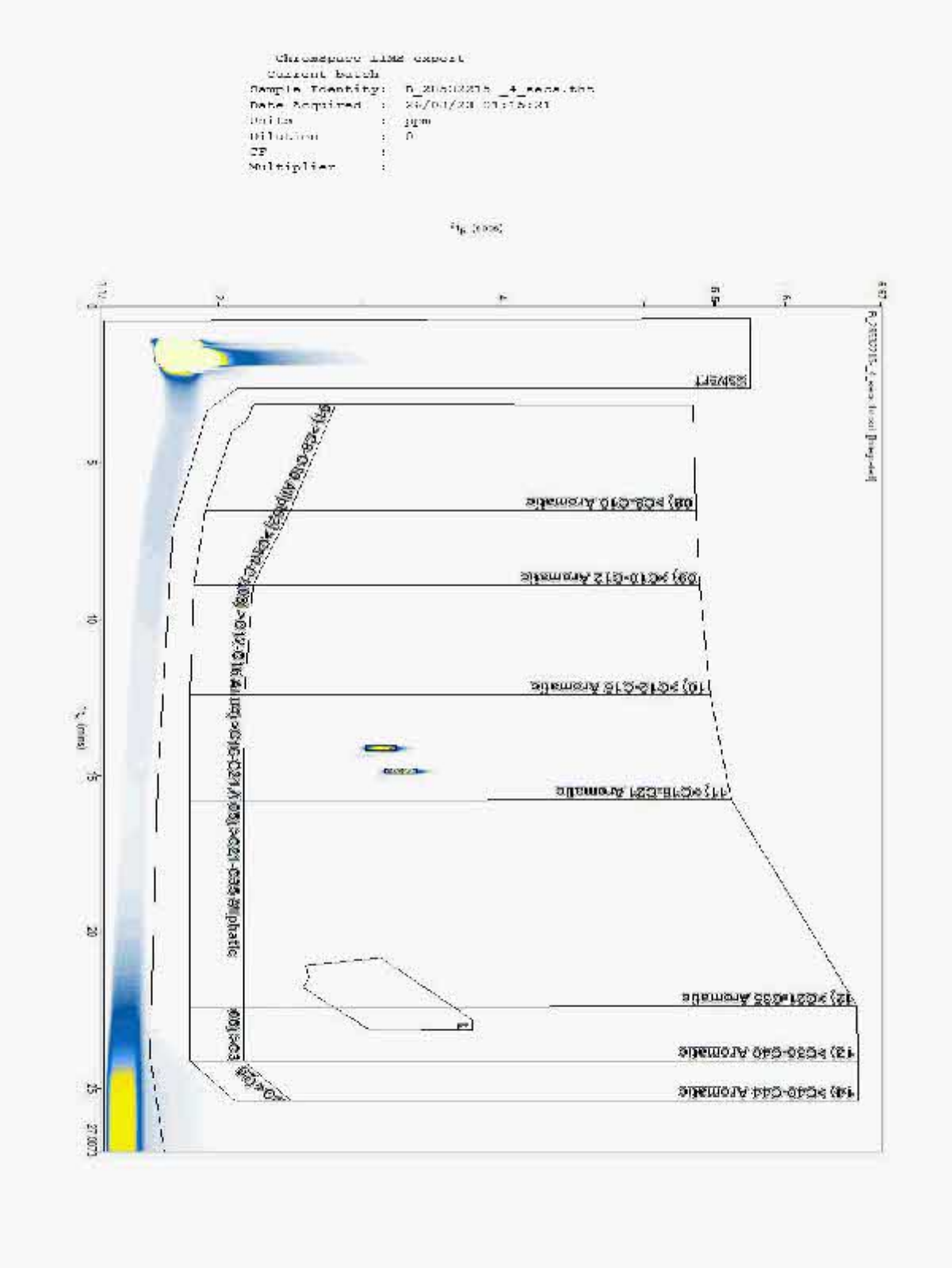


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28532215 **Depth :** 2.00 - 2.00
Sample ID : TP01

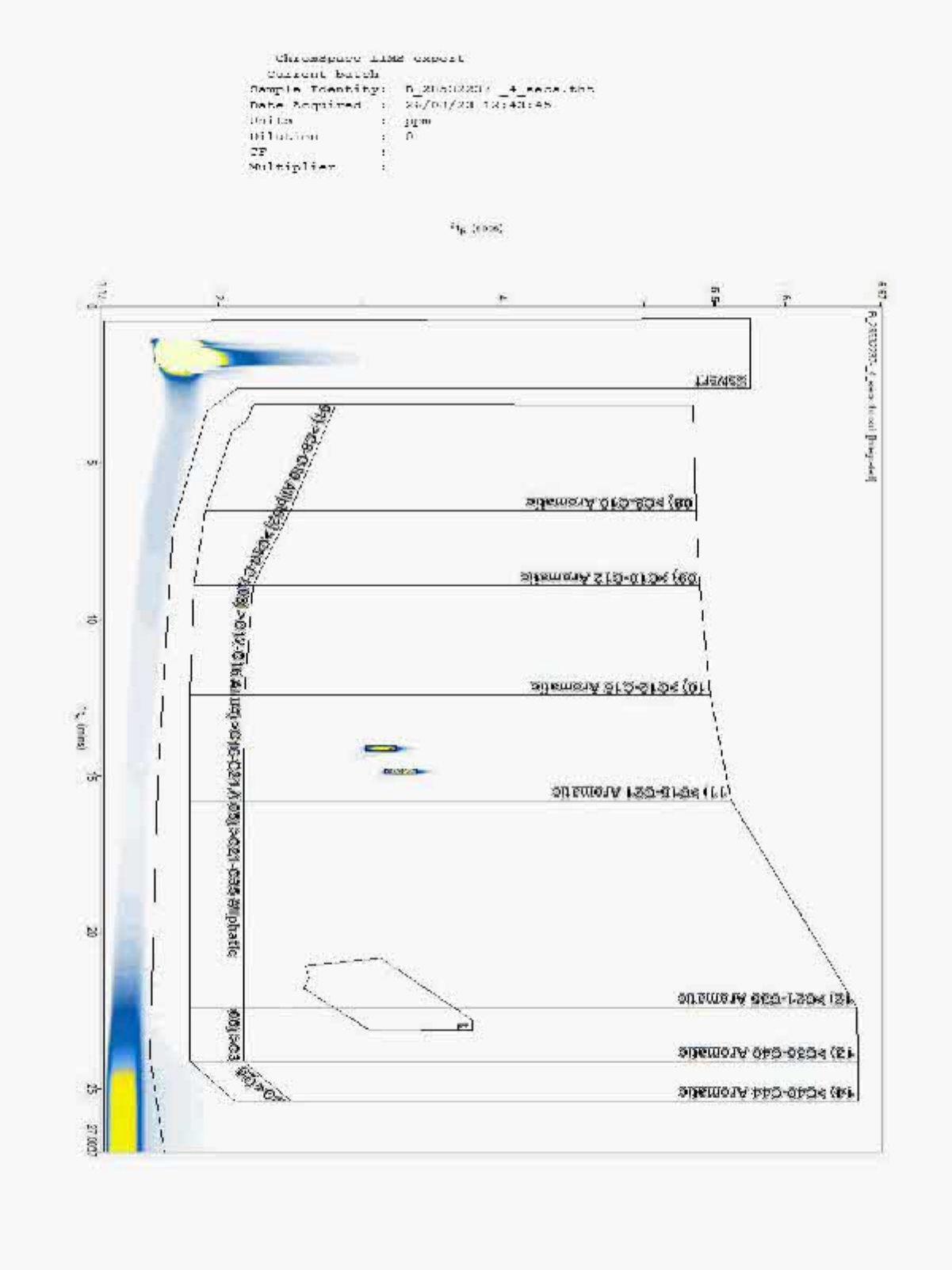


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28532237 **Depth :** 2.50 - 2.50
Sample ID : TP02

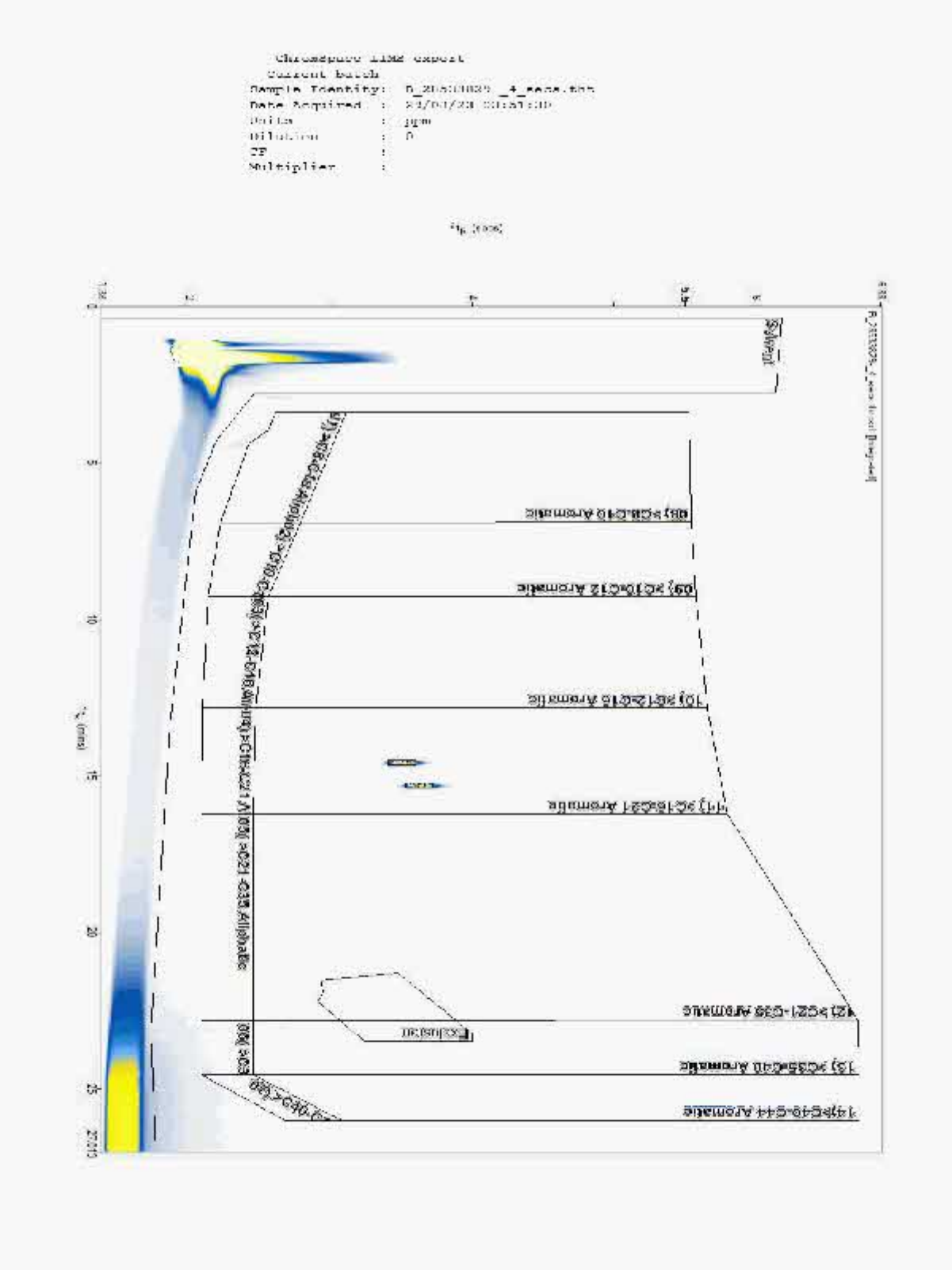


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28533829 **Depth :** 2.30 - 2.50
Sample ID : TP01

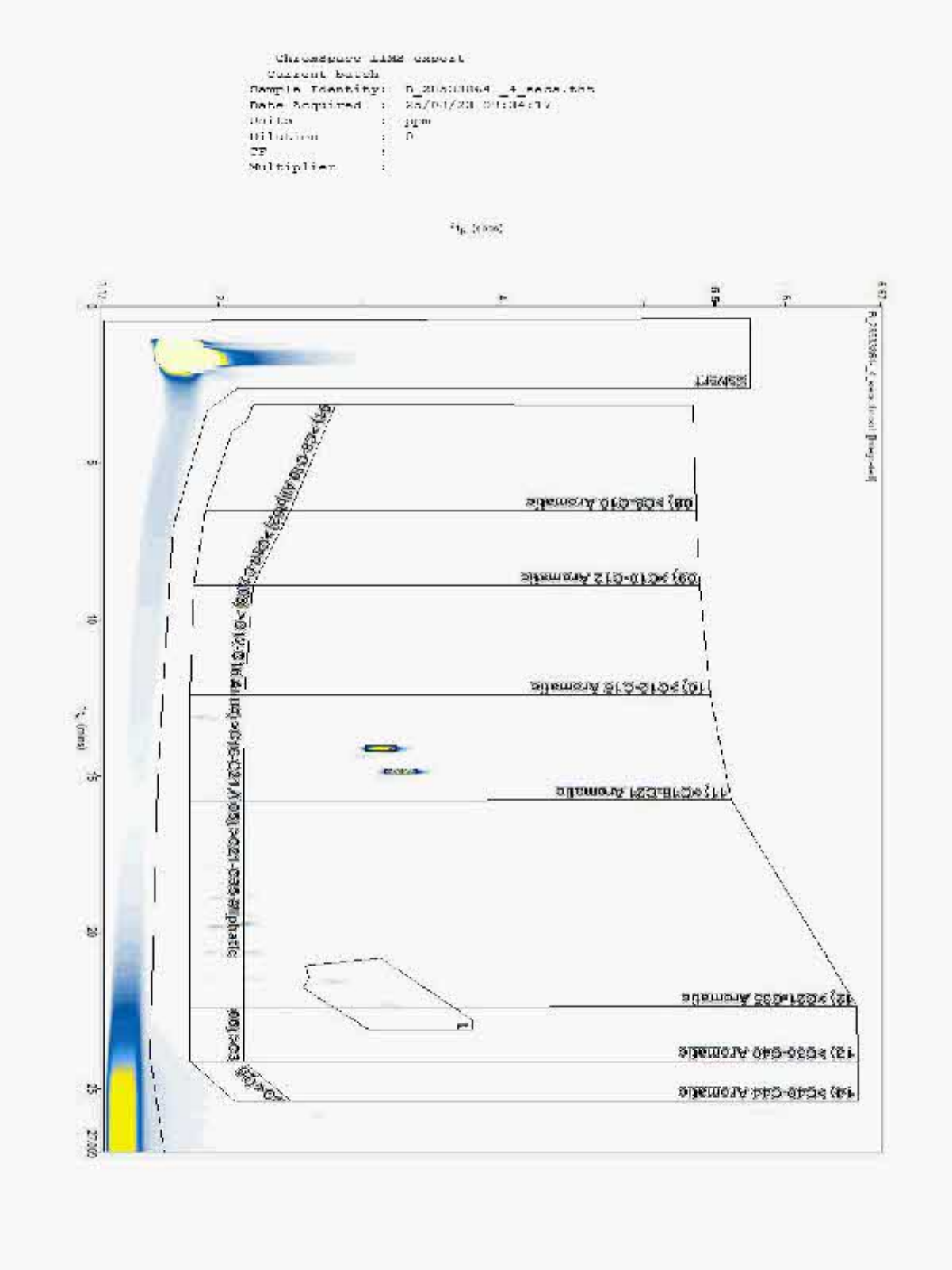


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

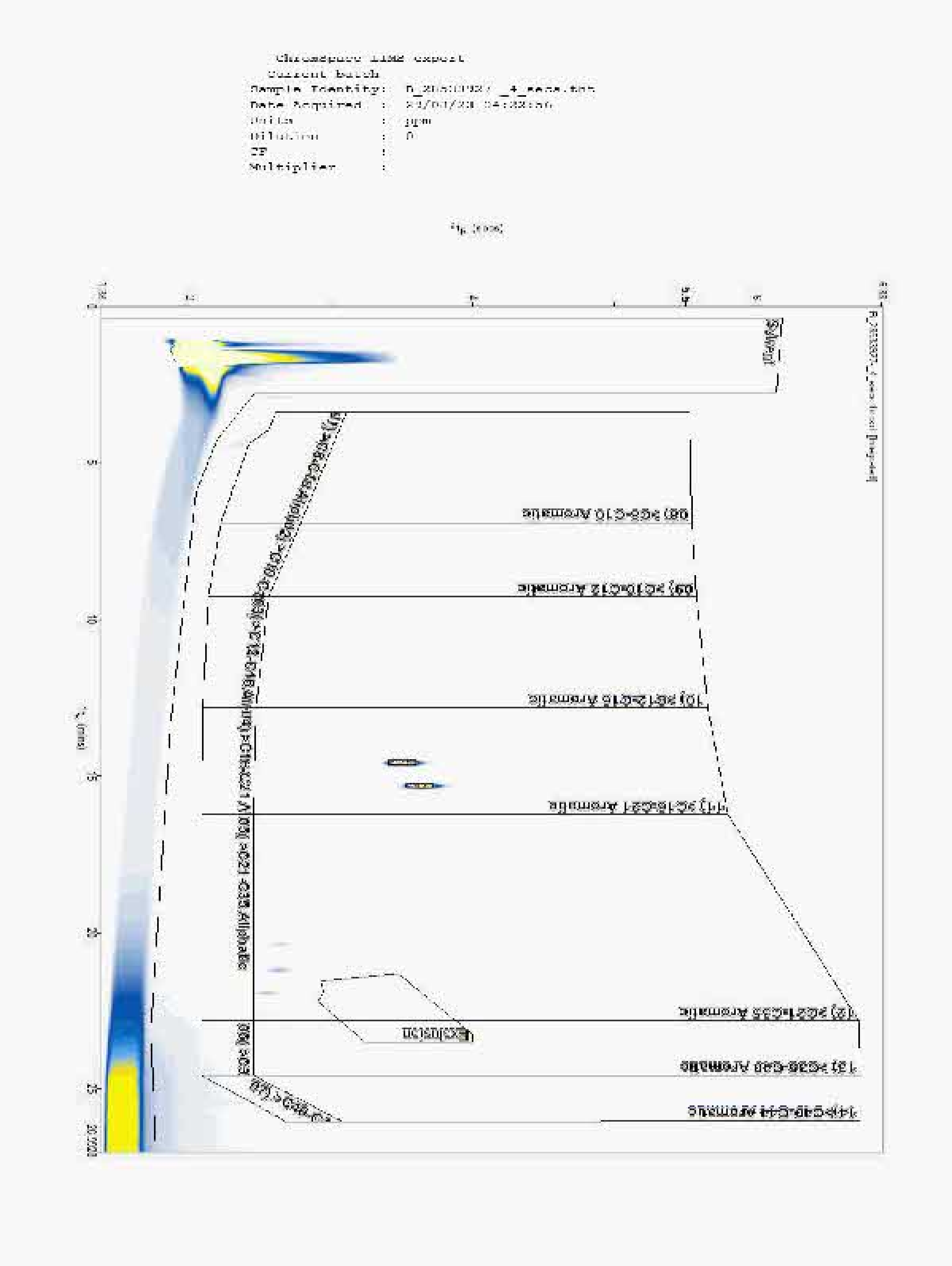
Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28533864 **Depth :** 1.00 - 1.00
Sample ID : TP04



Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28533927 **Depth :** 2.80 - 2.80
Sample ID : TP03

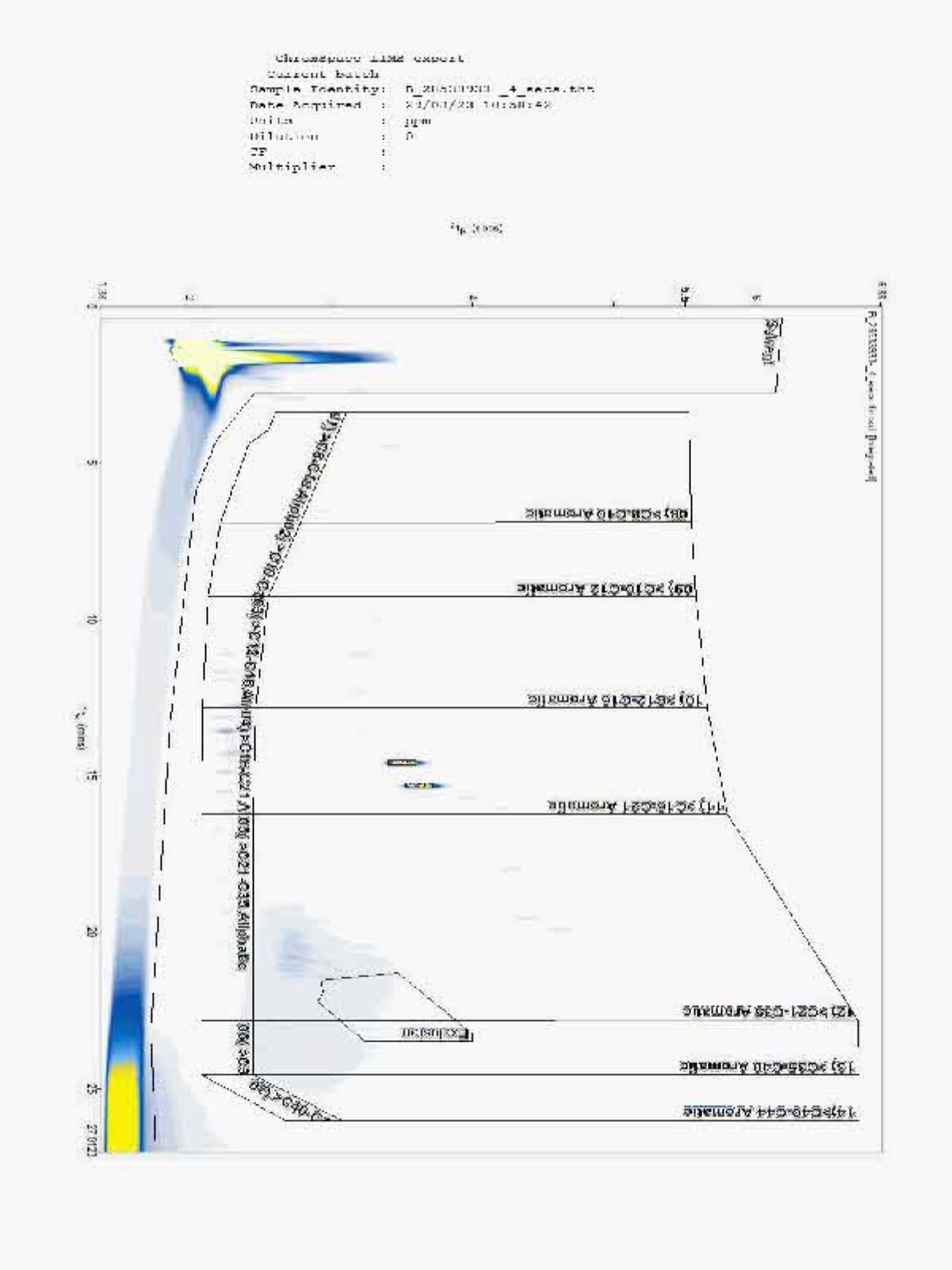


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28533933 **Depth :** 1.00 - 1.00
Sample ID : TP01

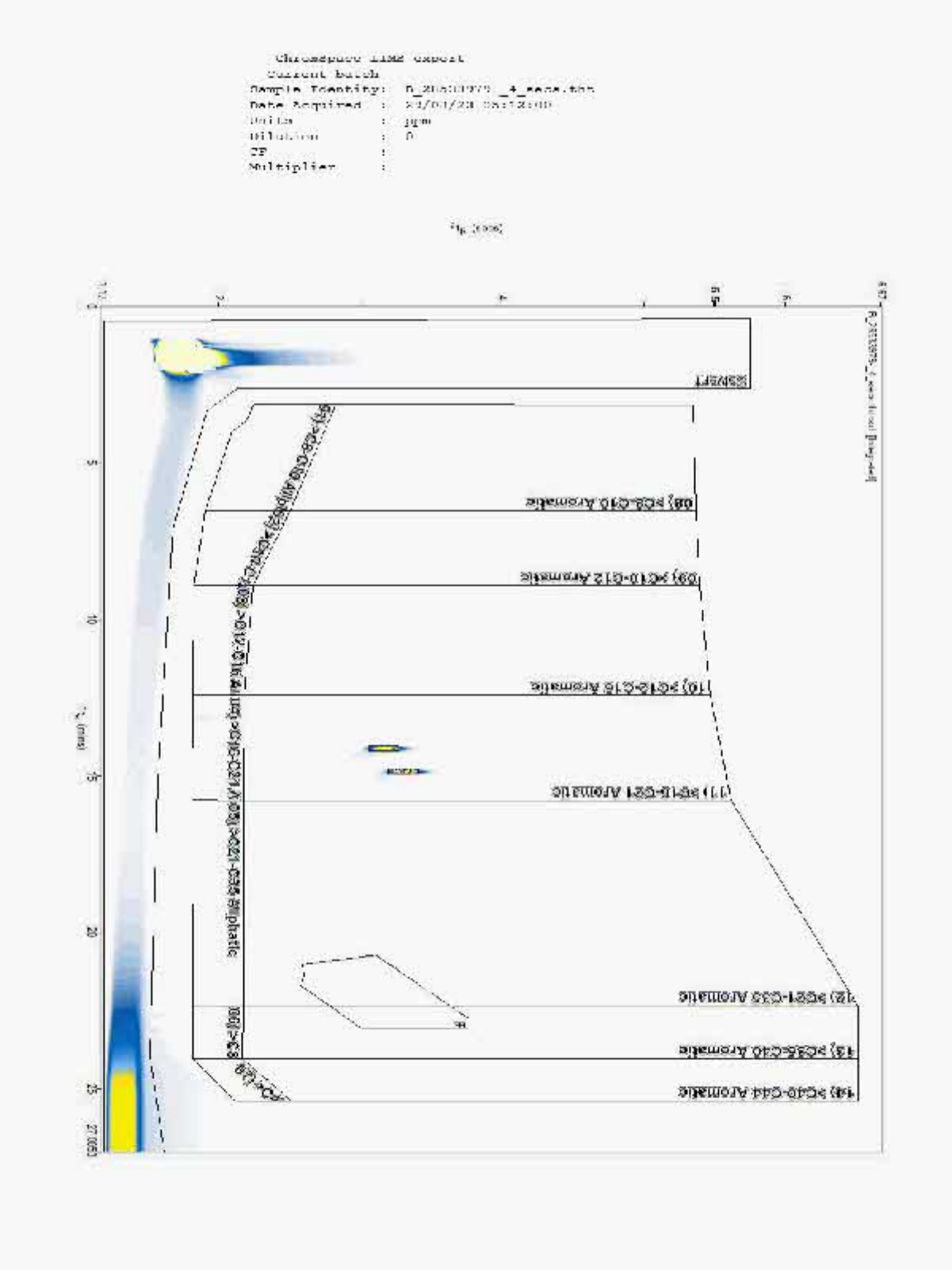


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28533979 **Depth :** 0.50 - 0.50
Sample ID : TP04

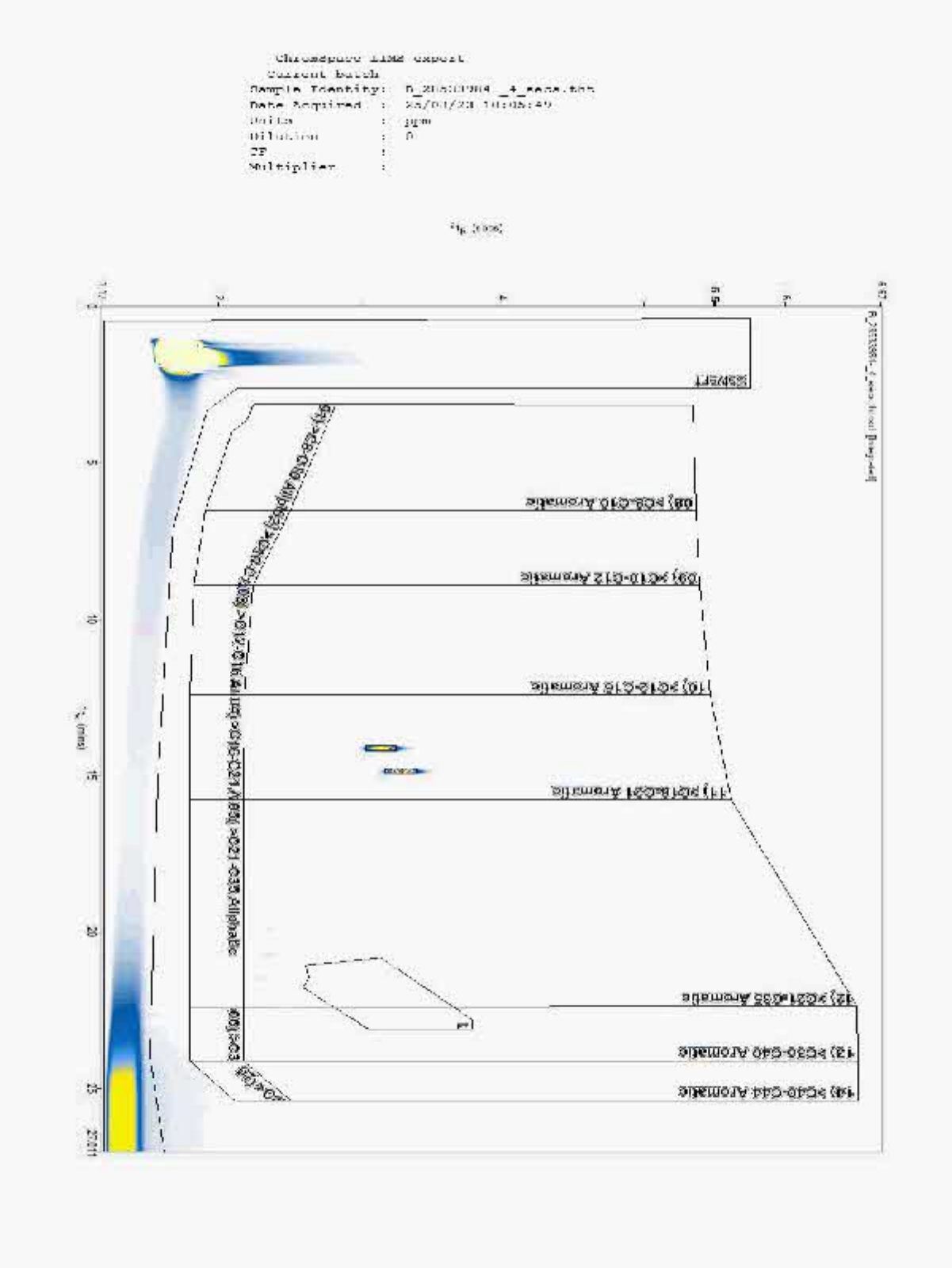


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28533984 **Depth :** 2.00 - 2.00
Sample ID : TP04

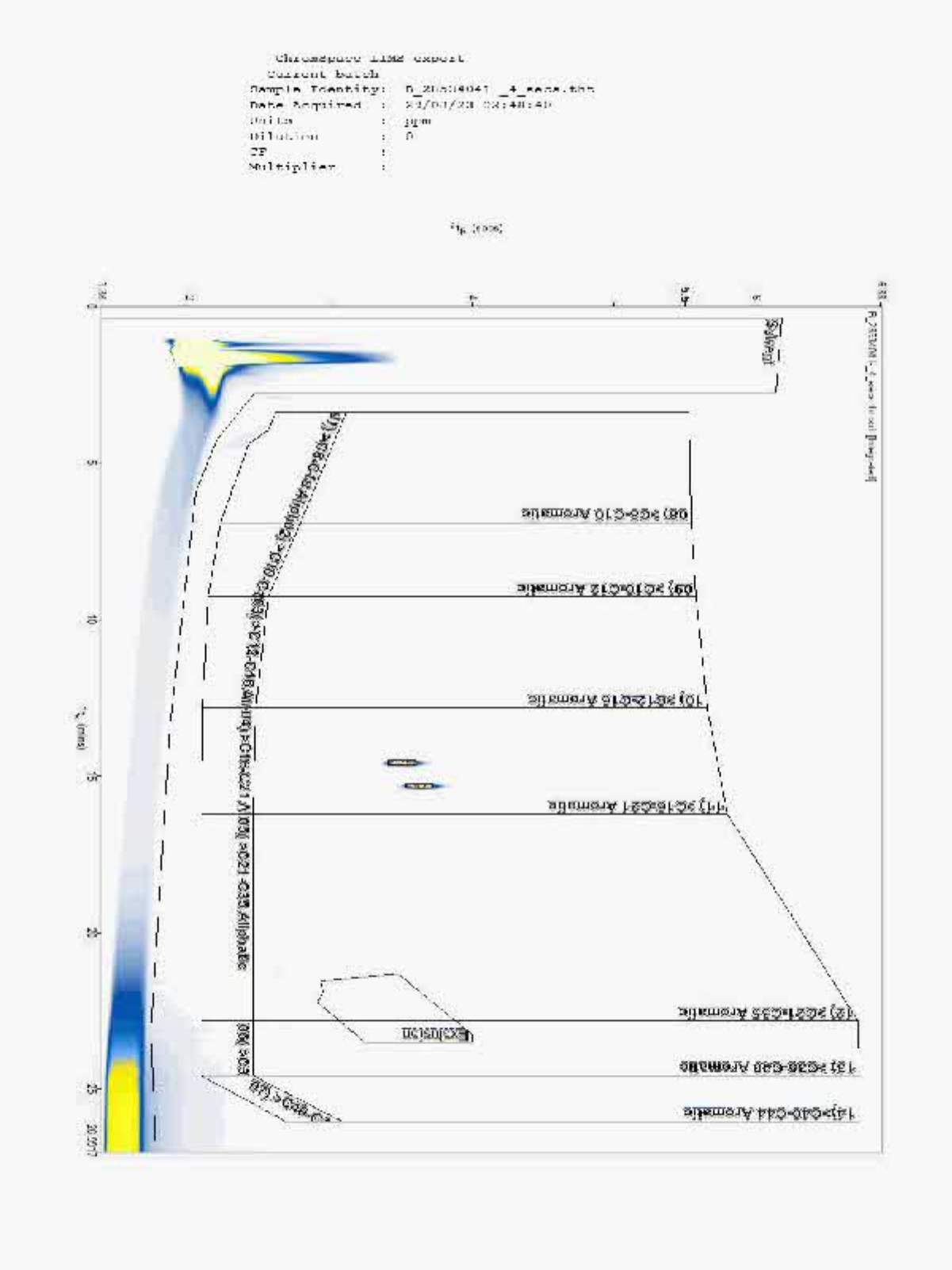


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28534041 **Depth :** 2.00 - 2.00
Sample ID : TP03



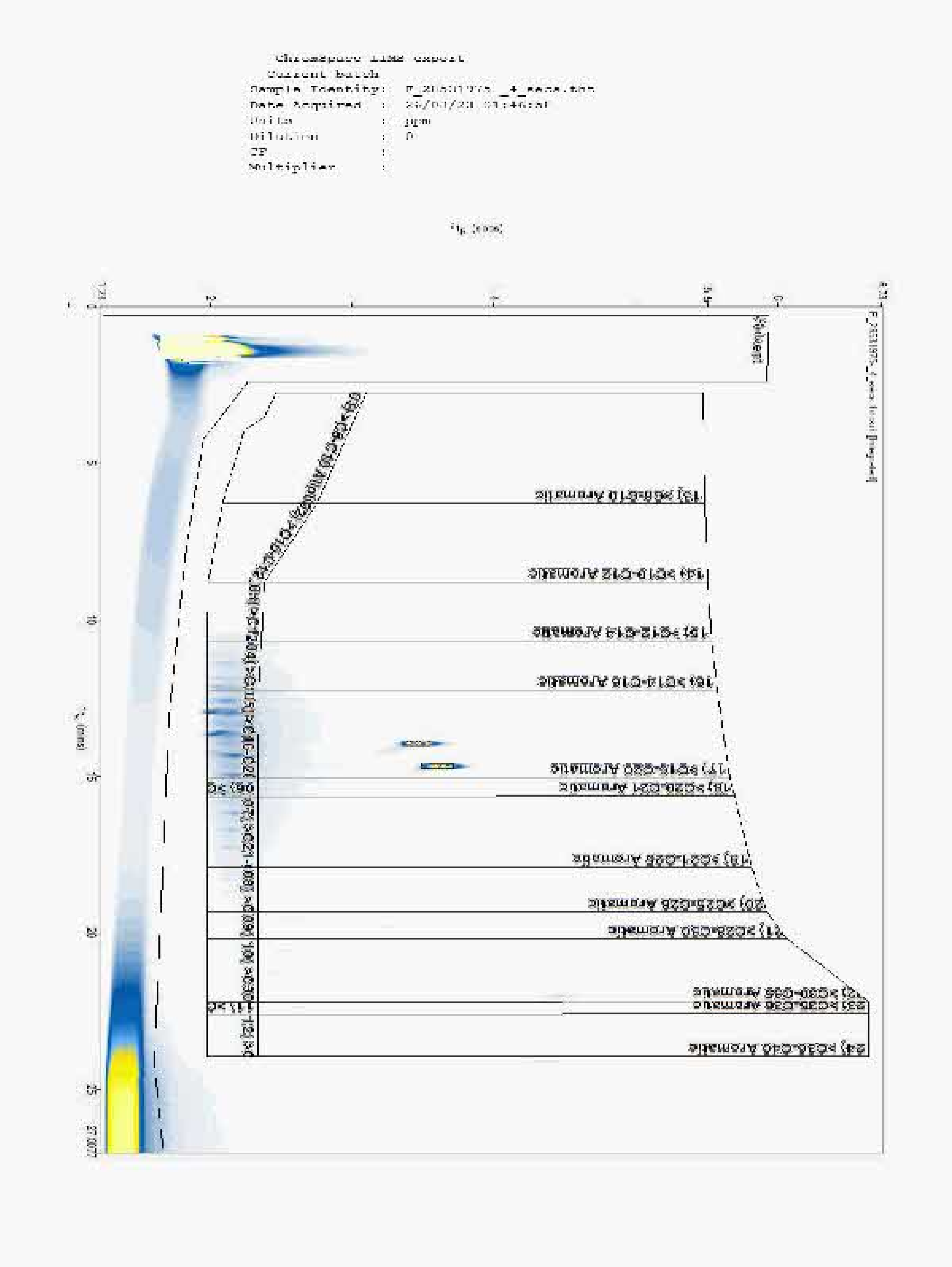
Validated

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: EPH by GCxGC-FID **Sample No :** 28531975 **Depth :** 0.50 - 0.50
Sample ID : TP02



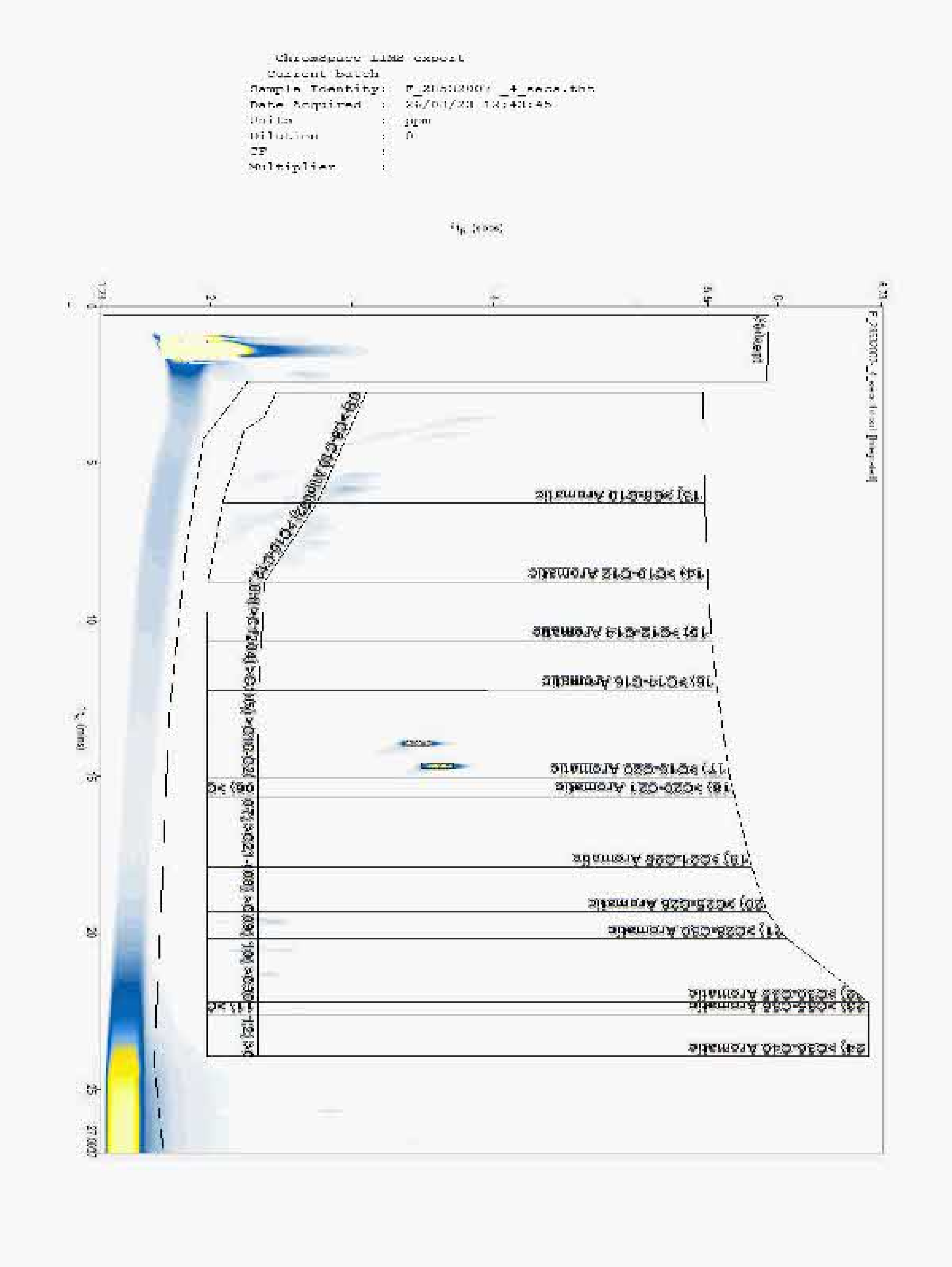
Validated

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

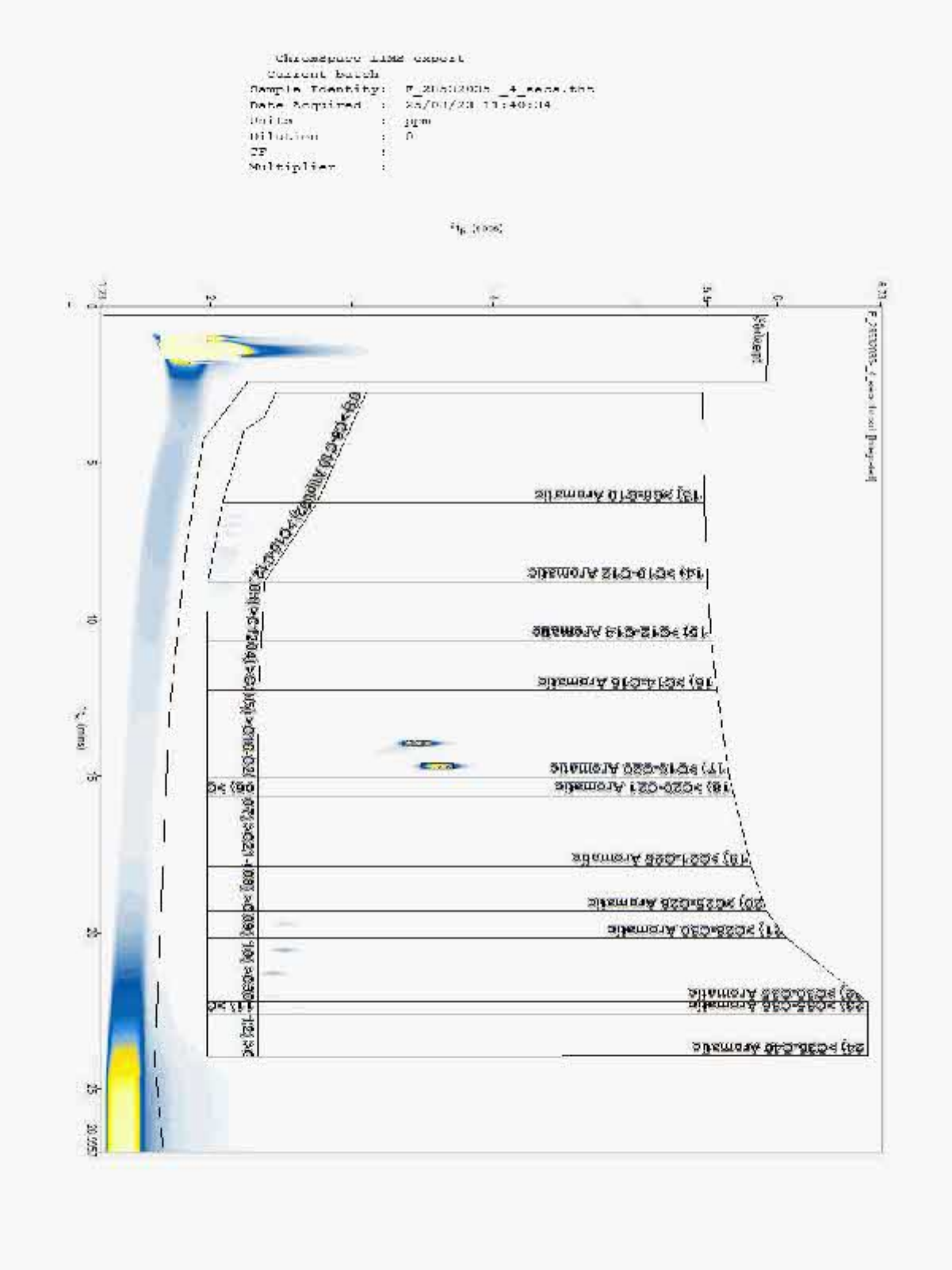
Chromatogram

Analysis: EPH by GCxGC-FID **Sample No :** 28532007 **Depth :** 1.00 - 1.00
Sample ID : TP02



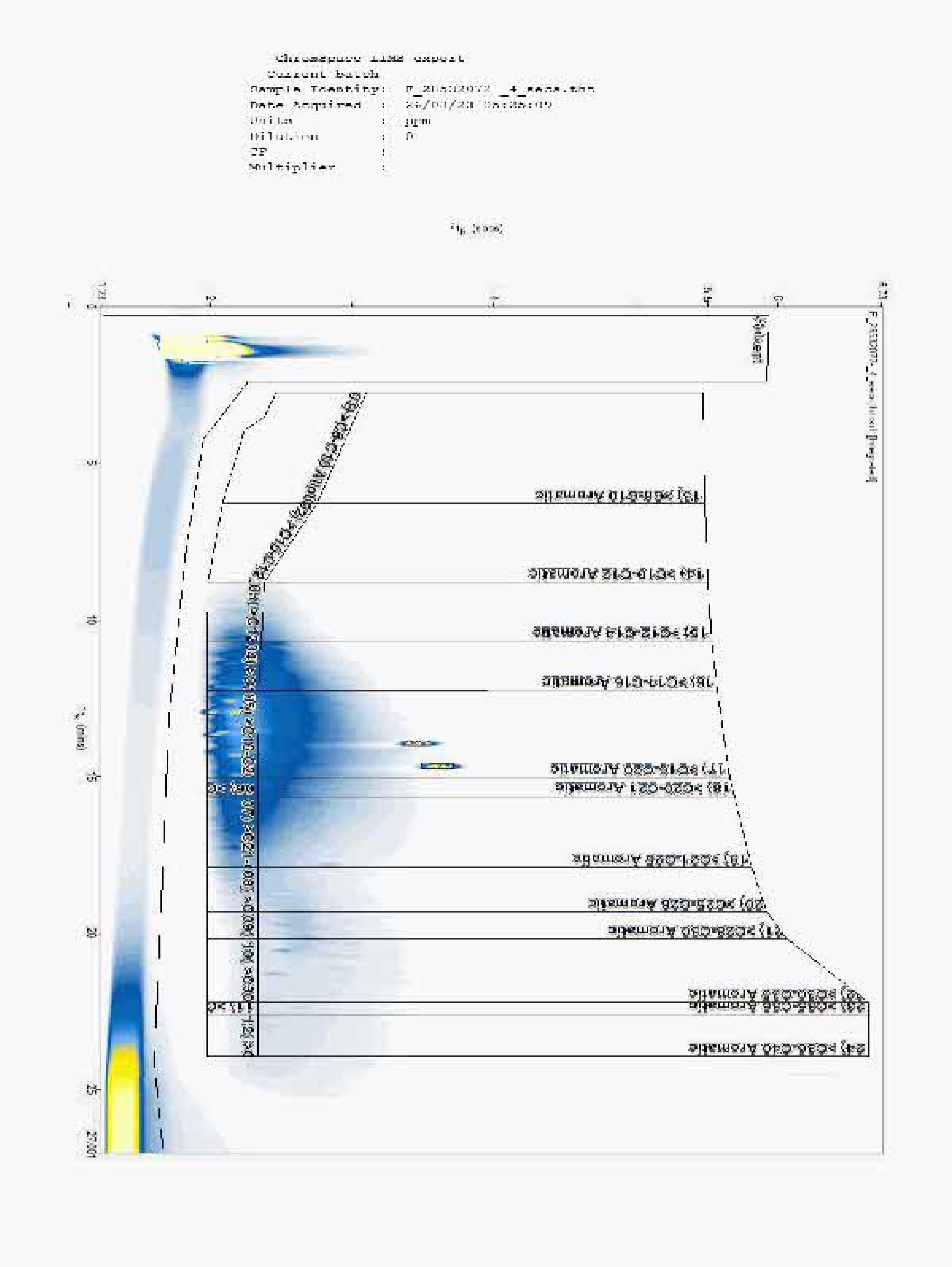
Chromatogram

Analysis: EPH by GCxGC-FID **Sample No :** 28532035 **Depth :** 2.00 - 2.00
Sample ID : TP02



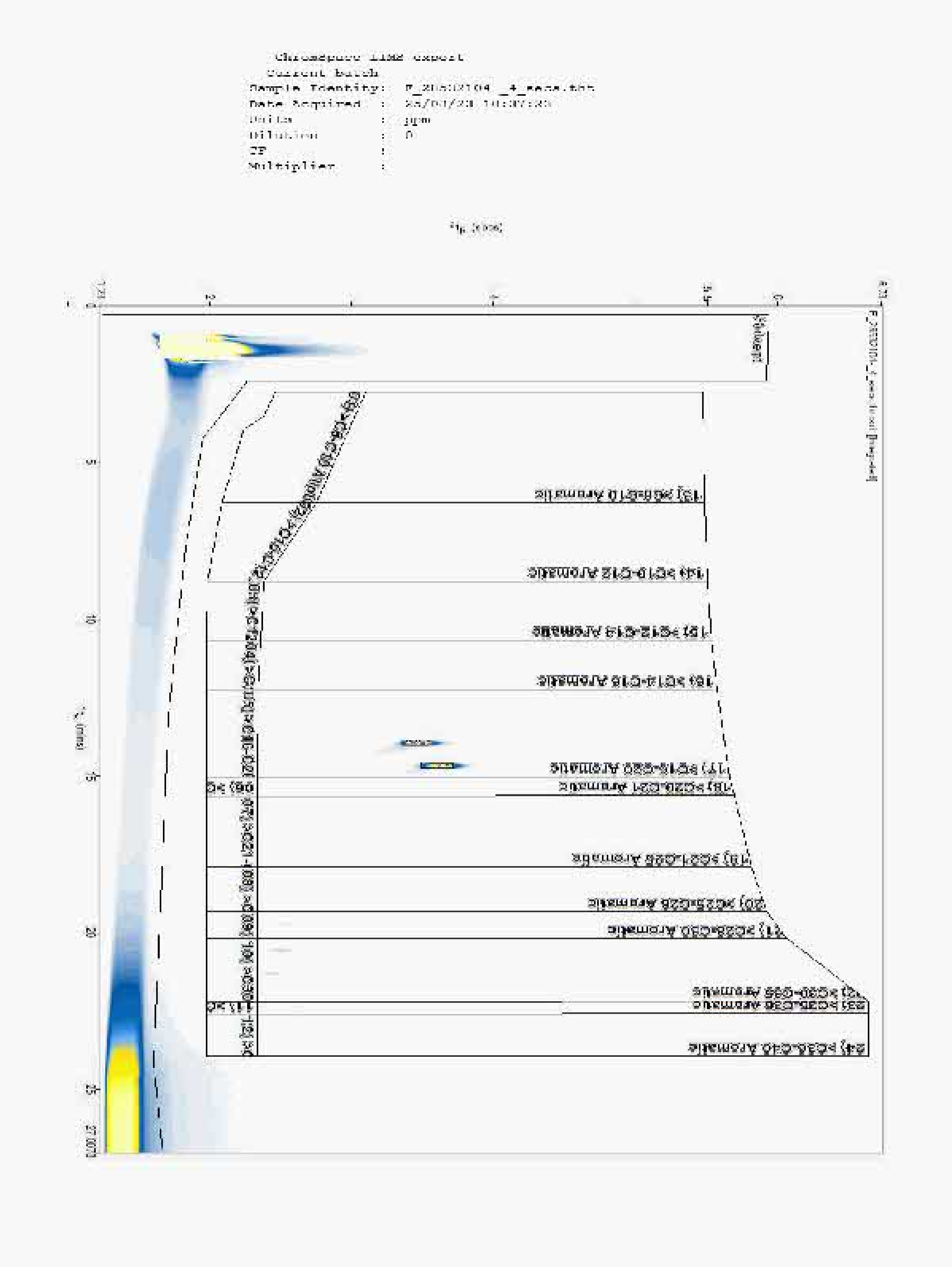
Chromatogram

Analysis: EPH by GCxGC-FID **Sample No :** 28532072 **Depth :** 0.50 - 0.50
Sample ID : TP01



Chromatogram

Analysis: EPH by GCxGC-FID **Sample No :** 28532104 **Depth :** 2.90 - 2.90
Sample ID : TP04



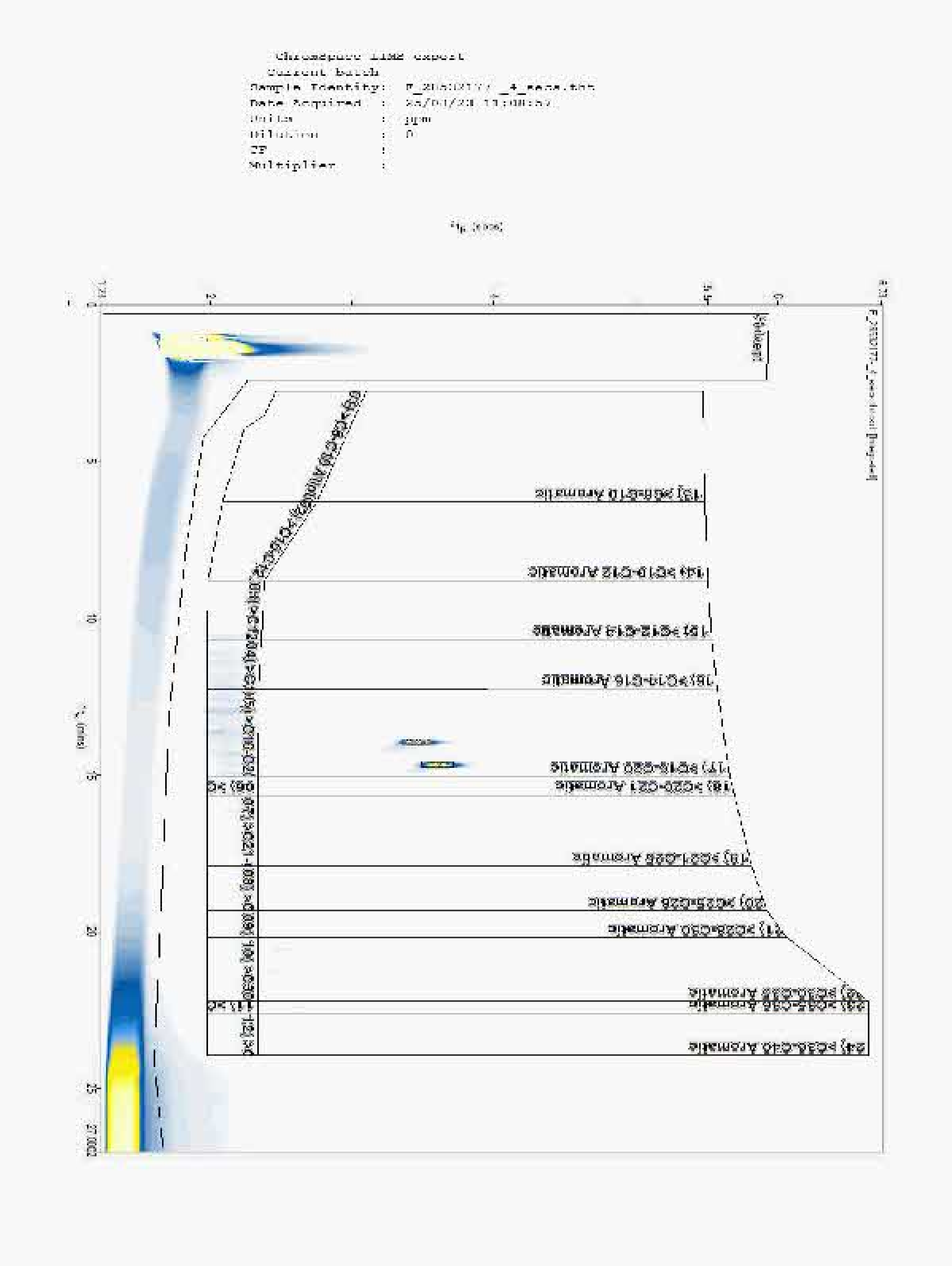
Validated

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

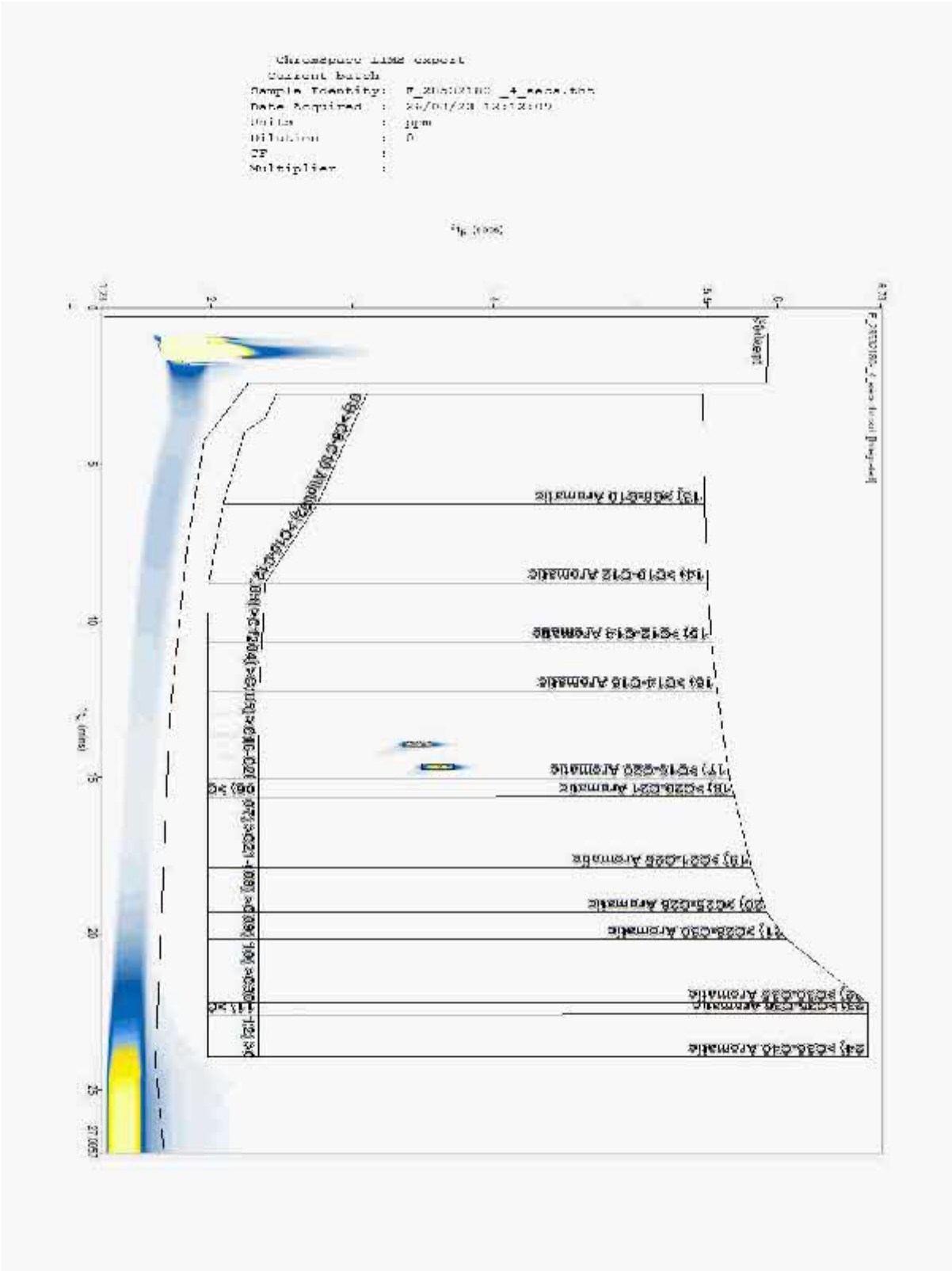
Chromatogram

Analysis: EPH by GCxGC-FID **Sample No :** 28532177 **Depth :** 0.50 - 0.50
Sample ID : TP03



Chromatogram

Analysis: EPH by GCxGC-FID **Sample No :** 28532180 **Depth :** 1.00 - 1.00
Sample ID : TP03



Validated

CERTIFICATE OF ANALYSIS

SDG: 230824-55 | **Report Number:** 703740 | **Superseded Report:** 703483

Client Ref. 70102251 | **Location:** Esso Express Chesterfield

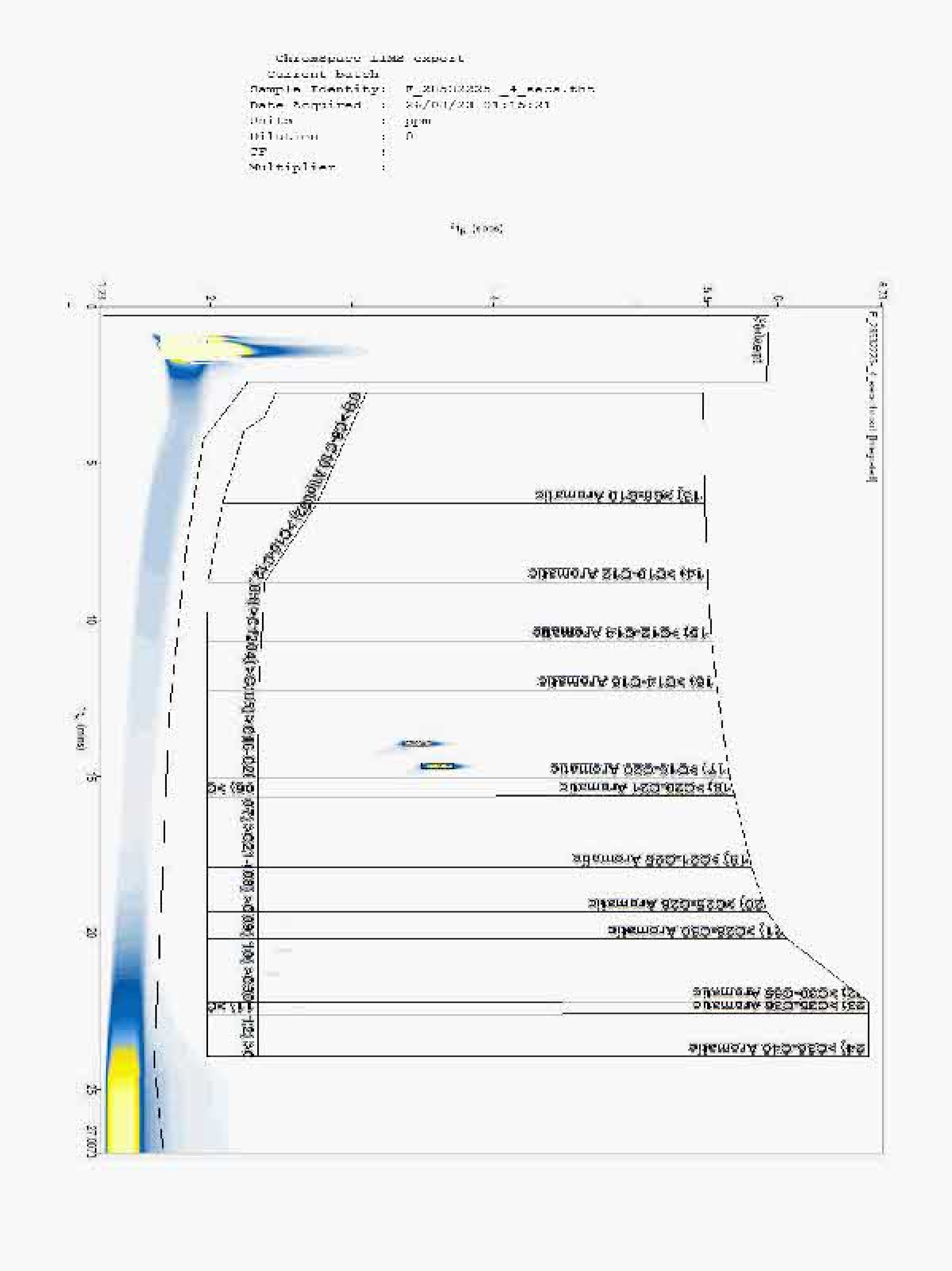
Chromatogram

Analysis: EPH by GCxGC-FID

Sample No : 28532225

Sample ID : TP01

Depth : 2.00 - 2.00



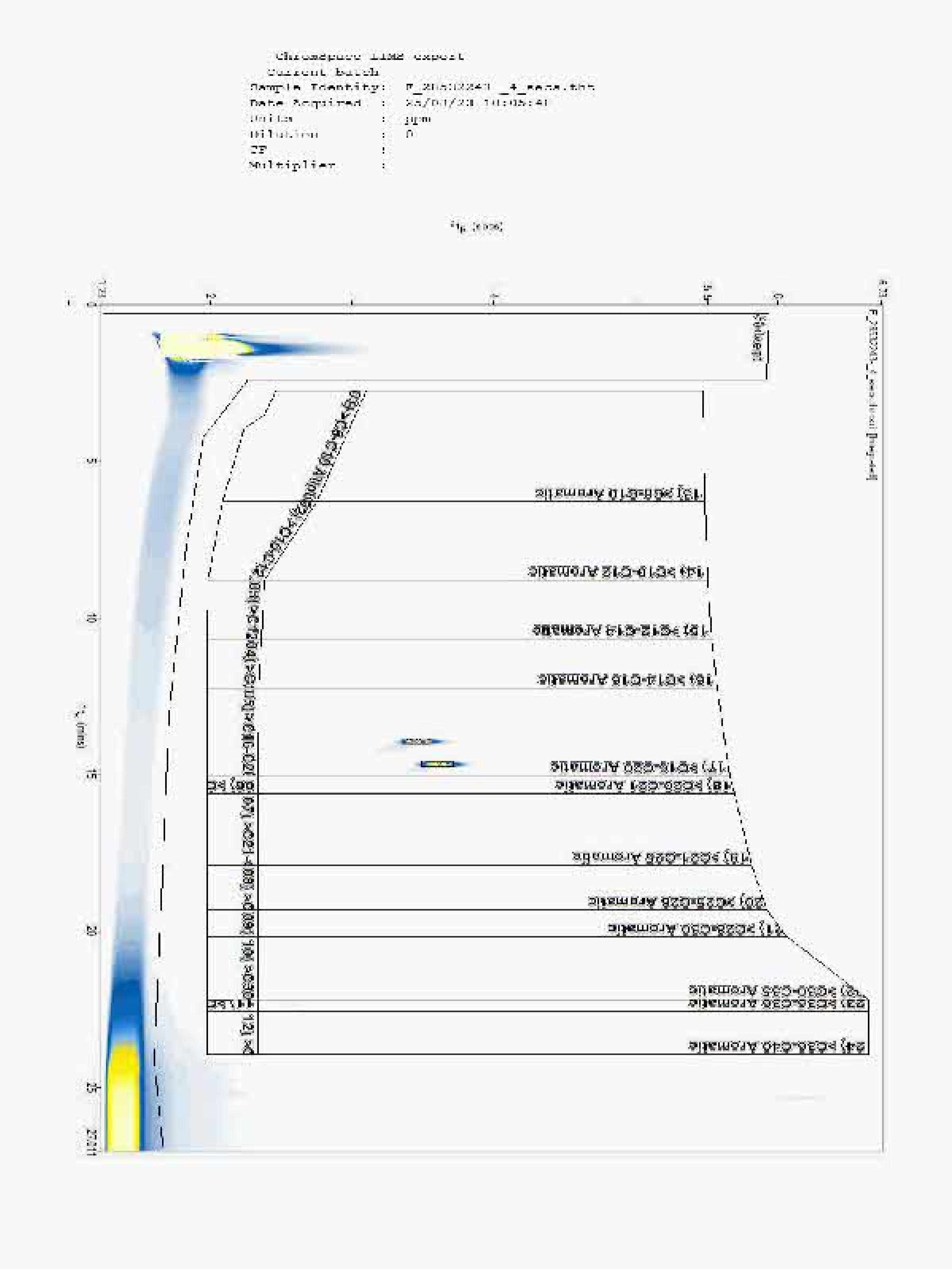
Validated

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: EPH by GCxGC-FID **Sample No :** 28532243 **Depth :** 2.50 - 2.50
Sample ID : TP02



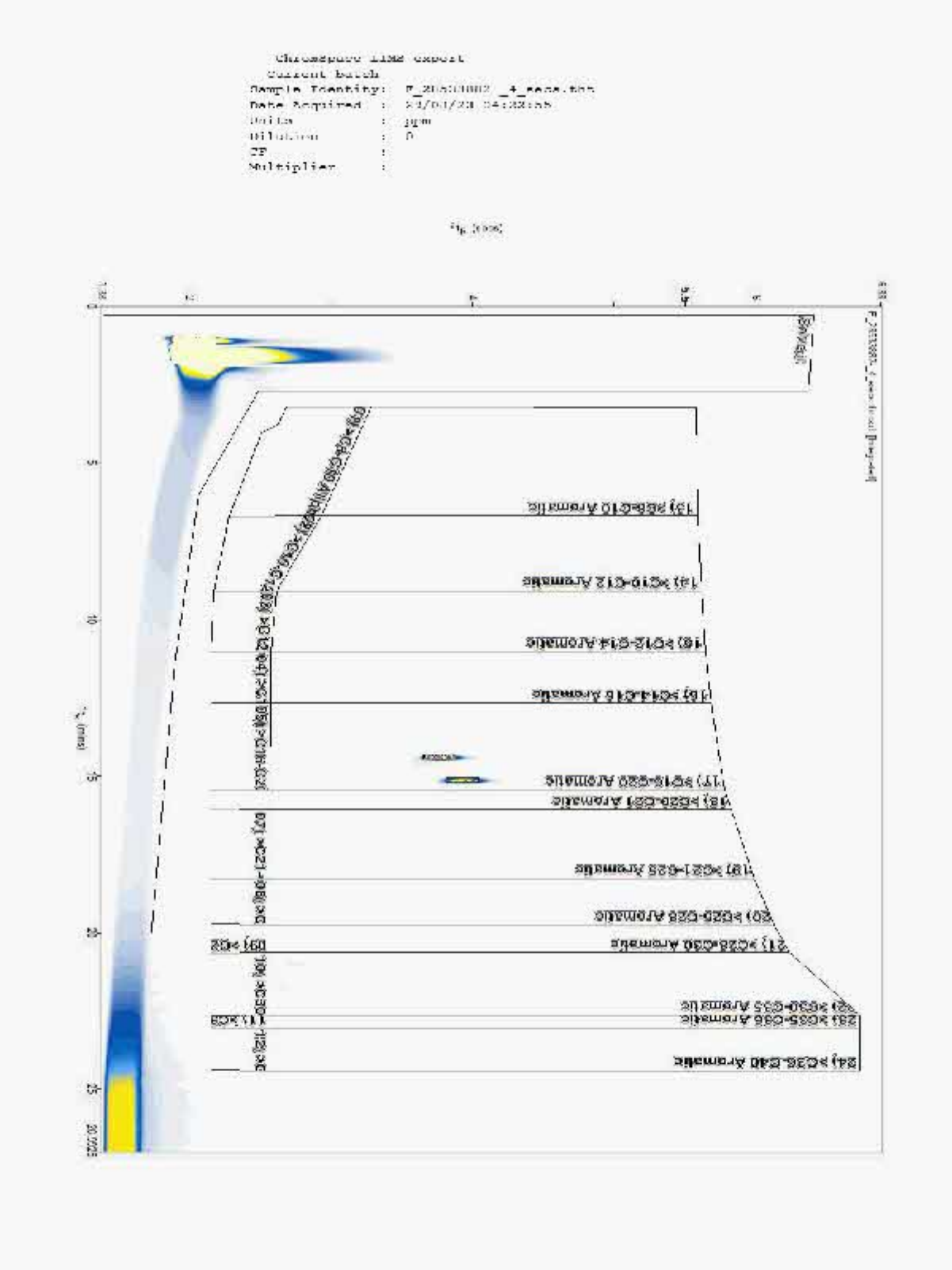
15:53:42 13/09/2023

CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: EPH by GCxGC-FID **Sample No :** 28533882 **Depth :** 2.30 - 2.50
Sample ID : TP01

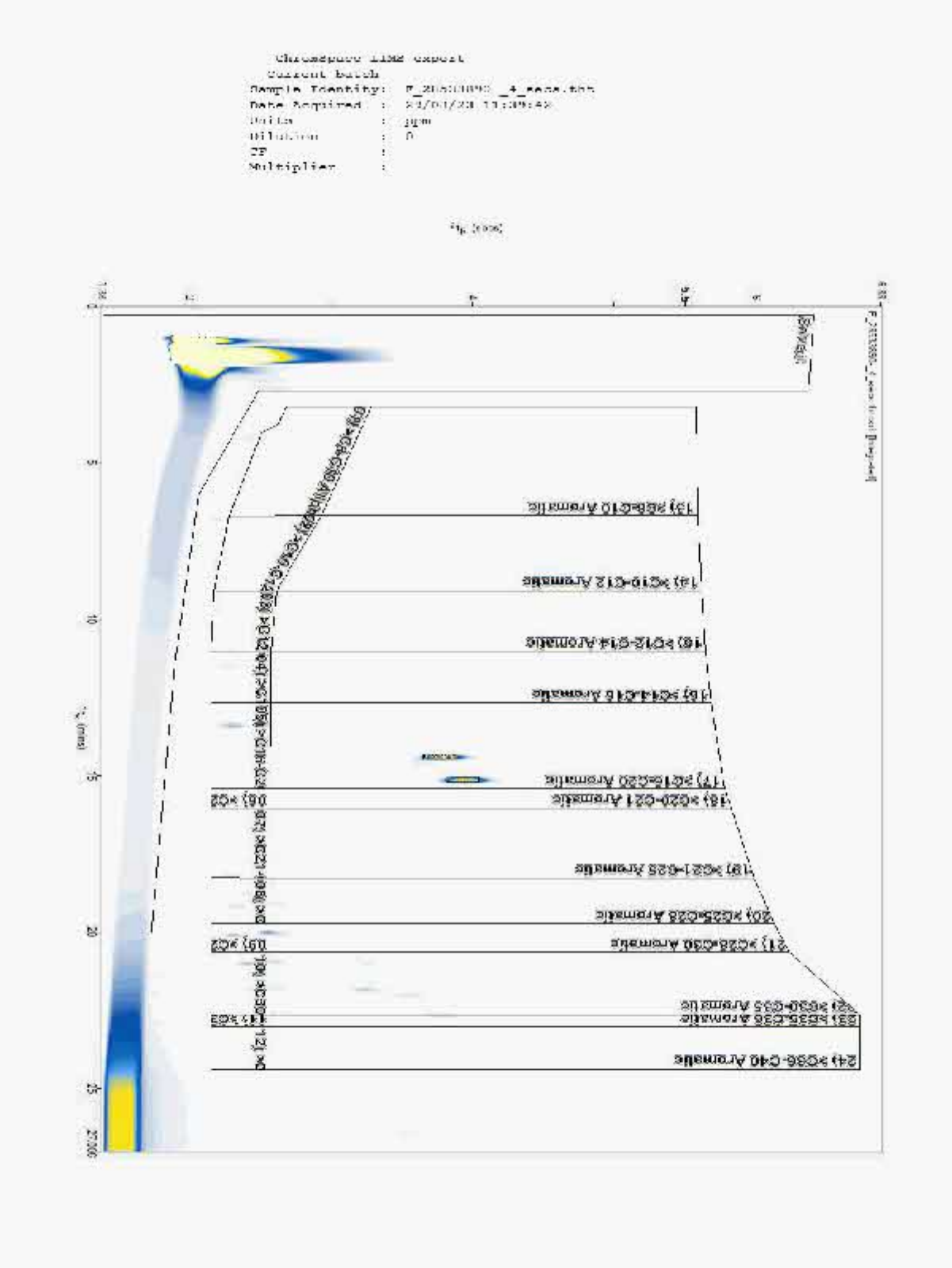


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: EPH by GCxGC-FID **Sample No :** 28533890 **Depth :** 1.00 - 1.00
Sample ID : TP04

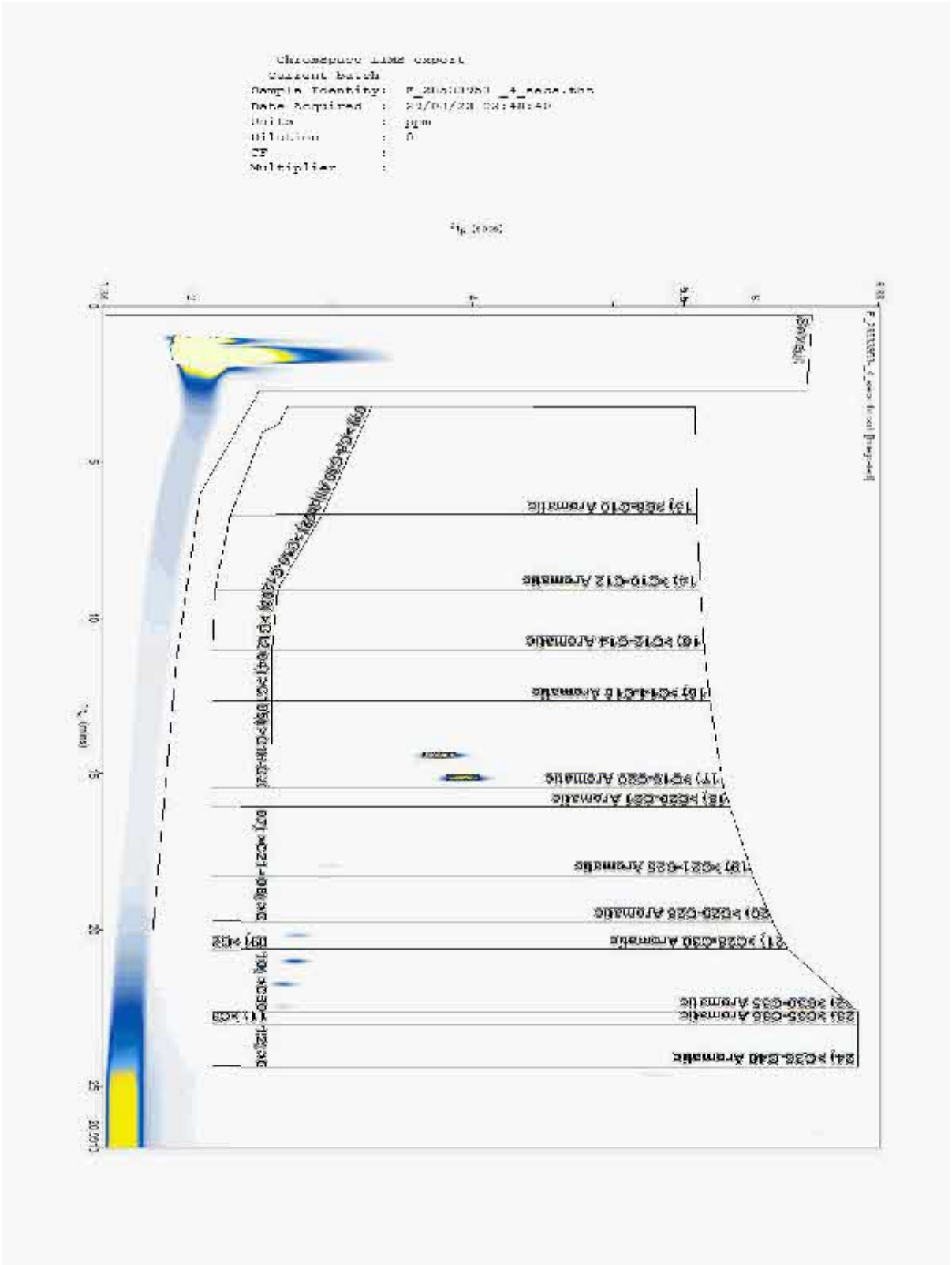


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: EPH by GCxGC-FID **Sample No :** 28533953 **Depth :** 2.80 - 2.80
Sample ID : TP03

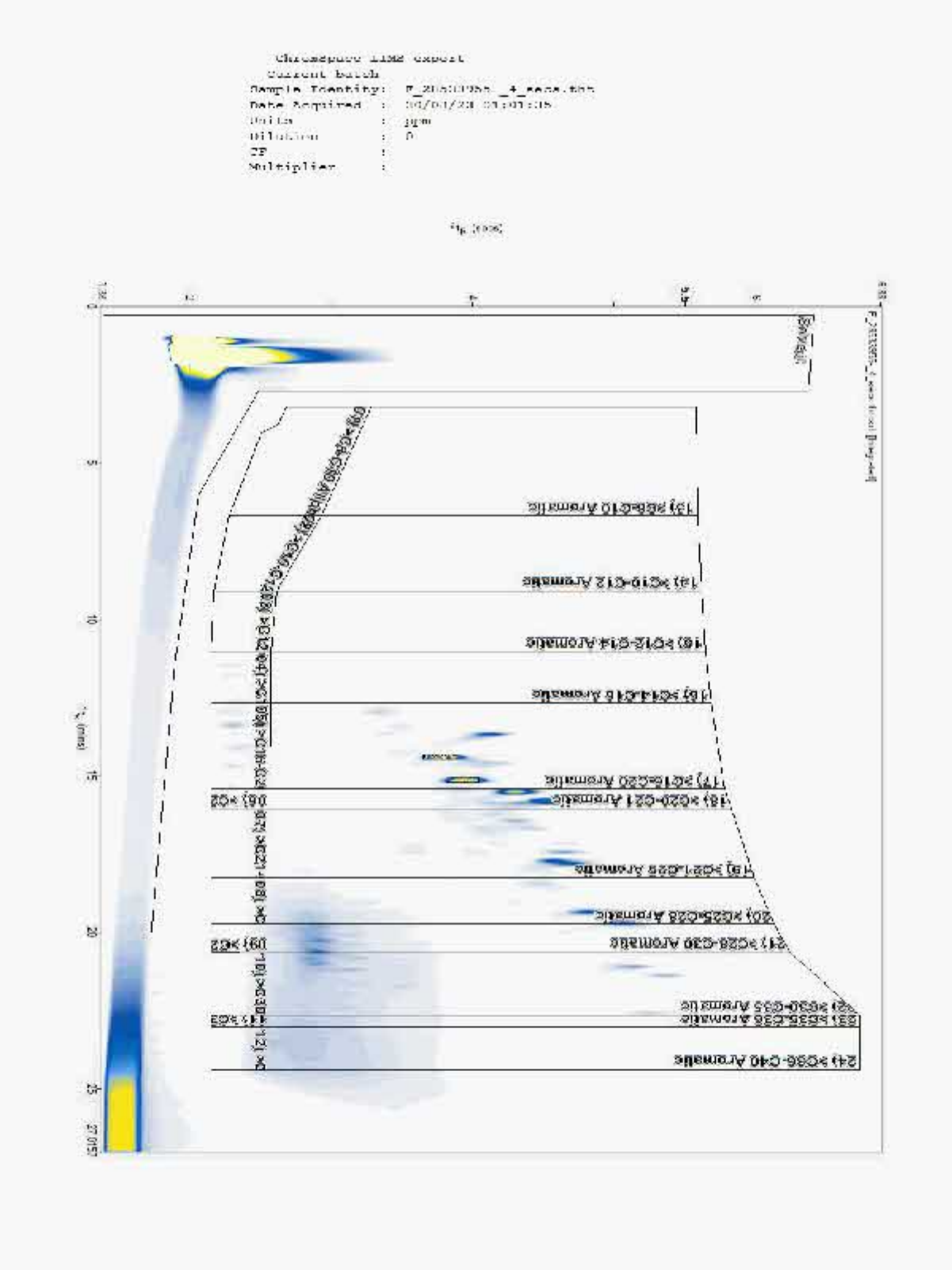


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: EPH by GCxGC-FID **Sample No :** 28533955 **Depth :** 1.00 - 1.00
Sample ID : TP01

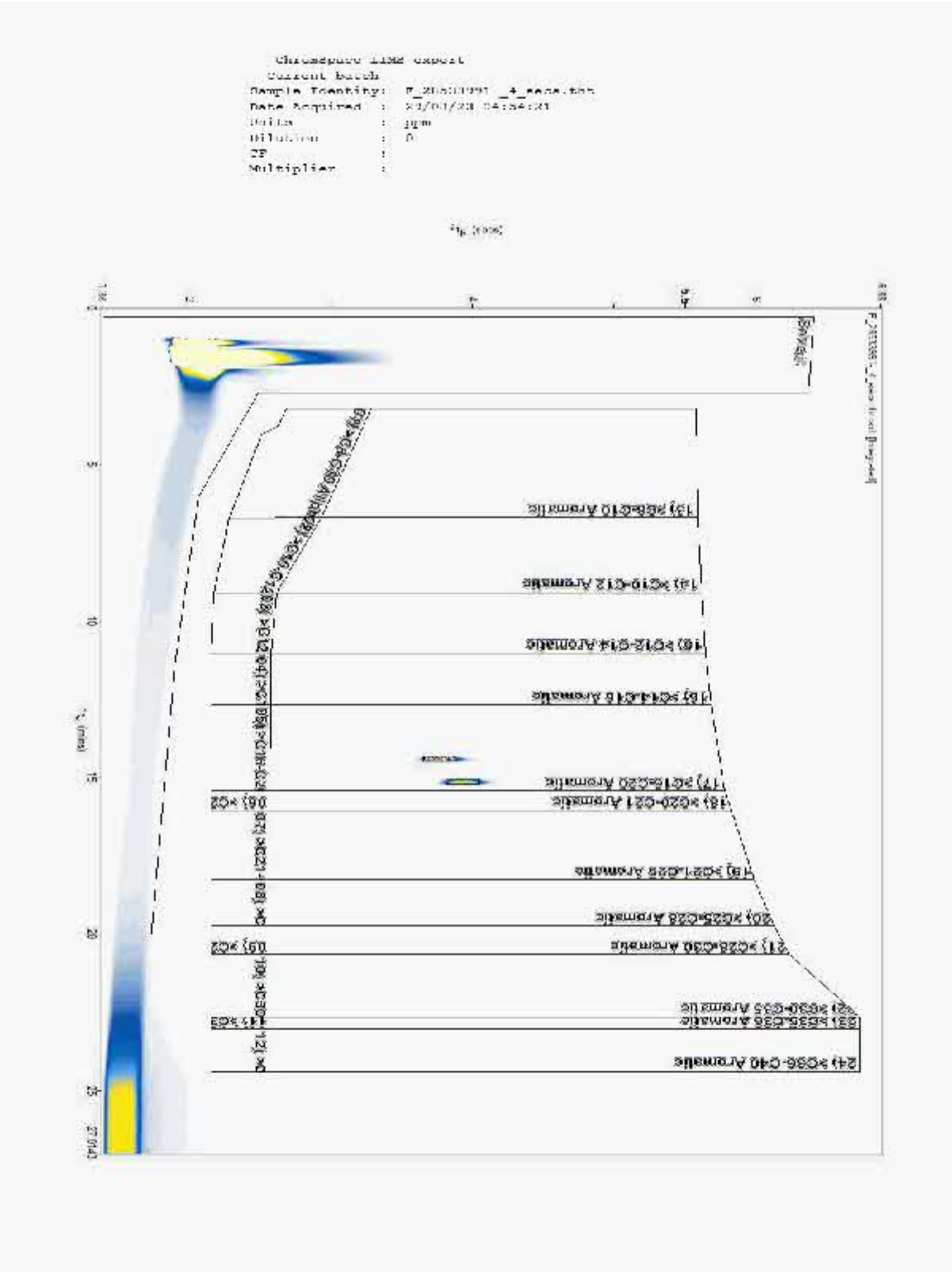


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: EPH by GCxGC-FID **Sample No :** 28533991 **Depth :** 0.50 - 0.50
Sample ID : TP04

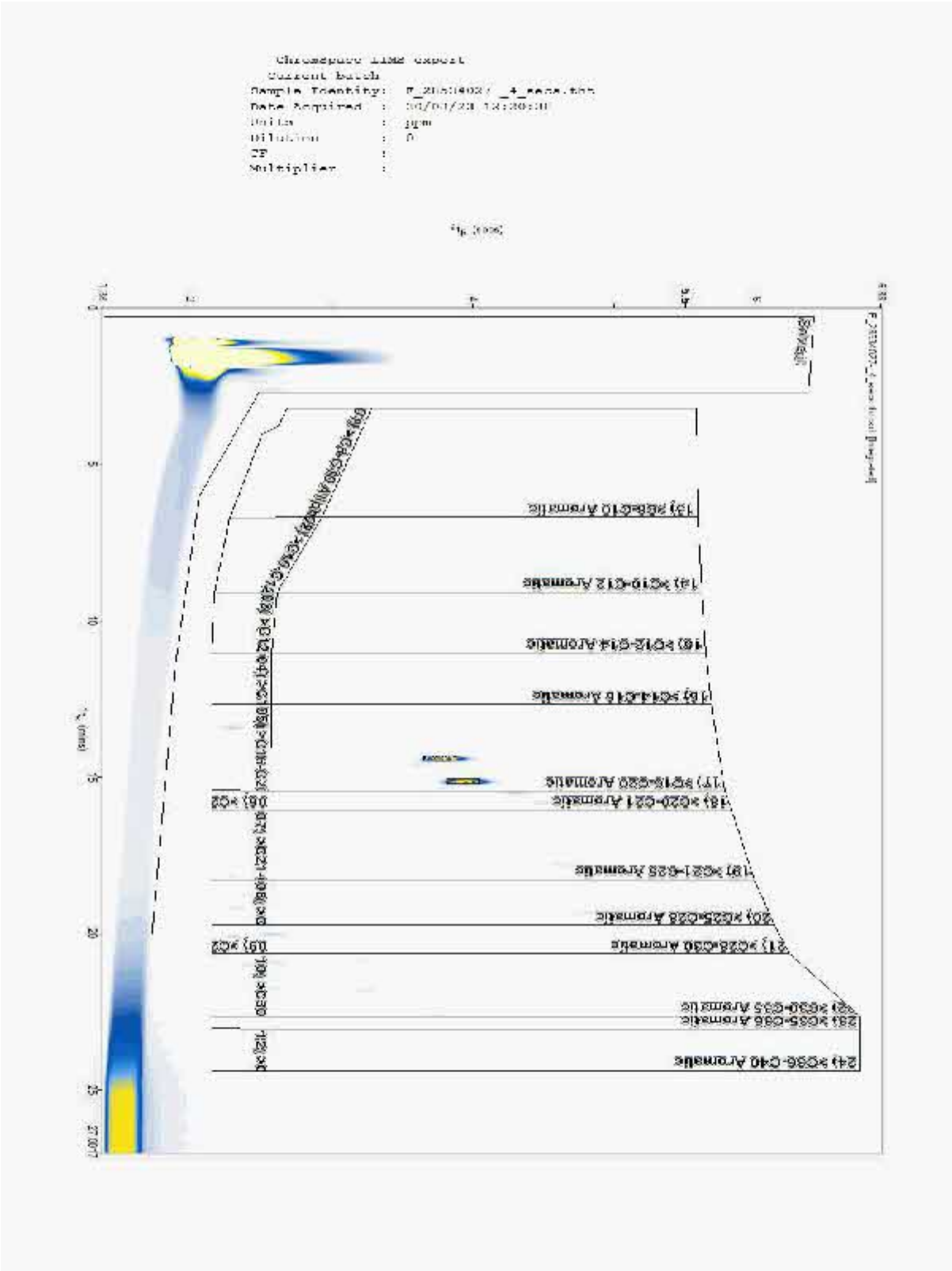


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: EPH by GCxGC-FID **Sample No :** 28534027 **Depth :** 2.00 - 2.00
Sample ID : TP04

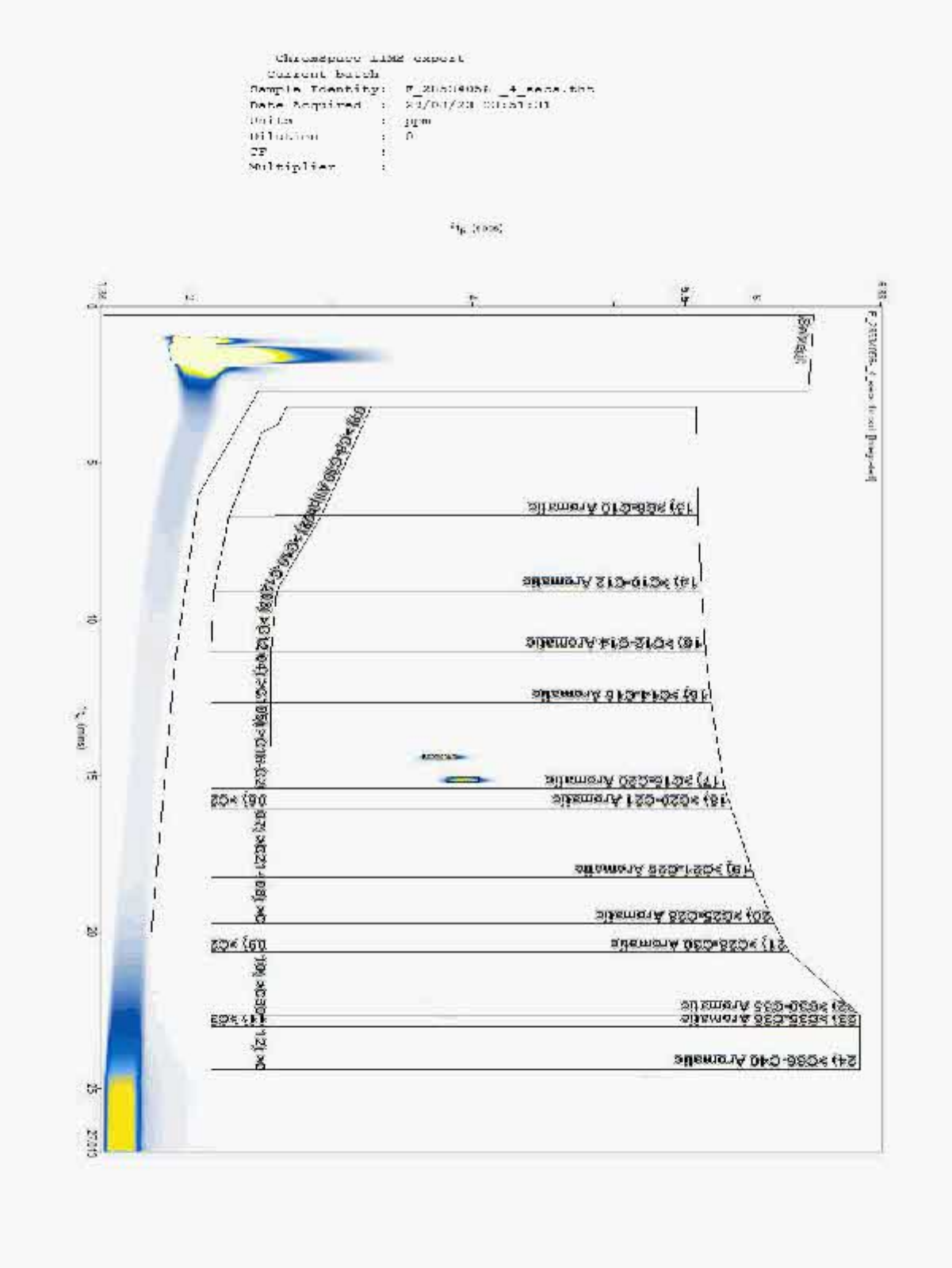


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

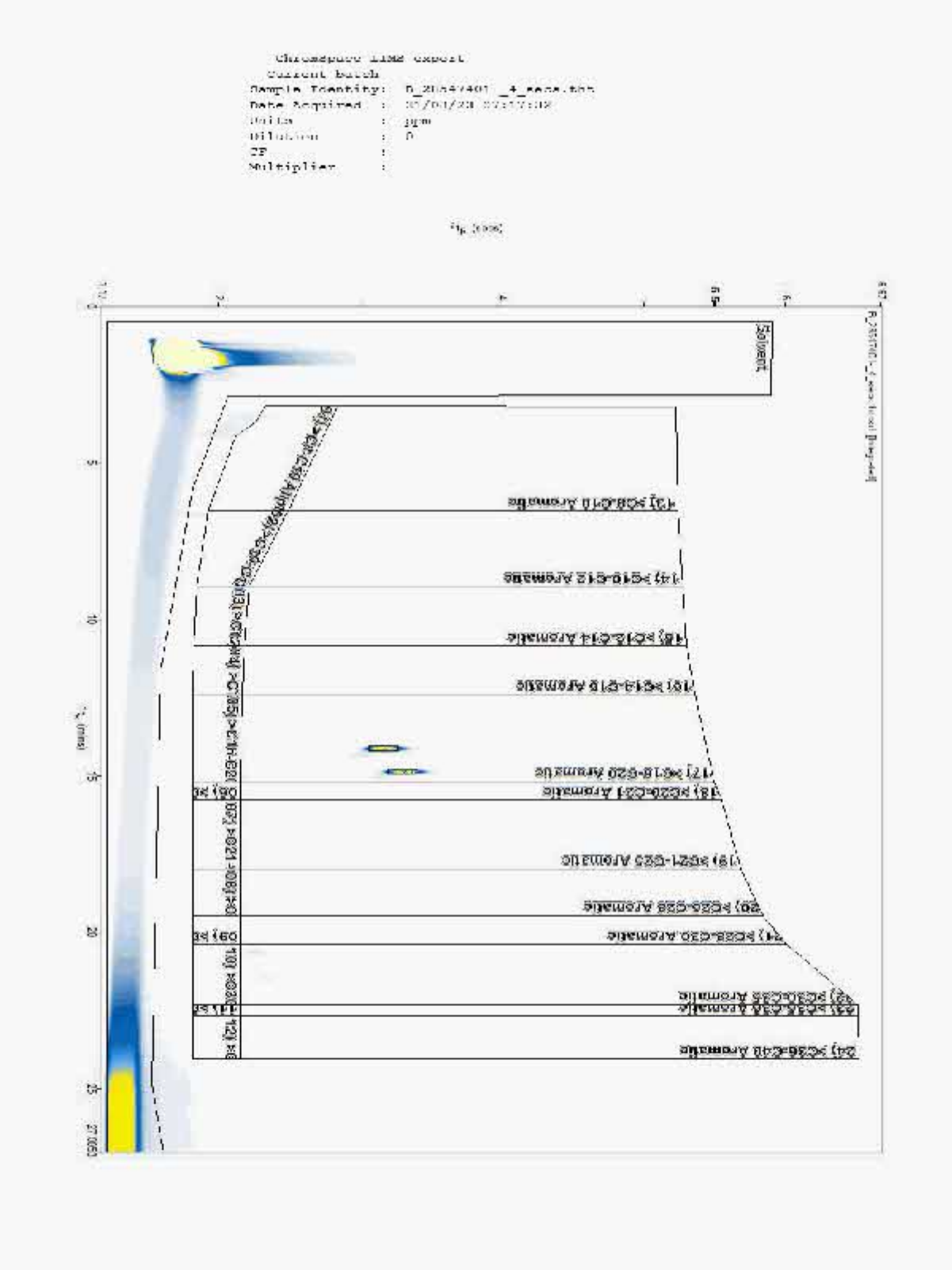
Chromatogram

Analysis: EPH by GCxGC-FID **Sample No :** 28534056 **Depth :** 2.00 - 2.00
Sample ID : TP03



Chromatogram

Analysis: EPH by GCxGC-FID **Sample No :** 28547401 **Depth :** 2.50 - 2.50
Sample ID : TP05

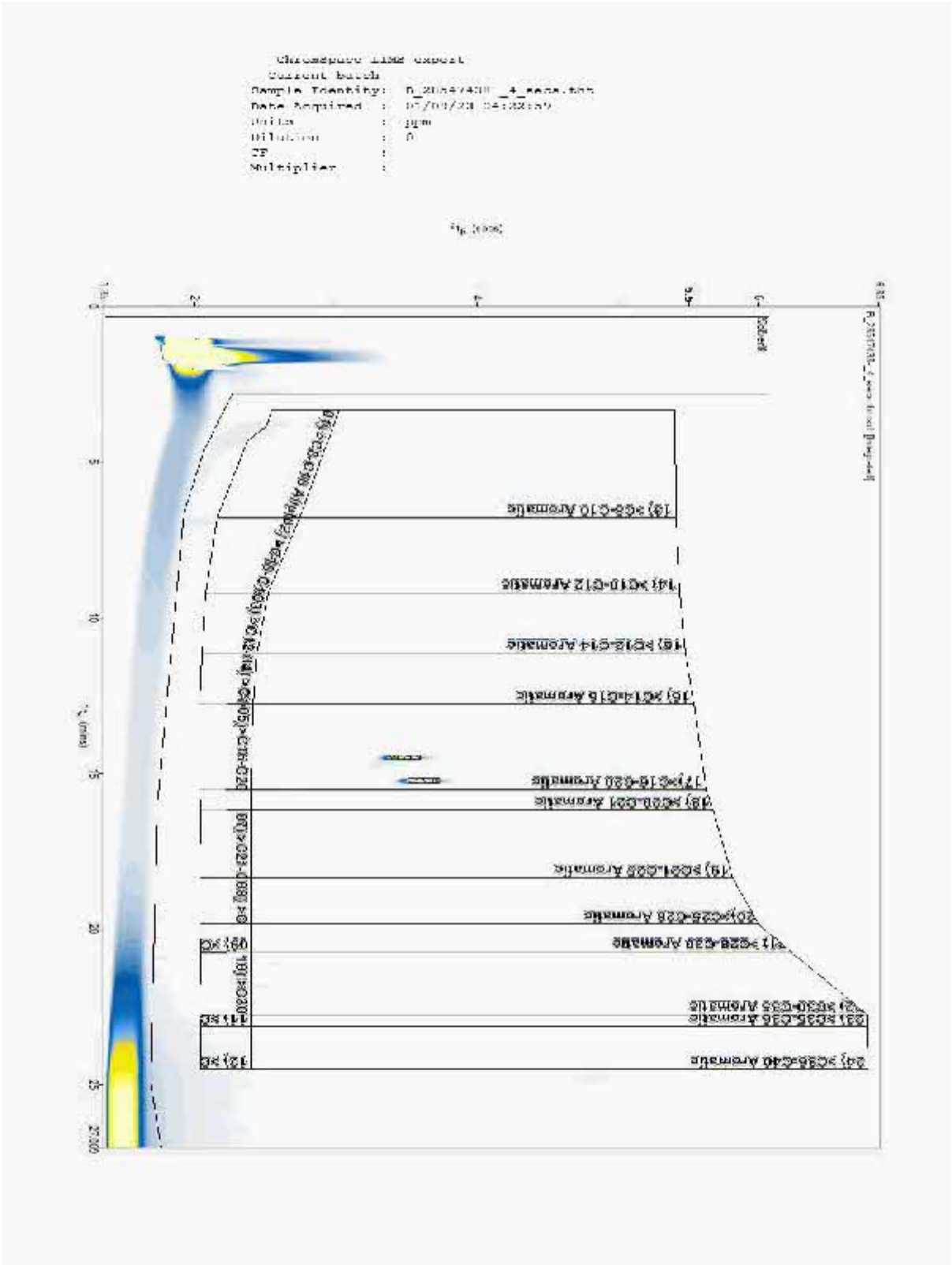


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: EPH by GCxGC-FID **Sample No :** 28547438 **Depth :** 2.30 - 2.30
Sample ID : TP05

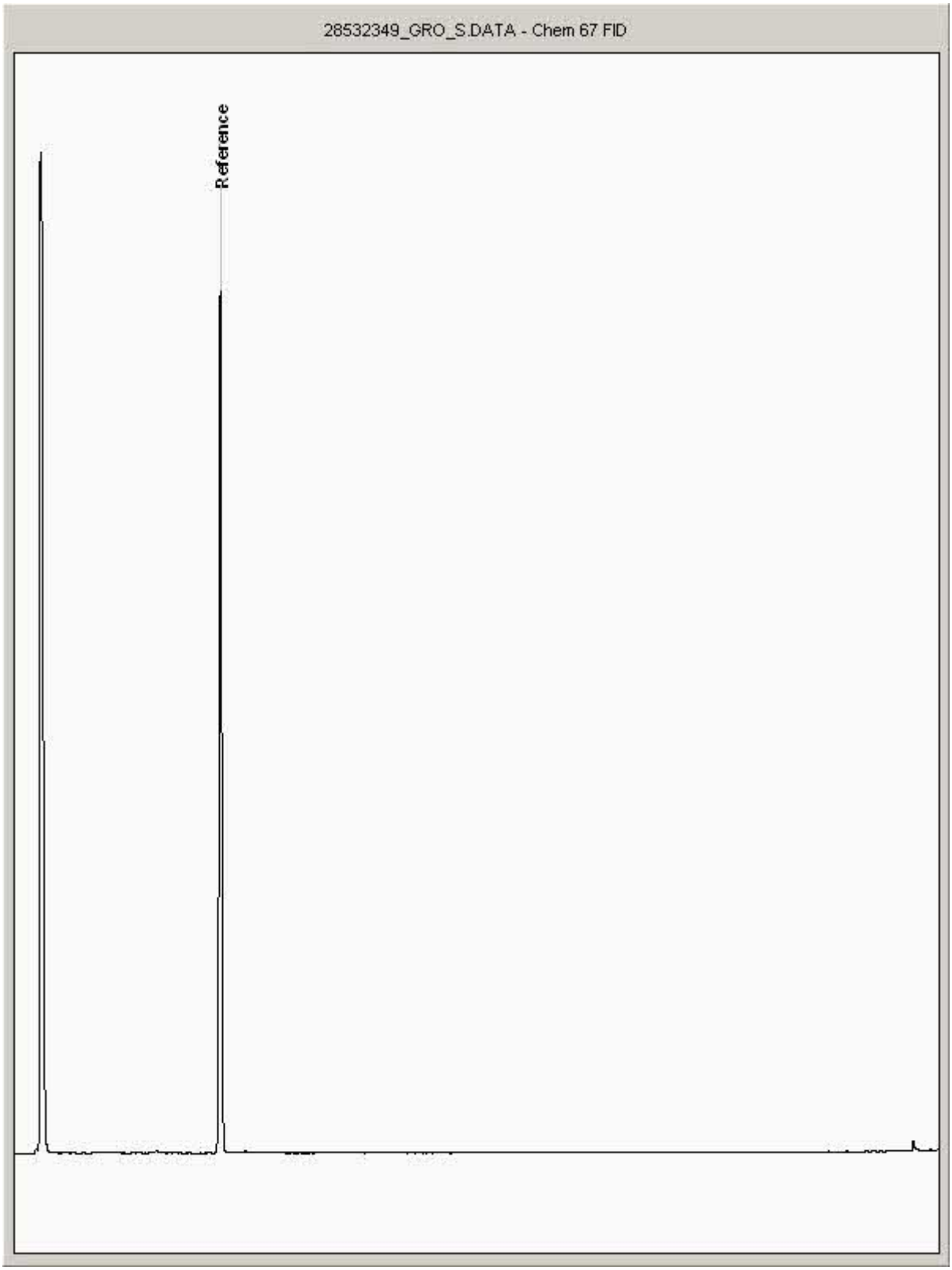


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28532349 **Depth :** 2.30 - 2.30
Sample ID : TP05

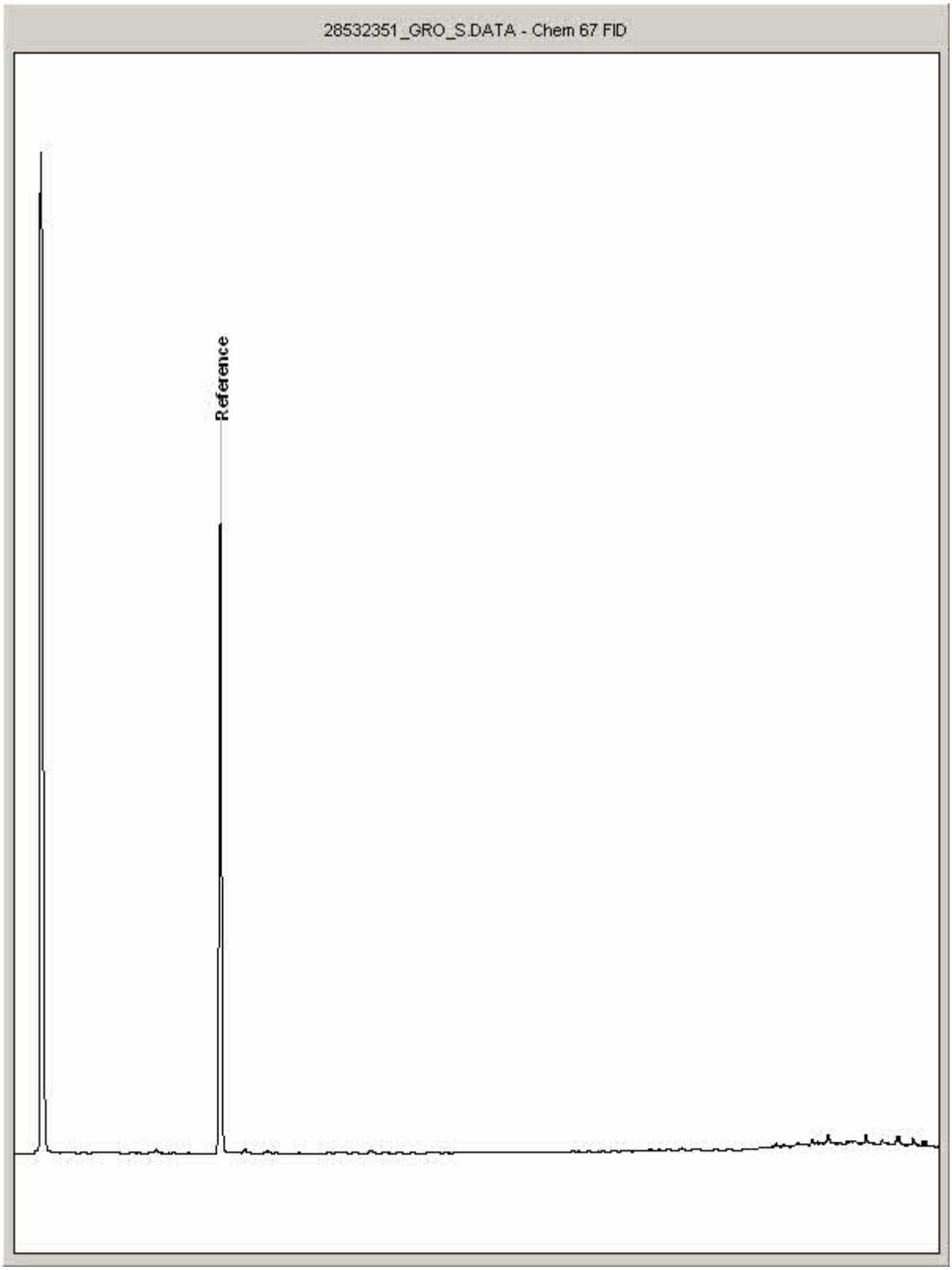


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28532351 **Depth :** 0.50 - 0.50
Sample ID : TP02

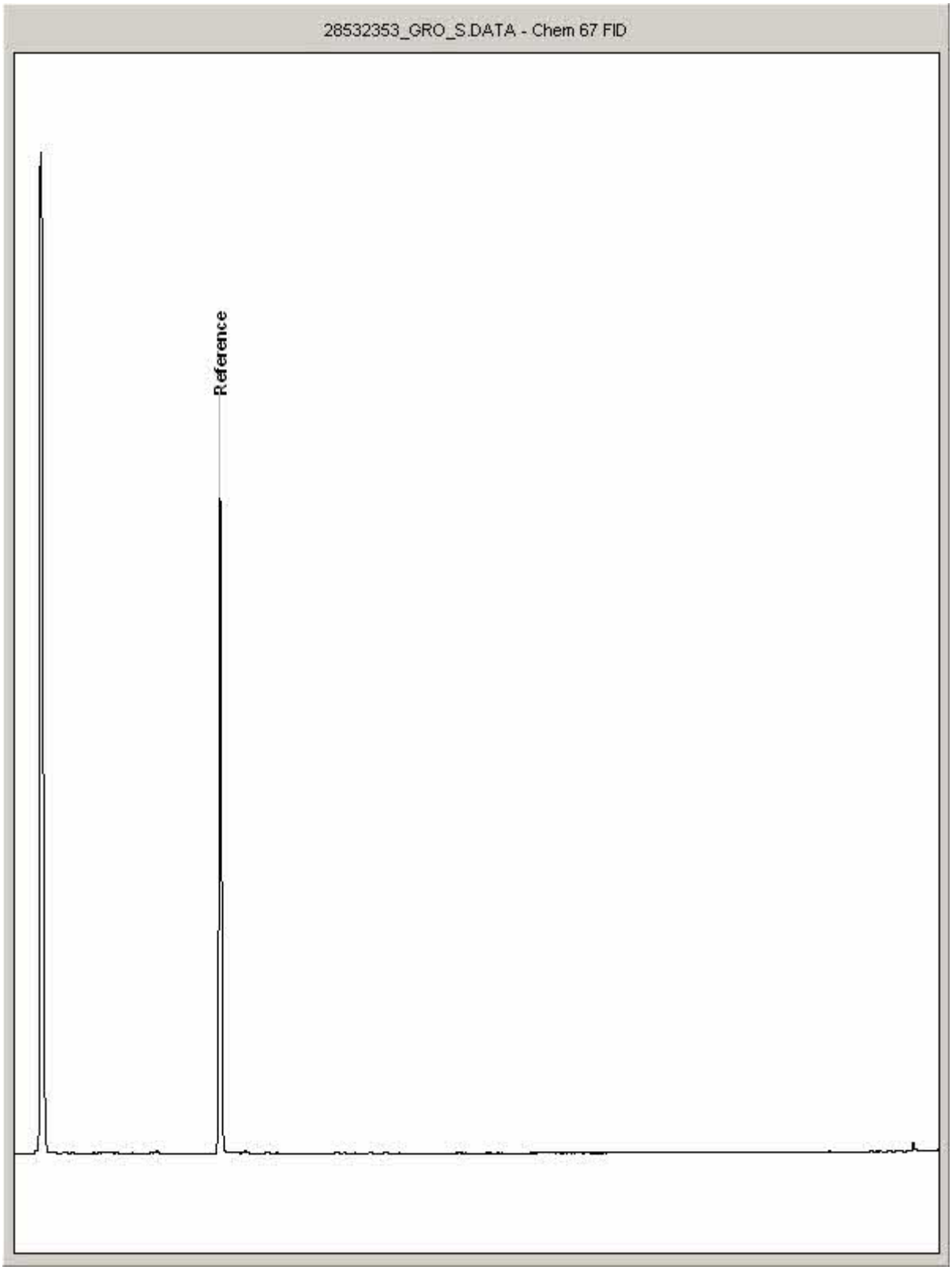


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28532353 **Depth :** 2.50 - 2.50
Sample ID : TP05

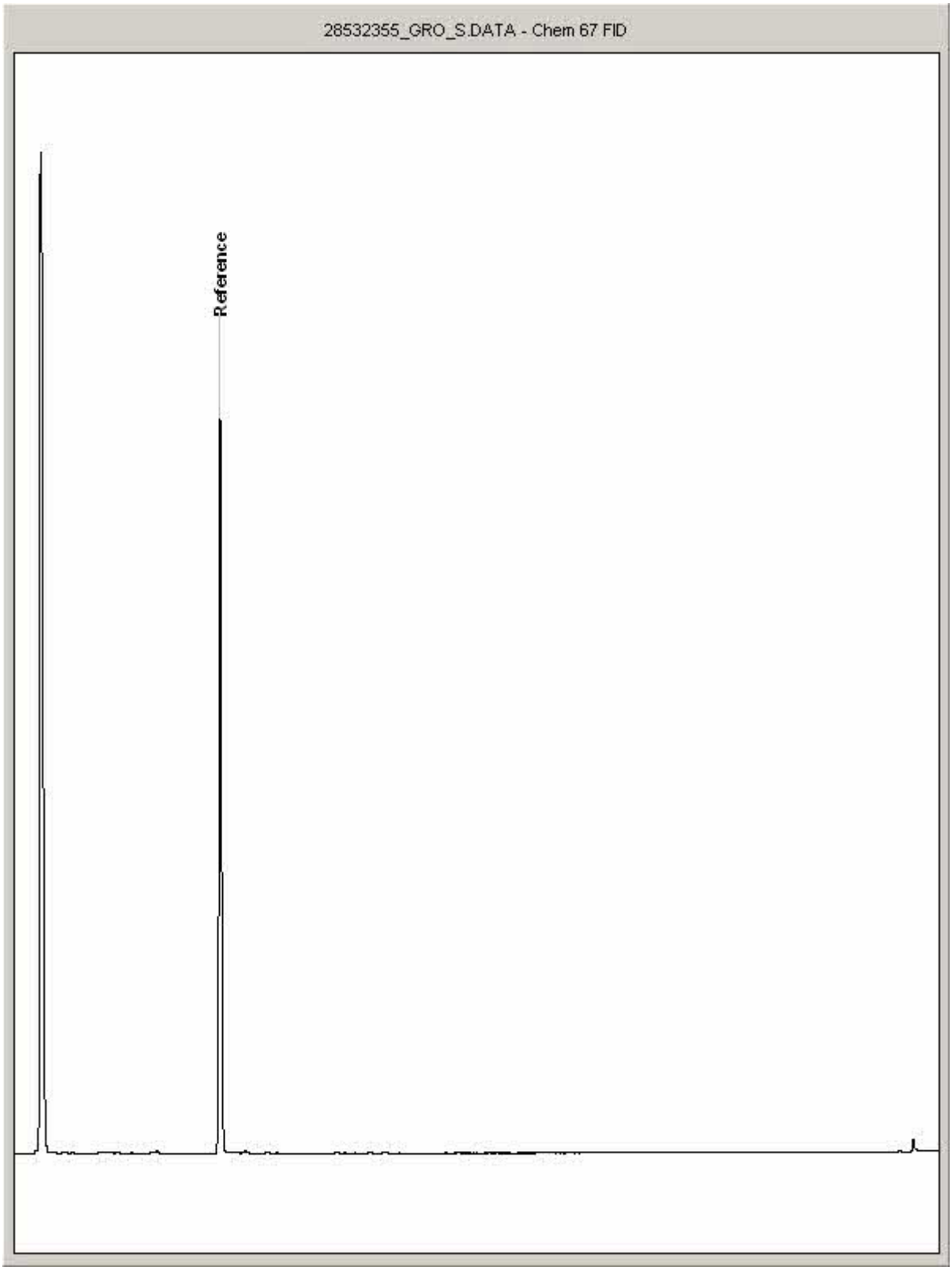


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28532355 **Depth :** 2.00 - 2.00
Sample ID : TP01

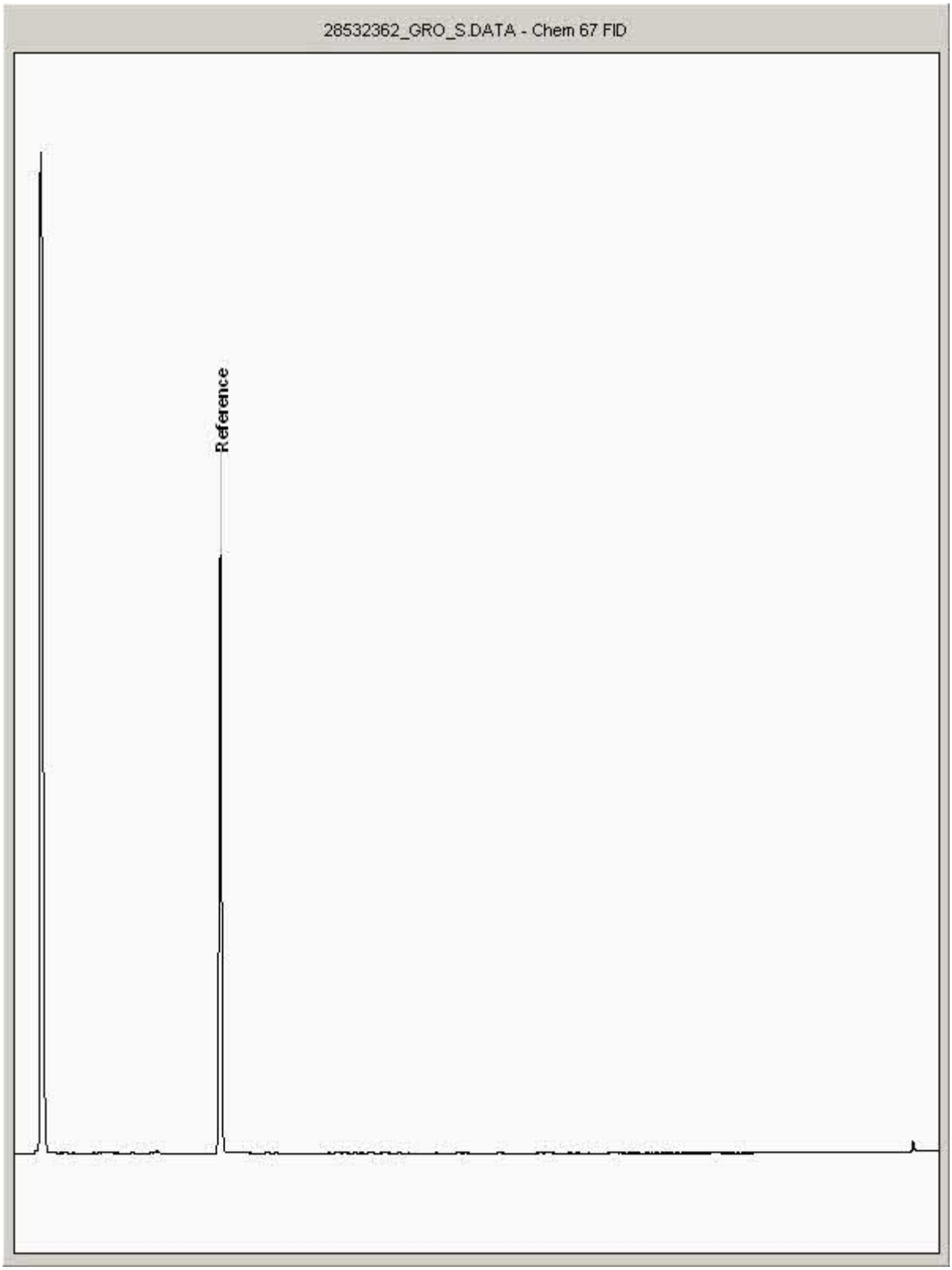


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28532362 **Depth :** 1.00 - 1.00
Sample ID : TP01

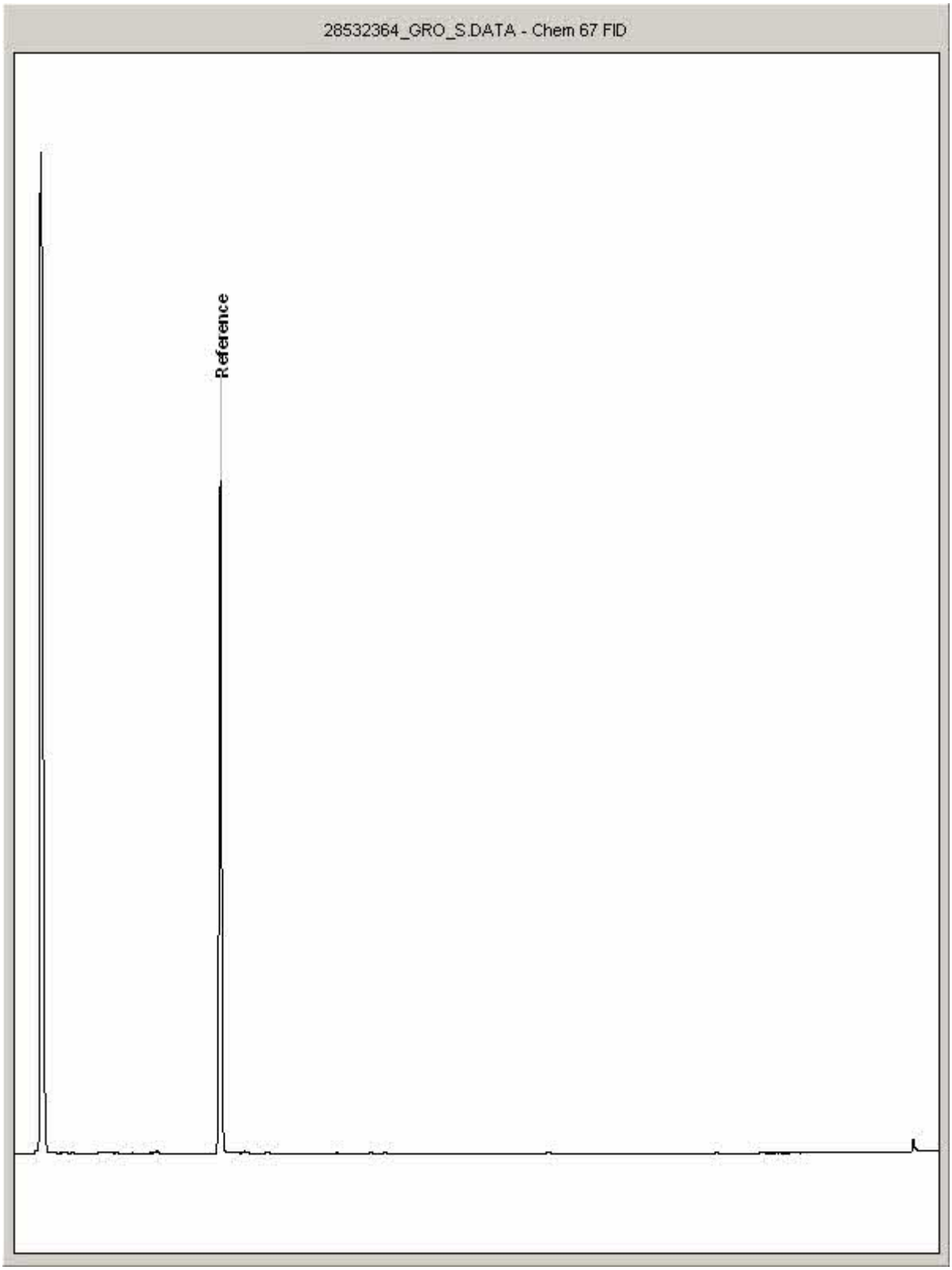


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28532364 **Depth :** 2.30 - 2.50
Sample ID : TP01

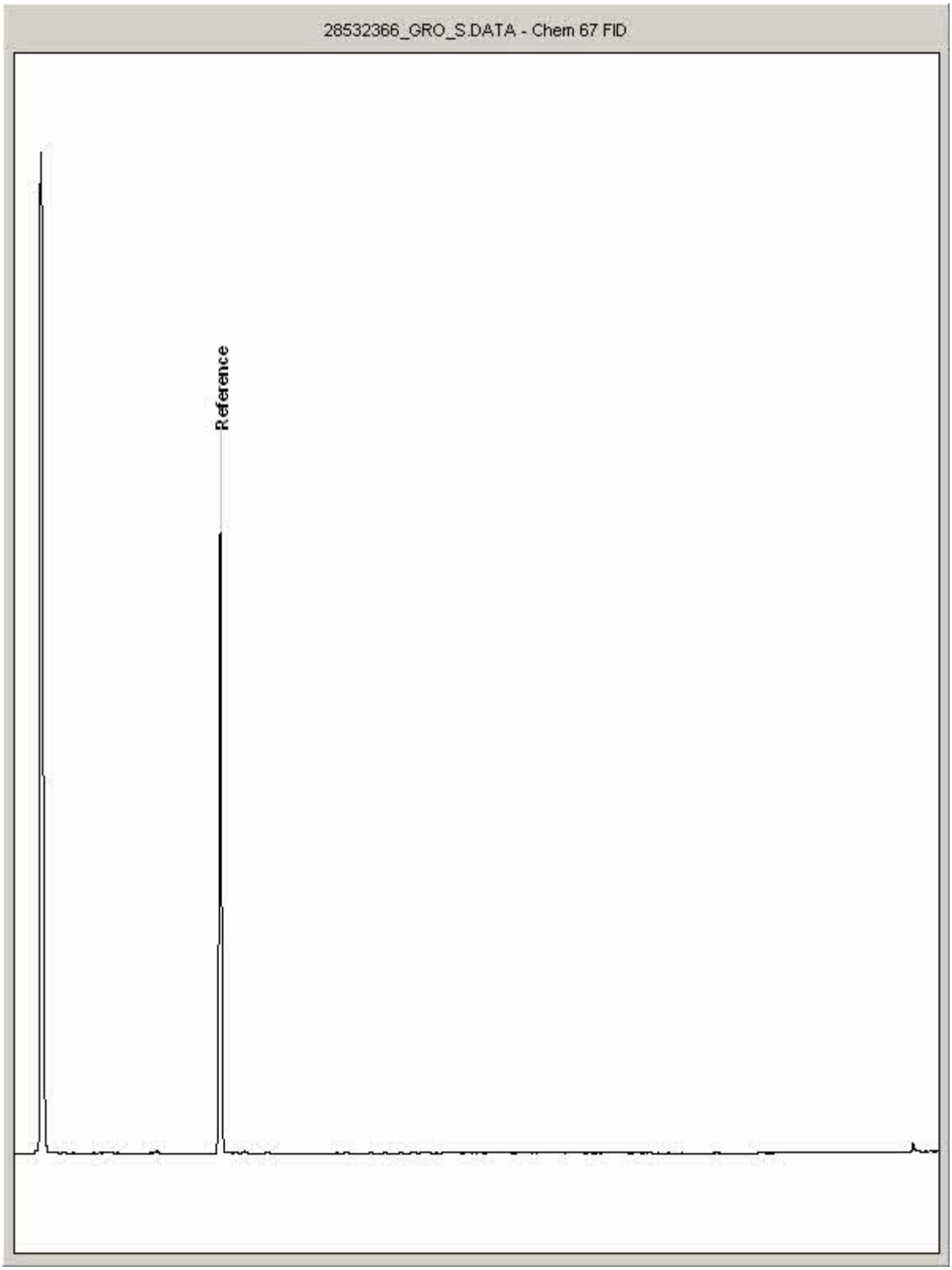


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28532366 **Depth :** 1.00 - 1.00
Sample ID : TP02

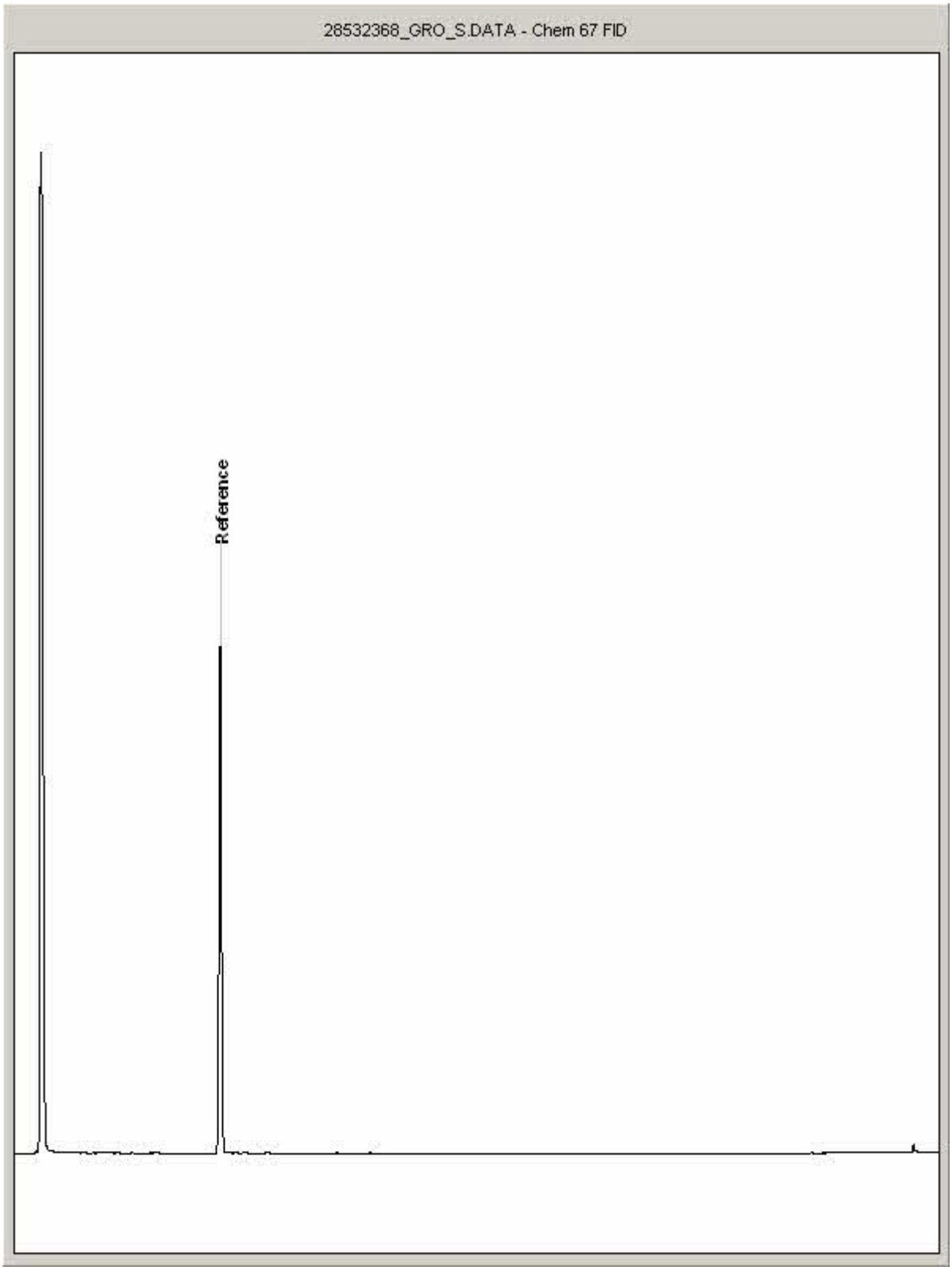


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28532368 **Depth :** 2.00 - 2.00
Sample ID : TP04

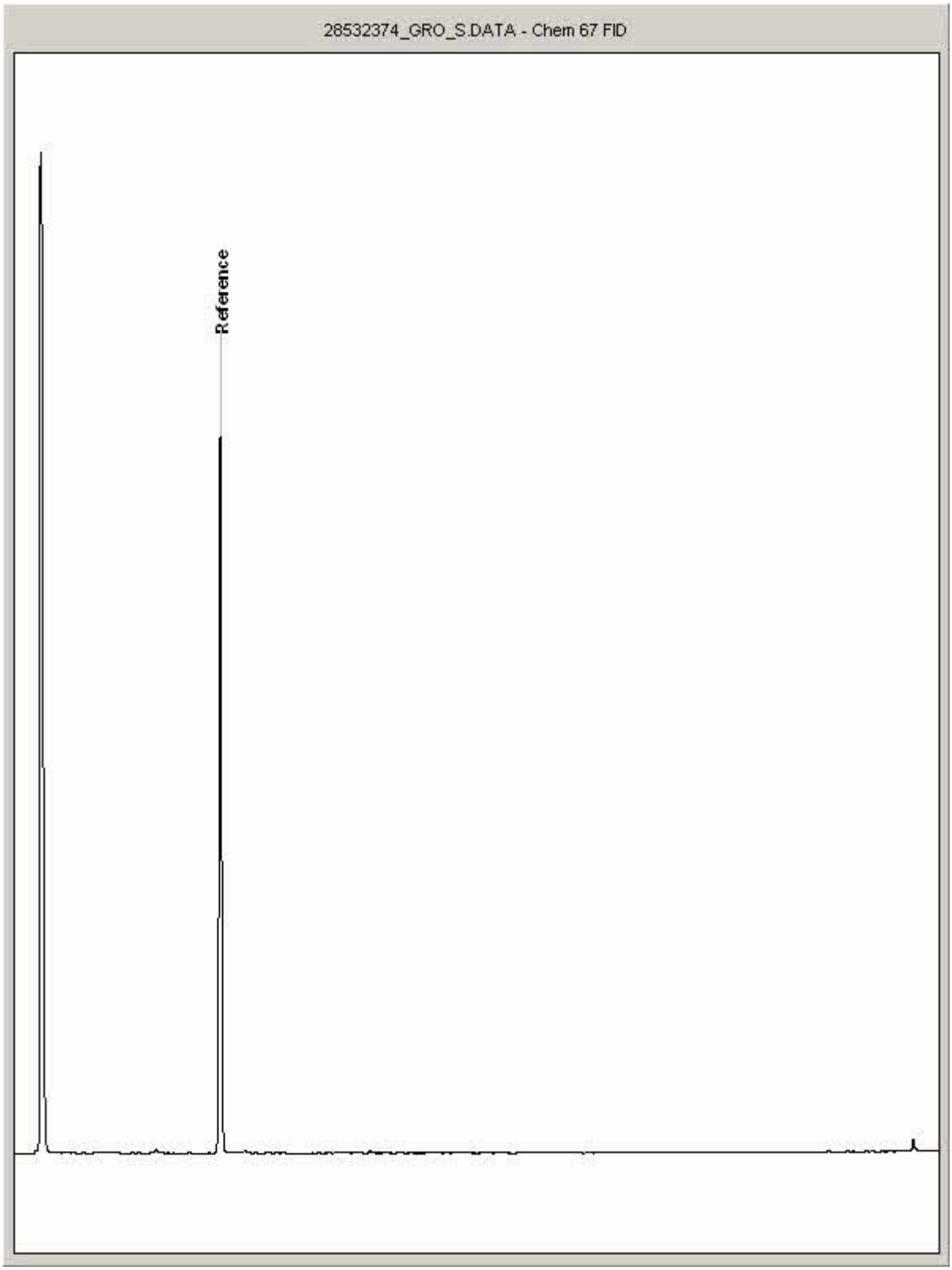


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28532374 **Depth :** 1.00 - 1.00
Sample ID : TP03

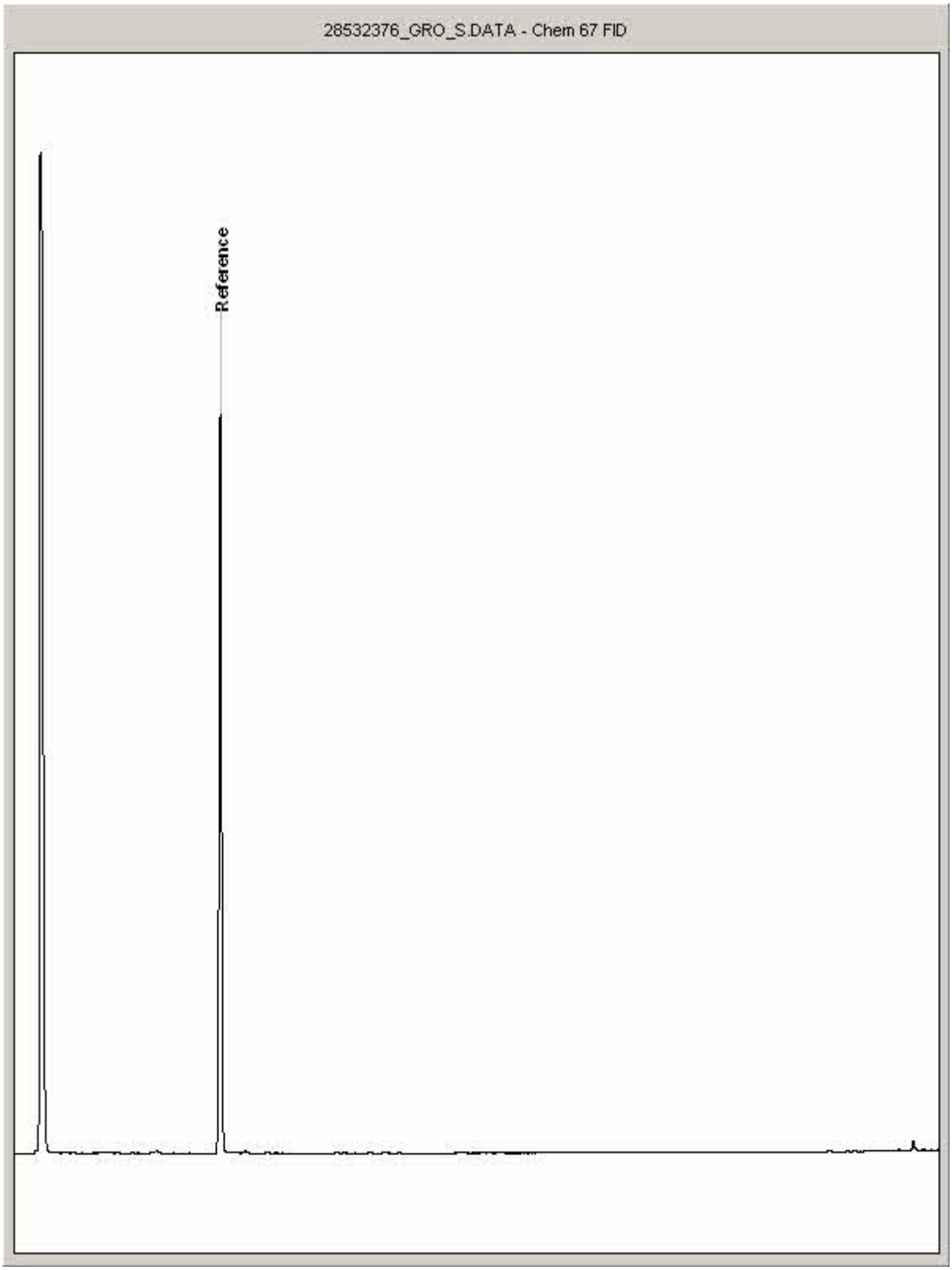


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28532376 **Depth :** 0.50 - 0.50
Sample ID : TP03

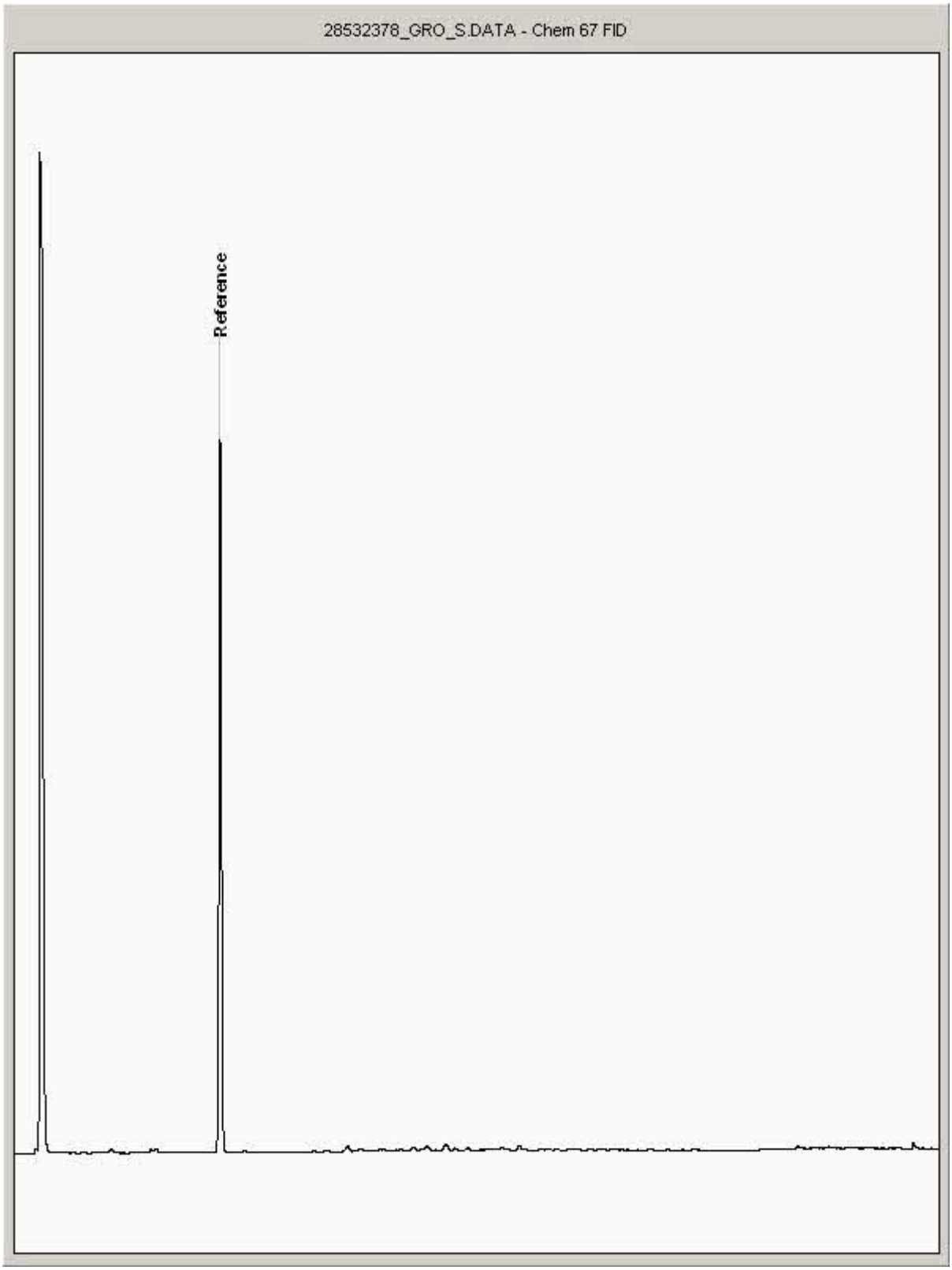


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28532378 **Depth :** 2.50 - 2.50
Sample ID : TP02

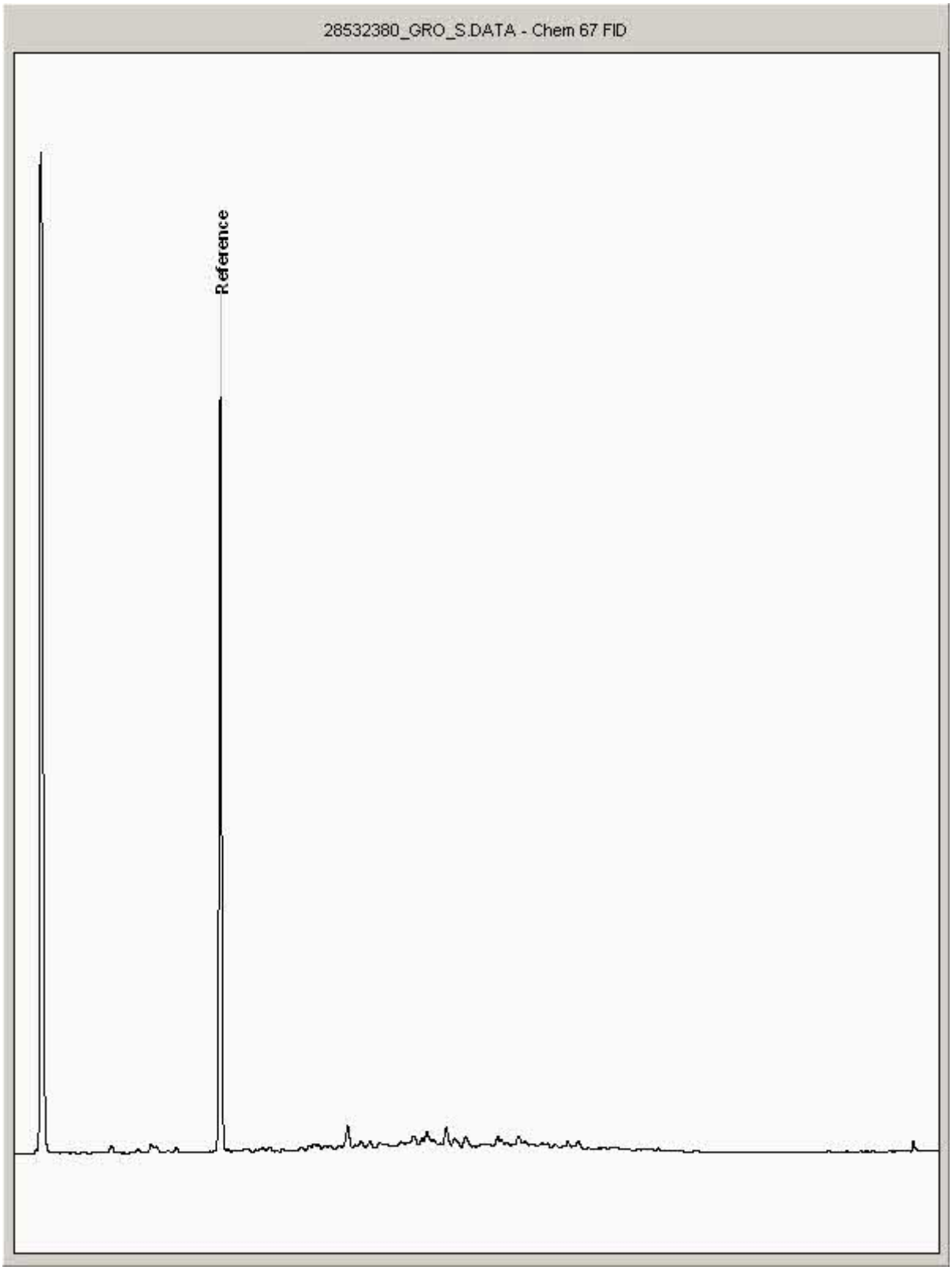


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28532380 **Depth :** 2.00 - 2.00
Sample ID : TP02

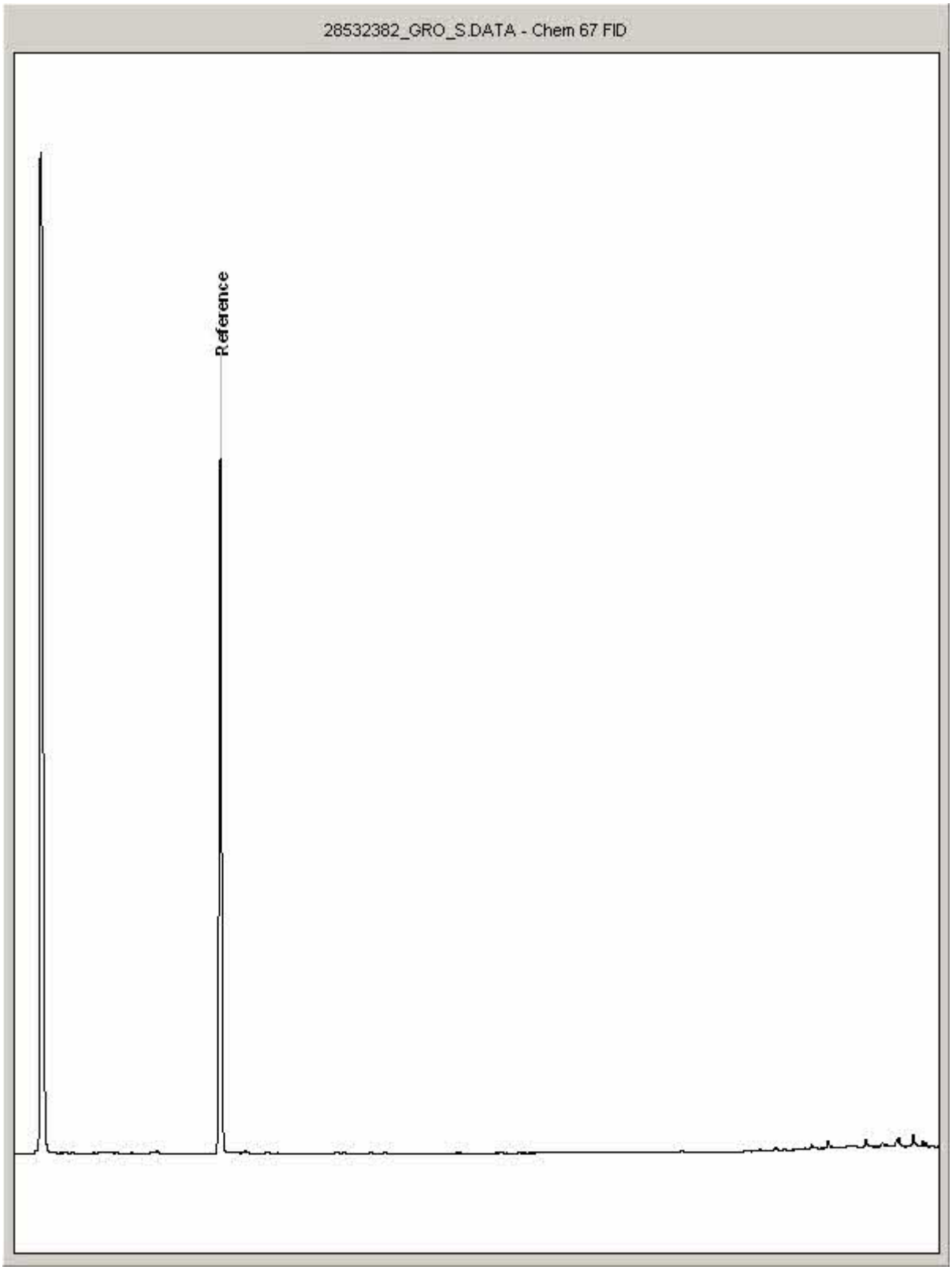


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28532382 **Depth :** 0.50 - 0.50
Sample ID : TP01

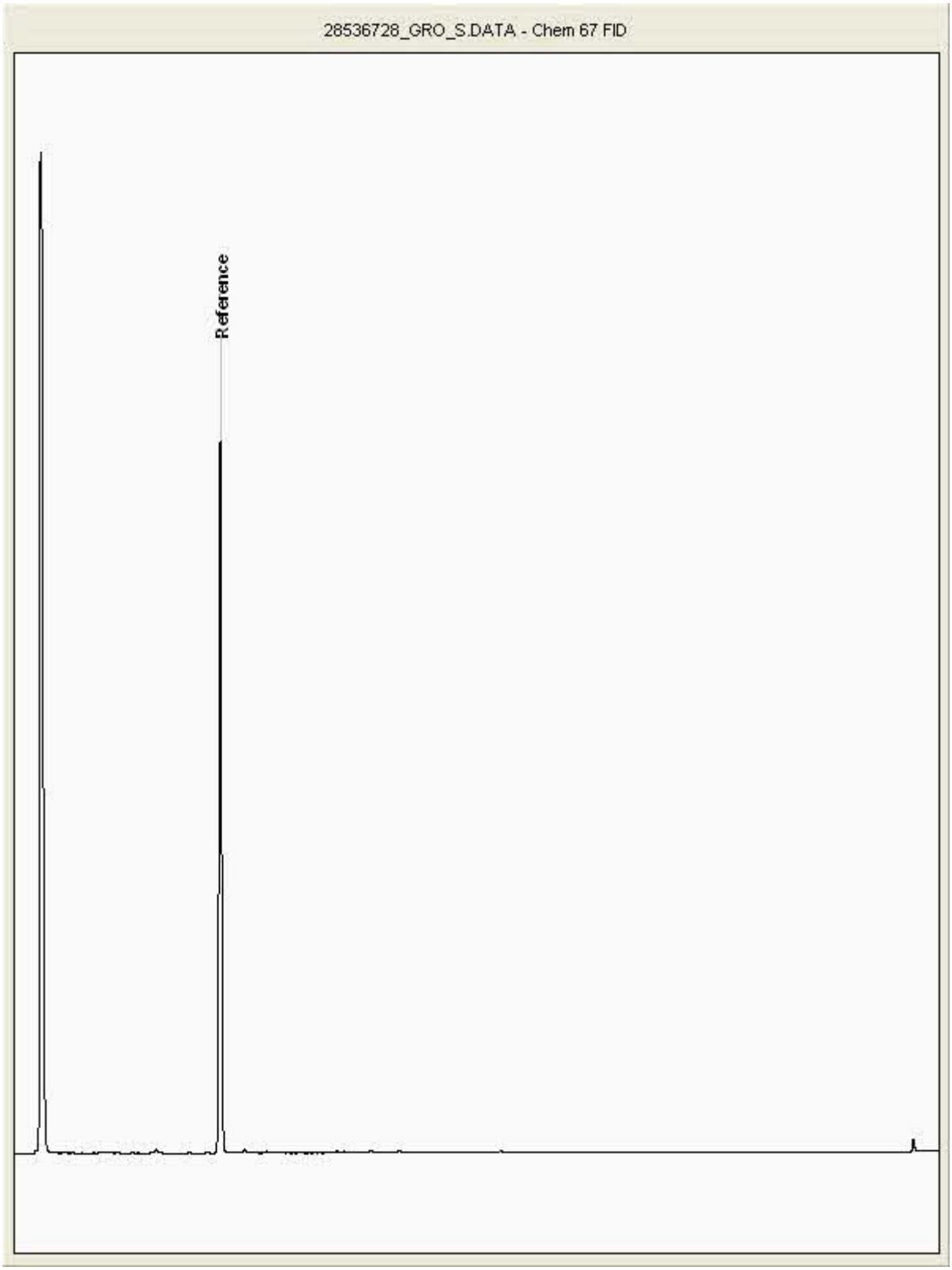


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28536728 **Depth :** 2.00 - 2.00
Sample ID : TP03

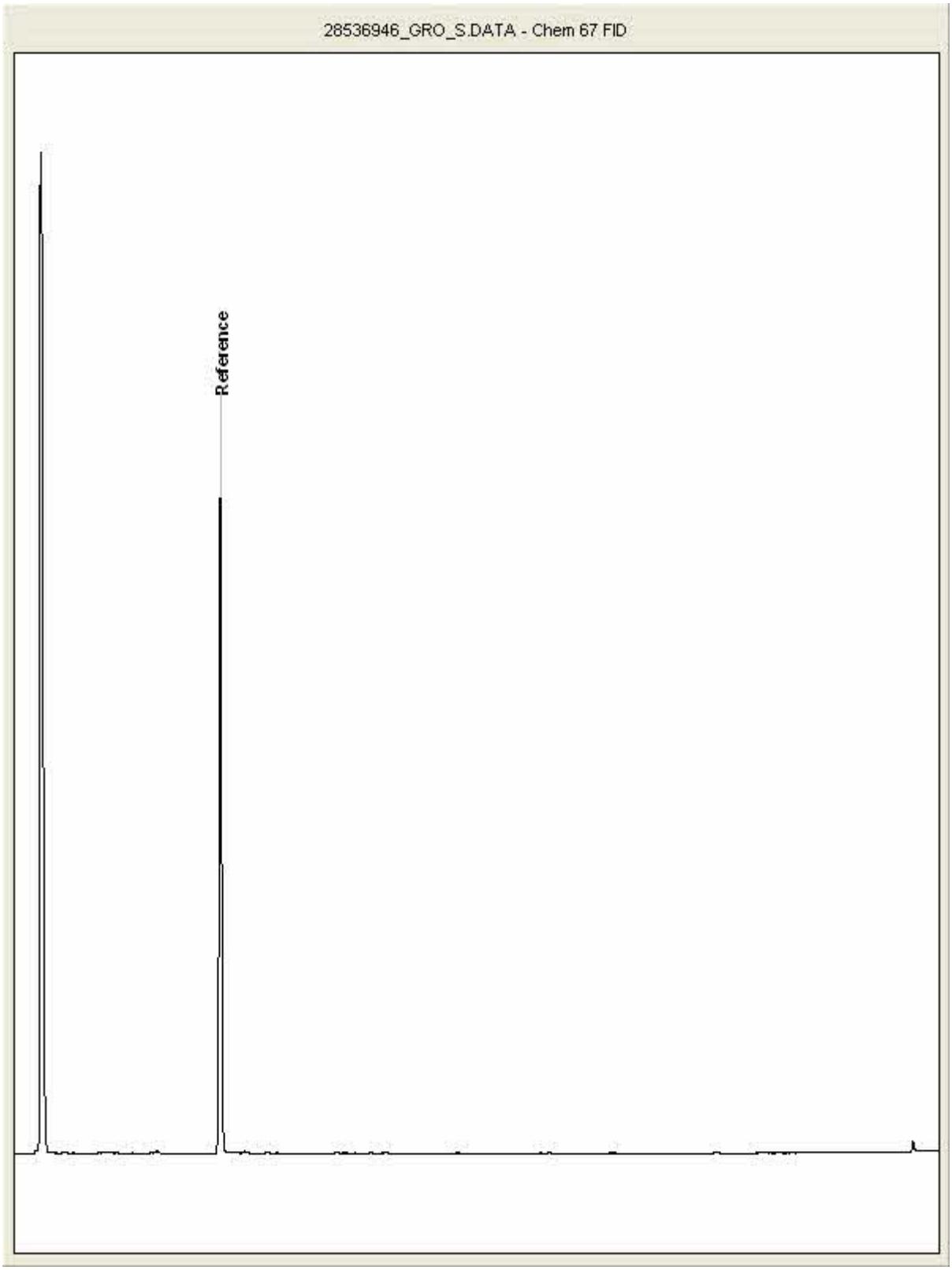


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28536946 **Depth :** 0.50 - 0.50
Sample ID : TP04

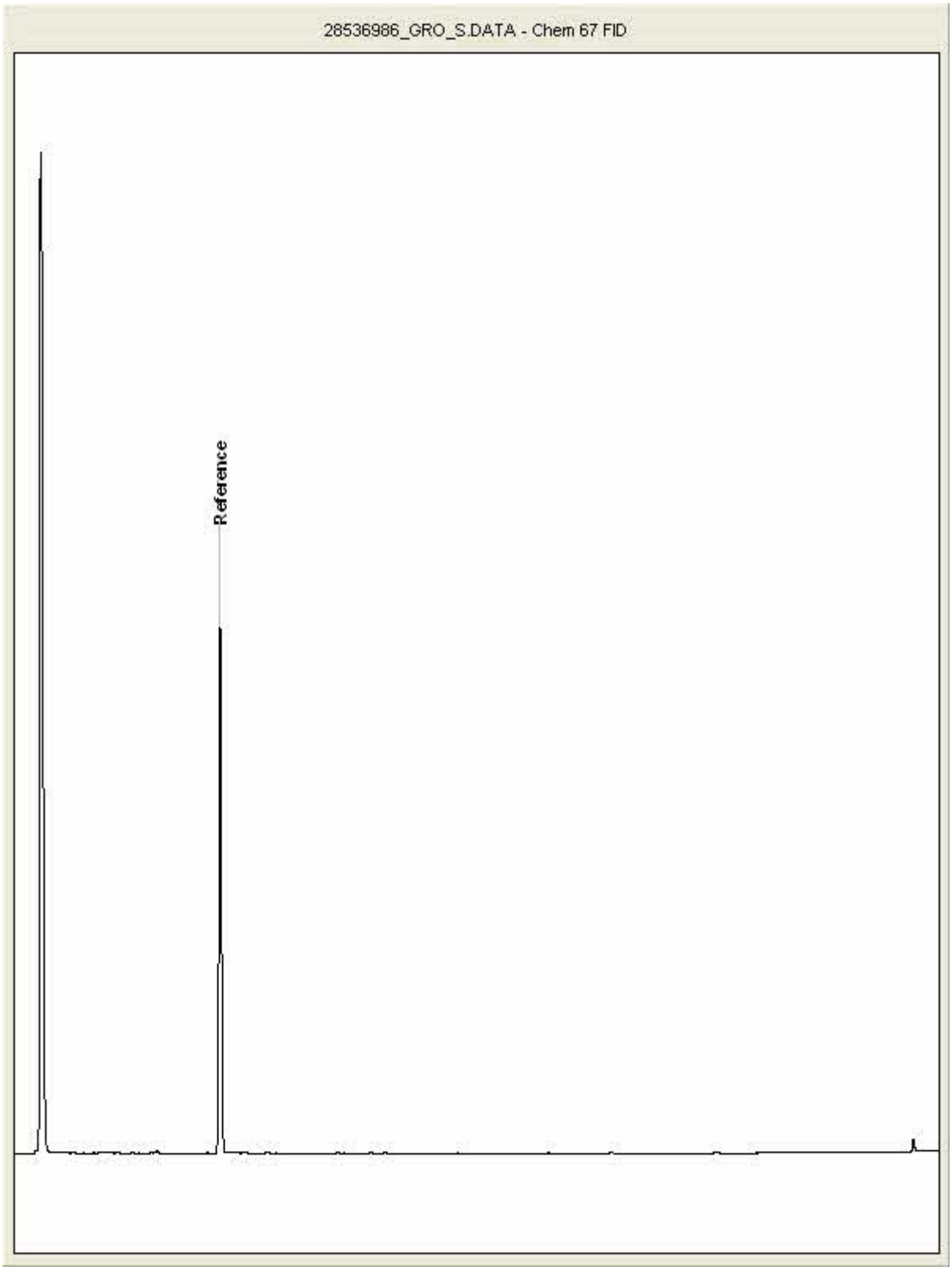


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28536986 **Depth :** 1.00 - 1.00
Sample ID : TP04

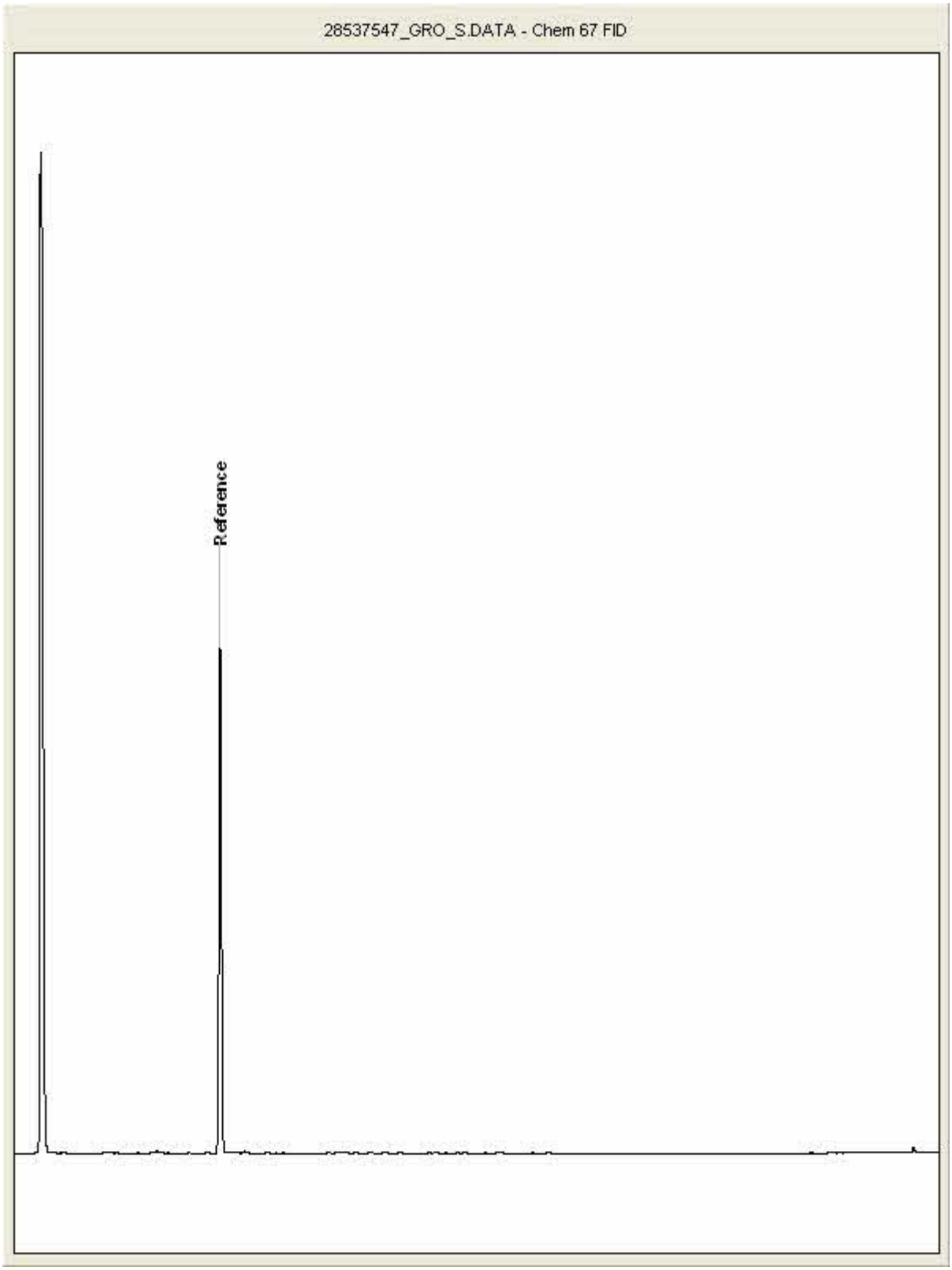


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28537547 **Depth :** 2.80 - 2.80
Sample ID : TP03

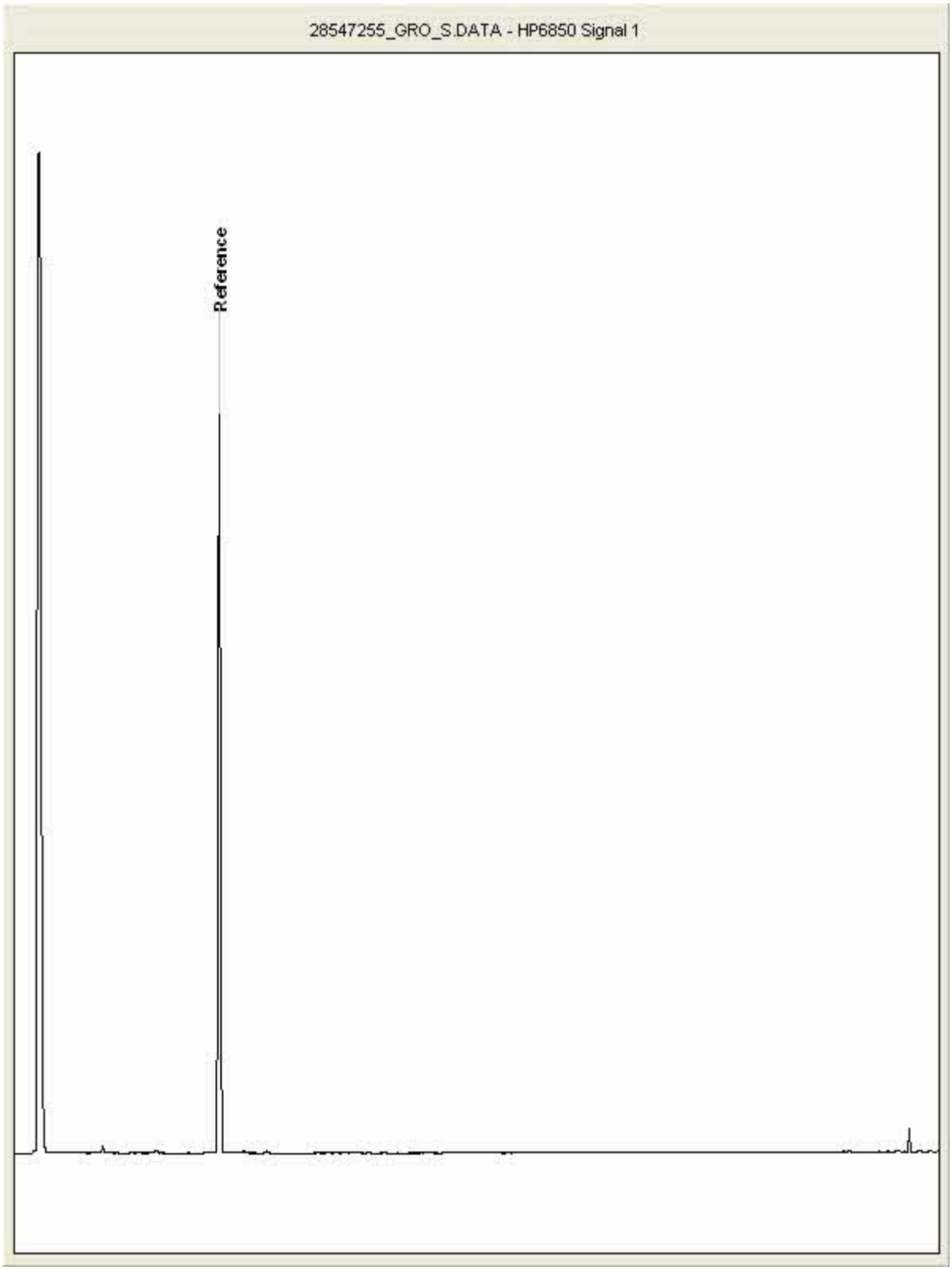


CERTIFICATE OF ANALYSIS

SDG: 230824-55 **Report Number:** 703740 **Superseded Report:** 703483
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28547255 **Depth :** 2.90 - 2.90
Sample ID : TP04



Appendix

General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses excep for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 15 day after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client require wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment i present in the volatile sample, the integrity of the data may be compromised. This will b flagged up as an invalid VOC on the test schedule and the result marked as deviating c the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not correcte for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this i possible interferences. In both cases the sample would be diluted which would cause th method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile lo may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. **Sample Deviations**

If a sample is classed as deviated then the associated results may be compromised.

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Matrix interference**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to late arrival of instructions or samples**
§	**Sampled on date not provided**

20. **Asbestos**

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained f supplied bulk materials andd soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised ligh microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised s sample which has been examined to determine the presence of asbestos fibres us ALS (Hawarden) in-house method of transmitted/polarised light microscopy and centr stop dispersion staining.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test ot than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products be found in HSG 264.

The identification of asbestos containing materials and soils falls v schedule of tests for which we hold UKAS accreditation, however interpretations and all other information contained in the report are outs scope of UKAS accreditation.

Units 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528777
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

WSP UK Limited
8 First Street
Manchester
Lancashire
M15 4RP

Attention: Rhys Evans

CERTIFICATE OF ANALYSIS

Date of report Generation:	25 September 2023
Customer:	WSP UK Limited
Sample Delivery Group (SDG):	230914-112
Your Reference:	70102251
Location:	Chesterfield Express SS
Report No:	705198
Order Number:	70102251-GW3

We received 16 samples on Thursday September 14, 2023 and 16 of these samples were scheduled for a was completed on Monday September 25, 2023. Accredited laboratory tests are defined within the report interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not sir sections alone.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and o this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager

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CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
28630926	VS01	ES	4.00 - 4.00	08/09/2023
28630976	VS02	ES	4.00 - 4.00	08/09/2023
28630982	VS03	ES	4.00 - 4.00	08/09/2023
28630987	VS04	ES	4.00 - 4.00	08/09/2023
28630995	VS05	ES	4.00 - 4.00	08/09/2023
28631000	VS06	ES	4.00 - 4.00	08/09/2023
28631007	VS07	ES	4.00 - 4.00	08/09/2023
28631023	VS08	ES	4.00 - 4.00	08/09/2023
28631016	VS09	ES	4.00 - 4.00	08/09/2023
28630933	VS10	ES	4.00 - 4.00	08/09/2023
28630939	VS11	ES	4.00 - 4.00	08/09/2023
28630946	VS12	ES	4.00 - 4.00	08/09/2023
28630952	VS13	ES	4.00 - 4.00	08/09/2023
28630959	VS14	ES	4.00 - 4.00	08/09/2023
28630965	VS15	ES	4.00 - 4.00	08/09/2023
28630970	VS16	ES	4.00 - 4.00	08/09/2023

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water
Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type
			28630926	VS01	ES	4.00 - 4.00	1kg TUB with Handle (ALE200)	S
			28630926	VS01	ES	4.00 - 4.00	250g Amber Jar (ALE210)	S
			28630926	VS01	ES	4.00 - 4.00	60g VOC (ALE215)	S
			28630976	VS02	ES	4.00 - 4.00	1kg TUB with Handle (ALE200)	S
			28630976	VS02	ES	4.00 - 4.00	250g Amber Jar (ALE210)	S
			28630976	VS02	ES	4.00 - 4.00	60g VOC (ALE215)	S
			28630982	VS03	ES	4.00 - 4.00	1kg TUB with Handle (ALE200)	S
			28630982	VS03	ES	4.00 - 4.00	250g Amber Jar (ALE210)	S
			28630982	VS03	ES	4.00 - 4.00	60g VOC (ALE215)	S
			28630987	VS04	ES	4.00 - 4.00	1kg TUB with Handle (ALE200)	S
			28630987	VS04	ES	4.00 - 4.00	250g Amber Jar (ALE210)	S
			28630987	VS04	ES	4.00 - 4.00	60g VOC (ALE215)	S
			28630995	VS05	ES	4.00 - 4.00	1kg TUB with Handle (ALE200)	S
			28630995	VS05	ES	4.00 - 4.00	250g Amber Jar (ALE210)	S
			28630995	VS05	ES	4.00 - 4.00	60g VOC (ALE215)	S
			28631000	VS06	ES	4.00 - 4.00	1kg TUB with Handle (ALE200)	S
			28631000	VS06	ES	4.00 - 4.00	250g Amber Jar (ALE210)	S
			28631000	VS06	ES	4.00 - 4.00	60g VOC (ALE215)	S
			28631007	VS07	ES	4.00 - 4.00	1kg TUB with Handle (ALE200)	S
			28631007	VS07	ES	4.00 - 4.00	250g Amber Jar (ALE210)	S
			28631007	VS07	ES	4.00 - 4.00	60g VOC (ALE215)	S
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 16	X				X				X				X				X				X	
Boron Water Soluble	All	NDPs: 0 Tests: 16		X			X			X			X			X			X			X		
EPH CWG GC (S)	All	NDPs: 0 Tests: 16		X			X			X			X			X			X			X		
GRO by GC-FID (S)	All	NDPs: 0 Tests: 16			X			X			X			X			X			X			X	
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 16		X			X			X			X			X			X			X		
Metals in solid samples by OES	All	NDPs: 0 Tests: 16		X			X			X			X			X			X			X		
PAH by GCMS	All	NDPs: 0 Tests: 16		X			X			X			X			X			X			X		
Sample description	All	NDPs: 0 Tests: 16		X			X			X			X			X			X			X		
Semi Volatile Organic Compounds	All	NDPs: 0 Tests: 16		X			X			X			X			X			X			X		
TPH CWG GC (S)	All	NDPs: 0 Tests: 16		X			X			X			X			X			X			X		
VOC MS (S)	All	NDPs: 0 Tests: 16			X			X			X			X			X			X			X	

28630959	VS14	ES	4.00 - 4.00	1kg TUB with Handle (ALE200)	S	X											
28630952	VS13	ES	4.00 - 4.00	60g VOC (ALE215)	S				X								X
				250g Amber Jar (ALE210)	S		X	X		X	X	X	X	X	X		
				1kg TUB with Handle (ALE200)	S	X											
28630946	VS12	ES	4.00 - 4.00	60g VOC (ALE215)	S				X								X
				250g Amber Jar (ALE210)	S		X	X		X	X	X	X	X	X		
				1kg TUB with Handle (ALE200)	S	X											
28630939	VS11	ES	4.00 - 4.00	60g VOC (ALE215)	S				X								X
				250g Amber Jar (ALE210)	S		X	X		X	X	X	X	X	X		
				1kg TUB with Handle (ALE200)	S	X											
28630933	VS10	ES	4.00 - 4.00	60g VOC (ALE215)	S				X								X
				250g Amber Jar (ALE210)	S		X	X		X	X	X	X	X	X		
				1kg TUB with Handle (ALE200)	S	X											
28631016	VS09	ES	4.00 - 4.00	60g VOC (ALE215)	S				X								X
				250g Amber Jar (ALE210)	S		X	X		X	X	X	X	X	X		
				1kg TUB with Handle (ALE200)	S	X											
28631023	VS08	ES	4.00 - 4.00	60g VOC (ALE215)	S				X								X
				250g Amber Jar (ALE210)	S		X	X		X	X	X	X	X	X		
				1kg TUB with Handle (ALE200)	S	X											

CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Results Legend
X Test
N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water
Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

			Lab Sample No(s)							
			28630959		28630965			28630970		
			Customer Sample Reference							
			VS14		VS15			VS16		
			AGS Reference							
			ES		ES			ES		
			Depth (m)							
			4.00 - 4.00		4.00 - 4.00			4.00 - 4.00		
			Container							
			250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle	250g Amber Jar (ALE210)	60g VOC (ALE215)
			Sample Type							
			S	S	S	S	S	S	S	S
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 16			X			X		
Boron Water Soluble	All	NDPs: 0 Tests: 16	X			X			X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 16	X			X			X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 16		X			X			X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 16	X			X			X	
Metals in solid samples by OES	All	NDPs: 0 Tests: 16	X			X			X	
PAH by GCMS	All	NDPs: 0 Tests: 16	X			X			X	
Sample description	All	NDPs: 0 Tests: 16	X			X			X	
Semi Volatile Organic Compounds	All	NDPs: 0 Tests: 16	X			X			X	
TPH CWG GC (S)	All	NDPs: 0 Tests: 16	X			X			X	
VOC MS (S)	All	NDPs: 0 Tests: 16		X			X			X

Sample Descriptions

Grain Sizes

very fine	< 0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	> 10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
28630926	VS01	4.00 - 4.00	Dark Brown	Sandy Loam	Vegetation	None
28630976	VS02	4.00 - 4.00	Light Brown	Silty Clay Loam	Stones	None
28630982	VS03	4.00 - 4.00	Light Brown	Sandy Clay Loam	Stones	None
28630987	VS04	4.00 - 4.00	Light Brown	Sandy Clay Loam	Stones	None
28630995	VS05	4.00 - 4.00	Dark Brown	Sandy Loam	Stones	None
28631000	VS06	4.00 - 4.00	Dark Brown	Sandy Loam	None	Stones
28631007	VS07	4.00 - 4.00	Dark Brown	Clay	None	None
28631023	VS08	4.00 - 4.00	Light Brown	Silty Clay	Stones	Vegetation
28631016	VS09	4.00 - 4.00	Light Brown	Silty Clay Loam	Stones	Vegetation
28630933	VS10	4.00 - 4.00	Light Brown	Silty Clay Loam	Stones	None
28630939	VS11	4.00 - 4.00	Dark Brown	Sandy Clay Loam	None	None
28630946	VS12	4.00 - 4.00	Dark Brown	Sandy Loam	Stones	Vegetation
28630952	VS13	4.00 - 4.00	Dark Brown	Sandy Clay Loam	None	None
28630959	VS14	4.00 - 4.00	Light Brown	Sandy Clay Loam	Stones	None
28630965	VS15	4.00 - 4.00	Dark Brown	Clay Loam	Stones	None
28630970	VS16	4.00 - 4.00	Light Brown	Silty Clay	Stones	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provid sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are c naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major pa

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the r sample.

CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Results Legend
ISO17025 accredited.
M MCERTS accredited.
aq Aqueous / settled sample.
diss.filt Dissolved / filtered sample.
tot.unfilt Total / unfiltered sample.
* Subcontracted - refer to subcontractor report for accreditation status.
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F) Trigger breach confirmed
1-4+ [@] Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	VS01	VS02	VS03	VS04	VS05	VS06
			Depth (m)	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023
			SDG Ref	230914-112	230914-112	230914-112	230914-112	230914-112	230914-112
			Lab Sample No.(s)	28630926	28630976	28630982	28630987	28630995	28631000
			AGS Reference	ES	ES	ES	ES	ES	ES
Moisture Content Ratio (% of as received sample)	%	PM024		17	17	14	15	12	12
Chromium, Hexavalent	<0.6 mg/kg	TM151		<0.6 M	<0.6 M	<0.6 M	<0.6 M	<0.6 M	<0.6 M
Arsenic	<0.6 mg/kg	TM181		7.21 M	5.29 M	7.31 M	7.38 M	5.09 M	4.68 M
Barium	<0.6 mg/kg	TM181		37.7 #	37.2 #	92.9 #	59.8 #	37.9 #	47 #
Beryllium	<0.01 mg/kg	TM181		0.733 M	0.95 M	0.765 M	0.971 M	0.888 M	0.812 M
Cadmium	<0.02 mg/kg	TM181		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	0.0936 M
Chromium	<0.9 mg/kg	TM181		6.47 M	6.49 M	6.98 M	7.31 M	6.13 M	8.32 M
Copper	<1.4 mg/kg	TM181		17.9 M	17.9 M	21.3 M	24.7 M	22.8 M	21.5 M
Lead	<0.7 mg/kg	TM181		21 M	11.8 M	21.2 M	25.2 M	15.4 M	15.9 M
Mercury	<0.1 mg/kg	TM181		<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M
Nickel	<0.2 mg/kg	TM181		27 M	28.9 M	34.3 M	31.5 M	35.4 M	29.7 M
Selenium	<1 mg/kg	TM181		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Vanadium	<0.2 mg/kg	TM181		21.7 #	26.3 #	16.2 #	16.4 #	18.1 #	14.1 #
Zinc	<1.9 mg/kg	TM181		72.8 M	60.1 M	86 M	89.6 M	92.4 M	87.7 M
Boron, water soluble	<1 mg/kg	TM222		<1 M	<1 M	<1 M	<1 M	<1 M	<1 M

CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Results Legend	
#	ISO17025 accredited.
M	MCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+ S@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	VS07	VS08	VS09	VS10	VS11	VS12
			Depth (m)	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023
			SDG Ref	230914-112	230914-112	230914-112	230914-112	230914-112	230914-112
			Lab Sample No.(s)	28631007	28631023	28631016	28630933	28630939	28630946
			AGS Reference	ES	ES	ES	ES	ES	ES
Moisture Content Ratio (% of as received sample)	%	PM024		10	15	15	12	6	17
Chromium, Hexavalent	<0.6 mg/kg	TM151		<0.6 M	<0.6 M	<0.6 M	<0.6 M	<0.6 M	<0.6 M
Arsenic	<0.6 mg/kg	TM181		21.4 M	3.28 M	5.43 M	5.92 M	5.11 M	14.4 M
Barium	<0.6 mg/kg	TM181		31.5 #	36.7 #	39.8 #	60.7 #	21.7 #	125 #
Beryllium	<0.01 mg/kg	TM181		0.881 M	0.404 M	0.581 M	0.676 M	0.489 M	1.26 M
Cadmium	<0.02 mg/kg	TM181		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
Chromium	<0.9 mg/kg	TM181		9.23 M	13.2 M	7.52 M	6.1 M	9.06 M	6.67 M
Copper	<1.4 mg/kg	TM181		28.7 M	10.3 M	14.7 M	17.6 M	17.8 M	34.6 M
Lead	<0.7 mg/kg	TM181		18.6 M	8.55 M	12.3 M	13.6 M	10.8 M	24.4 M
Mercury	<0.1 mg/kg	TM181		<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M
Nickel	<0.2 mg/kg	TM181		36.8 M	16.9 M	25.4 M	30.6 M	24.4 M	30.3 M
Selenium	<1 mg/kg	TM181		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Vanadium	<0.2 mg/kg	TM181		16.4 #	17 #	16.5 #	18.8 #	15.9 #	15.9 #
Zinc	<1.9 mg/kg	TM181		101 M	57.1 M	61.6 M	73.4 M	61 M	93 M
Boron, water soluble	<1 mg/kg	TM222		<1 M	<1 M	<1 M	1.74 M	<1 M	<1 M

CERTIFICATE OF ANALYSIS

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Client Ref. 70102251 **Location:** Chesterfield Express SS

Results Legend	
#	ISO17025 accredited.
M	MCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+ S@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	VS13	VS14	VS15	VS16		
			Depth (m)	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00		
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
			Date Sampled	08/09/2023	08/09/2023	08/09/2023	08/09/2023		
			Sampled Time	.	.	.	.		
			Date Received	14/09/2023	14/09/2023	14/09/2023	14/09/2023		
			SDG Ref	230914-112	230914-112	230914-112	230914-112		
			Lab Sample No.(s)	28630952	28630959	28630965	28630970		
			AGS Reference	ES	ES	ES	ES		
Moisture Content Ratio (% of as received sample)	%	PM024		17	17	14	16		
Chromium, Hexavalent	<0.6 mg/kg	TM151		<0.6 M	<0.6 M	<0.6 M	<0.6 M		
Arsenic	<0.6 mg/kg	TM181		6.97 M	9.14 M	44.4 M	4.9 M		
Barium	<0.6 mg/kg	TM181		51.5 #	51.9 #	64.4 #	31.9 #		
Beryllium	<0.01 mg/kg	TM181		0.752 M	0.912 M	1.3 M	0.719 M		
Cadmium	<0.02 mg/kg	TM181		<0.02 M	<0.02 M	<0.02 M	<0.02 M		
Chromium	<0.9 mg/kg	TM181		6.54 M	5.79 M	6.16 M	7.47 M		
Copper	<1.4 mg/kg	TM181		18 M	20.8 M	29 M	18.2 M		
Lead	<0.7 mg/kg	TM181		22.5 M	26.6 M	18.5 M	12.9 M		
Mercury	<0.1 mg/kg	TM181		<0.1 M	0.107 M	<0.1 M	<0.1 M		
Nickel	<0.2 mg/kg	TM181		26 M	32.1 M	39.7 M	16.5 M		
Selenium	<1 mg/kg	TM181		<1 #	<1 #	<1 #	<1 #		
Vanadium	<0.2 mg/kg	TM181		15.1 #	21.4 #	16.6 #	14.8 #		
Zinc	<1.9 mg/kg	TM181		75.2 M	75.3 M	94.9 M	55.9 M		
Boron, water soluble	<1 mg/kg	TM222		<1 M	<1 M	<1 M	<1 M		

CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

PAH by GCMS

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+ §@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	VS01	VS02	VS03	VS04	VS05	VS06
			Depth (m)	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023
			SDG Ref	230914-112	230914-112	230914-112	230914-112	230914-112	230914-112
			Lab Sample No.(s)	28630926	28630976	28630982	28630987	28630995	28631000
			AGS Reference	ES	ES	ES	ES	ES	ES
Naphthalene-d8 % recovery**	%	TM218		81.9	80.8	83.2	82.5	91.7	83.4
Acenaphthene-d10 % recovery**	%	TM218		80.5	78.6	79.7	79.2	92.6	78.4
Phenanthrene-d10 % recovery**	%	TM218		81.9	79.9	79.6	80	97.4	77.3
Chrysene-d12 % recovery**	%	TM218		78.6	76.8	78.7	80.3	94.1	75.6
Perylene-d12 % recovery**	%	TM218		78.5	75.6	79.3	80.6	97.3	75.5
Naphthalene	<0.009 mg/kg	TM218		<0.009 M	<0.009 M	<0.009 M	<0.009 M	<0.009 @ M	<0.009 M
Acenaphthylene	<0.012 mg/kg	TM218		<0.012 M	<0.012 M	<0.012 M	<0.012 M	<0.012 @ M	<0.012 M
Acenaphthene	<0.008 mg/kg	TM218		<0.008 M	<0.008 M	<0.008 M	<0.008 M	<0.008 @ M	<0.008 M
Fluorene	<0.01 mg/kg	TM218		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 @ M	<0.01 M
Phenanthrene	<0.015 mg/kg	TM218		<0.015 M	<0.015 M	<0.015 M	0.0226 M	0.0304 @ M	<0.015 M
Anthracene	<0.016 mg/kg	TM218		<0.016 M	<0.016 M	<0.016 M	<0.016 M	<0.016 @ M	<0.016 M
Fluoranthene	<0.017 mg/kg	TM218		<0.017 M	<0.017 M	<0.017 M	0.0476 M	0.0405 @ M	0.0194 M
Pyrene	<0.015 mg/kg	TM218		<0.015 M	<0.015 M	<0.015 M	0.0443 M	0.0384 @ M	0.0209 M
Benz(a)anthracene	<0.014 mg/kg	TM218		<0.014 M	<0.014 M	<0.014 M	0.0228 M	0.0206 @ M	<0.014 M
Chrysene	<0.01 mg/kg	TM218		<0.01 M	<0.01 M	<0.01 M	0.0264 M	0.0279 @ M	0.0139 M
Benzo(b)fluoranthene	<0.015 mg/kg	TM218		<0.015 M	<0.015 M	<0.015 M	0.0261 M	0.0343 @ M	<0.015 M
Benzo(k)fluoranthene	<0.014 mg/kg	TM218		<0.014 M	<0.014 M	<0.014 M	<0.014 M	<0.014 @ M	<0.014 M
Benzo(a)pyrene	<0.015 mg/kg	TM218		<0.015 M	<0.015 M	<0.015 M	<0.015 M	0.0194 @ M	<0.015 M
Indeno(1,2,3-cd)pyrene	<0.018 mg/kg	TM218		<0.018 M	<0.018 M	<0.018 M	<0.018 M	<0.018 @ M	<0.018 M
Dibenzo(a,h)anthracene	<0.023 mg/kg	TM218		<0.023 M	<0.023 M	<0.023 M	<0.023 M	<0.023 @ M	<0.023 M
Benzo(g,h,i)perylene	<0.024 mg/kg	TM218		<0.024 M	<0.024 M	<0.024 M	<0.024 M	<0.024 @ M	<0.024 M
PAH, Total Detected USEPA 16	<0.118 mg/kg	TM218		<0.118	<0.118	<0.118	0.19	0.212	<0.118

CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

PAH by GCMS

Results Legend	
#	ISO17025 accredited.
M	MCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+ §@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	VS07	VS08	VS09	VS10	VS11	VS12
			Depth (m)	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023
			SDG Ref	230914-112	230914-112	230914-112	230914-112	230914-112	230914-112
			Lab Sample No.(s)	28631007	28631023	28631016	28630933	28630939	28630946
			AGS Reference	ES	ES	ES	ES	ES	ES
Naphthalene-d8 % recovery**	%	TM218		81.6	82.8	82.8	83.2	82.9	81.9
Acenaphthene-d10 % recovery**	%	TM218		80.4	80.8	82.6	81.9	81.9	76.9
Phenanthrene-d10 % recovery**	%	TM218		81.8	81.6	85.9	83.9	84.7	75
Chrysene-d12 % recovery**	%	TM218		76.4	78	82.4	79	81.9	72.5
Perylene-d12 % recovery**	%	TM218		75.2	76.3	82.7	76	79.9	70.5
Naphthalene	<0.009 mg/kg	TM218		0.0104 M	<0.009 M	<0.009 M	0.0102 M	0.0129 M	<0.009 M
Acenaphthylene	<0.012 mg/kg	TM218		<0.012 M	<0.012 M	<0.012 M	<0.012 M	<0.012 M	<0.012 M
Acenaphthene	<0.008 mg/kg	TM218		<0.008 M	<0.008 M	<0.008 M	<0.008 M	<0.008 M	<0.008 M
Fluorene	<0.01 mg/kg	TM218		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Phenanthrene	<0.015 mg/kg	TM218		<0.015 M	<0.015 M	<0.015 M	0.0617 M	0.0796 M	<0.015 M
Anthracene	<0.016 mg/kg	TM218		<0.016 M	<0.016 M	<0.016 M	<0.016 M	<0.016 M	<0.016 M
Fluoranthene	<0.017 mg/kg	TM218		<0.017 M	<0.017 M	0.025 M	0.0659 M	0.0249 M	<0.017 M
Pyrene	<0.015 mg/kg	TM218		0.0222 M	<0.015 M	0.0258 M	0.0621 M	0.0324 M	<0.015 M
Benz(a)anthracene	<0.014 mg/kg	TM218		<0.014 M	<0.014 M	<0.014 M	0.026 M	<0.014 M	<0.014 M
Chrysene	<0.01 mg/kg	TM218		<0.01 M	<0.01 M	0.0132 M	0.029 M	0.0152 M	<0.01 M
Benzo(b)fluoranthene	<0.015 mg/kg	TM218		0.0171 M	<0.015 M	0.0216 M	0.0291 M	0.0263 M	<0.015 M
Benzo(k)fluoranthene	<0.014 mg/kg	TM218		<0.014 M	<0.014 M	<0.014 M	<0.014 M	<0.014 M	<0.014 M
Benzo(a)pyrene	<0.015 mg/kg	TM218		<0.015 M	<0.015 M	<0.015 M	0.0179 M	<0.015 M	<0.015 M
Indeno(1,2,3-cd)pyrene	<0.018 mg/kg	TM218		<0.018 M	<0.018 M	<0.018 M	<0.018 M	<0.018 M	<0.018 M
Dibenzo(a,h)anthracene	<0.023 mg/kg	TM218		<0.023 M	<0.023 M	<0.023 M	<0.023 M	<0.023 M	<0.023 M
Benzo(g,h,i)perylene	<0.024 mg/kg	TM218		<0.024 M	<0.024 M	<0.024 M	<0.024 M	<0.024 M	<0.024 M
PAH, Total Detected USEPA 16	<0.118 mg/kg	TM218		<0.118	<0.118	<0.118	0.302	0.191	<0.118

CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

PAH by GCMS

Results Legend	
#	ISO17025 accredited.
M	MCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+ §@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	VS13	VS14	VS15	VS16		
			Depth (m)	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00		
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
			Date Sampled	08/09/2023	08/09/2023	08/09/2023	08/09/2023		
			Sampled Time	.	.	.	.		
			Date Received	14/09/2023	14/09/2023	14/09/2023	14/09/2023		
			SDG Ref	230914-112	230914-112	230914-112	230914-112		
			Lab Sample No.(s)	28630952	28630959	28630965	28630970		
			AGS Reference	ES	ES	ES	ES		
Naphthalene-d8 % recovery**	%	TM218		83.9	84.5	83.2	80.3		
Acenaphthene-d10 % recovery**	%	TM218		80.3	80.9	80.4	75.9		
Phenanthrene-d10 % recovery**	%	TM218		80.3	80.6	81.5	76		
Chrysene-d12 % recovery**	%	TM218		81.2	82	77	77		
Perylene-d12 % recovery**	%	TM218		83.9	85.7	71.5	78.3		
Naphthalene	<0.009 mg/kg	TM218		<0.009 M	<0.009 M	<0.009 M	<0.009 M		
Acenaphthylene	<0.012 mg/kg	TM218		<0.012 M	<0.012 M	<0.012 M	<0.012 M		
Acenaphthene	<0.008 mg/kg	TM218		<0.008 M	<0.008 M	<0.008 M	<0.008 M		
Fluorene	<0.01 mg/kg	TM218		<0.01 M	<0.01 M	<0.01 M	<0.01 M		
Phenanthrene	<0.015 mg/kg	TM218		0.0187 M	<0.015 M	<0.015 M	<0.015 M		
Anthracene	<0.016 mg/kg	TM218		<0.016 M	<0.016 M	<0.016 M	<0.016 M		
Fluoranthene	<0.017 mg/kg	TM218		0.0881 M	0.0266 M	<0.017 M	0.0265 M		
Pyrene	<0.015 mg/kg	TM218		0.12 M	0.0259 M	<0.015 M	0.0248 M		
Benz(a)anthracene	<0.014 mg/kg	TM218		0.048 M	<0.014 M	<0.014 M	<0.014 M		
Chrysene	<0.01 mg/kg	TM218		0.0475 M	0.0156 M	<0.01 M	0.0151 M		
Benzo(b)fluoranthene	<0.015 mg/kg	TM218		0.0469 M	0.0227 M	<0.015 M	<0.015 M		
Benzo(k)fluoranthene	<0.014 mg/kg	TM218		<0.014 M	<0.014 M	<0.014 M	<0.014 M		
Benzo(a)pyrene	<0.015 mg/kg	TM218		0.0356 M	<0.015 M	<0.015 M	<0.015 M		
Indeno(1,2,3-cd)pyrene	<0.018 mg/kg	TM218		<0.018 M	<0.018 M	<0.018 M	<0.018 M		
Dibenzo(a,h)anthracene	<0.023 mg/kg	TM218		<0.023 M	<0.023 M	<0.023 M	<0.023 M		
Benzo(g,h,i)perylene	<0.024 mg/kg	TM218		<0.024 M	<0.024 M	<0.024 M	<0.024 M		
PAH, Total Detected USEPA 16	<0.118 mg/kg	TM218		0.405	<0.118	<0.118	<0.118		

Semi Volatile Organic Compounds

Results Legend
- # ISO17025 accredited.
- M MCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+ §@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	VS01	VS02	VS03	VS04	VS05	VS06
			Depth (m)	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023
			SDG Ref	230914-112	230914-112	230914-112	230914-112	230914-112	230914-112
			Lab Sample No.(s)	28630926	28630976	28630982	28630987	28630995	28631000
			AGS Reference	ES	ES	ES	ES	ES	ES
Phenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pentachlorophenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
n-Nitroso-n-dipropylamine	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrobenzene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isophorone	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Hexachloroethane	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Hexachlorocyclopentadiene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Hexachlorobutadiene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Hexachlorobenzene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
n-Dioctyl phthalate	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethyl phthalate	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Diethyl phthalate	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
n-Dibutyl phthalate	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzofuran	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Carbazole	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Butylbenzyl phthalate	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
bis(2-Ethylhexyl) phthalate	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
bis(2-Chloroethoxy)methane	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
bis(2-Chloroethyl)ether	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Azobenzene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4-Nitrophenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4-Nitroaniline	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4-Methylphenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4-Chlorophenylphenylether	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4-Chloroaniline	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4-Chloro-3-methylphenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4-Bromophenylphenylether	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
3-Nitroaniline	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-Nitrophenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-Nitroaniline	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-Methylphenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1,2,4-Trichlorobenzene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Semi Volatile Organic Compounds

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+ §@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	VS01	VS02	VS03	VS04	VS05	VS06
			Depth (m)	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023
			SDG Ref	230914-112	230914-112	230914-112	230914-112	230914-112	230914-112
			Lab Sample No.(s)	28630926	28630976	28630982	28630987	28630995	28631000
			AGS Reference	ES	ES	ES	ES	ES	ES
2-Chlorophenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,6-Dinitrotoluene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,4-Dinitrotoluene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,4-Dimethylphenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,4-Dichlorophenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,4,6-Trichlorophenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,4,5-Trichlorophenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1,4-Dichlorobenzene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1,3-Dichlorobenzene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1,2-Dichlorobenzene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-Chloronaphthalene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-Methylnaphthalene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b)fluoranthene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Naphthalene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Bis(2-chloroisopropyl) ether	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Semi Volatile Organic Compounds

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+ §@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	VS07	VS08	VS09	VS10	VS11	VS12
			Depth (m)	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023
			SDG Ref	230914-112	230914-112	230914-112	230914-112	230914-112	230914-112
			Lab Sample No.(s)	28631007	28631023	28631016	28630933	28630939	28630946
			AGS Reference	ES	ES	ES	ES	ES	ES
Phenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pentachlorophenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
n-Nitroso-n-dipropylamine	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrobenzene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isophorone	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Hexachloroethane	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Hexachlorocyclopentadiene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Hexachlorobutadiene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Hexachlorobenzene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
n-Dioctyl phthalate	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethyl phthalate	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Diethyl phthalate	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
n-Dibutyl phthalate	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzofuran	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Carbazole	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Butylbenzyl phthalate	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
bis(2-Ethylhexyl) phthalate	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
bis(2-Chloroethoxy)methane	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
bis(2-Chloroethyl)ether	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Azobenzene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4-Nitrophenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4-Nitroaniline	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4-Methylphenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4-Chlorophenylphenylether	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4-Chloroaniline	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4-Chloro-3-methylphenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4-Bromophenylphenylether	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
3-Nitroaniline	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-Nitrophenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-Nitroaniline	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-Methylphenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1,2,4-Trichlorobenzene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Semi Volatile Organic Compounds

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+ §@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	VS07	VS08	VS09	VS10	VS11	VS12
			Depth (m)	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023
			SDG Ref	230914-112	230914-112	230914-112	230914-112	230914-112	230914-112
			Lab Sample No.(s)	28631007	28631023	28631016	28630933	28630939	28630946
			AGS Reference	ES	ES	ES	ES	ES	ES
2-Chlorophenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,6-Dinitrotoluene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,4-Dinitrotoluene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,4-Dimethylphenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,4-Dichlorophenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,4,6-Trichlorophenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,4,5-Trichlorophenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1,4-Dichlorobenzene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1,3-Dichlorobenzene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1,2-Dichlorobenzene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-Chloronaphthalene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-Methylnaphthalene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b)fluoranthene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Naphthalene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Bis(2-chloroisopropyl) ether	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Semi Volatile Organic Compounds

Results Legend	
#	ISO17025 accredited.
M	MCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+ §@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	VS13	VS14	VS15	VS16		
			Depth (m)	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00		
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
			Date Sampled	08/09/2023	08/09/2023	08/09/2023	08/09/2023		
			Sampled Time	.	.	.	.		
			Date Received	14/09/2023	14/09/2023	14/09/2023	14/09/2023		
			SDG Ref	230914-112	230914-112	230914-112	230914-112		
			Lab Sample No.(s)	28630952	28630959	28630965	28630970		
			AGS Reference	ES	ES	ES	ES		
Phenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1		
Pentachlorophenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1		
n-Nitroso-n-dipropylamine	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1		
Nitrobenzene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1		
Isophorone	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1		
Hexachloroethane	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1		
Hexachlorocyclopentadiene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1		
Hexachlorobutadiene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1		
Hexachlorobenzene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1		
n-Dioctyl phthalate	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1		
Dimethyl phthalate	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1		
Diethyl phthalate	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1		
n-Dibutyl phthalate	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1		
Dibenzofuran	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1		
Carbazole	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1		
Butylbenzyl phthalate	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1		
bis(2-Ethylhexyl) phthalate	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1		
bis(2-Chloroethoxy)methane	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1		
bis(2-Chloroethyl)ether	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1		
Azobenzene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1		
4-Nitrophenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1		
4-Nitroaniline	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1		
4-Methylphenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1		
4-Chlorophenylphenylether	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1		
4-Chloroaniline	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1		
4-Chloro-3-methylphenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1		
4-Bromophenylphenylether	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1		
3-Nitroaniline	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1		
2-Nitrophenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1		
2-Nitroaniline	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1		
2-Methylphenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1		
1,2,4-Trichlorobenzene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1		

Semi Volatile Organic Compounds

Results Legend	Customer Sample Ref.	VS13	VS14	VS15	VS16		
# ISO17025 accredited.	Depth (m)	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00		
M MCERTS accredited.	Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
aq Aqueous / settled sample.	Date Sampled	08/09/2023	08/09/2023	08/09/2023	08/09/2023		
diss.filt Dissolved / filtered sample.	Sampled Time	.	.	.	.		
tot.unfilt Total / unfiltered sample.	Date Received	14/09/2023	14/09/2023	14/09/2023	14/09/2023		
* Subcontracted - refer to subcontractor report for accreditation status.	SDG Ref	230914-112	230914-112	230914-112	230914-112		
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	Lab Sample No.(s)	28630952	28630959	28630965	28630970		
(F) Trigger breach confirmed	AGS Reference	ES	ES	ES	ES		
1-4+ §@ Sample deviation (see appendix)							

Component	LOD/Units	Method						
2-Chlorophenol	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
2,6-Dinitrotoluene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
2,4-Dinitrotoluene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
2,4-Dimethylphenol	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
2,4-Dichlorophenol	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
2,4,6-Trichlorophenol	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
2,4,5-Trichlorophenol	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
1,4-Dichlorobenzene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
1,3-Dichlorobenzene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
1,2-Dichlorobenzene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
2-Chloronaphthalene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
2-Methylnaphthalene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
Acenaphthylene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
Acenaphthene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
Anthracene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
Benzo(a)anthracene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
Benzo(b)fluoranthene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
Benzo(k)fluoranthene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
Benzo(a)pyrene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
Benzo(g,h,i)perylene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
Chrysene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
Fluoranthene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
Fluorene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
Indeno(1,2,3-cd)pyrene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
Phenanthrene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
Pyrene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
Naphthalene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
Dibenzo(a,h)anthracene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
Bis(2-chloroisopropyl) ether	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		

CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

TPH CWG (S)

Results Legend
- # ISO17025 accredited.
- M MCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+ §@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	VS01	VS02	VS03	VS04	VS05	VS06
			Depth (m)	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023
			SDG Ref	230914-112	230914-112	230914-112	230914-112	230914-112	230914-112
			Lab Sample No.(s)	28630926	28630976	28630982	28630987	28630995	28631000
			AGS Reference	ES	ES	ES	ES	ES	ES
GRO Surrogate % recovery**	%	TM089		97.9	98.6	95.8	87.1	95.4	96.9
Aliphatics >C5-C6 (HS_1D_AL)	<0.01 mg/kg	TM089		<0.01	<0.01	0.0116	0.264	0.658	<0.01
Aliphatics >C6-C8 (HS_1D_AL)	<0.01 mg/kg	TM089		<0.01	<0.01	0.0661	0.302	0.177	0.026
Aliphatics >C8-C10 (HS_1D_AL)	<0.01 mg/kg	TM089		<0.01	<0.01	0.218	0.315	0.71	0.0475
Aliphatics >C10-C12 (EH_2D_AL_#1)	<1 mg/kg	TM414		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Aliphatics >C12-C16 (EH_2D_AL_#1)	<1 mg/kg	TM414		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Aliphatics >C16-C21 (EH_2D_AL_#1)	<1 mg/kg	TM414		<1 #	<1 #	<1 #	<1 #	1.08 #	<1 #
Aliphatics >C21-C35 (EH_2D_AL_#1)	<1 mg/kg	TM414		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Aliphatics >C35-C44 (EH_2D_AL_#1)	<1 mg/kg	TM414		<1	<1	<1	<1	<1	<1
Total Aliphatics >C10-C44 (EH_2D_AR_#1)	<5 mg/kg	TM414		<5	<5	<5	<5	<5	<5
Total Aliphatics & Aromatics >C10-C44 (EH_2D_Total_#1)	<10 mg/kg	TM414		<10	<10	<10	<10	<10	<10
Aromatics >EC5-EC7 (HS_1D_AR)	<0.01 mg/kg	TM089		<0.01	<0.01	<0.01	0.0614	<0.01	<0.01
Aromatics >EC7-EC8 (HS_1D_AR)	<0.01 mg/kg	TM089		<0.01	<0.01	<0.01	0.0484	0.0463	<0.01
Aromatics >EC8-EC10 (HS_1D_AR)	<0.01 mg/kg	TM089		<0.01	<0.01	0.145	0.21	0.472	0.0316
Aromatics > EC10-EC12 (EH_2D_AR_#1)	<1 mg/kg	TM414		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Aromatics > EC12-EC16 (EH_2D_AR_#1)	<1 mg/kg	TM414		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Aromatics > EC16-EC21 (EH_2D_AR_#1)	<1 mg/kg	TM414		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Aromatics > EC21-EC35 (EH_2D_AR_#1)	<1 mg/kg	TM414		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Aromatics >EC35-EC44 (EH_2D_AR_#1)	<1 mg/kg	TM414		<1	<1	<1	<1	<1	<1
Aromatics > EC40-EC44 (EH_2D_AR_#1)	<1 mg/kg	TM414		<1	<1	<1	<1	<1	<1
Total Aromatics > EC10-EC44 (EH_2D_AR_#1)	<5 mg/kg	TM414		<5	<5	<5	<5	<5	<5
Total Aliphatics & Aromatics >C5-C44 (EH_2D_Total_#1+HS_1D_Total)	<10 mg/kg	TM414		<10	<10	<10	<10	<10	<10
Total Aliphatics >C5-C10 (HS_1D_AL_TOTAL)	<0.05 mg/kg	TM089		<0.05	<0.05	0.296	0.881	1.54	0.0735
Total Aromatics >EC5-EC10 (HS_1D_AR_TOTAL)	<0.05 mg/kg	TM089		<0.05	<0.05	0.145	0.32	0.519	<0.05
GRO >C5-C10 (HS_1D_TOTAL)	<0.02 mg/kg	TM089		<0.02	<0.02	0.441	1.2	2.06	0.0735

CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

TPH CWG (S)

Results Legend	
#	ISO17025 accredited.
M	MCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+ §@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	VS07	VS08	VS09	VS10	VS11	VS12
			Depth (m)	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023
			SDG Ref	230914-112	230914-112	230914-112	230914-112	230914-112	230914-112
			Lab Sample No.(s)	28631007	28631023	28631016	28630933	28630939	28630946
			AGS Reference	ES	ES	ES	ES	ES	ES
GRO Surrogate % recovery**	%	TM089		94.3	91.2	84.6	94.5	75.8	97
Aliphatics >C5-C6 (HS_1D_AL)	<0.01 mg/kg	TM089		<0.01	<0.01	<0.01	0.0848	<0.01	<0.01
Aliphatics >C6-C8 (HS_1D_AL)	<0.01 mg/kg	TM089		0.0222	<0.01	0.0339	0.154	<0.01	<0.01
Aliphatics >C8-C10 (HS_1D_AL)	<0.01 mg/kg	TM089		0.0466	<0.01	0.0562	0.251	<0.01	<0.01
Aliphatics >C10-C12 (EH_2D_AL_#1)	<1 mg/kg	TM414		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Aliphatics >C12-C16 (EH_2D_AL_#1)	<1 mg/kg	TM414		<1 #	<1 #	1.08 #	2.41 #	<1 #	<1 #
Aliphatics >C16-C21 (EH_2D_AL_#1)	<1 mg/kg	TM414		<1 #	<1 #	2.97 #	2.2 #	<1 #	<1 #
Aliphatics >C21-C35 (EH_2D_AL_#1)	<1 mg/kg	TM414		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Aliphatics >C35-C44 (EH_2D_AL_#1)	<1 mg/kg	TM414		<1	<1	<1	<1	<1	<1
Total Aliphatics >C10-C44 (EH_2D_AR_#1)	<5 mg/kg	TM414		<5	<5	<5	5.16	<5	<5
Total Aliphatics & Aromatics >C10-C44 (EH_2D_Total_#1)	<10 mg/kg	TM414		<10	<10	<10	<10	<10	<10
Aromatics >EC5-EC7 (HS_1D_AR)	<0.01 mg/kg	TM089		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC7-EC8 (HS_1D_AR)	<0.01 mg/kg	TM089		<0.01	<0.01	<0.01	0.0542	<0.01	<0.01
Aromatics >EC8-EC10 (HS_1D_AR)	<0.01 mg/kg	TM089		0.0311	<0.01	0.0374	0.167	<0.01	<0.01
Aromatics > EC10-EC12 (EH_2D_AR_#1)	<1 mg/kg	TM414		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Aromatics > EC12-EC16 (EH_2D_AR_#1)	<1 mg/kg	TM414		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Aromatics > EC16-EC21 (EH_2D_AR_#1)	<1 mg/kg	TM414		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Aromatics > EC21-EC35 (EH_2D_AR_#1)	<1 mg/kg	TM414		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Aromatics >EC35-EC44 (EH_2D_AR_#1)	<1 mg/kg	TM414		<1	2.38	<1	<1	<1	<1
Aromatics > EC40-EC44 (EH_2D_AR_#1)	<1 mg/kg	TM414		<1	<1	<1	<1	<1	<1
Total Aromatics > EC10-EC44 (EH_2D_AR_#1)	<5 mg/kg	TM414		<5	<5	<5	<5	<5	<5
Total Aliphatics & Aromatics >C5-C44 (EH_2D_Total_#1+HS_1D_Total)	<10 mg/kg	TM414		<10	<10	<10	<10	<10	<10
Total Aliphatics >C5-C10 (HS_1D_AL_TOTAL)	<0.05 mg/kg	TM089		0.0688	<0.05	0.0901	0.489	<0.05	<0.05
Total Aromatics >EC5-EC10 (HS_1D_AR_TOTAL)	<0.05 mg/kg	TM089		<0.05	<0.05	<0.05	0.221	<0.05	<0.05
GRO >C5-C10 (HS_1D_TOTAL)	<0.02 mg/kg	TM089		0.0688	<0.02	0.0901	0.711	<0.02	<0.02

CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

TPH CWG (S)

Results Legend

#	ISO17025 accredited.
M	MCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+ §@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	VS13	VS14	VS15	VS16		
			Depth (m)	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00		
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
			Date Sampled	08/09/2023	08/09/2023	08/09/2023	08/09/2023		
			Sampled Time	.	.	.	.		
			Date Received	14/09/2023	14/09/2023	14/09/2023	14/09/2023		
			SDG Ref	230914-112	230914-112	230914-112	230914-112		
			Lab Sample No.(s)	28630952	28630959	28630965	28630970		
			AGS Reference	ES	ES	ES	ES		
GRO Surrogate % recovery**	%	TM089		97.5	91.9	99.9	109		
Aliphatics >C5-C6 (HS_1D_AL)	<0.01 mg/kg	TM089		0.0168	<0.01	<0.01	<0.01		
Aliphatics >C6-C8 (HS_1D_AL)	<0.01 mg/kg	TM089		0.066	<0.01	<0.01	<0.01		
Aliphatics >C8-C10 (HS_1D_AL)	<0.01 mg/kg	TM089		0.0804	<0.01	<0.01	<0.01		
Aliphatics >C10-C12 (EH_2D_AL_#1)	<1 mg/kg	TM414		<1 #	<1 #	<1 #	<1 #		
Aliphatics >C12-C16 (EH_2D_AL_#1)	<1 mg/kg	TM414		<1 #	<1 #	<1 #	<1 #		
Aliphatics >C16-C21 (EH_2D_AL_#1)	<1 mg/kg	TM414		<1 #	<1 #	<1 #	<1 #		
Aliphatics >C21-C35 (EH_2D_AL_#1)	<1 mg/kg	TM414		<1 #	<1 #	<1 #	<1 #		
Aliphatics >C35-C44 (EH_2D_AL_#1)	<1 mg/kg	TM414		1.17	<1	<1	<1		
Total Aliphatics >C10-C44 (EH_2D_AR_#1)	<5 mg/kg	TM414		<5	<5	<5	<5		
Total Aliphatics & Aromatics >C10-C44 (EH_2D_Total_#1)	<10 mg/kg	TM414		<10	<10	<10	<10		
Aromatics >EC5-EC7 (HS_1D_AR)	<0.01 mg/kg	TM089		<0.01	<0.01	<0.01	<0.01		
Aromatics >EC7-EC8 (HS_1D_AR)	<0.01 mg/kg	TM089		0.0144	<0.01	<0.01	<0.01		
Aromatics >EC8-EC10 (HS_1D_AR)	<0.01 mg/kg	TM089		0.054	<0.01	<0.01	<0.01		
Aromatics > EC10-EC12 (EH_2D_AR_#1)	<1 mg/kg	TM414		<1 #	<1 #	<1 #	<1 #		
Aromatics > EC12-EC16 (EH_2D_AR_#1)	<1 mg/kg	TM414		<1 #	<1 #	<1 #	<1 #		
Aromatics > EC16-EC21 (EH_2D_AR_#1)	<1 mg/kg	TM414		<1 #	<1 #	<1 #	<1 #		
Aromatics > EC21-EC35 (EH_2D_AR_#1)	<1 mg/kg	TM414		<1 #	<1 #	<1 #	<1 #		
Aromatics >EC35-EC44 (EH_2D_AR_#1)	<1 mg/kg	TM414		<1	<1	<1	<1		
Aromatics > EC40-EC44 (EH_2D_AR_#1)	<1 mg/kg	TM414		<1	<1	<1	<1		
Total Aromatics > EC10-EC44 (EH_2D_AR_#1)	<5 mg/kg	TM414		<5	<5	<5	<5		
Total Aliphatics & Aromatics >C5-C44 (EH_2D_Total_#1+HS_1D_Total)	<10 mg/kg	TM414		<10	<10	<10	<10		
Total Aliphatics >C5-C10 (HS_1D_AL_TOTAL)	<0.05 mg/kg	TM089		0.163	<0.05	<0.05	<0.05		
Total Aromatics >EC5-EC10 (HS_1D_AR_TOTAL)	<0.05 mg/kg	TM089		0.0684	<0.05	<0.05	<0.05		
GRO >C5-C10 (HS_1D_TOTAL)	<0.02 mg/kg	TM089		0.232	<0.02	<0.02	<0.02		

CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

VOC MS (S)

Results Legend

#	ISO17025 accredited.
M	MCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+ §@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	VS01	VS02	VS03	VS04	VS05	VS06
			Depth (m)	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023
			SDG Ref	230914-112	230914-112	230914-112	230914-112	230914-112	230914-112
			Lab Sample No.(s)	28630926	28630976	28630982	28630987	28630995	28631000
			AGS Reference	ES	ES	ES	ES	ES	ES
Dibromofluoromethane**	%	TM116		115	115	114	115	117	114
Toluene-d8**	%	TM116		92.8	101	100	107	95.5	95.3
4-Bromofluorobenzene**	%	TM116		101	102	102	92.7	95.5	98.7
Dichlorodifluoromethane	<0.0005 mg/kg	TM116		<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #
Chloromethane	<0.002 mg/kg	TM116		<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #
Vinyl Chloride	<0.0005 mg/kg	TM116		<0.005 @ M	<0.005 @ M	<0.005 @ M	<0.005 @ M	<0.005 @ M	<0.005 @ M
Bromomethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Chloroethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Trichlorofluorormethane	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M
1,1-Dichloroethene	<0.0005 mg/kg	TM116		<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #
Carbon Disulphide	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Dichloromethane	<0.005 mg/kg	TM116		<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #
Methyl Tertiary Butyl Ether	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	0.0474 M	0.0139 M	<0.005 M
trans-1,2-Dichloroethene	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
1,1-Dichloroethane	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M
cis-1,2-Dichloroethene	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M
2,2-Dichloropropane	<0.001 mg/kg	TM116		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Bromochloromethane	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
Chloroform	<0.003 mg/kg	TM116		<0.03 M	<0.03 M	<0.03 M	<0.03 M	<0.03 M	<0.03 M
1,1,1-Trichloroethane	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M
1,1-Dichloropropene	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M
Carbontetrachloride	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M
1,2-Dichloroethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Benzene	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Trichloroethene	<0.001 mg/kg	TM116		<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #
1,2-Dichloropropane	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M
Dibromomethane	<0.001 mg/kg	TM116		<0.01 3 M	<0.01 3 M	<0.01 3 M	<0.01 3 M	<0.01 3 M	<0.01 M
Bromodichloromethane	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
cis-1,3-Dichloropropene	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M
Toluene	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	0.0466 M	<0.01 M	0.0143 M
trans-1,3-Dichloropropene	<0.001 mg/kg	TM116		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,1,2-Trichloroethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M

CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

VOC MS (S)

Results Legend
ISO17025 accredited.
M MCERTS accredited.
aq Aqueous / settled sample.
diss.filt Dissolved / filtered sample.
tot.unfilt Total / unfiltered sample.
* Subcontracted - refer to subcontractor report for accreditation status.
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F) Trigger breach confirmed
1-4+ §@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	VS01	VS02	VS03	VS04	VS05	VS06
			Depth (m)	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023
			SDG Ref	230914-112	230914-112	230914-112	230914-112	230914-112	230914-112
			Lab Sample No.(s)	28630926	28630976	28630982	28630987	28630995	28631000
			AGS Reference	ES	ES	ES	ES	ES	ES
1,3-Dichloropropane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Tetrachloroethene	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
Dibromochloromethane	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
1,2-Dibromoethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Chlorobenzene	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
1,1,1,2-Tetrachloroethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Ethylbenzene	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
p/m-Xylene	<0.002 mg/kg	TM116		<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #
o-Xylene	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
Styrene	<0.002 mg/kg	TM116		<0.02 @ #	<0.02 @ #	<0.02 @ #	<0.02 @ #	<0.02 @ #	<0.02 @ #
Bromoform	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
Isopropylbenzene	<0.002 mg/kg	TM116		<0.02 3 #	<0.02 3 #	<0.02 3 #	<0.02 3 #	<0.02 3 #	<0.02 #
1,1,2,2-Tetrachloroethane	<0.002 mg/kg	TM116		<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #
1,2,3-Trichloropropane	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
Bromobenzene	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
Propylbenzene	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
2-Chlorotoluene	<0.003 mg/kg	TM116		<0.03 M	<0.03 M	<0.03 M	<0.03 M	<0.03 M	<0.03 M
1,3,5-Trimethylbenzene	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
4-Chlorotoluene	<0.003 mg/kg	TM116		<0.03 M	<0.03 M	<0.03 M	<0.03 M	<0.03 M	<0.03 M
tert-Butylbenzene	<0.002 mg/kg	TM116		<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #
1,2,4-Trimethylbenzene	<0.003 mg/kg	TM116		<0.03 #	<0.03 #	<0.03 #	<0.03 #	<0.03 #	<0.03 #
sec-Butylbenzene	<0.001 mg/kg	TM116		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
4-Isopropyltoluene	<0.002 mg/kg	TM116		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
1,3-Dichlorobenzene	<0.005 mg/kg	TM116		<0.05 M	<0.05 M	<0.05 M	<0.05 M	<0.05 M	<0.05 M
1,4-Dichlorobenzene	<0.005 mg/kg	TM116		<0.05 M	<0.05 M	<0.05 M	<0.05 M	<0.05 M	<0.05 M
n-Butylbenzene	<0.003 mg/kg	TM116		<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
1,2-Dichlorobenzene	<0.005 mg/kg	TM116		<0.05 M	<0.05 M	<0.05 M	<0.05 M	<0.05 M	<0.05 M
1,2-Dibromo-3-chloropropane	<0.002 mg/kg	TM116		<0.02 3 M	<0.02 3 M	<0.02 3 M	<0.02 3 M	<0.02 3 M	<0.02 M
Tert-amyl methyl ether	<0.001 mg/kg	TM116		<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #
1,2,4-Trichlorobenzene	<0.007 mg/kg	TM116		<0.07	<0.07	<0.07	<0.07	<0.07	<0.07
Hexachlorobutadiene	<0.004 mg/kg	TM116		<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Naphthalene	<0.008 mg/kg	TM116		<0.08 M	<0.08 M	<0.08 M	<0.08 M	<0.08 M	<0.08 M

CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

VOC MS (S)

Results Legend	Customer Sample Ref.	VS01	VS02	VS03	VS04	VS05	VS06
# ISO17025 accredited.	Depth (m)	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00
M MCERTS accredited.	Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
aq Aqueous / settled sample.	Date Sampled	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023
diss.filt Dissolved / filtered sample.	Sampled Time	.	.	.	.	.	.
tot.unfilt Total / unfiltered sample.	Date Received	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023
* Subcontracted - refer to subcontractor report for accreditation status.	SDG Ref	230914-112	230914-112	230914-112	230914-112	230914-112	230914-112
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	Lab Sample No.(s)	28630926	28630976	28630982	28630987	28630995	28631000
(F) Trigger breach confirmed	AGS Reference	ES	ES	ES	ES	ES	ES
1-4+ §@ Sample deviation (see appendix)							

Component	LOD/Units	Method						
1,2,3-Trichlorobenzene	<0.01 mg/kg	TM116	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #
1,3,5-Trichlorobenzene	<0.007 mg/kg	TM116	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07
Sum of Detected Xylenes	<0.02 mg/kg	TM116	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Sum of BTEX	<0.007 mg/kg	TM116	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07

VOC MS (S)

Results Legend

#	ISO17025 accredited.
M	MCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+ §@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	VS07	VS08	VS09	VS10	VS11	VS12
			Depth (m)	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023
			SDG Ref	230914-112	230914-112	230914-112	230914-112	230914-112	230914-112
			Lab Sample No.(s)	28631007	28631023	28631016	28630933	28630939	28630946
			AGS Reference	ES	ES	ES	ES	ES	ES
Dibromofluoromethane**	%	TM116		114	110	115	114	113	115
Toluene-d8**	%	TM116		96.8	98.3	101	97.1	97.7	100
4-Bromofluorobenzene**	%	TM116		100	107	101	97.2	104	102
Dichlorodifluoromethane	<0.0005 mg/kg	TM116		<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #
Chloromethane	<0.002 mg/kg	TM116		<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #
Vinyl Chloride	<0.0005 mg/kg	TM116		<0.005 @ M	<0.005 @ M	<0.005 @ M	<0.005 @ M	<0.005 @ M	<0.005 @ M
Bromomethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Chloroethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Trichlorofluorormethane	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M
1,1-Dichloroethene	<0.0005 mg/kg	TM116		<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #
Carbon Disulphide	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Dichloromethane	<0.005 mg/kg	TM116		<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #
Methyl Tertiary Butyl Ether	<0.0005 mg/kg	TM116		0.0123 M	<0.005 M	<0.005 M	0.0121 M	0.0194 M	<0.005 M
trans-1,2-Dichloroethene	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
1,1-Dichloroethane	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M
cis-1,2-Dichloroethene	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M
2,2-Dichloropropane	<0.001 mg/kg	TM116		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Bromochloromethane	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
Chloroform	<0.003 mg/kg	TM116		<0.03 M	<0.03 M	<0.03 M	<0.03 M	<0.03 M	<0.03 M
1,1,1-Trichloroethane	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M
1,1-Dichloropropene	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M
Carbontetrachloride	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M
1,2-Dichloroethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Benzene	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Trichloroethene	<0.001 mg/kg	TM116		<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #
1,2-Dichloropropane	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M
Dibromomethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 3 M	<0.01 M	<0.01 M	<0.01 3 M
Bromodichloromethane	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
cis-1,3-Dichloropropene	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M	<0.005 M
Toluene	<0.001 mg/kg	TM116		0.0111 M	<0.01 M	<0.01 M	0.0628 M	<0.01 M	<0.01 M
trans-1,3-Dichloropropene	<0.001 mg/kg	TM116		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,1,2-Trichloroethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M

CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

VOC MS (S)

Results Legend
ISO17025 accredited.
M MCERTS accredited.
aq Aqueous / settled sample.
diss.filt Dissolved / filtered sample.
tot.unfilt Total / unfiltered sample.
* Subcontracted - refer to subcontractor report for accreditation status.
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F) Trigger breach confirmed
1-4+ §@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	VS07	VS08	VS09	VS10	VS11	VS12
			Depth (m)	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023
			SDG Ref	230914-112	230914-112	230914-112	230914-112	230914-112	230914-112
			Lab Sample No.(s)	28631007	28631023	28631016	28630933	28630939	28630946
			AGS Reference	ES	ES	ES	ES	ES	ES
1,3-Dichloropropane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Tetrachloroethene	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
Dibromochloromethane	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
1,2-Dibromoethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Chlorobenzene	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
1,1,1,2-Tetrachloroethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Ethylbenzene	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
p/m-Xylene	<0.002 mg/kg	TM116		<0.02 #	<0.02 #	<0.02 #	0.0252 #	<0.02 #	<0.02 #
o-Xylene	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
Styrene	<0.002 mg/kg	TM116		<0.02 @ #	<0.02 @ #	<0.02 @ #	<0.02 @ #	<0.02 @ #	<0.02 @ #
Bromoform	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
Isopropylbenzene	<0.002 mg/kg	TM116		<0.02 #	<0.02 #	<0.02 3 #	<0.02 #	<0.02 #	<0.02 3 #
1,1,2,2-Tetrachloroethane	<0.002 mg/kg	TM116		<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #
1,2,3-Trichloropropane	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
Bromobenzene	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
Propylbenzene	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
2-Chlorotoluene	<0.003 mg/kg	TM116		<0.03 M	<0.03 M	<0.03 M	<0.03 M	<0.03 M	<0.03 M
1,3,5-Trimethylbenzene	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M	<0.02 M
4-Chlorotoluene	<0.003 mg/kg	TM116		<0.03 M	<0.03 M	<0.03 M	<0.03 M	<0.03 M	<0.03 M
tert-Butylbenzene	<0.002 mg/kg	TM116		<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #
1,2,4-Trimethylbenzene	<0.003 mg/kg	TM116		<0.03 #	<0.03 #	<0.03 #	<0.03 #	<0.03 #	<0.03 #
sec-Butylbenzene	<0.001 mg/kg	TM116		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
4-Isopropyltoluene	<0.002 mg/kg	TM116		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
1,3-Dichlorobenzene	<0.005 mg/kg	TM116		<0.05 M	<0.05 M	<0.05 M	<0.05 M	<0.05 M	<0.05 M
1,4-Dichlorobenzene	<0.005 mg/kg	TM116		<0.05 M	<0.05 M	<0.05 M	<0.05 M	<0.05 M	<0.05 M
n-Butylbenzene	<0.003 mg/kg	TM116		<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
1,2-Dichlorobenzene	<0.005 mg/kg	TM116		<0.05 M	<0.05 M	<0.05 M	<0.05 M	<0.05 M	<0.05 M
1,2-Dibromo-3-chloropropane	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 3 M	<0.02 M	<0.02 M	<0.02 3 M
Tert-amyl methyl ether	<0.001 mg/kg	TM116		<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #
1,2,4-Trichlorobenzene	<0.007 mg/kg	TM116		<0.07	<0.07	<0.07	<0.07	<0.07	<0.07
Hexachlorobutadiene	<0.004 mg/kg	TM116		<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Naphthalene	<0.008 mg/kg	TM116		<0.08 M	<0.08 M	<0.08 M	<0.08 M	<0.08 M	<0.08 M

CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

VOC MS (S)

Results Legend	Customer Sample Ref.	VS07	VS08	VS09	VS10	VS11	VS12
# ISO17025 accredited.	Depth (m)	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00
M MCERTS accredited.	Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
aq Aqueous / settled sample.	Date Sampled	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023
diss.filt Dissolved / filtered sample.	Sampled Time	.	.	.	.	.	.
tot.unfilt Total / unfiltered sample.	Date Received	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023
* Subcontracted - refer to subcontractor report for accreditation status.	SDG Ref	230914-112	230914-112	230914-112	230914-112	230914-112	230914-112
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	Lab Sample No.(s)	28631007	28631023	28631016	28630933	28630939	28630946
(F) Trigger breach confirmed	AGS Reference	ES	ES	ES	ES	ES	ES
1-4+ §@ Sample deviation (see appendix)							

Component	LOD/Units	Method						
1,2,3-Trichlorobenzene	<0.01 mg/kg	TM116	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #
1,3,5-Trichlorobenzene	<0.007 mg/kg	TM116	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07
Sum of Detected Xylenes	<0.02 mg/kg	TM116	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Sum of BTEX	<0.007 mg/kg	TM116	<0.07	<0.07	<0.07	0.088	<0.07	<0.07

VOC MS (S)

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+ §@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	VS13	VS14	VS15	VS16		
			Depth (m)	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00		
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
			Date Sampled	08/09/2023	08/09/2023	08/09/2023	08/09/2023		
			Sampled Time	.	.	.	.		
			Date Received	14/09/2023	14/09/2023	14/09/2023	14/09/2023		
			SDG Ref	230914-112	230914-112	230914-112	230914-112		
			Lab Sample No.(s)	28630952	28630959	28630965	28630970		
			AGS Reference	ES	ES	ES	ES		
Dibromofluoromethane**	%	TM116		116	115	116	112		
Toluene-d8**	%	TM116		110	93.9	99.3	98.1		
4-Bromofluorobenzene**	%	TM116		96.6	99.3	97.2	105		
Dichlorodifluoromethane	<0.0005 mg/kg	TM116		<0.005 #	<0.005 #	<0.005 #	<0.005 #		
Chloromethane	<0.002 mg/kg	TM116		<0.02 #	<0.02 #	<0.02 #	<0.02 #		
Vinyl Chloride	<0.0005 mg/kg	TM116		<0.005 @ M	<0.005 @ M	<0.005 @ M	<0.005 @ M		
Bromomethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M		
Chloroethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M		
Trichlorofluorormethane	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M		
1,1-Dichloroethene	<0.0005 mg/kg	TM116		<0.005 #	<0.005 #	<0.005 #	<0.005 #		
Carbon Disulphide	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M		
Dichloromethane	<0.005 mg/kg	TM116		<0.05 #	<0.05 #	<0.05 #	<0.05 #		
Methyl Tertiary Butyl Ether	<0.0005 mg/kg	TM116		0.0111 M	0.0102 M	<0.005 M	<0.005 M		
trans-1,2-Dichloroethene	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M		
1,1-Dichloroethane	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M		
cis-1,2-Dichloroethene	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M		
2,2-Dichloropropane	<0.001 mg/kg	TM116		<0.01	<0.01	<0.01	<0.01		
Bromochloromethane	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M		
Chloroform	<0.003 mg/kg	TM116		<0.03 M	<0.03 M	<0.03 M	<0.03 M		
1,1,1-Trichloroethane	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M		
1,1-Dichloropropene	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M		
Carbontetrachloride	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M		
1,2-Dichloroethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M		
Benzene	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M		
Trichloroethene	<0.001 mg/kg	TM116		<0.01 #	<0.01 #	<0.01 #	<0.01 #		
1,2-Dichloropropane	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M		
Dibromomethane	<0.001 mg/kg	TM116		<0.01 3 M	<0.01 3 M	<0.01 M	<0.01 M		
Bromodichloromethane	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M		
cis-1,3-Dichloropropene	<0.0005 mg/kg	TM116		<0.005 M	<0.005 M	<0.005 M	<0.005 M		
Toluene	<0.001 mg/kg	TM116		0.0184 M	<0.01 M	<0.01 M	<0.01 M		
trans-1,3-Dichloropropene	<0.001 mg/kg	TM116		<0.01	<0.01	<0.01	<0.01		
1,1,2-Trichloroethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M		

VOC MS (S)

Results Legend
- # ISO17025 accredited.
- M MCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+ §@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	VS13	VS14	VS15	VS16		
			Depth (m)	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00		
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
			Date Sampled	08/09/2023	08/09/2023	08/09/2023	08/09/2023		
			Sampled Time	.	.	.	.		
			Date Received	14/09/2023	14/09/2023	14/09/2023	14/09/2023		
			SDG Ref	230914-112	230914-112	230914-112	230914-112		
			Lab Sample No.(s)	28630952	28630959	28630965	28630970		
			AGS Reference	ES	ES	ES	ES		
1,3-Dichloropropane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M		
Tetrachloroethene	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M		
Dibromochloromethane	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M		
1,2-Dibromoethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M		
Chlorobenzene	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M		
1,1,1,2-Tetrachloroethane	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M		
Ethylbenzene	<0.001 mg/kg	TM116		<0.01 M	<0.01 M	<0.01 M	<0.01 M		
p/m-Xylene	<0.002 mg/kg	TM116		<0.02 #	<0.02 #	<0.02 #	<0.02 #		
o-Xylene	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M		
Styrene	<0.002 mg/kg	TM116		<0.02 @ #	<0.02 @ #	<0.02 @ #	<0.02 @ #		
Bromoform	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M		
Isopropylbenzene	<0.002 mg/kg	TM116		<0.02 3 #	<0.02 3 #	<0.02 #	<0.02 #		
1,1,2,2-Tetrachloroethane	<0.002 mg/kg	TM116		<0.02 #	<0.02 #	<0.02 #	<0.02 #		
1,2,3-Trichloropropane	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M		
Bromobenzene	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M		
Propylbenzene	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M		
2-Chlorotoluene	<0.003 mg/kg	TM116		<0.03 M	<0.03 M	<0.03 M	<0.03 M		
1,3,5-Trimethylbenzene	<0.002 mg/kg	TM116		<0.02 M	<0.02 M	<0.02 M	<0.02 M		
4-Chlorotoluene	<0.003 mg/kg	TM116		<0.03 M	<0.03 M	<0.03 M	<0.03 M		
tert-Butylbenzene	<0.002 mg/kg	TM116		<0.02 #	<0.02 #	<0.02 #	<0.02 #		
1,2,4-Trimethylbenzene	<0.003 mg/kg	TM116		<0.03 #	<0.03 #	<0.03 #	<0.03 #		
sec-Butylbenzene	<0.001 mg/kg	TM116		<0.01	<0.01	<0.01	<0.01		
4-Isopropyltoluene	<0.002 mg/kg	TM116		<0.02	<0.02	<0.02	<0.02		
1,3-Dichlorobenzene	<0.005 mg/kg	TM116		<0.05 M	<0.05 M	<0.05 M	<0.05 M		
1,4-Dichlorobenzene	<0.005 mg/kg	TM116		<0.05 M	<0.05 M	<0.05 M	<0.05 M		
n-Butylbenzene	<0.003 mg/kg	TM116		<0.03	<0.03	<0.03	<0.03		
1,2-Dichlorobenzene	<0.005 mg/kg	TM116		<0.05 M	<0.05 M	<0.05 M	<0.05 M		
1,2-Dibromo-3-chloropropane	<0.002 mg/kg	TM116		<0.02 3 M	<0.02 3 M	<0.02 M	<0.02 M		
Tert-amyl methyl ether	<0.001 mg/kg	TM116		<0.01 #	<0.01 #	<0.01 #	<0.01 #		
1,2,4-Trichlorobenzene	<0.007 mg/kg	TM116		<0.07	<0.07	<0.07	<0.07		
Hexachlorobutadiene	<0.004 mg/kg	TM116		<0.04	<0.04	<0.04	<0.04		
Naphthalene	<0.008 mg/kg	TM116		<0.08 M	<0.08 M	<0.08 M	<0.08 M		

CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

VOC MS (S)

Results Legend		Customer Sample Ref.	VS13	VS14	VS15	VS16		
#	ISO17025 accredited.	Depth (m)	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00		
M	mCERTS accredited.	Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
aq	Aqueous / settled sample.	Date Sampled	08/09/2023	08/09/2023	08/09/2023	08/09/2023		
diss.filt	Dissolved / filtered sample.	Sampled Time	.	.	.	.		
tot.unfilt	Total / unfiltered sample.	Date Received	14/09/2023	14/09/2023	14/09/2023	14/09/2023		
*	Subcontracted - refer to subcontractor report for accreditation status.	SDG Ref	230914-112	230914-112	230914-112	230914-112		
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	Lab Sample No.(s)	28630952	28630959	28630965	28630970		
(F)	Trigger breach confirmed	AGS Reference	ES	ES	ES	ES		
1-4+ §@	Sample deviation (see appendix)							

Component	LOD/Units	Method						
1,2,3-Trichlorobenzene	<0.01 mg/kg	TM116	<0.1 #	<0.1 #	<0.1 #	<0.1 #		
1,3,5-Trichlorobenzene	<0.007 mg/kg	TM116	<0.07	<0.07	<0.07	<0.07		
Sum of Detected Xylenes	<0.02 mg/kg	TM116	<0.2	<0.2	<0.2	<0.2		
Sum of BTEX	<0.007 mg/kg	TM116	<0.07	<0.07	<0.07	<0.07		

CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Asbestos Identification - Solid Samples

Results Legend
ISO17025 accredited.
M MCERTS accredited.
* Subcontracted test.
(F) Trigger breach confirmed
1-5&+§@ Sample deviation (see appendix)

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Asbestos Actinolite	Asbestos Anthophyllite	Asbestos Tremolite	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	VS01ES 4.00 - 4.00 SOLID 08/09/2023 00:00:00 14/09/2023 05:00:00 230914-112 28630926 TM048	21/09/2023	Alex Horner	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	VS02ES 4.00 - 4.00 SOLID 08/09/2023 00:00:00 14/09/2023 05:00:00 230914-112 28630976 TM048	21/09/2023	Alex Horner	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	VS03ES 4.00 - 4.00 SOLID 08/09/2023 00:00:00 14/09/2023 05:00:00 230914-112 28630982 TM048	21/09/2023	Alex Horner	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	VS04ES 4.00 - 4.00 SOLID 08/09/2023 00:00:00 14/09/2023 05:00:00 230914-112 28630987 TM048	21/09/2023	Alex Horner	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	VS05ES 4.00 - 4.00 SOLID 08/09/2023 00:00:00 14/09/2023 05:00:00 230914-112 28630995 TM048	21/09/2023	Paul Poynton	N/A	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	VS06ES 4.00 - 4.00 SOLID 08/09/2023 00:00:00 14/09/2023 05:00:00 230914-112 28631000 TM048	21/09/2023	Alex Horner	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	VS07ES 4.00 - 4.00 SOLID 08/09/2023 00:00:00 14/09/2023 05:00:00 230914-112 28631007 TM048	21/09/2023	Alex Horner	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	VS08ES 4.00 - 4.00 SOLID 08/09/2023 00:00:00 14/09/2023 05:00:00 230914-112 28631023 TM048	21/09/2023	Paul Poynton	N/A	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Asbestos Actinolite	Asbestos Anthophyllite	Asbestos Tremolite	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	VS09ES 4.00 - 4.00 SOLID 08/09/2023 00:00:00 14/09/2023 05:00:00 230914-112 28631016 TM048	21/09/2023	Alex Horner	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	VS10ES 4.00 - 4.00 SOLID 08/09/2023 00:00:00 14/09/2023 05:00:00 230914-112 28630933 TM048	21/09/2023	Paul Poynton	N/A	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	VS11ES 4.00 - 4.00 SOLID 08/09/2023 00:00:00 14/09/2023 05:00:00 230914-112 28630939 TM048	21/09/2023	Paul Poynton	N/A	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	VS12ES 4.00 - 4.00 SOLID 08/09/2023 00:00:00 14/09/2023 05:00:00 230914-112 28630946 TM048	21/09/2023	Alex Horner	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	VS13ES 4.00 - 4.00 SOLID 08/09/2023 00:00:00 14/09/2023 05:00:00 230914-112 28630952 TM048	21/09/2023	Alex Horner	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	VS14ES 4.00 - 4.00 SOLID 08/09/2023 00:00:00 14/09/2023 05:00:00 230914-112 28630959 TM048	22/09/2023	Paul Poynton	N/A	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	VS15ES 4.00 - 4.00 SOLID 08/09/2023 00:00:00 14/09/2023 05:00:00 230914-112 28630965 TM048	21/09/2023	Alex Horner	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	VS16ES 4.00 - 4.00 SOLID 08/09/2023 00:00:00 14/09/2023 05:00:00 230914-112 28630970 TM048	22/09/2023	Paul Poynton	N/A	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

Table of Results - Appendix

Method No	Description
TM048	Identification of Asbestos in Bulk Material
TM218	The determination of PAH in soil samples by GC-MS
TM222	Determination of Hot Water Soluble Boron in Soils (10:1 Water:Soil) by ICP OES.
PM024	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM089	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM151	Determination of Hexavalent Chromium using Kone analyser
TM181	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM157	Determination of SVOC in Soils by GC-MS extracted by sonication in DCM/Acetone
TM414	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID
TM116	Determination of Volatile Organic Compounds by Headspace / GC-MS

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden (Method codes TM).

CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Test Completion Dates

Lab Sample No(s)	28630926	28630976	28630982	28630987	28630995	28631000	28631007	28631023	28631016	28630933
Customer Sample Ref	VS01	VS02	VS03	VS04	VS05	VS06	VS07	VS08	VS09	VS10
AGS Ref.	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
Depth	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Asbestos ID in Solid Samples	21-Sep-2023	22-Sep-2023	21-Sep-2023	21-Sep-2023	21-Sep-2023	22-Sep-2023	22-Sep-2023	21-Sep-2023	22-Sep-2023	21-Sep-2023
Boron Water Soluble	19-Sep-2023	19-Sep-2023	19-Sep-2023	19-Sep-2023	19-Sep-2023	19-Sep-2023	19-Sep-2023	19-Sep-2023	19-Sep-2023	21-Sep-2023
EPH CWG GC (S)	19-Sep-2023	16-Sep-2023	21-Sep-2023	21-Sep-2023	20-Sep-2023	21-Sep-2023	21-Sep-2023	21-Sep-2023	16-Sep-2023	16-Sep-2023
GRO by GC-FID (S)	19-Sep-2023	19-Sep-2023	19-Sep-2023	20-Sep-2023	20-Sep-2023	19-Sep-2023	19-Sep-2023	19-Sep-2023	19-Sep-2023	19-Sep-2023
Hexavalent Chromium (s)	20-Sep-2023	20-Sep-2023	20-Sep-2023	20-Sep-2023	20-Sep-2023	20-Sep-2023	20-Sep-2023	20-Sep-2023	20-Sep-2023	20-Sep-2023
Metals in solid samples by OES	19-Sep-2023	19-Sep-2023	19-Sep-2023	18-Sep-2023	19-Sep-2023	19-Sep-2023	19-Sep-2023	19-Sep-2023	19-Sep-2023	19-Sep-2023
PAH by GCMS	20-Sep-2023	20-Sep-2023	20-Sep-2023	20-Sep-2023	25-Sep-2023	20-Sep-2023	20-Sep-2023	20-Sep-2023	20-Sep-2023	20-Sep-2023
Sample description	15-Sep-2023	15-Sep-2023	15-Sep-2023	15-Sep-2023	15-Sep-2023	15-Sep-2023	15-Sep-2023	15-Sep-2023	15-Sep-2023	15-Sep-2023
Semi Volatile Organic Compounds	21-Sep-2023	21-Sep-2023	21-Sep-2023	21-Sep-2023	21-Sep-2023	21-Sep-2023	21-Sep-2023	21-Sep-2023	21-Sep-2023	21-Sep-2023
TPH CWG GC (S)	19-Sep-2023	19-Sep-2023	21-Sep-2023	21-Sep-2023	20-Sep-2023	21-Sep-2023	21-Sep-2023	21-Sep-2023	19-Sep-2023	19-Sep-2023
VOC MS (S)	18-Sep-2023	18-Sep-2023	18-Sep-2023	18-Sep-2023	18-Sep-2023	19-Sep-2023	19-Sep-2023	19-Sep-2023	18-Sep-2023	19-Sep-2023

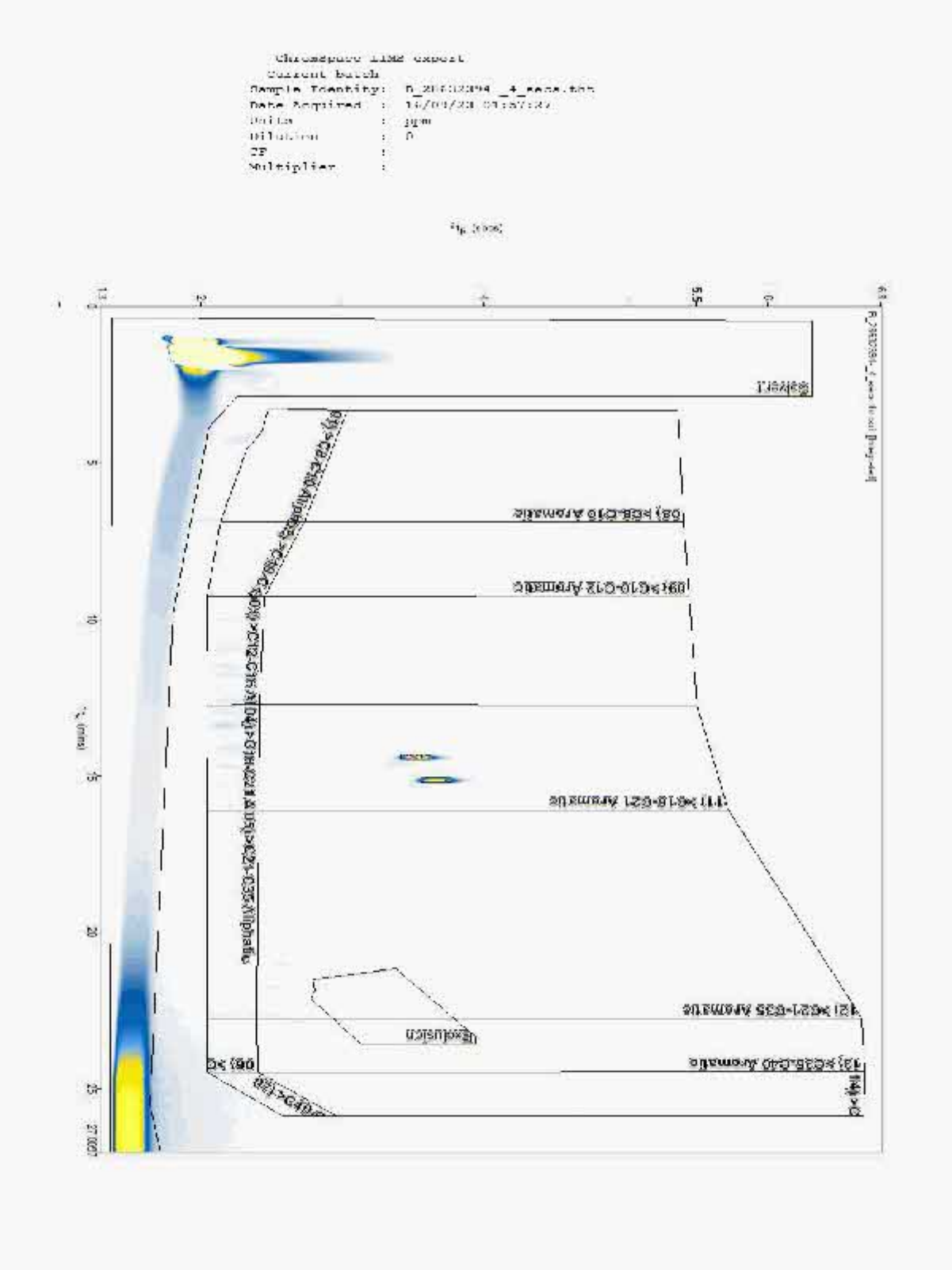
Lab Sample No(s)	28630939	28630946	28630952	28630959	28630965	28630970
Customer Sample Ref	VS11	VS12	VS13	VS14	VS15	VS16
AGS Ref.	ES	ES	ES	ES	ES	ES
Depth	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00	4.00 - 4.00
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Asbestos ID in Solid Samples	21-Sep-2023	22-Sep-2023	22-Sep-2023	22-Sep-2023	21-Sep-2023	22-Sep-2023
Boron Water Soluble	19-Sep-2023	19-Sep-2023	19-Sep-2023	19-Sep-2023	19-Sep-2023	21-Sep-2023
EPH CWG GC (S)	16-Sep-2023	21-Sep-2023	21-Sep-2023	21-Sep-2023	21-Sep-2023	21-Sep-2023
GRO by GC-FID (S)	19-Sep-2023	19-Sep-2023	19-Sep-2023	19-Sep-2023	20-Sep-2023	19-Sep-2023
Hexavalent Chromium (s)	20-Sep-2023	20-Sep-2023	20-Sep-2023	20-Sep-2023	20-Sep-2023	20-Sep-2023
Metals in solid samples by OES	19-Sep-2023	19-Sep-2023	19-Sep-2023	18-Sep-2023	19-Sep-2023	18-Sep-2023
PAH by GCMS	20-Sep-2023	20-Sep-2023	20-Sep-2023	20-Sep-2023	20-Sep-2023	20-Sep-2023
Sample description	15-Sep-2023	15-Sep-2023	15-Sep-2023	15-Sep-2023	15-Sep-2023	15-Sep-2023
Semi Volatile Organic Compounds	21-Sep-2023	21-Sep-2023	21-Sep-2023	21-Sep-2023	21-Sep-2023	21-Sep-2023
TPH CWG GC (S)	19-Sep-2023	21-Sep-2023	21-Sep-2023	21-Sep-2023	21-Sep-2023	21-Sep-2023
VOC MS (S)	19-Sep-2023	18-Sep-2023	18-Sep-2023	18-Sep-2023	19-Sep-2023	19-Sep-2023

CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28632394 **Depth :** 4.00 - 4.00
Sample ID : VS10

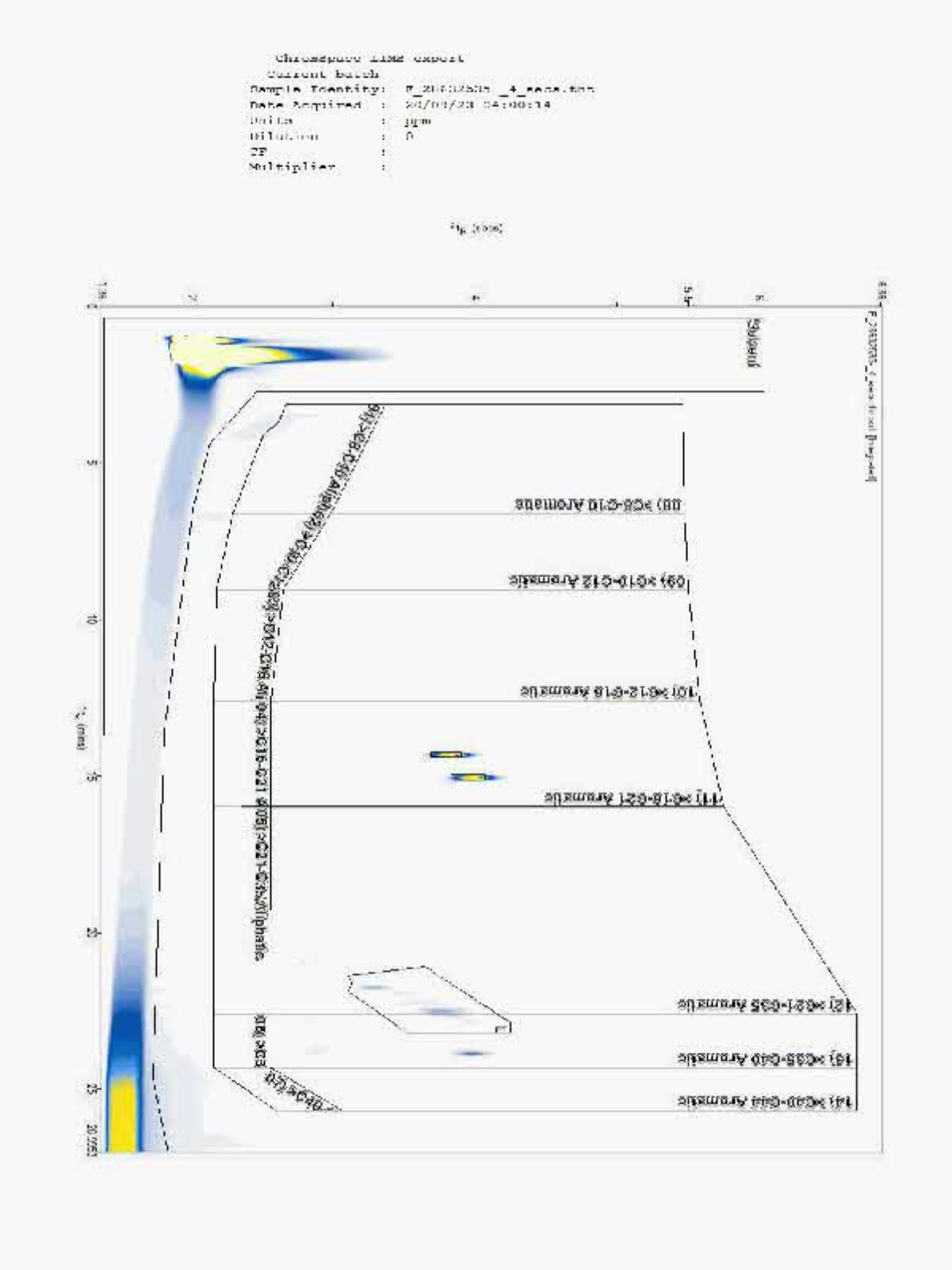


CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28632535 **Depth :** 4.00 - 4.00
Sample ID : VS08

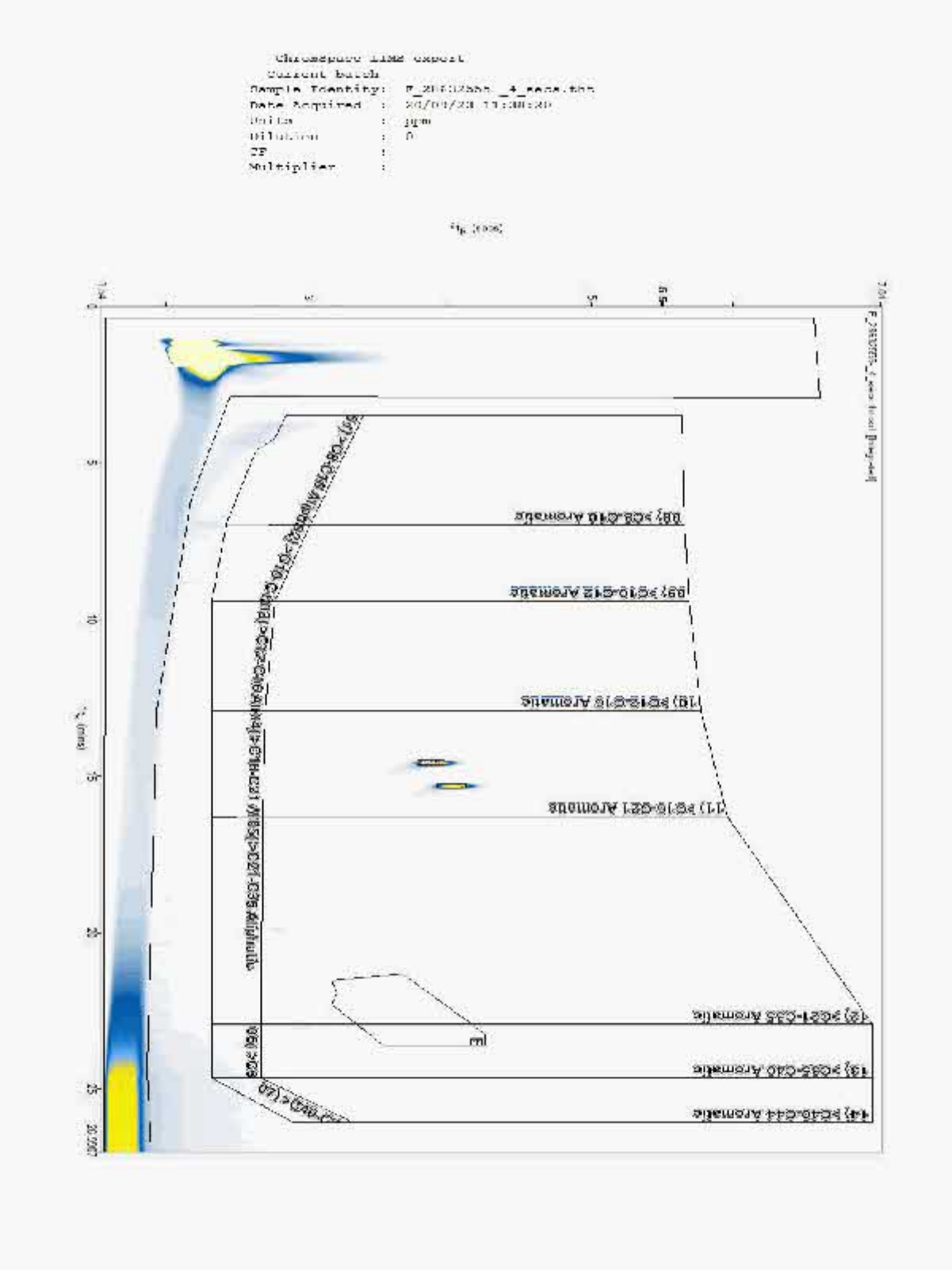


CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28632555 **Depth :** 4.00 - 4.00
Sample ID : VS15

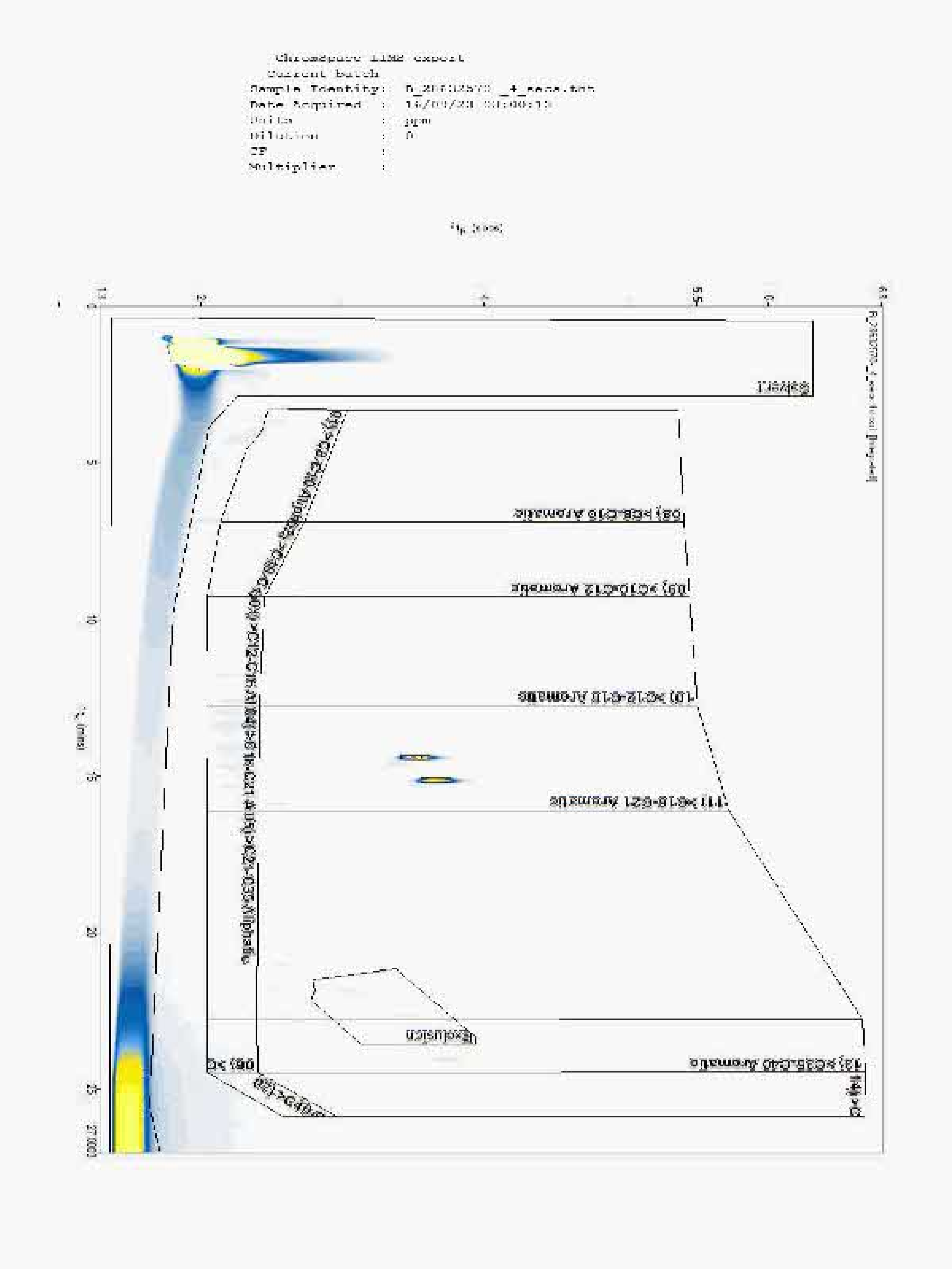


Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 28632570
Sample ID : VS09

Depth : 4.00 - 4.00

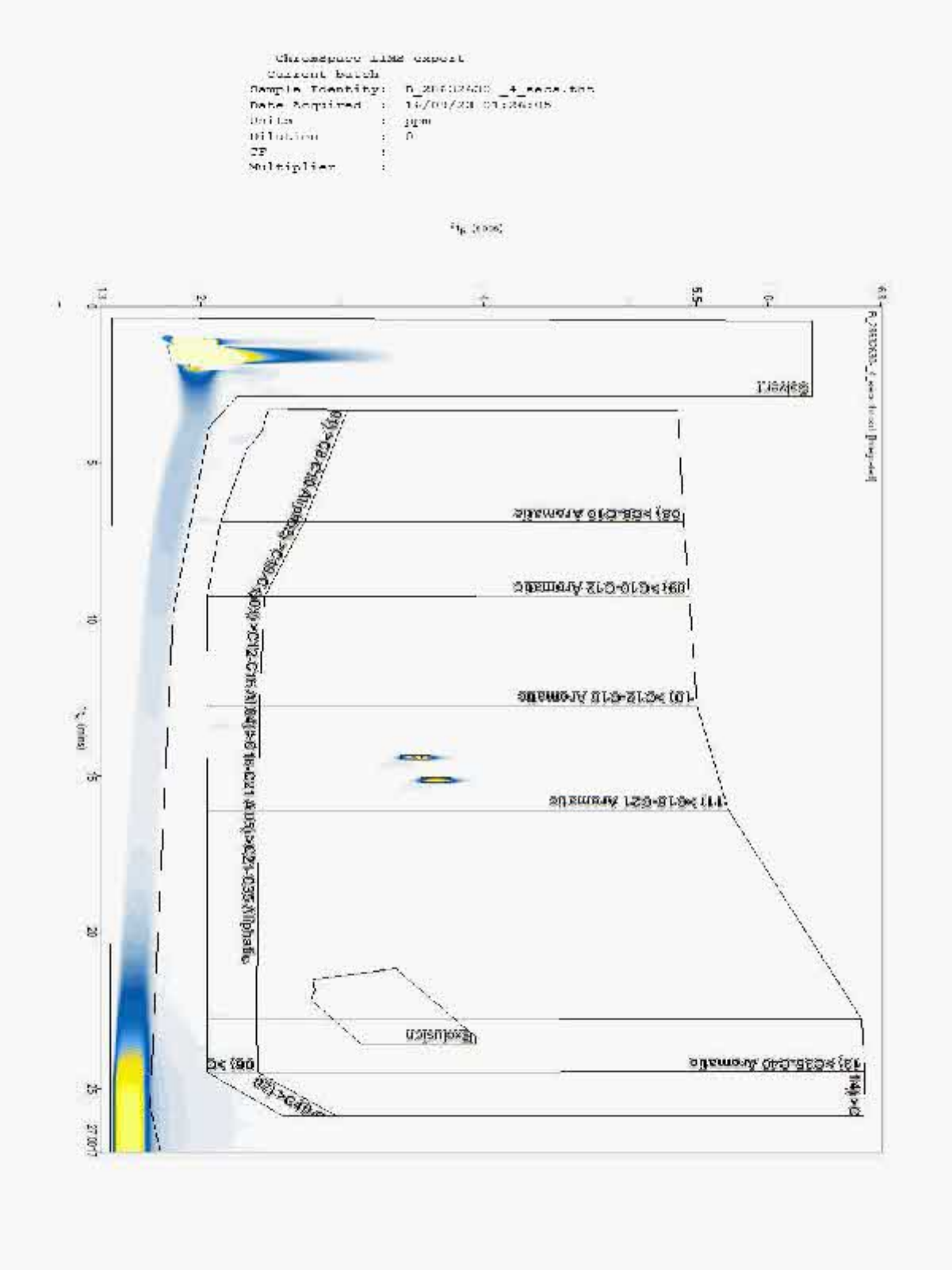


CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

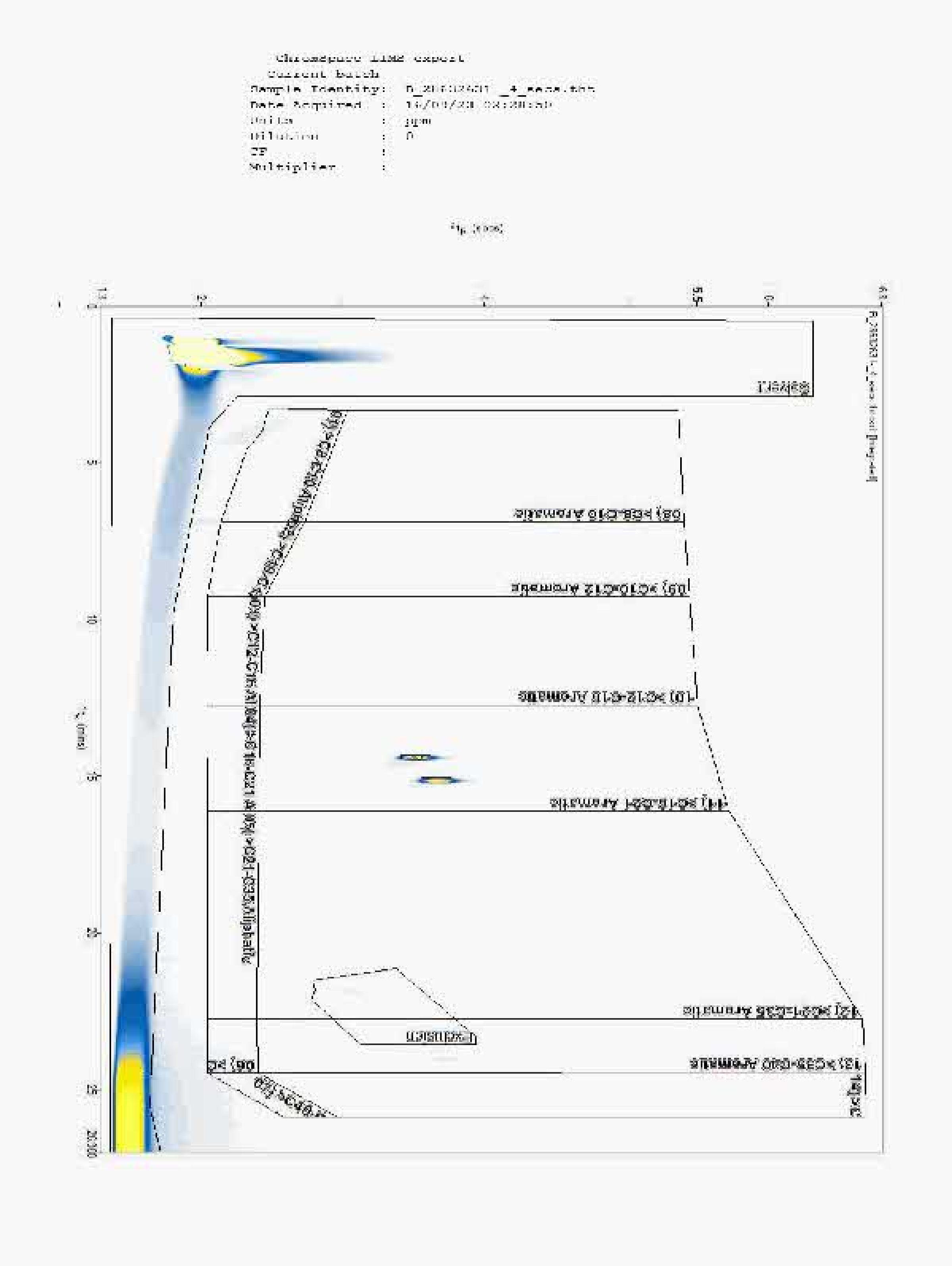
Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28632630 **Depth :** 4.00 - 4.00
Sample ID : VS11



Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28632631 **Depth :** 4.00 - 4.00
Sample ID : VS01

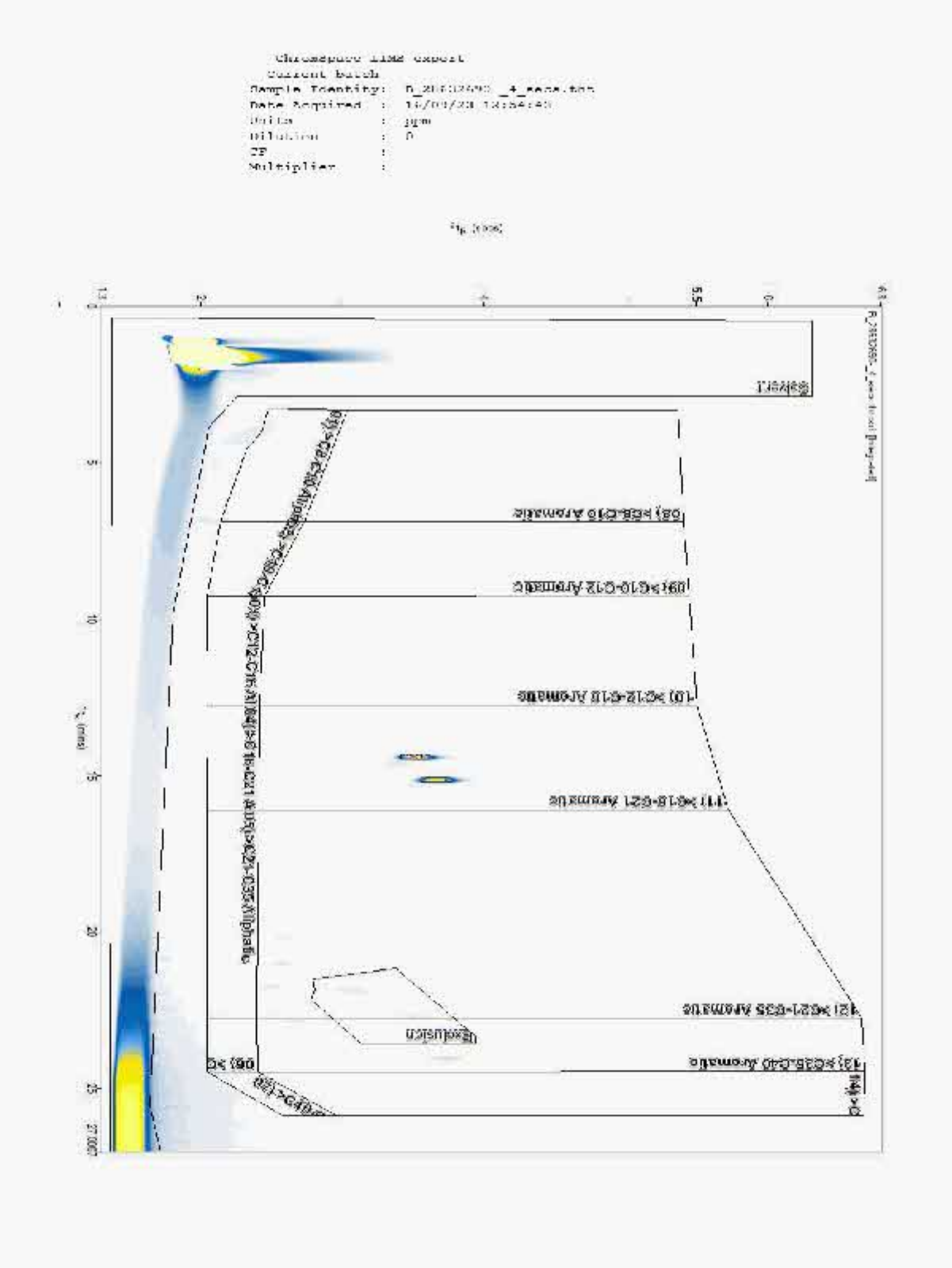


CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28632690 **Depth :** 4.00 - 4.00
Sample ID : VS02

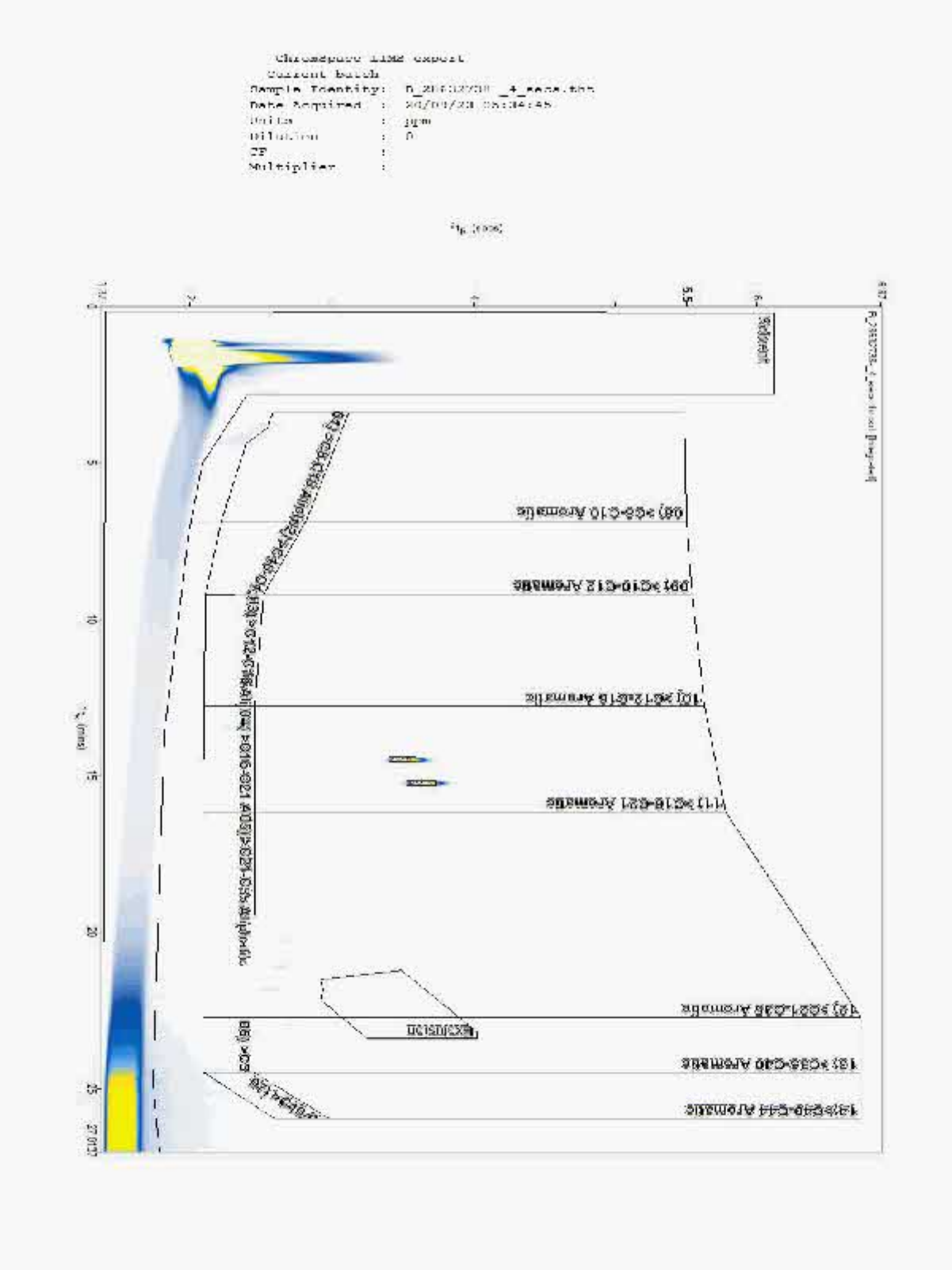


CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28632738 **Depth :** 4.00 - 4.00
Sample ID : VS07

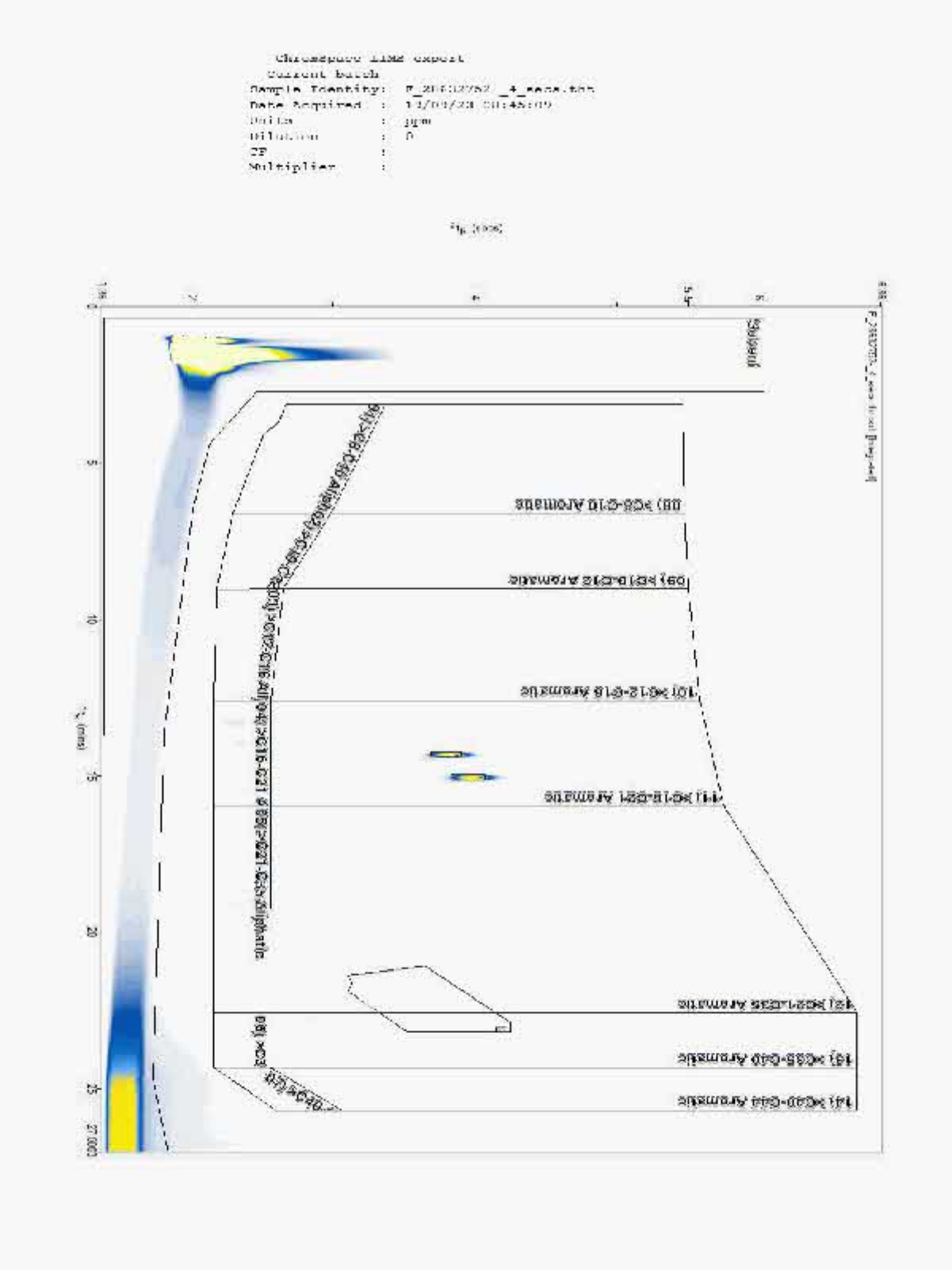


CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28632752 **Depth :** 4.00 - 4.00
Sample ID : VS05

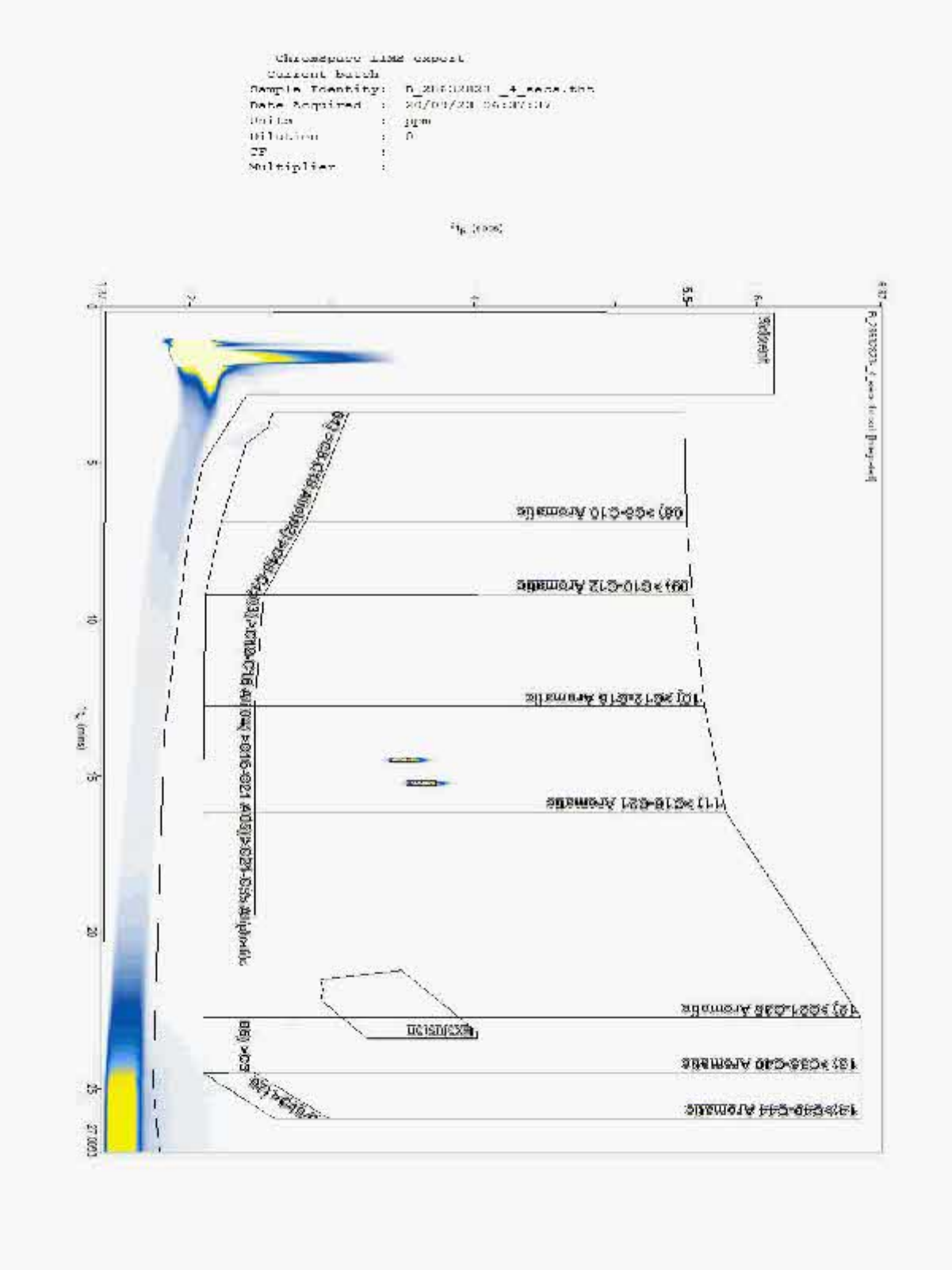


CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28632823 **Depth :** 4.00 - 4.00
Sample ID : VS13

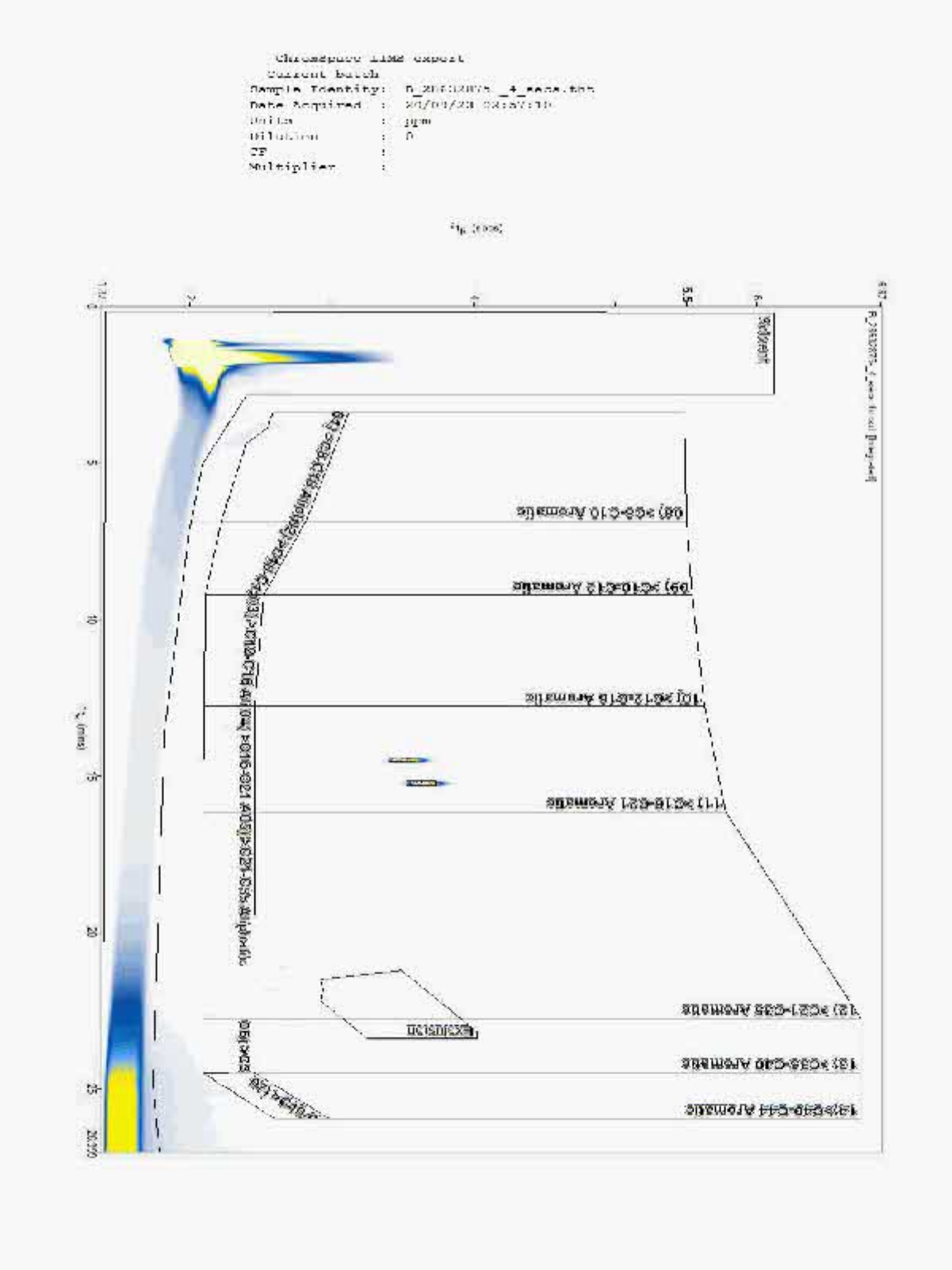


CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28632875 **Depth :** 4.00 - 4.00
Sample ID : VS06

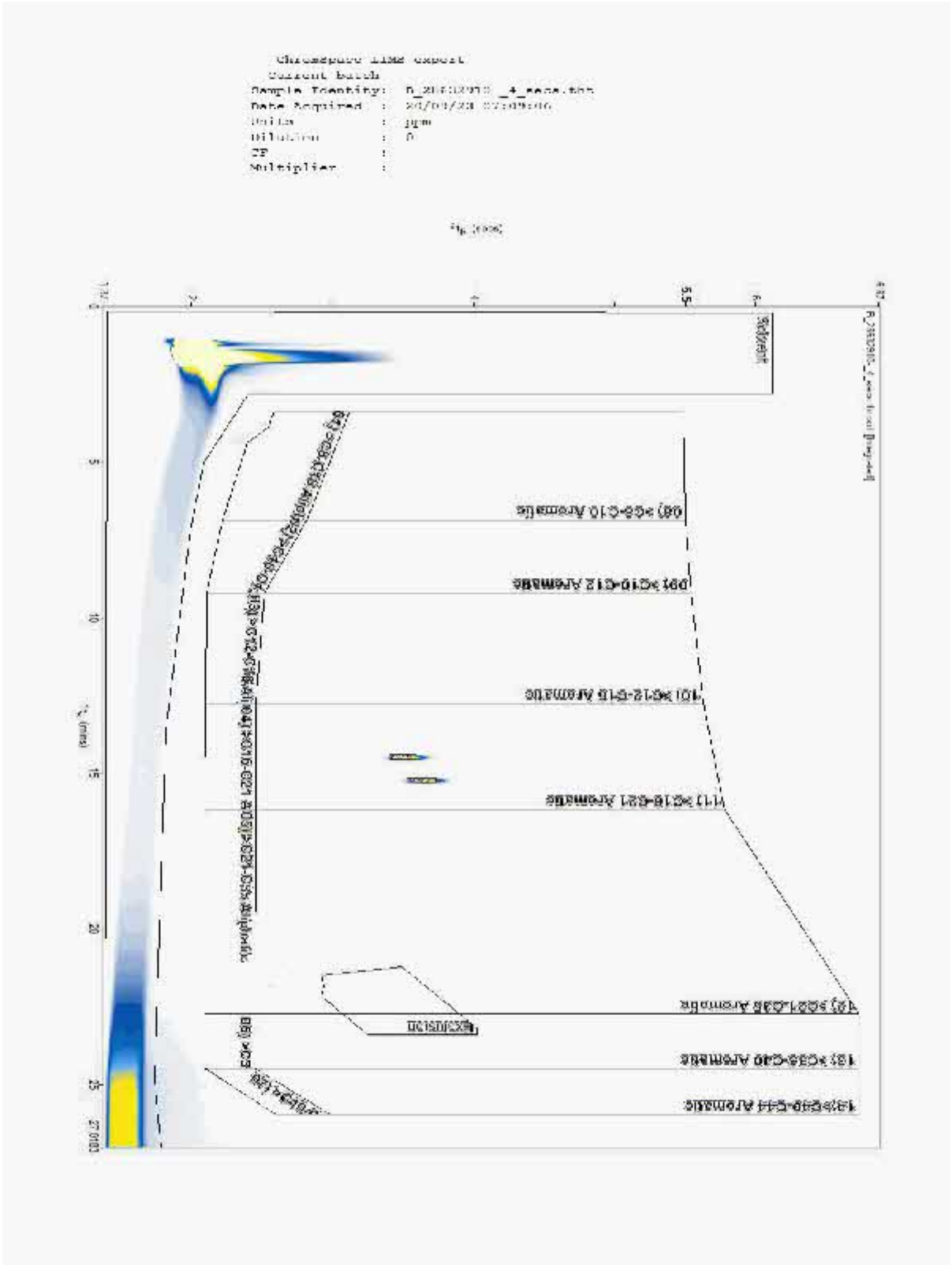


CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28632910 **Depth :** 4.00 - 4.00
Sample ID : VS12

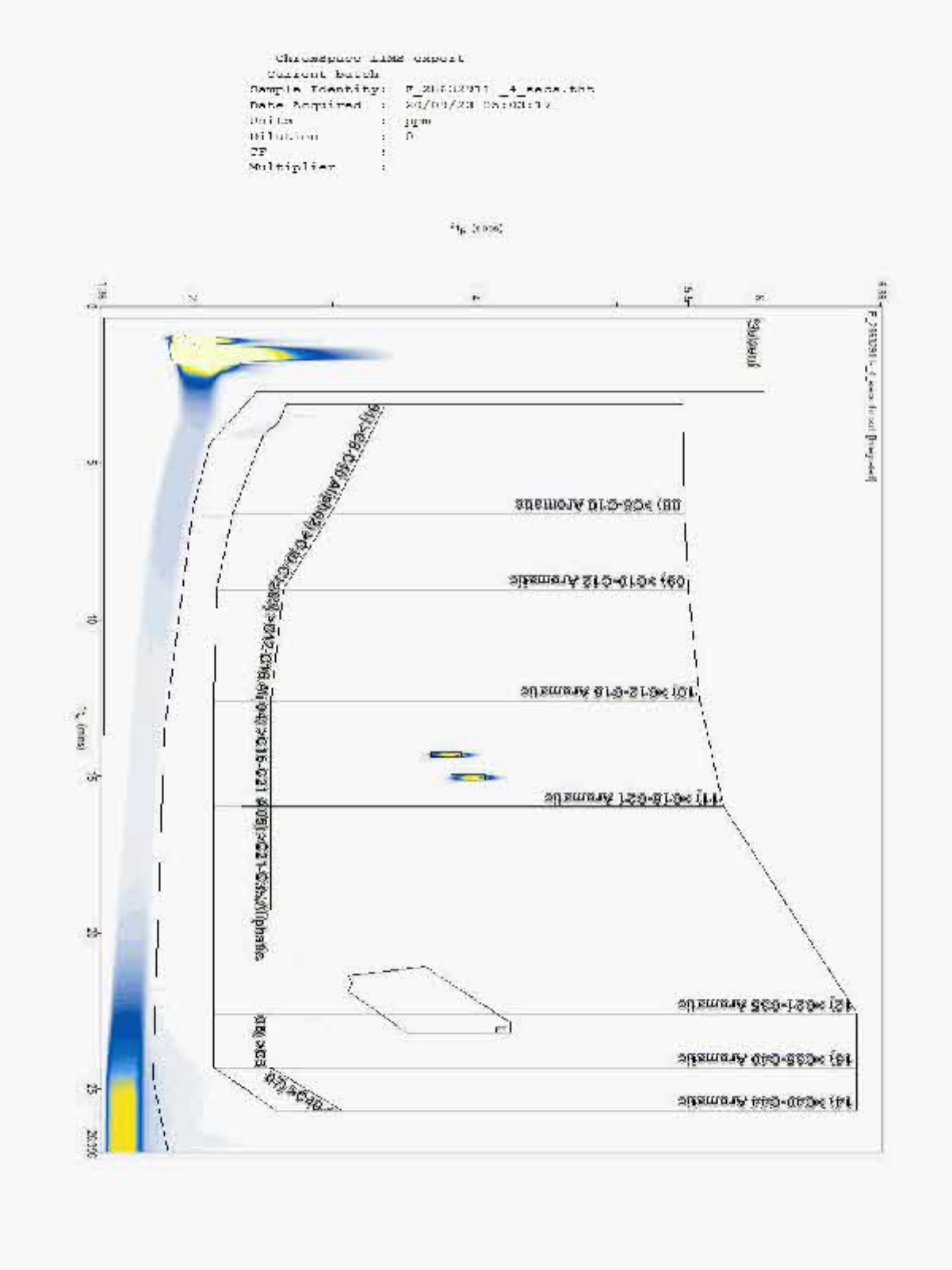


CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28632911 **Depth :** 4.00 - 4.00
Sample ID : VS16

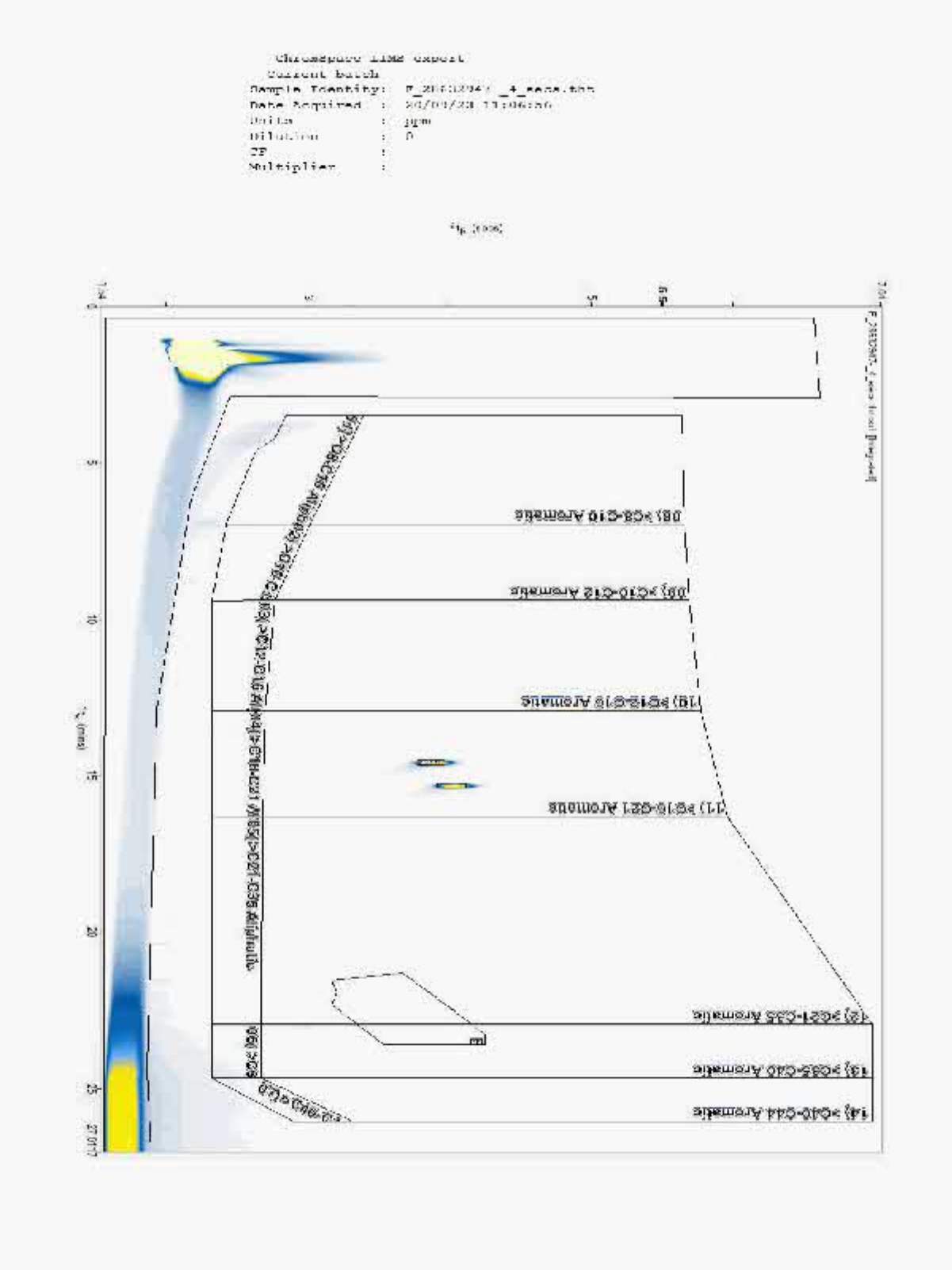


CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28632947 **Depth :** 4.00 - 4.00
Sample ID : VS04

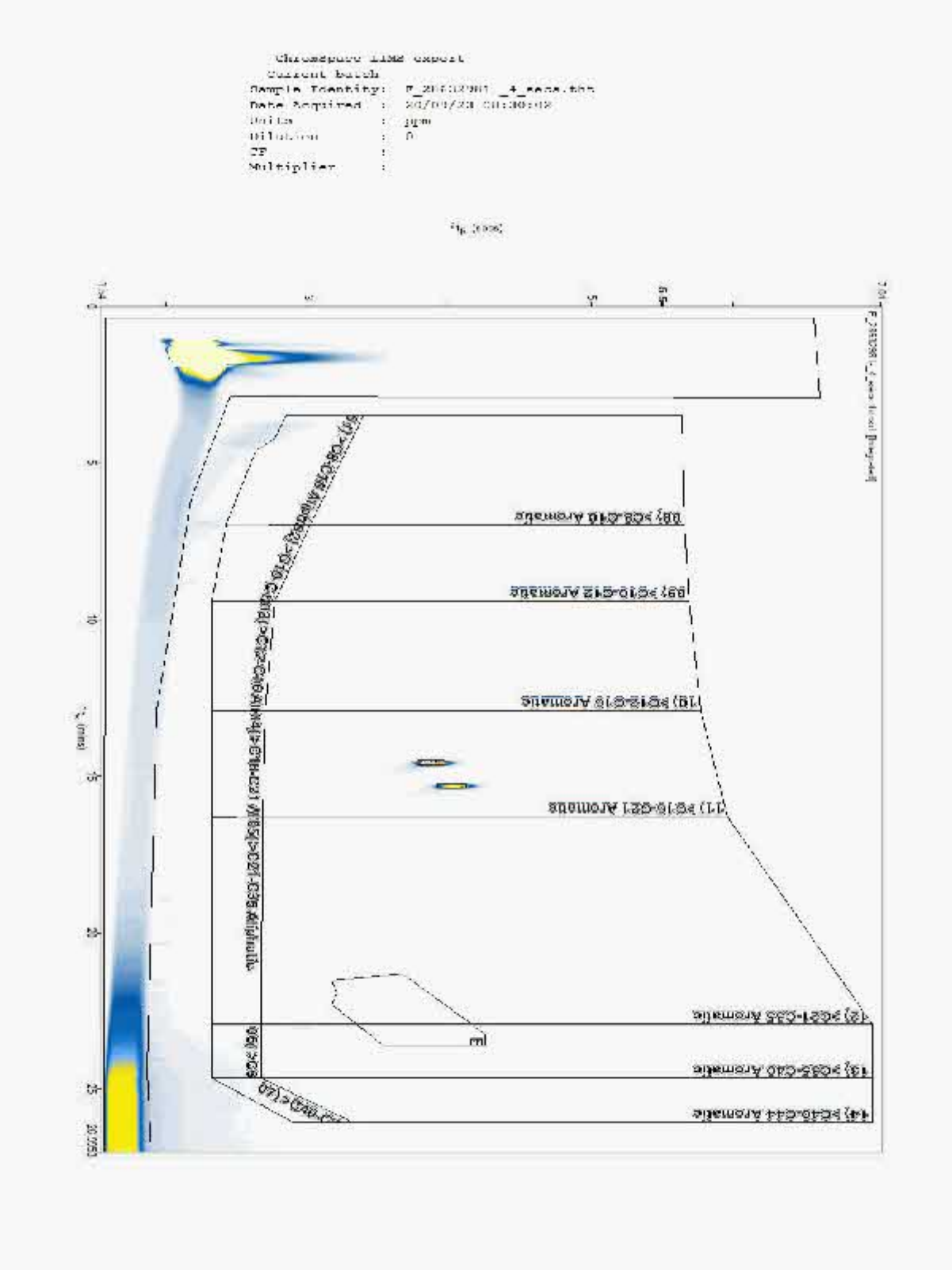


CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28632981 **Depth :** 4.00 - 4.00
Sample ID : VS14

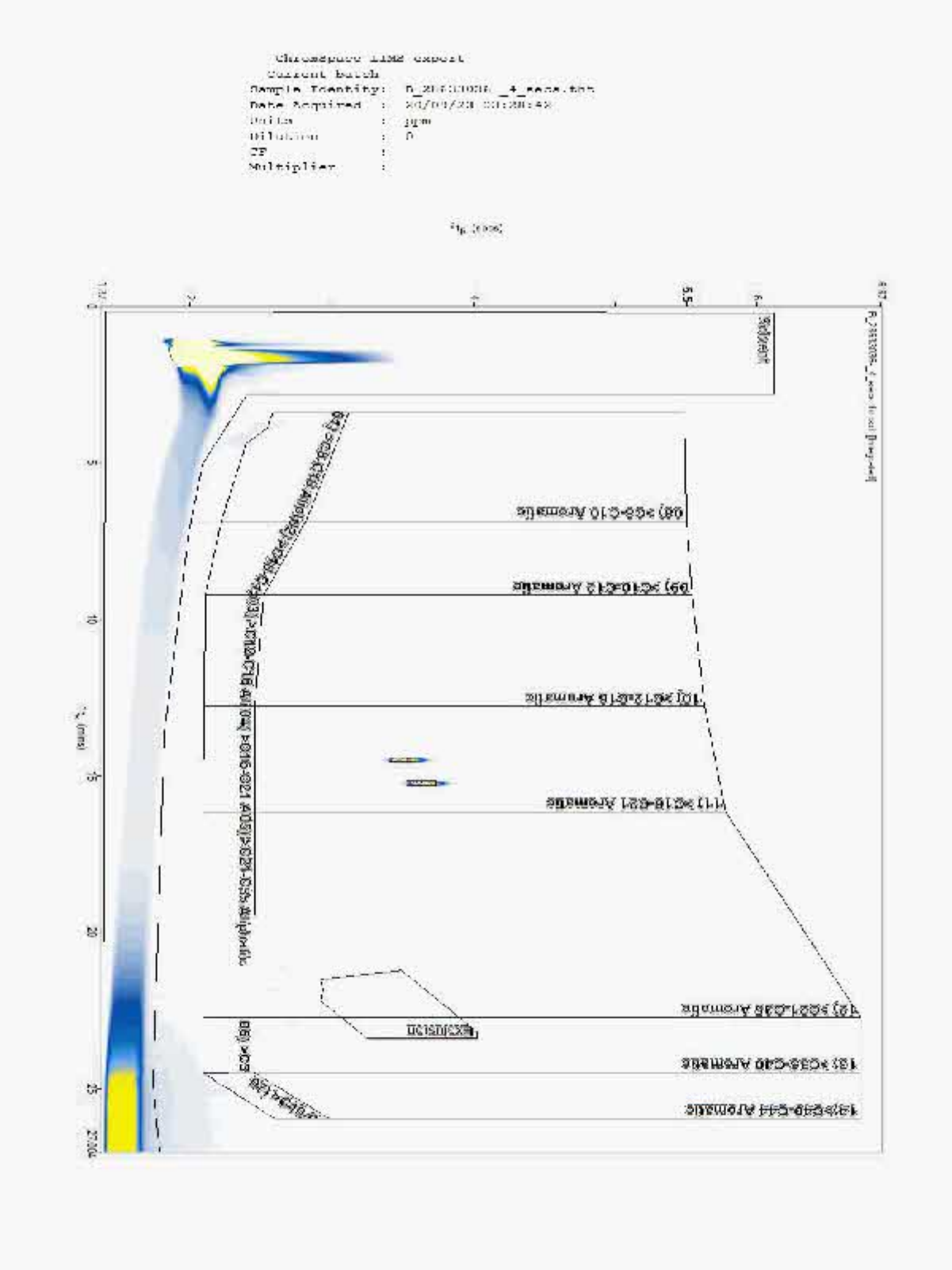


CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28633036 **Depth :** 4.00 - 4.00
Sample ID : VS03

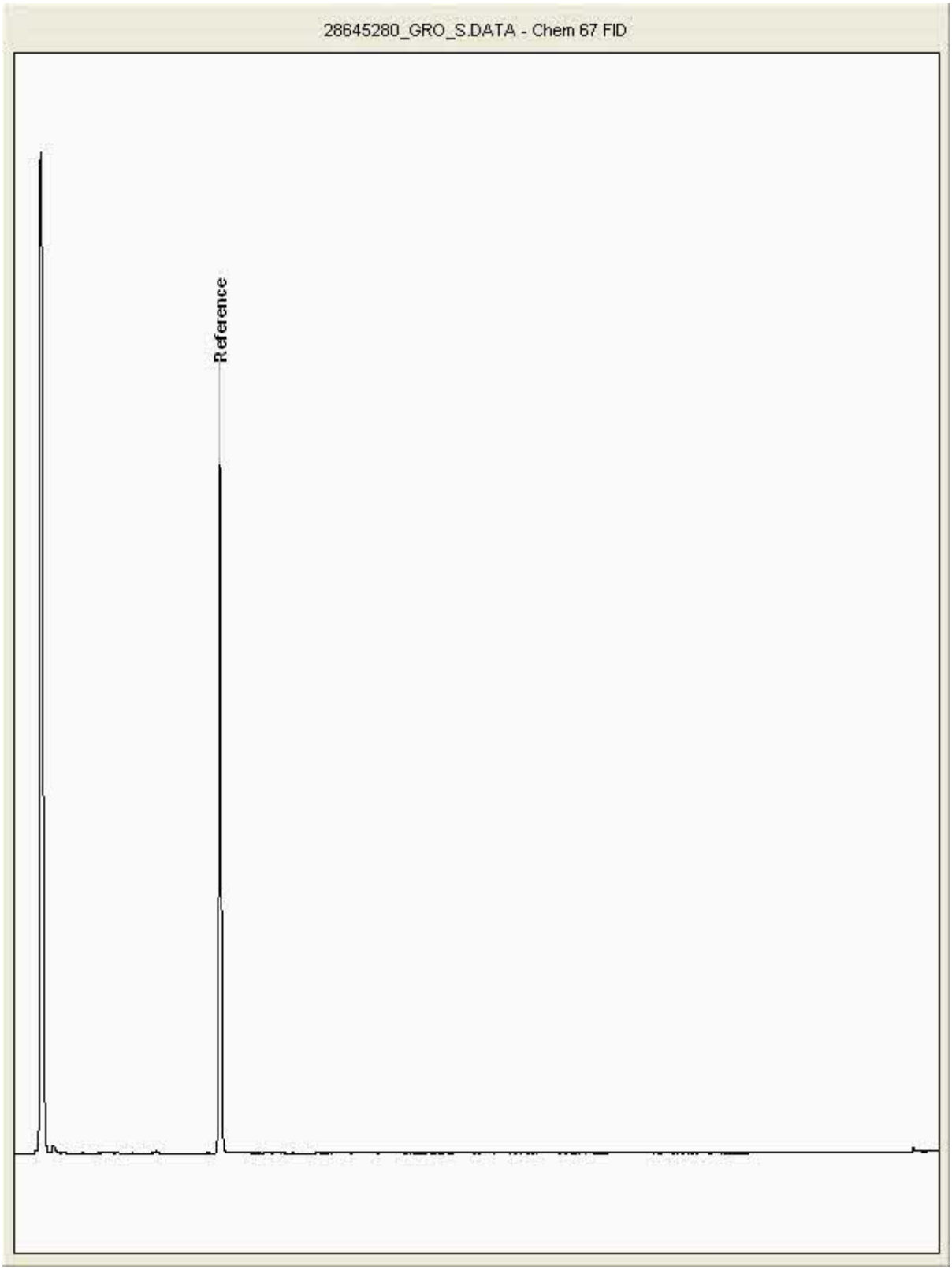


CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28645280 **Depth :** 4.00 - 4.00
Sample ID : VS12

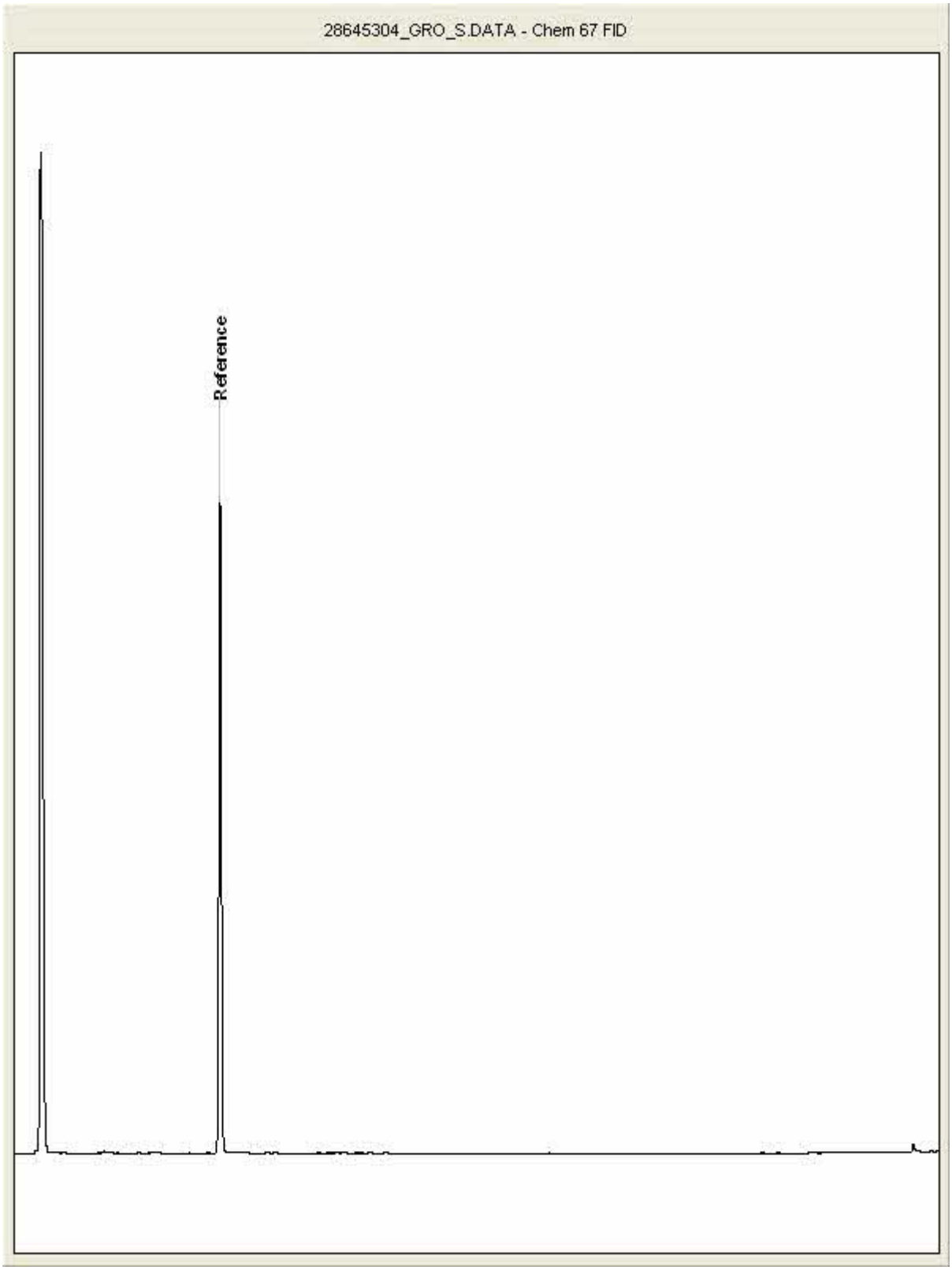


CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28645304 **Depth :** 4.00 - 4.00
Sample ID : VS02

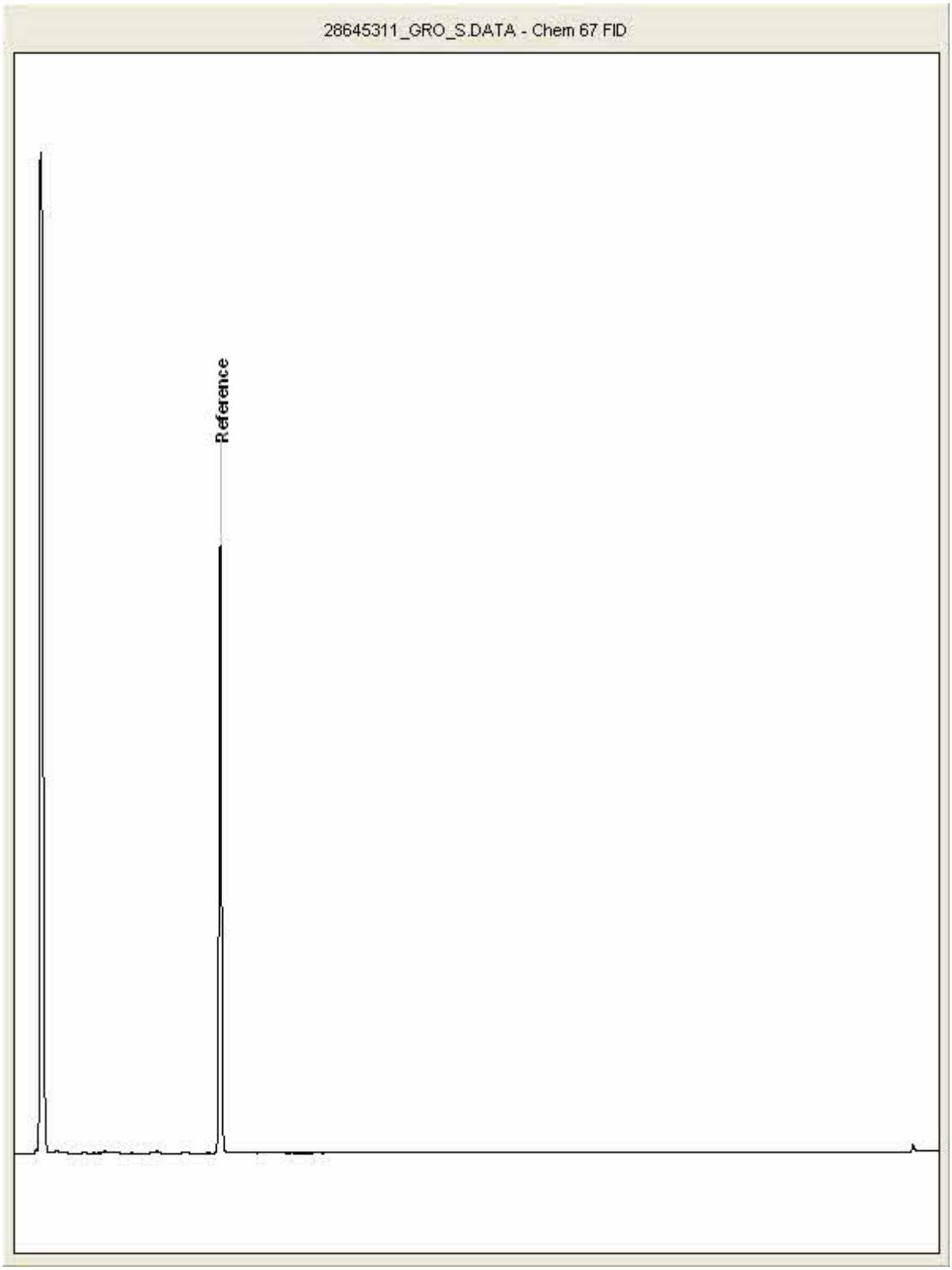


CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28645311 **Depth :** 4.00 - 4.00
Sample ID : VS14

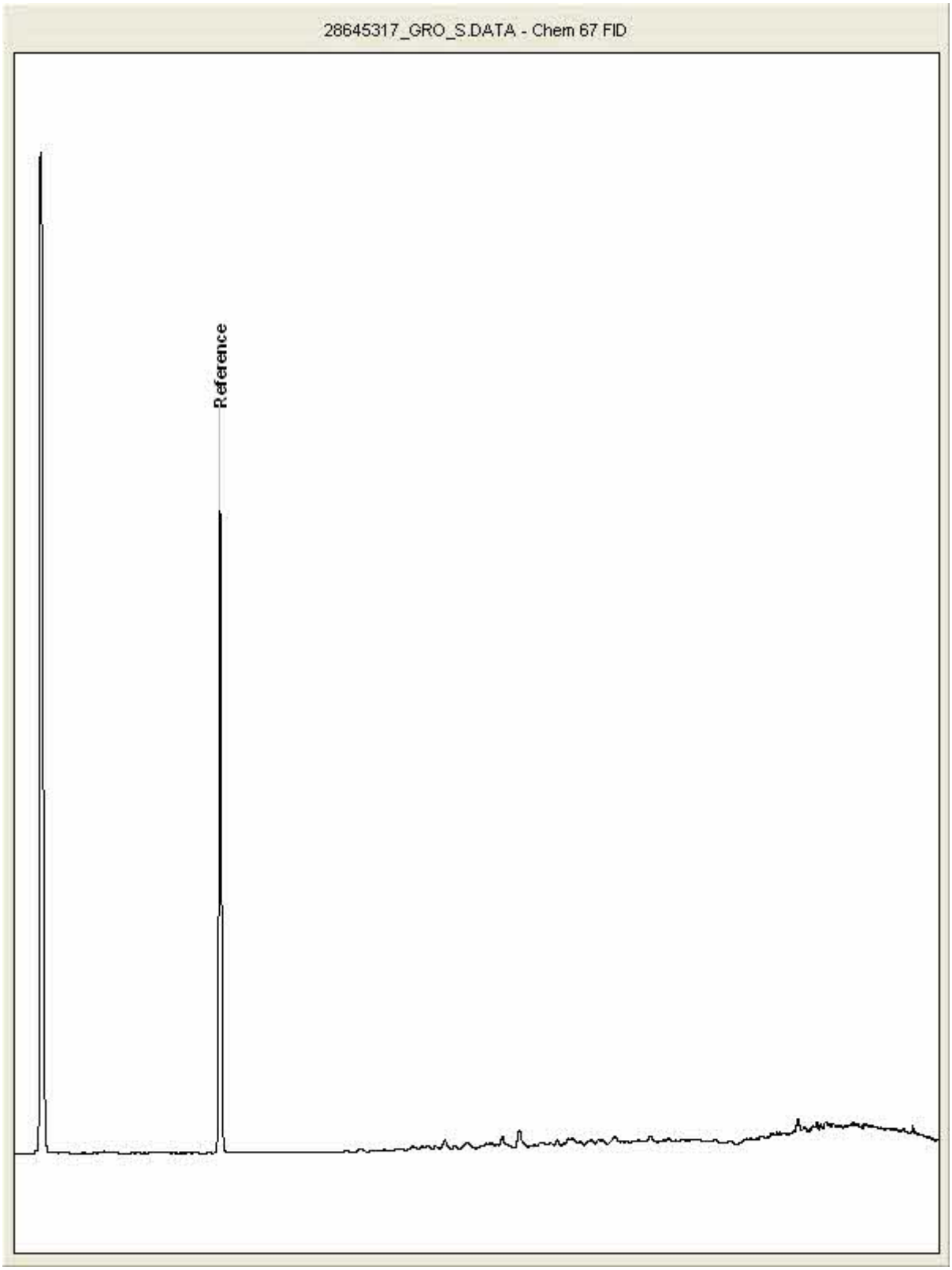


CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28645317 **Depth :** 4.00 - 4.00
Sample ID : VS03

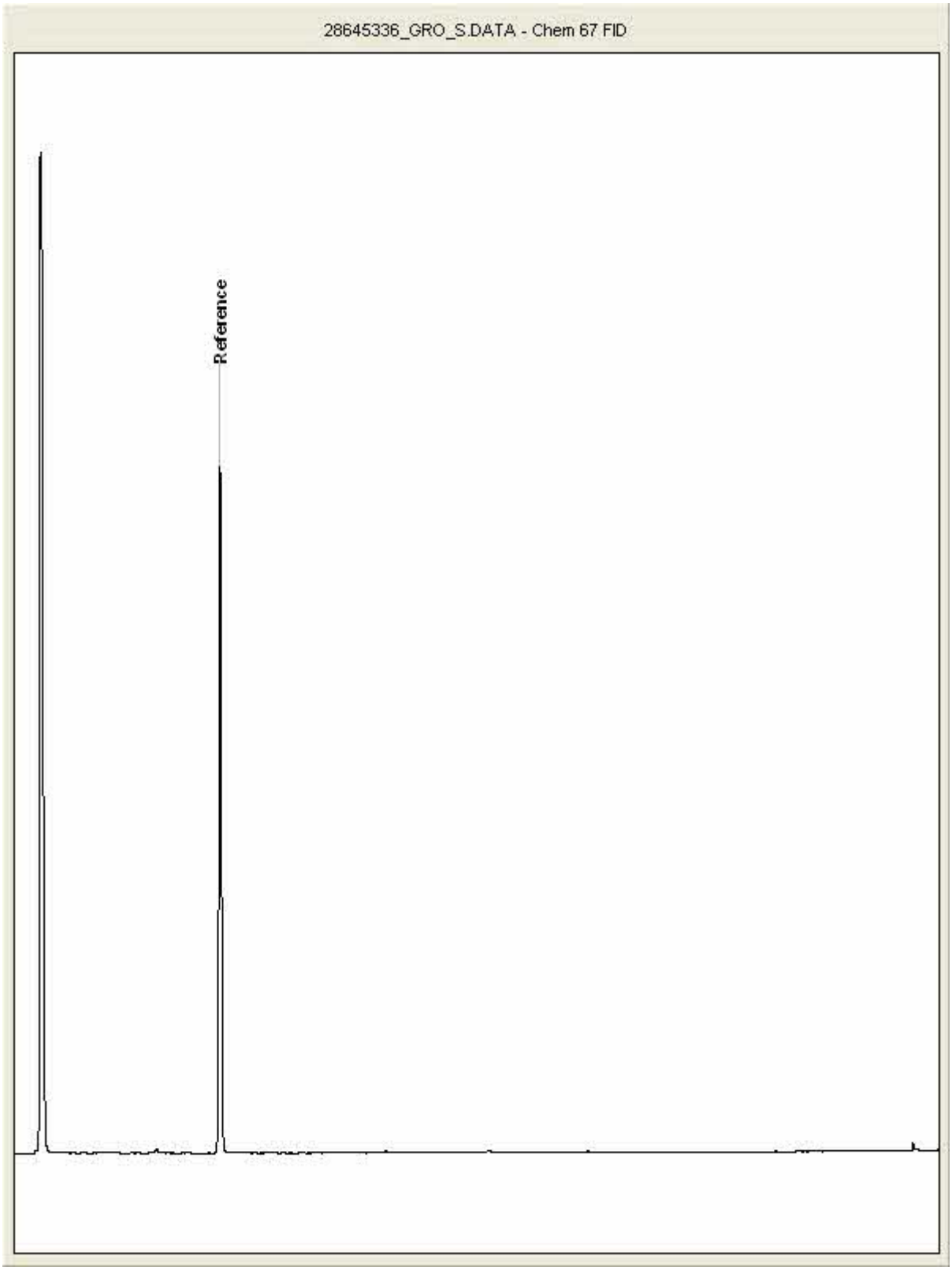


CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28645336 **Depth :** 4.00 - 4.00
Sample ID : VS13

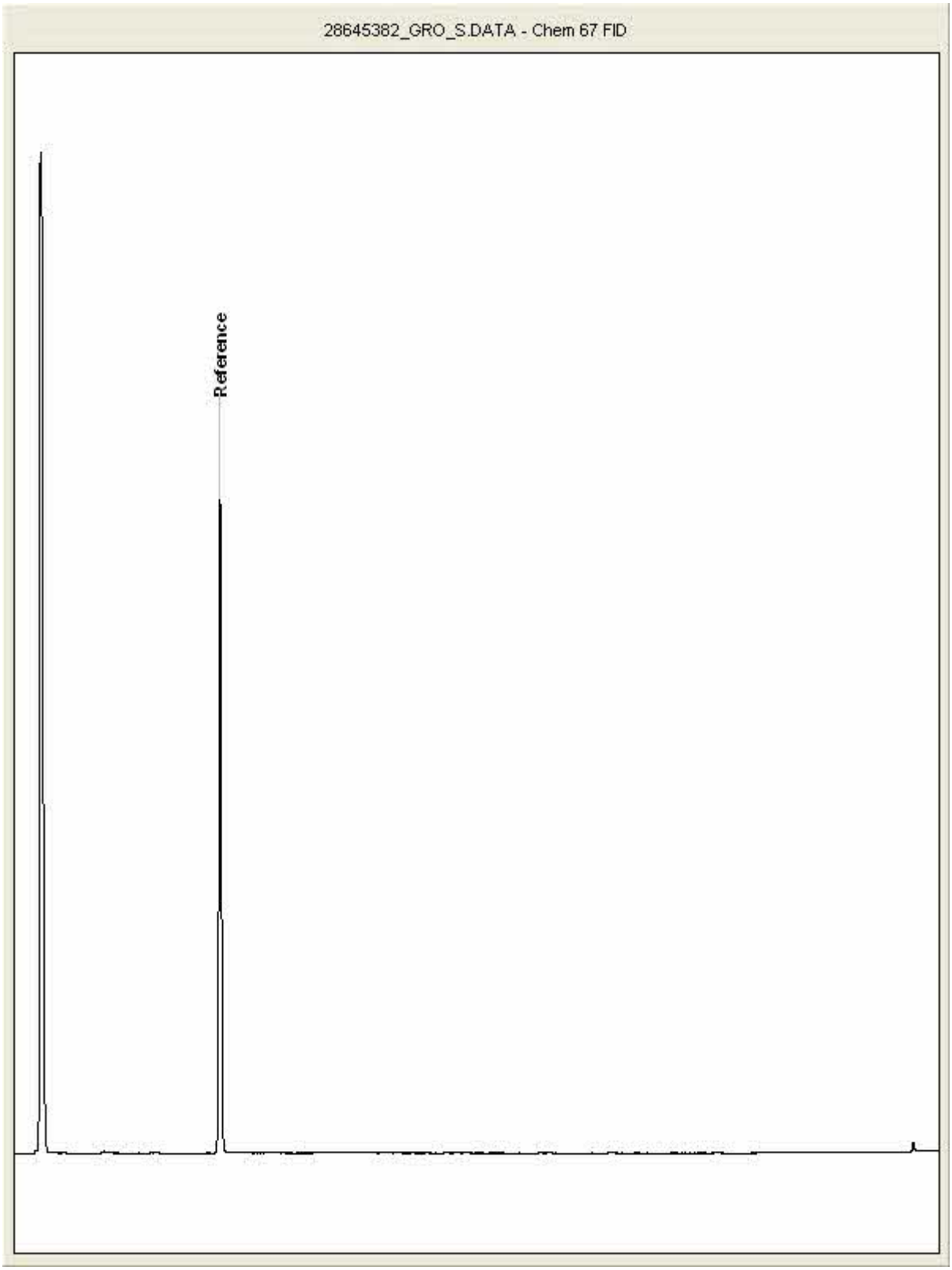


CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28645382 **Depth :** 4.00 - 4.00
Sample ID : VS01

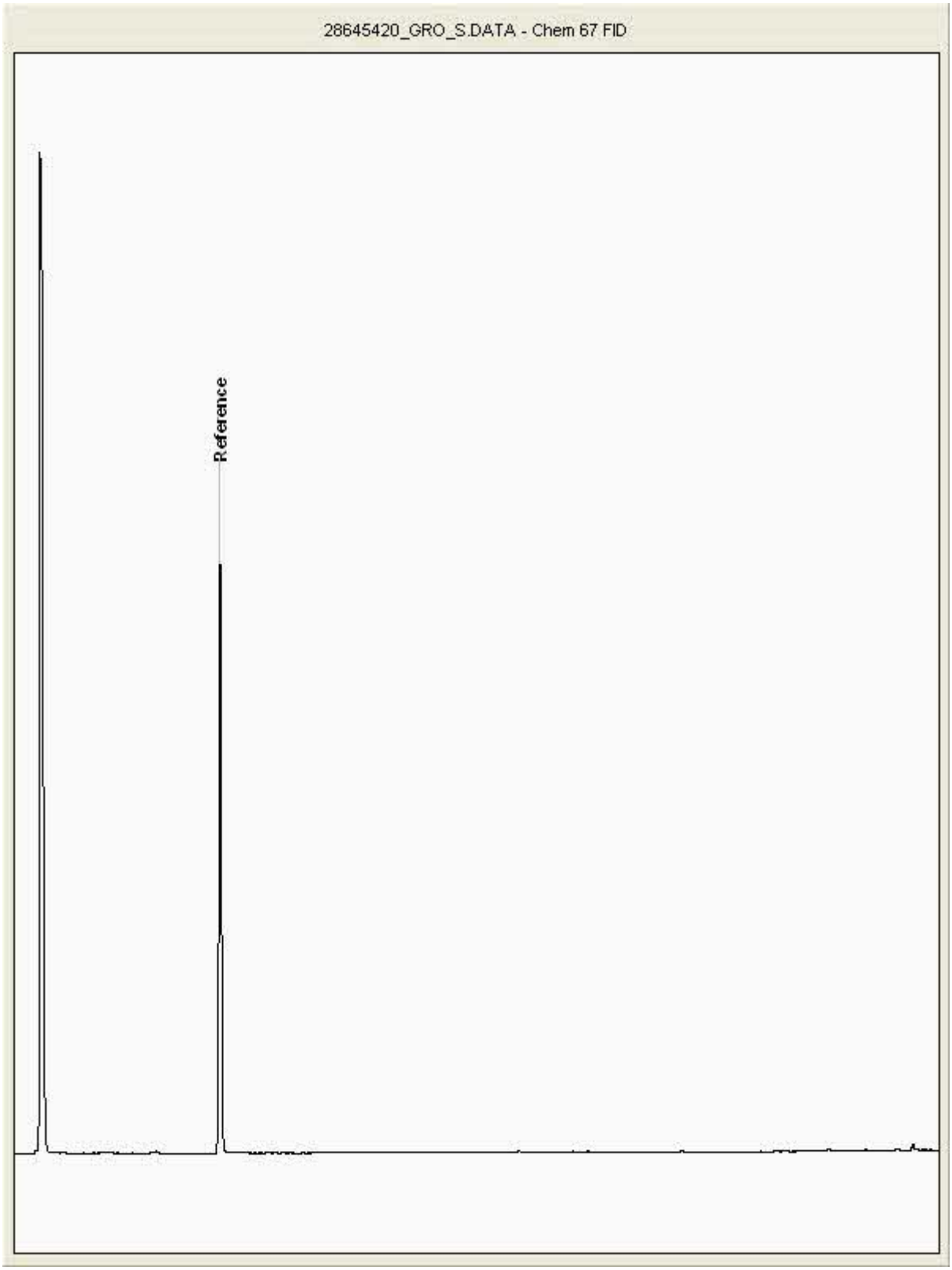


CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28645420 **Depth :** 4.00 - 4.00
Sample ID : VS09

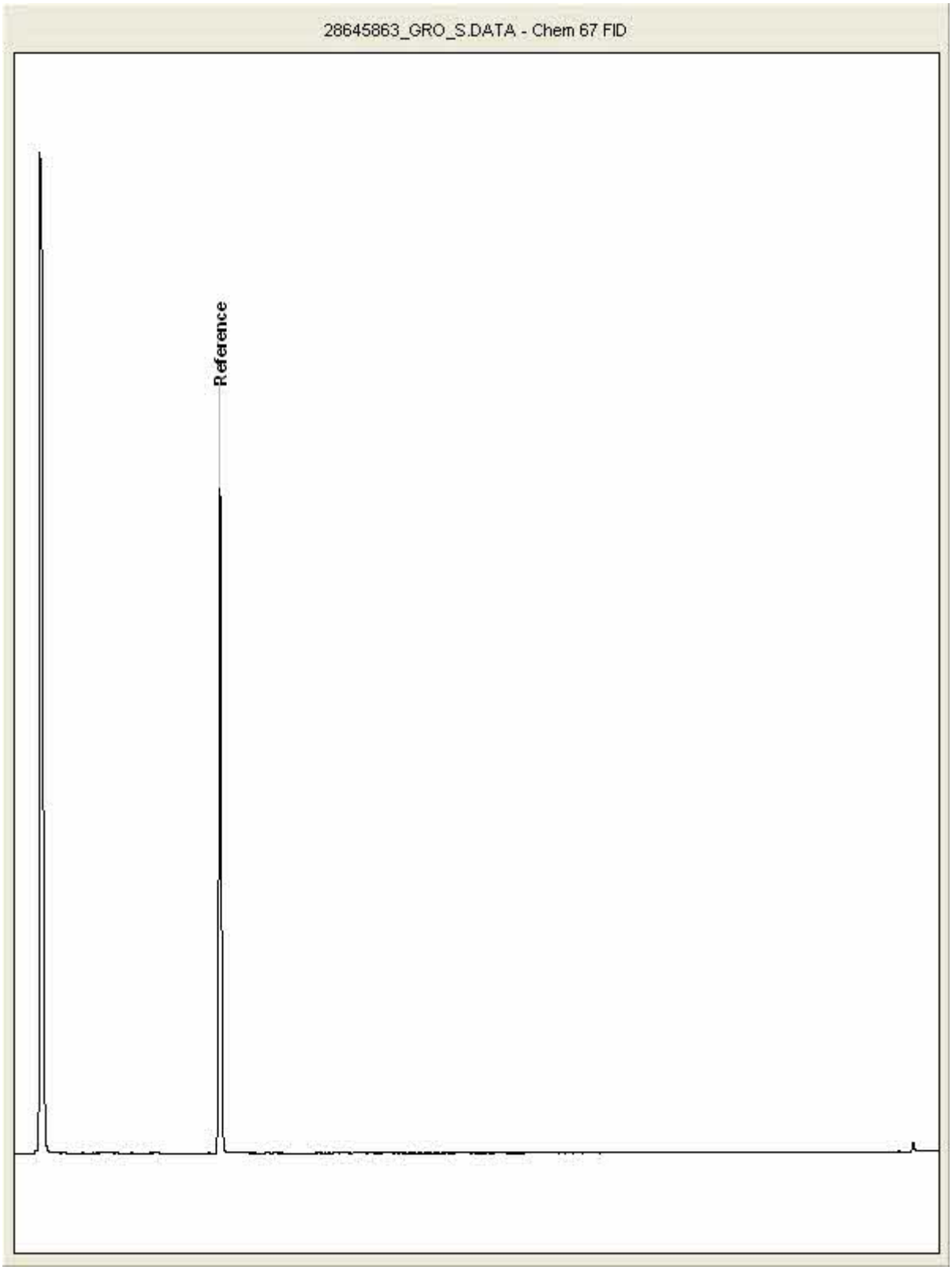


CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28645863 **Depth :** 4.00 - 4.00
Sample ID : VS08

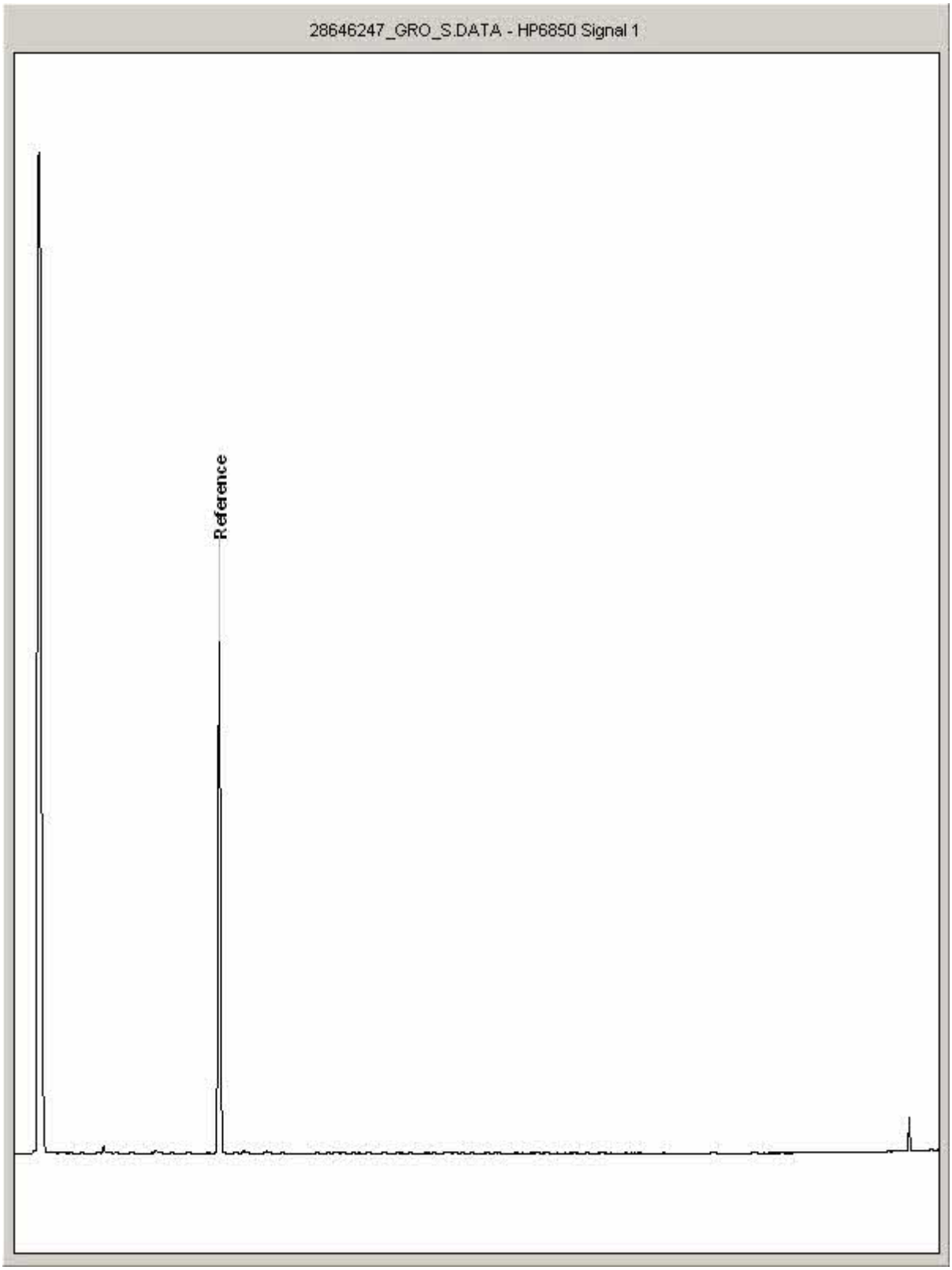


CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28646247 **Depth :** 4.00 - 4.00
Sample ID : VS11

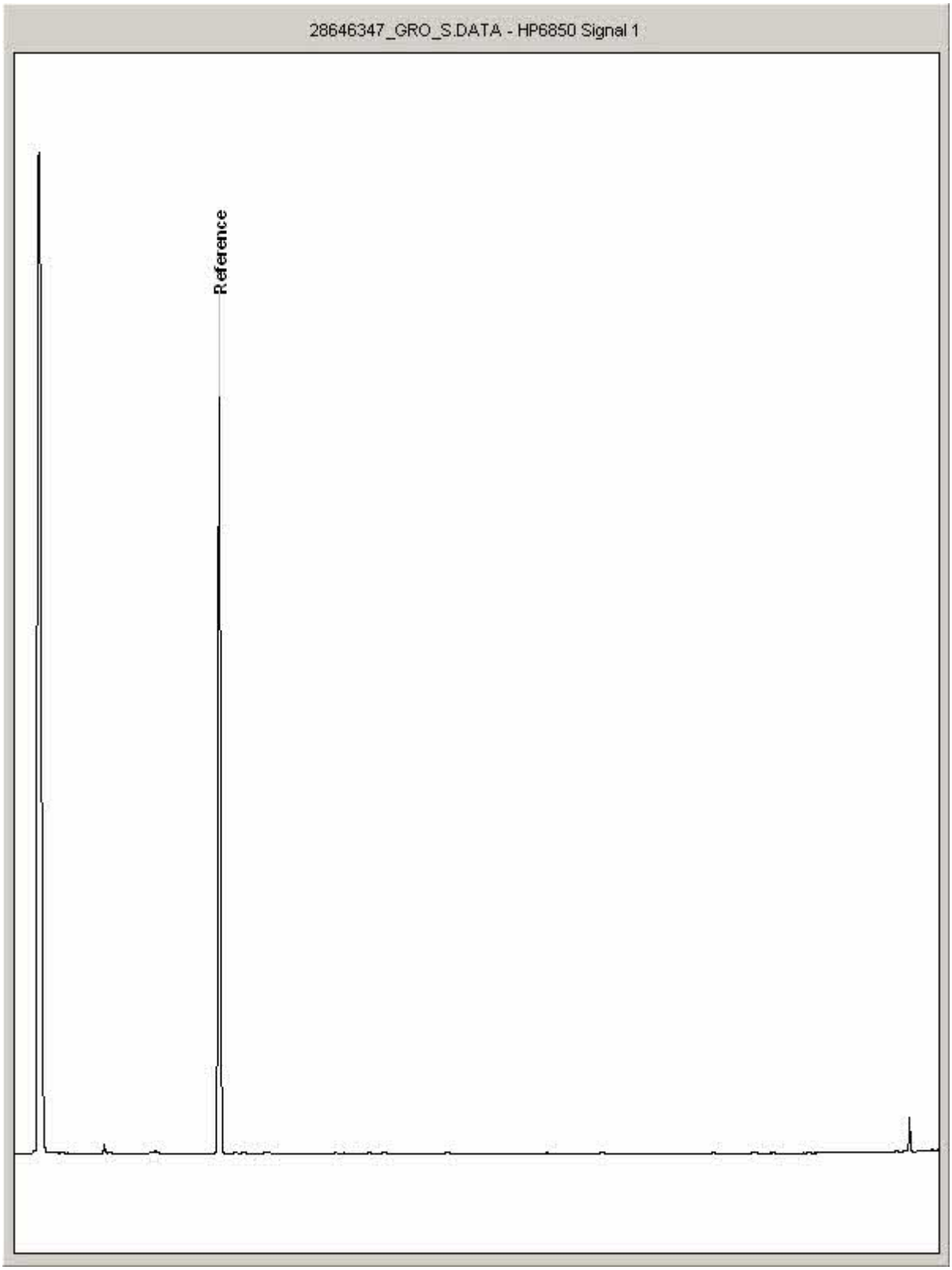


CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28646347 **Depth :** 4.00 - 4.00
Sample ID : VS16

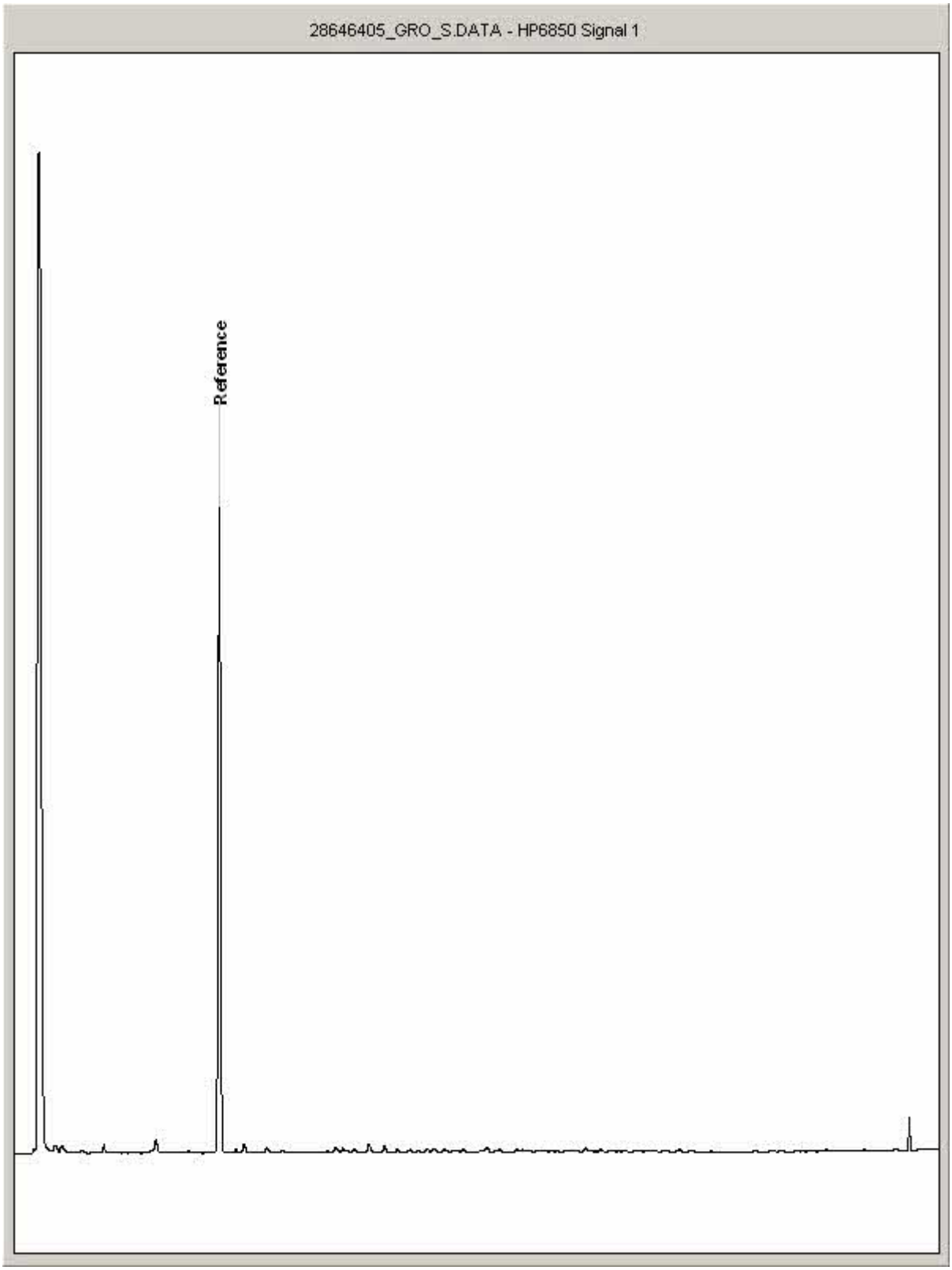


CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28646405 **Depth :** 4.00 - 4.00
Sample ID : VS10

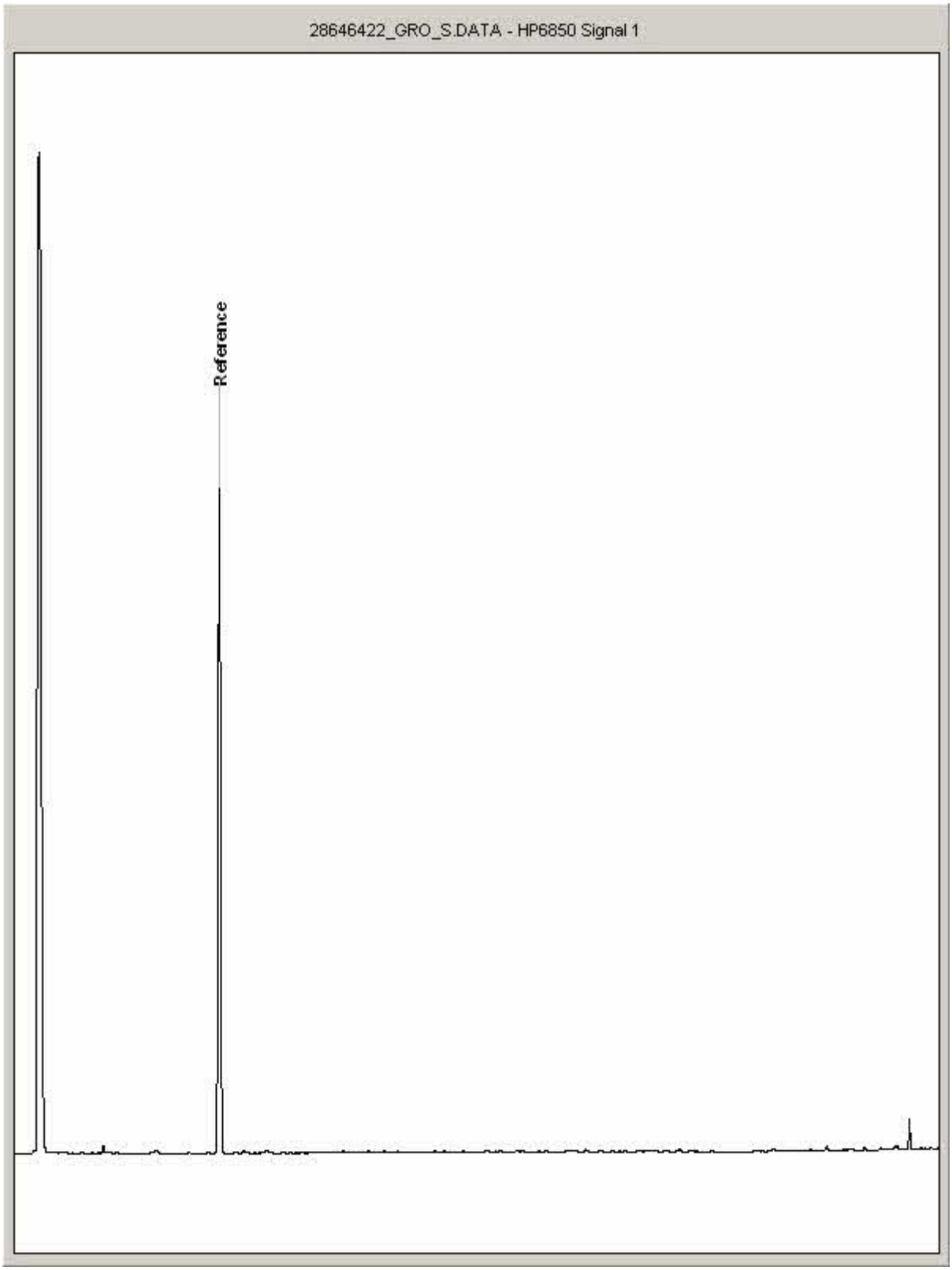


CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28646422 **Depth :** 4.00 - 4.00
Sample ID : VS07

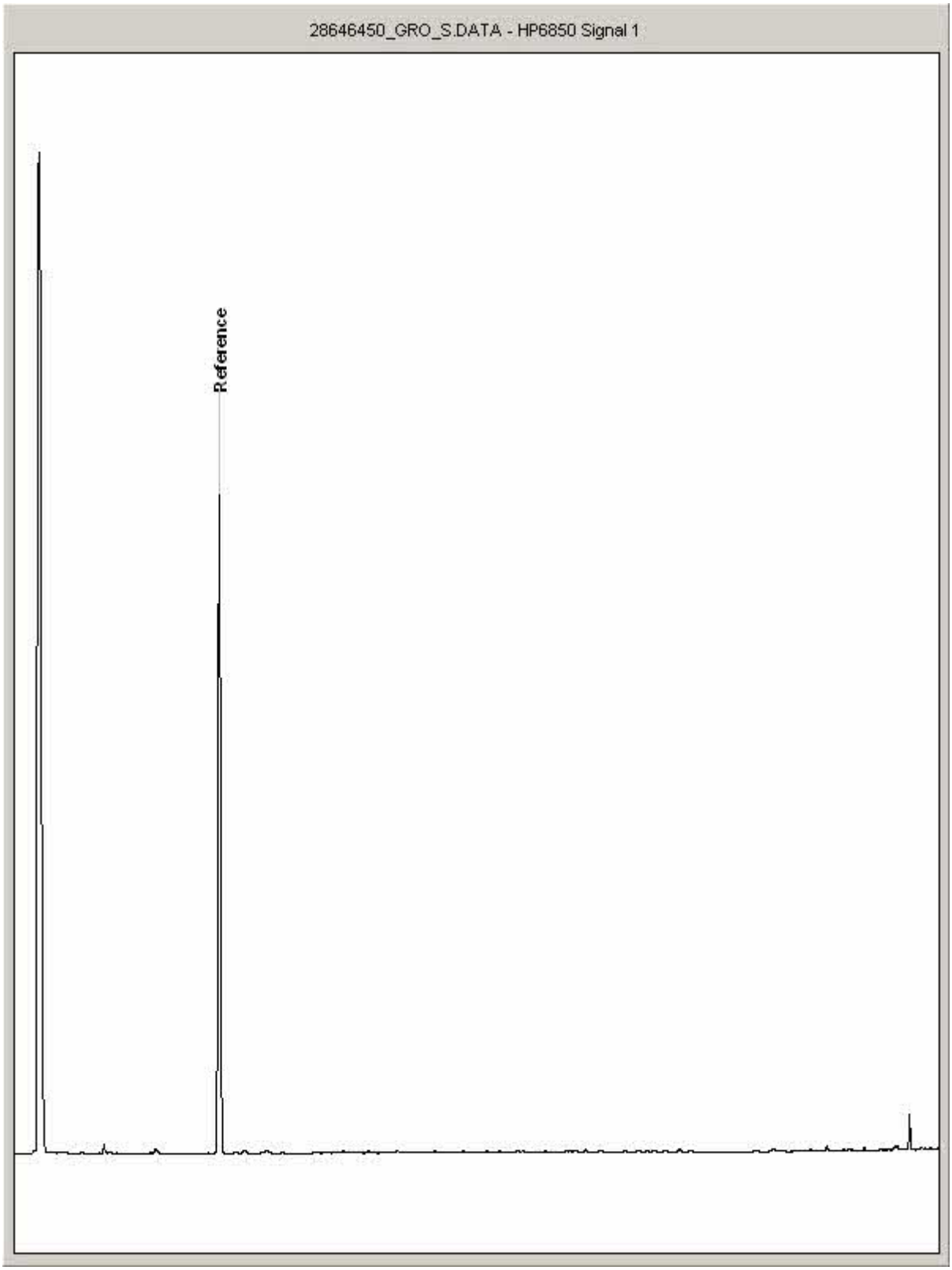


CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28646450 **Depth :** 4.00 - 4.00
Sample ID : VS06

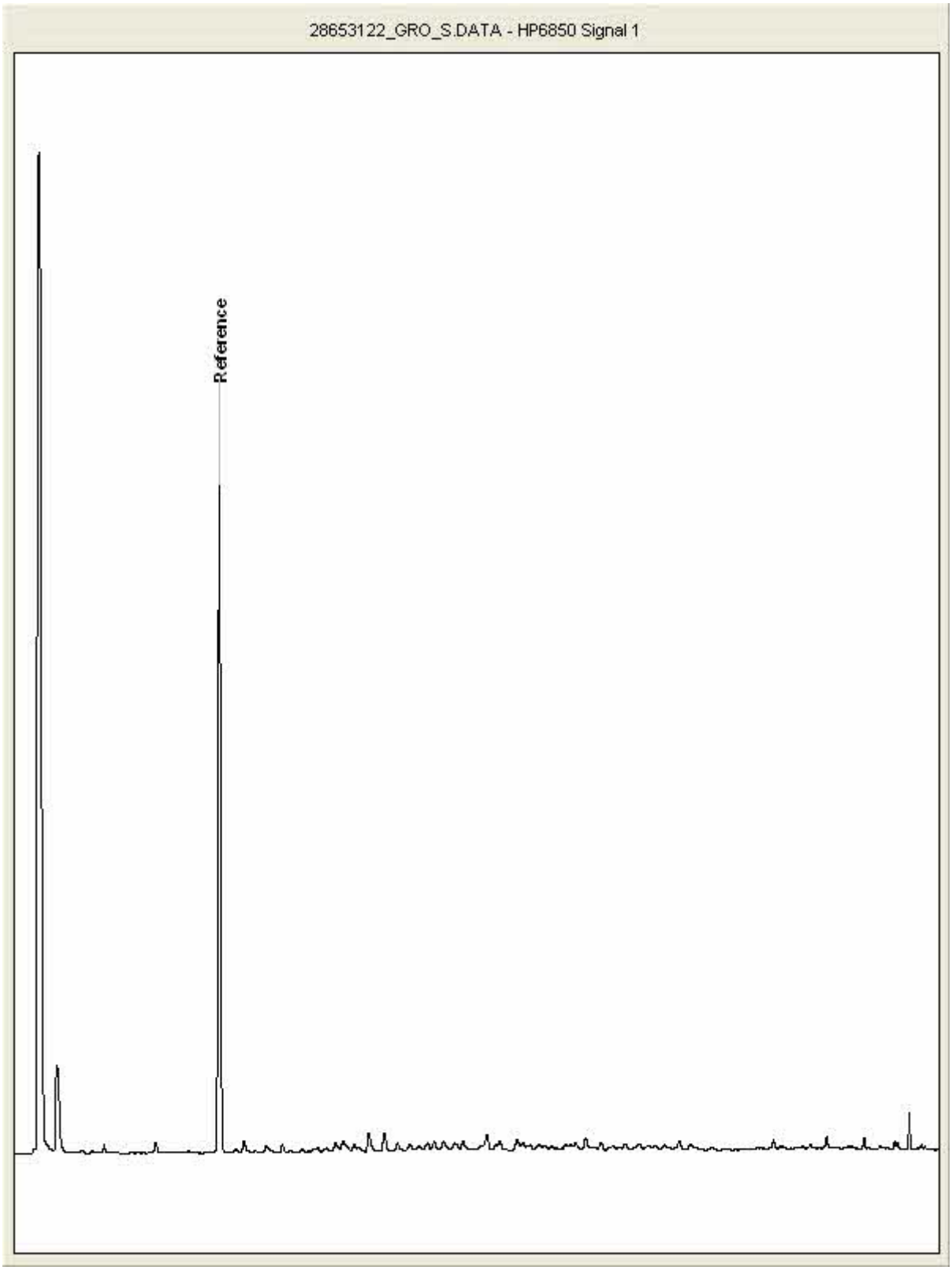


CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28653122 **Depth :** 4.00 - 4.00
Sample ID : VS05

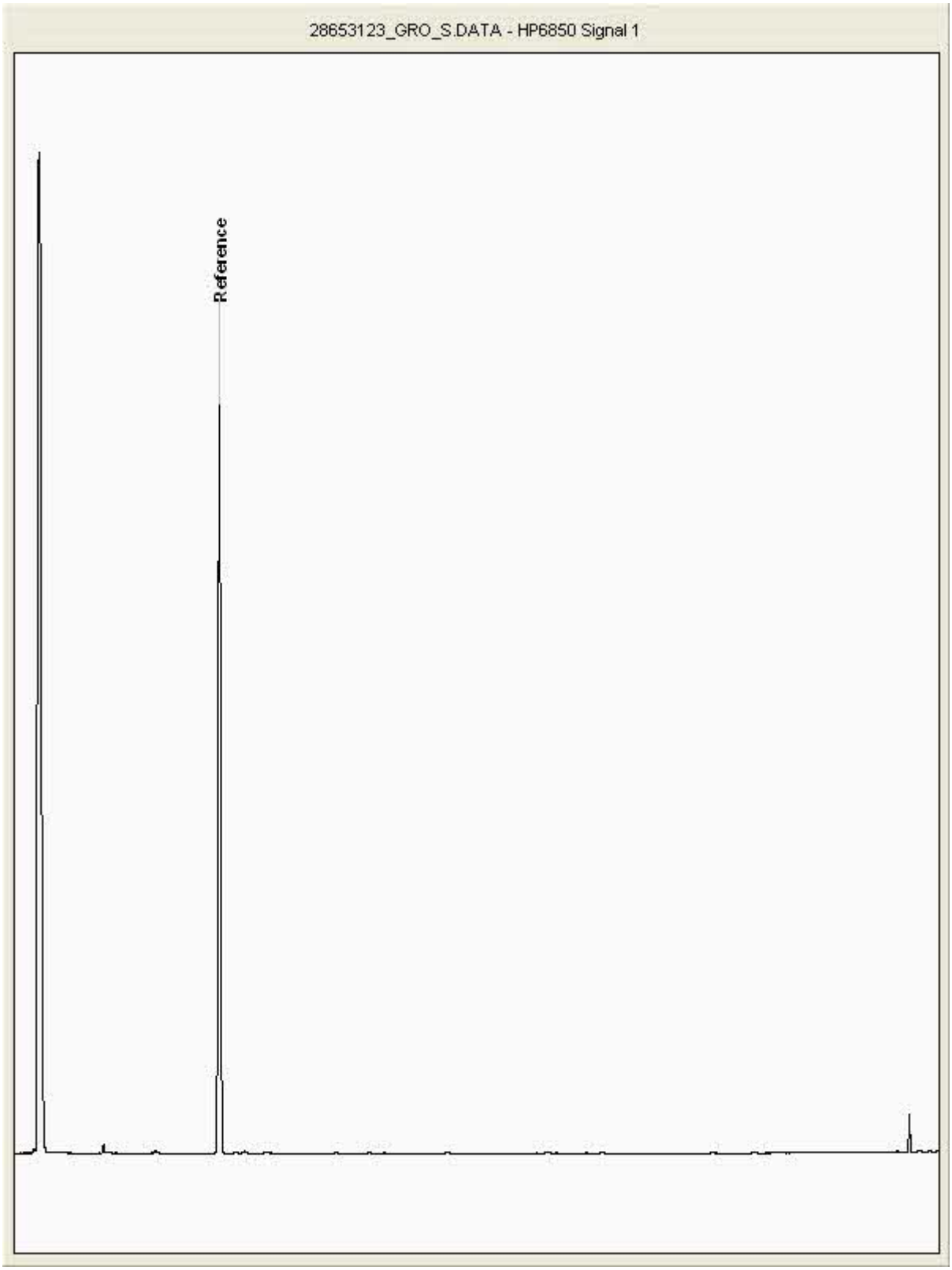


CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28653123 **Depth :** 4.00 - 4.00
Sample ID : VS15

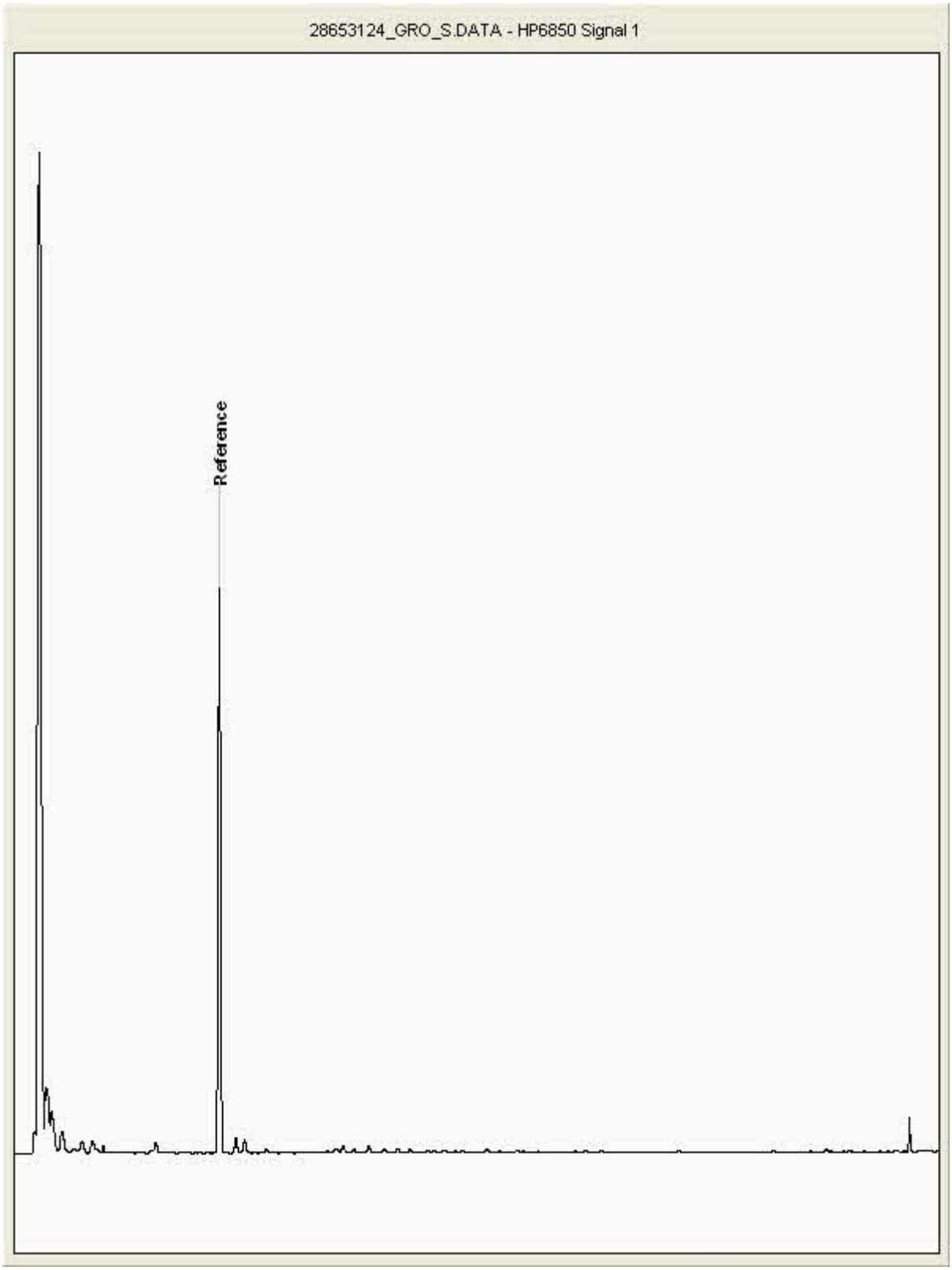


CERTIFICATE OF ANALYSIS

SDG: 230914-112 **Report Number:** 705198 **Superseded Report:**
Client Ref. 70102251 **Location:** Chesterfield Express SS

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28653124 **Depth :** 4.00 - 4.00
Sample ID : VS04



Appendix

General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses excep for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 15 day after analysis is completed (e-mailed) for all sample types unless the sample is destroye on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of 15 days after the date of receipt unless we are instructed to the contrary. Once the init period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client require wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment i present in the volatile sample, the integrity of the data may be compromised. This will b flagged up as an invalid VOC on the test schedule and the result marked as deviating c the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not correcte for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this i possible interferences. In both cases the sample would be diluted which would cause th method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile lo may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. **Sample Deviations**

If a sample is classed as deviated then the associated results may be compromised.

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Matrix interference**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to late arrival of instructions or samples**
§	**Sampled on date not provided**

20. **Asbestos**

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained f supplied bulk materials andd soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised ligh microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised s sample which has been examined to determine the presence of asbestos fibres us ALS (Hawarden) in-house method of transmitted/polarised light microscopy and centr stop dispersion staining.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test ot than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products be found in HSG 264.

The identification of asbestos containing materials and soils falls v schedule of tests for which we hold UKAS accreditation, however interpretations and all other information contained in the report are outs scope of UKAS accreditation.

Units 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528777
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

WSP UK Limited
8 First Street
Manchester
Lancashire
M15 4RP

Attention: Daniel Hoyle

CERTIFICATE OF ANALYSIS

Date of report Generation:	16 October 2023
Customer:	WSP UK Limited
Sample Delivery Group (SDG):	231009-39
Your Reference:	70102251
Location:	Esso Express Chesterfield
Report No:	707471
Order Number:	70102251-GW2

We received 8 samples on Saturday October 07, 2023 and 8 of these samples were scheduled for ana completed on Monday October 16, 2023. Accredited laboratory tests are defined within the i interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not sir sections alone.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and o this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager

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CERTIFICATE OF ANALYSIS

SDG: 231009-39 **Report Number:** 707471 **Superseded Report:**
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
28751496	L1	ES	0.50 - 1.00	05/10/2023
28751502	L2	ES	0.50 - 1.00	05/10/2023
28751514	L3	ES	0.50 - 1.00	05/10/2023
28751526	L4	ES	0.50 - 1.00	05/10/2023
28751533	L5	ES	0.50 - 1.00	05/10/2023
28751539	L6	ES	0.50 - 1.00	05/10/2023
28751545	L7	ES	0.50 - 1.00	05/10/2023
28751550	L8	ES	0.50 - 1.00	05/10/2023

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

SDG: 231009-39 **Report Number:** 707471 **Superseded Report:**
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water
Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type
			28751496	L1	ES	0.50 - 1.00	1kg TUB with Handle (ALE200)	S
			28751502	L2	ES	0.50 - 1.00	250g Amber Jar (ALE210)	S
			28751514	L3	ES	0.50 - 1.00	60g VOC (ALE215)	S
			28751526	L4	ES	0.50 - 1.00	1kg TUB with Handle (ALE200)	S
			28751533	L5	ES	0.50 - 1.00	250g Amber Jar (ALE210)	S
			28751539	L6	ES	0.50 - 1.00	60g VOC (ALE215)	S
			28751545	L7	ES	0.50 - 1.00	1kg TUB with Handle (ALE200)	S
							250g Amber Jar (ALE210)	S
							60g VOC (ALE215)	S
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 8	X				X	
Boron Water Soluble	All	NDPs: 0 Tests: 8		X				X
EPH CWG GC (S)	All	NDPs: 0 Tests: 8		X				X
GRO by GC-FID (S)	All	NDPs: 0 Tests: 8			X			X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 8		X				X
Metals in solid samples by OES	All	NDPs: 0 Tests: 8		X				X
PAH by GCMS	All	NDPs: 0 Tests: 8		X				X
pH	All	NDPs: 0 Tests: 8		X				X
Sample description	All	NDPs: 0 Tests: 8		X				X
Semi Volatile Organic Compounds	All	NDPs: 0 Tests: 8		X				X
Total Organic Carbon	All	NDPs: 0 Tests: 8		X				X
TPH CWG GC (S)	All	NDPs: 0 Tests: 8		X				X
VOC MS (S)	All	NDPs: 0 Tests: 8			X			X

28751550	L8	ES	0.50 - 1.00	60g VOC (ALE215)	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)
				S	S	S
						X
					X	
					X	
				X		
					X	
					X	
					X	
					X	
					X	
					X	
					X	
					X	
				X		

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Sample Descriptions

Grain Sizes

very fine	< 0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	> 10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
28751496	L1	0.50 - 1.00	Dark Brown	Sandy Loam	Stones	None
28751502	L2	0.50 - 1.00	Dark Brown	Sandy Clay Loam	Stones	None
28751514	L3	0.50 - 1.00	Light Brown	Sandy Clay Loam	Stones	None
28751526	L4	0.50 - 1.00	Light Brown	Sandy Clay	Stones	None
28751533	L5	0.50 - 1.00	Dark Brown	Sandy Loam	Stones	Tile/Insulation Board
28751539	L6	0.50 - 1.00	Dark Brown	Sandy Loam	Stones	None
28751545	L7	0.50 - 1.00	Dark Brown	Sandy Loam	Stones	Vegetation
28751550	L8	0.50 - 1.00	Dark Brown	Sandy Loam	Stones	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provid sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are c naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major pa

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the n sample.

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Client Ref. 70102251 **Location:** Esso Express Chesterfield

Results Legend	
#	ISO17025 accredited.
M	MCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+ [@]	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	L1	L2	L3	L4	L5	L6
			Depth (m)	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	05/10/2023	05/10/2023	05/10/2023	05/10/2023	05/10/2023	05/10/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	07/10/2023	07/10/2023	07/10/2023	07/10/2023	07/10/2023	07/10/2023
			SDG Ref	231009-39	231009-39	231009-39	231009-39	231009-39	231009-39
			Lab Sample No.(s)	28751496	28751502	28751514	28751526	28751533	28751539
			AGS Reference	ES	ES	ES	ES	ES	ES
Moisture Content Ratio (% of as received sample)	%	PM024		28	21	23	10	23	22
Organic Carbon, Total	<0.2 %	TM132		19.5 M	4.65 M	3.36 M	3.63 M	9.84 M	12.1 M
pH	1 pH Units	TM133		8.02 M	8.59 M	8.11 M	9.05 M	8.22 M	8.36 M
Chromium, Hexavalent	<0.6 mg/kg	TM151		<0.6 M	<0.6 M	<0.6 M	<0.6 M	<0.6 M	<0.6 M
Arsenic	<0.6 mg/kg	TM181		44.2 M	19.4 M	18.8 M	4.62 M	43.3 M	42.9 M
Barium	<0.6 mg/kg	TM181		124 #	59 #	92.3 #	859 #	246 #	277 #
Beryllium	<0.01 mg/kg	TM181		2.01 M	0.885 M	1.1 M	0.528 M	2.39 M	2.47 M
Cadmium	<0.02 mg/kg	TM181		<0.02 M	<0.02 M	<0.02 M	2.95 M	0.055 M	<0.02 M
Chromium	<0.9 mg/kg	TM181		9.84 M	9.92 M	8.97 M	5.33 M	9.64 M	6.78 M
Copper	<1.4 mg/kg	TM181		89.7 M	29 M	50 M	8.72 M	65.5 M	57.4 M
Lead	<0.7 mg/kg	TM181		103 M	49.7 M	116 M	30.6 M	183 M	179 M
Mercury	<0.1 mg/kg	TM181		0.172 M	0.113 M	0.261 M	<0.1 M	1.22 M	1.34 M
Nickel	<0.2 mg/kg	TM181		40.7 M	14.4 M	22.1 M	6.24 M	32.9 M	31.2 M
Selenium	<1 mg/kg	TM181		1.73 #	<1 #	<1 #	1.18 #	1.61 #	1.93 #
Vanadium	<0.2 mg/kg	TM181		41 #	26.8 #	23.8 #	9.19 #	38.7 #	35.3 #
Zinc	<1.9 mg/kg	TM181		69.3 M	60.3 M	83.6 M	68.7 M	118 M	110 M
Boron, water soluble	<1 mg/kg	TM222		1.24 M	1.64 M	<1 M	<1 M	1.27 M	1.35 M

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SDG: 231009-39 **Report Number:** 707471 **Superseded Report:**
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Results Legend	
#	ISO17025 accredited.
M	MCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+ §@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	L7	L8				
			Depth (m)	0.50 - 1.00	0.50 - 1.00				
			Sample Type	Soil/Solid (S)	Soil/Solid (S)				
			Date Sampled	05/10/2023	05/10/2023				
			Sampled Time	.	.				
			Date Received	07/10/2023	07/10/2023				
			SDG Ref	231009-39	231009-39				
			Lab Sample No.(s)	28751545	28751550				
			AGS Reference	ES	ES				
Moisture Content Ratio (% of as received sample)	%	PM024		24	15				
Organic Carbon, Total	<0.2 %	TM132		11.6 M	12.4 M				
pH	1 pH Units	TM133		8.28 M	8.39 M				
Chromium, Hexavalent	<0.6 mg/kg	TM151		<0.6 M	<0.6 M				
Arsenic	<0.6 mg/kg	TM181		47.1 M	43 M				
Barium	<0.6 mg/kg	TM181		260 #	248 #				
Beryllium	<0.01 mg/kg	TM181		2.5 M	2.51 M				
Cadmium	<0.02 mg/kg	TM181		0.143 M	0.0243 M				
Chromium	<0.9 mg/kg	TM181		9.01 M	7.12 M				
Copper	<1.4 mg/kg	TM181		305 M	62.4 M				
Lead	<0.7 mg/kg	TM181		207 M	217 M				
Mercury	<0.1 mg/kg	TM181		1.33 M	3.44 M				
Nickel	<0.2 mg/kg	TM181		32.7 M	35.2 M				
Selenium	<1 mg/kg	TM181		1.94 #	1.94 #				
Vanadium	<0.2 mg/kg	TM181		39 #	40.2 #				
Zinc	<1.9 mg/kg	TM181		246 M	110 M				
Boron, water soluble	<1 mg/kg	TM222		1.46 M	1.22 M				

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PAH by GCMS

Results Legend	
#	ISO17025 accredited.
M	MCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+ §@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	L1	L2	L3	L4	L5	L6
			Depth (m)	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	05/10/2023	05/10/2023	05/10/2023	05/10/2023	05/10/2023	05/10/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	07/10/2023	07/10/2023	07/10/2023	07/10/2023	07/10/2023	07/10/2023
			SDG Ref	231009-39	231009-39	231009-39	231009-39	231009-39	231009-39
			Lab Sample No.(s)	28751496	28751502	28751514	28751526	28751533	28751539
			AGS Reference	ES	ES	ES	ES	ES	ES
Naphthalene-d8 % recovery**	%	TM218		94.4	93	97.2	90.2	84.2	94.3
Acenaphthene-d10 % recovery**	%	TM218		96.9	92	98.6	87.9	84	96.7
Phenanthrene-d10 % recovery**	%	TM218		95	91.5	96.5	88.1	82.4	92.8
Chrysene-d12 % recovery**	%	TM218		85.5	88.8	87.1	85.9	75.9	80
Perylene-d12 % recovery**	%	TM218		81.6	85	88	88.7	72.2	74.4
Naphthalene	<0.009 mg/kg	TM218		0.0288 M	0.0122 M	0.0374 M	0.0225 M	0.118 M	0.121 M
Acenaphthylene	<0.012 mg/kg	TM218		<0.012 M	<0.012 M	<0.012 M	<0.012 M	0.0361 M	0.0323 M
Acenaphthene	<0.008 mg/kg	TM218		<0.008 M	<0.008 M	<0.008 M	<0.008 M	0.0277 M	0.0195 M
Fluorene	<0.01 mg/kg	TM218		<0.01 M	<0.01 M	<0.01 M	<0.01 M	0.0351 M	0.0313 M
Phenanthrene	<0.015 mg/kg	TM218		0.0884 M	0.029 M	0.0251 M	<0.015 M	0.635 M	0.514 M
Anthracene	<0.016 mg/kg	TM218		<0.016 M	<0.016 M	<0.016 M	<0.016 M	0.128 M	0.0807 M
Fluoranthene	<0.017 mg/kg	TM218		0.042 M	<0.017 M	0.0314 M	0.0343 M	1.45 M	0.834 M
Pyrene	<0.015 mg/kg	TM218		0.0426 M	0.0191 M	0.0302 M	0.0353 M	1.27 M	0.726 M
Benz(a)anthracene	<0.014 mg/kg	TM218		0.0355 M	<0.014 M	0.0196 M	0.0265 M	0.67 M	0.38 M
Chrysene	<0.01 mg/kg	TM218		0.0406 M	0.0163 M	0.0217 M	0.0253 M	0.741 M	0.429 M
Benzo(b)fluoranthene	<0.015 mg/kg	TM218		0.0411 M	<0.015 M	0.0251 M	0.0345 M	0.835 M	0.451 M
Benzo(k)fluoranthene	<0.014 mg/kg	TM218		<0.014 M	<0.014 M	<0.014 M	<0.014 M	0.3 M	0.16 M
Benzo(a)pyrene	<0.015 mg/kg	TM218		0.0212 M	<0.015 M	<0.015 M	0.0267 M	0.645 M	0.328 M
Indeno(1,2,3-cd)pyrene	<0.018 mg/kg	TM218		<0.018 M	<0.018 M	<0.018 M	0.0208 M	0.375 M	0.194 M
Dibenzo(a,h)anthracene	<0.023 mg/kg	TM218		<0.023 M	<0.023 M	<0.023 M	<0.023 M	0.0801 M	0.0352 M
Benzo(g,h,i)perylene	<0.024 mg/kg	TM218		<0.024 M	<0.024 M	<0.024 M	<0.024 M	0.41 M	0.189 M
PAH, Total Detected USEPA 16	<0.118 mg/kg	TM218		0.34	<0.118	0.191	0.226	7.75	4.52

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PAH by GCMS

Results Legend	
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M	MCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+ §@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	L7	L8				
			Depth (m)	0.50 - 1.00	0.50 - 1.00				
			Sample Type	Soil/Solid (S)	Soil/Solid (S)				
			Date Sampled	05/10/2023	05/10/2023				
			Sampled Time	.	.				
			Date Received	07/10/2023	07/10/2023				
			SDG Ref	231009-39	231009-39				
			Lab Sample No.(s)	28751545	28751550				
			AGS Reference	ES	ES				
Naphthalene-d8 % recovery**	%	TM218		85.9	96.7				
Acenaphthene-d10 % recovery**	%	TM218		84.8	96.7				
Phenanthrene-d10 % recovery**	%	TM218		83.6	93.6				
Chrysene-d12 % recovery**	%	TM218		77.1	85.1				
Perylene-d12 % recovery**	%	TM218		73	78.4				
Naphthalene	<0.009 mg/kg	TM218		0.0901 M	0.0654 M				
Acenaphthylene	<0.012 mg/kg	TM218		0.038 M	0.0171 M				
Acenaphthene	<0.008 mg/kg	TM218		0.0247 M	<0.008 M				
Fluorene	<0.01 mg/kg	TM218		0.0368 M	<0.01 M				
Phenanthrene	<0.015 mg/kg	TM218		0.642 M	0.232 M				
Anthracene	<0.016 mg/kg	TM218		0.121 M	0.0339 M				
Fluoranthene	<0.017 mg/kg	TM218		1.47 M	0.305 M				
Pyrene	<0.015 mg/kg	TM218		1.29 M	0.278 M				
Benz(a)anthracene	<0.014 mg/kg	TM218		0.727 M	0.163 M				
Chrysene	<0.01 mg/kg	TM218		0.764 M	0.187 M				
Benzo(b)fluoranthene	<0.015 mg/kg	TM218		0.852 M	0.217 M				
Benzo(k)fluoranthene	<0.014 mg/kg	TM218		0.333 M	0.0747 M				
Benzo(a)pyrene	<0.015 mg/kg	TM218		0.687 M	0.147 M				
Indeno(1,2,3-cd)pyrene	<0.018 mg/kg	TM218		0.383 M	0.0976 M				
Dibenzo(a,h)anthracene	<0.023 mg/kg	TM218		0.0803 M	<0.023 M				
Benzo(g,h,i)perylene	<0.024 mg/kg	TM218		0.421 M	0.0939 M				
PAH, Total Detected USEPA 16	<0.118 mg/kg	TM218		7.97	1.91				

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Semi Volatile Organic Compounds

Results Legend	
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M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+ §@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	L1	L2	L3	L4	L5	L6
			Depth (m)	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	05/10/2023	05/10/2023	05/10/2023	05/10/2023	05/10/2023	05/10/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	07/10/2023	07/10/2023	07/10/2023	07/10/2023	07/10/2023	07/10/2023
			SDG Ref	231009-39	231009-39	231009-39	231009-39	231009-39	231009-39
			Lab Sample No.(s)	28751496	28751502	28751514	28751526	28751533	28751539
			AGS Reference	ES	ES	ES	ES	ES	ES
Phenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pentachlorophenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
n-Nitroso-n-dipropylamine	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrobenzene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isophorone	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Hexachloroethane	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Hexachlorocyclopentadiene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Hexachlorobutadiene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Hexachlorobenzene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
n-Dioctyl phthalate	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethyl phthalate	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Diethyl phthalate	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
n-Dibutyl phthalate	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzofuran	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Carbazole	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Butylbenzyl phthalate	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
bis(2-Ethylhexyl) phthalate	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
bis(2-Chloroethoxy)methane	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
bis(2-Chloroethyl)ether	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Azobenzene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4-Nitrophenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4-Nitroaniline	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4-Methylphenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4-Chlorophenylphenylether	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4-Chloroaniline	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4-Chloro-3-methylphenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4-Bromophenylphenylether	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
3-Nitroaniline	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-Nitrophenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-Nitroaniline	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-Methylphenol	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1,2,4-Trichlorobenzene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

CERTIFICATE OF ANALYSIS

SDG: 231009-39 **Report Number:** 707471 **Superseded Report:**
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Semi Volatile Organic Compounds

Results Legend	Customer Sample Ref.	L1	L2	L3	L4	L5	L6
# ISO17025 accredited.	Depth (m)	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00
M MCERTS accredited.	Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
aq Aqueous / settled sample.	Date Sampled	05/10/2023	05/10/2023	05/10/2023	05/10/2023	05/10/2023	05/10/2023
diss.filt Dissolved / filtered sample.	Sampled Time	.	.	.	.	.	.
tot.unfilt Total / unfiltered sample.	Date Received	07/10/2023	07/10/2023	07/10/2023	07/10/2023	07/10/2023	07/10/2023
* Subcontracted - refer to subcontractor report for accreditation status.	SDG Ref	231009-39	231009-39	231009-39	231009-39	231009-39	231009-39
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	Lab Sample No.(s)	28751496	28751502	28751514	28751526	28751533	28751539
(F) Trigger breach confirmed	AGS Reference	ES	ES	ES	ES	ES	ES
1-4+§@ Sample deviation (see appendix)							

Component	LOD/Units	Method						
2-Chlorophenol	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,6-Dinitrotoluene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,4-Dinitrotoluene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,4-Dimethylphenol	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,4-Dichlorophenol	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,4,6-Trichlorophenol	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,4,5-Trichlorophenol	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1,4-Dichlorobenzene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1,3-Dichlorobenzene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1,2-Dichlorobenzene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-Chloronaphthalene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-Methylnaphthalene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	0.141	0.13
Acenaphthylene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	0.574	0.31
Benzo(b)fluoranthene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	0.438	0.246
Benzo(k)fluoranthene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	0.442	0.265
Benzo(a)pyrene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	0.549	0.301
Benzo(g,h,i)perylene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	0.291	0.173
Chrysene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	0.575	0.3
Fluoranthene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	1.15	0.549
Fluorene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	0.401	0.257
Phenanthrene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	0.41	0.246
Pyrene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	1.03	0.521
Naphthalene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Bis(2-chloroisopropyl) ether	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Semi Volatile Organic Compounds

Results Legend		Customer Sample Ref.	L7	L8				
#	ISO17025 accredited.							
M	MCERTS accredited.							
aq	Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.	Depth (m)	0.50 - 1.00	0.50 - 1.00				
tot.unfilt	Total / unfiltered sample.	Sample Type	Soil/Solid (S)	Soil/Solid (S)				
*	Subcontracted - refer to subcontractor report for accreditation status.	Date Sampled	05/10/2023	05/10/2023				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	Sampled Time	.	.				
		Date Received	07/10/2023	07/10/2023				
(F)	Trigger breach confirmed	SDG Ref	231009-39	231009-39				
1-4+ §@	Sample deviation (see appendix)	Lab Sample No.(s)	28751545	28751550				
		AGS Reference	ES	ES				

Component	LOD/Units	Method						
Phenol	<0.1 mg/kg	TM157	<0.1	<0.1				
Pentachlorophenol	<0.1 mg/kg	TM157	<0.1	<0.1				
n-Nitroso-n-dipropylamine	<0.1 mg/kg	TM157	<0.1	<0.1				
Nitrobenzene	<0.1 mg/kg	TM157	<0.1	<0.1				
Isophorone	<0.1 mg/kg	TM157	<0.1	<0.1				
Hexachloroethane	<0.1 mg/kg	TM157	<0.1	<0.1				
Hexachlorocyclopentadiene	<0.1 mg/kg	TM157	<0.1	<0.1				
Hexachlorobutadiene	<0.1 mg/kg	TM157	<0.1	<0.1				
Hexachlorobenzene	<0.1 mg/kg	TM157	<0.1	<0.1				
n-Dioctyl phthalate	<0.1 mg/kg	TM157	<0.1	<0.1				
Dimethyl phthalate	<0.1 mg/kg	TM157	<0.1	<0.1				
Diethyl phthalate	<0.1 mg/kg	TM157	<0.1	<0.1				
n-Dibutyl phthalate	<0.1 mg/kg	TM157	<0.1	<0.1				
Dibenzofuran	<0.1 mg/kg	TM157	<0.1	<0.1				
Carbazole	<0.1 mg/kg	TM157	<0.1	<0.1				
Butylbenzyl phthalate	<0.1 mg/kg	TM157	<0.1	<0.1				
bis(2-Ethylhexyl) phthalate	<0.1 mg/kg	TM157	<0.1	<0.1				
bis(2-Chloroethoxy)methane	<0.1 mg/kg	TM157	<0.1	<0.1				
bis(2-Chloroethyl)ether	<0.1 mg/kg	TM157	<0.1	<0.1				
Azobenzene	<0.1 mg/kg	TM157	<0.1	<0.1				
4-Nitrophenol	<0.1 mg/kg	TM157	<0.1	<0.1				
4-Nitroaniline	<0.1 mg/kg	TM157	<0.1	<0.1				
4-Methylphenol	<0.1 mg/kg	TM157	<0.1	<0.1				
4-Chlorophenylphenylether	<0.1 mg/kg	TM157	<0.1	<0.1				
4-Chloroaniline	<0.1 mg/kg	TM157	<0.1	<0.1				
4-Chloro-3-methylphenol	<0.1 mg/kg	TM157	<0.1	<0.1				
4-Bromophenylphenylether	<0.1 mg/kg	TM157	<0.1	<0.1				
3-Nitroaniline	<0.1 mg/kg	TM157	<0.1	<0.1				
2-Nitrophenol	<0.1 mg/kg	TM157	<0.1	<0.1				
2-Nitroaniline	<0.1 mg/kg	TM157	<0.1	<0.1				
2-Methylphenol	<0.1 mg/kg	TM157	<0.1	<0.1				
1,2,4-Trichlorobenzene	<0.1 mg/kg	TM157	<0.1	<0.1				

Semi Volatile Organic Compounds

Results Legend		Customer Sample Ref.	L7	L8				
#	ISO17025 accredited.	Depth (m)	0.50 - 1.00	0.50 - 1.00				
M	mCERTS accredited.	Sample Type	Soil/Solid (S)	Soil/Solid (S)				
aq	Aqueous / settled sample.	Date Sampled	05/10/2023	05/10/2023				
diss.filt	Dissolved / filtered sample.	Sampled Time	.	.				
tot.unfilt	Total / unfiltered sample.	Date Received	07/10/2023	07/10/2023				
*	Subcontracted - refer to subcontractor report for accreditation status.	SDG Ref	231009-39	231009-39				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	Lab Sample No.(s)	28751545	28751550				
(F)	Trigger breach confirmed	AGS Reference	ES	ES				
1-4+§@	Sample deviation (see appendix)							

Component	LOD/Units	Method						
2-Chlorophenol	<0.1 mg/kg	TM157	<0.1	<0.1				
2,6-Dinitrotoluene	<0.1 mg/kg	TM157	<0.1	<0.1				
2,4-Dinitrotoluene	<0.1 mg/kg	TM157	<0.1	<0.1				
2,4-Dimethylphenol	<0.1 mg/kg	TM157	<0.1	<0.1				
2,4-Dichlorophenol	<0.1 mg/kg	TM157	<0.1	<0.1				
2,4,6-Trichlorophenol	<0.1 mg/kg	TM157	<0.1	<0.1				
2,4,5-Trichlorophenol	<0.1 mg/kg	TM157	<0.1	<0.1				
1,4-Dichlorobenzene	<0.1 mg/kg	TM157	<0.1	<0.1				
1,3-Dichlorobenzene	<0.1 mg/kg	TM157	<0.1	<0.1				
1,2-Dichlorobenzene	<0.1 mg/kg	TM157	<0.1	<0.1				
2-Chloronaphthalene	<0.1 mg/kg	TM157	<0.1	<0.1				
2-Methylnaphthalene	<0.1 mg/kg	TM157	<0.1	<0.1				
Acenaphthylene	<0.1 mg/kg	TM157	<0.1	<0.1				
Acenaphthene	<0.1 mg/kg	TM157	<0.1	<0.1				
Anthracene	<0.1 mg/kg	TM157	<0.1	<0.1				
Benzo(a)anthracene	<0.1 mg/kg	TM157	0.513	0.295				
Benzo(b)fluoranthene	<0.1 mg/kg	TM157	0.471	0.176				
Benzo(k)fluoranthene	<0.1 mg/kg	TM157	0.423	0.218				
Benzo(a)pyrene	<0.1 mg/kg	TM157	0.561	0.249				
Benzo(g,h,i)perylene	<0.1 mg/kg	TM157	0.287	<0.1				
Chrysene	<0.1 mg/kg	TM157	0.548	0.268				
Fluoranthene	<0.1 mg/kg	TM157	1.07	0.614				
Fluorene	<0.1 mg/kg	TM157	<0.1	<0.1				
Indeno(1,2,3-cd)pyrene	<0.1 mg/kg	TM157	0.368	0.152				
Phenanthrene	<0.1 mg/kg	TM157	0.384	0.225				
Pyrene	<0.1 mg/kg	TM157	0.948	0.529				
Naphthalene	<0.1 mg/kg	TM157	<0.1	<0.1				
Dibenzo(a,h)anthracene	<0.1 mg/kg	TM157	<0.1	<0.1				
Bis(2-chloroisopropyl) ether	<0.1 mg/kg	TM157	<0.1	<0.1				

CERTIFICATE OF ANALYSIS

SDG: 231009-39 **Report Number:** 707471 **Superseded Report:**
Client Ref. 70102251 **Location:** Esso Express Chesterfield

TPH CWG (S)

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+ §@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	L1	L2	L3	L4	L5	L6
			Depth (m)	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	05/10/2023	05/10/2023	05/10/2023	05/10/2023	05/10/2023	05/10/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	07/10/2023	07/10/2023	07/10/2023	07/10/2023	07/10/2023	07/10/2023
			SDG Ref	231009-39	231009-39	231009-39	231009-39	231009-39	231009-39
			Lab Sample No.(s)	28751496	28751502	28751514	28751526	28751533	28751539
			AGS Reference	ES	ES	ES	ES	ES	ES
GRO Surrogate % recovery**	%	TM089		59.5 4	72.6	95.5	90.2	86.2	69 4
Aliphatics >C5-C6 (HS_1D_AL)	<0.01 mg/kg	TM089		<0.01 4	<0.01	0.0477	0.0246	<0.01	<0.01 4
Aliphatics >C6-C8 (HS_1D_AL)	<0.01 mg/kg	TM089		<0.01 4	<0.01	0.71	0.139	<0.01	<0.01 4
Aliphatics >C8-C10 (HS_1D_AL)	<0.01 mg/kg	TM089		<0.01 4	<0.01	0.846	0.158	<0.01	<0.01 4
Aliphatics >C10-C12 (EH_2D_AL_#1)	<1 mg/kg	TM414		1.38 #	<1 #	<1 #	<1 #	3.7 #	3.91 #
Aliphatics >C12-C16 (EH_2D_AL_#1)	<1 mg/kg	TM414		2.55 #	<1 #	<1 #	<1 #	3.46 #	5.04 #
Aliphatics >C16-C21 (EH_2D_AL_#1)	<1 mg/kg	TM414		2.07 #	1.03 #	<1 #	<1 #	3.57 #	4.3 #
Aliphatics >C21-C35 (EH_2D_AL_#1)	<1 mg/kg	TM414		<1 #	1.46 #	<1 #	<1 #	4.05 #	5.86 #
Aliphatics >C35-C44 (EH_2D_AL_#1)	<1 mg/kg	TM414		<1	<1	<1	<1	<1	<1
Total Aliphatics >C10-C44 (EH_2D_AR_#1)	<5 mg/kg	TM414		6.92	<5	<5	<5	15	20
Total Aliphatics & Aromatics >C10-C44 (EH_2D_Total_#1)	<10 mg/kg	TM414		19.5	<10	<10	<10	85.5	82.4
Aromatics >EC5-EC7 (HS_1D_AR)	<0.01 mg/kg	TM089		<0.01 4	<0.01	<0.01	<0.01	<0.01	<0.01 4
Aromatics >EC7-EC8 (HS_1D_AR)	<0.01 mg/kg	TM089		<0.01 4	<0.01	<0.01	<0.01	<0.01	<0.01 4
Aromatics >EC8-EC10 (HS_1D_AR)	<0.01 mg/kg	TM089		<0.01 4	<0.01	0.564	0.105	<0.01	<0.01 4
Aromatics > EC10-EC12 (EH_2D_AR_#1)	<1 mg/kg	TM414		<1 #	<1 #	2.82 #	<1 #	<1 #	1.02 #
Aromatics > EC12-EC16 (EH_2D_AR_#1)	<1 mg/kg	TM414		2.81 #	<1 #	<1 #	<1 #	10.6 #	11.3 #
Aromatics > EC16-EC21 (EH_2D_AR_#1)	<1 mg/kg	TM414		3.8 #	<1 #	<1 #	<1 #	17 #	16.8 #
Aromatics > EC21-EC35 (EH_2D_AR_#1)	<1 mg/kg	TM414		4.35 #	2.55 #	<1 #	<1 #	40.8 #	32.2 #
Aromatics >EC35-EC44 (EH_2D_AR_#1)	<1 mg/kg	TM414		<1	<1	<1	<1	1.31	<1
Aromatics > EC40-EC44 (EH_2D_AR_#1)	<1 mg/kg	TM414		<1	<1	<1	<1	<1	<1
Total Aromatics > EC10-EC44 (EH_2D_AR_#1)	<5 mg/kg	TM414		12.6	<5	<5	<5	70.5	62.4
Total Aliphatics & Aromatics >C5-C44 (EH_2D_Total_#1+HS_1D_Total)	<10 mg/kg	TM414		19.5	<10	<10	<10	85.5	82.4
Total Aliphatics >C5-C10 (HS_1D_AL_TOTAL)	<0.05 mg/kg	TM089		<0.05 4	<0.05	1.6	0.321	<0.05	<0.05 4
Total Aromatics >EC5-EC10 (HS_1D_AR_TOTAL)	<0.05 mg/kg	TM089		<0.05 4	<0.05	0.564	0.105	<0.05	<0.05 4
GRO >C5-C10 (HS_1D_TOTAL)	<0.02 mg/kg	TM089		<0.02 4	<0.02	2.17	0.427	<0.02	<0.02 4

CERTIFICATE OF ANALYSIS

SDG: 231009-39 **Report Number:** 707471 **Superseded Report:**
Client Ref. 70102251 **Location:** Esso Express Chesterfield

TPH CWG (S)

Results Legend		Customer Sample Ref.	L7	L8				
#	ISO17025 accredited.							
M	MCERTS accredited.							
aq	Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.	Depth (m)	0.50 - 1.00	0.50 - 1.00				
tot.unfilt	Total / unfiltered sample.	Sample Type	Soil/Solid (S)	Soil/Solid (S)				
*	Subcontracted - refer to subcontractor report for accreditation status.	Date Sampled	05/10/2023	05/10/2023				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	Sampled Time	.	.				
		Date Received	07/10/2023	07/10/2023				
(F)	Trigger breach confirmed	SDG Ref	231009-39	231009-39				
1-4+ §@	Sample deviation (see appendix)	Lab Sample No.(s)	28751545	28751550				
		AGS Reference	ES	ES				

Component	LOD/Units	Method						
GRO Surrogate % recovery**	%	TM089	66.6 4	72.2				
Aliphatics >C5-C6 (HS_1D_AL)	<0.01 mg/kg	TM089	<0.01 4	<0.01				
Aliphatics >C6-C8 (HS_1D_AL)	<0.01 mg/kg	TM089	<0.01 4	<0.01				
Aliphatics >C8-C10 (HS_1D_AL)	<0.01 mg/kg	TM089	<0.01 4	<0.01				
Aliphatics >C10-C12 (EH_2D_AL_#1)	<1 mg/kg	TM414	1.36 #	1.64 #				
Aliphatics >C12-C16 (EH_2D_AL_#1)	<1 mg/kg	TM414	2.97 #	3.02 #				
Aliphatics >C16-C21 (EH_2D_AL_#1)	<1 mg/kg	TM414	2.99 #	3.08 #				
Aliphatics >C21-C35 (EH_2D_AL_#1)	<1 mg/kg	TM414	6.84 #	4.87 #				
Aliphatics >C35-C44 (EH_2D_AL_#1)	<1 mg/kg	TM414	<1	<1				
Total Aliphatics >C10-C44 (EH_2D_AR_#1)	<5 mg/kg	TM414	14.4	12.9				
Total Aliphatics & Aromatics >C10-C44 (EH_2D_Total_#1)	<10 mg/kg	TM414	73.2	50.5				
Aromatics >EC5-EC7 (HS_1D_AR)	<0.01 mg/kg	TM089	<0.01 4	<0.01				
Aromatics >EC7-EC8 (HS_1D_AR)	<0.01 mg/kg	TM089	<0.01 4	<0.01				
Aromatics >EC8-EC10 (HS_1D_AR)	<0.01 mg/kg	TM089	<0.01 4	<0.01				
Aromatics > EC10-EC12 (EH_2D_AR_#1)	<1 mg/kg	TM414	<1 #	<1 #				
Aromatics > EC12-EC16 (EH_2D_AR_#1)	<1 mg/kg	TM414	6.38 #	6.85 #				
Aromatics > EC16-EC21 (EH_2D_AR_#1)	<1 mg/kg	TM414	15.9 #	10.2 #				
Aromatics > EC21-EC35 (EH_2D_AR_#1)	<1 mg/kg	TM414	34.9 #	19.2 #				
Aromatics >EC35-EC44 (EH_2D_AR_#1)	<1 mg/kg	TM414	1.03	<1				
Aromatics > EC40-EC44 (EH_2D_AR_#1)	<1 mg/kg	TM414	<1	<1				
Total Aromatics > EC10-EC44 (EH_2D_AR_#1)	<5 mg/kg	TM414	58.8	37.6				
Total Aliphatics & Aromatics >C5-C44 (EH_2D_Total_#1+HS_1D_Total)	<10 mg/kg	TM414	73.2	50.5				
Total Aliphatics >C5-C10 (HS_1D_AL_TOTAL)	<0.05 mg/kg	TM089	<0.05 4	<0.05				
Total Aromatics >EC5-EC10 (HS_1D_AR_TOTAL)	<0.05 mg/kg	TM089	<0.05 4	<0.05				
GRO >C5-C10 (HS_1D_TOTAL)	<0.02 mg/kg	TM089	<0.02 4	<0.02				

CERTIFICATE OF ANALYSIS

SDG: 231009-39 **Report Number:** 707471 **Superseded Report:**
Client Ref. 70102251 **Location:** Esso Express Chesterfield

VOC MS (S)

Results Legend

#	ISO17025 accredited.
M	MCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+ §@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	L1	L2	L3	L4	L5	L6
			Depth (m)	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	05/10/2023	05/10/2023	05/10/2023	05/10/2023	05/10/2023	05/10/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	07/10/2023	07/10/2023	07/10/2023	07/10/2023	07/10/2023	07/10/2023
			SDG Ref	231009-39	231009-39	231009-39	231009-39	231009-39	231009-39
			Lab Sample No.(s)	28751496	28751502	28751514	28751526	28751533	28751539
			AGS Reference	ES	ES	ES	ES	ES	ES
Dibromofluoromethane**	%	TM116		118	115	107	106	113	113
Toluene-d8**	%	TM116		100	95.2	101	102	93.4	96.3
4-Bromofluorobenzene**	%	TM116		73.1	83.8	96.1	100	71.5	89.3
Dichlorodifluoromethane	<0.0005 mg/kg	TM116		<0.005 #	<0.01 #	<0.005 #	<0.005 #	<0.005 #	<0.01 #
Chloromethane	<0.002 mg/kg	TM116		<0.02 #	<0.04 #	<0.02 #	<0.02 #	<0.02 #	<0.04 #
Vinyl Chloride	<0.0005 mg/kg	TM116		<0.005 M	<0.01 @ M	<0.005 M	<0.005 M	<0.005 M	<0.01 @ M
Bromomethane	<0.001 mg/kg	TM116		<0.01 M	<0.02 3 M	<0.01 M	<0.01 M	<0.01 M	<0.02 3 M
Chloroethane	<0.001 mg/kg	TM116		<0.01 M	<0.02 M	<0.01 M	<0.01 M	<0.01 M	<0.02 M
Trichlorofluorormethane	<0.0005 mg/kg	TM116		<0.005 M	<0.01 3 M	<0.005 M	<0.005 M	<0.005 M	<0.01 3 M
1,1-Dichloroethene	<0.0005 mg/kg	TM116		<0.005 #	<0.01 3 #	<0.005 #	<0.005 #	<0.005 #	<0.01 3 #
Carbon Disulphide	<0.001 mg/kg	TM116		<0.01 M	0.0298 3 M	<0.01 M	0.0143 M	0.0439 M	0.0557 3 M
Dichloromethane	<0.005 mg/kg	TM116		<0.05 #	<0.1 #	<0.05 #	<0.05 #	<0.05 #	<0.1 #
Methyl Tertiary Butyl Ether	<0.0005 mg/kg	TM116		<0.005 M	<0.01 M	<0.005 M	<0.005 M	<0.005 M	<0.01 M
trans-1,2-Dichloroethene	<0.001 mg/kg	TM116		<0.01 M	<0.02 3 M	<0.01 M	<0.01 M	<0.01 M	<0.02 3 M
1,1-Dichloroethane	<0.0005 mg/kg	TM116		<0.005 M	<0.01 M	<0.005 M	<0.005 M	<0.005 M	<0.01 M
cis-1,2-Dichloroethene	<0.0005 mg/kg	TM116		<0.005 M	<0.01 M	<0.005 M	<0.005 M	<0.005 M	<0.01 M
2,2-Dichloropropane	<0.001 mg/kg	TM116		<0.01	<0.02	<0.01	<0.01	<0.01	<0.02
Bromochloromethane	<0.002 mg/kg	TM116		<0.02 M	<0.04 M	<0.02 M	<0.02 M	<0.02 M	<0.04 M
Chloroform	<0.003 mg/kg	TM116		<0.03 M	<0.06 3 M	<0.03 M	<0.03 M	<0.03 M	<0.06 3 M
1,1,1-Trichloroethane	<0.0005 mg/kg	TM116		<0.005 M	<0.01 3 M	<0.005 M	<0.005 M	<0.005 M	<0.01 3 M
1,1-Dichloropropene	<0.0005 mg/kg	TM116		<0.005 M	<0.01 M	<0.005 M	<0.005 M	<0.005 M	<0.01 M
Carbontetrachloride	<0.0005 mg/kg	TM116		<0.005 M	<0.01 M	<0.005 M	<0.005 M	<0.005 M	<0.01 M
1,2-Dichloroethane	<0.001 mg/kg	TM116		<0.01 M	<0.02 M	<0.01 M	<0.01 M	<0.01 M	<0.02 M
Benzene	<0.001 mg/kg	TM116		<0.01 M	<0.02 M	0.019 M	<0.01 M	<0.01 M	<0.02 M
Trichloroethene	<0.001 mg/kg	TM116		<0.01 #	<0.02 #	<0.01 #	<0.01 #	<0.01 #	<0.02 #
1,2-Dichloropropane	<0.0005 mg/kg	TM116		<0.005 M	<0.01 M	<0.005 M	<0.005 M	<0.005 M	<0.01 M
Dibromomethane	<0.001 mg/kg	TM116		<0.01 M	<0.02 M	<0.01 M	<0.01 M	<0.01 M	<0.02 M
Bromodichloromethane	<0.002 mg/kg	TM116		<0.02 M	<0.04 M	<0.02 M	<0.02 M	<0.02 M	<0.04 M
cis-1,3-Dichloropropene	<0.0005 mg/kg	TM116		<0.005 M	<0.01 M	<0.005 M	<0.005 M	<0.005 M	<0.01 M
Toluene	<0.001 mg/kg	TM116		<0.01 M	<0.02 M	0.0373 M	0.0115 M	<0.01 M	<0.02 M
trans-1,3-Dichloropropene	<0.001 mg/kg	TM116		<0.01	<0.02	<0.01	<0.01	<0.01	<0.02
1,1,2-Trichloroethane	<0.001 mg/kg	TM116		<0.01 M	<0.02 M	<0.01 M	<0.01 M	<0.01 M	<0.02 M

CERTIFICATE OF ANALYSIS

SDG: 231009-39 **Report Number:** 707471 **Superseded Report:**
Client Ref. 70102251 **Location:** Esso Express Chesterfield

VOC MS (S)

Results Legend
- # ISO17025 accredited.
- M MCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+ §@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	L1	L2	L3	L4	L5	L6
			Depth (m)	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	05/10/2023	05/10/2023	05/10/2023	05/10/2023	05/10/2023	05/10/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	07/10/2023	07/10/2023	07/10/2023	07/10/2023	07/10/2023	07/10/2023
			SDG Ref	231009-39	231009-39	231009-39	231009-39	231009-39	231009-39
			Lab Sample No.(s)	28751496	28751502	28751514	28751526	28751533	28751539
			AGS Reference	ES	ES	ES	ES	ES	ES
1,3-Dichloropropane	<0.001 mg/kg	TM116		<0.01 M	<0.02 M	<0.01 M	<0.01 M	<0.01 M	<0.02 M
Tetrachloroethene	<0.002 mg/kg	TM116		<0.02 M	<0.04 M	<0.02 M	<0.02 M	<0.02 M	<0.04 M
Dibromochloromethane	<0.002 mg/kg	TM116		<0.02 M	<0.04 M	<0.02 M	<0.02 M	<0.02 M	<0.04 M
1,2-Dibromoethane	<0.001 mg/kg	TM116		<0.01 M	<0.02 M	<0.01 M	<0.01 M	<0.01 M	<0.02 M
Chlorobenzene	<0.002 mg/kg	TM116		<0.02 M	<0.04 M	<0.02 M	<0.02 M	<0.02 M	<0.04 M
1,1,1,2-Tetrachloroethane	<0.001 mg/kg	TM116		<0.01 M	<0.02 M	<0.01 M	<0.01 M	<0.01 M	<0.02 M
Ethylbenzene	<0.001 mg/kg	TM116		<0.01 M	<0.02 M	<0.01 M	<0.01 M	<0.01 M	<0.02 M
p/m-Xylene	<0.002 mg/kg	TM116		<0.02 #	<0.04 #	<0.02 #	<0.02 #	<0.02 #	<0.04 #
o-Xylene	<0.002 mg/kg	TM116		<0.02 M	<0.04 M	<0.02 M	<0.02 M	<0.02 M	<0.04 M
Styrene	<0.002 mg/kg	TM116		<0.02 #	<0.04 @ #	<0.02 #	<0.02 #	<0.02 #	<0.04 @ #
Bromoform	<0.002 mg/kg	TM116		<0.085 M	<0.11 M	<0.055 M	<0.05 M	<0.075 M	<0.11 M
Isopropylbenzene	<0.002 mg/kg	TM116		<0.02 #	<0.04 #	<0.02 #	<0.02 #	<0.02 #	<0.04 #
1,1,2,2-Tetrachloroethane	<0.002 mg/kg	TM116		<0.02 #	<0.04 #	<0.02 #	<0.02 #	<0.02 #	<0.04 #
1,2,3-Trichloropropane	<0.002 mg/kg	TM116		<0.02 M	<0.04 M	<0.02 M	<0.02 M	<0.02 M	<0.04 M
Bromobenzene	<0.002 mg/kg	TM116		<0.02 M	<0.04 M	<0.02 M	<0.02 M	<0.02 M	<0.04 M
Propylbenzene	<0.002 mg/kg	TM116		<0.02 M	<0.04 M	<0.02 M	<0.02 M	<0.02 M	<0.04 M
2-Chlorotoluene	<0.003 mg/kg	TM116		<0.03 M	<0.06 M	<0.03 M	<0.03 M	<0.03 M	<0.06 M
1,3,5-Trimethylbenzene	<0.002 mg/kg	TM116		<0.02 M	<0.04 M	<0.02 M	<0.02 M	<0.02 M	<0.04 M
4-Chlorotoluene	<0.003 mg/kg	TM116		<0.03 M	<0.06 M	<0.03 M	<0.03 M	<0.03 M	<0.06 M
tert-Butylbenzene	<0.002 mg/kg	TM116		<0.02 #	<0.04 #	<0.02 #	<0.02 #	<0.02 #	<0.04 #
1,2,4-Trimethylbenzene	<0.003 mg/kg	TM116		<0.03 #	<0.06 #	<0.03 #	<0.03 #	<0.03 #	<0.06 #
sec-Butylbenzene	<0.001 mg/kg	TM116		<0.01	<0.02	<0.01	<0.01	<0.01	<0.02
4-Isopropyltoluene	<0.002 mg/kg	TM116		<0.02	<0.04	<0.02	<0.02	<0.02	<0.04
1,3-Dichlorobenzene	<0.005 mg/kg	TM116		<0.05 M	<0.1 M	<0.05 M	<0.05 M	<0.05 M	<0.1 M
1,4-Dichlorobenzene	<0.005 mg/kg	TM116		<0.05 M	<0.1 M	<0.05 M	<0.05 M	<0.05 M	<0.1 M
n-Butylbenzene	<0.003 mg/kg	TM116		<0.03	<0.06	<0.03	<0.03	<0.03	<0.06
1,2-Dichlorobenzene	<0.005 mg/kg	TM116		<0.05 M	<0.1 M	<0.05 M	<0.05 M	<0.05 M	<0.1 M
1,2-Dibromo-3-chloropropane	<0.002 mg/kg	TM116		<0.02 M	<0.04 M	<0.02 M	<0.02 M	<0.02 M	<0.04 M
Tert-amyl methyl ether	<0.001 mg/kg	TM116		<0.01 #	<0.02 #	<0.01 #	<0.01 #	<0.01 #	<0.02 #
1,2,4-Trichlorobenzene	<0.007 mg/kg	TM116		<0.07	<0.14 3	<0.07	<0.07	<0.07	<0.14 3
Hexachlorobutadiene	<0.004 mg/kg	TM116		<0.04	<0.08	<0.04	<0.04	<0.04	<0.08
Naphthalene	<0.008 mg/kg	TM116		<0.08 M	<0.16 M	<0.08 M	<0.08 M	<0.08 M	<0.16 M

CERTIFICATE OF ANALYSIS

SDG: 231009-39 **Report Number:** 707471 **Superseded Report:**
Client Ref. 70102251 **Location:** Esso Express Chesterfield

VOC MS (S)

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+ §@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	L1	L2	L3	L4	L5	L6
			Depth (m)	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	05/10/2023	05/10/2023	05/10/2023	05/10/2023	05/10/2023	05/10/2023
			Sampled Time	.	.	.	.	.	.
			Date Received	07/10/2023	07/10/2023	07/10/2023	07/10/2023	07/10/2023	07/10/2023
			SDG Ref	231009-39	231009-39	231009-39	231009-39	231009-39	231009-39
			Lab Sample No.(s)	28751496	28751502	28751514	28751526	28751533	28751539
			AGS Reference	ES	ES	ES	ES	ES	ES
1,2,3-Trichlorobenzene	<0.01 mg/kg	TM116		<0.1 #	<0.2 3 #	<0.1 #	<0.1 #	<0.1 #	<0.2 3 #
1,3,5-Trichlorobenzene	<0.007 mg/kg	TM116		<0.07	<0.14	<0.07	<0.07	<0.07	<0.14
Sum of Detected Xylenes	<0.02 mg/kg	TM116		<0.2	<0.4	<0.2	<0.2	<0.2	<0.4
Sum of BTEX	<0.007 mg/kg	TM116		<0.07	<0.14	<0.07	<0.07	<0.07	<0.14

CERTIFICATE OF ANALYSIS

SDG: 231009-39 **Report Number:** 707471 **Superseded Report:**
Client Ref. 70102251 **Location:** Esso Express Chesterfield

VOC MS (S)

Results Legend		Customer Sample Ref.	L7	L8				
#	ISO17025 accredited.							
M	mCERTS accredited.							
aq	Aqueous / settled sample.	Depth (m)	0.50 - 1.00	0.50 - 1.00				
diss.filt	Dissolved / filtered sample.	Sample Type	Soil/Solid (S)	Soil/Solid (S)				
tot.unfilt	Total / unfiltered sample.	Date Sampled	05/10/2023	05/10/2023				
*	Subcontracted - refer to subcontractor report for accreditation status.	Sampled Time	.	.				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	Date Received	07/10/2023	07/10/2023				
		SDG Ref	231009-39	231009-39				
(F)	Trigger breach confirmed	Lab Sample No.(s)	28751545	28751550				
1-4+ §@	Sample deviation (see appendix)	AGS Reference	ES	ES				

Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	116	119				
Toluene-d8**	%	TM116	97.9	93.1				
4-Bromofluorobenzene**	%	TM116	74.4	75.1				
Dichlorodifluoromethane	<0.0005 mg/kg	TM116	<0.005 #	<0.005 #				
Chloromethane	<0.002 mg/kg	TM116	<0.02 #	<0.02 #				
Vinyl Chloride	<0.0005 mg/kg	TM116	<0.005 M	<0.005 M				
Bromomethane	<0.001 mg/kg	TM116	<0.01 M	<0.01 M				
Chloroethane	<0.001 mg/kg	TM116	<0.01 M	<0.01 M				
Trichlorofluorormethane	<0.0005 mg/kg	TM116	<0.005 M	<0.005 M				
1,1-Dichloroethene	<0.0005 mg/kg	TM116	<0.005 #	<0.005 #				
Carbon Disulphide	<0.001 mg/kg	TM116	0.0351 M	0.0344 M				
Dichloromethane	<0.005 mg/kg	TM116	<0.05 #	<0.05 #				
Methyl Tertiary Butyl Ether	<0.0005 mg/kg	TM116	<0.005 M	<0.005 M				
trans-1,2-Dichloroethene	<0.001 mg/kg	TM116	<0.01 M	<0.01 M				
1,1-Dichloroethane	<0.0005 mg/kg	TM116	<0.005 M	<0.005 M				
cis-1,2-Dichloroethene	<0.0005 mg/kg	TM116	<0.005 M	<0.005 M				
2,2-Dichloropropane	<0.001 mg/kg	TM116	<0.01	<0.01				
Bromochloromethane	<0.002 mg/kg	TM116	<0.02 M	<0.02 M				
Chloroform	<0.003 mg/kg	TM116	<0.03 M	<0.03 M				
1,1,1-Trichloroethane	<0.0005 mg/kg	TM116	<0.005 M	<0.005 M				
1,1-Dichloropropene	<0.0005 mg/kg	TM116	<0.005 M	<0.005 M				
Carbontetrachloride	<0.0005 mg/kg	TM116	<0.005 M	<0.005 M				
1,2-Dichloroethane	<0.001 mg/kg	TM116	<0.01 M	<0.01 M				
Benzene	<0.001 mg/kg	TM116	<0.01 M	<0.01 M				
Trichloroethene	<0.001 mg/kg	TM116	<0.01 #	<0.01 #				
1,2-Dichloropropane	<0.0005 mg/kg	TM116	<0.005 M	<0.005 M				
Dibromomethane	<0.001 mg/kg	TM116	<0.01 M	<0.01 M				
Bromodichloromethane	<0.002 mg/kg	TM116	<0.02 M	<0.02 M				
cis-1,3-Dichloropropene	<0.0005 mg/kg	TM116	<0.005 M	<0.005 M				
Toluene	<0.001 mg/kg	TM116	<0.01 M	<0.01 M				
trans-1,3-Dichloropropene	<0.001 mg/kg	TM116	<0.01	<0.01				
1,1,2-Trichloroethane	<0.001 mg/kg	TM116	<0.01 M	<0.01 M				

VOC MS (S)

Results Legend		Customer Sample Ref.	L7	L8				
#	ISO17025 accredited.	Depth (m)	0.50 - 1.00	0.50 - 1.00				
M	mCERTS accredited.	Sample Type	Soil/Solid (S)	Soil/Solid (S)				
aq	Aqueous / settled sample.	Date Sampled	05/10/2023	05/10/2023				
diss.filt	Dissolved / filtered sample.	Sampled Time	.	.				
tot.unfilt	Total / unfiltered sample.	Date Received	07/10/2023	07/10/2023				
*	Subcontracted - refer to subcontractor report for accreditation status.	SDG Ref	231009-39	231009-39				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	Lab Sample No.(s)	28751545	28751550				
(F)	Trigger breach confirmed	AGS Reference	ES	ES				
1-4+ §@	Sample deviation (see appendix)							

Component	LOD/Units	Method						
1,3-Dichloropropane	<0.001 mg/kg	TM116	<0.01 M	<0.01 M				
Tetrachloroethene	<0.002 mg/kg	TM116	<0.02 M	<0.02 M				
Dibromochloromethane	<0.002 mg/kg	TM116	<0.02 M	<0.02 M				
1,2-Dibromoethane	<0.001 mg/kg	TM116	<0.01 M	<0.01 M				
Chlorobenzene	<0.002 mg/kg	TM116	<0.02 M	<0.02 M				
1,1,1,2-Tetrachloroethane	<0.001 mg/kg	TM116	<0.01 M	<0.01 M				
Ethylbenzene	<0.001 mg/kg	TM116	<0.01 M	<0.01 M				
p/m-Xylene	<0.002 mg/kg	TM116	<0.02 #	<0.02 #				
o-Xylene	<0.002 mg/kg	TM116	<0.02 M	<0.02 M				
Styrene	<0.002 mg/kg	TM116	<0.02 #	<0.02 #				
Bromoform	<0.002 mg/kg	TM116	<0.07 M	<0.07 M				
Isopropylbenzene	<0.002 mg/kg	TM116	<0.02 #	<0.02 #				
1,1,2,2-Tetrachloroethane	<0.002 mg/kg	TM116	<0.02 #	<0.02 #				
1,2,3-Trichloropropane	<0.002 mg/kg	TM116	<0.02 M	<0.02 M				
Bromobenzene	<0.002 mg/kg	TM116	<0.02 M	<0.02 M				
Propylbenzene	<0.002 mg/kg	TM116	<0.02 M	<0.02 M				
2-Chlorotoluene	<0.003 mg/kg	TM116	<0.03 M	<0.03 M				
1,3,5-Trimethylbenzene	<0.002 mg/kg	TM116	<0.02 M	<0.02 M				
4-Chlorotoluene	<0.003 mg/kg	TM116	<0.03 M	<0.03 M				
tert-Butylbenzene	<0.002 mg/kg	TM116	<0.02 #	<0.02 #				
1,2,4-Trimethylbenzene	<0.003 mg/kg	TM116	<0.03 #	<0.03 #				
sec-Butylbenzene	<0.001 mg/kg	TM116	<0.01	<0.01				
4-Isopropyltoluene	<0.002 mg/kg	TM116	<0.02	<0.02				
1,3-Dichlorobenzene	<0.005 mg/kg	TM116	<0.05 M	<0.05 M				
1,4-Dichlorobenzene	<0.005 mg/kg	TM116	<0.05 M	<0.05 M				
n-Butylbenzene	<0.003 mg/kg	TM116	<0.03	<0.03				
1,2-Dichlorobenzene	<0.005 mg/kg	TM116	<0.05 M	<0.05 M				
1,2-Dibromo-3-chloropropane	<0.002 mg/kg	TM116	<0.02 M	<0.02 M				
Tert-amyl methyl ether	<0.001 mg/kg	TM116	<0.01 #	<0.01 #				
1,2,4-Trichlorobenzene	<0.007 mg/kg	TM116	<0.07	<0.07				
Hexachlorobutadiene	<0.004 mg/kg	TM116	<0.04	<0.04				
Naphthalene	<0.008 mg/kg	TM116	<0.08 M	<0.08 M				

CERTIFICATE OF ANALYSIS

SDG: 231009-39 **Report Number:** 707471 **Superseded Report:**
Client Ref. 70102251 **Location:** Esso Express Chesterfield

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+ §@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	L7	L8				
			Depth (m)	0.50 - 1.00	0.50 - 1.00				
			Sample Type	Soil/Solid (S)	Soil/Solid (S)				
			Date Sampled	05/10/2023	05/10/2023				
			Sampled Time	.	.				
			Date Received	07/10/2023	07/10/2023				
			SDG Ref	231009-39	231009-39				
			Lab Sample No.(s)	28751545	28751550				
			AGS Reference	ES	ES				
1,2,3-Trichlorobenzene	<0.01 mg/kg	TM116		<0.1 #	<0.1 #				
1,3,5-Trichlorobenzene	<0.007 mg/kg	TM116		<0.07	<0.07				
Sum of Detected Xylenes	<0.02 mg/kg	TM116		<0.2	<0.2				
Sum of BTEX	<0.007 mg/kg	TM116		<0.07	<0.07				

CERTIFICATE OF ANALYSIS

SDG: 231009-39 **Report Number:** 707471 **Superseded Report:**
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Asbestos Identification - Solid Samples

Results Legend
ISO17025 accredited.
M MCERTS accredited.
***** Subcontracted test.
(F) Trigger breach confirmed
1-5&♦§@ Sample deviation (see appendix)

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Asbestos Actinolite	Asbestos Anthophyllite	Asbestos Tremolite	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	L1ES 0.50 - 1.00 SOLID 05/10/2023 00:00:00 07/10/2023 05:00:00 231009-39 28751496 TM048	12/10/2023	Alex Horner	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	L2ES 0.50 - 1.00 SOLID 05/10/2023 00:00:00 07/10/2023 05:00:00 231009-39 28751502 TM048	12/10/2023	Alex Horner	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	L3ES 0.50 - 1.00 SOLID 05/10/2023 00:00:00 07/10/2023 05:00:00 231009-39 28751514 TM048	12/10/2023	Odhran McLernon	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	L4ES 0.50 - 1.00 SOLID 05/10/2023 00:00:00 07/10/2023 05:00:00 231009-39 28751526 TM048	12/10/2023	Alex Horner	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	L5ES 0.50 - 1.00 SOLID 05/10/2023 00:00:00 07/10/2023 05:00:00 231009-39 28751533 TM048	12/10/2023	Alex Horner	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	L6ES 0.50 - 1.00 SOLID 05/10/2023 00:00:00 07/10/2023 05:00:00 231009-39 28751539 TM048	12/10/2023	Odhran McLernon	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	L7ES 0.50 - 1.00 SOLID 05/10/2023 00:00:00 07/10/2023 05:00:00 231009-39 28751545 TM048	12/10/2023	Alex Horner	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	L8ES 0.50 - 1.00 SOLID 05/10/2023 00:00:00 07/10/2023 05:00:00 231009-39 28751550 TM048	12/10/2023	Alex Horner	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

Table of Results - Appendix

Method No	Description
PM024	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM089	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM151	Determination of Hexavalent Chromium using Kone analyser
TM181	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM116	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	ELTRA CS800 Operators Guide
TM133	Determination of pH in Soil and Water using the GLpH pH Meter
TM157	Determination of SVOC in Soils by GC-MS extracted by sonication in DCM/Acetone
TM414	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID
TM048	Identification of Asbestos in Bulk Material
TM218	The determination of PAH in soil samples by GC-MS
TM222	Determination of Hot Water Soluble Boron in Soils (10:1 Water:Soil) by ICP OES.

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden (Method codes TM).

CERTIFICATE OF ANALYSIS

SDG: 231009-39 **Report Number:** 707471 **Superseded Report:**
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Test Completion Dates

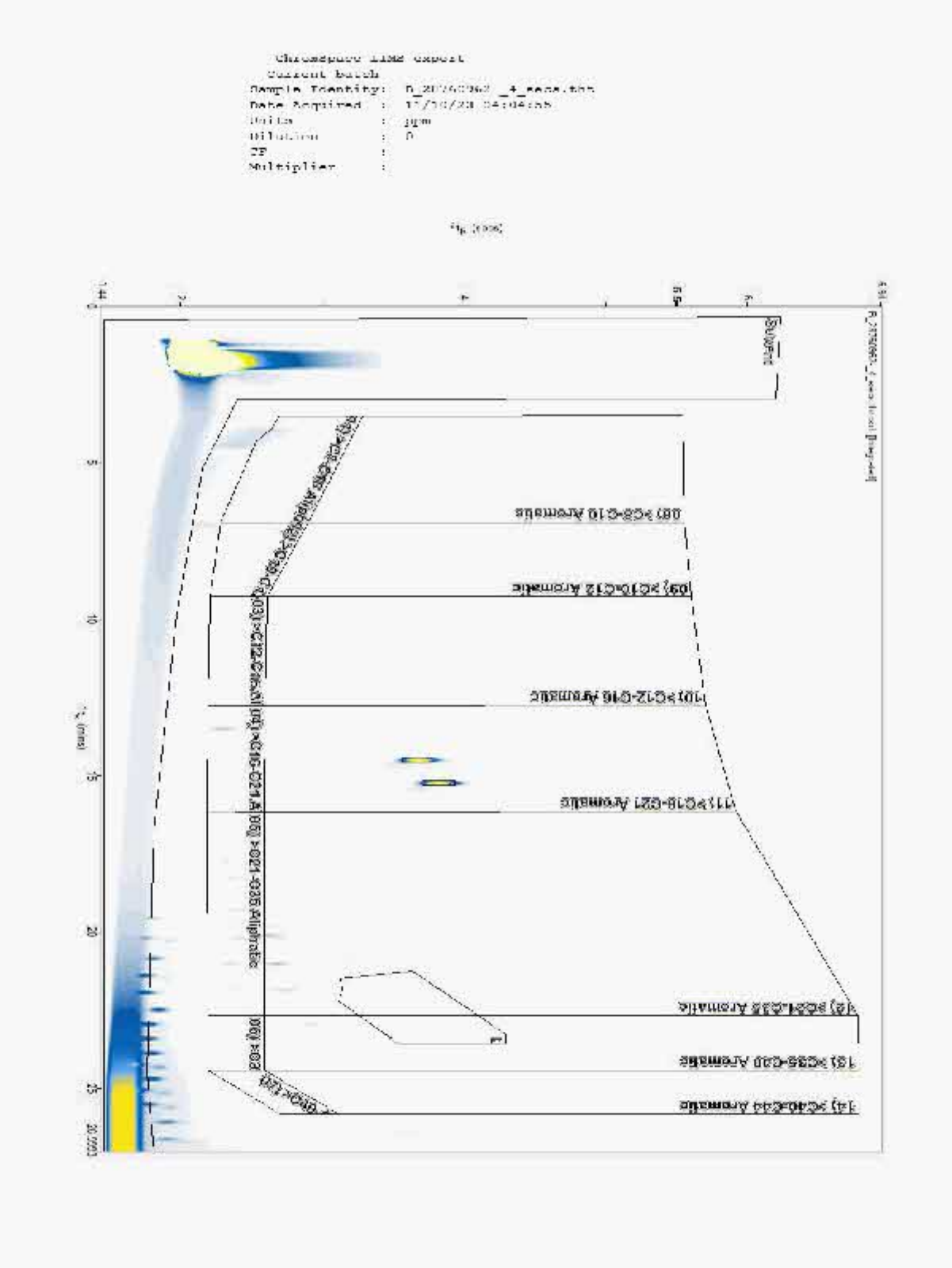
Lab Sample No(s)	28751496	28751502	28751514	28751526	28751533	28751539	28751545	28751550
Customer Sample Ref	L1	L2	L3	L4	L5	L6	L7	L8
AGS Ref.	ES	ES	ES	ES	ES	ES	ES	ES
Depth	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00	0.50 - 1.00
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Asbestos ID in Solid Samples	13-Oct-2023	13-Oct-2023	12-Oct-2023	13-Oct-2023	13-Oct-2023	12-Oct-2023	13-Oct-2023	13-Oct-2023
Boron Water Soluble	13-Oct-2023	13-Oct-2023	13-Oct-2023	13-Oct-2023	13-Oct-2023	13-Oct-2023	13-Oct-2023	13-Oct-2023
EPH CWG GC (S)	12-Oct-2023	12-Oct-2023	12-Oct-2023	12-Oct-2023	12-Oct-2023	12-Oct-2023	12-Oct-2023	12-Oct-2023
GRO by GC-FID (S)	13-Oct-2023	13-Oct-2023	13-Oct-2023	13-Oct-2023	12-Oct-2023	13-Oct-2023	13-Oct-2023	13-Oct-2023
Hexavalent Chromium (s)	16-Oct-2023	16-Oct-2023	16-Oct-2023	16-Oct-2023	16-Oct-2023	16-Oct-2023	16-Oct-2023	16-Oct-2023
Metals in solid samples by OES	13-Oct-2023	13-Oct-2023	13-Oct-2023	13-Oct-2023	13-Oct-2023	13-Oct-2023	13-Oct-2023	13-Oct-2023
PAH by GCMS	12-Oct-2023	12-Oct-2023	12-Oct-2023	12-Oct-2023	12-Oct-2023	12-Oct-2023	12-Oct-2023	12-Oct-2023
pH	13-Oct-2023	13-Oct-2023	13-Oct-2023	13-Oct-2023	13-Oct-2023	13-Oct-2023	13-Oct-2023	13-Oct-2023
Sample description	11-Oct-2023	11-Oct-2023	11-Oct-2023	11-Oct-2023	11-Oct-2023	11-Oct-2023	11-Oct-2023	11-Oct-2023
Semi Volatile Organic Compounds	13-Oct-2023	13-Oct-2023	13-Oct-2023	13-Oct-2023	13-Oct-2023	13-Oct-2023	13-Oct-2023	13-Oct-2023
Total Organic Carbon	13-Oct-2023	13-Oct-2023	13-Oct-2023	13-Oct-2023	13-Oct-2023	13-Oct-2023	13-Oct-2023	13-Oct-2023
TPH CWG GC (S)	13-Oct-2023	13-Oct-2023	13-Oct-2023	13-Oct-2023	12-Oct-2023	13-Oct-2023	13-Oct-2023	13-Oct-2023
VOC MS (S)	12-Oct-2023	12-Oct-2023	12-Oct-2023	12-Oct-2023	12-Oct-2023	12-Oct-2023	12-Oct-2023	12-Oct-2023

CERTIFICATE OF ANALYSIS

SDG: 231009-39 **Report Number:** 707471 **Superseded Report:**
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28760962 **Depth :** 0.50 - 1.00
Sample ID : L2

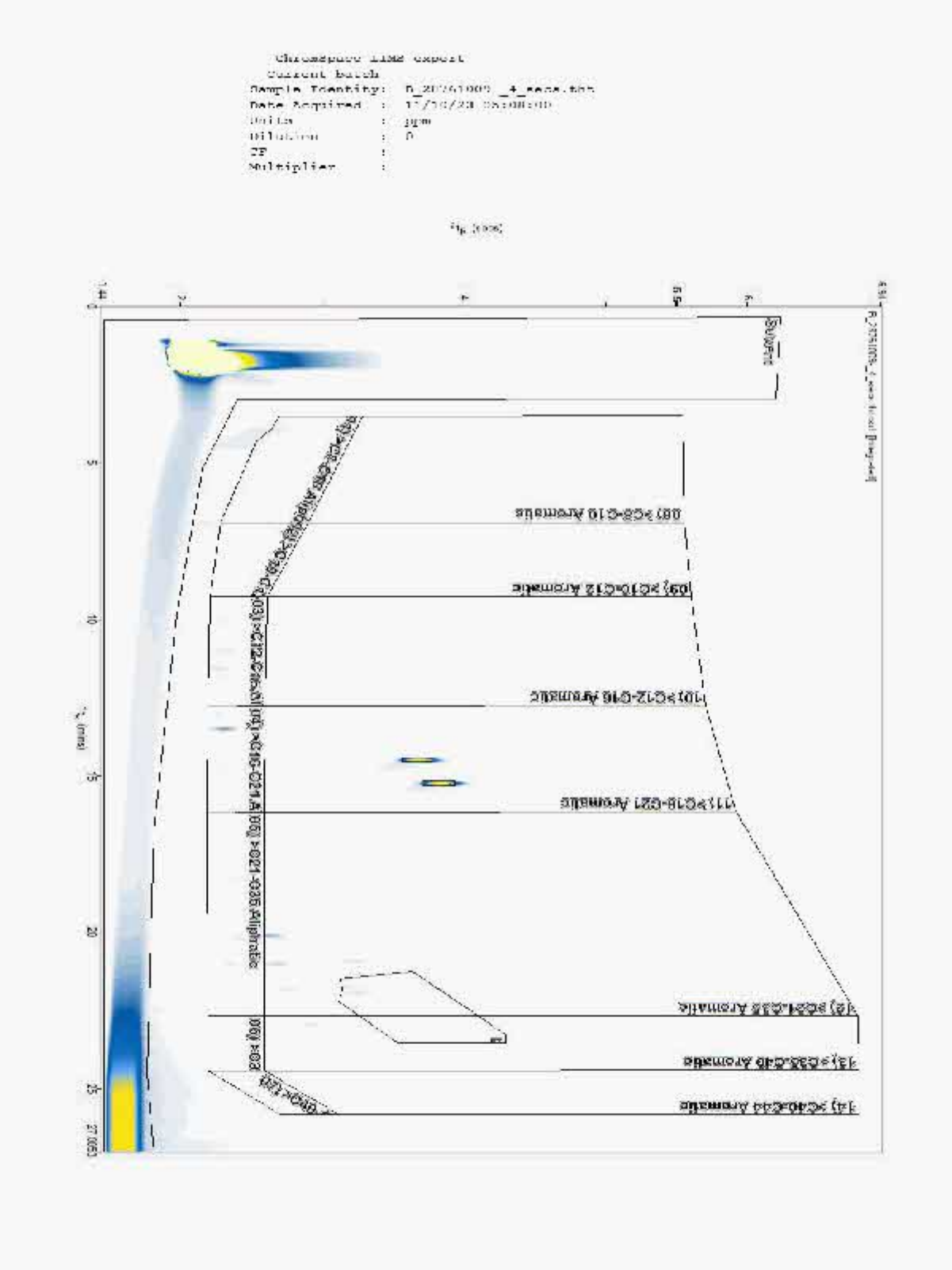


CERTIFICATE OF ANALYSIS

SDG: 231009-39 **Report Number:** 707471 **Superseded Report:**
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28761009 **Depth :** 0.50 - 1.00
Sample ID : L1



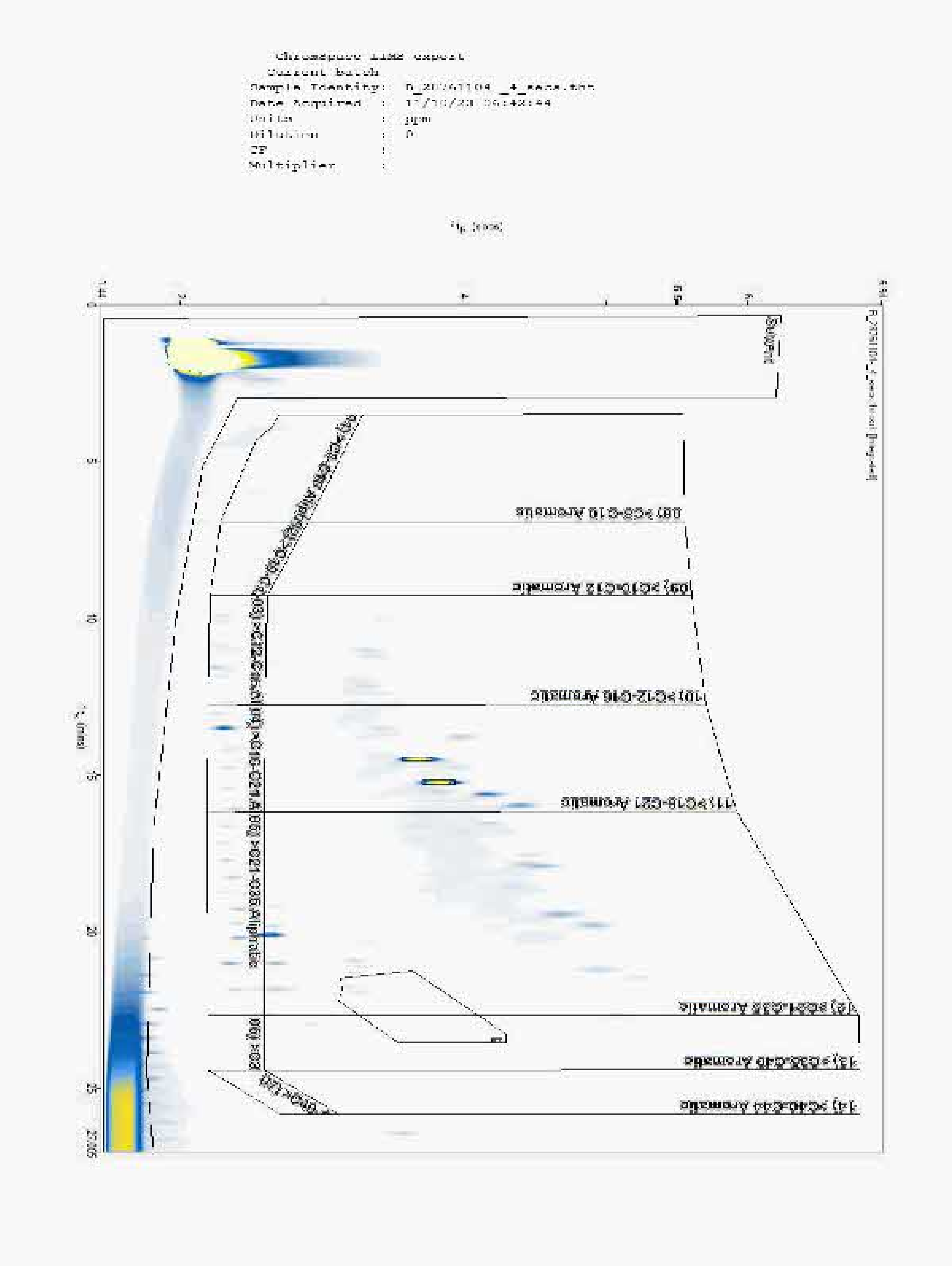
Validated

CERTIFICATE OF ANALYSIS

SDG: 231009-39 **Report Number:** 707471 **Superseded Report:**
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28761104 **Depth :** 0.50 - 1.00
Sample ID : L5

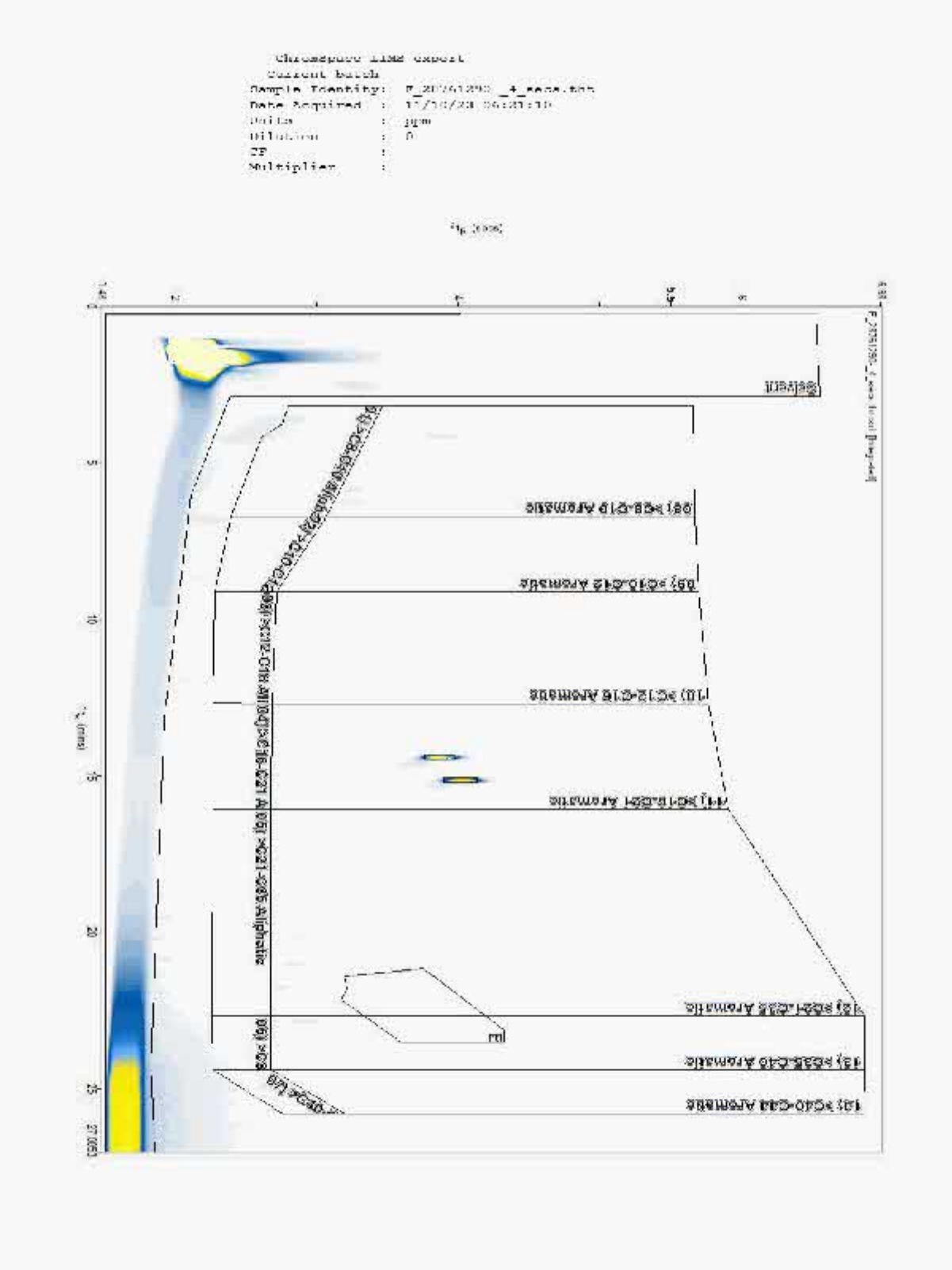


CERTIFICATE OF ANALYSIS

SDG: 231009-39 **Report Number:** 707471 **Superseded Report:**
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28761290 **Depth :** 0.50 - 1.00
Sample ID : L4

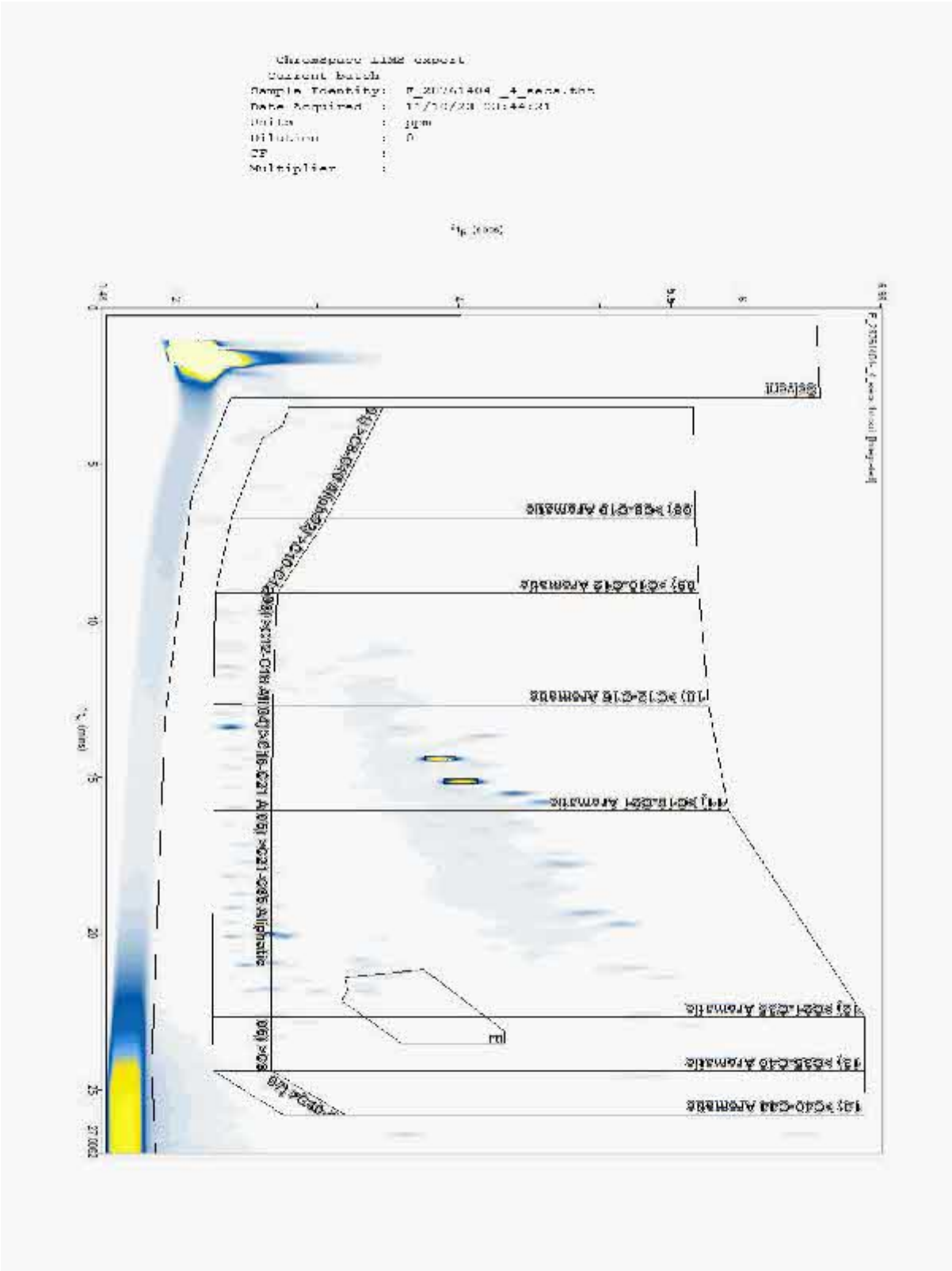


CERTIFICATE OF ANALYSIS

SDG: 231009-39 **Report Number:** 707471 **Superseded Report:**
Client Ref. 70102251 **Location:** Esso Express Chesterfield

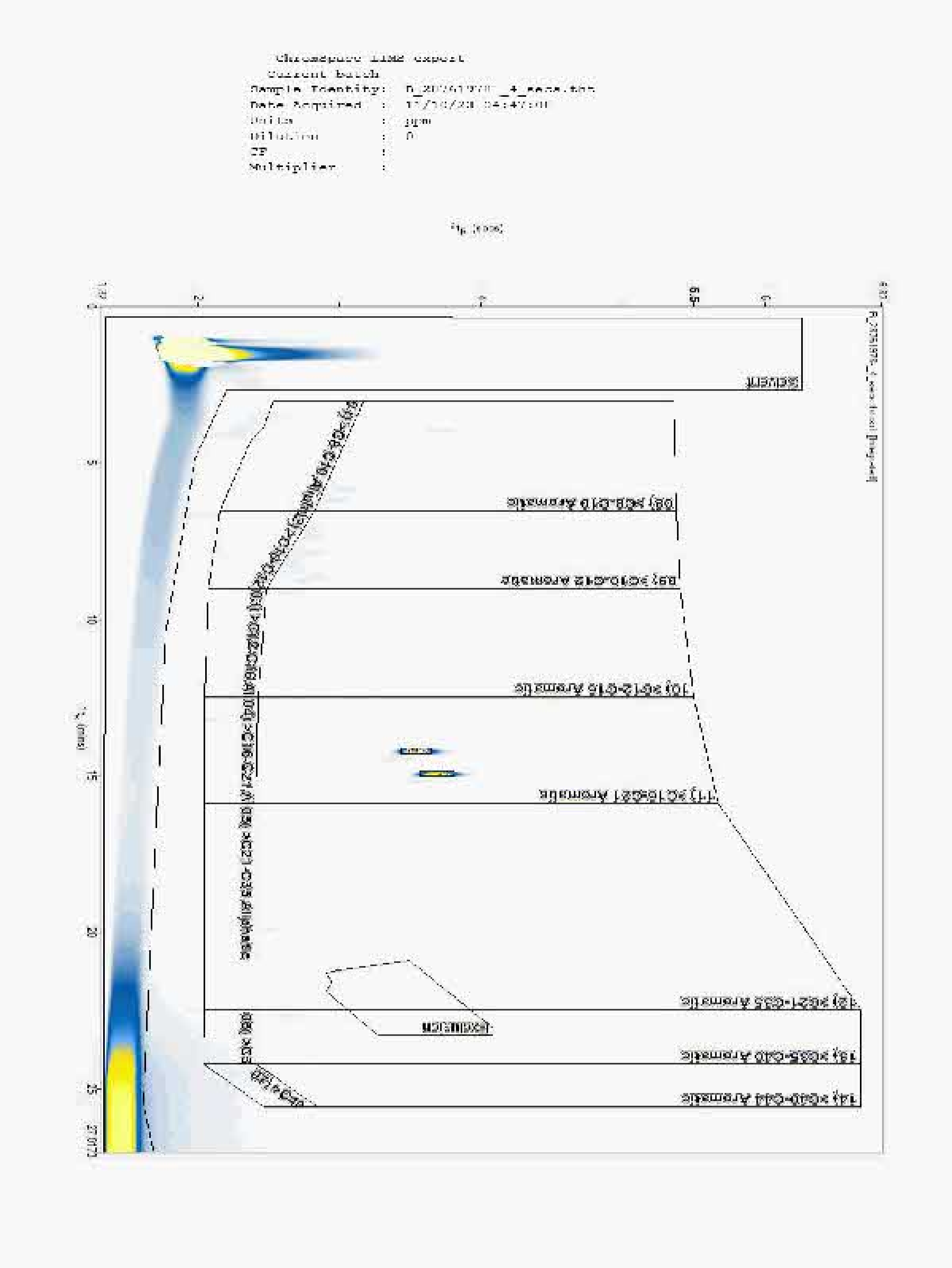
Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28761404 **Depth :** 0.50 - 1.00
Sample ID : L7



Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28761978 **Depth :** 0.50 - 1.00
Sample ID : L3

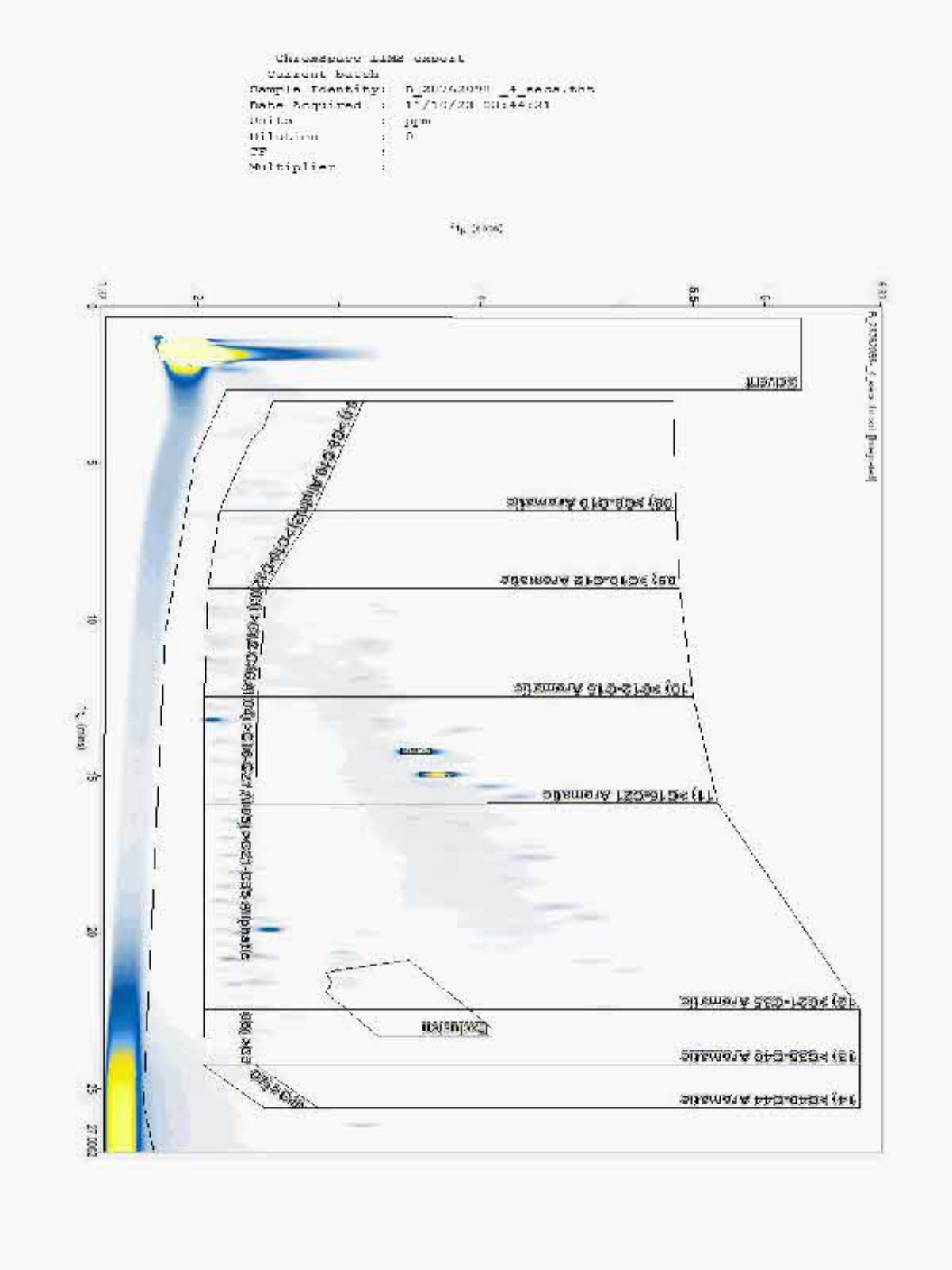


CERTIFICATE OF ANALYSIS

SDG: 231009-39 **Report Number:** 707471 **Superseded Report:**
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28762098 **Depth :** 0.50 - 1.00
Sample ID : L6

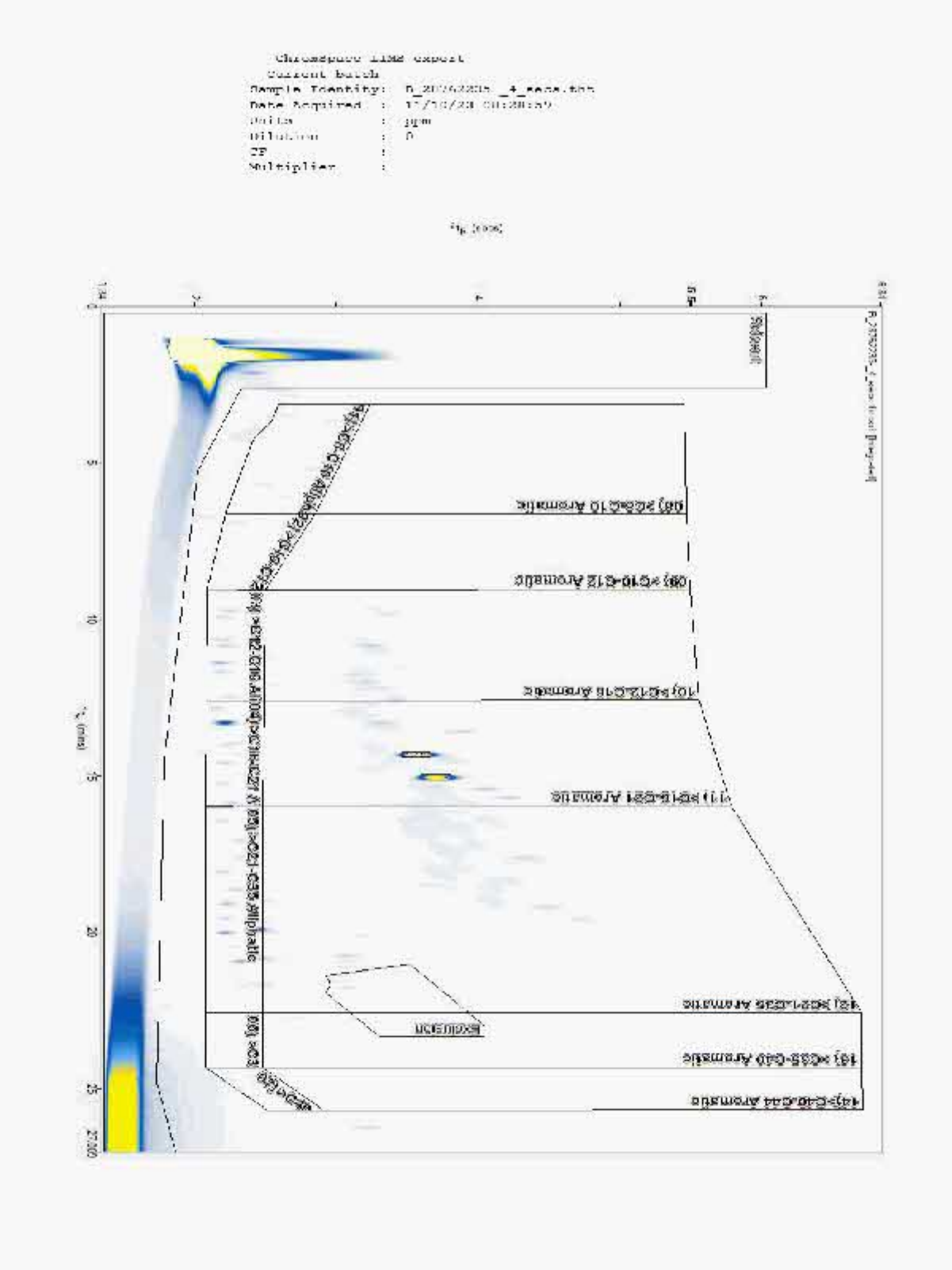


CERTIFICATE OF ANALYSIS

SDG: 231009-39 **Report Number:** 707471 **Superseded Report:**
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 28762235 **Depth :** 0.50 - 1.00
Sample ID : L8

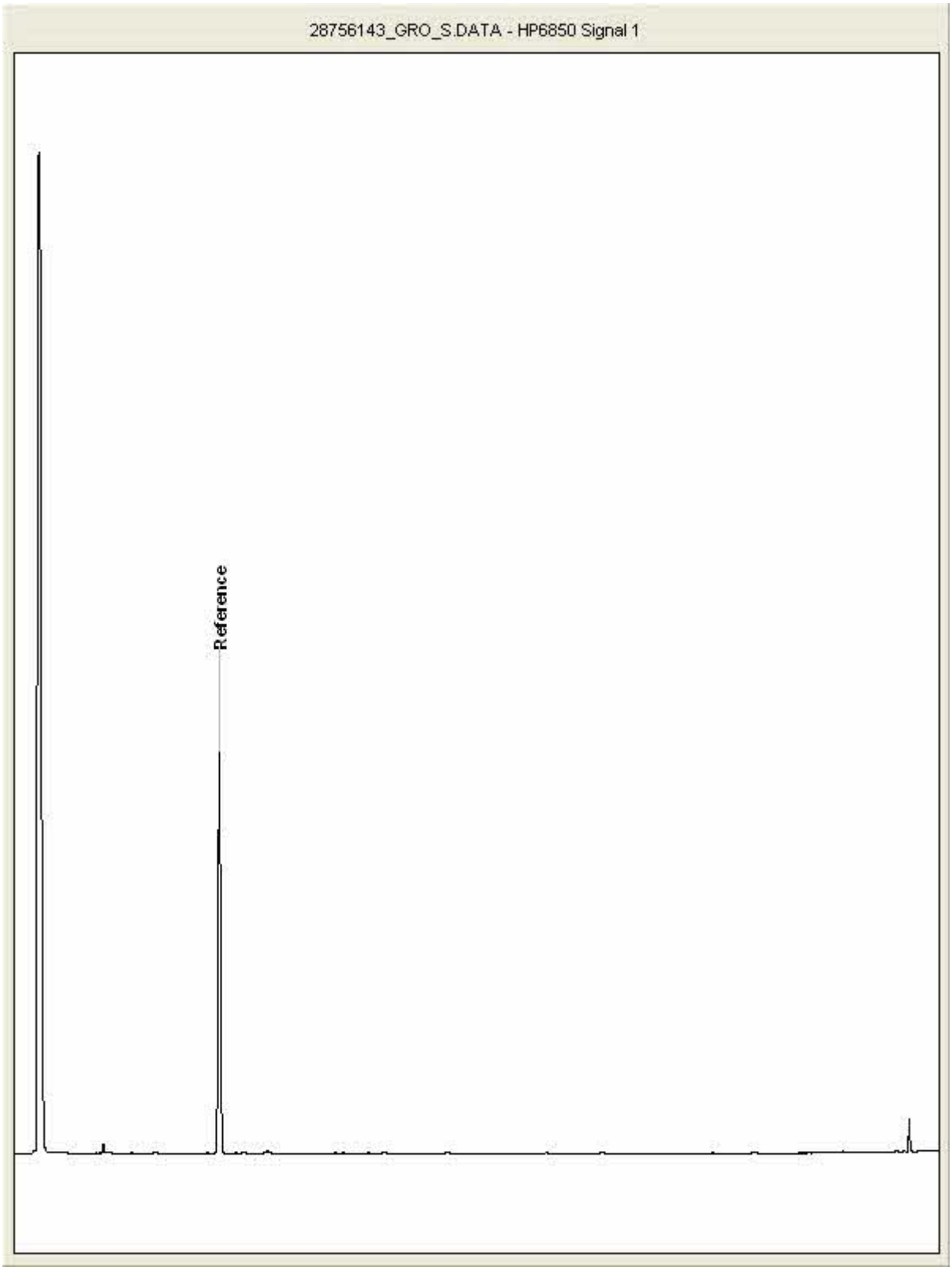


CERTIFICATE OF ANALYSIS

SDG: 231009-39 **Report Number:** 707471 **Superseded Report:**
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28756143 **Depth :** 0.50 - 1.00
Sample ID : L7

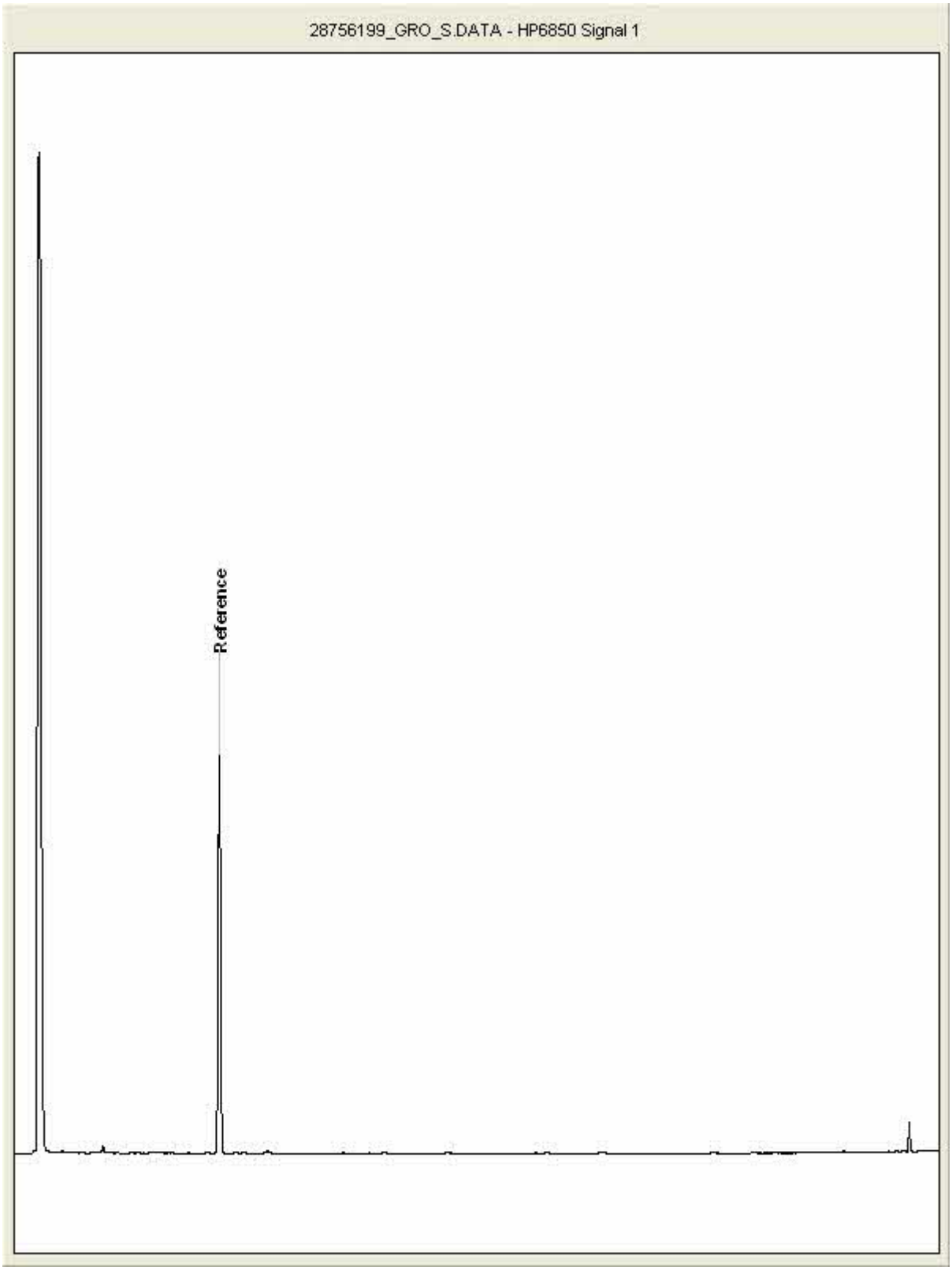


CERTIFICATE OF ANALYSIS

SDG: 231009-39 **Report Number:** 707471 **Superseded Report:**
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28756199 **Depth :** 0.50 - 1.00
Sample ID : L8

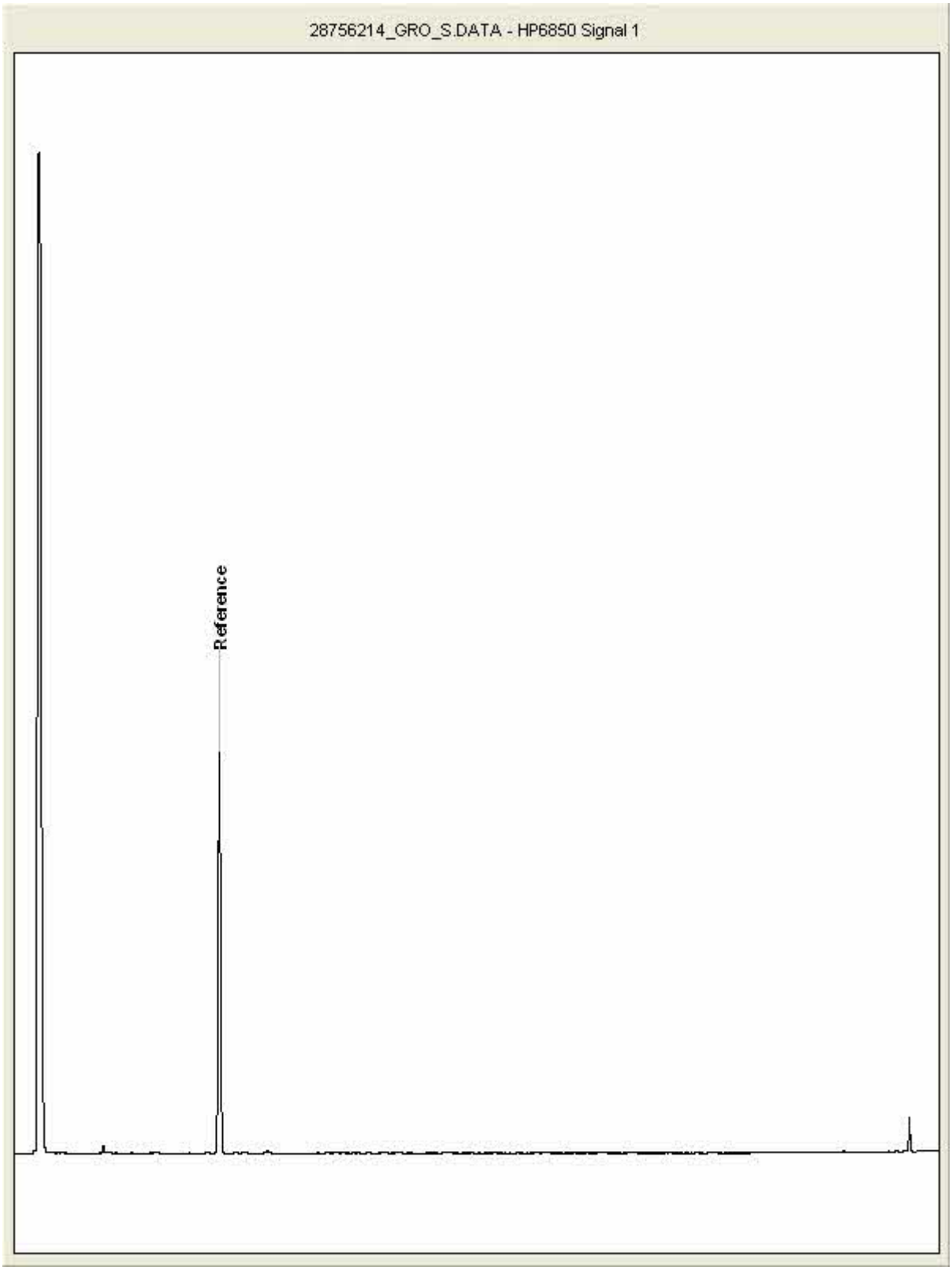


CERTIFICATE OF ANALYSIS

SDG: 231009-39 **Report Number:** 707471 **Superseded Report:**
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28756214 **Depth :** 0.50 - 1.00
Sample ID : L2

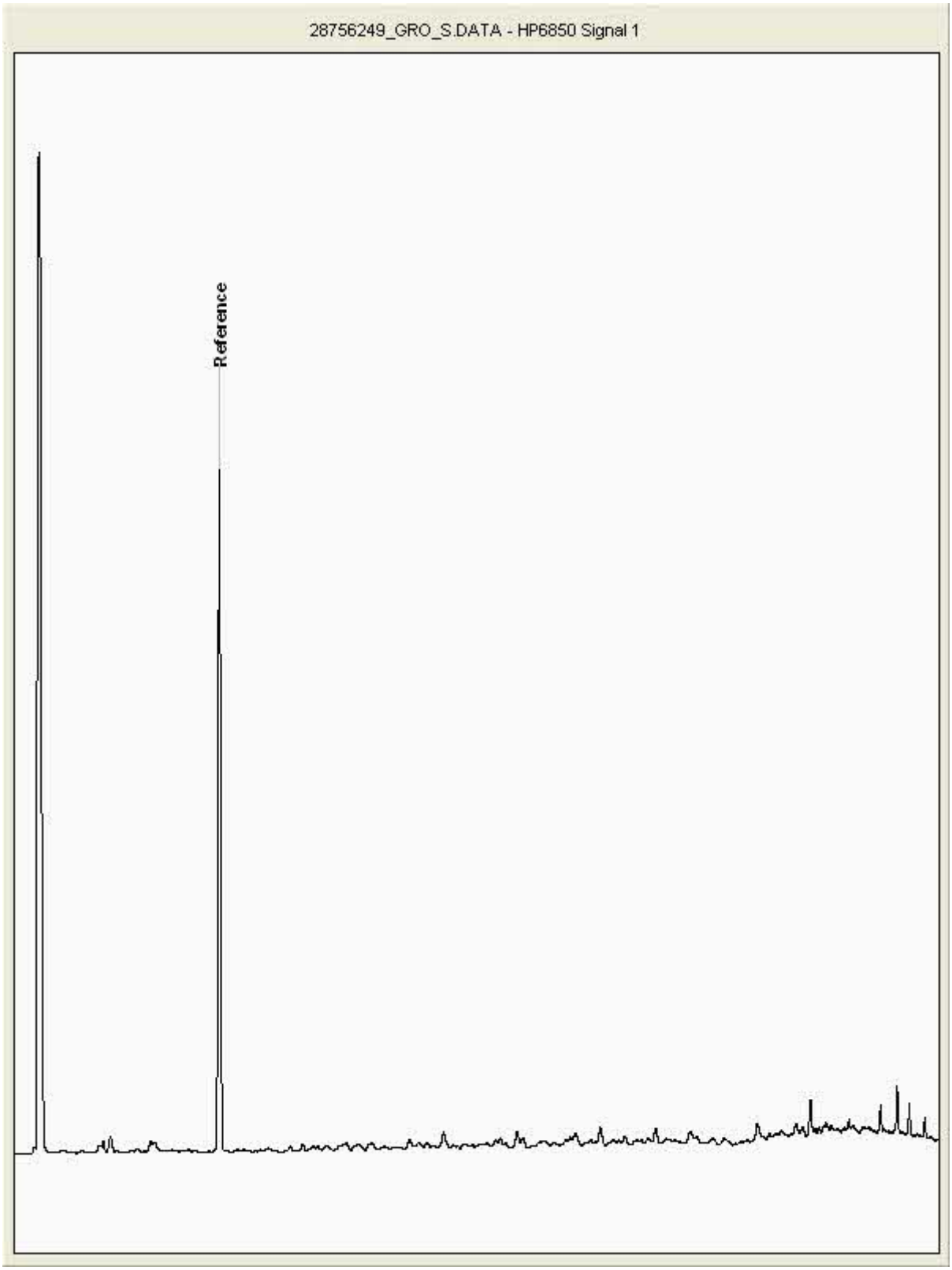


CERTIFICATE OF ANALYSIS

SDG: 231009-39 **Report Number:** 707471 **Superseded Report:**
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28756249 **Depth :** 0.50 - 1.00
Sample ID : L3

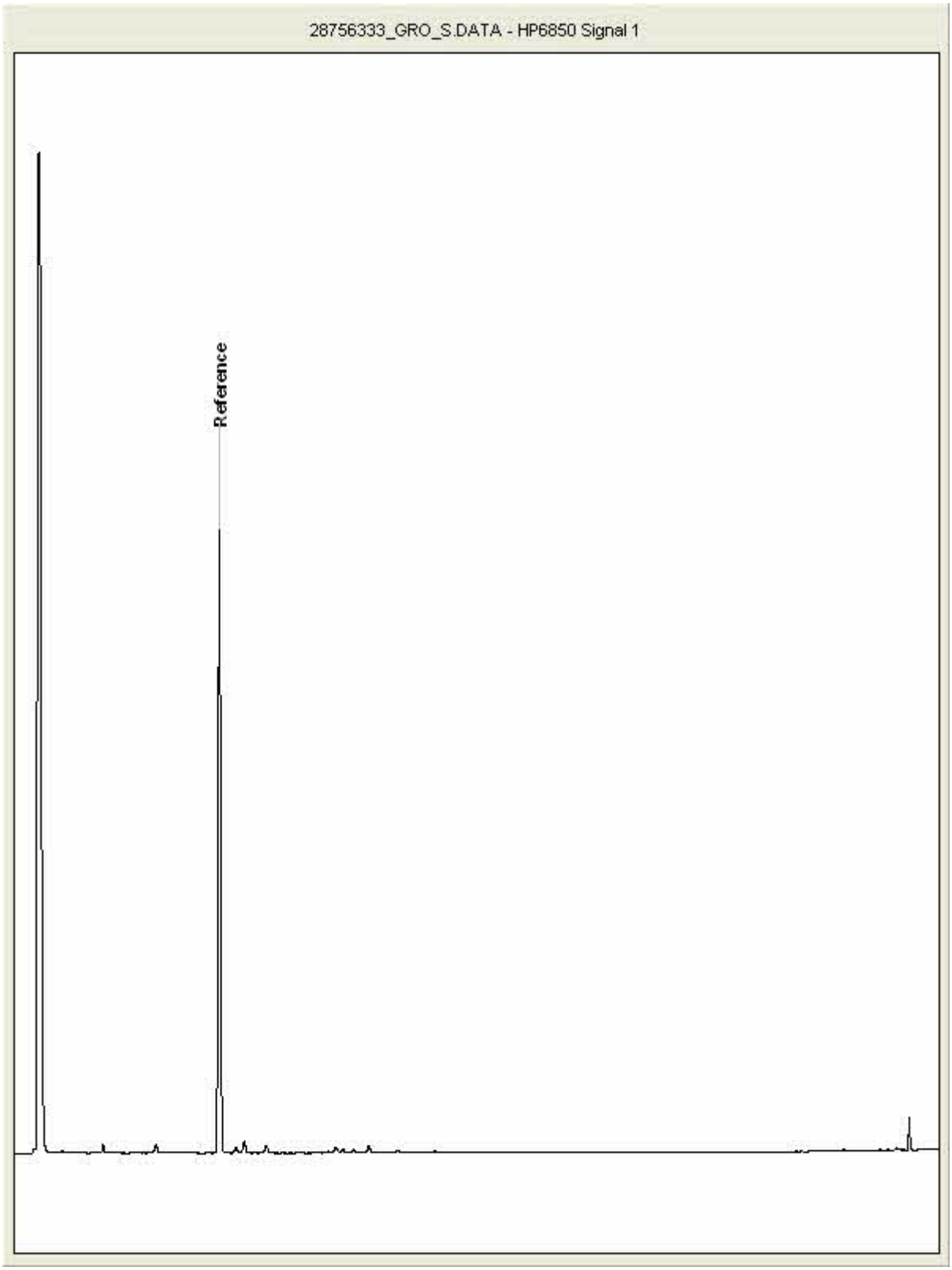


CERTIFICATE OF ANALYSIS

SDG: 231009-39 **Report Number:** 707471 **Superseded Report:**
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28756333 **Depth :** 0.50 - 1.00
Sample ID : L4

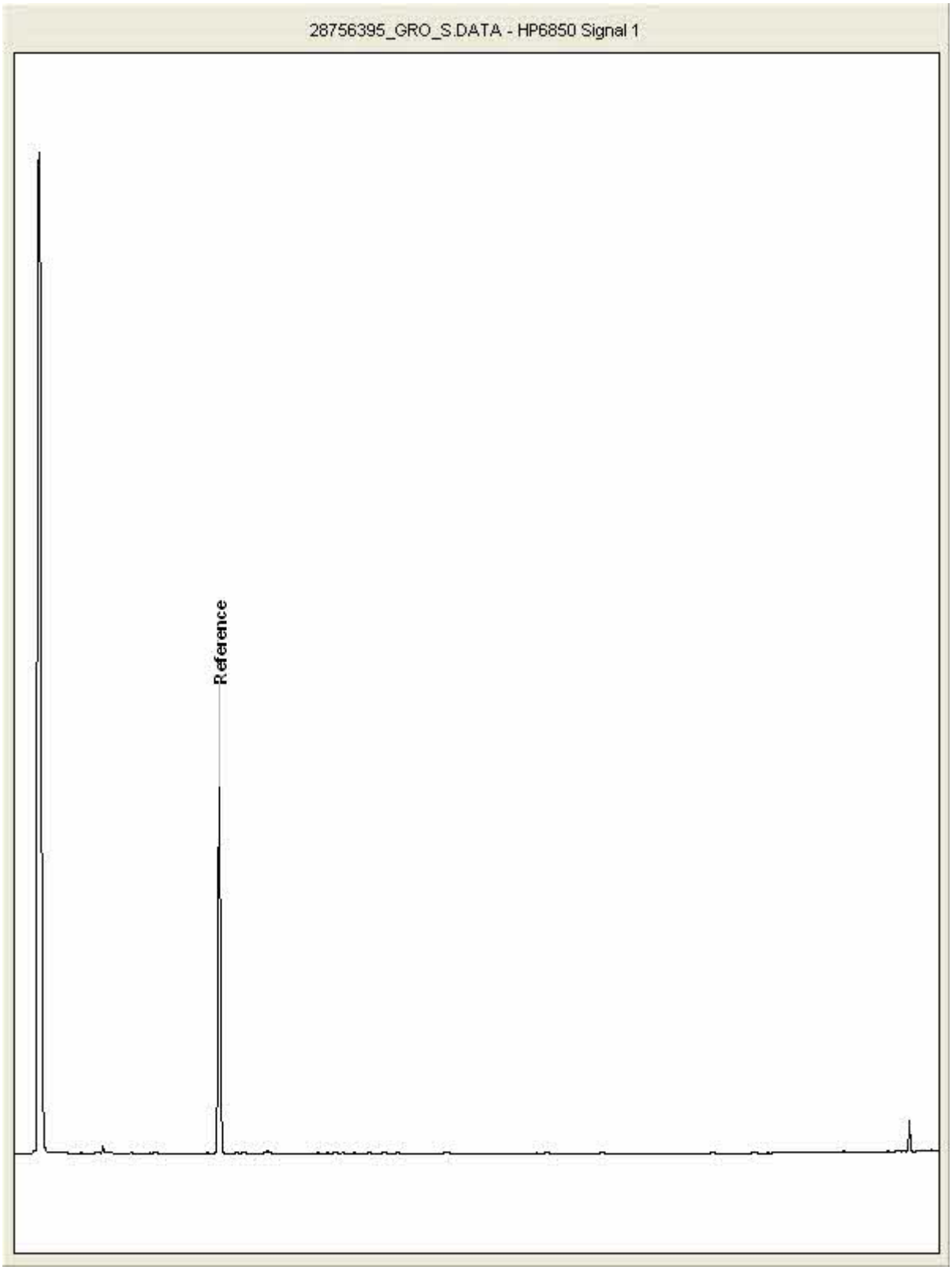


CERTIFICATE OF ANALYSIS

SDG: 231009-39 **Report Number:** 707471 **Superseded Report:**
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28756395 **Depth :** 0.50 - 1.00
Sample ID : L6

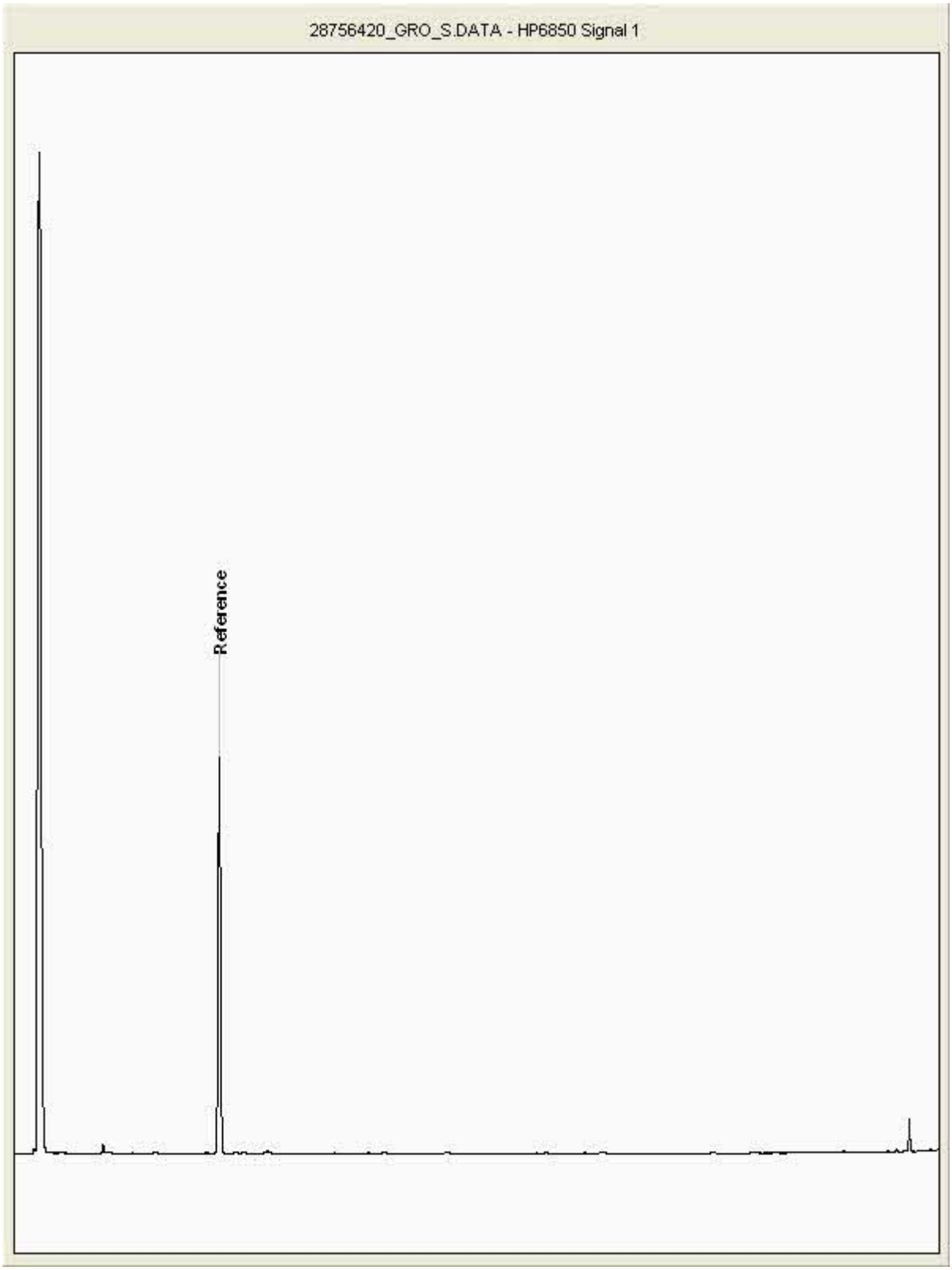


CERTIFICATE OF ANALYSIS

SDG: 231009-39 **Report Number:** 707471 **Superseded Report:**
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28756420 **Depth :** 0.50 - 1.00
Sample ID : L1

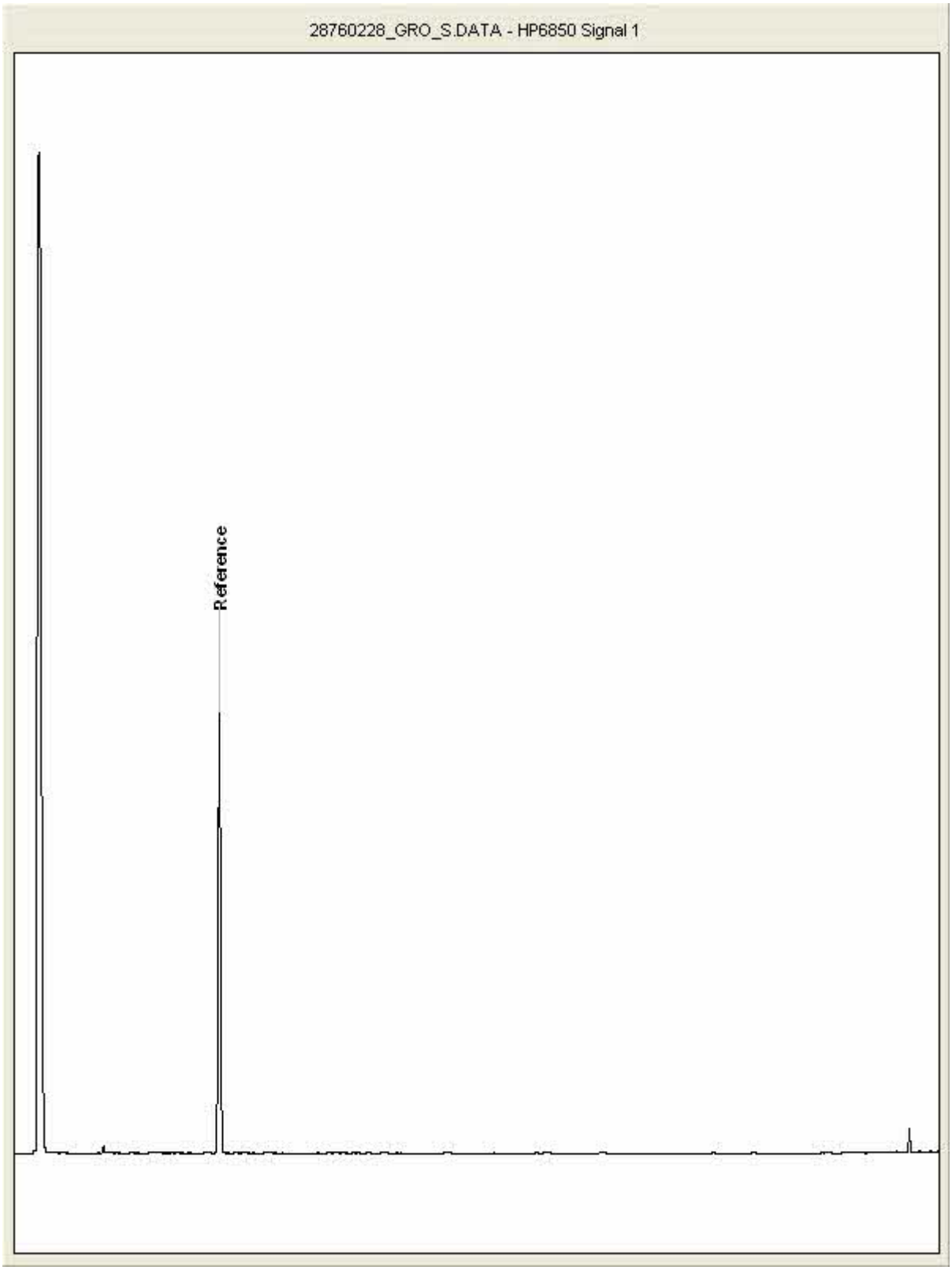


CERTIFICATE OF ANALYSIS

SDG: 231009-39 **Report Number:** 707471 **Superseded Report:**
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28760228 **Depth :** 0.50 - 1.00
Sample ID : L7

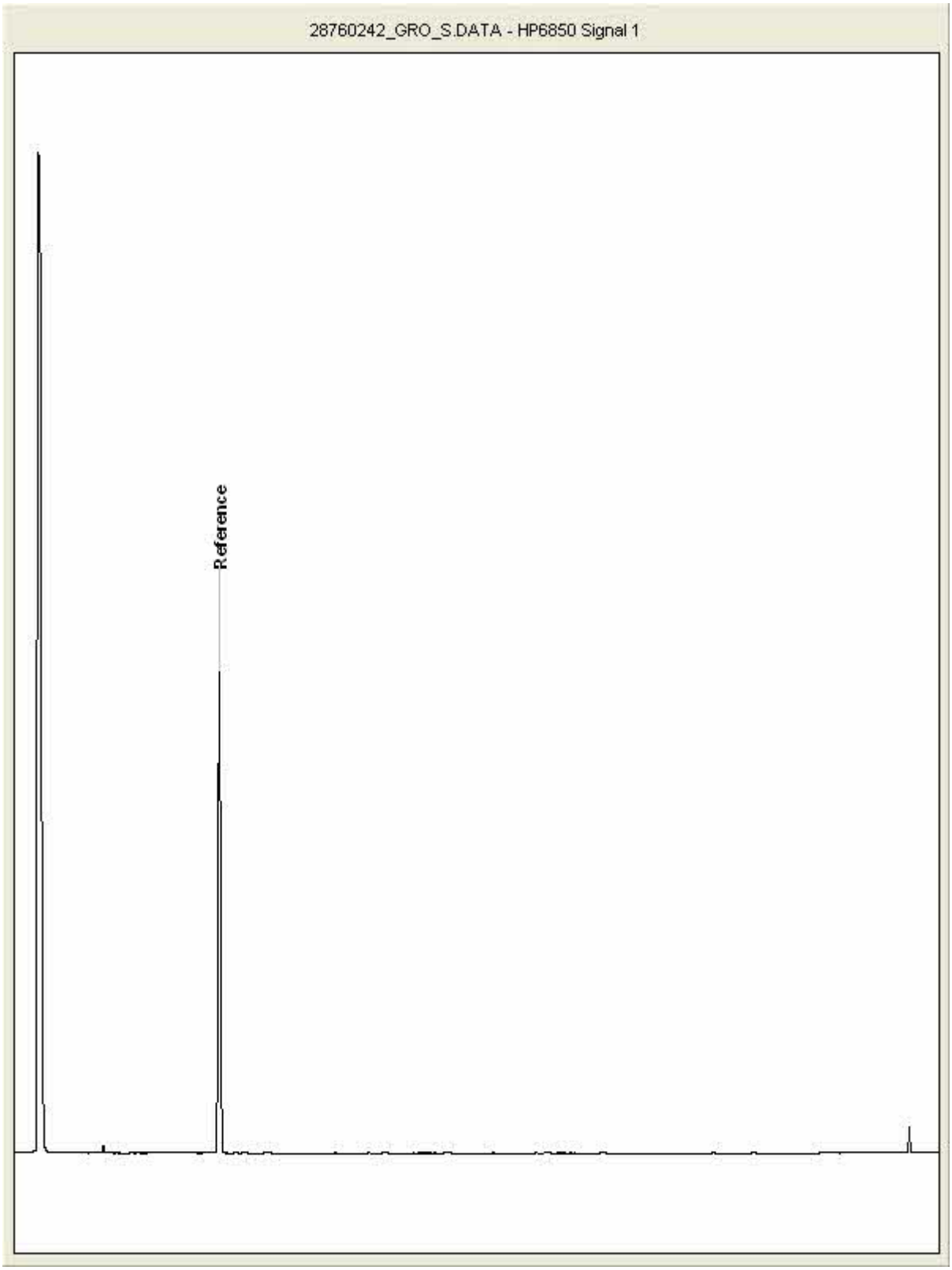


CERTIFICATE OF ANALYSIS

SDG: 231009-39 **Report Number:** 707471 **Superseded Report:**
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28760242 **Depth :** 0.50 - 1.00
Sample ID : L8

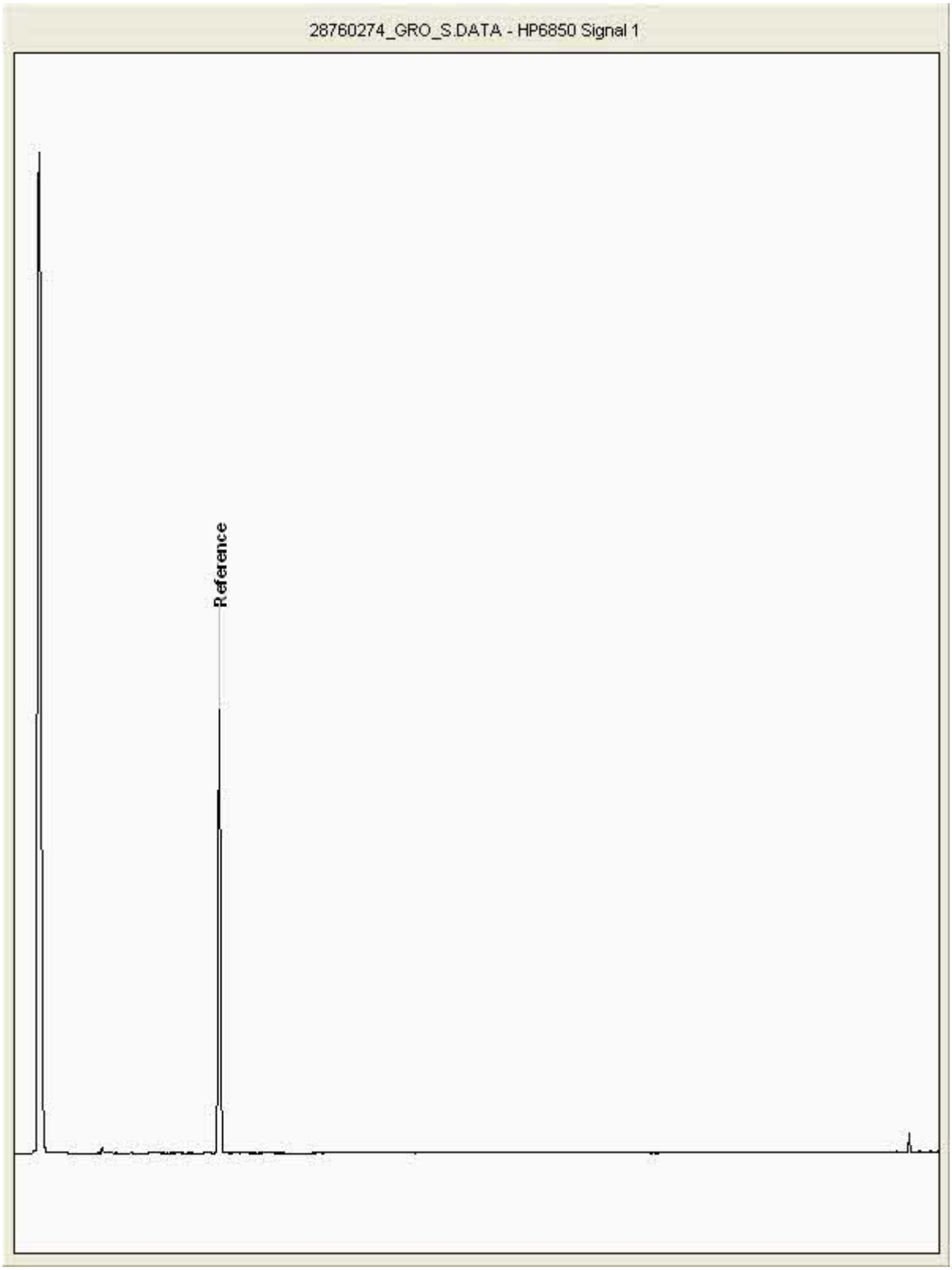


CERTIFICATE OF ANALYSIS

SDG: 231009-39 **Report Number:** 707471 **Superseded Report:**
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28760274 **Depth :** 0.50 - 1.00
Sample ID : L6

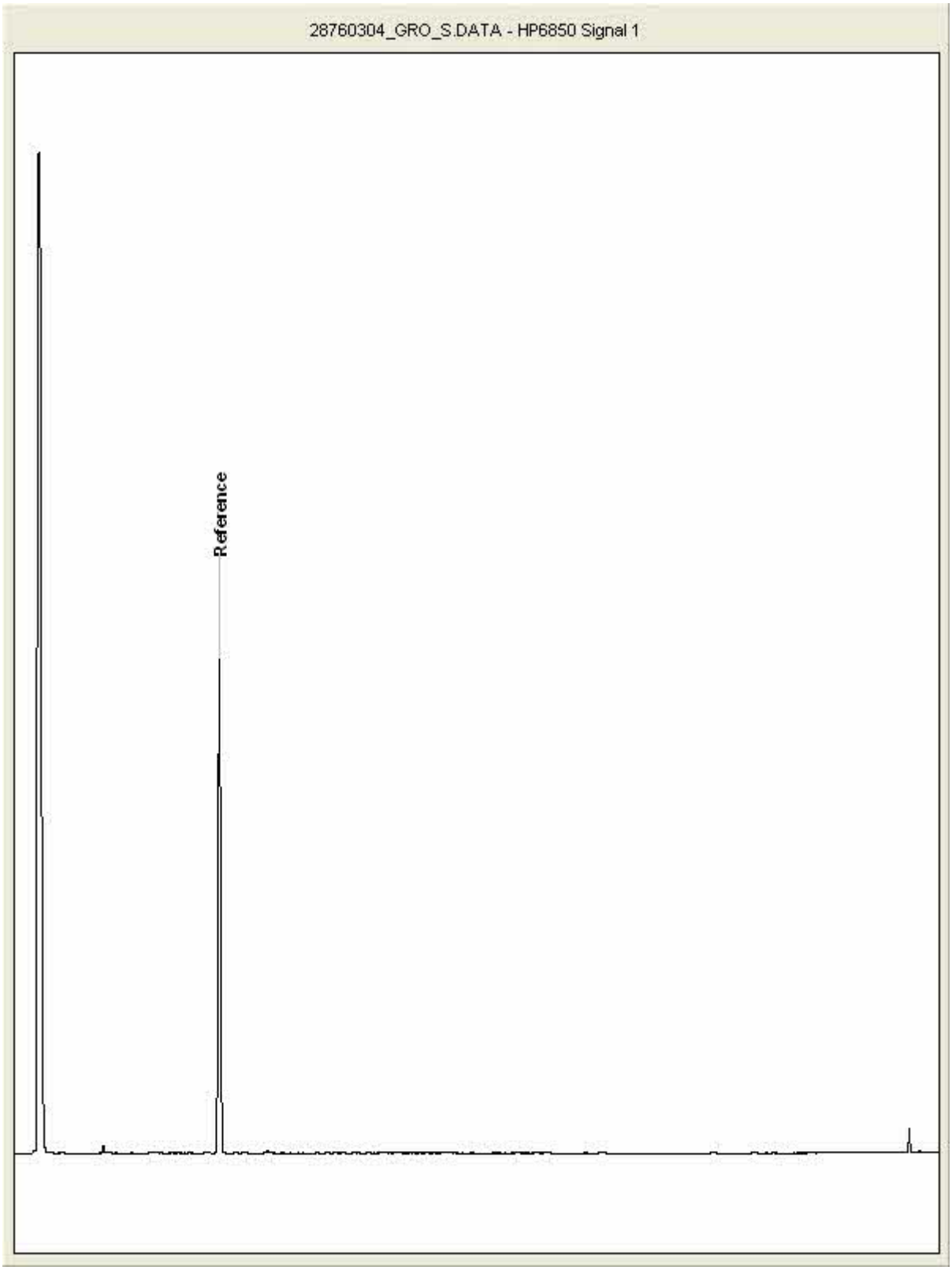


CERTIFICATE OF ANALYSIS

SDG: 231009-39 **Report Number:** 707471 **Superseded Report:**
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28760304 **Depth :** 0.50 - 1.00
Sample ID : L2

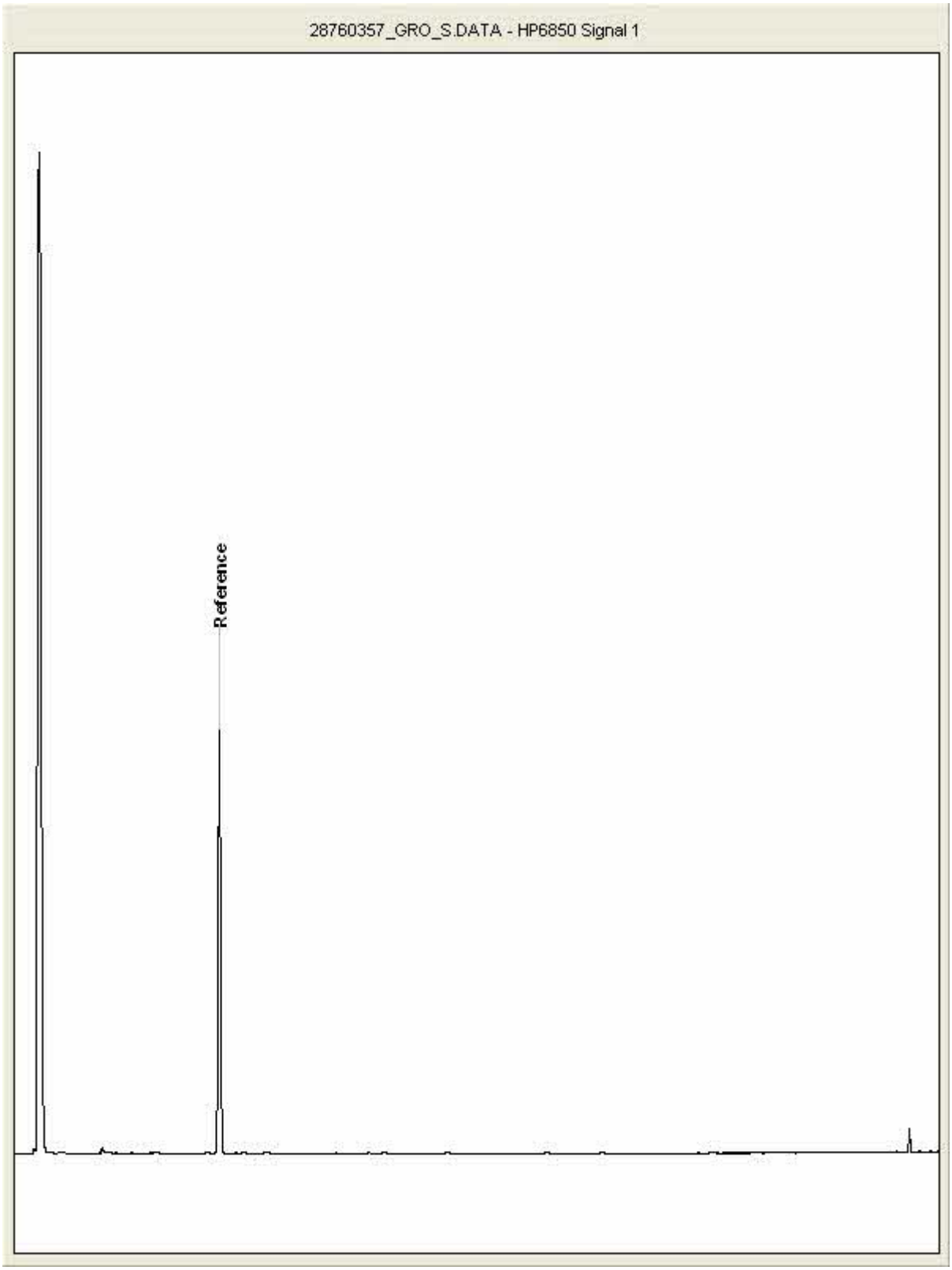


CERTIFICATE OF ANALYSIS

SDG: 231009-39 **Report Number:** 707471 **Superseded Report:**
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28760357 **Depth :** 0.50 - 1.00
Sample ID : L1

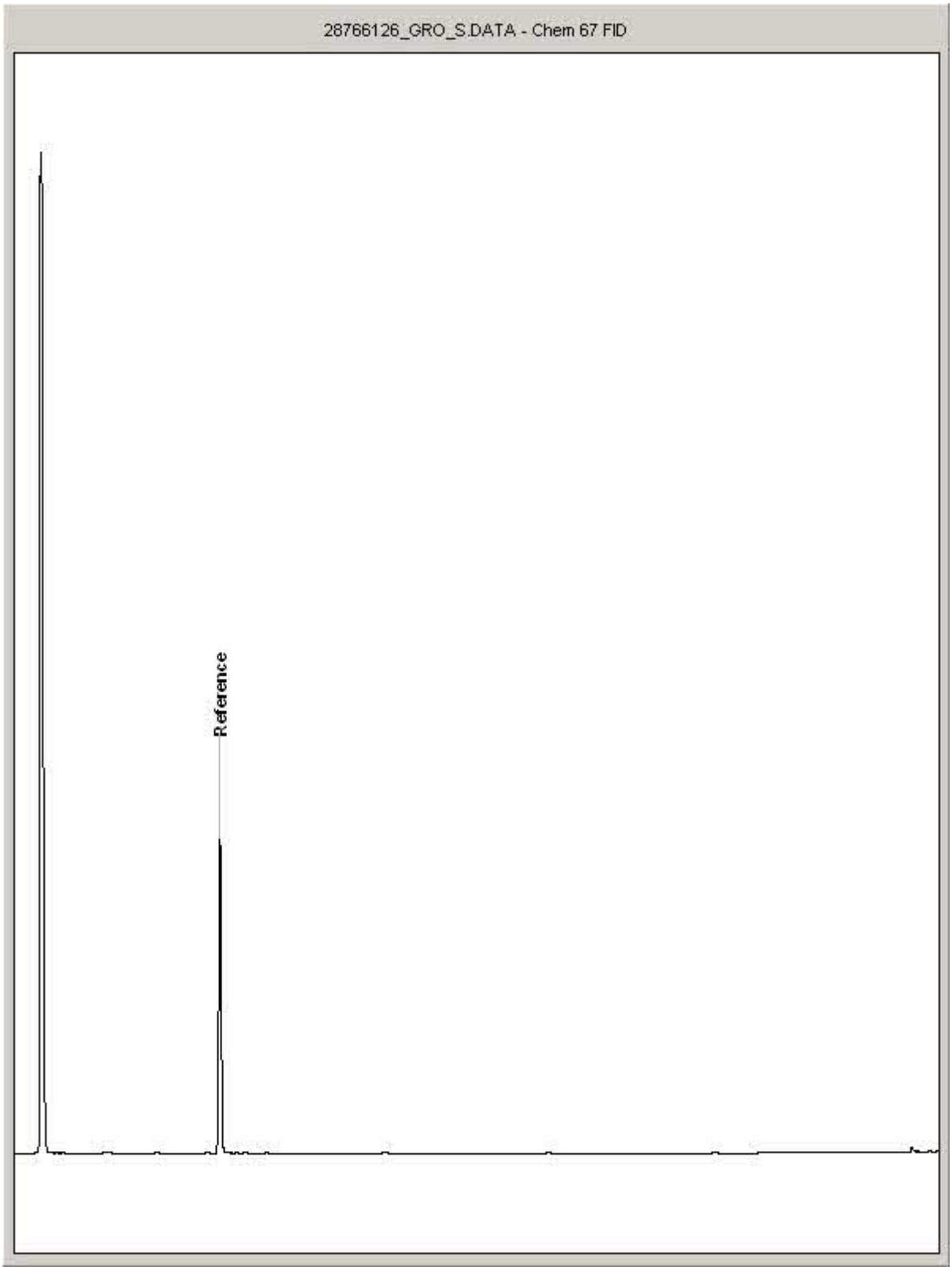


CERTIFICATE OF ANALYSIS

SDG: 231009-39 **Report Number:** 707471 **Superseded Report:**
Client Ref. 70102251 **Location:** Esso Express Chesterfield

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 28766126 **Depth :** 0.50 - 1.00
Sample ID : L5



Appendix

General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses excep for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 15 day after analysis is completed (e-mailed) for all sample types unless the sample is destroye on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of 15 days after the date of receipt unless we are instructed to the contrary. Once the init period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client require wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment i present in the volatile sample, the integrity of the data may be compromised. This will b flagged up as an invalid VOC on the test schedule and the result marked as deviating c the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not correcte for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this i possible interferences. In both cases the sample would be diluted which would cause th method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile lo may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. **Sample Deviations**

If a sample is classed as deviated then the associated results may be compromised.

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Matrix interference**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to late arrival of instructions or samples**
§	**Sampled on date not provided**

20. **Asbestos**

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained f supplied bulk materials andd soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised ligt microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised s sample which has been examined to determine the presence of asbestos fibres us ALS (Hawarden) in-house method of transmitted/polarised light microscopy and centr stop dispersion staining.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test ot than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products be found in HSG 264.

The identification of asbestos containing materials and soils falls v schedule of tests for which we hold UKAS accreditation, however interpretations and all other information contained in the report are outs scope of UKAS accreditation.

Appendix E

HUMAN HEALTH SUPPORTING INFORMATION

Chesterfield Express
Environmental Report on Site Redevelopment
Laboratory Analysis of Soil Samples and Screening Against Generic Assessment Criteria

				L1	L2	L3	L4	L5	L6	L7	L8
			Human Health	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00
Test	Units	LOD	Commercial 1% GAC	05/10/2023	05/10/2023	05/10/2023	05/10/2023	05/10/2023	05/10/2023	05/10/2023	05/10/2023
Sample Description											
Colour	No units		-	Dark Brown	Dark Brown	Light Brown	Light Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown
Description	No units		-	Sandy Loam	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay	Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam
Inclusion 1)	No units		-	Stones	Stones	Stones	Stones	Stones	Stones	Stones	Stones
Inclusion 2)	No units		-	None	None	None	None	Tile/Insulation Board	None	Vegetation	None
Moisture Content Ratio (% of as received sample)	%		-	28	21	23	10	23	22	24	15
Asbestos											
Date of Analysis	No units		-	12/10/2023	12/10/2023	12/10/2023	12/10/2023	12/10/2023	12/10/2023	12/10/2023	12/10/2023
Analysed By	No units		-	Alex Homer	Alex Homer	Odhran McLernon	Alex Homer	Alex Homer	Odhran McLernon	Alex Homer	Alex Homer
Chrysotile (White) Asbestos	No units		-	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Amosite (Brown) Asbestos	No units		-	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Crocidolite (Blue) Asbestos	No units		-	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Asbestos Anthophyllite	No units		-	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Asbestos Tremolite	No units		-	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Asbestos Actinolite	No units		-	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Non-Asbestos Fibre	No units		-	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Comments	No units		-	-	-	-	-	-	-	-	-
Carbon											
Organic Carbon, Total	%	<0.200	-	19.5	4.65	3.36	3.63	9.84	12.1	11.6	12.4
Inorganics											
pH	pH Units	<1.000	-	8.02	8.59	8.11	9.05	8.22	8.36	8.28	8.39
ANC @ pH 4	mol/kg	<0.030	-	-	-	-	-	-	-	-	-
ANC @ pH 6	mol/kg	<0.030	-	-	-	-	-	-	-	-	-
Loss on ignition	%	<0.700	-	-	-	-	-	-	-	-	-
Metals - (Solids)											
Chromium, Hexavalent	mg/kg	<0.600	24	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600
Boron, water soluble	mg/kg	<1.000	207000	1.24	1.64	<1.000	<1.000	1.27	1.35	1.46	1.22
Arsenic	mg/kg	<0.600	635	44.2	19.4	18.8	4.62	43.3	42.9	47.1	43
Barium	mg/kg	<0.600	22100	124	59	92.3	859	246	277	260	248
Beryllium	mg/kg	<0.010	12	2.01	0.885	1.1	0.528	2.39	2.47	2.5	2.51
Cadmium	mg/kg	<0.020	223	<0.020	<0.020	<0.020	2.95	0.055	<0.020	0.143	0.0243
Chromium	mg/kg	<0.900	9550	9.84	9.92	8.97	5.33	9.64	6.78	9.01	7.12
Copper	mg/kg	<1.400	69800	89.7	29	50	8.72	65.5	57.4	305	62.4
Lead	mg/kg	<0.700	1390	103	49.7	116	30.6	183	179	207	217
Mercury	mg/kg	<0.100	1110	0.172	0.113	0.261	<0.100	1.22	1.34	1.33	3.44
Nickel	mg/kg	<0.200	1710	40.7	14.4	22.1	6.24	32.9	31.2	32.7	35.2
Selenium	mg/kg	<1.000	12300	1.73	<1.000	<1.000	1.18	1.61	1.93	1.94	1.94
Vanadium	mg/kg	<0.200	9220	41	26.8	23.8	9.19	38.7	35.3	39	40.2
Zinc	mg/kg	<1.900	1050000	69.3	60.3	83.6	68.7	118	110	246	110
Gasoline Range Organics (GRO)											
Total Aliphatics >C5-C10	mg/kg	<50.000	-	<0.050	<0.050	1.6	0.321	<0.050	<0.050	<0.050	<0.050
Total Aromatics >EC5-EC10	mg/kg	<50.000	-	<0.050	<0.050	0.564	0.105	<0.050	<0.050	<0.050	<0.050
GRO >C5-C10	mg/kg	<20.000	-	<0.020	<0.020	2.17	0.427	<0.020	<0.020	<0.020	<0.020
EPH (Extractable Petroleum Hydrocarbons)											
EPH Surrogate % recovery**	%		-	-	-	-	-	-	-	-	-
Mineral Oil >C10-C40	mg/kg	<5.000	-	-	-	-	-	-	-	-	-
TPH Criteria Working Group (TPH CWG)											
GRO Surrogate % recovery**	%		-	59.5	72.6	95.5	90.2	86.2	69	66.6	72.2
Aliphatics >C5-C6	mg/kg	<10.000	3190	<0.010	<0.010	0.0477	0.0246	<0.010	<0.010	<0.010	<0.010
Aliphatics >C6-C8	mg/kg	<10.000	7780	<0.010	<0.010	0.71	0.139	<0.010	<0.010	<0.010	<0.010
Aliphatics >C8-C10	mg/kg	<10.000	2000	<0.010	<0.010	0.846	0.158	<0.010	<0.010	<0.010	<0.010
Aliphatics >C10-C12	mg/kg	<1000.000	9690	1.38	<1.000	<1.000	<1.000	3.7	3.91	1.36	1.64
Aliphatics >C12-C16	mg/kg	<1000.000	58800	2.55	<1.000	<1.000	<1.000	3.46	5.04	2.97	3.02
Aliphatics >C16-C21	mg/kg	<1000.000	1580000	2.07	1.03	<1.000	<1.000	3.57	4.3	2.99	3.08
Aliphatics >C21-C35	mg/kg	<1000.000	1580000	<1.000	1.46	<1.000	<1.000	4.05	5.86	6.84	4.87
Aliphatics >C35-C44	mg/kg	<1000.000	1580000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000
Total Aliphatics >C10-C44	mg/kg	<5000.000	-	6.92	<5.000	<5.000	<5.000	15	20	14.4	12.9
Total Aliphatics & Aromatics >C10-C44	mg/kg	<10000.000	-	19.5	<10.000	<10.000	<10.000	85.5	82.4	73.2	50.5
Aromatics >EC5-EC7	mg/kg	<10.000	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Aromatics >EC7-EC8	mg/kg	<10.000	56100	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Aromatics >EC8-EC10	mg/kg	<10.000	3460	<0.010	<0.010	0.564	0.105	<0.010	<0.010	<0.010	<0.010
Aromatics > EC10-EC12	mg/kg	<1000.000	16200	<1.000	<1.000	2.82	<1.000	<1.000	1.02	<1.000	<1.000
Aromatics > EC12-EC16	mg/kg	<1000.000	36200	2.81	<1.000	<1.000	<1.000	10.6	11.3	6.38	6.85
Aromatics > EC16-EC21	mg/kg	<1000.000	28200	3.8	<1.000	<1.000	<1.000	17	16.8	15.9	10.2
Aromatics > EC21-EC35	mg/kg	<1000.000	28400	4.35	2.55	<1.000	<1.000	40.8	32.2	34.9	19.2
Aromatics >EC35-EC44	mg/kg	<1000.000	28400	<1.000	<1.000	<1.000	<1.000	1.31	<1.000	1.03	<1.000
Aromatics > EC40-EC44	mg/kg	<1000.000	-	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000
Total Aromatics > EC10-EC44	mg/kg	<5000.000	-	12.6	<5.000	<5.000	<5.000	70.5	62.4	58.8	37.6
Total Aliphatics & Aromatics >C5-C44	mg/kg	<10000.000	-	19.5	<10.000	<10.000	<10.000	85.5	82.4	73.2	50.5
Polyaromatic Hydrocarbons (PAHs)											
Coronene	mg/kg	<200.000	-	-	-	-	-	-	-	-	-
Naphthalene-d8 % recovery**	%		-	94.4	93	97.2	90.2	84.2	94.3	85.9	96.7
Acenaphthene-d10 % recovery**	%		-	96.9	92	98.6	87.9	84	96.7	84.8	96.7
Phenanthrene-d10 % recovery**	%		-	95	91.5	96.5	88.1	82.4	92.8	83.6	93.6
Chrysene-d12 % recovery**	%		-	85.5	88.8	87.1	85.9	75.9	80	77.1	85.1
Perylene-d12 % recovery**	%		-	81.6	85	88	88.7	72.2	74.4	73	78.4
Naphthalene	mg/kg	<9.000	193	0.0288	0.0122	0.0374	0.0225	0.118	0.121	0.0901	0.0654
Acenaphthylene	mg/kg	<12.000	-	<0.012	<0.012	<0.012	<0.012	0.0361	0.0323	0.038	0.0171
Acenaphthene	mg/kg	<8.000	-	<0.008	<0.008	<0.008	<0.008	0.0277	0.0195	0.0247	<0.008
Fluorene	mg/kg	<10.000	-	<0.010	<0.010	<0.010	<0.010	0.0351	0.0313	0.0368	<0.010
Phenanthrene	mg/kg	<15.000	-	0.0884	0.029	0.0251	<0.015	0.635	0.514	0.642	0.232
Anthracene	mg/kg	<16.000	-	<0.016	<0.016	<0.016	<0.016	0.128	0.0807	0.121	0.0339
Fluoranthene	mg/kg	<17.000	-	0.042	<0.017	0.0314	0.0343	1.45	0.834	1.47	0.305
Pyrene	mg/kg	<15.000	-	0.0426	0.0191	0.0302	0.0353	1.27	0.726	1.29	0.278
Benz(a)anthracene	mg/kg	<14.000	-	0.0355	<0.014	0.0196	0.0265	0.67	0.38	0.727	0.163
Chrysene	mg/kg	<10.000	-	0.0406	0.0163	0.0217	0.0253	0.741	0.429	0.764	0.187
Benzo(b)fluoranthene	mg/kg	<15.000	-	0.0411	<0.015	0.0251	0.0345	0.835	0.451	0.852	0.217
Benzo(k)fluoranthene	mg/kg	<14.000	-	<0.014	<0.014	<0.014	<0.014	0.3	0.16	0.333	0.0747
Benzo(a)pyrene	mg/kg	<15.000	38	0.0212	<0.015	<0.015	0.0267	0.645	0.328	0.687	0.147
Indeno(1,2,3-cd)pyrene	mg/kg	<18.000	-	<0.018	<0.018	<0.018	0.0208	0.375	0.194	0.383	0.0976
Dibenzo(a,h)anthracene	mg/kg	<23.000	-	<0.023	<0.023	<0.023	<0.023	0.0801	0.0352	0.0803	<0.023
Benzo(g,h,i)perylene	mg/kg	<24.000	-	<0.024	<0.024	<0.024	<0.024	0.41	0.189	0.421	0.0939
PAH, Total Detected USEPA 16	mg/kg	<118.000	-	0.34	<0.118	0.191	0.226	7.75	4.52	7.97	1.91
WAC	mg/kg		-	-	-	-	-	-	-	-	-
PCB's - (Solids)											
PCB congener 28	mg/kg	<3.000	-	-	-	-	-	-	-	-	-
PCB congener 52	mg/kg	<3.000	-	-	-	-	-	-	-	-	-
PCB congener 101	mg/kg	<3.000	-	-	-	-	-	-	-	-	-
PCB congener 118	mg/kg	<3.000	-	-	-	-	-	-	-	-	-
PCB congener 138	mg/kg	<3.000	-	-	-	-	-	-	-	-	-
PCB congener 153	mg/kg	<3.000	-	-	-	-	-	-	-	-	-
PCB congener 180	mg/kg	<3.000	-	-	-	-	-	-	-	-	-
Sum of detected PCB 7 Congeners	mg/kg	<21.000	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds (SVOCs)											
Phenol	mg/kg	<100.000	760	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Pentachlorophenol	mg/kg	<100.000	406	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
n-Nitroso-n-dipropylamine	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Nitrobenzene	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Isophorone	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Hexachloroethane	mg/kg	<100.000	21	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Hexachlorocyclopentadiene	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Hexachlorobutadiene	mg/kg	<100.000	31	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Hexachlorobenzene	mg/kg	<100.000	105	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
n-Dioctyl phthalate	mg/kg	<100.000	89100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Dimethyl phthalate	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Diethyl phthalate	mg/kg	<100.000	144000	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
n-Dibutyl phthalate	mg/kg	<100.000	15400	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Dibenzofuran	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Carbazole	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Butylbenzyl phthalate	mg/kg	<100.000	940000	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
bis(2-Ethylhexyl) phthalate	mg/kg	<100.000	85200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
bis(2-Chloroethoxy)methane	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
bis(2-Chloroethyl)ether	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Azobenzene	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
4-Nitrophenol	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
4-Nitroaniline	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
4-Methylphenol	mg/kg	<100.000	160000	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
4-Chlorophenylphenylether	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
4-Chloroaniline	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
4-Chloro-3-methylphenol	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
4-Bromophenylphenylether	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
3-Nitroaniline	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
2-Nitrophenol	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
2-Nitroaniline	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
2-Methylphenol	mg/kg	<100.000	160000	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
1,2,4-Trichlorobenzene	mg/kg	<100.000	26	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
2-Chlorophenol	mg/kg	<100.000	2700	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
2,6-Dinitrotoluene	mg/kg	<100.000	1850	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
2,4-Dinitrotoluene	mg/kg	<100.000	3720	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
2,4-Dimethylphenol	mg/kg	<100.000	15700	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
2,4-Dichlorophenol	mg/kg	<100.000	2700	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
2,4,6-Trichlorophenol	mg/kg	<100.000	2700	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
2,4,5-Trichlorophenol	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
1,4-Dichlorobenzene	mg/kg	<100.000	584	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
1,3-Dichlorobenzene	mg/kg	<100.000	30	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
1,2-Dichlorobenzene	mg/kg	<100.000	2020	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
2-Chloronaphthalene	mg/kg	<100.000	370	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
2-Methylnaphthalene	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	0.141	0.13	<0.100	<0.100
Acenaphthylene	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Acenaphthene	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Anthracene	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Benzo(a)anthracene	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	0.574	0.31	0.513	0.295
Benzo(b)fluoranthene	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	0.438	0.246	0.471	0.176
Benzo(k)fluoranthene	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	0.442	0.265	0.423	0.218
Benzo(a)pyrene	mg/kg	<100.000	38	<0.100	<0.100	<0.100	<0.100	0.549	0.301	0.561	0.249
Benzo(g,h,i)perylene	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	0.291	0.173	0.287	<0.100
Chrysene	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	0.575	0.3	0.548	0.268
Fluoranthene	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	1.15	0.549	1.07	0.614
Fluorene	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Indeno(1,2,3-cd)pyrene	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	0.401	0.257	0.368	0.152
Phenanthrene	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	0.41	0.246	0.384	0.225
Pyrene	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	1.03	0.521	0.948	0.529
Naphthalene	mg/kg	<100.000	293	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Dibenzo(a,h)anthracene	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Bis(2-chloroisopropyl) ether	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Volatile Organic Compounds (VOCs)											
Dibromofluoromethane**	%			118	115	107	106	113	113	116	119
Toluene-d8**	%			100	95.2	101	102	93.4	96.3	97.9	93.1
4-Bromofluorobenzene**	%			73.1	83.8	96.1	100	71.5	89.3	74.4	75.1
Dichlorodifluoromethane	mg/kg	<0.500		<0.005	<0.010	<0.005	<0.005	<0.005	<0.010	<0.005	<0.005
Chloromethane	mg/kg	<2.000	0.96	<0.020	<0.040	<0.020	<0.020	<0.020	<0.040	<0.020	<0.020
Vinyl Chloride	mg/kg	<0.500	0.059	<0.005	<0.010	<0.005	<0.005	<0.005	<0.010	<0.005	<0.005
Bromomethane	mg/kg	<1.000	-	<0.010	<0.020	<0.010	<0.010	<0.010	<0.020	<0.010	<0.010
Chloroethane	mg/kg	<1.000	904	<0.010	<0.020	<0.010	<0.010	<0.010	<0.020	<0.010	<0.010
Trichlorofluoromethane	mg/kg	<0.500	-	<0.005	<0.010	<0.005	<0.005	<0.005	<0.010	<0.005	<0.005
1,1-Dichloroethene	mg/kg	<0.500	24	<0.005	<0.010	<0.005	<0.005	<0.005	<0.010	<0.005	<0.005
Carbon Disulphide	mg/kg	<1.000	11	<0.010	0.0298	<0.010	0.0143	0.0439	0.0557	0.0351	0.0344
Dichloromethane	mg/kg	<5.000	257	<0.050	<0.100	<0.050	<0.050	<0.050	<0.100	<0.050	<0.050
Methyl Tertiary Butyl Ether	mg/kg	<0.500	7480	<0.005	<0.010	<0.005	<0.005	<0.005	<0.010	<0.005	<0.005
trans-1,2-Dichloroethene	mg/kg	<1.000	21	<0.010	<0.020	<0.010	<0.010	<0.010	<0.020	<0.010	<0.010
1,1-Dichloroethane	mg/kg	<0.500	263	<0.005	<0.010	<0.005	<0.005	<0.005	<0.010	<0.005	<0.005
cis-1,2-Dichloroethene	mg/kg	<0.500	14	<0.005	<0.010	<0.005	<0.005	<0.005	<0.010	<0.005	<0.005
2,2-Dichloropropane	mg/kg	<1.000	-	<0.010	<0.020	<0.010	<0.010	<0.010	<0.020	<0.010	<0.010
Bromochloromethane	mg/kg	<2.000	-	<0.020	<0.040	<0.020	<0.020	<0.020	<0.040	<0.020	<0.020
Chloroform	mg/kg	<3.000	99	<0.030	<0.060	<0.030	<0.030	<0.030	<0.060	<0.030	<0.030
1,1,1-Trichloroethane	mg/kg	<0.500	1580	<0.005	<0.010	<0.005	<0.005	<0.005	<0.010	<0.005	<0.005
1,1-Dichloropropene	mg/kg	<0.500	-	<0.005	<0.010	<0.005	<0.005	<0.005	<0.010	<0.005	<0.005
Carbontetrachloride	mg/kg	<0.500	31	<0.005	<0.010	<0.005	<0.005	<0.005	<0.010	<0.005	<0.005
1,2-Dichloroethane	mg/kg	<1.000	0.67	<0.010	<0.020	<0.010	<0.010	<0.010	<0.020	<0.010	<0.010
Benzene	mg/kg	<1.000	27	<0.010	<0.020	0.019	<0.010	<0.010	<0.020	<0.010	<0.010
Trichloroethene	mg/kg	<1.000	0.73	<0.010	<0.020	<0.010	<0.010	<0.010	<0.020	<0.010	<0.010
1,2-Dichloropropane	mg/kg	<0.500	3.1	<0.005	<0.010	<0.005	<0.005	<0.005	<0.010	<0.005	<0.005
Dibromomethane	mg/kg	<1.000	-	<0.010	<0.020	<0.010	<0.010	<0.010	<0.020	<0.010	<0.010
Bromodichloromethane	mg/kg	<2.000	2	<0.020	<0.040	<0.020	<0.020	<0.020	<0.040	<0.020	<0.020
cis-1,3-Dichloropropene	mg/kg	<0.500	-	<0.005	<0.010	<0.005	<0.005	<0.005	<0.010	<0.005	<0.005
Toluene	mg/kg	<1.000	56300	<0.010	<0.020	0.0373	0.0115	<0.010	<0.020	<0.010	<0.010
trans-1,3-Dichloropropene	mg/kg	<1.000	-	<0.010	<0.020	<0.010	<0.010	<0.010	<0.020	<0.010	<0.010
1,1,2-Trichloroethane	mg/kg	<1.000	89	<0.010	<0.020	<0.010	<0.010	<0.010	<0.020	<0.010	<0.010
1,3-Dichloropropane	mg/kg	<1.000	-	<0.010	<0.020	<0.010	<0.010	<0.010	<0.020	<0.010	<0.010
Tetrachloroethene	mg/kg	<2.000	-	<0.020	<0.040	<0.020	<0.020	<0.020	<0.040	<0.020	<0.020
Dibromochloromethane	mg/kg	<2.000	-	<0.020	<0.040	<0.020	<0.020	<0.020	<0.040	<0.020	<0.020
1,2-Dibromoethane	mg/kg	<1.000	-	<0.010	<0.020	<0.010	<0.010	<0.010	<0.020	<0.010	<0.010
Chlorobenzene	mg/kg	<2.000	58	<0.020	<0.040	<0.020	<0.020	<0.020	<0.040	<0.020	<0.020
1,1,1,2-Tetrachloroethane	mg/kg	<1.000	108	<0.010	<0.020	<0.010	<0.010	<0.010	<0.020	<0.010	<0.010
Ethylbenzene	mg/kg	<1.000	5710	<0.010	<0.020	<0.010	<0.010	<0.010	<0.020	<0.010	<0.010
p/m-Xylene	mg/kg	<2.000	5920	<0.020	<0.040	<0.020	<0.020	<0.020	<0.040	<0.020	<0.020
o-Xylene	mg/kg	<2.000	5920	<0.020	<0.040	<0.020	<0.020	<0.020	<0.040	<0.020	<0.020
Styrene	mg/kg	<2.000	3170	<0.020	<0.040	<0.020	<0.020	<0.020	<0.040	<0.020	<0.020
Bromofom	mg/kg	<2.000	714	<0.085	<0.110	<0.055	<0.050	<0.075	<0.110	<0.070	<0.070
Isopropylbenzene	mg/kg	<2.000	1300	<0.020	<0.040	<0.020	<0.020	<0.020	<0.040	<0.020	<0.020
1,1,2,2-Tetrachloroethane	mg/kg	<2.000	274	<0.020	<0.040	<0.020	<0.020	<0.020	<0.040	<0.020	<0.020
1,2,3-Trichloropropane	mg/kg	<2.000	-	<0.020	<0.040	<0.020	<0.020	<0.020	<0.040	<0.020	<0.020
Bromobenzene	mg/kg	<2.000	91	<0.020	<0.040	<0.020	<0.020	<0.020	<0.040	<0.020	<0.020
Propylbenzene	mg/kg	<2.000	-	<0.020	<0.040	<0.020	<0.020	<0.020	<0.040	<0.020	<0.020
2-Chlorotoluene	mg/kg	<3.000	-	<0.030	<0.060	<0.030	<0.030	<0.030	<0.060	<0.030	<0.030
1,3,5-Trimethylbenzene	mg/kg	<2.000	611	<0.020	<0.040	<0.020	<0.020	<0.020	<0.040	<0.020	<0.020
4-Chlorotoluene	mg/kg	<3.000	-	<0.030	<0.060	<0.030	<0.030	<0.030	<0.060	<0.030	<0.030
tert-Butylbenzene	mg/kg	<2.000	-	<0.020	<0.040	<0.020	<0.020	<0.020	<0.040	<0.020	<0.020
1,2,4-Trimethylbenzene	mg/kg	<3.000	611	<0.030	<0.060	<0.030	<0.030	<0.030	<0.060	<0.030	<0.030
sec-Butylbenzene	mg/kg	<1.000	-	<0.010	<0.020	<0.010	<0.010	<0.010	<0.020	<0.010	<0.010
4-Isopropyltoluene	mg/kg	<2.000	-	<0.020	<0.040	<0.020	<0.020	<0.020	<0.040	<0.020	<0.020
1,3-Dichlorobenzene	mg/kg	<5.000	30	<0.050	<0.100	<0.050	<0.050	<0.050	<0.100	<0.050	<0.050
1,4-Dichlorobenzene	mg/kg	<5.000	584	<0.050	<0.100	<0.050	<0.050	<0.050	<0.100	<0.050	<0.050
n-Butylbenzene	mg/kg	<3.000	-	<0.030	<0.060	<0.030	<0.030	<0.030	<0.060	<0.030	<0.030
1,2-Dichlorobenzene	mg/kg	<5.000	2020	<0.050	<0.100	<0.050	<0.050	<0.050	<0.100	<0.050	<0.050
1,2-Dibromo-3-chloropropane	mg/kg	<2.000	-	<0.020	<0.040	<0.020	<0.020	<0.020	<0.040	<0.020	<0.020
Tert-amyl methyl ether	mg/kg	<1.000	-	<0.010	<0.020	<0.010	<0.010	<0.010	<0.020	<0.010	<0.010
1,2,4-Trichlorobenzene	mg/kg	<7.000	26	<0.070	<0.140	<0.070	<0.070	<0.070	<0.140	<0.070	<0.070
Hexachlorobutadiene	mg/kg	<4.000	31	<0.040	<0.080	<0.040	<0.040	<0.040	<0.080	<0.040	<0.040
Naphthalene	mg/kg	<8.000	193	<0.080	<0.160	<0.080	<0.080	<0.080	<0.160	<0.080	<0.080
1,2,3-Trichlorobenzene	mg/kg	<10.000	102	<0.100	<0.200	<0.100	<0.100	<0.100	<0.200	<0.100	<0.100
1,3,5-Trichlorobenzene	mg/kg	<7.000	22	<0.070	<0.140	<0.070	<0.070	<0.070	<0.140	<0.070	<0.070
Sum of Detected Xylenes	mg/kg	<0.020	5920	<0.200	<0.400	<0.200	<0.200	<0.200	<0.400	<0.200	<0.200
Sum of BTEX	mg/kg	<7.000	-	<0.070	<0.140	<0.070	<0.070	<0.070	<0.140	<0.070	<0.070
Polyaromatic Hydrocarbons (PAH) - (Solids)											
PAH Total 17 (inc Coronene) Moisture Corrected	mg/kg	<10.000	-	-	-	-	-	-	-	-	-

Chesterfield Express
Environmental Report on Site Redevelopment
Laboratory Analysis of Soil Samples and Screening Against Generic Assessment Criteria

				TP01	TP01	TP01	TP01	TP02	TP02	TP02	TP02	TP03	TP03	TP03	TP03	TP04	TP04	TP04	TP04	TP05	TP05
			Human Health	0.50-0.50	1.00-1.00	2.00-2.00	2.30-2.50	0.50-0.50	1.00-1.00	2.00-2.00	2.50-2.50	0.50-0.50	1.00-1.00	2.00-2.00	2.80-2.80	0.50-0.50	1.00-1.00	2.00-2.00	2.90-2.90	2.30-2.30	2.50-2.50
Test	Units	LOD	Commercial 1% GAC	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023	22/08/2023
Sample Description																					
Colour	No units		-	Light Brown	Light Brown	Light Brown	Light Brown	Light Brown	Dark Brown	Light Brown	Light Brown	Light Brown	Light Brown	Grey	Dark Brown	Dark Brown	Dark Brown	Light Brown	Light Brown	Light Brown	Light Brown
Description	No units		-	Sand	Sand	Sandy Clay Loam	Sandy Clay Loam	Sand	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Sand	Sand	Sandy Silt Loam	Shale	Sandy Clay	Sandy Clay Loam	Sandy Silt Loam	Sandy Clay	Sandy Clay Loam	Sandy Clay
Inclusion 1)	No units		-	Stones	Stones	Stones	None	Stones	Stones	Stones	None	Stones	Stones	Vegetation	Stones	Stones	Stones	Stones	None	Stones	None
Inclusion 2)	No units		-	Crushed Brick	None	None	None	Stones	None	None	None	None	Stones	None	None	Vegetation	Vegetation	None	None	None	None
Moisture Content Ratio (% of as received sample)	%		-	5.2	4.5	17	24	2.9	20	15	17	6.9	4.5	19	5.7	19	26	15	5.3	14	19
Asbestos																					
Date of Analysis	No units		-	04/09/2023	04/09/2023	04/09/2023	04/09/2023	04/09/2023	04/09/2023	04/09/2023	04/09/2023	04/09/2023	04/09/2023	04/09/2023	04/09/2023	04/09/2023	04/09/2023	04/09/2023	04/09/2023	04/09/2023	04/09/2023
Analysed By	No units		-	Alex Homer	Alex Homer	Alex Homer	Alex Homer	Alex Homer	Alex Homer	Alex Homer	Alex Homer	Alex Homer	Alex Homer	Alex Homer	Alex Homer	Alex Homer	Alex Homer	Alex Homer	Alex Homer	Alex Homer	Alex Homer
Chrysotile (White) Asbestos	No units		-	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Amosite (Brown) Asbestos	No units		-	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Crocidolite (Blue) Asbestos	No units		-	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Asbestos Anthophyllite	No units		-	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Asbestos Tremolite	No units		-	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Asbestos Actinolite	No units		-	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Non-Asbestos Fibre	No units		-	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Comments	No units		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon																					
Organic Carbon, Total	%	<0.200	-	0.459	1.24	<0.200	0.345	<0.200	3	0.398	<0.200	0.34	<0.200	0.248	<0.200	0.887	6.83	1.52	0.226	0.372	0.212
Inorganics																					
pH	pH Units	<1.000	-	9.9	11.3	8.01	7.87	11.5	8.05	7.38	8	11.2	11.1	7.87	8.02	8.01	7.96	8.41	7.63	8.3	8.19
ANC @ pH 4	mol/kg	<0.030	-	0.207	0.156	0.102	0.0751	0.878	0.0791	0.0557	0.066	0.141	0.304	0.0918	0.042	0.0636	0.0857	0.0759	0.0692	0.0506	0.081
ANC @ pH 6	mol/kg	<0.030	-	0.109	0.112	<0.030	0.0373	0.356	<0.030	<0.030	<0.030	0.0975	0.145	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Loss on ignition	%	<0.700	-	<0.700	1.93	1.69	2.73	1.38	8.16	2.26	2.08	1.56	<0.700	2.36	1.32	3.54	12.2	3	1.9	3.38	3.41
Metals - (Solids)																					
Chromium, Hexavalent	mg/kg	<0.600	24	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600
Boron, water soluble	mg/kg	<1.000	207000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000
Arsenic	mg/kg	<0.600	635	2.65	4.37	7.33	11.1	2.61	18.4	5.7	2.24	2.91	2.09	3.77	5.69	12.7	24.5	8.11	5.4	5.09	6.83
Barium	mg/kg	<0.600	22100	73.8	275	28.9	30.1	213	87.6	26.8	27.5	66.7	78.2	40.5	22.7	39.5	144	56.7	32.5	45.4	25
Beryllium	mg/kg	<0.010	12	0.167	0.195	0.356	0.253	0.173	0.754	0.57	0.224	0.137	0.0962	0.456	0.532	0.744	1.67	0.741	0.454	0.92	0.226
Cadmium	mg/kg	<0.020	223	0.476	0.981	<0.020	<0.020	0.667	<0.020	<0.020	<0.020	0.811	0.681	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Chromium	mg/kg	<0.900	9550	4	3.01	9.06	9.94	4.63	8.58	9.59	10.8	4.64	3.09	10.7	4.93	6.64	10.8	5.56	4.85	8.28	3.57
Copper	mg/kg	<1.400	69800	4.92	5.13	13.4	9.9	6.25	36.3	15.8	6.28	4.31	5.55	11.7	14.3	17.6	45.5	18.4	14.8	22	12.1
Lead	mg/kg	<0.700	1390	39.9	189	11.6	14.9	44.4	58.6	17.9	6.38	138	97.6	8.52	11.5	27.6	118	31.1	10.1	16.1	12.9
Mercury	mg/kg	<0.100	1110	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	0.386	<0.100	<0.100	<0.100	<0.100
Nickel	mg/kg	<0.200	1710	4.32	4.02	12.9	9.74	5.25	14.5	12.4	9.11	4.43	3.24	9.84	21	11.7	26.3	20.3	27.2	38.7	9.21
Selenium	mg/kg	<1.000	12300	1.06	1.2	<1.000	<1.000	1.46	<1.000	<1.000	<1.000	1.01	1.11	<1.000	<1.000	<1.000	1.35	<1.000	<1.000	<1.000	<1.000
Vanadium	mg/kg	<0.200	9220	5.38	5.93	22.2	23	6.82	30.2	17.9	12	6.27	5.27	14.2	9.39	19.5	37.5	13	11.3	20.3	16.3
Zinc	mg/kg	<1.900	1050000	69.7	97.5	42.9	32.8	105	58.6	46.8	52.5	194	150	34.8	63.7	46.1	69.4	65.4	67.7	84.7	32.6
Gasoline Range Organics (GRO)																					
Total Aliphatics >C5-C10	mg/kg	<50.000	-	<0.050	<0.050	<0.050	<0.050	0.132	<0.050	1.29	0.424	<0.050	0.0565	0.0713	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Total Aromatics >EC5-EC10	mg/kg	<50.000	-	<0.050	<0.050	<0.050	<0.050	0.0536	<0.050	0.686	0.221	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
GRO >C5-C10	mg/kg	<20.000	-	<0.020	<0.020	<0.020	<0.020	0.185	<0.020	1.98	0.644	<0.020	0.0565	0.0713	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
EPH (Extractable Petroleum Hydrocarbons)																					
EPH Surrogate % recovery**	%		-	103	105	93	100	91.4	93.3	90.4	96.8	96	99.3	96.3	98.8	93.6	95.5	91.8	96.7	99.5	92.9
Mineral Oil >C10-C40	mg/kg	<5.000	-	866	14	<5.000	<5.000	67.6	6.38	6.01	<5.000	15.6	<5.000	<5.000	<5.000	<5.000	5.57	<5.000	<5.000	<5.000	<5.000
TPH Criteria Working Group (TPH CWG)																					
GRO Surrogate % recovery**	%		-	103	96.3	105	96.5	99.8	109	105	107	106	103	99.2	125	97.8	73	120	107	99.4	102
Aliphatics >C5-C6	mg/kg	<10.000	3190	<0.010	<0.010	<0.010	<0.010	0.0206	<0.010	0.013	0.012	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Aliphatics >C6-C8	mg/kg	<10.000	7780	0.0179	<0.010	<0.010	<0.010	0.0505	<0.010	0.306	0.12	<0.010	0.0251	0.0209	0.0202	<0.010	<0.010	0.0152	<0.010	<0.010	<0.010
Aliphatics >C8-C10	mg/kg	<10.000	2000	0.0179	<0.010	<0.010	<0.010	0.0608	<0.010	0.971	0.292	<0.010	0.0314	0.0504	0.0276	<0.010	<0.010	0.0105	<0.010	<0.010	<0.010
Aliphatics >C10-C12	mg/kg	<1000.000	9690	2.29	<1.000	<1.000	<1.000	<1.000	<1.000	1.22	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000
Aliphatics >C12-C16	mg/kg	<1000.000	58800	359	1.81	<1.000	<1.000	17	<1.000	<1.000	<1.000	9.97	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000
Aliphatics >C16-C21	mg/kg	<1000.000	1580000	961	4.21	<1.000	<1.000	55.9	<1.000	<1.000	<1.000	13.1	5.43	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000
Aliphatics >C21-C35	mg/kg	<1000.000	1580000	250	<1.000	<1.000	<1.000	20.8	1.07	<1.000	<1.000	3.73	1.45	<1.000	<1.000	<1.000	3.51	<1.000	<1.000	<1.000	<1.000
Aliphatics >C35-C44	mg/kg	<1000.000	1580000	1.36	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	1.73	<1.000	<1.000	<1.000	<1.000
Total Aliphatics >C10-C44	mg/kg	<5000.000	-	1570	7.01	<5.000	<5.000	94	<5.000	<5.000	<5.000	27.5	7.87	<5.000	<5.000	<5.000	6.4	<5.000	<5.000	<5.000	<5.000
Total Aliphatics & Aromatics >C10-C44	mg/kg	<10000.000	-	1710	55.2	<10.000	<10.000	102	<10.000	<10.000	<10.000	30.8	<10.000	<10.000	<10.000	<10.000	11.9	<10.000	<10.000	<10.000	<10.000
Aromatics >EC5-EC7	mg/kg	<10.000	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Aromatics >EC7-EC8	mg/kg	<10.000	56100	<0.010	<0.010	<0.010	<0.010	0.0134	<0.010	0.0389	0.0264	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Aromatics >EC8-EC10	mg/kg	<10.000	3460	0.0127	<0.010	<0.010	<0.010	0.0402	<0.010	0.647	0.194	<0.010	0.0209	0.0332	0.018	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Aromatics > EC10-EC12	mg/kg	<1000.000	16200	<1.000	<1.000	<1.000	<1.000	<1.000	2.02	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000
Aromatics > EC12-EC16	mg/kg	<1000.000	36200	50.7	1.33	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000
Aromatics > EC16-EC21	mg/kg	<1000.000	28200	3.48	1.52	<1.000	<1.000	1.13	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000
Aromatics > EC21-EC35	mg/kg	<1000.000	28400	56.2	27.1	<1.000	<1.000	5.31	1.46	<1.000	<1.000	1.17	<1.000	<1.000	1.26	<1.000	3.41	<1.000	<1.000	<1.000	<1.000
Aromatics >EC35-EC44	mg/kg	<1000.000	28400	25.5	18.2	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000
Aromatics > EC40-EC44	mg/kg	<1000.000	-	5.94	4.12	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000
Total Aromatics > EC10-EC44	mg/kg	<5000.000	-	136	48.2	<5.000	<5.000	8.07	<5.000	<5.000	<5.000	<5.000	<5.000	<5.000	<5.000	<5.000	5.5	<5.000	<5.000	<5.000	<5.000
Total Aliphatics & Aromatics >C5-C44	mg/kg	<10000.000	-	1710	55.2	<10.000	<10.000	102	<10.000	<10.000	<10.000	27.5	<10.000	<10.000	<10.000	<10.000	11.9	<10.000	<10.000	<10.000	<10.000
Polyaromatic Hydrocarbons (PAHs)																					
Coronene	mg/kg	<200.000	-	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200
Naphthalene-d8 % recovery**	%		-	87.8	87.1	90.2	86.9	88	89.1	90.3	90.9	87.9	87.6	87.6	88.9	88	88.1	86.7	86.6	91.7	91.3
Acenaphthene-d10 % recovery**	%		-	93.1	84.6	88.5	86.7	88.9	87.9	88.2	89	87.9	86.5	86.4	88.6	87.9	78.9	86.2	86.4	94.4	93.4
Phenanthrene-d10 % recovery**	%		-	92.6	87.1	83.3	88.7	88.3	85.2	86.4	86.6	86.5	85	89.2	89.6	89	73.1	88.8	85.4	97.2	98.1
Chrysene-d12 % recovery**	%		-	98.4	75.6	86.8	73.7	88.9	87.9	95.7	90.6	87	86.7	71.8	74.9	75.1	72.5	75.8	85.5	99.6	100
Perylene-d12 % recovery**	%		-	97.5	70.8	88.5	71.1	88.6	88.3	96.6	91.9	89.1	87.1	70.5	70.7	70	76.7	70.6	85.1	87.5	91
Naphthalene	mg/kg	<9.000	193	<0.009	0.155	<0.009	<0.009	<0.009	0.303	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	0.0134	0.0227	0.0105	<0.009	<0.009	<0.009
Acenaphthylene	mg/kg	<12.000	-	0.0169	<0.120	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012
Acenaphthene	mg/kg	<8.000	-	<0.008	<0.080	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008
Fluorene	mg/kg	<10.000	-	<0.010	<0.100	<0.010	<0.010	<0.010	<0.010	0.0147	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Phenanthrene	mg/kg	<15.000	-	0.116	<0.150	<0.015	<0.015	0.0275	0.0395	<0.015	<0.015	0.0561	<0.015	<0.015	<0.015	0.0594	0.167	0.0643	<0.015	<0.015	<0.015
Anthracene	mg/kg	<16.000	-	<0.016	<0.160	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	0.0319	<0.016	<0.016	<0.016	<0.016
Fluoranthene	mg/kg	<17.000	-	0.126	<0.170	<0.017	<0.017	0.0432	0.0225	<0.017	<0.017	0.104	<0.017	<0.017	<0.017	0.114	0.36	0.112	<0.017	<0.017	<0.017
Pyrene	mg/kg	<15.000	-	0.151	0.181	<0.015	<0.015	0.0504	0.0219	<0.015	<0.015	0.0951	<0.015	<0.015	<0.015	0.101	0.301	0.0929	<0.015	<0.015	<0.015
Benz(a)anthracene	mg/kg	<14.000	-	0.0803	<0.140	<0.014	<0.014	0.0278	<0.014	<0.014	<0.014	0.0556	<0.014	<0.014	<0.014	0.0565	0.18	0.0442	<0.014	<0.014	<0.014
Chrysene	mg/kg	<10.000	-	0.0863	<0.100	<0.010	<0.010	0.0268	0.0174	<0.010	<0.010	0.0457	<0.010	<0.010	<0.010	0.0634	0.207	0.0545	<0.010	<0.010	<0.010
Benzo(b)fluoranthene	mg/kg	<15.000	-	0.117	<0.150	<0.015	<0.015	0.0402	0.024	<0.015	<0.015	0.06	<0.015	<0.015	<0.015	0.0479	0.235	0.0428	<0.015	<0.015	<0.015
Benzo(k)fluoranthene	mg/kg	<14.000	-	0.048	<0.140	<0.014	<0.014	0.017	<0.014	<0.014	<0.014	0.0251	<0.014	<0.014	<0.014	0.0295	0.114	0.0187	<0.014	<0.014	<0.014
Benzo(a)pyrene	mg/kg	<15.000	38	0.125	<0.150	<0.015	<0.015	0.036	<0.015	<0.015	<0.015	0.0609	<0.015	<0.015	<0.015	0.0463	0.175	0.03	<0.015	<0.015	<0.015
Indeno(1,2,3-cd)pyrene	mg/kg	<18.000	-	0.103	<0.180	<0.018	<0.018	0.0258	<0.018	<0.018	<0.018	0.0424	<0.018	<0.018	<0.018	0.0326	0.104	0.0222	<0.018	<0.018	<0.018
Dibenzo(a,h)anthracene	mg/kg	<23.000	-	<0.023	<0.230	<0.023	<0.023	<0.023	<0.023	<0.023	<0.023	<0.023	<0.023	<0.023	<0.023	<0.023	<0.023	<0.023	<0.023	<0.023	<0.023
Benzo(g,h,i)perylene	mg/kg	<24.000	-	0.135	<0.240	<0.024	<0.024	0.0313	<0.024	<0.024	<0.024	0.0508	<0.024	<0.024	<0.024	0.0349	0.101	<0.024	<0.024	<0.024	<0.024
PAH, Total Detected USEPA 16	mg/kg	<118.000	-	1.1	<1.180	<0.118	<0.118	0.326	0.429	<0.118	<0.118	0.595	<0.118	<0.118	<0.118	0.599	2	0.492	<0.118	<0.118	<0.118
WAC	mg/kg		-	10	100	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
PCB's - (Solids)																					
PCB congener 28	mg/kg	<3.000	-	<0.015	<0.030	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
PCB congener 52	mg/kg	<3.000	-	<0.015	<0.030	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
PCB congener 101	mg/kg	<3.000	-	<0.015	<0.030	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
PCB congener 118	mg/kg	<3.000	-	<0.015	<0.030	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
PCB congener 138	mg/kg	<3.000	-	<0.015	<0.030	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
PCB congener 153	mg/kg	<3.000	-	<0.015	<0.030	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
PCB congener 180	mg/kg	<3.000	-	<0.015	<0.030	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Sum of detected PCB 7 Congeners	mg/kg	<21.000	-	<0.105	<0.210	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021
Semi-Volatile Organic Compounds (SVOCs)																					
Phenol	mg/kg	<100.000	760	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Pentachlorophenol	mg/kg	<100.000	406	<0.200	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
n-Nitroso-n-dipropylamine	mg/kg	<100.000	-	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Nitrobenzene	mg/kg	<100.000	-	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Isophorone	mg/kg	<100.000	-	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Hexachloroethane	mg/kg	<100.000	21	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Hexachlorocyclopentadiene	mg/kg	<100.000	-	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Hexachlorobutadiene	mg/kg	<100.000	31	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Hexachlorobenzene	mg/kg	<100.000	105	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
n-Dioctyl phthalate	mg/kg	<100.000	89100	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Dimethyl phthalate	mg/kg	<100.000	-	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Diethyl phthalate	mg/kg	<100.000	144000	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
n-Dibutyl phthalate	mg/kg	<100.000	15400	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Dibenzofuran	mg/kg	<100.000	-	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	0.41	<0.100	<0.100	<0.100	<0.100
Carbazole	mg/kg	<100.000	-	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Butylbenzyl phthalate	mg/kg	<100.000	940000	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
bis(2-Ethylhexyl) phthalate	mg/kg	<100.000	85200	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
bis(2-Chloroethoxy)methane	mg/kg	<100.000	-	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
bis(2-Chloroethyl)ether	mg/kg	<100.000	-	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Azobenzene	mg/kg	<100.000	-	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
4-Nitrophenol	mg/kg	<100.000	-	<0.200	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
4-Nitroaniline	mg/kg	<100.000	-	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
4-Methylphenol	mg/kg	<100.000	160000	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
4-Chlorophenylphenylether	mg/kg	<100.000	-	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
4-Chloroaniline	mg/kg	<100.000	-	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
4-Chloro-3-methylphenol	mg/kg	<100.000	-	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
4-Bromophenylphenylether	mg/kg	<100.000	-	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
3-Nitroaniline	mg/kg	<100.000	-	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
2-Nitrophenol	mg/kg	<100.000	-	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
2-Nitroaniline	mg/kg	<100.000	-	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
2-Methylphenol	mg/kg	<100.000	160000	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
1,2,4-Trichlorobenzene	mg/kg	<100.000	26	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
2-Chlorophenol	mg/kg	<100.000	2700	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
2,6-Dinitrotoluene	mg/kg	<100.000	1850	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
2,4-Dinitrotoluene	mg/kg	<100.000	3720	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
2,4-Dimethylphenol	mg/kg	<100.000	15700	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
2,4-Dichlorophenol	mg/kg	<100.000	2700	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
2,4,6-Trichlorophenol	mg/kg	<100.000	2700	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
2,4,5-Trichlorophenol	mg/kg	<100.000	-	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
1,4-Dichlorobenzene	mg/kg	<100.000	584	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
1,3-Dichlorobenzene	mg/kg	<100.000	30	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
1,2-Dichlorobenzene	mg/kg	<100.000	2020	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
2-Chloronaphthalene	mg/kg	<100.000	370	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
2-Methylnaphthalene	mg/kg	<100.000	-	<0.200	<0.100	<0.100	<0.100	<0.100	0.261	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	0.362	<0.100	<0.100	<0.100	<0.100
Acenaphthylene	mg/kg	<100.000	-	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Acenaphthene	mg/kg	<100.000	-	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Anthracene	mg/kg	<100.000	-	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Benzo(a)anthracene	mg/kg	<100.000	-	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	0.156	<0.100	<0.100	<0.100	<0.100
Benzo(b)fluoranthene	mg/kg	<100.000	-	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Benzo(k)fluoranthene	mg/kg	<100.000	-	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Benzo(a)pyrene	mg/kg	<100.000	38	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Benzo(g,h,i)perylene	mg/kg	<100.000	-	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Chrysene	mg/kg	<100.000	-	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	0.158	<0.100	<0.100	<0.100	<0.100
Fluoranthene	mg/kg	<100.000	-	0.354	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	0.217	<0.100	<0.100	<0.100	<0.100
Fluorene	mg/kg	<100.000	-	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Indeno(1,2,3-cd)pyrene	mg/kg	<100.000	-	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Phenanthrene	mg/kg	<100.000	-	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	0.42	<0.100	<0.100	<0.100	<0.100
Pyrene	mg/kg	<100.000	-	0.36	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	0.232	<0.100	<0.100	<0.100	<0.100
Naphthalene	mg/kg	<100.000	293	<0.200	<0.100	<0.100	<0.100	<0.100	0.347	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Dibenzo(a,h)anthracene	mg/kg	<100.000	-	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Bis(2-chloroisopropyl) ether	mg/kg	<100.000	-	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Volatile Organic Compounds (VOCs)																					
Dibromofluoromethane**	%			115	113	108	112	114	111	110	111	116	112	115	117	117	119	113	117	108	110
Toluene-d8**	%			97.6	98.1	99.8	100	96.5	99.7	98.7	100	98.8	98.6	103	102	103	100	98.3	103	96.4	102
4-Bromofluorobenzene**	%			94.3	94	101	98.5	93	98.3	100	99.3	99.8	98.8	96.9	96.7	96.1	82.9	90.9	94.5	94.6	100
Dichlorodifluoromethane	mg/kg	<0.500		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chloromethane	mg/kg	<2.000	0.96	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Vinyl Chloride	mg/kg	<0.500	0.059	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Bromomethane	mg/kg	<1.000	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Chloroethane	mg/kg	<1.000	904	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Trichlorofluoromethane	mg/kg	<0.500	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
1,1-Dichloroethene	mg/kg	<0.500	24	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Carbon Disulphide	mg/kg	<1.000	11	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.0122	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Dichloromethane	mg/kg	<5.000	257	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Methyl Tertiary Butyl Ether	mg/kg	<0.500	7480	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
trans-1,2-Dichloroethene	mg/kg	<1.000	21	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
1,1-Dichloroethane	mg/kg	<0.500	263	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
cis-1,2-Dichloroethene	mg/kg	<0.500	14	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
2,2-Dichloropropane	mg/kg	<1.000	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Bromochloromethane	mg/kg	<2.000	-	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Chloroform	mg/kg	<3.000	99	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
1,1,1-Trichloroethane	mg/kg	<0.500	1580	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
1,1-Dichloropropene	mg/kg	<0.500	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Carbontetrachloride	mg/kg	<0.500	31	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
1,2-Dichloroethane	mg/kg	<1.000	0.67	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Benzene	mg/kg	<1.000	27	<0.010	<0.010	<0.010	<0.010	0.0143	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Trichloroethene	mg/kg	<1.000	0.73	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
1,2-Dichloropropane	mg/kg	<0.500	3.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dibromomethane	mg/kg	<1.000	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Bromodichloromethane	mg/kg	<2.000	2	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
cis-1,3-Dichloropropene	mg/kg	<0.500	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Toluene	mg/kg	<1.000	56300	<0.010	<0.010	<0.010	<0.010	0.0235	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
trans-1,3-Dichloropropene	mg/kg	<1.000	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
1,1,2-Trichloroethane	mg/kg	<1.000	89	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
1,3-Dichloropropane	mg/kg	<1.000	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Tetrachloroethene	mg/kg	<2.000	-	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Dibromochloromethane	mg/kg	<2.000	-	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
1,2-Dibromoethane	mg/kg	<1.000	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Chlorobenzene	mg/kg	<2.000	58	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
1,1,1,2-Tetrachloroethane	mg/kg	<1.000	108	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Ethylbenzene	mg/kg	<1.000	5710	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
p/m-Xylene	mg/kg	<2.000	5920	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
o-Xylene	mg/kg	<2.000	5920	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Styrene	mg/kg	<2.000	3170	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Bromoform	mg/kg	<2.000	714	<0.050	<0.060	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.080	<0.060	<0.050	<0.050	<0.050
Isopropylbenzene	mg/kg	<2.000	1300	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
1,1,2,2-Tetrachloroethane	mg/kg	<2.000	274	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
1,2,3-Trichloropropane	mg/kg	<2.000	-	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Bromobenzene	mg/kg	<2.000	91	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Propylbenzene	mg/kg	<2.000	-	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
2-Chlorotoluene	mg/kg	<3.000	-	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
1,3,5-Trimethylbenzene	mg/kg	<2.000	611	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
4-Chlorotoluene	mg/kg	<3.000	-	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
tert-Butylbenzene	mg/kg	<2.000	-	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
1,2,4-Trimethylbenzene	mg/kg	<3.000	611	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
sec-Butylbenzene	mg/kg	<1.000	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
4-Isopropyltoluene	mg/kg	<2.000	-	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
1,3-Dichlorobenzene	mg/kg	<5.000	30	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,4-Dichlorobenzene	mg/kg	<5.000	584	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
n-Butylbenzene	mg/kg	<3.000	-	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
1,2-Dichlorobenzene	mg/kg	<5.000	2020	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,2-Dibromo-3-chloropropane	mg/kg	<2.000	-	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Tert-amyl methyl ether	mg/kg	<1.000	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
1,2,4-Trichlorobenzene	mg/kg	<7.000	26	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070
Hexachlorobutadiene	mg/kg	<4.000	31	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Naphthalene	mg/kg	<8.000	193	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
1,2,3-Trichlorobenzene	mg/kg	<10.000	102	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
1,3,5-Trichlorobenzene	mg/kg	<7.000	22	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070
Sum of Detected Xylenes	mg/kg	<0.020	5920	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200
Sum of BTEX	mg/kg	<7.000	-	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070
Polyaromatic Hydrocarbons (PAH) - (Solids)																					
PAH Total 17 (inc Coronene) Moisture Corrected	mg/kg	<10.000	-	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000

Chesterfield Express
Environmental Report on Site Redevelopment
Laboratory Analysis of Soil Samples and Screening Against Generic Assessment Criteria

				VS01	VS02	VS03	VS04	VS05	VS06	VS07	VS08	VS09	VS10	VS11	VS12	VS13	VS14	VS15	VS16
			Human Health	4.00-4.00	4.00-4.00	4.00-4.00	4.00-4.00	4.00-4.00	4.00-4.00	4.00-4.00	4.00-4.00	4.00-4.00	4.00-4.00	4.00-4.00	4.00-4.00	4.00-4.00	4.00-4.00	4.00-4.00	4.00-4.00
Test	Units	LOD	Commercial 1% GAC	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023	08/09/2023
Sample Description																			
Colour	No units		-	Dark Brown	Light Brown	Light Brown	Light Brown	Dark Brown	Dark Brown	Dark Brown	Light Brown	Light Brown	Light Brown	Dark Brown	Dark Brown	Dark Brown	Light Brown	Dark Brown	Light Brown
Description	No units		-	Sandy Loam	Silty Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Sandy Loam	Sandy Loam	Clay	Silty Clay	Silty Clay Loam	Silty Clay Loam	Sandy Clay Loam	Sandy Loam	Sandy Clay Loam	Sandy Clay Loam	Clay Loam	Silty Clay
Inclusion 1)	No units		-	Vegetation	Stones	Stones	Stones	Stones	None	None	Stones	Stones	Stones	None	Stones	None	Stones	Stones	Stones
Inclusion 2)	No units		-	None	None	None	None	Stones	Stones	None	Vegetation	Vegetation	None	None	Vegetation	None	None	None	None
Moisture Content Ratio (% of as received sample)	%		-	17	17	14	15	12	12	10	15	15	12	6	17	17	17	14	16
Asbestos																			
Date of Analysis	No units		-	21/09/2023	21/09/2023	21/09/2023	21/09/2023	21/09/2023	21/09/2023	21/09/2023	21/09/2023	21/09/2023	21/09/2023	21/09/2023	21/09/2023	21/09/2023	22/09/2023	21/09/2023	22/09/2023
Analysed By	No units		-	Alex Homer	Alex Homer	Alex Homer	Alex Homer	Paul Poynton	Alex Homer	Alex Homer	Paul Poynton	Alex Homer	Paul Poynton	Paul Poynton	Alex Homer	Alex Homer	Paul Poynton	Alex Homer	Paul Poynton
Chrysotile (White) Asbestos	No units		-	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Amosite (Brown) Asbestos	No units		-	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Crocidolite (Blue) Asbestos	No units		-	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Asbestos Anthophyllite	No units		-	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Asbestos Tremolite	No units		-	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Asbestos Actinolite	No units		-	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Non-Asbestos Fibre	No units		-	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Comments	No units		-	-	-	-	-	N/A	-	-	N/A	-	N/A	N/A	-	-	N/A	-	N/A
Carbon																			
Organic Carbon, Total	%	<0.200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Inorganics																			
pH	pH Units	<1.000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANC @ pH 4	mol/kg	<0.030	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANC @ pH 6	mol/kg	<0.030	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Loss on ignition	%	<0.700	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals - (Solids)																			
Chromium, Hexavalent	mg/kg	<0.600	24	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600
Boron, water soluble	mg/kg	<1.000	207000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	1.74	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000
Arsenic	mg/kg	<0.600	635	7.21	5.29	7.31	7.38	5.09	4.68	21.4	3.28	5.43	5.92	5.11	14.4	6.97	9.14	44.4	4.9
Barium	mg/kg	<0.600	22100	37.7	37.2	92.9	59.8	37.9	47	31.5	36.7	39.8	60.7	21.7	125	51.5	51.9	64.4	31.9
Beryllium	mg/kg	<0.010	12	0.733	0.95	0.765	0.971	0.888	0.812	0.881	0.404	0.581	0.676	0.489	1.26	0.752	0.912	1.3	0.719
Cadmium	mg/kg	<0.020	223	<0.020	<0.020	<0.020	<0.020	<0.020	0.0936	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Chromium	mg/kg	<0.900	9550	6.47	6.49	6.98	7.31	6.13	8.32	9.23	13.2	7.52	6.1	9.06	6.67	6.54	5.79	6.16	7.47
Copper	mg/kg	<1.400	69800	17.9	17.9	21.3	24.7	22.8	21.5	28.7	10.3	14.7	17.6	17.8	34.6	18	20.8	29	18.2
Lead	mg/kg	<0.700	1390	21	11.8	21.2	25.2	15.4	15.9	18.6	8.55	12.3	13.6	10.8	24.4	22.5	26.6	18.5	12.9
Mercury	mg/kg	<0.100	1110	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	0.107	<0.100	<0.100
Nickel	mg/kg	<0.200	1710	27	28.9	34.3	31.5	35.4	29.7	36.8	16.9	25.4	30.6	24.4	30.3	26	32.1	39.7	16.5
Selenium	mg/kg	<1.000	12300	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000
Vanadium	mg/kg	<0.200	9220	21.7	26.3	16.2	16.4	18.1	14.1	16.4	17	16.5	18.8	15.9	15.9	15.1	21.4	16.6	14.8
Zinc	mg/kg	<1.900	1050000	72.8	60.1	86	89.6	92.4	87.7	101	57.1	61.6	73.4	61	93	75.2	75.3	94.9	55.9
Gasoline Range Organics (GRO)																			
Total Aliphatics >C5-C10	mg/kg	<50.000	-	<0.050	<0.050	0.296	0.881	1.54	0.0735	0.0688	<0.050	0.0901	0.489	<0.050	<0.050	0.163	<0.050	<0.050	<0.050
Total Aromatics >EC5-EC10	mg/kg	<50.000	-	<0.050	<0.050	0.145	0.32	0.519	<0.050	<0.050	<0.050	<0.050	0.221	<0.050	<0.050	0.0684	<0.050	<0.050	<0.050
GRO >C5-C10	mg/kg	<20.000	-	<0.020	<0.020	0.441	1.2	2.06	0.0735	0.0688	<0.020	0.0901	0.711	<0.020	<0.020	0.232	<0.020	<0.020	<0.020
EPH (Extractable Petroleum Hydrocarbons)																			
EPH Surrogate % recovery**	%		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mineral Oil >C10-C40	mg/kg	<5.000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH Criteria Working Group (TPH CWG)																			
GRO Surrogate % recovery**	%		-	97.9	98.6	95.8	87.1	95.4	96.9	94.3	91.2	84.6	94.5	75.8	97	97.5	91.9	99.9	109
Aliphatics >C5-C6	mg/kg	<10.000	3190	<0.010	<0.010	0.0116	0.264	0.658	<0.010	<0.010	<0.010	<0.010	0.0848	<0.010	<0.010	0.0168	<0.010	<0.010	<0.010
Aliphatics >C6-C8	mg/kg	<10.000	7780	<0.010	<0.010	0.0661	0.302	0.177	0.026	0.0222	<0.010	0.0339	0.154	<0.010	<0.010	0.066	<0.010	<0.010	<0.010
Aliphatics >C8-C10	mg/kg	<10.000	2000	<0.010	<0.010	0.218	0.315	0.71	0.0475	0.0466	<0.010	0.0562	0.251	<0.010	<0.010	0.0804	<0.010	<0.010	<0.010
Aliphatics >C10-C12	mg/kg	<1000.000	9690	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000
Aliphatics >C12-C16	mg/kg	<1000.000	58800	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	1.08	2.41	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000
Aliphatics >C16-C21	mg/kg	<1000.000	1580000	<1.000	<1.000	<1.000	<1.000	1.08	<1.000	<1.000	<1.000	2.97	2.2	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000
Aliphatics >C21-C35	mg/kg	<1000.000	1580000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000
Aliphatics >C35-C44	mg/kg	<1000.000	1580000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	1.17	<1.000	<1.000	<1.000
Total Aliphatics >C10-C44	mg/kg	<5000.000	-	<5.000	<5.000	<5.000	<5.000	<5.000	<5.000	<5.000	<5.000	<5.000	5.16	<5.000	<5.000	<5.000	<5.000	<5.000	<5.000
Total Aliphatics & Aromatics >C10-C44	mg/kg	<10000.000	-	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000
Aromatics >EC5-EC7	mg/kg	<10.000	-	<0.010	<0.010	<0.010	0.0614	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Aromatics >EC7-EC8	mg/kg	<10.000	56100	<0.010	<0.010	<0.010	0.0484	0.0463	<0.010	<0.010	<0.010	<0.010	0.0542	<0.010	<0.010	0.0144	<0.010	<0.010	<0.010
Aromatics >EC8-EC10	mg/kg	<10.000	3460	<0.010	<0.010	0.145	0.21	0.472	0.0316	0.0311	<0.010	0.0374	0.167	<0.010	<0.010	0.054	<0.010	<0.010	<0.010
Aromatics > EC10-EC12	mg/kg	<1000.000	16200	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000
Aromatics > EC12-EC16	mg/kg	<1000.000	36200	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000
Aromatics > EC16-EC21	mg/kg	<1000.000	28200	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000
Aromatics > EC21-EC35	mg/kg	<1000.000	28400	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000
Aromatics >EC35-EC44	mg/kg	<1000.000	28400	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	2.38	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000
Aromatics > EC40-EC44	mg/kg	<1000.000	-	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000
Total Aromatics > EC10-EC44	mg/kg	<5000.000	-	<5.000	<5.000	<5.000	<5.000	<5.000	<5.000	<5.000	<5.000	<5.000	<5.000	<5.000	<5.000	<5.000	<5.000	<5.000	<5.000
Total Aliphatics & Aromatics >C5-C44	mg/kg	<10000.000	-	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000	<10.000
Polyaromatic Hydrocarbons (PAHs)																			
Coronene	mg/kg	<200.000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene-d8 % recovery**	%		-	81.9	80.8	83.2	82.5	91.7	83.4	81.6	82.8	82.8	83.2	82.9	81.9	83.9	84.5	83.2	80.3
Acenaphthene-d10 % recovery**	%		-	80.5	78.6	79.7	79.2	92.6	78.4	80.4	80.8	82.6	81.9	81.9	76.9	80.3	80.9	80.4	75.9
Phenanthrene-d10 % recovery**	%		-	81.9	79.9	79.6	80	97.4	77.3	81.8	81.6	85.9	83.9	84.7	75	80.3	80.6	81.5	76
Chrysene-d12 % recovery**	%		-	78.6	76.8	78.7	80.3	94.1	75.6	76.4	78	82.4	79	81.9	72.5	81.2	82	77	77
Perylene-d12 % recovery**	%		-	78.5	75.6	79.3	80.6	97.3	75.5	75.2	76.3	82.7	76	79.9	70.5	83.9	85.7	71.5	78.3
Naphthalene	mg/kg	<9.000	193	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	0.0104	<0.009	<0.009	0.0102	0.0129	<0.009	<0.009	<0.009	<0.009	<0.009
Acenaphthylene	mg/kg	<12.000	-	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012
Acenaphthene	mg/kg	<8.000	-	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008
Fluorene	mg/kg	<10.000	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Phenanthrene	mg/kg	<15.000	-	<0.015	<0.015	<0.015	0.0226	0.0304	<0.015	<0.015	<0.015	<0.015	0.0617	0.0796	<0.015	0.0187	<0.015	<0.015	<0.015
Anthracene	mg/kg	<16.000	-	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016
Fluoranthene	mg/kg	<17.000	-	<0.017	<0.017	<0.017	0.0476	0.0405	0.0194	<0.017	<0.017	0.025	0.0659	0.0249	<0.017	0.0881	0.0266	<0.017	0.0265
Pyrene	mg/kg	<15.000	-	<0.015	<0.015	<0.015	0.0443	0.0384	0.0209	0.0222	<0.015	0.0258	0.0621	0.0324	<0.015	0.12	0.0259	<0.015	0.0248
Benz(a)anthracene	mg/kg	<14.000	-	<0.014	<0.014	<0.014	0.0228	0.0206	<0.014	<0.014	<0.014	<0.014	0.026	<0.014	<0.014	0.048	<0.014	<0.014	<0.014
Chrysene	mg/kg	<10.000	-	<0.010	<0.010	<0.010	0.0264	0.0279	0.0139	<0.010	<0.010	0.0132	0.029	0.0152	<0.010	0.0475	0.0156	<0.010	0.0151
Benzo(b)fluoranthene	mg/kg	<15.000	-	<0.015	<0.015	<0.015	0.0261	0.0343	<0.015	0.0171	<0.015	0.0216	0.0291	0.0263	<0.015	0.0469	0.0227	<0.015	<0.015
Benzo(k)fluoranthene	mg/kg	<14.000	-	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014
Benzo(a)pyrene	mg/kg	<15.000	38	<0.015	<0.015	<0.015	<0.015	0.0194	<0.015	<0.015	<0.015	<0.015	0.0179	<0.015	<0.015	0.0356	<0.015	<0.015	<0.015
Indeno(1,2,3-cd)pyrene	mg/kg	<18.000	-	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018
Dibenzo(a,h)anthracene	mg/kg	<23.000	-	<0.023	<0.023	<0.023	<0.023	<0.023	<0.023	<0.023	<0.023	<0.023	<0.023	<0.023	<0.023	<0.023	<0.023	<0.023	<0.023
Benzo(g,h,i)perylene	mg/kg	<24.000	-	<0.024	<0.024	<0.024	<0.024	<0.024	<0.024	<0.024	<0.024	<0.024	<0.024	<0.024	<0.024	<0.024	<0.024	<0.024	<0.024
PAH, Total Detected USEPA 16	mg/kg	<118.000	-	<0.118	<0.118	<0.118	0.19	0.212	<0.118	<0.118	<0.118	<0.118	0.302	0.191	<0.118	0.405	<0.118	<0.118	<0.118
WAC	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PCB's - (Solids)																			
PCB congener 28	mg/kg	<3.000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PCB congener 52	mg/kg	<3.000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PCB congener 101	mg/kg	<3.000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PCB congener 118	mg/kg	<3.000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PCB congener 138	mg/kg	<3.000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PCB congener 153	mg/kg	<3.000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PCB congener 180	mg/kg	<3.000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sum of detected PCB 7 Congeners	mg/kg	<21.000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds (SVOCs)																			
Phenol	mg/kg	<100.000	760	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Pentachlorophenol	mg/kg	<100.000	406	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
n-Nitroso-n-dipropylamine	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Nitrobenzene	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Isophorone	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Hexachloroethane	mg/kg	<100.000	21	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Hexachlorocyclopentadiene	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Hexachlorobutadiene	mg/kg	<100.000	31	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Hexachlorobenzene	mg/kg	<100.000	105	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
n-Dioctyl phthalate	mg/kg	<100.000	89100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Dimethyl phthalate	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Diethyl phthalate	mg/kg	<100.000	144000	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
n-Dibutyl phthalate	mg/kg	<100.000	15400	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Dibenzofuran	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Carbazole	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Butylbenzyl phthalate	mg/kg	<100.000	940000	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
bis(2-Ethylhexyl) phthalate	mg/kg	<100.000	85200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
bis(2-Chloroethoxy)methane	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
bis(2-Chloroethyl)ether	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Azobenzene	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
4-Nitrophenol	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
4-Nitroaniline	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
4-Methylphenol	mg/kg	<100.000	160000	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
4-Chlorophenylphenylether	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
4-Chloroaniline	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
4-Chloro-3-methylphenol	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
4-Bromophenylphenylether	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
3-Nitroaniline	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
2-Nitrophenol	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
2-Nitroaniline	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
2-Methylphenol	mg/kg	<100.000	160000	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
1,2,4-Trichlorobenzene	mg/kg	<100.000	26	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
2-Chlorophenol	mg/kg	<100.000	2700	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
2,6-Dinitrotoluene	mg/kg	<100.000	1850	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
2,4-Dinitrotoluene	mg/kg	<100.000	3720	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
2,4-Dimethylphenol	mg/kg	<100.000	15700	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
2,4-Dichlorophenol	mg/kg	<100.000	2700	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
2,4,6-Trichlorophenol	mg/kg	<100.000	2700	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
2,4,5-Trichlorophenol	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
1,4-Dichlorobenzene	mg/kg	<100.000	584	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
1,3-Dichlorobenzene	mg/kg	<100.000	30	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
1,2-Dichlorobenzene	mg/kg	<100.000	2020	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
2-Chloronaphthalene	mg/kg	<100.000	370	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
2-Methylnaphthalene	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Acenaphthylene	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Acenaphthene	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Anthracene	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Benzo(a)anthracene	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Benzo(b)fluoranthene	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Benzo(k)fluoranthene	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Benzo(a)pyrene	mg/kg	<100.000	38	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Benzo(g,h,i)perylene	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Chrysene	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Fluoranthene	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Fluorene	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Indeno(1,2,3-cd)pyrene	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Phenanthrene	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Pyrene	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Naphthalene	mg/kg	<100.000	293	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Dibenzo(a,h)anthracene	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Bis(2-chloroisopropyl) ether	mg/kg	<100.000	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Volatile Organic Compounds (VOCs)																			
Dibromofluoromethane**	%			115	115	114	115	117	114	114	110	115	114	113	115	116	115	116	112
Toluene-d8**	%			92.8	101	100	107	95.5	95.3	96.8	98.3	101	97.1	97.7	100	110	93.9	99.3	98.1
4-Bromofluorobenzene**	%			101	102	102	92.7	95.5	98.7	100	107	101	97.2	104	102	96.6	99.3	97.2	105
Dichlorodifluoromethane	mg/kg	<0.500		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chloromethane	mg/kg	<2.000	0.96	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Vinyl Chloride	mg/kg	<0.500	0.059	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Bromomethane	mg/kg	<1.000	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Chloroethane	mg/kg	<1.000	904	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Trichlorofluoromethane	mg/kg	<0.500	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
1,1-Dichloroethene	mg/kg	<0.500	24	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Carbon Disulphide	mg/kg	<1.000	11	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Dichloromethane	mg/kg	<5.000	257	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Methyl Tertiary Butyl Ether	mg/kg	<0.500	7480	<0.005	<0.005	<0.005	0.0474	0.0139	<0.005	0.0123	<0.005	<0.005	0.0121	0.0194	<0.005	0.0111	0.0102	<0.005	<0.005
trans-1,2-Dichloroethene	mg/kg	<1.000	21	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
1,1-Dichloroethane	mg/kg	<0.500	263	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
cis-1,2-Dichloroethene	mg/kg	<0.500	14	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
2,2-Dichloropropane	mg/kg	<1.000	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Bromochloromethane	mg/kg	<2.000	-	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Chloroform	mg/kg	<3.000	99	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
1,1,1-Trichloroethane	mg/kg	<0.500	1580	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
1,1-Dichloropropene	mg/kg	<0.500	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Carbontetrachloride	mg/kg	<0.500	31	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
1,2-Dichloroethane	mg/kg	<1.000	0.67	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Benzene	mg/kg	<1.000	27	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Trichloroethene	mg/kg	<1.000	0.73	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
1,2-Dichloropropane	mg/kg	<0.500	3.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dibromomethane	mg/kg	<1.000	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Bromodichloromethane	mg/kg	<2.000	2	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
cis-1,3-Dichloropropene	mg/kg	<0.500	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Toluene	mg/kg	<1.000	56300	<0.010	<0.010	<0.010	0.0466	<0.010	0.0143	0.0111	<0.010	<0.010	0.0628	<0.010	<0.010	0.0184	<0.010	<0.010	<0.010
trans-1,3-Dichloropropene	mg/kg	<1.000	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
1,1,2-Trichloroethane	mg/kg	<1.000	89	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
1,3-Dichloropropane	mg/kg	<1.000	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Tetrachloroethene	mg/kg	<2.000	-	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Dibromochloromethane	mg/kg	<2.000	-	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
1,2-Dibromoethane	mg/kg	<1.000	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Chlorobenzene	mg/kg	<2.000	58	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
1,1,1,2-Tetrachloroethane	mg/kg	<1.000	108	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Ethylbenzene	mg/kg	<1.000	5710	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
p/m-Xylene	mg/kg	<2.000	5920	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.0252	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
o-Xylene	mg/kg	<2.000	5920	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Styrene	mg/kg	<2.000	3170	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Bromoform	mg/kg	<2.000	714	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Isopropylbenzene	mg/kg	<2.000	1300	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
1,1,2,2-Tetrachloroethane	mg/kg	<2.000	274	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
1,2,3-Trichloropropane	mg/kg	<2.000	-	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Bromobenzene	mg/kg	<2.000	91	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Propylbenzene	mg/kg	<2.000	-	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
2-Chlorotoluene	mg/kg	<3.000	-	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
1,3,5-Trimethylbenzene	mg/kg	<2.000	611	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
4-Chlorotoluene	mg/kg	<3.000	-	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
tert-Butylbenzene	mg/kg	<2.000	-	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
1,2,4-Trimethylbenzene	mg/kg	<3.000	611	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
sec-Butylbenzene	mg/kg	<1.000	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
4-Isopropyltoluene	mg/kg	<2.000	-	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
1,3-Dichlorobenzene	mg/kg	<5.000	30	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,4-Dichlorobenzene	mg/kg	<5.000	584	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
n-Butylbenzene	mg/kg	<3.000	-	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
1,2-Dichlorobenzene	mg/kg	<5.000	2020	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,2-Dibromo-3-chloropropane	mg/kg	<2.000	-	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Tert-amyl methyl ether	mg/kg	<1.000	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
1,2,4-Trichlorobenzene	mg/kg	<7.000	26	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070
Hexachlorobutadiene	mg/kg	<4.000	31	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Naphthalene	mg/kg	<8.000	193	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
1,2,3-Trichlorobenzene	mg/kg	<10.000	102	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
1,3,5-Trichlorobenzene	mg/kg	<7.000	22	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070
Sum of Detected Xylenes	mg/kg	<0.020	5920	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200
Sum of BTEX	mg/kg	<7.000	-	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	0.088	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070
Polyaromatic Hydrocarbons (PAH) - (Solids)																			
PAH Total 17 (inc Coronene) Moisture Corrected	mg/kg	<10.000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

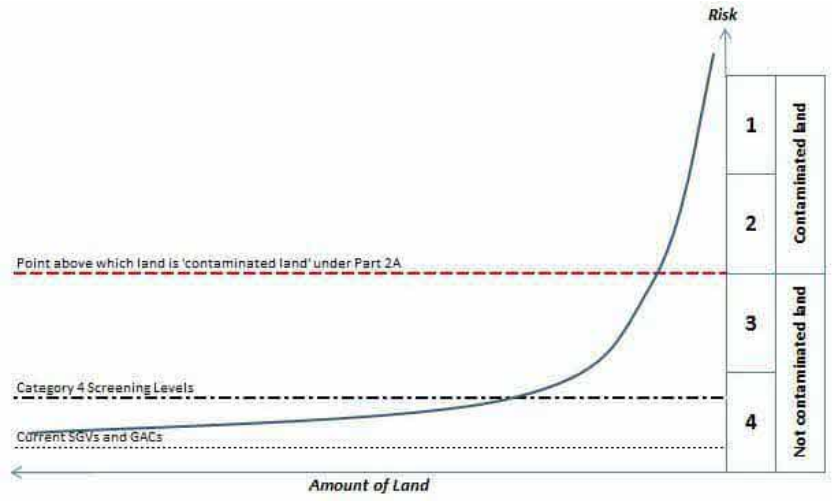
METHODOLOGY FOR THE DERIVATION OF GENERIC QUANTITATIVE ASSESSMENT CRITERIA TO EVALUATE RISKS TO HUMAN HEALTH FROM SOIL & GROUNDWATER CONTAMINATION

UK APPROACH

In the UK, the potential risks to human health from contamination in the ground are usually evaluated through a generic quantitative risk assessment (GQRA) approach. This allows generic and conservative exposure assumptions to be readily applied to risk assessments, and can be a useful tool for rapidly screening data and to identify those contaminants or scenarios that could benefit from further investigation and/or site-specific detailed quantitative risk assessment (DQRA). Current industry good practice is to use the approach presented in the Environment Agency (EA) publications SR2[1] and SR3[2]. This approach allows the derivation of Generic Assessment Criteria (GACs), primarily for chronic exposure.

In April 2012, the Department of Environment, Food and Rural Affairs (Defra) published updated statutory guidance[3] which introduced a four category approach to determining whether land in England and Wales is contaminated or not on the grounds of significant possibility of significant harm (SPOSH). **Figure 1** presents a graphical representation of the categories.

Figure 1: Four Categories for Determining if Land Represent a SPOSH



Cases classified as Category 1 are considered to be SPOSH based on actual evidence or an unacceptably high probability of harm existing. Category 4 cases are those where there is no risk, or a low risk of SPOSH.

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[1] Environment Agency '*Human Health Toxicological Assessment of Contaminants in Soil',* Report SC050021/SR2. January 2009.
[2] Environment Agency '*Updated Technical Background to the CLEA Model*,' Report SC050021/SR3. January 2009.
[3] Defra '*Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance'.* April 2012.

GACs represent a minimal risk level, well within Category 4. A 2014 publication by Contaminated Land: Applicatons in Real Environments (CL:AIRE),SP1010[4] and endorsed by Defra[5] provided an approach to determine Category 4 Screening Levels (C4SLs) which are higher than the GACs whilst being "more pragmatic but still strongly precautionary". It also provided C4SLs for six contaminants of concern. Although the C4SLs were designed to support Part 2A assessments to determine 'contaminated land' they are specifically mentioned, along with reference to the Part 2A statutory guidance, by the Department for Communities and Local Government (DCLG) for use in a planning context[6].

An updated version the Contaminated Land Exposure Assessment (CLEA) Workbook (v1.071) was released by the EA in September 2015 to take into account the publication of SP1010. The updates comprised: additional toxicity data for the six chemicals for which C4SLs were derived; two new public open space land use scenarios; updated exposure parameters; options to run the model using C4SL exposure assumptions; and increased functionality. There were no changes to algorithms, so it is still possible to replicate the withdrawn SGVs using the input parameters held within v1.071.

It should be noted that the four category approach has not been adopted in Scotland under Part 2A or the planning regime. The Part 2A statutory guidance applicable in Scotland (Paper SE/2006/44 dated May 2006) does not reflect the changes introduced by Defra in April 2012 which allow for the use of C4SLs within Part 2A risk assessments. Additionally, it is considered that the principal of 'minimal risk' should still apply under planning in Scotland, based on current guidance.

WSP APPROACH

Following the withdrawal of the SGVs, and in the absence of an industry-wide, accepted set of GACs it is down to individual practitioners to derive their own soil assessment criteria. WSP has used the approach provided within SR2, SR3, SP1010, CLEA Workbook v1.071 and SR4[7] to produce a set of minimal risk GACs. The chemical-specific data within two key publications were considered during their production: CL:AIRE 2010[8] and LQM 2015[9]. Both documents provide comprehensive sets of GACs for different contaminants of concern.

The LQM Suitable For Use Levels (S4ULs) have selected exposure parameters consistent with the C4SL exposure scenarios. This approach was rejected by WSP as not representing minimal risk. However, the LQM S4UL document was critically reviewed and the approach and chemical input parameters were utilised where considered to be appropriate.

An industry-led C4SL Working Group is in the process of deriving a larger set of C4SLs in the near future, for approximately 20 contaminants. This will include a critical review of the chemical input data for all selected substances, and may therefore lead to further amendments to the chemical input data used in the WSP in-house screening values. It is considered likely that the contaminant list will

[4] CL:AIRE *'Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination'* SP1010, Final Project Report (Revision 2). September 2014.
[5] Defra 'SP1010: *Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Policy Companion Document'*. December 2014.
[6] DCLG Planning Practice Guidance '*Land Affected by Contamination'*, particularly Paragraphs 001 and 007. Ref IDs: 33-001-20140306 & 33-007-20140612.
[7] Environment Agency '*CLEA Software (Version 1.05) Handbook (and Software)',* Report SC050021/SR4. September 2009.
[8] CL:AIRE 'The EIC/AGS/CL:AIRE *Soil Generic Assessment Criteria for Human Health Risk Assessment'.* ISBN 978-1-05046-20-1. January 2010.
[9] Nathanail et al '*The LQM/CIEH S4ULs for Human Health Risk Assessment'*, Land Quality Press, ISBN 978-0-9931084-0-2. 2015.

crossover with the 2009 EIC/AGS/CL:AIRE GACs. As such, this document was not critically reviewed by WSP.

WSP's current approach to the assessment of risks to human health is to continue to evaluate minimal risk through the use of in-house derived GACs, and to use the published C4SLs as a secondary tier of assessment until such time as additional C4SLs are published and/or in-house values are derived.

EXPOSURE MODELS

LAND USES

WSP has largely adopted the exposure assumptions of the generic land use scenarios included within SR3, with two additional public open space scenarios included from within SP1010 and two bespoke exposure scenarios (highways):

- Residential with homegrown produce consumption;
- Residential without homegrown produce consumption;
- Allotments;
- Commercial;
- Public open space near residential housing (POS_{resi});
- Public park (POS_{park});
- Highways (surface soils); and
- Highways (subsurface soils).

Exceptions are described in the following Sections.

SOIL PROPERTIES

SR3 assumes a sandy loam soil with a pH of 7 and a Soil Organic Matter (SOM) content of 6% for its generic land uses, based on the geographical spread of topsoils in the UK. WSP has adopted these default values. In addition, GACs based on an SOM of 1% and 2.5% have been derived, based on common experience of the nature of Made Ground and lack of topsoil on many brownfield sites.

RECEPTOR CHARACTERISTICS AND BEHAVIOURS

SP1010 provides some updated exposure parameters for long-term inhalation rates[10] and the consumption rates for homegrown produce[11] compared to those provided in SR3. This data was used to derived WSP's GACs.

The changes in inhalation rates do not apply to the allotment generic land use scenario, as these are based on the breathing rates for short-term exposure of light to moderate intensity activity which were derived from a study that was not updated in USEPA 2011, so the SR3 rates were retained.

[10] USEPA, National Centre for Environmental Assessment '*Exposure Factors Handbook: 2011 Edition'* EPA/600/R-09/052F. September 2011.
[11] National Diet and Nutrition Survey 2008/2009 to 2010/2011.

HIGHWAYS EXPOSURE SCENARIOS

Human health GAC for a Highways exposure scenario have been derived. The site area is defined by publicly accessible land adjacent to highways, comprising both hard and soft landscaped areas. Exposure is considered to be largely transitory.

There are no publicly available GAC for this exposure scenario. Consequently, WSP have derived GAC for the following exposure scenarios:

- à Highways (surface soils); and
- à Highways (sub-surface soils).

Surface soils GAC are for soil at ground level and within 300mm of the surface. Conversely, subsurface GAC are for soils at a depth exceeding 0.3m bgl. These GAC are not to be used as import criteria.

The critical receptor is a young female child, CLEA age classes 4-9. This is consistent with the critical receptor for the POS(resi) exposure scenario, and considered to be appropriate for a child potentially playing outside without direct adult supervision.

For all GAC, a sandy loam soil and a soil organic matter content of 1% is assumed. There is no building on site.

Exposure scenarios for surface and subsurface soils are detailed below. These are considered to be conservative estimates, due to the mostly transitory use of publically accessible lands adjacent to highways.

HIGHWAYS GAC (SURFACE SOILS)

The relevant exposure pathways include direct soil and dust ingestion, dermal contact (outdoors) and the inhalation of outdoor dust and vapour.

The exposure frequency is 170 days per annum, and the occupancy period outdoors is 1 hour per day (as per the POS (resi) exposure scenario). The soil and dust ingestion rate has been set at 50 mg/day, consistent with a POS(park) exposure scenario.

HIGHWAYS GAC (SUBSURFACE SOILS)

The single relevant exposure pathway is the inhalation of outdoor vapour. Direct exposure pathways are not viable due to the depth of the soils below ground level.

The exposure frequency is 170 days per annum, and the occupancy period outdoors is 1 hour per day (as per the POS (resi) exposure scenario). The soil and dust ingestion rate has been set to zero, as direct exposure pathways to soils at this depth are not viable.

CHEMICAL DATA

PHYSICO-CHEMICAL PARAMETERS

Physico-chemical properties for the contaminants for which GACs have been derived have been obtained following critical review of the following hierarchy of data sources:

1. Environment Agency/Defra SGV reports where available;
2. Environment Agency '*Compilation of Data for Priority Organic Pollutants for Derivation of Soil Guideline Values*', Report SC050021/SR7, November 2008; and
3. Published fate and transport reviews within Nathanail et. al 2015 and CL:AIRE 2010.

Where appropriate, and where sufficient data is available, values were adjusted to reflect a UK soil temperature of 10ºC (e.g. K_{aw}).

TOXICOLOGICAL DATA

Toxicological data for the derivation of minimal risk Health Criteria Values (HCV) for each contaminant was selected with due regard to the approach presented in SR2. Where appropriate, the following hierarchy of data sources was used:

1. UK toxicity reviews published by authoritative bodies including:
   - EA;
   - Public Health England (PHE);
   - Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment (COT); and
   - Committee on Carcinogenicity of Chemicals in Food, Consumer Products and the Environment (COC).
2. Authoritative European sources such as European Food Standards Agency (EFSA)
3. International organisations including:
   - World Health Organisation (WHO); and
   - Joint FAO/WHO Expert Committee on Food Additives (JECFA).
4. Authoritative country-specific sources including:
   - United States Environmental Protection Agency (USEPA);
   - US Agency for Toxic Substances and Disease Registry (ATSDR);
   - US Integrated Risk Information System (IRIS); and
   - Netherlands National Institute for Public Health and the Environment (RIVM).

Factors such as the applicability of the data to human health (e.g. epidemiological vs. animal studies), the quality of the data, the level of uncertainty in the results and the age of the data were also taken into account in the final selection. Details for specific substances are available on request.

MEAN DAILY INTAKES

Estimations of background exposure for each threshold substance have been updated. In line with the SR2 approach, the exposure from non-threshold substances in the soil does not take into account exposure from other sources, and as such GACs were derived without consideration of the Mean Daily Intake (MDI) for those substances.

The data published by the EA in its series of TOX reports between 2002 and 2009 was evaluated to determine whether the values were considered to remain valid today. Values from these current UK published sources were not amended unless they were considered to be significantly different so that the GACs remained as comparable as possible with the revoked SGVs.

ORAL MEAN DAILY INTAKES

Oral MDI were generally estimated as the sum of exposure via the ingestion of food and drinking water using the default adult physiological parameters presented in Table 3.3 of SR2.

Data on the exposure of substances from food ingestion was generally obtained from UK Total Diet Studies (TDS) published by the Food Standards Agency (FSA) and its predecessor the Ministry of Agriculture, Fisheries and Food (MAFF) and from studies commissioned by COT. Where no UK-specific data was available, MDI were derived from the European Food Safety Authority (EFSA), Health Canada and US sources. This was a rare occurrence, and in these instances, the data was evaluated to determine its applicability to the UK.

Data on the concentrations of substances in tap water was obtained from a variety of sources. UK data was used where available, with preference given to Drinking Water Inspectorate (DWI) 2014 data from water company tap water testing (LOD, 1st and 99th percentile data is available). Where the substance was not included in tap water testing, other UK sources of information were considered including:

- à DWI data from water company tap water testing from previous years;
- à COT; and
- à FSA.

Where UK data was not available, a number of other data sources were considered, largely WHO International Programme on Chemical Safety (IPCS) Concise International Chemical Assessment Documents (CICADs) and background documents for the development of Guidelines for Drinking Water Quality, using professional judgement on the relevance of the data to the UK. The final decision on the MDI from drinking water was made using professional judgement on the balance of relevance and probability, taking into account the detection limit where not detected, Koc and solubility, reduction in use of the substance, banned substances, tight controls (e.g. on explosives) and with due consideration to the SR2 instruction that “if no data or information in background exposure are available, background exposure should be assumed to be negligible and the MDI set to zero….”.

Data from other countries was generally not used because it was considered that the hydrogeology of these countries along with industrial practices were unlikely to be reflective of the UK.

INHALATION MEAN DAILY INTAKES

Inhalation MDIs were based on estimates of average daily exposure by the inhalation pathway and calculated using the default adult physiological parameters presented in Table 3.3 of SR2.

The inhalation MDIs were generally estimated using background exposure data from the UK, derived from Defra's UK-AIR: Air Information Resource[12], which provides ambient air quality data from a number of sites forming a UK-wide monitoring network. The MDIs for heavy metals were based on rolling annual average metal mass concentration data from Defra's UK Heavy Metals Monitoring Network from the period October 2009 to September 2010[13].

Information for some substances was obtained from UK sources including Environment Agency TOX reports and data from the UK Expert Panel on Air Quality Standards (EPAQS). Where recent UK data was not available, data was sourced from the International Programme on Chemical Safety (IPCS), the World Health Organisation (WHO), the Agency for Toxic Substances and Diseases Registry (ATSDR), Health Canada, and various other peer-reviewed sources summarised by LQM/CIEH[14].

For other substances, where no data or information on background exposure was available, background exposure was assumed to be negligible and the MDI set at 0.5*TDI in accordance with guidance in SR2.

PLANT UPTAKE

Soil to plant concentration factors are available in CLEA v1.071 for arsenic, cadmium, hexavalent chromium, lead, mercury, nickel and selenium. For all remaining inorganic chemicals, concentration factors were obtained using the PRISM model. Substance-specific correction factors have been selected in accordance with the guidance established within SR3. This is consistent to the approach utilised in the derivation of the LQM S4UL and the EIC/AGS/CL:AIRE GAC.

Where there is a lack of appropriate data to enable the derivation of specific soil to plant concentrations factors for organic chemicals, plant uptake was modelled within CLEA v1.071 using the generic equations recommended within SR3, as follows:

- Green Vegetables – Ryan et al. (1988);
- Root Vegetables – Trapp (2002);
- Tuber Vegetables – Trapp et al. (2007); and
- Tree Fruit – Trapp et al. (2003).

There are no suitable models available for modelling uptake for herbaceous fruit or shrub fruit. Exposure is considered negligible.

[12] Crown 2016 copyright Defra via uk-air.defra.gov.uk, licenced under the Open Government Licence (OGL).
[13] Defra, 2013 Spreadsheet of historic data for multiple years for the Metals network. Available online at: http://uk-air.defra.gov.uk/data/metals-data. [Accessed 13/03/2016].
[14] LQM/CIEH, 2015. The LQM/CIEH S4ULs for Human Health Risk Assessment.

SOIL SATURATION LIMITS

GACs are not limited to their theoretical soil saturation within CLEA, although where either the aqueous or the vapour-based saturation is exceeded, this is highlighted within the Workbook (compared with the lower of the two values). This affects pathways which depend on partitioning calculations so in reality this only affects the vapour pathways and is relevant to organic substances and other substances, such as elemental mercury, that have a significant volatile component. However, the Workbook highlights saturation for direct contact pathways to indicate to the user where further qualitative consideration of free phase contamination at the surface may be required.

Where the lower of the two saturation limits is exceeded and the vapour pathway is the only exposure route being considered, the chronic risks to human health are likely to be negligible. Further evaluation could be undertaken using an alternative model suitable for evaluating non-aqueous phase liquids (NAPLs), such as the Johnson & Ettinger (J&E) approach described in USEPA 2003. However, WSP considers that if NAPLs are suspected, given the known limitations and over-simplifications of J&E, soil vapour monitoring is a more accurate way of assessing potential risks.

Where the lower saturation limit is exceeded for the vapour pathway and a number of exposure routes are being considered, then the contribution from the NAPL via vapour inhalation to the overall exposure can be evaluated using the procedure provided in SR4. WSP would evaluate this as part of a DQRA process or through soil vapour monitoring on-site to determine site-specific soil vapour concentrations.

CHEMICAL SPECIFIC ASSUMPTIONS

CYANIDES

Cyanide has high acute toxicity, and short term exposure is an important consideration when assessing the risks from soils contaminated with cyanide. The primary risk to human receptors from free cyanide in soils is an acute risk.

There is no current UK guidance available for calculating acute risks from free cyanide. Consequently, GAC for acute exposure were derived using the algorithms presented in MADEP 1992[15] and assuming a one-off ingestion of 10g of soil (this conservative value has been taken as an upper bound estimate for a one-off soil ingestion rate amongst children). Receptor body weights have been selected according to the critical receptor for each exposure scenario. The lowest of the chronic and acute GAC for each land use scenario were adopted by WSP.

LEAD

The SGV for lead was withdrawn by the EA in 2009, and in 2011 the EA withdrew their published TOX report in light of new scientific evidence. The C4SL for lead was derived using the latest scientific evidence from a large human dataset. As such, no chemical-specific margin was applied in the derivation of the C4SL for lead. It may be possible for WSP to derive a GAC for lead using the same dataset and applying a chemical-specific margin, but the value is likely to be lower than UK natural background concentrations. Therefore, WSP has adopted the toxicological data used to derive the C4SLs in deriving the GAC for lead until such time as alternative GACs are published by an authoritative body. The relative bioavailability was set at 100% in line with the approach taken for other GACs, whereas the C4SL assumes 60% for soil and 64% for airborne dust. Thus, the WSP GAC are lower than the C4SLs.

[15] MADEP '*Background Documentation for the Development of an "Available Cyanide" Benchmark Concentration'* 1992. http://www.mass.gov/dep/toxics/cn_soil.htm

POLYCYCLIC AROMATIC HYDROCARBONS

WSP's approach to the assessment of polycyclic aromatic hydrocarbons (PAHs) uses the surrogate marker approach. BaP was used as a surrogate marker for all genotoxic PAHs in line with the Health Protection Agency 2010[16] recommendations and SP1010. This assumes that the PAH profile of the data is similar to that of the coal tars used in the Culp *et al* oral carcinogenicity study from which the toxicity data for BaP was produced. In reality, this profile has been shown by HPA to be applicable on the majority of contaminated sites based on assessment of sites across the country.

The alternative is the Toxic Equivalency Factor (TEF) approach which uses a reference compound and assigns TEFs for other compounds based on estimates of potency. Key uncertainties with this approach include the assumption that all compounds have the same toxic mechanism of action within the body and that no compounds with a greater potency than the reference compound are present. It is considered by the HPA that the TEF approach is likely to under predict the true carcinogenicity of PAHs and therefore favours the surrogate marker approach.

For these reasons, WSP considers that the adoption of BaP as a surrogate marker for genotoxic PAHs, as opposed to the TEF approach, is reasonable. In rare cases where the PAH profile may differ from the wide definitions of the Culp *et al* study the user should discuss their project with an experienced risk assessor. In addition, WSP has derived a GAC for naphthalene, which is commonly a risk driver due to its high volatility, relative to other PAH compounds.

TRIMETHYLBENZENES

The GAC for trimethylbenzenes can be used for the assessment of any individual isomer (1,2,3-trimethylbenzene, 1,2,4-trimethylbenzene or 1,3,5-trimethylbenzene), or a mixture of the three isomers.

CHEMICAL GROUPS

For a number of chemical groups, the available toxicity data is for combinations of chemicals. Given that the physico-chemical parameters may differ between the chemicals, the GACs for the chemicals within the groups have been calculated and then the lowest GAC selected to represent the entire group. This was the approach taken by the EA for m-, o- and p-xylenes, and has also been adopted by WSP for:

- 2-chlorophenol, 2,4-dichlorophenol, 2,4,6-trichlorophenol and 2,3,4,6-tetrachlorophenol;
- 2-, 3- and 4-methylphenol (total cresols);
- aldrin and dieldrin; and
- α- and β-endosulphan.

[16] HPA Contaminated Land Information Sheet '*Risk Assessment Approaches for Polycyclic Aromatic Hydrocarbons (PAHs)* 2010

EXPOSURE TO VAPOURS

INHALATION OF MEASURED VAPOURS

WSP has derived a set of soil vapour GACs (GAC_{sv}) that allow for the assessment of measured site soil vapour concentrations, using J&E, in order to establish potential risks via indoor inhalation of vapours. This methodology enables a more robust assessment of exposure via the inhalation of soil vapours indoors than using CLEA-derived soil GAC, as it is based upon measured soil vapour concentrations beneath the site. It also allows for the assessment of vapours from all source terms (i.e. groundwater, soil or NAPL). Outdoor inhalation was not included. WSP considers that the indoor inhalation pathway is the significantly dominant risk-driver.

The generic land use scenarios within CLEA (residential and commercial) that were used to derive the soil GAC were used to define the receptor and building characteristics for the soil vapour GAC. Only residential and commercial generic land use scenarios include the indoor inhalation of vapours pathway.

The GAC_{sv} were derived for three different soil types; sand, sandy loam and clay, reflecting the importance of this parameter within the J&E model. A depth to contamination of 0.85 m below the base of the building foundation was assumed (i.e. 1 m below ground level). This differs from the depth assumed for the soil GAC (0.5 m bgl), but was selected by WSP as a reasonable worst case scenario.

It is acknowledged that the J&E commonly over-predicts indoor vapour concentrations. In particular, it will significantly over-predict vapour concentrations for suspended floor slabs, which many new builds are constructed with, it does not take into account lateral migration and assumes an infinite source of contamination at steady state conditions. In addition, it is common for soil gas/vapour wells to be installed with at least 1 m of plain riser at the surface and this equates to a total depth of 0.85 m below the building foundation plus a 0.15 m thick foundation, and so is more representative of the depth that samples will be taken from.

The TDSIs and IDs for each substance were converted from $\mu gkg^{-1}{}_{bw}day^{-1}$ to μgm^{-3} using the standard conversions quoted in Table 3.3 of SR2, thereby replacing the need to model C_{air} in the equation:

$$= \alpha. \quad _{v} \quad .1{,}000{,}000$$

Where:

C_{air} is the concentration of vapours within the building, mg^{-3}

α is the steady state attenuation coefficient between soil and indoor air, dimensionless

C_{vap} is the soil vapour concentration, $mgcm^{-3}$

The target concentrations within indoor air for each substance (C_{air}) are a function of receptor inhalation rates and occupancy periods, as defined by the site conceptual exposure model (assuming standard CLEA occupancy periods and receptors).

The attenuation factor was calculated using J&E (Equation 10.4 in SR3) and the resulting C_{vap} is equivalent to the GAC_{sv} for the modelled exposure scenario.

Where reported soil vapour concentrations exceed the relevant saturated vapour concentration, free product may occur, and the user should discuss their project with an experienced risk assessor.

INHALATION OF GROUNDWATER-DERIVED VAPOURS

WSP has derived a set of groundwater GACs (GAC_{gw}) to evaluate the potential risks through the indoor inhalation of groundwater-derived vapours by first applying the approach described above for the derivation of the WSP GAC_{sv} to determine the acceptable concentration in soil vapour directly above the water table.

The depth to groundwater was assumed to be 1 m bgl (i.e. 0.85 m below the base of the building foundation). This depth was considered to be more representative of commonly encountered groundwater conditions than the 0.5 m below the base of the building foundation (i.e. 0.65 m bgl) that is used by CLEA for an unsaturated source present in the overlying soil.

The GAC_{gw} was then back-calculated from the GAC_{sv} using the air-water partition coefficient (K_{aw}) for each substance.

The WSP Groundwater Vapour GAC are protective against a dissolved phase contaminant source only. If the presence of NAPL is suspected, the risks from this source will need to be assessed. Where reported groundwater concentrations exceed the relevant solubility limit, free product may occur, and the user should discuss their project with an experienced risk assessor.

Appendix F

RISK APPRAISAL METHODOLOGY

CIRIA C552 RISK ASSESSMENT

The identification of potential pollutant linkages is a key aspect of the evaluation of potentially contaminated land. An approach based on the UK CIRIA 552 report C552 (Contaminated Land Risk Assessment: A Guide to Good Practice, 2001) has been adopted within this report. The assessment considers which source – pathway – receptor pollutant linkages are likely to be plausible and potentially complete, and the potential risk they represent. For each of the pollutant linkages, an estimate of:

- the potential severity (consequence) of the risk, and
- the probability (likelihood) of the risk occurring

has been undertaken to assess the potential risk associated with a complete pollutant linkage.

Table 1 – Classification of consequence (CIRIA C552, 2001)

Classification	Category	Definition	Examples
Severe Short term (acute) risks only	Humans	Short term (acute) risk to human health likely to result in "significant harm" as defined by the Environmental Protection Act 1990, Part 2a	High concentrations of cyanide on the surface of an informal recreation area
	Controlled Waters	Short term risk of pollution of sensitive water resource	Major spillage of contaminants from site into controlled waters
	Property	Catastrophic damage to buildings / property	Explosion causing building collapse
	Ecological Systems	Short term risk to a particular ecosystem or organism forming part of such ecosystem	
Medium Chronic (long term) risks; 'significant harm'	Humans	Chronic damage to human health ("significant harm" as defined in DEFRA, 2006)	Concentrations of a contaminant from a site exceed the generic or site-specific assessment criteria
	Controlled Waters	Pollution of sensitive water resources	Leaching of contaminants from a site into a Principal or Secondary A aquifer
	Ecological Systems	Significant change in a particular ecosystem or organism forming part of such ecosystem	Death of a species within a designated nature reserve
Mild Chronic (long term) risks; less sensitive receptors	Controlled Waters	Pollution of non-sensitive water resources	Pollution of non-classified surface watercourse
	Property	Significant damage to buildings, structures, crops and services ("significant harm" as defined in DEFRA, 2006) and damage to sensitive buildings / structures and services	Foundation damage to a building rendering it unsafe to occupy due to instability
	Ecological Systems	Damage to the environment	
Minor Chronic (long term) risk; mild	Humans	Non-permanent health effects to human health that are easily prevented by the use of PPE	Presence of contaminants at such concentrations that protective equipment is required during site works
	Property	Easily repairable effects of damage to buildings, structures and services	Discoloration of concrete
	Financial / Project	Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve	

Table 2 – Classification of probability (CIRIA C552, 2001)

Classification	Definition
High likelihood	There is a pollutant linkage and an event that either appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution.
Likely	There is a pollutant linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.
Low likelihood	There is a pollutant linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even or a longer period such an event would take place, and is less likely in the shorter term.
Unlikely	There is a pollutant linkage but circumstances are such that it is improbable that an event would occur even in the very long term.

Table 3 – Comparison of consequence against probability (CIRIA C552, 2001)

	Severe	Medium	Mild	Minor
High Likelihood	Very High Risk	High Risk	Moderate Risk	Low / Moderate Risk
Likely	High Risk	Moderate Risk	Low to Moderate Risk	Low Risk
Low Likelihood	Moderate Risk	Low / Moderate Risk	Low Risk	Very Low Risk
Unlikely	Low / Moderate Risk	Low Risk	Very Low Risk	Very Low Risk

Table 4 - Risk classification descriptions (CIRIA C552, 2001)

Risk Classification	Definition
Very high risk	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR, there is evidence that severe harm to a designated receptor is currently happening. This risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not undertaken already) and remediation are likely to be required.
High risk	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short term and are likely over the longer term.
Moderate risk	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild. Investigation (if not undertaken already) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term.
Low risk	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.
Very low risk	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

Appendix G

REPORT LIMITATIONS

REPORT LIMITATIONS - GROUND AND WATER

GENERAL

1. WSP UK Limited has prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed and outlined in the body of the report.

2. Unless explicitly agreed otherwise, in writing, this report has been prepared under WSP UK Limited standard Terms and Conditions as included within our proposal to the Client.

3. Project specific appointment documents may be agreed at our discretion and a charge may be levied for both the time to review and finalise appointments documents and also for associated changes to the appointment terms. WSP UK Limited reserves the right to amend the fee should any changes to the appointment terms create an increase risk to WSP UK Limited.

4. The report needs to be considered in the light of the WSP UK Limited proposal and associated limitations of scope. The report needs to be read in full and isolated sections cannot be used without full reference to other elements of the report and any previous works referenced within the report.

PHASE 1 GEO ENVIRONMENTAL AND PRELIMINARY RISK ASSESSMENTS

Coverage: *This section covers reports with the following titles or combination of titles: phase 1; desk top study; geo environmental assessment; development appraisal; preliminary environmental risk assessment; constraints report; due diligence report; geotechnical development review; environmental statement; environmental chapter; project scope summary report (PSSR), program environmental impact report (PEIR), geotechnical development risk register; and, baseline environmental assessment.*

5. The works undertaken to prepare this report comprised a study of available and easily documented information from a variety of sources (including the Client), together with (where appropriate) a brief walk over inspection of the Site and correspondence with relevant authorities and other interested parties. Due to the short timescales associated with these projects responses may not have been received from all parties. WSP UK Limited cannot be held responsible for any disclosures that are provided post production of our report and will not automatically update our report.

6. The opinions given in this report have been dictated by the finite data on which they are based and are relevant only for the purpose for which the report was commissioned. The information reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative data pertaining to site conditions. Should additional information become available which may affect the opinions expressed in this report, WSP UK Limited reserves the right to review such information and, if warranted, to modify the opinions accordingly.

7. It should be noted that any risks identified in this report are perceived risks based on the information reviewed. Actual risks can only be assessed following intrusive investigations of the site.

8. WSP UK Limited does not warrant work / data undertaken / provided by others.

REPORT LIMITATIONS - GROUND RISK AND REMEDIATION

INTRUSIVE INVESTIGATION REPORTS

Coverage: *The following report titles (or combination) may cover this category of work: geo environmental site investigation; geotechnical assessment; GIR (Ground Investigation reports); preliminary environmental and geotechnical risk assessment; and, geotechnical risk register.*

9. The investigation has been undertaken to provide information concerning either:

- **i.** The type and degree of contamination present at the site in order to allow a generic quantitative risk assessment to be undertaken; or
- **ii.** Information on the soil properties present at the site to allow for geotechnical development constraints to be considered.

10. The scope of the investigation was selected on the basis of the specific development and land use scenario proposed by the Client and may be inappropriate to another form of development or scheme. If the development layout was not known at the time of the investigation the report findings may need revisiting once the development layout is confirmed.

11. For contamination purposes, the objectives of the investigation are limited to establishing the risks associated with potential contamination sources with the potential to cause harm to human health, building materials, the environment (including adjacent land), or controlled waters.

12. For geotechnical investigations the purpose is to broadly consider potential development constraints associated with the physical property of the soils underlying the site within the context of the proposed future or continued use of the site, as stated within the report.

13. The amount of exploratory work, soil property testing and chemical testing undertaken has necessarily been restricted by various factors which may include accessibility, the presence of services; existing buildings; current site usage or short timescales. The exploratory holes completed assess only a small percentage of the area in relation to the overall size of the Site, and as such can only provide a general indication of conditions.

14. The number of sampling points and the methods of sampling and testing do not preclude the possible existence of contamination where concentrations may be significantly higher than those actually encountered or ground conditions that vary from those identified. In addition, 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.

15. The inspection, testing and monitoring records relate specifically to the investigation points and the timeframe that the works were undertaken. They will also be limited by the techniques employed. As part of this assessment, WSP UK Limited has used reasonable skill and care to extrapolate conditions between these points based upon assumptions to develop our interpretation and conclusions. The assumption made in forming our conclusions is that the ground and groundwater conditions (both chemically and physically) are the same as have been encountered during the works undertaken at the specific points of investigation. Conditions can change between investigation points and these interpretations should be considered indicative.

16. The risk assessment and opinions provided are based on currently available guidance relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of any future changes or amendments to these values. Specific assumptions associated

with the WSP UK Limited risk assessment process have been outlined within the body or associated appendix of the report.

17. Additional investigations may be required in order to satisfy relevant planning conditions or to resolve any engineering and environmental issues.

18. Where soil contamination concentrations recorded as part of this investigation are used for commentary on potential waste classification of soils for disposal purposes, these should be classed as indicative only. Due consideration should be given to the variability of contaminant concentrations taken from targeted samples versus bulk excavated soils and the potential variability of contaminant concentrations between sampling locations. Where major waste disposal operations are considered, targeted waste classification investigations should be designed.

19. The results of the asbestos testing are factually reported and interpretation given as to how this relates to the previous use of the site, the types of ground encountered and site conceptualisation. This does not however constitute a formal asbestos assessment. These results should be treated cautiously and should not be relied upon to provide detailed and representative information on the delineation, type and extent of bulk ACMs and / or trace loose asbestos fibres within the soil matrix at the site.

20. If costs have been included in relation to additional site works, and / or site remediation works these must be considered as indicative only and must be confirmed by a qualified quantity surveyor.

EUROCODE 7: GEOTECHNICAL DESIGN

21. On 1st April 2010, BS EN 1997-1:2004 (Eurocode 7: Geotechnical Design – Part 1) became the mandatory baseline standard for geotechnical ground investigations.

22. In terms of geotechnical design for foundations, slopes, retaining walls and earthworks, EC7 sets guidance on design procedures including specific guidance on the numbers and spacings of boreholes for geotechnical design, there are limits to methods of ground investigation and the quality of data obtained and there are also prescriptive methods of assessing soil strengths and methods of design. Unless otherwise explicitly stated, the work has not been undertaken in accordance with EC7. A standard geotechnical interpretative report will not meet the requirements of the Geotechnical Design Report (GDR) under Eurocode 7. The GDR can only be prepared following confirmation of all structural loads and serviceability requirements. The report is likely to represent a Ground Investigation Report (GIR) under the Eurocode 7 guidance.

DETAILED QUANTITATIVE RISK ASSESSMENTS AND REMEDIAL STRATEGY REPORTS

23. These reports build upon previous report versions and associated notes. The scope of the investigation, further testing and monitoring and associated risk assessments were selected on the basis of the specific development and land use scenario proposed by the Client and may not be appropriate to another form of development or scheme layout. The risk assessment and opinions provided are based on currently available approaches in the generation of Site Specific Assessment Criteria relating to contamination concentrations and are not considered to represent a risk in a specific land use scenario to a specific receptor. No liability can be accepted for the retrospective effects of any future changes or amendments to these values, associated models or associated guidance.

24. The outputs of the Detailed Quantitative Risk Assessments are based upon WSP UK Limited manipulation of standard risk assessment models. These are our interpretation of the risk assessment criteria.

25. Prior to adoption on site they will need discussing and agreeing with the Regulatory Authorities prior to adoption on site. The regulatory discussion and engagement process may result in an alternative interpretation being determined and agreed. The process and timescales associated with the Regulatory Authority engagement are not within the control of WSP UK Limited. All costs and programmes presented as a result of this process should be validated by a quantity surveyor and should be presumed to be indicative.

GEOTECHNICAL DESIGN REPORT (GDR)

26. The GDR can only be prepared following confirmation of all structural loads and serviceability requirements. All the relevant information needs to be provided to allow for a GDR to be produced.

MONITORING (INCLUDING REMEDIATION MONITORING REPORTS)

27. These reports are factual in nature and comprise monitoring, normally groundwater and ground gas and data provided by contractors as part of an earthworks or remedial works.

28. The data is presented and will be compared with assessment criteria.

Appendix H

CANOPY DESIGN

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Structural Calculations for:

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Prepared by: **Saif Asghar**
Date: 23rd August 2023

Checked by: **Joynul Islam**
Date: 29th August 2023

Approved by: **Razwan Mohammed**
Date: 19th September 2023

Contents

1 Technical Description

1.1 Project Brief

Our client proposes to construct a new petrol filling station at Newbold Road, Chesterfield, Derbyshire. The scheme will include a new canopy supplied by Global-MSI.

The canopy will comprise fixed based columns supporting a series of cantilevered beams and rafters. A cold rolled grid of purlins and underlining rails will support profiled metal deck and soffit sheeting.

The general arrangement of the new canopy is indicated on Global-MSI drawing number CP/45797/1 which should accompany these calculations.

1.2 Technical Reference

The canopy has been designed to the following codes of practice and technical brochures:

BS EN 1990:2002	Eurocode – Basis of structural design
BS EN 1991-1-1:2002	Eurocode 1: Actions on structures – General Actions – Densities, self-weight, imposed loads for buildings
BS EN 1991-1-3:2003	Eurocode 1: Actions on structures – General Actions – Snow loads
BS EN 1991-1-4:2005	Eurocode 1: Actions on structures – General Actions – Wind actions
BS EN 1991-1-7:2006	Eurocode 1: Actions on structures – General Actions – Accidental actions
BS EN 1992-1-1:2004	Eurocode 2: Design of concrete structures – General rules and rules for buildings
BS EN 1993-1-1:2005	Eurocode 3: Design of steel structures – General rules and rules for buildings
BS EN 1993-1-8:2005	Eurocode 3: Design of steel structures – Design of joints
BS EN 1997-1:2004	Eurocode 7: Geotechnical design – General rules

SCI P358 Joints in steel construction: Simple joints to Eurocode 3
SCI P398 Joints in steel construction: Moment-resisting joints to Eurocode 3
BW Industries Purlin Load Tables
Rigidal 20/125/1000 trapezoidal profile (roof sheet) – Technical Data Sheet
Rigidal 20/100/1000 trapezoidal profile (soffit sheet) – Technical Data Sheet

1.3 Materials

1.3.1 Structural Members

I-shaped UB hot formed from steel grade S355;
RHS hot formed from steel grade S355;
Purlins– cold rolled steel with tensile strength R_m= 390 MPa;
Roof corrugated sheet - steel with yield strength R_m= 320 MPa.
All primary structural steel CE Marked - BS EN 1090 – 1 Execution Class 2;
Underlining corrugated sheet – aluminium with max yield strength Rm= 180 MPa

1.4 Structure Description

1.4.1 Super-Structure

The main canopy columns will comprise 3 No. 400x200x10.0 SHS. The canopy will be constructed using a series of simply supported and cantilevered UB sections. The steelwork arrangement is indicated on the Global-MSI general arrangement drawing.

1.4.2 Roof cladding and supports

The canopy deck will be clad using 0.7mm thick steel corrugated sheets supported on 171mm “Z” profile purlins. It will be underlined using 0.5mm thick aluminium corrugated sheets supported by 151mm “Z” profile purlins.

1.5 Disproportionate Collapse

Structure falls into consequence Class 2A. All connections are designed so they can resist 75kN horizontal tying force.

1.6 Design Software

The following computer aided design software has been used in the preparation of structural calculations for the canopy:

Tekla Structural Designer 23.2.1.1
Master Series Connection Design v2020.10 x64
Tedds

2 Loading Schedule

2.1 Dead Loads

G_k roof	0.7mm 20/125/1000 steel roof sheet	= 0.07 kN/m^2
	Purlins @ max 1.5m c/c	= 0.03 kN/m^2
	Underlining rails @max 2.0m c/c	= 0.03 kN/m^2
	0.5mm aluminium 20/100/1000 soffit sheet	= 0.05 kN/m^2
		= **0.18 kN/m^2**
G_k services:	Lighting	= 0.05 kN/m^2
		= 0.05 kN/m^2
G_k Fascia	(Including signage)	= **0.20 kN/m**

(Note: self-weight of steelwork accounted for in Tekla Structural Designer Analysis)

2.2 Imposed Load

(BS EN 1991-1-1:2002)

Roof category	H
Roof pitch α	= < 30°
Q_{ki} Roof	= **0.60 kN/m^2**

2.3 Snow Load

(BS EN 1991-1-3:2003)

Grid Reference			SK 370 727
From characteristic ground snow load map (Fig. NA.1)		Zone 4	z = 4
Site altitude above sea level			A = 127 m
Snow on ground	S_l = [0.15 + (0.1z + 0.05)] + (A – 100)/525		S_k = 0.65 kN/m^2
Snow load shape coefficient for roof where		α_i < 30°	μ_i = 0.8
Exposure coefficient			C_e = 1
Thermal coefficient			C_t = 1
Snow load on roof		Q_{ks} Roof	= **0.52 kN/m^2**

2.4 Wind Load

(BS EN 1991-1-4:2005)

Site altitude		A	= 127 m
Distance to the shoreline			= 69.3 km
Fundamental basic wind velocity (Fig. NA.1)		$V_{b,0}$	= 22.00 m/s
Season factor		C_{season}	= 1
Probability factor		C_{prob}	= 1
Directional factor		C_{dr}	= 1
Altitude factor	$C_{alt} = 1 + 0.001 \times Af\ o\ zr \leq 10m$	C_{alt}	= 1.13
Basic wind velocity		V_b	= 24.79 m/s
Reference mean (basic) velocity pressure	$Q_b = 0.613 v_b^2$	Q_b	= 0.38 kN/m^2

Site is > 1 km inside the town

Exposure factor (N.A.7)		$C_e(z)$	= 2.1
Effective height		z	= 6.2m
Peak wind pressure	$Q_p = c_e(z) \times Q_b$	Q_p	= 0.79 kN/m^2

Vertical pressure coefficients (overall pressure coefficients):

From table 7.6:

Roof pitch	α = 0°		
Blockage	φ=0		
Overall force coefficients	C_f	$C_f\,\varphi_{max}$ = +0.2	$C_f\,\varphi_{min}$ = -0.5

Vertical wind loading:

Wind pressure	Q_{kwp}	$= q_p C_f\,\varphi_{max}$	= 0.79 x 0.2	= **0.16 kN/m^2**
Wind suction	Q_{kwu}	$= q_p C_f\,\varphi_{min}$	= 0.79 x (-0.5)	= **- 0.40 kN/m^2**

Lateral force coefficients:

Wind in x-axis direction:

Overall force coefficients	C_f	$= C_{f,0}.\psi_r.\psi_\lambda$		
Slenderness	λ	= L/b	= 7.2/0.90	=8.0
End-effect factor (Fig. 7.36)	ψ_λ	= 0.68		
Reduction factor (Fig. 7.24)	ψ_r	= 1		
Solidity ratio	φ	= 1		
Force coefficient (Fig. 7.23, d/b>10)	$C_{f,0}$	= 0.94		
Winward coefficient	C_{fw}	$= \psi_\lambda\,\psi_r\,C_{f,0}$	= 0.68 x 1 x 0.94	= 0.64
Leeward coefficient (cl. 7.2.2)	C_{fl}	$= C_{fw}$ x (– 0.85)	= 0.64 x (- 0.85)	= - 0.54

Wind in y-axis direction:

Overall force coefficients	C_f	$= C_{f,0}.\psi_r.\psi_\lambda$		
Slenderness	λ	= L/b	= 18.60/0.90	=20.7
End-effect factor (Fig. 7.36)	ψ_λ	= 0.77		
Reduction factor (Fig. 7.24)	ψ_r	= 1		
Solidity ratio	φ	= 1		
Force coefficient (Fig. 7.23, d/b>10)	$C_{f,0}$	= 0.9		
Winward coefficient	C_{fw}	$= \psi_\lambda\ \psi_r\ C_{f,0}$	= 0.77 x 1 x 0.9	= 0.69
Leeward coefficient (cl. 7.2.2)	C_{fl}	$= C_{fw}$ x (– 0.85)	= 0.69 x (- 0.85)	= - 0.59

Lateral wind loading:

Wind in x-axis direction: fascia depth = 0.90m

Windward pressure	Q_{kww}	$= q_p.C_{fw}$	= 0.79 x 0.64	= 0.51 kN/m^2	x 0.90	Q_{kww}	= 0.46 kN/m
Leeward pressure	Q_{kwl}	$= q_p.C_{fl}$	= 0.79 x (-0.54)	= - 0.43 kN/m^2	x 0.90	Q_{kwl}	= - 0.39 kN/m

Wind in y-axis direction: fascia depth = 0.90m

Windward pressure	Q_{kww}	$= q_p.C_{fw}$	= 0.79 x 0.69	= 0.55 kN/m^2	x 0.90	Q_{kww}	= 0.49 kN/m
Leeward pressure	Q_{kwl}	$= q_p.C_{fl}$	= 0.79 x (-0.59)	= - 0.47 kN/m^2	x 0.90	Q_{kwl}	= - 0.42 kN/m

Frictional drag across roof:

Area of external surface parallel to the wind	A_{fr}	= 2A	= 2 x (18.60 x 7.20)	= 267.8 m^2
Friction coefficient (T. 7.10)	C_{fr}	= 0.04		
Total Friction force	W_{kf}	$= q_p.A_{fr}.C_{fr}$	= 0.79 x 267.8 x 0.04	= 8.48 kN
Number of columns	n	= 3		
Friction force for a column	Q_{kwf}	$= W_{kf}$ / n	= 8.48 / 3	= 2.8 kN

Vertical net pressure coefficients for purlins and soffit rails:

From Table 7.6

Roof pitch	α = 0°		
Blockage	φ=0		
Zone A		$C_{pnet}\ \varphi_{max}$ = +0.5	$C_{pnet}\ \varphi_{min}$ = -0.6

Vertical wind loading:

Wind pressure	Q_{kwp}	$= q_p C_{pnet}\ \varphi_{max}$	= 0.79 x 0.5	= **0.40 kN/m^2**
Wind suction	Q_{kwu}	$= q_p C_{pnet}\ \varphi_{min}$	= 0.79 x (-0.6)	= **- 0.47 kN/m^2**

2.5 Accidental Load

(BS EN 1991-1-7:2006)

Equivalent static design force (Tab. 4.2) $A_{x\text{-}x}$ = 75 kN $A_{y\text{-}y}$ = 75 kN

Level at which the force is applied h = 0.5m above the finished forecourt level

3 Roof Sheet Design

Maximum unfactored loading on 0.7mm 20/125/1000 steel roof sheeting are:

Downwards: selfweight + $G_{k\,serv}$ + Q_{ks} + Q_{kwp}	= 0.07 + 0.05 + 0.52 + 0.16	= 0.80 kN/m^2
Uplift: selfweight + Q_{kwu}	= 0.07 – 0.40	=-0.33 kN/m^2

From tables below, try double span sheeting max span = 2.00 m

Technical Data - RigiSystems 20/125/1000

SAFE SUPERIMPOSED LOADS (e.g. snow)

	SPAN	SINGLE SPAN Normal	SINGLE SPAN Abnormal	DOUBLE SPAN Normal	DOUBLE SPAN Abnormal	MULTI-SPAN Normal	MULTI-SPAN Abnormal
0.7mm Steel	1.00	4.03	4.03	3.65	3.65	4.27	4.27
	1.25	2.23	2.58	2.34	2.34	2.73	2.73
	1.50	1.29	1.79	1.62	1.62	1.90	1.90
	1.75	0.81	1.32	1.19	1.19	1.39	1.39
	2.00	0.54	1.01	0.91	0.91	1.02	1.07
	2.25	0.38	0.80	0.72	0.72	0.72	0.84
	2.50	0.28	0.62	0.58	0.58	0.52	0.68
	2.75	0.21	0.46	0.48	0.48	0.39	0.56
	3.00	-	0.36	0.39	0.41	0.30	0.47

Technical Data - RigiSystems 20/125/1000

SAFE UPLIFT LOADS (e.g. wind)

	SPAN	SINGLE SPAN Trough	SINGLE SPAN Crown	DOUBLE SPAN Trough	DOUBLE SPAN Crown	MULTI-SPAN Trough	MULTI-SPAN Crown
0.7mm Steel	1.00	4.17	4.17	4.56	4.61	5.30	5.39
	1.25	2.67	2.67	2.93	2.95	3.41	3.45
	1.50	1.85	1.85	2.04	2.05	2.38	2.39
	1.75	1.34	1.34	1.50	1.51	1.75	1.76
	2.00	0.92	0.92	1.15	1.15	1.34	1.35
	2.25	0.66	0.66	0.91	0.91	1.06	1.06
	2.50	0.49	0.49	0.74	0.74	0.86	0.86
	2.75	0.38	0.38	0.61	0.61	0.71	0.71
	3.00	0.29	0.29	0.51	0.51	0.54	0.54

Use Rigidal 20/125/1000 steel roof double span sheeting max span = 2.00m

4 Soffit Sheet Design

Maximum unfactored loading on Rigidal 0.5mm aluminium 20/100/1000 trapezoidal profile are:
Suction: selfweight + Q_{kwu} = 0.05 + (- 0.40) = - 0.35 kN/m^2

From tables below, try double-span sheeting max span = 2.0m
Max allowable load = 0.58 kN/m^2 > 0.35 kN/m^2 therefore ok

Technical Data - RigiSystems 20/100/1000

SAFE UPLIFT LOADS (e.g. wind)

	SPAN	SINGLE SPAN		DOUBLE SPAN		MULTI-SPAN	
		Trough	Crown	Trough	Crown	Trough	Crown
0.5mm Aluminium	1.00	1.79	1.79	2.41	2.24	2.81	2.58
	1.25	0.95	0.95	1.54	1.51	1.80	1.81
	1.50	0.57	0.57	1.07	1.08	1.04	1.04
	1.75	0.37	0.37	0.79	0.79	0.67	0.67
	2.00	0.25	0.25	0.58	0.58	0.46	0.46
	2.25	-	-	0.41	0.41	0.33	0.33
	2.50	-	-	0.31	0.31	0.25	0.25
	2.75	-	-	0.24	0.24	-	-
	3.00	-	-	-	-	-	-

Use Rigidal 20/100/1000 max span 2.0m

5 Purlin Design

Maximum unfactored loading on BW Industries Z-section cold rolled purlins (sleeved) are:

Downwards: G_k roof + G_k serv. + Q_{ks} + $Q_{kw,p}$ = 0.07 + 0.05 + 0.52 + 0.40 = 1.04 kN/m^2

Suction: G_k roof + Q_{kwu} = 0.07 – 0.47 = -0.40 kN/m

Try 4.1m span, 1.5m spacing:

Max.Suction force (UDL) = 4.1 x 1.5 x [1.0 x 0.07 + 1.5 x (-0.47)] = - 3.91 kN

For downward pressure, purlin capacity (by interpolation) = 1.88 kN/m^2 > 1.04 kN/m^2 therefore ok

ZED SECTION LOAD TABLES

Sleeved Span Loads

NOTE: Working load values under 0.3 kN/m² or over 3 kN/m² are omitted

Deflection Ratio **Span/180**

Span (mm)	Section	Total Working U.D.L. kN	Working Loads: Allowable loading in kN/m² Purlin centres in millimetres 1000	1200	1500	1800	2000	2400	Deflection Span/180	Ultimate Uniformly Distributed Load, kN: Gravity Load	Uplift - metal cladding Number of anti sag rods 0	1	2
4000	Z12110	8.22	2.06	1.71	1.37	1.14	1.03	0.86	8.22	12.57	10.81	12.57	12.57
	Z12114	8.82	2.21	1.84	1.47	1.23	1.10	0.92	8.82	14.30	12.09	14.30	14.30
	Z12115	9.41	2.35	1.96	1.57	1.31	1.18	0.98	9.41	16.00	13.36	16.00	16.00
	Z12116	9.99	2.50	2.08	1.67	1.39	1.25	1.04	9.99	17.69	14.62	17.69	17.69
	Z12118	11.13	2.78	2.32	1.86	1.55	1.39	1.16	11.13	20.99	17.12	20.86	20.99
	Z12120	12.24	3.06	2.55	2.04	1.70	1.53	1.28	12.24	24.20	19.61	24.20	24.20
	Z14113	10.29	2.57	2.14	1.71	1.43	1.29	1.07	10.29	15.43	13.05	15.43	15.43
	Z14114	11.71	2.93	2.44	1.95	1.63	1.46	1.22	11.71	17.56	14.59	17.56	17.56
	Z14115	13.11	3.28	2.73	2.19	1.82	1.64	1.37	13.11	19.67	16.12	19.67	19.67
	Z14116	14.50	3.62	3.02	2.38	1.99	1.79	1.49	14.50	21.75	17.64	21.75	21.75
	Z14118	15.86	3.99	3.32	2.66	2.21	1.99	1.66	15.95	25.83	20.65	25.83	25.83
	Z14120	17.55	4.39	3.66	2.93	2.44	2.19	1.83	17.55	29.82	23.63	29.82	29.82
	Z15113	11.29	2.82	2.35	1.88	1.57	1.41	1.18	11.29	16.93	14.22	16.93	16.93
	Z15114	12.85	3.21	2.68	2.14	1.78	1.61	1.34	12.85	19.27	15.89	19.27	19.27
	Z15115	14.39	3.60	3.00	2.40	2.00	1.80	1.50	14.39	21.59	17.59	21.59	21.59
	Z15116	15.89	3.98	3.32	2.65	2.21	1.99	1.66	15.89	23.87	19.21	23.87	23.87
	Z15118	18.75	4.68	3.91	3.12	2.60	2.34	1.95	18.75	28.37	22.48	28.37	28.37
	Z15120	20.65	5.16	4.30	3.44	2.87	2.58	2.15	20.65	32.76	25.72	32.76	32.76
	Z17113	12.58	3.14	2.62	2.09	1.74	1.57	1.31	12.58	18.84	18.84	18.84	18.84
	Z17114	14.65	3.66	3.05	2.44	2.04	1.83	1.53	14.65	21.98	21.11	21.98	21.98
	Z17115	16.73	4.18	3.48	2.79	2.32	2.09	1.74	16.73	25.09	25.09	25.09	25.09

ZED SECTION LOAD TABLES

Sleeved Span Loads

Deflection Ratio **Span/180**

Span (mm)	Section	Total Working U.D.L. kN	Working Loads: Allowable loading in kN/m² Purlin centres in millimetres 1000	1200	1500	1600	2000	2400	Deflection Span/180	Ultimate Uniformly Distributed Load, kN: Gravity Load	Uplift - metal cladding Number of anti sag rods 0	1	2
5000	Z12113	5.26	1.05	0.88	0.70	0.66	0.53	0.44	5.26	10.06	7.56	9.79	10.06
	Z12114	5.65	1.13	0.94	0.75	0.63	0.56	0.47	5.65	11.44	8.48	10.93	11.44
	Z12115	6.02	1.20	1.00	0.80	0.67	0.60	0.50	6.02	12.80	9.42	12.05	12.80
	Z12116	6.40	1.28	1.07	0.85	0.71	0.64	0.53	6.40	14.15	10.34	13.18	14.15
	Z12118	7.15	1.43	1.19	0.95	0.79	0.71	0.59	7.13	16.79	12.17	15.36	16.79
	Z12120	7.84	1.57	1.31	1.04	0.87	0.78	0.65	7.84	19.36	14.00	17.53	19.36
	Z14113	7.52	1.50	1.25	1.00	0.84	0.75	0.63	7.52	12.35	9.13	11.63	12.35
	Z14114	8.07	1.61	1.34	1.08	0.90	0.81	0.67	8.07	14.05	10.25	13.20	14.05
	Z14115	8.61	1.72	1.44	1.15	0.96	0.86	0.72	8.61	15.73	11.38	14.55	15.73
	Z14116	9.15	1.83	1.53	1.22	1.02	0.92	0.76	9.15	17.40	12.47	15.89	17.40
	Z14118	10.21	2.04	1.70	1.36	1.13	1.02	0.85	10.21	20.66	14.67	18.53	20.66
	Z14120	11.23	2.25	1.87	1.50	1.25	1.12	0.94	11.23	23.85	16.86	21.13	23.85
	Z15113	8.83	1.77	1.47	1.18	0.98	0.88	0.74	8.83	13.55	9.95	12.89	13.55
	Z15114	9.48	1.90	1.58	1.26	1.05	0.95	0.79	9.48	15.42	11.17	14.38	15.42
	Z15115	10.12	2.02	1.69	1.35	1.12	1.01	0.84	10.12	17.27	12.38	15.85	17.27
	Z15116	10.75	2.15	1.79	1.43	1.19	1.08	0.90	10.75	19.10	13.59	17.31	19.10
	Z15118	12.00	2.40	2.00	1.60	1.33	1.20	1.00	12.00	22.70	15.98	20.16	22.70
	Z15120	13.21	2.64	2.20	1.76	1.47	1.32	1.10	13.21	26.21	18.36	23.01	26.21
	Z17113	10.05	2.01	1.67	1.34	1.12	1.01	0.84	10.05	15.07	12.76	15.07	15.07
	Z17114	11.72	2.34	1.95	1.56	1.30	1.17	0.98	11.72	17.59	14.50	17.58	17.59
	Z17115	13.38	2.68	2.23	1.78	1.49	1.34	1.12	13.38	20.07	16.22	20.07	20.07

Use Z171/15 sleeved purlins @ 1.5m c/c

6 Underlining Rail Design

Maximum unfactored loading on BW Industries Z-section cold rolled purlins (butted) are:

Suction: selfweight + Q_{kwu} = 0.05 – 0.47 = - 0.42 kN/m^2

Try 4m span, 2.0m spacing:

Max.Suction force = 4 x 2.0 x [1.0 x 0.05 + 1.5 x (-0.47)] = - 5.24 kN

For uplift, purlin capacity = 5.65 kN > 5.24 kN therefore ok

ZED SECTION LOAD TABLES

Butted Single Span Loads

Deflection Ratio **Span/180**

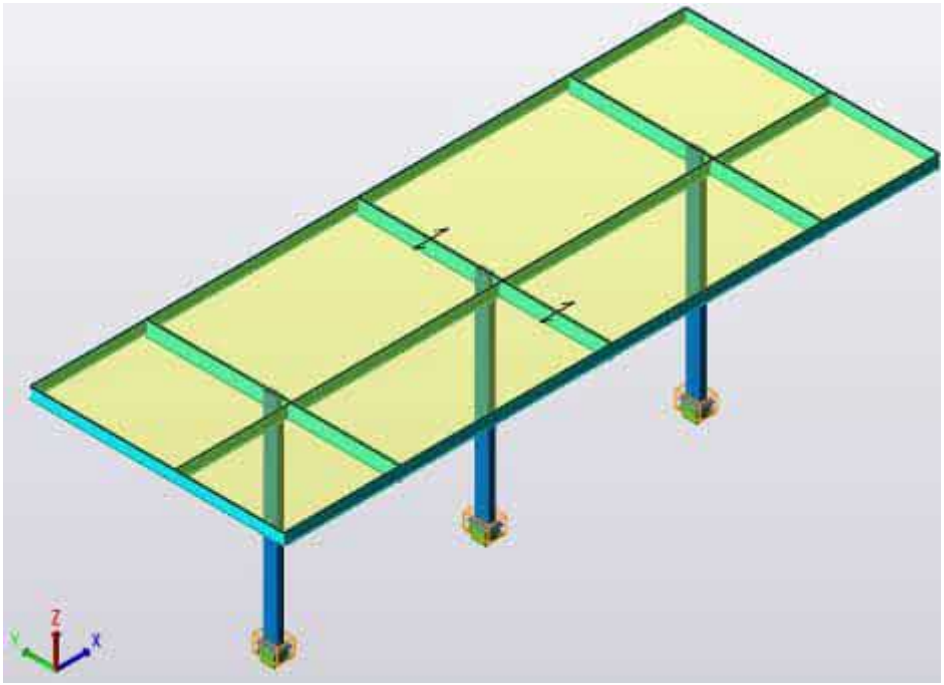
Span (mm)	Section	Total Working U.D.L. kN	Working Loads: Allowable loading in kN/m² Purlin centres in millimetres 1000	1200	1500	1800	2000	2400	Deflection Span/180	Ultimate Uniformally Distributed Load, kN: Gravity Load	Uplift - metal cladding Number of anti sag rods 0	1	2
6000	Z12113	3.06	0.51	0.42	0.34	0.28	0.25	0.21	3.06	6.70	3.10	4.26	5.79
	Z12114	3.28	0.55	0.46	0.36	0.30	0.27	0.23	3.28	7.63	3.50	4.76	6.44
	Z12115	3.50	0.58	0.49	0.39	0.32	0.29	0.24	3.50	8.54	3.90	5.25	7.09
	Z12116	3.72	0.62	0.52	0.41	0.34	0.31	0.26	3.72	9.43	4.30	5.74	7.73
	Z12118	4.14	0.69	0.58	0.46	0.38	0.35	0.29	4.14	11.19	5.10	6.72	8.98
	Z12120	4.56	0.76	0.63	0.51	0.42	0.38	0.32	4.56	12.91	5.90	7.69	10.21
	Z14113	4.37	0.73	0.61	0.49	0.40	0.36	0.30	4.37	8.23	3.74	5.14	7.00
	Z14114	4.69	0.78	0.65	0.52	0.43	0.39	0.33	4.69	9.37	4.22	5.73	7.79
	Z14115	5.01	0.83	0.70	0.56	0.46	0.42	0.35	5.01	10.49	4.70	6.33	8.57
	Z14116	5.32	0.89	0.74	0.59	0.49	0.44	0.37	5.32	11.60	5.18	6.92	9.34
	Z14118	5.93	0.99	0.82	0.66	0.55	0.49	0.41	5.93	13.78	6.14	8.09	10.84
	Z14120	6.53	1.09	0.91	0.73	0.60	0.54	0.45	6.53	15.90	7.10	9.25	12.32
	Z15113	5.13	0.86	0.71	0.57	0.48	0.43	0.36	5.13	9.03	4.08	5.59	7.62
	Z15114	5.51	0.92	0.77	0.61	0.51	0.46	0.38	5.51	10.28	4.60	6.24	8.49
	Z15115	5.88	0.98	0.82	0.65	0.54	0.49	0.41	5.88	11.51	5.13	6.89	9.33
	Z15116	6.25	1.04	0.87	0.69	0.58	0.52	0.43	6.25	12.73	5.65	7.63	10.17
	Z15118	6.98	1.16	0.97	0.78	0.65	0.58	0.48	6.98	15.13	6.69	8.80	11.81

Use Z151/16 butted underlining rails @ 2.0 m c/c max

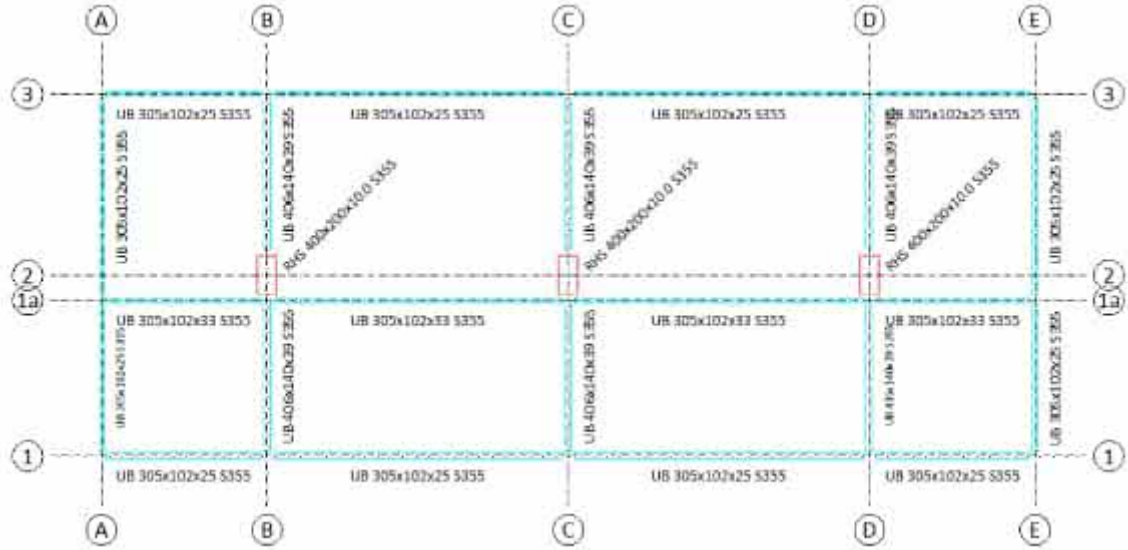
7 Super-Structure Design

7.1 Frame Arrangement

Isometric View

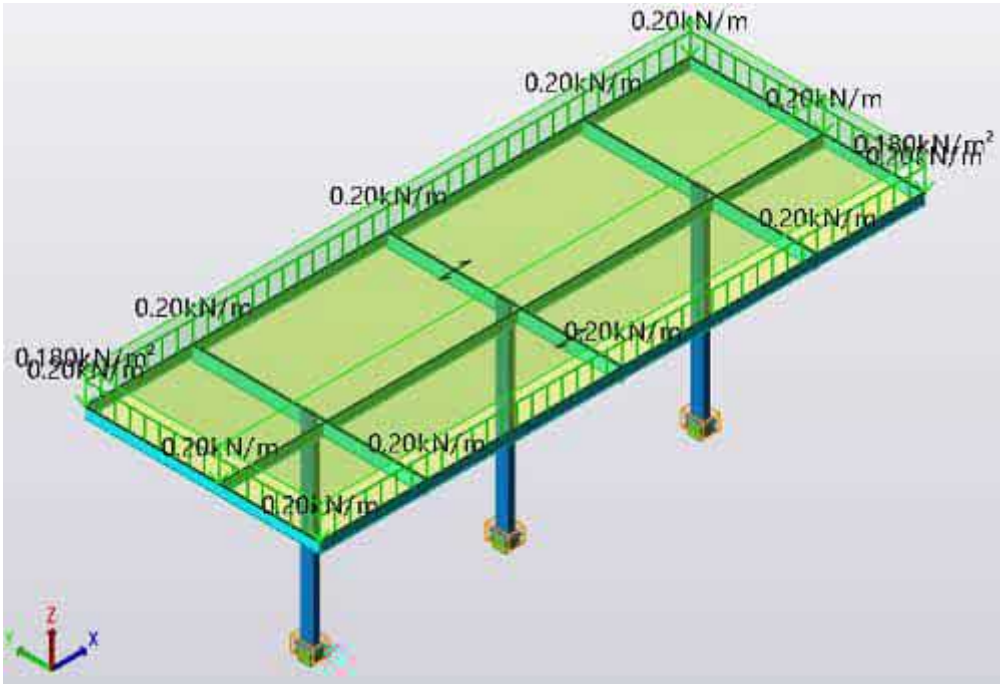


Roof Plan

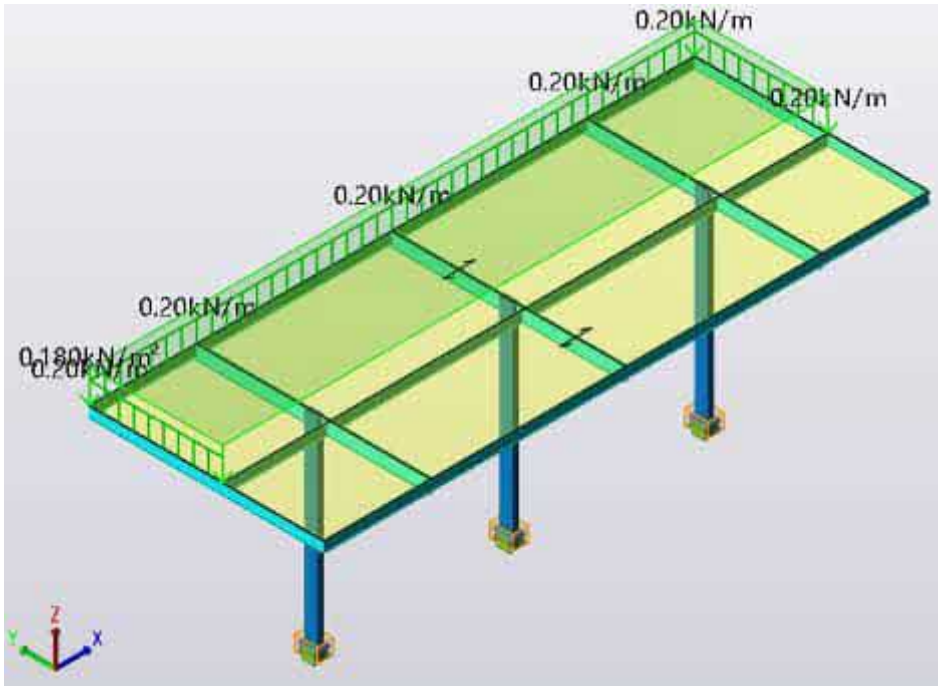


7.2 Loadcase Diagrams

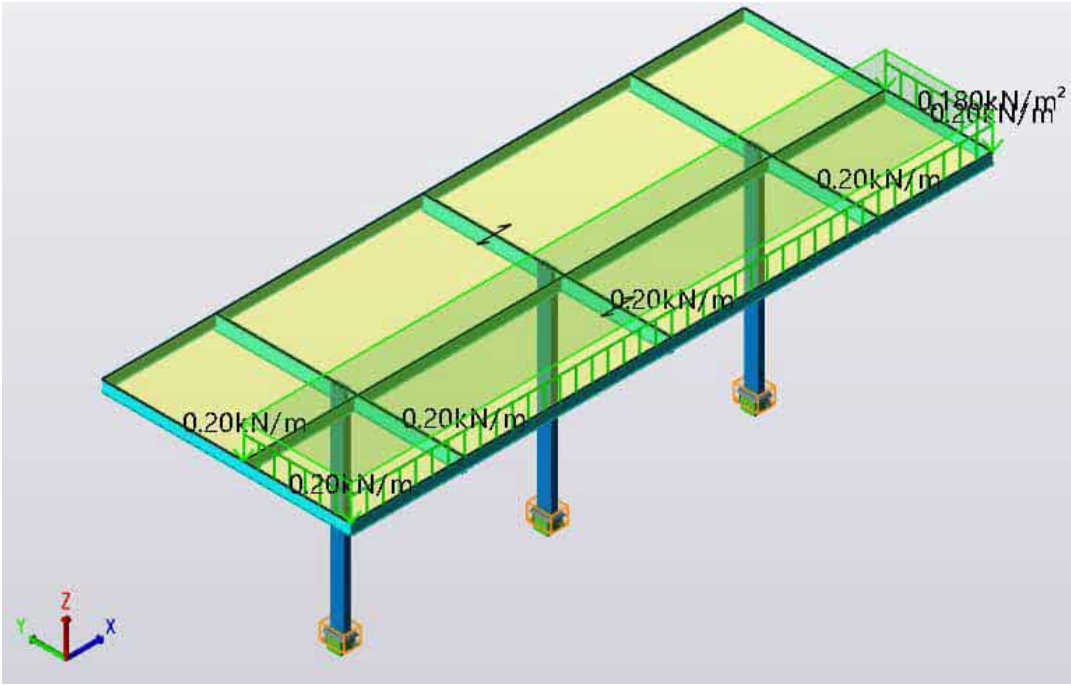
Roof Dead ($G_{k\ roof}$, $G_{k\ fascia}$)



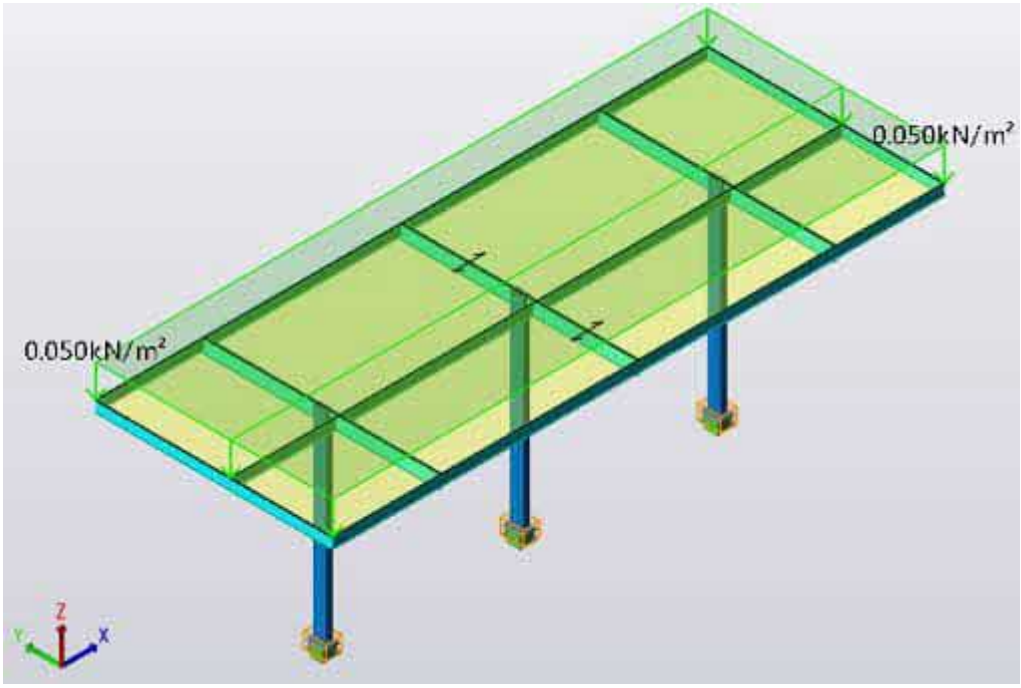
Roof Dead (unfavourable) ($G_{k\_sup\ roof}$, $G_{k\ fascia}$)



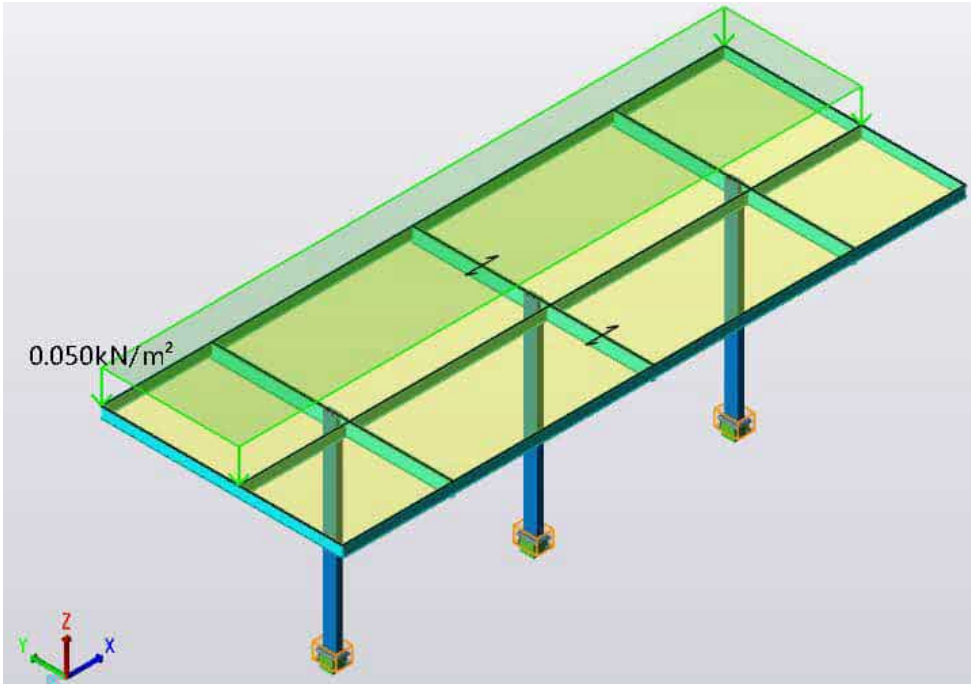
Roof Dead (favourable) ($G_{k\_inf\ roof}$, $G_{k\ fascia}$)



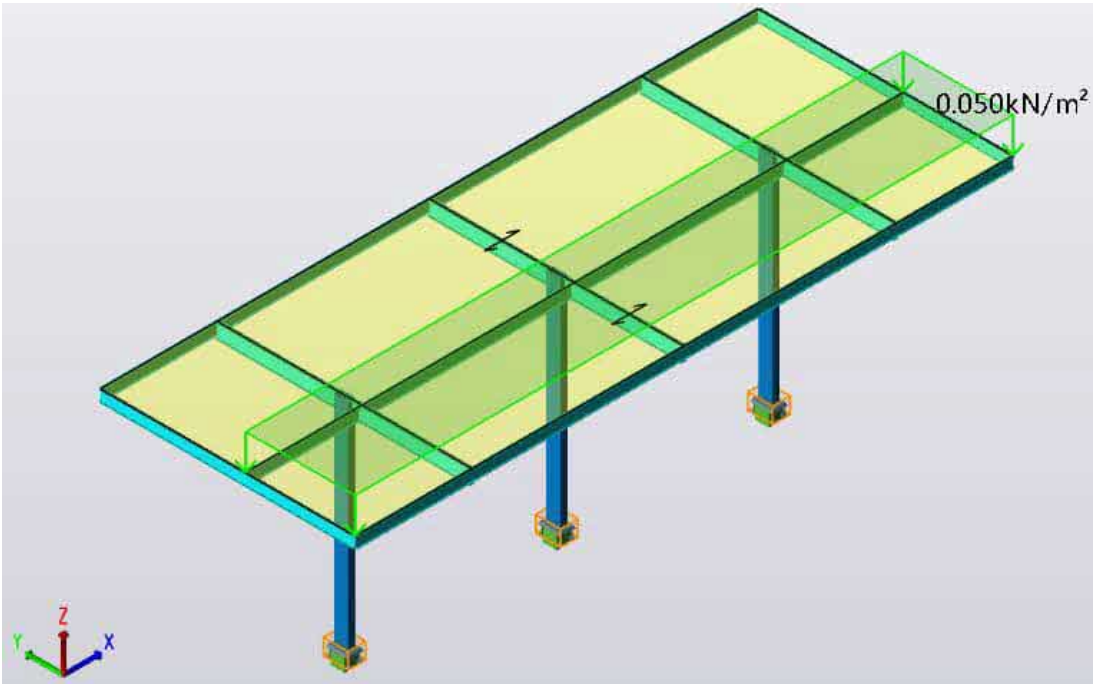
Roof (Services) ($G_{k,Ser.}$)



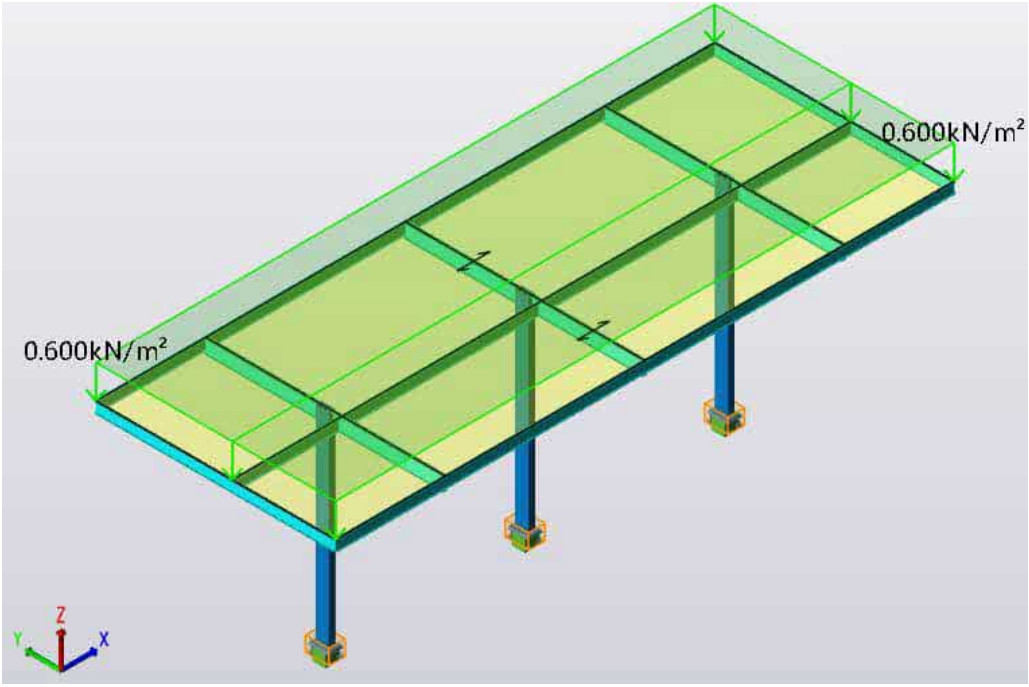
Roof Services (unfavourable) ($G_{k\_sup, Ser.}$)



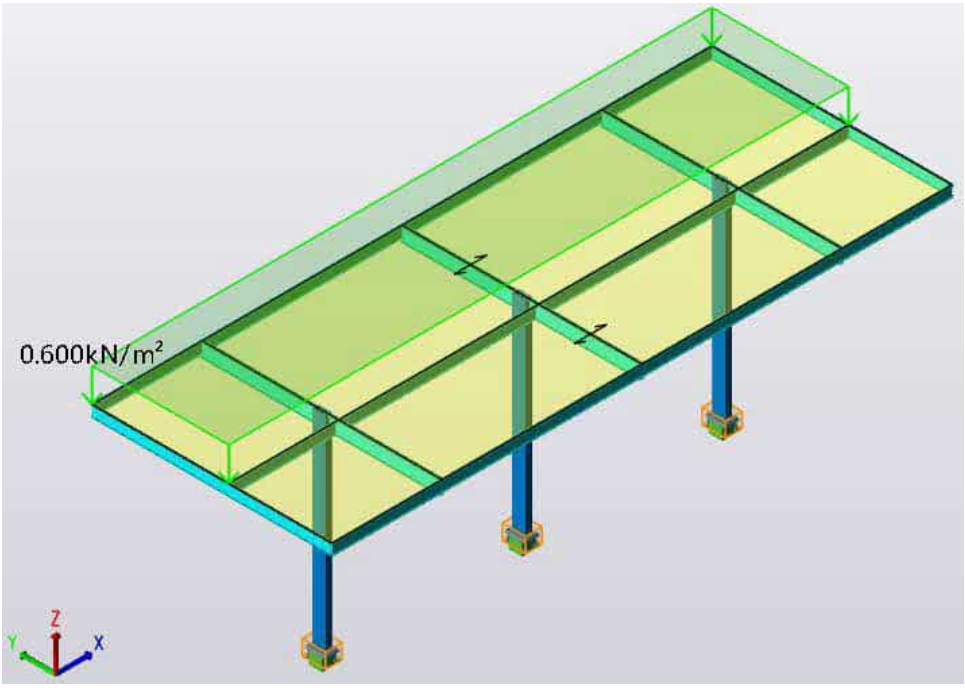
Roof Services (favourable) ($G_{k\_inf, Ser.}$)



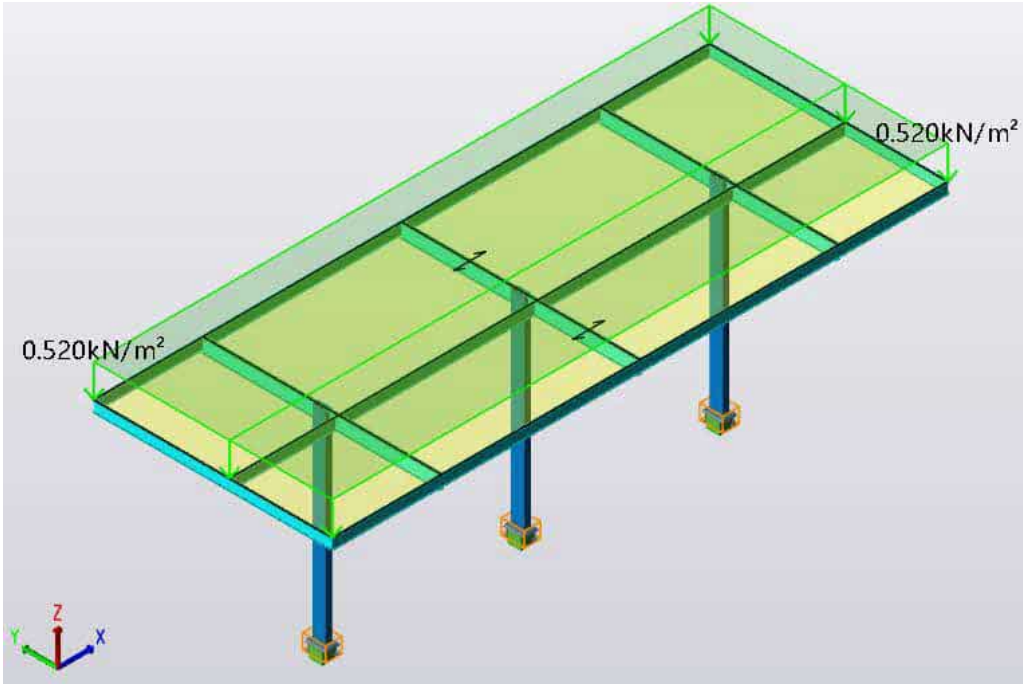
Roof Imposed ($Q_{ki\ roof}$)



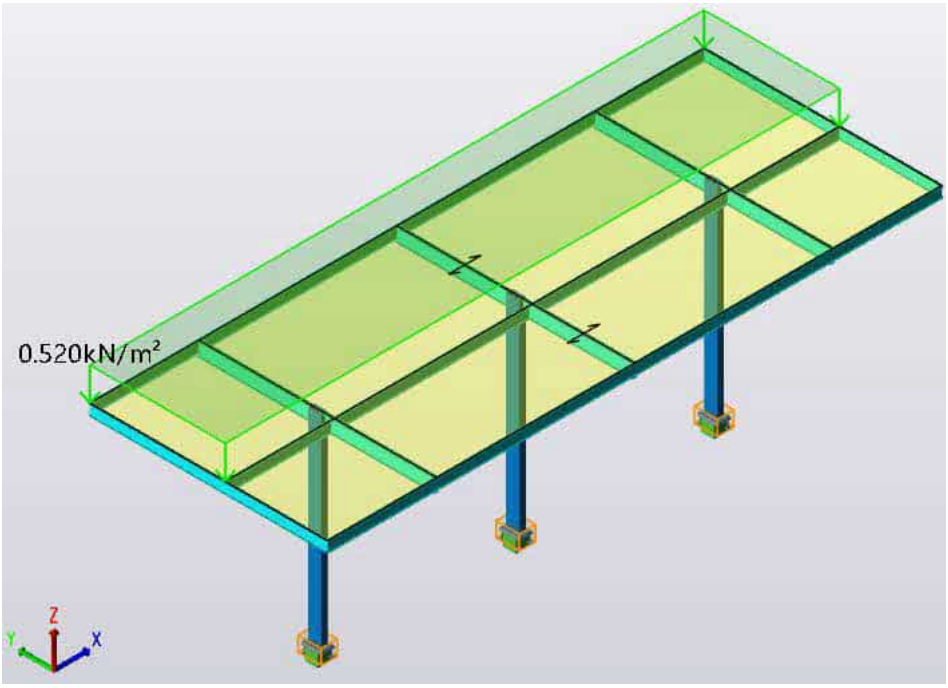
Roof Imposed (unfavourable) ($Q_{ki\_sup\ roof}$)



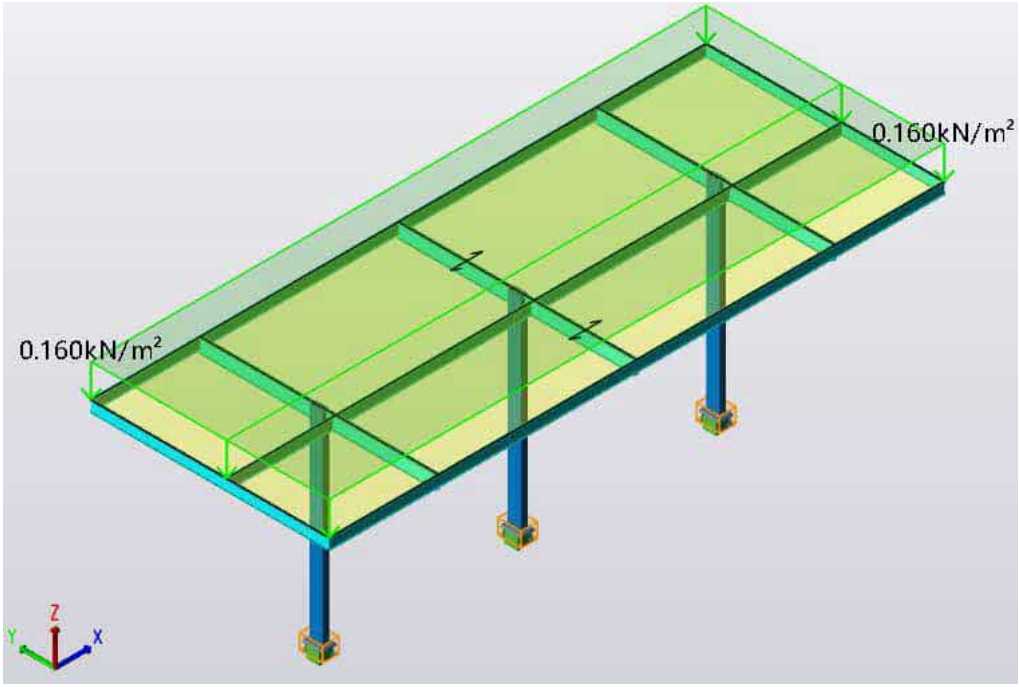
Roof Snow (Q_{ks})



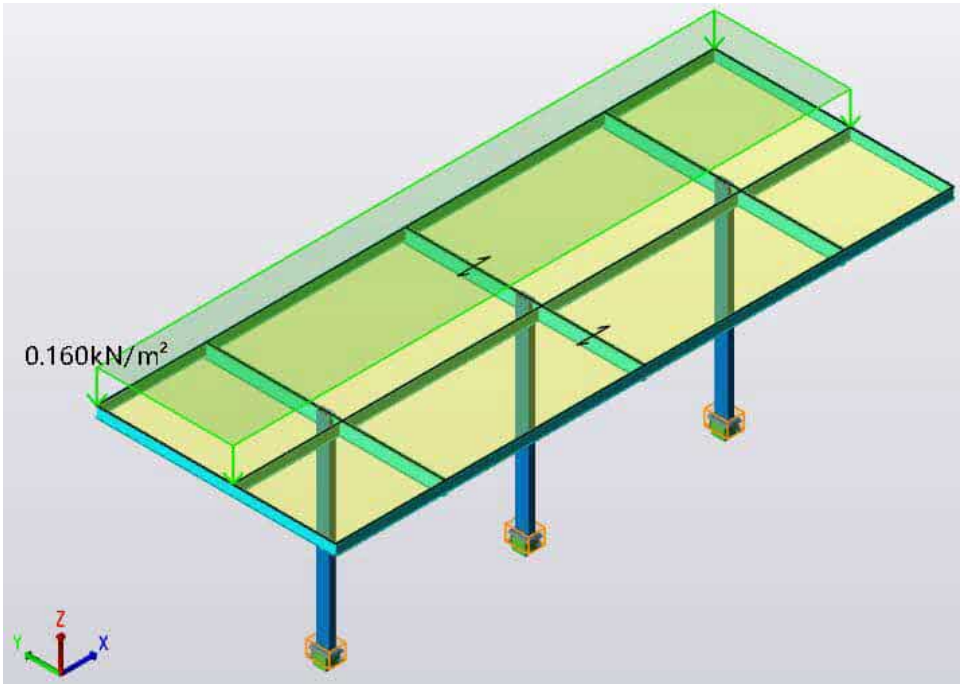
Roof Snow (unfavourable) (Q_{ks_sup})



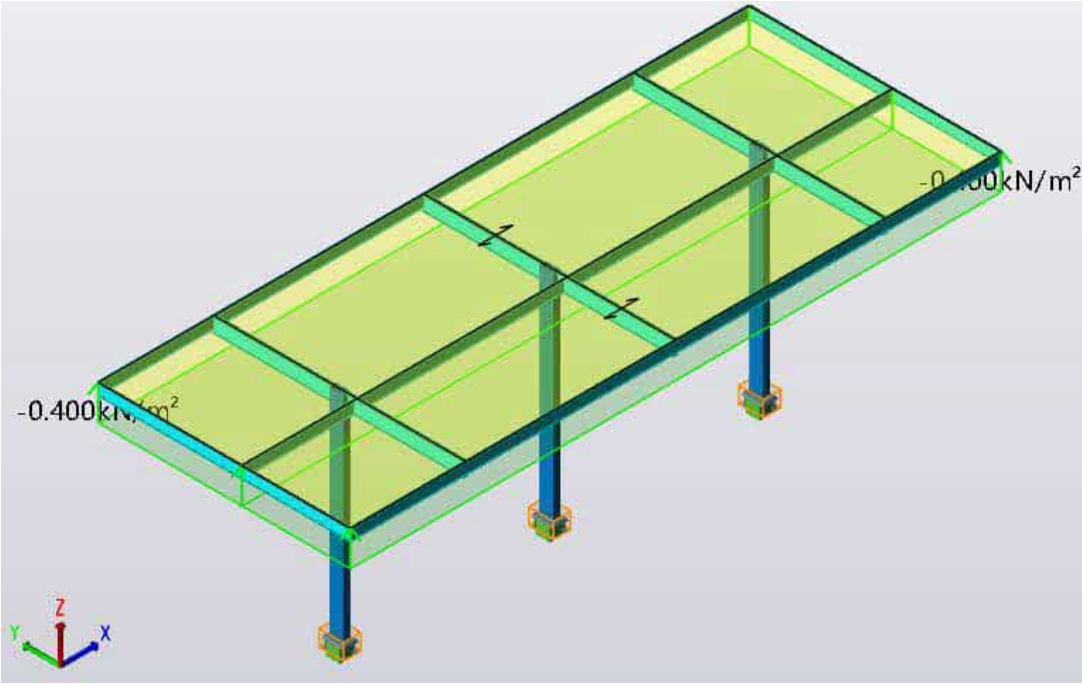
Wind Pressure (Q_{kwp})



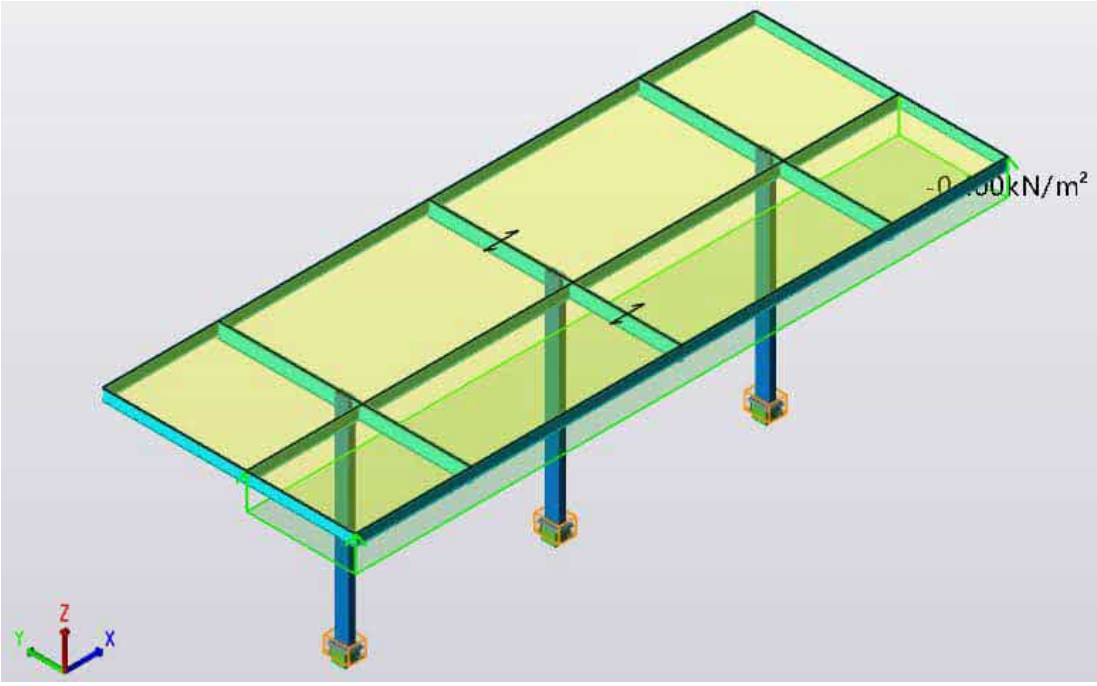
Wind Pressure (unfavourable) (Q_{kwp_sup})



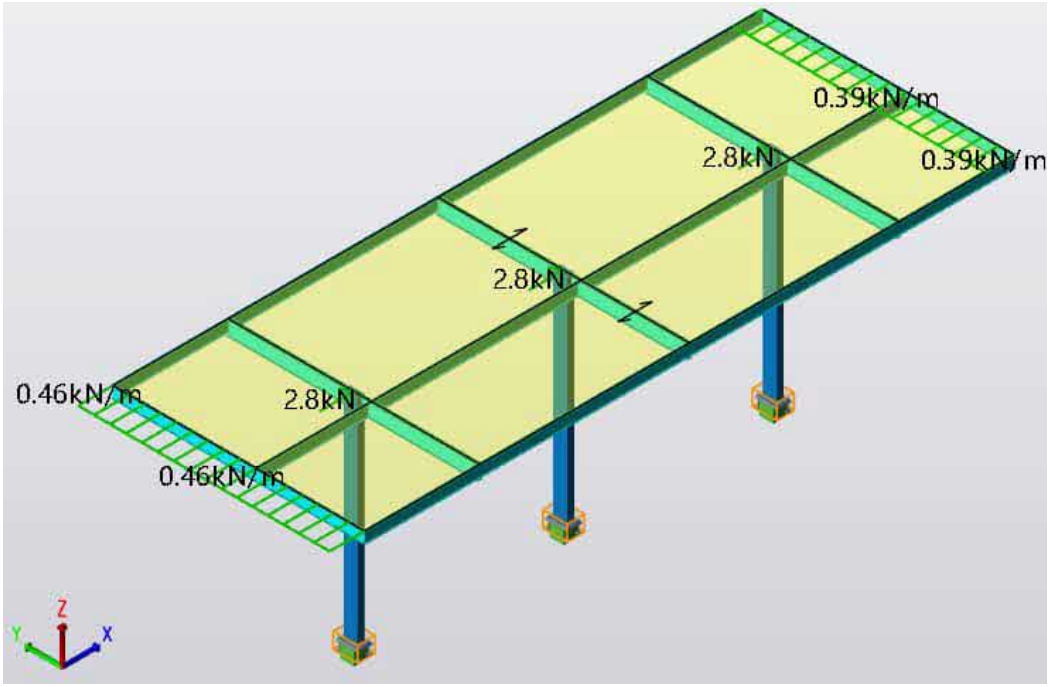
Wind Suction (Q_{kwu})



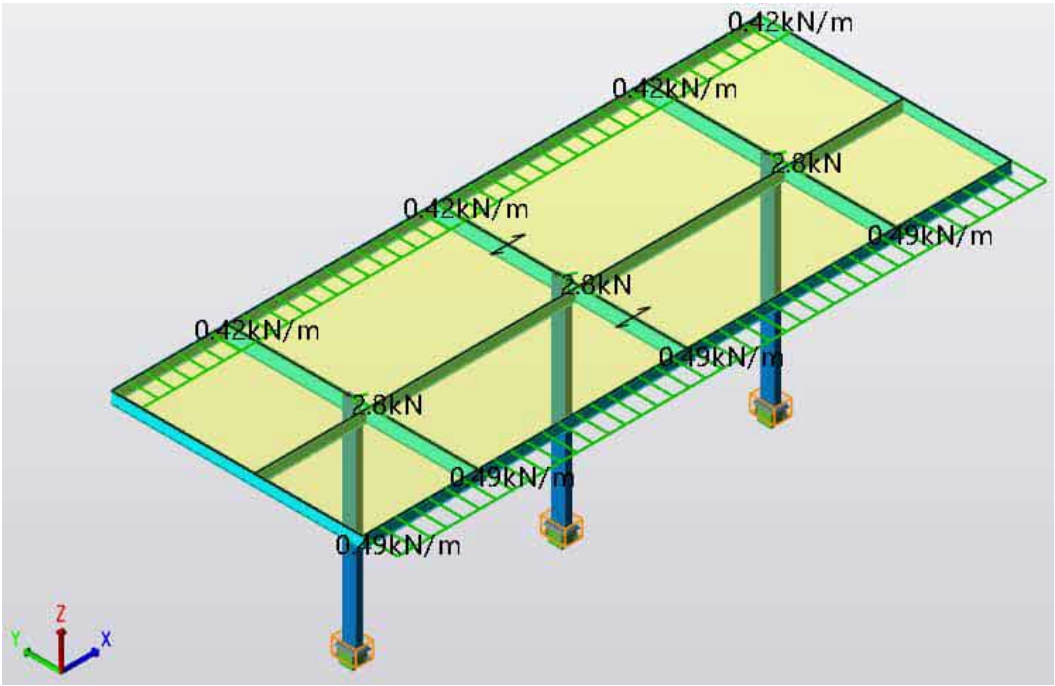
Wind Suction (unfavourable) (Q_{kwu_sup})



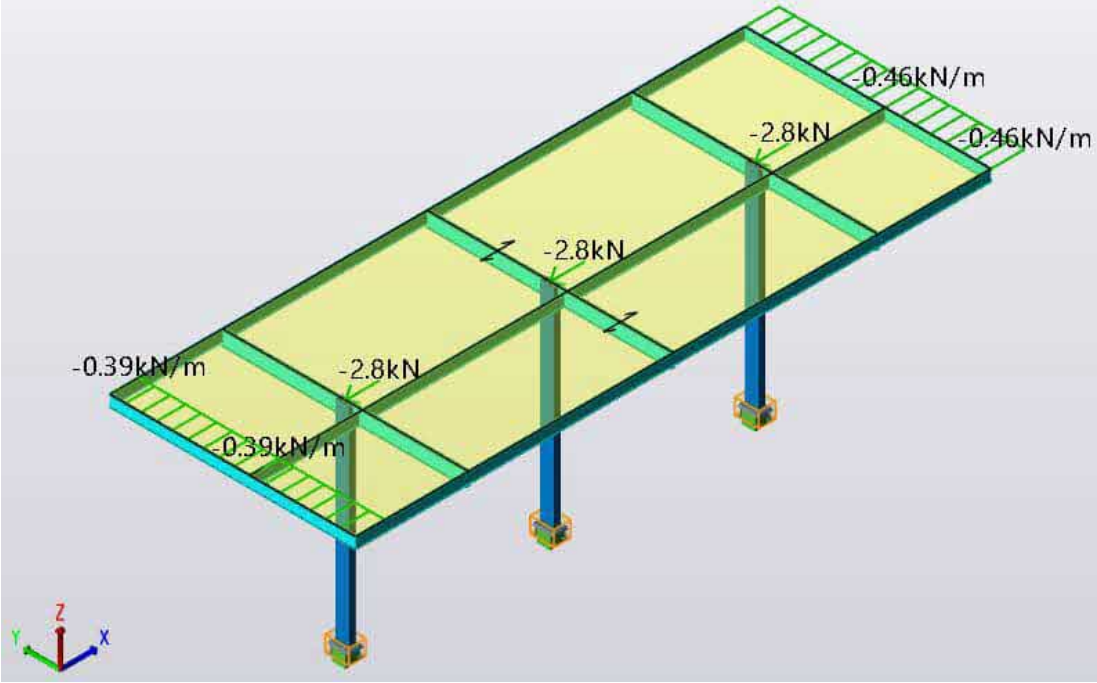
Wind Lateral (Q_{kwh}) X+



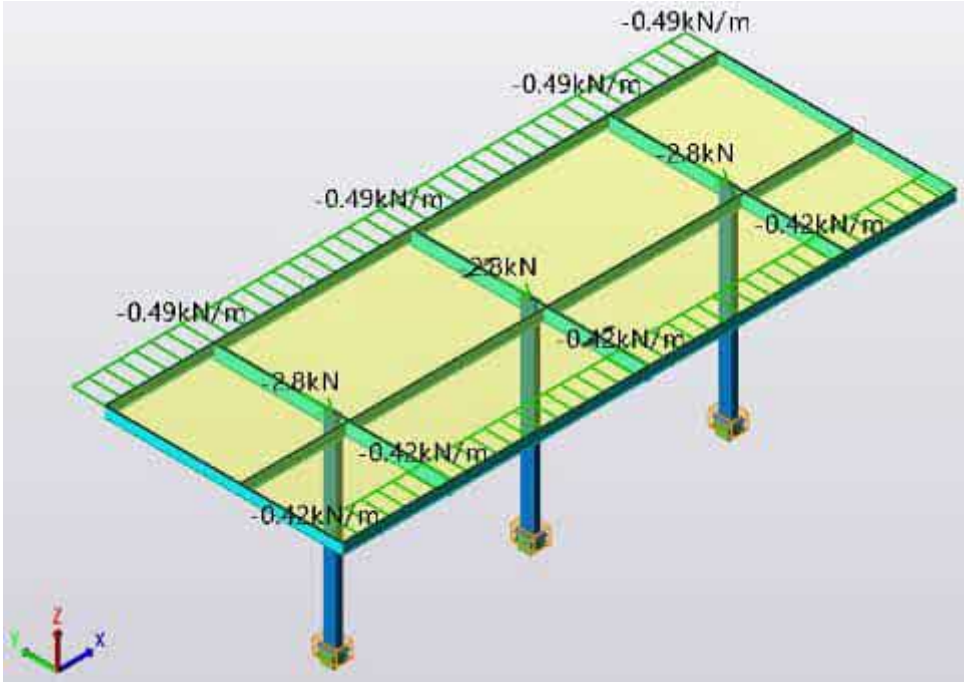
Wind Lateral (Q_{kwh}) Y+



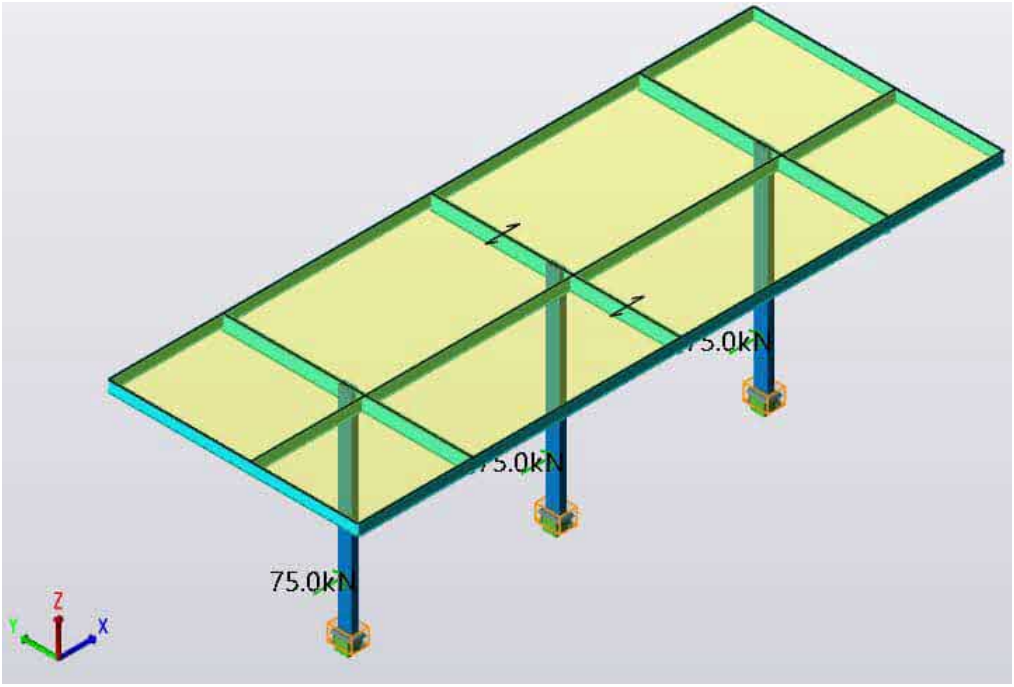
Wind Lateral (Q_{kwh}) X-



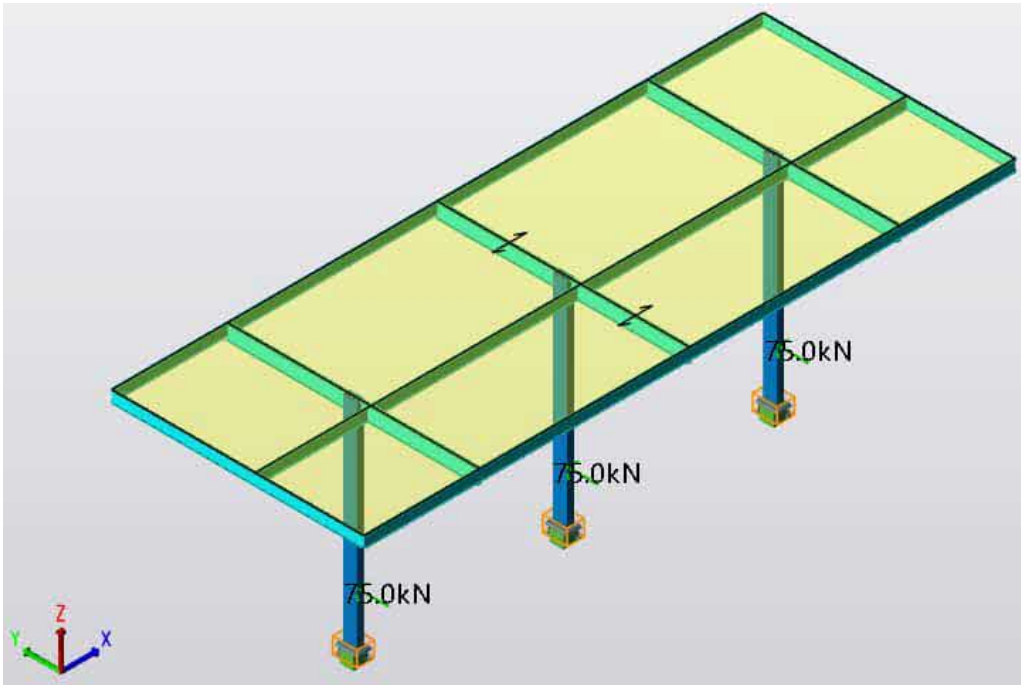
Wind Lateral (Q_{kwh}) Y-



Accidental Load (A_{x-x})



Accidental Load (A_{y-y})



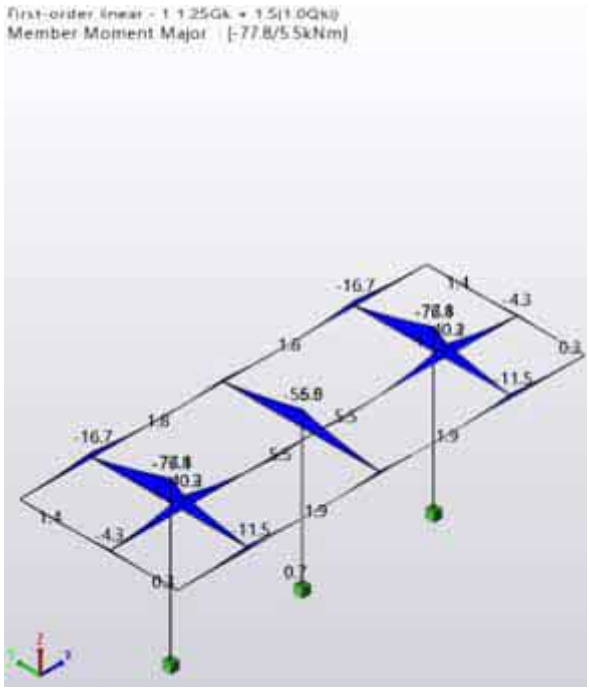
7.3 Loadcases and Combinations

(BS EN 1990: 2002)

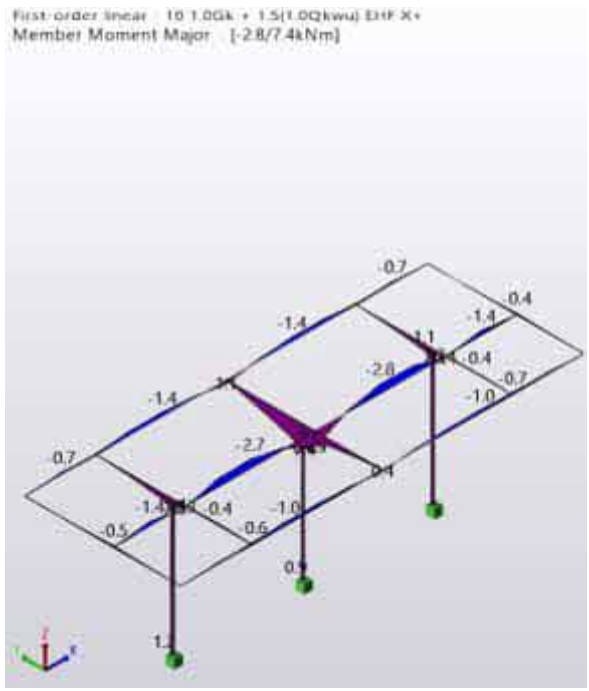
Refer to attached report titled “Appendix A Building Loading” for loadcases and combinations adopted.

7.4 Internal Forces Diagrams

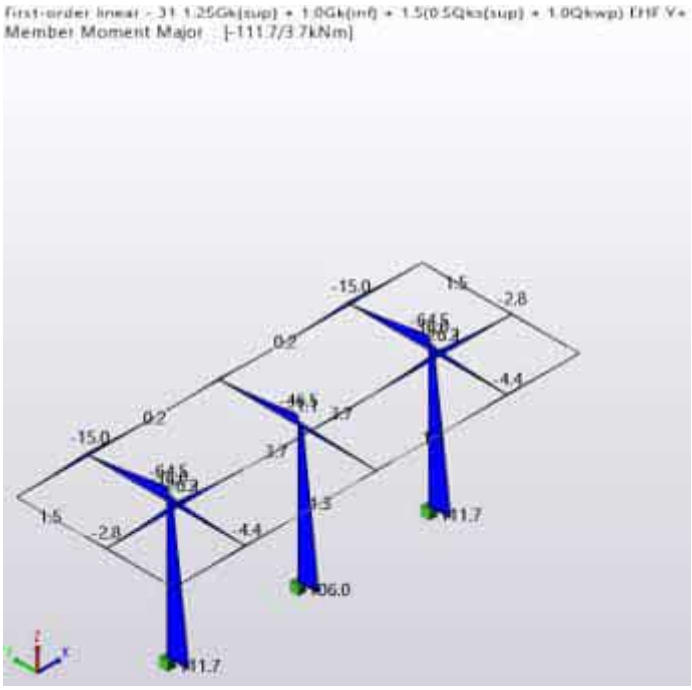
Max. Bending Moment: Beams



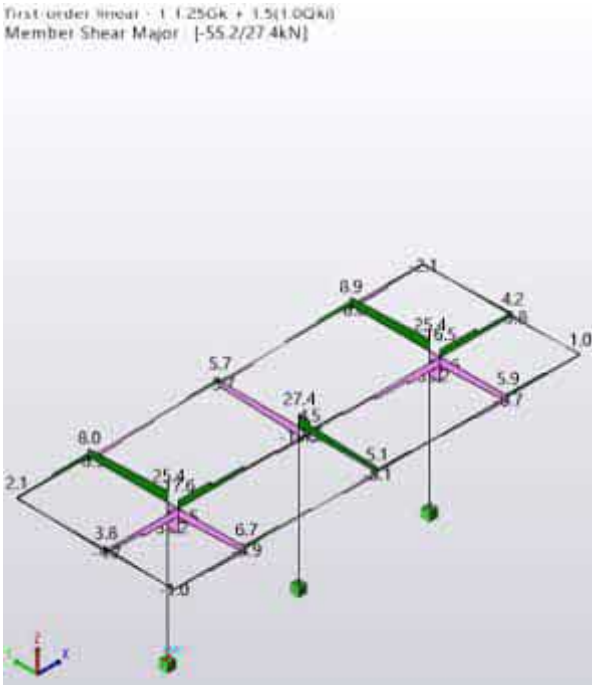
Max. Bending Moment: Beams (Suction Condition)



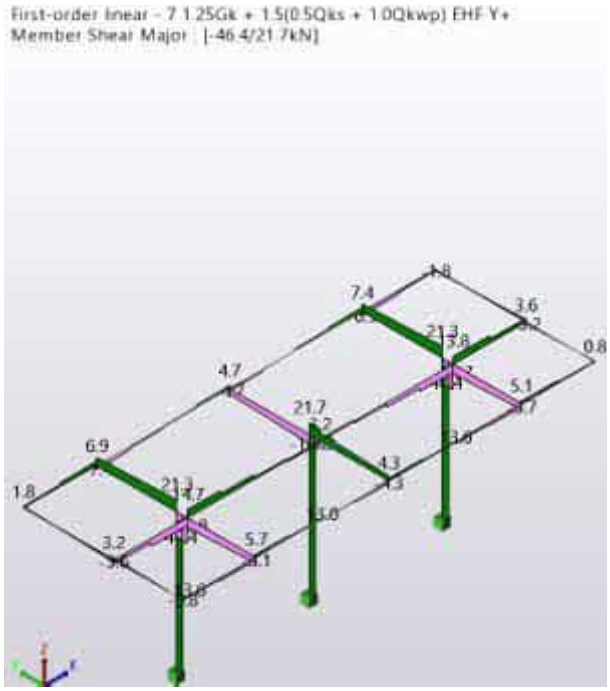
Max. Bending Moment: Columns



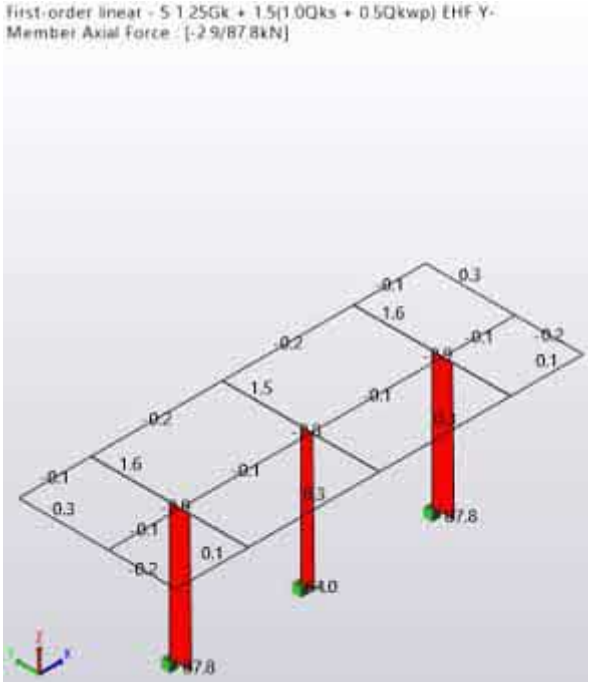
Max Shear Force: Beams



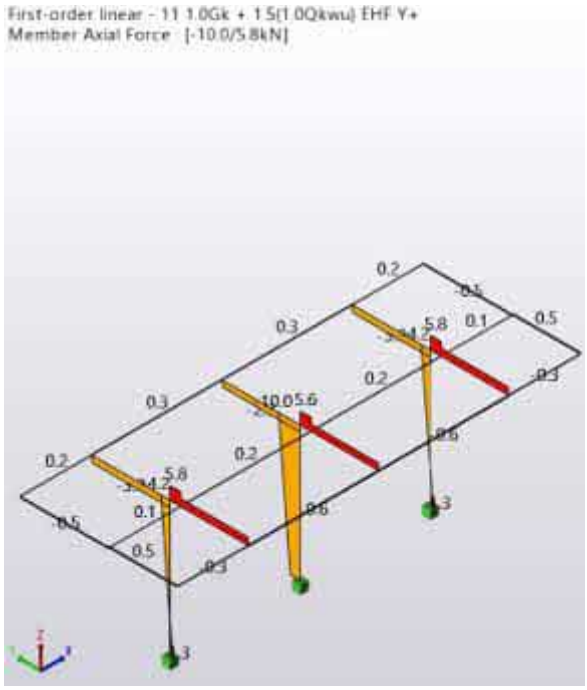
Max. Shear Force: Columns



Max. Axial Load: Columns

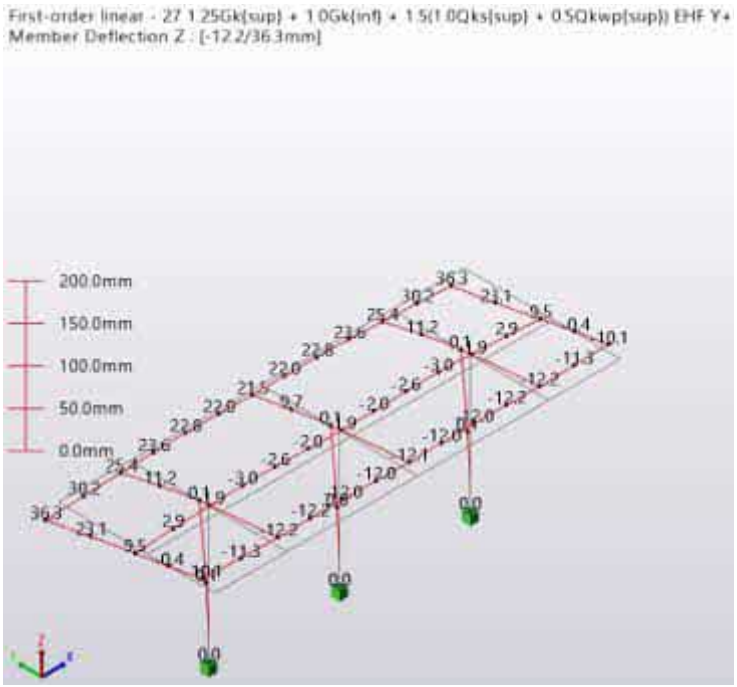


Max. Axial Load: Columns (Suction Condition)

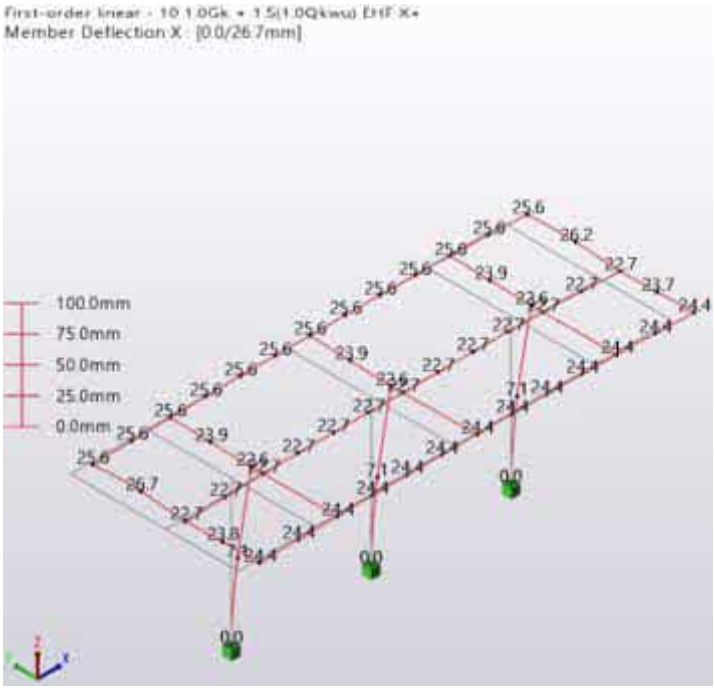


7.5 Displacement Diagrams

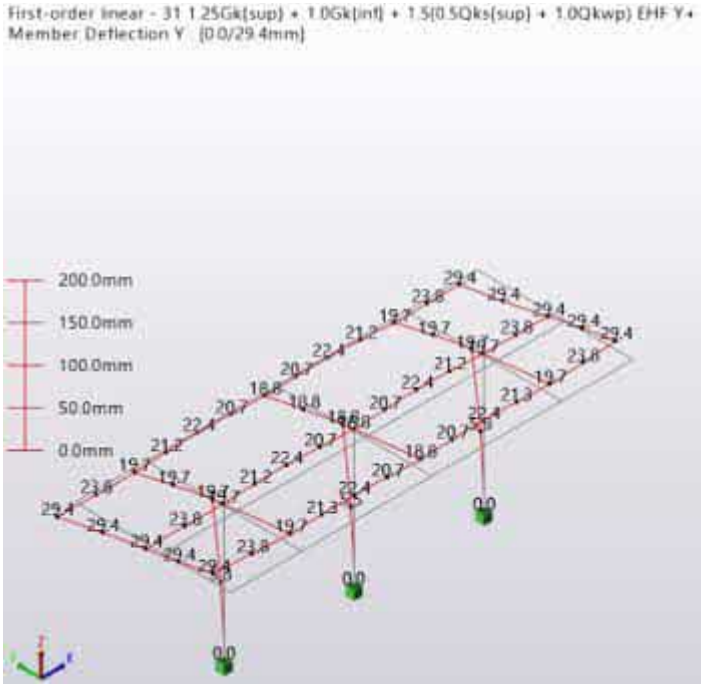
Max. Vertical Deflection



Max. Horizontal Deflection (X Axis)



Max. Horizontal Deflection (Y Axis)



7.6 Support Reaction Forces

Refer to Appendix D “Base Reactions” for support reaction forces used in column baseplate and foundation design.

7.7 Design of Hot Rolled Steel Sections

Refer to Appendix B “Steelwork Design Summary” for all hot rolled steel sections in canopy.

7.8 Design of Bolted Connections

Refer to Appendix C “Beam End Forces” and Appendix E “Design of Bolted Connections”.

7.9 Design of Column Baseplates

Refer to Appendix D “Base Reactions” and Appendix E “Design of Bolted Connections”.

8 Substructure Design

8.1 Ground Bearing Pad Foundations

Refer to Appendix F “Design of Pad Foundations”.

Appendix A

Building Loading

Structure

Action Codes

General Loading	BS EN 1991-1-1 + UK NA (2002)
Wind Loading	BS EN 1991-1-4 + UK NA (2005)
Snow Loading	BS EN 1991-1-3 + UK NA (2003)
Seismic Loading	BS EN 1998-1 + UK NA (2004)
Combinations	BS EN 1990 + UK NA (2002)

Resistance Codes

Steel Design	BS EN 1993-1-1 + UK NA (2005)
Concrete Design	BS EN 1992-1-1 + UK NA (2004)
Composite Design	BS EN 1994-1-1 + UK NA (2004)
Timber Design	BS EN 1995-1-1 + UK NA (2004)
Masonry Design	BS EN 1996-1-1 + UK NA (2005)
Foundation Design	BS EN 1997-1 + UK NA (2004)
Seismic Design and Detailing	BS EN 1998-1 + UK NA (2004)
Steel Fire Design	BS EN 1993-1-2 + UK NA (2005)

Combinations

Name	Class	Active	Strength	Service
1 1.25Gk + 1.5(1.0Qki)	Gravity	●	●	●
2 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF X+	Lateral	●	●	●
3 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF Y+	Lateral	●	●	●
4 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF X-	Lateral	●	●	●
5 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF Y-	Lateral	●	●	●
6 1.25Gk + 1.5(0.5QkS + 1.0Qkwp) EHF X+	Lateral	●	●	●
7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	Lateral	●	●	●
8 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF X-	Lateral	●	●	●
9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	Lateral	●	●	●
10 1.0Gk + 1.5(1.0Qkwu) EHF X+	Lateral	●	●	●
11 1.0Gk + 1.5(1.0Qkwu) EHF Y+	Lateral	●	●	●
12 1.0Gk + 1.5(1.0Qkwu) EHF X-	Lateral	●	●	●
13 1.0Gk + 1.5(1.0Qkwu) EHF Y-	Lateral	●	●	●
14 1.0Gk + 1.3(1.0Qki)	Gravity	●	●	●
15 1.0Gk + 1.3(1.0Qks + 0.5Qkwp) EHF X+	Lateral	●	●	●
16 1.0Gk + 1.3(1.0Qks + 0.5Qkwp) EHF Y+	Lateral	●	●	●
17 1.0Gk + 1.3(1.0Qks + 0.5Qkwp) EHF X-	Lateral	●	●	●
18 1.0Gk + 1.3(1.0Qks + 0.5Qkwp) EHF Y-	Lateral	●	●	●
19 1.0Gk + 1.3(0.5Qks + 1.0Qkwp) EHF X+	Lateral	●	●	●
20 1.0Gk + 1.3(0.5Qks + 1.0Qkwp) EHF Y+	Lateral	●	●	●
21 1.0Gk + 1.3(0.5Qks + 1.0Qkwp) EHF X-	Lateral	●	●	●
22 1.0Gk + 1.3(0.5Qks + 1.0Qkwp) EHF Y-	Lateral	●	●	●
23 1.0Gk + 1.0Ax-x	Gravity	●	●	●
24 1.0Gk + 1.0Ay-y	Gravity	●	●	●
25 $1.25Gk_{sup}$ + $1.0Gk_{inf}$ + $1.5(1.0Qki_{sup})$	Gravity	●	●	●
26 $1.25Gk_{sup}$ + $1.0Gk_{inf}$ + $1.5(1.0Qks_{sup}$ + $0.5Qkwp_{sup})$ EHF X+	Lateral	●	●	●
27 $1.25Gk_{sup}$ + $1.0Gk_{inf}$ + $1.5(1.0Qks_{sup}$ + $0.5Qkwp_{sup})$ EHF Y+	Lateral	●	●	●
28 $1.25Gk_{sup}$ + $1.0Gk_{inf}$ + $1.5(1.0Qks_{sup}$ + $0.5Qkwp_{sup})$ EHF X-	Lateral	●	●	●

Name	Class	Active	Strength	Service
29 1.25Gk$_{sup}$ + 1.0Gk$_{inf}$ + 1.5(1.0Qks$_{sup}$ + 0.5Qkwp$_{sup}$) EHF Y-	Lateral	●	●	●
30 1.25Gk$_{sup}$ + 1.0Gk$_{inf}$ + 1.5(0.5Qks$_{sup}$ + 1.0Qkwp) EHF X+	Lateral	●	●	●
31 1.25Gk$_{sup}$ + 1.0Gk$_{inf}$ + 1.5(0.5Qks$_{sup}$ + 1.0Qkwp) EHF Y+	Lateral	●	●	●
32 1.25Gk$_{sup}$ + 1.0Gk$_{inf}$ + 1.5(0.5Qks$_{sup}$ + 1.0Qkwp) EHF X-	Lateral	●	●	●
33 1.25Gk$_{sup}$ + 1.0Gk$_{inf}$ + 1.5(0.5Qks$_{sup}$ + 1.0Qkwp) EHF Y-	Lateral	●	●	●
34 1.0Gk + 1.5(1.0Qkwu$_{sup}$) EHF X+	Lateral	●	●	●
35 1.0Gk + 1.5(1.0Qkwu$_{sup}$) EHF Y+	Lateral	●	●	●
36 1.0Gk + 1.5(1.0Qkwu$_{sup}$) EHF X-	Lateral	●	●	●
37 1.0Gk + 1.5(1.0Qkwu$_{sup}$) EHF Y-	Lateral	●	●	●

1 1.25Gk + 1.5(1.0Qki)

Loadcase Title	Strength	Service	SLS Quasi
1 Self weight - excluding slabs	1.250	1.000	1.000
2 Slab self weight	1.250	1.000	1.000
3 Roof Dead	1.250	1.000	1.000
6 Roof Services	1.250	1.000	1.000
9 Roof Imposed	1.500	1.000	1.000

2 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF X+

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.250	1.000
2 Slab self weight	1.250	1.000
3 Roof Dead	1.250	1.000
6 Roof Services	1.250	1.000
11 Snow	1.500	1.000
13 Wind Pressure Wkp	0.750	0.500
17 Lateral Wind Wk X+	0.750	0.500
EHF$_{Dir1+}$	1.000	0.000

3 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF Y+

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.250	1.000
2 Slab self weight	1.250	1.000
3 Roof Dead	1.250	1.000
6 Roof Services	1.250	1.000
13 Wind Pressure Wkp	0.750	0.500
18 Lateral Wind Wk Y+	0.750	0.500
11 Snow	1.500	1.000
EHF$_{Dir2+}$	1.000	0.000

4 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF X-

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.250	1.000
2 Slab self weight	1.250	1.000
3 Roof Dead	1.250	1.000
6 Roof Services	1.250	1.000
11 Snow	1.500	1.000
13 Wind Pressure Wkp	0.750	0.500
19 Lateral Wind Wk X-	0.750	0.500
EHF$_{Dir1-}$	1.000	0.000

5 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF Y-

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.250	1.000
2 Slab self weight	1.250	1.000
3 Roof Dead	1.250	1.000
6 Roof Services	1.250	1.000
13 Wind Pressure Wkp	0.750	0.500
11 Snow	1.500	1.000
20 Lateral Wind Wk Y-	0.750	0.500
EHF_{Dir2-}	1.000	0.000

6 1.25Gk + 1.5(0.5QkS + 1.0Qkwp) EHF X+

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.250	1.000
2 Slab self weight	1.250	1.000
3 Roof Dead	1.250	1.000
6 Roof Services	1.250	1.000
13 Wind Pressure Wkp	1.500	1.000
11 Snow	0.750	0.500
17 Lateral Wind Wk X+	1.500	1.000
EHF_{Dir1+}	1.000	0.000

7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.250	1.000
2 Slab self weight	1.250	1.000
3 Roof Dead	1.250	1.000
6 Roof Services	1.250	1.000
11 Snow	0.750	0.500
13 Wind Pressure Wkp	1.500	1.000
18 Lateral Wind Wk Y+	1.500	1.000
EHF_{Dir2+}	1.000	0.000

8 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF X-

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.250	1.000
2 Slab self weight	1.250	1.000
3 Roof Dead	1.250	1.000
6 Roof Services	1.250	1.000
13 Wind Pressure Wkp	1.500	1.000
11 Snow	0.750	0.500
19 Lateral Wind Wk X-	1.500	1.000
EHF_{Dir1-}	1.000	0.000

9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.250	1.000
2 Slab self weight	1.250	1.000
3 Roof Dead	1.250	1.000
6 Roof Services	1.250	1.000

Loadcase Title	Strength	Service
11 Snow	0.750	0.500
13 Wind Pressure Wkp	1.500	1.000
20 Lateral Wind Wk Y-	1.500	1.000
EHF_{Dir2-}	1.000	0.000

10 1.0Gk + 1.5(1.0Qkwu) EHF X+

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.000	1.000
2 Slab self weight	1.000	1.000
15 Wind Suction Wku	1.500	1.000
17 Lateral Wind Wk X+	1.500	1.000
3 Roof Dead	1.000	1.000
EHF_{Dir1+}	1.000	0.000

11 1.0Gk + 1.5(1.0Qkwu) EHF Y+

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.000	1.000
2 Slab self weight	1.000	1.000
15 Wind Suction Wku	1.500	1.000
18 Lateral Wind Wk Y+	1.500	1.000
3 Roof Dead	1.000	1.000
EHF_{Dir2+}	1.000	0.000

12 1.0Gk + 1.5(1.0Qkwu) EHF X-

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.000	1.000
2 Slab self weight	1.000	1.000
15 Wind Suction Wku	1.500	1.000
3 Roof Dead	1.000	1.000
19 Lateral Wind Wk X-	1.500	1.000
EHF_{Dir1-}	1.000	0.000

13 1.0Gk + 1.5(1.0Qkwu) EHF Y-

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.000	1.000
2 Slab self weight	1.000	1.000
15 Wind Suction Wku	1.500	1.000
3 Roof Dead	1.000	1.000
20 Lateral Wind Wk Y-	1.500	1.000
EHF_{Dir2-}	1.000	0.000

14 1.0Gk + 1.3(1.0Qki)

Loadcase Title	Strength	Service	SLS Quasi
1 Self weight - excluding slabs	1.000	1.000	1.000
2 Slab self weight	1.000	1.000	1.000
3 Roof Dead	1.000	1.000	1.000
6 Roof Services	1.000	1.000	1.000
9 Roof Imposed	1.300	1.000	1.000

15 1.0Gk + 1.3(1.0Qks + 0.5Qkwp) EHF X+

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.000	1.000
2 Slab self weight	1.000	1.000
3 Roof Dead	1.000	1.000
6 Roof Services	1.000	1.000
11 Snow	1.300	1.000
13 Wind Pressure Wkp	0.650	0.500
17 Lateral Wind Wk X+	0.650	0.500
EHF_{Dir1+}	1.000	0.000

16 1.0Gk + 1.3(1.0Qks + 0.5Qkwp) EHF Y+

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.000	1.000
2 Slab self weight	1.000	1.000
3 Roof Dead	1.000	1.000
6 Roof Services	1.000	1.000
11 Snow	1.300	1.000
13 Wind Pressure Wkp	0.650	0.500
18 Lateral Wind Wk Y+	0.650	0.500
EHF_{Dir2+}	1.000	0.000

17 1.0Gk + 1.3(1.0Qks + 0.5Qkwp) EHF X-

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.000	1.000
2 Slab self weight	1.000	1.000
3 Roof Dead	1.000	1.000
6 Roof Services	1.000	1.000
11 Snow	1.300	1.000
13 Wind Pressure Wkp	0.650	0.500
19 Lateral Wind Wk X-	0.650	0.500
EHF_{Dir1-}	1.000	0.000

18 1.0Gk + 1.3(1.0Qks + 0.5Qkwp) EHF Y-

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.000	1.000
2 Slab self weight	1.000	1.000
3 Roof Dead	1.000	1.000
6 Roof Services	1.000	1.000
11 Snow	1.300	1.000
13 Wind Pressure Wkp	0.650	0.500
20 Lateral Wind Wk Y-	0.650	0.500
EHF_{Dir2-}	1.000	0.000

19 1.0Gk + 1.3(0.5Qks + 1.0Qkwp) EHF X+

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.000	1.000
2 Slab self weight	1.000	1.000
3 Roof Dead	1.000	1.000
6 Roof Services	1.000	1.000
11 Snow	0.650	0.500
13 Wind Pressure Wkp	1.300	1.000
17 Lateral Wind Wk X+	1.300	1.000

Loadcase Title	Strength	Service
EHF_{Dir1+}	1.000	0.000

20 1.0Gk + 1.3(0.5Qks + 1.0Qkwp) EHF Y+

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.000	1.000
2 Slab self weight	1.000	1.000
3 Roof Dead	1.000	1.000
6 Roof Services	1.000	1.000
11 Snow	0.650	0.500
13 Wind Pressure Wkp	1.300	1.000
18 Lateral Wind Wk Y+	1.300	1.000
EHF_{Dir2+}	1.000	0.000

21 1.0Gk + 1.3(0.5Qks + 1.0Qkwp) EHF X-

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.000	1.000
2 Slab self weight	1.000	1.000
3 Roof Dead	1.000	1.000
6 Roof Services	1.000	1.000
11 Snow	0.650	0.500
13 Wind Pressure Wkp	1.300	1.000
19 Lateral Wind Wk X-	1.300	1.000
EHF_{Dir1-}	1.000	0.000

22 1.0Gk + 1.3(0.5Qks + 1.0Qkwp) EHF Y-

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.000	1.000
2 Slab self weight	1.000	1.000
3 Roof Dead	1.000	1.000
6 Roof Services	1.000	1.000
11 Snow	0.650	0.500
13 Wind Pressure Wkp	1.300	1.000
20 Lateral Wind Wk Y-	1.300	1.000
EHF_{Dir2-}	1.000	0.000

23 1.0Gk + 1.0Ax-x

Loadcase Title	Strength	Service	SLS Quasi
1 Self weight - excluding slabs	1.000	1.000	1.000
2 Slab self weight	1.000	1.000	1.000
3 Roof Dead	1.000	1.000	1.000
6 Roof Services	1.000	1.000	1.000
21 Accidental Load Ax-x	1.000	1.000	1.000

24 1.0Gk + 1.0Ay-y

Loadcase Title	Strength	Service	SLS Quasi
1 Self weight - excluding slabs	1.000	1.000	1.000
2 Slab self weight	1.000	1.000	1.000
3 Roof Dead	1.000	1.000	1.000
6 Roof Services	1.000	1.000	1.000
22 Accidental Load Ay-y	1.000	1.000	1.000

25 $1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(1.0Qki_{sup})$

Loadcase Title	Strength	Service	SLS Quasi
1 Self weight - excluding slabs	1.250	1.000	1.000
2 Slab self weight	1.250	1.000	1.000
4 Roof Dead (unfavourable)	1.250	1.000	1.000
7 Roof Services (unfavourable)	1.250	1.000	1.000
5 Roof Dead (favourable)	1.000	1.000	1.000
8 Roof Services (favourable)	1.000	1.000	1.000
10 Roof Imposed (unfavourable)	1.500	1.000	1.000

26 $1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(1.0Qks_{sup} + 0.5Qkwp_{sup})$ EHF X+

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.250	1.000
2 Slab self weight	1.250	1.000
4 Roof Dead (unfavourable)	1.250	1.000
7 Roof Services (unfavourable)	1.250	1.000
5 Roof Dead (favourable)	1.000	1.000
8 Roof Services (favourable)	1.000	1.000
12 Snow (unfavourable)	1.500	1.000
14 Wkp (unfavourable)	0.750	0.500
17 Lateral Wind Wk X+	0.750	0.500
EHF_{Dir1+}	1.000	0.000

27 $1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(1.0Qks_{sup} + 0.5Qkwp_{sup})$ EHF Y+

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.250	1.000
2 Slab self weight	1.250	1.000
4 Roof Dead (unfavourable)	1.250	1.000
7 Roof Services (unfavourable)	1.250	1.000
5 Roof Dead (favourable)	1.000	1.000
8 Roof Services (favourable)	1.000	1.000
12 Snow (unfavourable)	1.500	1.000
14 Wkp (unfavourable)	0.750	0.500
18 Lateral Wind Wk Y+	0.750	0.500
EHF_{Dir2+}	1.000	0.000

28 $1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(1.0Qks_{sup} + 0.5Qkwp_{sup})$ EHF X-

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.250	1.000
2 Slab self weight	1.250	1.000
4 Roof Dead (unfavourable)	1.250	1.000
7 Roof Services (unfavourable)	1.250	1.000
5 Roof Dead (favourable)	1.000	1.000
8 Roof Services (favourable)	1.000	1.000
12 Snow (unfavourable)	1.500	1.000
14 Wkp (unfavourable)	0.750	0.500
19 Lateral Wind Wk X-	0.750	0.500
EHF_{Dir1-}	1.000	0.000

29 $1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(1.0Qks_{sup} + 0.5Qkwp_{sup})$ EHF Y-

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.250	1.000
2 Slab self weight	1.250	1.000
4 Roof Dead (unfavourable)	1.250	1.000
7 Roof Services (unfavourable)	1.250	1.000
5 Roof Dead (favourable)	1.000	1.000
8 Roof Services (favourable)	1.000	1.000
12 Snow (unfavourable)	1.500	1.000
14 Wkp (unfavourable)	0.750	0.500
20 Lateral Wind Wk Y-	0.750	0.500
EHF_{Dir2-}	1.000	0.000

30 $1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp)$ EHF X+

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.250	1.000
2 Slab self weight	1.250	1.000
4 Roof Dead (unfavourable)	1.250	1.000
7 Roof Services (unfavourable)	1.250	1.000
5 Roof Dead (favourable)	1.000	1.000
8 Roof Services (favourable)	1.000	1.000
12 Snow (unfavourable)	0.750	0.500
14 Wkp (unfavourable)	1.500	1.000
17 Lateral Wind Wk X+	1.500	1.000
EHF_{Dir1+}	1.000	0.000

31 $1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp)$ EHF Y+

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.250	1.000
2 Slab self weight	1.250	1.000
4 Roof Dead (unfavourable)	1.250	1.000
7 Roof Services (unfavourable)	1.250	1.000
5 Roof Dead (favourable)	1.000	1.000
8 Roof Services (favourable)	1.000	1.000
12 Snow (unfavourable)	0.750	0.500
14 Wkp (unfavourable)	1.500	1.000
18 Lateral Wind Wk Y+	1.500	1.000
EHF_{Dir2+}	1.000	0.000

32 $1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp)$ EHF X-

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.250	1.000
2 Slab self weight	1.250	1.000
4 Roof Dead (unfavourable)	1.250	1.000
7 Roof Services (unfavourable)	1.250	1.000
5 Roof Dead (favourable)	1.000	1.000
8 Roof Services (favourable)	1.000	1.000
12 Snow (unfavourable)	0.750	0.500
14 Wkp (unfavourable)	1.500	1.000
19 Lateral Wind Wk X-	1.500	1.000
EHF_{Dir1-}	1.000	0.000

33 $1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp)$ EHF Y-

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.250	1.000
2 Slab self weight	1.250	1.000
4 Roof Dead (unfavourable)	1.250	1.000
7 Roof Services (unfavourable)	1.250	1.000
5 Roof Dead (favourable)	1.000	1.000
8 Roof Services (favourable)	1.000	1.000
12 Snow (unfavourable)	0.750	0.500
14 Wkp (unfavourable)	1.500	1.000
20 Lateral Wind Wk Y-	1.500	1.000
EHF_{Dir2-}	1.000	0.000

34 1.0Gk + 1.5(1.0$Qkwu_{sup}$) EHF X+

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.000	1.000
2 Slab self weight	1.000	1.000
3 Roof Dead	1.000	1.000
16 Wku (unfavourable)	1.500	1.000
17 Lateral Wind Wk X+	1.500	1.000
EHF_{Dir1+}	1.000	0.000

35 1.0Gk + 1.5(1.0$Qkwu_{sup}$) EHF Y+

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.000	1.000
2 Slab self weight	1.000	1.000
3 Roof Dead	1.000	1.000
16 Wku (unfavourable)	1.500	1.000
18 Lateral Wind Wk Y+	1.500	1.000
EHF_{Dir2+}	1.000	0.000

36 1.0Gk + 1.5(1.0$Qkwu_{sup}$) EHF X-

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.000	1.000
2 Slab self weight	1.000	1.000
3 Roof Dead	1.000	1.000
16 Wku (unfavourable)	1.500	1.000
19 Lateral Wind Wk X-	1.500	1.000
EHF_{Dir1-}	1.000	0.000

37 1.0Gk + 1.5(1.0$Qkwu_{sup}$) EHF Y-

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.000	1.000
2 Slab self weight	1.000	1.000
3 Roof Dead	1.000	1.000
16 Wku (unfavourable)	1.500	1.000
20 Lateral Wind Wk Y-	1.500	1.000
EHF_{Dir2-}	1.000	0.000

Appendix B

Steelwork Design Summary

Static

Member Reference	Section	Grade	Length [m]	Utilization	Status
SB 1/B/3-1/A/3	UB 305x102x25	S355	3.300	0.458	Pass
SB 1/C/3-1/B/3	UB 305x102x25	S355	6.000	0.344	Pass
SB 1/D/3-1/C/3	UB 305x102x25	S355	6.000	0.344	Pass
SB 1/E/3-1/D/3	UB 305x102x25	S355	3.300	0.458	Pass
SB 1/E/1a-1/E/3	UB 305x102x25	S355	4.100	0.113	Pass
SB 1/E/1-1/E/1a	UB 305x102x25	S355	3.100	0.095	Pass
SB 1/D/1-1/E/1	UB 305x102x25	S355	3.300	0.310	Pass
SB 1/C/1-1/D/1	UB 305x102x25	S355	6.000	0.228	Pass
SB 1/B/1-1/C/1	UB 305x102x25	S355	6.000	0.228	Pass
SB 1/A/1-1/B/1	UB 305x102x25	S355	3.300	0.310	Pass
SB 1/A/1a-1/A/1	UB 305x102x25	S355	3.100	0.095	Pass
SB 1/A/3-1/A/1a	UB 305x102x25	S355	4.100	0.113	Pass
SB 1/D/1a-1/E/1a	UB 305x102x33	S355	3.300	0.614	Pass
SB 1/C/1a-1/D/1a	UB 305x102x33	S355	6.000	0.449	Pass
SB 1/B/1a-1/C/1a	UB 305x102x33	S355	6.000	0.449	Pass
SB 1/A/1a-1/B/1a	UB 305x102x33	S355	3.300	0.614	Pass
SB 1/D/2-1/D/3	UB 406x140x39	S355	3.600	0.652	Pass
SB 1/D/1-1/D/2	UB 406x140x39	S355	3.600	0.657	Pass
SB 1/C/2-1/C/1	UB 406x140x39	S355	3.600	0.473	Pass
SB 1/C/3-1/C/2	UB 406x140x39	S355	3.600	0.479	Pass
SB 1/B/2-1/B/3	UB 406x140x39	S355	3.600	0.652	Pass
SB 1/B/1-1/B/2	UB 406x140x39	S355	3.600	0.657	Pass

Column Design

Column Design Summary

Static

Member Reference	Section	Grade	Length [m]	Utilization	Status
SC D/2	RHS 400x200x10.0	S355	6.200	0.275	Beyond Scope
SC C/2	RHS 400x200x10.0	S355	6.200	0.218	Beyond Scope
SC B/2	RHS 400x200x10.0	S355	6.200	0.275	Beyond Scope

* Refer to classification check Calculations.

Date	22.08.2023	Sheet No.	1		
Project Ref.	45797	Prepared by	SA	Checked by	JI
Project name	Chesterfield				
Subject	App_B Steelwork Design Summary (Classification Check)				

MSI Global-MSI

Section properties — Col. Ref. SC 2/D

f_y	355	N/mm²	h	400	mm
W_{pl}	1430	cm³	b	200	mm
W_{el}	1150	cm³	t	10	mm
i	14.3	cm	A_{eff}	106	cm²
A	113	cm²	λ_{M0}	1	
I_{xx}	23000	cm⁴	L	6300	mm

α = 0.49
L_{cr} = Column length
i = Radius of gyration
$\bar{\lambda} = \pi\sqrt{\frac{E}{f_y}} = 93.9\varepsilon$

* Tekla Structural Designer will not analyse 400 x 200 x 10 RHS sections as they are categorised as class 4 slender cross sections, which is beyond the scope of the software.

Consider Column SC 2/D subjected to compression (Combination 1.25Gk + 1.5Qki)

N_{Ed} = 85 kN
V_{Ed} = 0 kN
M_{Ed} = 5 kNm

Classification of cross section (EN 1993-1-1:2005, Cl.5.5)

$\varepsilon = \sqrt{235/f_y}$ (EN 1993-1-1:2005, Cl 5.5 Table 5.2) — ε — 0.81

Internal compression parts

$c = h - 3t$ — c — 370 mm

$\frac{c}{t}$ — $\frac{c}{t}$ — 37

The limiting value for Class 1 is	$c/t \le 33\varepsilon$	26.8
The limiting value for Class 2 is	$c/t \le 38\varepsilon$	30.9
The limiting value for Class 3 is	$c/t \le 42\varepsilon$	34.2

Therefore, the internal compression parts are Class 4

Compression resistance of cross section (EN 1993-1-1:2005, Cl. 6.2.4)

$N_{c,Rd} = \frac{A_{eff} f_y}{\gamma_{M0}}$ — $N_{c,Rd}$ — 3763 kN

$\frac{N_{Ed}}{N_{c,Rd}} =$ — $\frac{N_{Ed}}{N_{c,Rd}} =$ — 0.023 PASS

Buckling resistance of members (EN 1993-1-1:2005, Cl. 6.3)

$N_{b,Rd} = \frac{\chi A_{eff} f_y}{\gamma_{M1}}$ — $N_{b,Rd}$ — 3047 kN

$\chi = \frac{1}{\Phi + \sqrt{\Phi^2 - \bar{\lambda}^2}} < 1$ — χ = — 0.81

$\Phi = 0.5[1 + \alpha(\bar{\lambda} - 0.2) + \bar{\lambda}^2]$ — Φ = — 0.744

$\bar{\lambda} = \sqrt{\frac{A_{eff} f_y}{N_{cr}}} = \frac{L_{cr}}{i}\frac{\sqrt{\frac{A_{eff}}{A}}}{\lambda_1}$ — $\bar{\lambda}$ = — 0.559

$\frac{N_{Ed}}{N_{b,Rd}} < 1$ — $\frac{N_{Ed}}{N_{b,Rd}}$ — 0.028 PASS

Date	22.08.2023	Sheet No.	2		
Project Ref.	45797	Prepared by	SA	Checked by	JI
Project name	Chesterfield				
Subject	App_B Steelwork Design Summary (Classification Check)				

Consider Column SC 2/D subjected to compression and bending (Combination 1.25Gksup + 1.0Gkinf + 1.5(0.5Qkssup + 1.0Qkwpsup) EHF Y+)

N_{Ed} = 100 kN

V_{Ed} = 25 kN

M_{Ed} = 250 kNm

Classification of cross section (EN 1993-1-1:2005, Cl.5.5)

$\varepsilon = \sqrt{235/f_y}$ (EN 1993-1-1:2005, Cl 5.5 Table 5.2) ε 0.81

Internal compression parts

$c = h - 3t$ c 370 mm

$\frac{c}{t}$ $\frac{c}{t}$ 37

The limiting value for Class 1 is $c/t \leq 36\varepsilon/\alpha$ 59.8

Therefore, the internal elements are Class 1

Compression resistance of cross section (EN 1993-1-1:2005, Cl. 6.2.4)

$N_{c,Rd} = \frac{Af_y}{\gamma_{M0}}$ $N_{c,Rd}$ 4012 kN

$\frac{N_{Ed}}{N_{c,Rd}} =$ $\frac{N_{Ed}}{N_{c,Rd}} =$ 0.025 PASS

Bending moment resistance of cross section (EN 1993-1-1:2005, Cl. 6.2.5)

$M_{c,Rd} = \frac{W_{pl} f_y}{\gamma_{M0}}$ $M_{c,Rd} =$ 508 kNm

$\frac{M_{Ed}}{M_{c,Rd}} < 1$ $\frac{M_{Ed}}{M_{c,Rd}}$ 0.492 PASS

Shear resistance of cross section (EN 1993-1-1:2005, Cl. 6.2.6)

$V_{c,Rd}$ from (Blue Book) $V_{c,Rd}$ = 1570 kN

$\frac{V_{Ed}}{V_{c,Rd}} < 1$ $\frac{V_{Ed}}{V_{c,Rd}}$ = 0.016 PASS

Shear buckling in webs neglected if:

$\frac{h_w}{t_w} \leq 72\frac{\varepsilon}{\eta}$ $72\frac{\varepsilon}{\eta} = 58.6$ $\frac{h_w}{t_w}$ = 38 PASS

Buckling resistance of members (EN 1993-1-1:2005, Cl. 6.3)

$\frac{N_{Ed}}{\chi_y N_{Rk}/\gamma_{M1}} + k_{yy}\frac{M_{y,Ed} + \Delta M_{y,Ed}}{\chi_{LT} M_{y,Rk}/\gamma_{M1}} + k_{yz}\frac{M_{z,Ed} + \Delta M_{z,Ed}}{M_{z,Rk}/\gamma_{M1}} \leq 1.0$ Eq. 6.61 0.33 PASS

$\chi_y = \frac{1}{\Phi_y + \sqrt{\Phi_y{}^2 - \bar{\lambda}_y^2}} < 1$ $\chi_y =$ 0.8

$\Phi_y = 0.5\left[1 + \alpha(\overline{\lambda_y} - 0.2) + \overline{\lambda_y}^2\right]$ $\Phi_y =$ 0.76

$\overline{\lambda_y} = \sqrt{\frac{Af_y}{N_{cr}}} = \frac{L_{cr}}{i_y}\frac{1}{\lambda_1}$ $\overline{\lambda_y} =$ 0.58

Date	22.08.2023	Sheet No.	3		
Project Ref.	45797	Prepared by	SA	Checked by	JI
Project name	Chesterfield				
Subject	App_B Steelwork Design Summary (Classification Check)				

Lateral torsional buckling effects are neglected, and only cross-sectional verification apply.

$$k_{yy} = C_{my}\left(1 + (\overline{\lambda_y} - 0.2)\frac{N_{Ed}}{\chi_y N_{Rk}/\gamma_{M1}}\right) \leq C_{my}\left(1 + \frac{0.8N_{Ed}}{\chi_y N_{Rk}/\gamma_{M1}}\right)$$ Table B.1 — 0.607 — PASS

$$C_{my}\left(1 + \frac{0.8N_{Ed}}{\chi_y N_{Rk}/\gamma_{M1}}\right) = 0.615$$

$k_{zy} = 0.6k_{yy}$ Table B.1 — 0.364

$C_{my} = C_{mz} = C_{mLT} = 0.6$ Table B.3 — $C_{my} =$ 0.6

Serviceability Limit State

$\delta_i = \frac{WL^3}{3EI}$ Deflection due to impact load @ impact location — $\delta_i =$ 1.7 mm

$\delta_w = \frac{WL^3}{8EI} + \frac{WL^3}{3EI}$ Deflection due to wind load — $\delta_w =$ 12.7 mm

PASS, L/100

Considering the calculations above, the section 400 x 200 x 10 RHS is adequate to use.

Appendix C

Beam End Forces

End 1/End 2 + Coincident, First-order linear, All combinations

St. 1 (Roof)

Reference	Span	Section	Grade	End	Condition	Combination	F_x [kN]	F_y [kN]	F_z [kN]	M_x [kNm]	M_y [kNm]	M_z [kNm]
SB 1/A/1-1/B/1	1	UB 305x102x25	S355	1	Min F_z	4 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF X-	0.3	-0.0	-1.0	0.0	-0.0	0.0
					Min F_x	6 1.25Gk + 1.5(0.5QkS + 1.0Qkwp) EHF X+	-0.7	0.0	-0.8	0.0	-0.0	0.0
					Min F_y	7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	0.3	-0.6	-0.8	0.0	-0.0	0.0
					Max F_x	8 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF X-	0.6	-0.0	-0.9	0.0	-0.0	0.0
					Max F_y	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	-0.3	0.5	-0.9	0.0	-0.0	0.0
					Max F_z	34 1.0Gk + 1.5(1.0$Qkwu_{sup}$) EHF X+	-0.7	0.0	0.2	0.0	-0.0	0.0
				2	Max F_z, Max M_y	4 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF X-	-0.3	0.1	6.0	0.0	11.5	-0.2
					Max F_x	6 1.25Gk + 1.5(0.5QkS + 1.0Qkwp) EHF X+	0.7	-0.2	5.1	0.0	9.8	0.3
					Min F_y, Max M_z	7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	-0.3	-1.7	5.1	0.0	9.9	1.9
					Min F_x	8 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF X-	-0.6	0.2	5.1	0.0	9.9	-0.3
					Max F_y, Min M_z	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	0.3	1.6	5.1	0.0	9.9	-1.8
					Min M_y	10 1.0Gk + 1.5(1.0Qkwu) EHF X+	0.7	-0.2	0.4	0.0	0.6	0.3
					Min F_z	34 1.0Gk + 1.5(1.0$Qkwu_{sup}$) EHF X+	0.7	-0.2	0.2	0.0	0.0	0.3
SB 1/A/1a-1/A/1	1	UB 305x102x25	S355	1	Max F_z, Min M_y	2 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF X+	0.0	-0.8	3.8	-0.0	-4.3	-0.7
					Min F_y, Min M_z	6 1.25Gk + 1.5(0.5QkS + 1.0Qkwp) EHF X+	0.0	-1.5	3.2	-0.0	-3.7	-1.3
					Min F_x	7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	-0.6	-0.3	3.2	-0.0	-3.7	-0.8
					Max F_y, Max M_z	8 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF X-	-0.0	1.3	3.2	-0.0	-3.7	1.1
					Max F_x	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	0.5	0.3	3.2	-0.0	-3.7	0.8
					Min F_z, Max M_y	12 1.0Gk + 1.5(1.0Qkwu) EHF X-	-0.0	1.3	0.3	0.0	-0.4	1.1
				2	Max F_z	4 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF X-	0.0	0.3	1.0	0.0	0.0	0.0
					Min F_y	6 1.25Gk + 1.5(0.5QkS + 1.0Qkwp) EHF X+	-0.0	-0.7	0.8	0.0	0.0	0.0
					Max F_x	7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	0.6	0.3	0.8	0.0	0.0	0.0
					Max F_y	8 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF X-	0.0	0.6	0.9	0.0	0.0	0.0
					Min F_x	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	-0.5	-0.3	0.9	0.0	0.0	0.0

Reference	Span	Section	Grade	End	Condition	Combination	F_x [kN]	F_y [kN]	F_z [kN]	M_x [kNm]	M_y [kNm]	M_z [kNm]
					Min F_z	34 1.0Gk + 1.5(1.0Qkwu$_{sup}$) EHF X+	-0.0	-0.7	-0.2	0.0	0.0	0.0
SB 1/A/1a-1/B/1a	1	UB 305x102x33	S355	1	Min F_z	2 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF X+	-1.7	-0.1	-8.0	0.0	0.0	-0.1
					Min F_x	6 1.25Gk + 1.5(0.5QkS + 1.0Qkwp) EHF X+	-3.4	-0.1	-6.9	0.0	0.0	-0.2
					Max F_y, Max M_z	7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	-0.1	1.0	-6.8	0.0	0.0	1.5
					Max F_x	8 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF X-	2.9	0.1	-6.8	0.0	0.0	0.2
					Min F_y, Min M_z	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	0.1	-1.0	-6.8	0.0	0.0	-1.5
					Max F_z	12 1.0Gk + 1.5(1.0Qkwu) EHF X-	2.8	0.1	-0.6	-0.0	-0.0	0.2
				2	Max F_z, Max M_y	2 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF X+	1.7	-0.1	16.6	-0.0	40.4	0.2
					Max F_x	6 1.25Gk + 1.5(0.5QkS + 1.0Qkwp) EHF X+	3.4	-0.2	13.9	-0.0	34.2	0.4
					Min F_y, Max M_z	7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	0.1	-1.4	13.8	-0.0	34.1	2.6
					Min F_x	8 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF X-	-2.9	0.2	13.8	-0.0	34.1	-0.4
					Max F_y, Min M_z	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	-0.1	1.4	13.8	-0.0	34.1	-2.6
					Min F_z, Min M_y	12 1.0Gk + 1.5(1.0Qkwu) EHF X-	-2.8	0.2	-0.8	0.0	-0.4	-0.3
SB 1/A/3-1/A/1a	1	UB 305x102x25	S355	1	Min F_y	6 1.25Gk + 1.5(0.5QkS + 1.0Qkwp) EHF X+	-0.1	-1.1	1.8	0.0	0.0	0.0
					Max F_x	7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	0.5	-0.2	1.8	0.0	0.0	0.0
					Max F_y	8 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF X-	0.1	0.9	1.8	0.0	0.0	0.0
					Min F_x	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	-0.6	0.2	1.8	0.0	0.0	0.0
					Min F_z	10 1.0Gk + 1.5(1.0Qkwu) EHF X+	-0.1	-1.1	0.1	-0.0	0.0	0.0
					Max F_z	28 1.25Gk$_{sup}$ + 1.0Gk$_{inf}$ + 1.5(1.0Qks$_{sup}$ + 0.5Qkwp$_{sup}$) EHF X-	0.1	0.5	2.4	0.0	0.0	0.0
				2	Max F_z, Max M_y	2 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF X+	0.1	-0.9	4.2	-0.0	4.3	0.8
					Min F_y, Max M_z	6 1.25Gk + 1.5(0.5QkS + 1.0Qkwp) EHF X+	0.1	-1.8	3.6	-0.0	3.7	1.5
					Min F_x	7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	-0.5	0.2	3.6	-0.0	3.7	-0.6
					Max F_y, Min M_z	8 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF X-	-0.1	1.6	3.6	-0.0	3.7	-1.3
					Max F_x	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	0.6	-0.2	3.6	-0.0	3.7	0.6
					Min F_z, Min M_y	12 1.0Gk + 1.5(1.0Qkwu) EHF X-	-0.1	1.5	0.3	0.0	0.4	-1.3
SB 1/B/1-1/B/2	1	UB 406x140x39	S355	1	Min F_z	3 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF Y+	-1.6	-0.2	-12.7	-0.0	0.0	-0.3
					Min F_x	7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	-3.2	-0.3	-10.9	-0.0	0.0	-0.5

Reference	Span	Section	Grade	End	Condition	Combination	F_x [kN]	F_y [kN]	F_z [kN]	M_x [kNm]	M_y [kNm]	M_z [kNm]
					Max F_y, Max M_z	8 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF X-	-0.1	0.4	-10.8	-0.0	0.0	0.6
					Max F_x	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	3.0	0.3	-10.8	-0.0	0.0	0.5
					Min F_y, Min M_z	30 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp) EHF X+	0.1	-0.5	-5.4	-0.0	0.0	-0.7
					Max F_z	37 1.0Gk + 1.5(1.0$Qkwu_{sup}$) EHF Y-	3.0	0.3	-0.3	-0.0	-0.0	0.5
				2	Max F_z, Max M_y	3 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF Y+	3.0	0.1	55.5	-0.1	78.2	0.1
					Min M_x, Min M_z	6 1.25Gk + 1.5(0.5QkS + 1.0Qkwp) EHF X+	-0.1	2.5	46.3	-0.2	65.7	-1.3
					Max F_x	7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	6.0	0.2	46.4	-0.0	65.9	0.3
					Min F_y	8 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF X-	0.1	-2.5	46.3	0.1	65.8	1.3
					Max M_x	12 1.0Gk + 1.5(1.0Qkwu) EHF X-	0.1	-2.4	-3.0	0.1	-1.3	1.3
					Min F_z, Min M_y	13 1.0Gk + 1.5(1.0Qkwu) EHF Y-	-5.7	-0.2	-3.1	-0.0	-1.5	-0.3
					Max F_y	30 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp) EHF X+	-0.1	2.5	30.6	-0.2	35.8	-1.3
					Max M_z	32 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp) EHF X-	0.0	-2.4	30.7	0.1	35.9	1.3
					Min F_x	33 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp) EHF Y-	-5.8	-0.2	30.6	-0.0	35.7	-0.3
SB 1/B/1-1/C/1	1	UB 305x102x25	S355	1	Max F_z	3 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF Y+	0.3	-0.8	6.8	-0.0	-11.5	-0.7
					Min M_y	4 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF X-	0.1	-0.1	6.7	-0.0	-11.5	-0.2
					Min F_y, Min M_z	7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	0.6	-1.5	5.7	-0.0	-9.9	-1.3
					Min F_x	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	-0.6	1.4	5.7	-0.0	-9.9	1.3
					Max M_y	10 1.0Gk + 1.5(1.0Qkwu) EHF X+	-0.3	0.2	0.1	-0.0	-0.6	0.3
					Max F_x	31 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp) EHF Y+	0.6	-1.5	2.9	0.0	-4.4	-1.3
					Max F_y, Max M_z	33 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp) EHF Y-	-0.6	1.4	2.9	-0.0	-4.4	1.3
					Min F_z	37 1.0Gk + 1.5(1.0$Qkwu_{sup}$) EHF Y-	-0.6	1.4	0.1	0.0	-0.0	1.3
				2	Max F_z, Max M_y	5 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF Y-	0.3	0.7	5.2	0.0	6.9	-0.6
					Max F_x, Max F_y, Min M_z	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	0.6	1.4	4.3	0.0	5.9	-1.2

Reference	Span	Section	Grade	End	Condition	Combination	F_x [kN]	F_y [kN]	F_z [kN]	M_x [kNm]	M_y [kNm]	M_z [kNm]
					Min F_x, Min F_y, Max M_z	31 1.25Gk$_{sup}$ + 1.0Gk$_{inf}$ + 1.5(0.5Qks$_{sup}$ + 1.0Qkwp) EHF Y+	-0.6	-1.5	1.9	-0.0	1.3	1.3
					Min F_z, Min M_y	35 1.0Gk + 1.5(1.0Qkwu$_{sup}$) EHF Y+	-0.6	-1.4	-0.3	-0.0	-1.4	1.3
SB 1/B/1a-1/C/1a	1	UB 305x102x33	S355	1	Max F_z, Min M_y	4 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF X-	0.5	-0.1	17.7	-0.0	-40.4	-0.2
					Min F_y, Min M_z	7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	-0.2	-1.3	14.7	-0.0	-34.1	-1.7
					Max F_x	8 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF X-	0.9	-0.2	14.7	-0.0	-34.2	-0.3
					Min F_z, Max M_y	10 1.0Gk + 1.5(1.0Qkwu) EHF X+	-1.3	0.2	-1.7	-0.0	0.5	0.3
					Min F_x	30 1.25Gk$_{sup}$ + 1.0Gk$_{inf}$ + 1.5(0.5Qks$_{sup}$ + 1.0Qkwp) EHF X+	-1.3	0.3	11.1	0.0	-26.1	0.4
					Max F_y, Max M_z	33 1.25Gk$_{sup}$ + 1.0Gk$_{inf}$ + 1.5(0.5Qks$_{sup}$ + 1.0Qkwp) EHF Y-	0.2	1.4	11.1	0.0	-26.2	1.8
				2	Max F_z	2 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF X+	0.7	-0.1	4.6	0.0	0.9	0.1
					Min F_x	8 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF X-	-0.9	0.2	3.2	0.0	-0.2	-0.3
					Max F_y, Min M_z	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	-0.2	1.4	3.3	0.0	-0.1	-1.8
					Min F_z, Min M_y	12 1.0Gk + 1.5(1.0Qkwu) EHF X-	-0.8	0.2	-3.0	0.0	-4.5	-0.3
					Max M_y	18 1.0Gk + 1.3(1.0Qks + 0.5Qkwp) EHF Y-	-0.1	0.6	3.9	0.0	0.9	-0.8
					Max F_x	30 1.25Gk$_{sup}$ + 1.0Gk$_{inf}$ + 1.5(0.5Qks$_{sup}$ + 1.0Qkwp) EHF X+	1.3	-0.3	2.0	-0.0	-1.1	0.4
					Min F_y, Max M_z	31 1.25Gk$_{sup}$ + 1.0Gk$_{inf}$ + 1.5(0.5Qks$_{sup}$ + 1.0Qkwp) EHF Y+	0.2	-1.4	1.9	-0.0	-1.3	1.8
SB 1/B/2-1/B/3	1	UB 406x140x39	S355	1	Max F_y, Max M_z	6 1.25Gk + 1.5(0.5QkS + 1.0Qkwp) EHF X+	0.1	0.7	21.3	-0.0	-64.1	1.4
					Max F_x	7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	3.0	-0.2	21.3	-0.0	-64.0	-0.2
					Min F_x	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	-3.2	0.2	21.4	-0.0	-64.4	0.3
					Min F_z, Max M_y	11 1.0Gk + 1.5(1.0Qkwu) EHF Y+	3.0	-0.2	-1.3	-0.0	2.6	-0.2
					Max F_z, Min M_y	29 1.25Gk$_{sup}$ + 1.0Gk$_{inf}$ + 1.5(1.0Qks$_{sup}$ + 0.5Qkwp$_{sup}$) EHF Y-	-1.6	0.1	25.7	-0.0	-77.2	0.1
					Min F_y, Min M_z	32 1.25Gk$_{sup}$ + 1.0Gk$_{inf}$ + 1.5(0.5Qks$_{sup}$ + 1.0Qkwp) EHF X-	-0.1	-0.7	21.4	0.0	-64.7	-1.4
				2	Min F_y, Max M_z	6 1.25Gk + 1.5(0.5QkS + 1.0Qkwp) EHF X+	-0.1	-0.7	-14.3	0.0	-0.0	1.0
					Min F_x	7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	-3.0	0.2	-14.3	0.0	-0.0	-0.4

Reference	Span	Section	Grade	End	Condition	Combination	F_x [kN]	F_y [kN]	F_z [kN]	M_x [kNm]	M_y [kNm]	M_z [kNm]
					Max F_x	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	3.2	-0.2	-14.4	0.0	-0.0	0.5
					Max F_z	11 1.0Gk + 1.5(1.0Qkwu) EHF Y+	-3.0	0.2	0.2	0.0	-0.0	-0.4
					Min F_z	29 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(1.0Qks_{sup} + 0.5$Qkwp_{sup}$) EHF Y-	1.6	-0.1	-17.2	0.0	-0.0	0.2
					Max F_y, Min M_z	32 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp) EHF X-	0.1	0.7	-14.5	-0.0	-0.0	-1.0
SB 1/B/3-1/A/3	1	UB 305x102x25	S355	1	Min F_x	6 1.25Gk + 1.5(0.5QkS + 1.0Qkwp) EHF X+	-1.1	-0.4	6.9	0.0	-14.3	-0.4
					Max F_y, Max M_z	7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	-0.2	1.6	6.9	0.0	-14.3	1.8
					Max F_x	8 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF X-	0.9	0.4	6.9	0.0	-14.3	0.5
					Min F_y, Min M_z	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	0.2	-1.7	6.9	0.0	-14.3	-1.8
					Min F_z, Max M_y	10 1.0Gk + 1.5(1.0Qkwu) EHF X+	-1.1	-0.4	0.1	0.0	-0.3	-0.4
					Max F_z, Min M_y	28 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(1.0Qks_{sup} + 0.5$Qkwp_{sup}$) EHF X-	0.5	0.2	8.4	0.0	-17.8	0.2
				2	Max F_x	6 1.25Gk + 1.5(0.5QkS + 1.0Qkwp) EHF X+	1.1	-0.1	-1.8	0.0	0.0	0.0
					Max F_y	7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	0.2	0.5	-1.8	0.0	0.0	0.0
					Min F_x	8 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF X-	-0.9	0.1	-1.8	0.0	0.0	0.0
					Min F_y	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	-0.2	-0.6	-1.8	0.0	0.0	0.0
					Max F_z	10 1.0Gk + 1.5(1.0Qkwu) EHF X+	1.1	-0.1	-0.1	0.0	-0.0	0.0
					Min F_z	28 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(1.0Qks_{sup} + 0.5$Qkwp_{sup}$) EHF X-	-0.5	0.1	-2.4	0.0	0.0	0.0
SB 1/C/1-1/D/1	1	UB 305x102x25	S355	1	Max F_z, Min M_y	5 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF Y-	-0.3	0.7	5.2	0.0	-6.9	0.6
					Min F_x, Max F_y, Max M_z	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	-0.6	1.4	4.3	0.0	-5.9	1.2
					Max F_x, Min F_y, Min M_z	31 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp) EHF Y+	0.6	-1.5	1.9	-0.0	-1.3	-1.3
					Min F_z, Max M_y	35 1.0Gk + 1.5(1.0$Qkwu_{sup}$) EHF Y+	0.6	-1.4	-0.3	-0.0	1.4	-1.3
				2	Max M_y	2 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF X+	-0.1	-0.1	6.7	-0.0	11.5	0.2
					Max F_z	3 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF Y+	-0.3	-0.8	6.8	-0.0	11.5	0.7
					Min F_y, Max M_z	7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	-0.6	-1.5	5.7	-0.0	9.9	1.3
					Max F_x	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	0.6	1.4	5.7	-0.0	9.9	-1.3
					Min M_y	12 1.0Gk + 1.5(1.0Qkwu) EHF X-	0.3	0.2	0.1	-0.0	0.6	-0.3

Reference	Span	Section	Grade	End	Condition	Combination	F_x [kN]	F_y [kN]	F_z [kN]	M_x [kNm]	M_y [kNm]	M_z [kNm]
					Min F_x	31 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp) EHF Y+	-0.6	-1.5	2.9	0.0	4.4	1.3
					Max F_y, Min M_z	33 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp) EHF Y-	0.6	1.4	2.9	-0.0	4.4	-1.3
					Min F_z	37 1.0Gk + 1.5(1.0$Qkwu_{sup}$) EHF Y-	0.6	1.4	0.1	0.0	0.0	-1.3
SB 1/C/1a-1/D/1a	1	UB 305x102x33	S355	1	Max F_z	4 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF X-	-0.7	-0.1	4.6	0.0	-0.9	-0.1
					Max F_x	6 1.25Gk + 1.5(0.5QkS + 1.0Qkwp) EHF X+	0.9	0.2	3.2	0.0	0.2	0.3
					Max F_y, Max M_z	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	0.2	1.4	3.3	0.0	0.1	1.8
					Min F_z, Max M_y	10 1.0Gk + 1.5(1.0Qkwu) EHF X+	0.8	0.2	-3.0	0.0	4.5	0.3
					Min M_y	18 1.0Gk + 1.3(1.0Qks + 0.5Qkwp) EHF Y-	0.1	0.6	3.9	0.0	-0.9	0.8
					Min F_y, Min M_z	31 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp) EHF Y+	-0.2	-1.4	1.9	-0.0	1.3	-1.8
					Min F_x	32 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp) EHF X-	-1.3	-0.3	2.0	-0.0	1.1	-0.4
				2	Max F_z, Max M_y	2 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF X+	-0.5	-0.1	17.7	-0.0	40.4	0.2
					Min F_x	6 1.25Gk + 1.5(0.5QkS + 1.0Qkwp) EHF X+	-0.9	-0.2	14.7	-0.0	34.2	0.3
					Min F_y, Max M_z	7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	0.2	-1.3	14.7	-0.0	34.1	1.7
					Min F_z, Min M_y	12 1.0Gk + 1.5(1.0Qkwu) EHF X-	1.3	0.2	-1.7	-0.0	-0.5	-0.3
					Max F_x	32 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp) EHF X-	1.3	0.3	11.1	0.0	26.1	-0.4
					Max F_y, Min M_z	33 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp) EHF Y-	-0.2	1.4	11.1	0.0	26.2	-1.8
SB 1/C/2-1/C/1	1	UB 406x140x39	S355	1	Max F_z, Min M_y	5 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF Y-	2.8	0.0	27.6	0.0	-56.5	0.0
					Min F_y, Max M_x, Min M_z	6 1.25Gk + 1.5(0.5QkS + 1.0Qkwp) EHF X+	0.0	-2.6	21.8	0.2	-46.3	-1.4
					Max F_y, Min M_x, Max M_z	8 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF X-	0.0	2.6	21.8	-0.2	-46.3	1.4
					Max F_x	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	5.6	0.0	21.9	0.0	-46.6	0.0
					Min F_z, Max M_y	11 1.0Gk + 1.5(1.0Qkwu) EHF Y+	-5.6	0.0	-7.6	0.0	6.9	0.0
					Min F_x	31 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp) EHF Y+	-5.8	0.0	11.2	0.0	-21.1	0.0
				2	Min F_z	5 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF Y-	-1.4	0.0	-10.3	0.0	0.0	0.0

Reference	Span	Section	Grade	End	Condition	Combination	F_x [kN]	F_y [kN]	F_z [kN]	M_x [kNm]	M_y [kNm]	M_z [kNm]
					Max F_y, Min M_z	6 1.25Gk + 1.5(0.5QkS + 1.0Qkwp) EHF X+	-0.0	0.4	-8.6	-0.0	0.0	-0.6
					Min F_y, Max M_z	8 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF X-	-0.0	-0.4	-8.6	0.0	0.0	0.6
					Min F_x	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	-2.8	0.0	-8.7	0.0	0.0	0.0
					Max F_x	31 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp) EHF Y+	2.9	0.0	-3.8	0.0	-0.0	0.0
					Max F_z	35 1.0Gk + 1.5(1.0$Qkwu_{sup}$) EHF Y+	2.9	0.0	0.6	0.0	-0.0	0.0
SB 1/C/3-1/B/3	1	UB 305x102x25	S355	1	Max F_x, Min F_y, Min M_z	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	0.4	-1.5	4.6	0.0	-5.6	-1.3
					Min F_z, Max M_y	13 1.0Gk + 1.5(1.0Qkwu) EHF Y-	0.3	-1.4	-0.8	0.0	1.3	-1.2
					Max F_z, Min M_y	27 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(1.0Qks_{sup} + 0.5$Qkwp_{sup}$) EHF Y+	-0.2	0.7	5.8	0.0	-8.9	0.7
					Min F_x	30 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp) EHF X+	-0.4	-0.4	4.7	0.0	-7.0	-0.5
					Max F_y, Max M_z	31 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp) EHF Y+	-0.4	1.4	4.8	0.0	-7.2	1.3
				2	Max F_z	5 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF Y-	-0.2	-0.8	8.9	-0.0	16.8	0.7
					Max F_y, Min M_z	7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	0.3	1.4	7.4	-0.0	14.3	-1.3
					Min F_x	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	-0.4	-1.5	7.5	-0.0	14.3	1.3
					Min M_y	10 1.0Gk + 1.5(1.0Qkwu) EHF X+	0.4	0.4	-0.3	-0.0	0.3	-0.5
					Min F_z	11 1.0Gk + 1.5(1.0Qkwu) EHF Y+	0.3	1.4	-0.3	-0.0	0.4	-1.3
					Max M_y	28 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(1.0Qks_{sup} + 0.5$Qkwp_{sup}$) EHF X-	-0.1	-0.2	8.8	-0.0	17.8	0.3
					Max F_x	30 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp) EHF X+	0.4	0.4	7.4	-0.0	15.0	-0.5
					Min F_y, Max M_z	33 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp) EHF Y-	-0.3	-1.5	7.4	-0.0	15.0	1.4
SB 1/C/3-1/C/2	1	UB 406x140x39	S355	1	Max F_y, Max M_z	6 1.25Gk + 1.5(0.5QkS + 1.0Qkwp) EHF X+	-0.0	0.7	-9.3	-0.0	-0.0	1.0
					Min F_y, Min M_z	8 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF X-	-0.0	-0.7	-9.3	0.0	-0.0	-1.0
					Min F_x	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	-2.9	0.0	-9.3	0.0	-0.0	0.0
					Max F_z	13 1.0Gk + 1.5(1.0Qkwu) EHF Y-	-2.9	0.0	1.7	0.0	-0.0	0.0

Reference	Span	Section	Grade	End	Condition	Combination	F_x [kN]	F_y [kN]	F_z [kN]	M_x [kNm]	M_y [kNm]	M_z [kNm]
					Min F_z	27 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(1.0Qks_{sup} + 0.5$Qkwp_{sup}$) EHF Y+	1.4	0.0	-11.6	0.0	-0.0	0.0
					Max F_x	31 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp) EHF Y+	2.8	0.0	-9.6	0.0	-0.0	0.0
				2	Min F_y, Max M_z	6 1.25Gk + 1.5(0.5QkS + 1.0Qkwp) EHF X+	0.0	-0.7	16.1	0.0	45.8	1.4
					Max F_y, Min M_z	8 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF X-	0.0	0.7	16.1	-0.0	45.8	-1.4
					Max F_x	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	2.9	0.0	16.0	0.0	45.4	0.0
					Min F_z, Min M_y	13 1.0Gk + 1.5(1.0Qkwu) EHF Y-	2.9	0.0	-2.6	0.0	-7.7	0.0
					Max F_z, Max M_y	27 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(1.0Qks_{sup} + 0.5$Qkwp_{sup}$) EHF Y+	-1.4	0.0	19.8	0.0	56.6	0.0
					Min F_x	31 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp) EHF Y+	-2.8	0.0	16.3	0.0	46.5	0.0
SB 1/D/1-1/D/2	1	UB 406x140x39	S355	1	Min F_z	3 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF Y+	-1.6	0.2	-12.7	0.0	0.0	0.3
					Min F_y, Min M_z	6 1.25Gk + 1.5(0.5QkS + 1.0Qkwp) EHF X+	-0.1	-0.4	-10.8	0.0	0.0	-0.6
					Min F_x	7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	-3.2	0.3	-10.9	0.0	0.0	0.5
					Max F_x	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	3.0	-0.3	-10.8	0.0	0.0	-0.5
					Max F_y, Max M_z	32 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp) EHF X-	0.1	0.5	-5.4	0.0	0.0	0.7
					Max F_z	37 1.0Gk + 1.5(1.0$Qkwu_{sup}$) EHF Y-	3.0	-0.3	-0.3	0.0	-0.0	-0.5
				2	Max F_z, Max M_y	3 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF Y+	3.0	-0.1	55.5	0.1	78.2	-0.1
					Max F_y	6 1.25Gk + 1.5(0.5QkS + 1.0Qkwp) EHF X+	0.1	2.5	46.3	-0.1	65.8	-1.3
					Max F_x	7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	6.0	-0.2	46.4	0.0	65.9	-0.3
					Max M_x, Max M_z	8 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF X-	-0.1	-2.5	46.3	0.2	65.7	1.3
					Min M_x	10 1.0Gk + 1.5(1.0Qkwu) EHF X+	0.1	2.4	-3.0	-0.1	-1.3	-1.3
					Min F_z, Min M_y	13 1.0Gk + 1.5(1.0Qkwu) EHF Y-	-5.7	0.2	-3.1	0.0	-1.5	0.3
					Min M_z	30 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp) EHF X+	0.0	2.4	30.7	-0.1	35.9	-1.3
					Min F_y	32 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp) EHF X-	-0.1	-2.5	30.6	0.2	35.8	1.3

Reference	Span	Section	Grade	End	Condition	Combination	F_x [kN]	F_y [kN]	F_z [kN]	M_x [kNm]	M_y [kNm]	M_z [kNm]
					Min F_x	33 1.25Gk$_{sup}$ + 1.0Gk$_{inf}$ + 1.5(0.5Qks$_{sup}$ + 1.0Qkwp) EHF Y-	-5.8	0.2	30.6	0.0	35.7	0.3
SB 1/D/1-1/E/1	1	UB 305x102x25	S355	1	Max F_z, Min M_y	2 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF X+	0.3	0.1	6.0	0.0	-11.5	0.2
					Max F_x	6 1.25Gk + 1.5(0.5QkS + 1.0Qkwp) EHF X+	0.6	0.2	5.1	0.0	-9.9	0.3
					Min F_y, Min M_z	7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	0.3	-1.7	5.1	0.0	-9.9	-1.9
					Min F_x	8 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF X-	-0.7	-0.2	5.1	0.0	-9.8	-0.3
					Max F_y, Max M_z	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	-0.3	1.6	5.1	0.0	-9.9	1.8
					Max M_y	12 1.0Gk + 1.5(1.0Qkwu) EHF X-	-0.7	-0.2	0.4	0.0	-0.6	-0.3
					Min F_z	36 1.0Gk + 1.5(1.0Qkwu$_{sup}$) EHF X-	-0.7	-0.2	0.2	0.0	-0.0	-0.3
				2	Min F_z	2 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF X+	-0.3	-0.0	-1.0	0.0	0.0	0.0
					Min F_x	6 1.25Gk + 1.5(0.5QkS + 1.0Qkwp) EHF X+	-0.6	-0.0	-0.9	0.0	0.0	0.0
					Min F_y	7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	-0.3	-0.6	-0.8	0.0	0.0	0.0
					Max F_x	8 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF X-	0.7	0.0	-0.8	0.0	0.0	0.0
					Max F_y	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	0.3	0.5	-0.9	0.0	0.0	0.0
					Max F_z	36 1.0Gk + 1.5(1.0Qkwu$_{sup}$) EHF X-	0.7	0.0	0.2	0.0	0.0	0.0
SB 1/D/1a-1/E/1a	1	UB 305x102x33	S355	1	Max F_z, Min M_y	4 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF X-	-1.7	-0.1	16.6	-0.0	-40.4	-0.2
					Max F_x	6 1.25Gk + 1.5(0.5QkS + 1.0Qkwp) EHF X+	2.9	0.2	13.8	-0.0	-34.1	0.4
					Min F_y, Min M_z	7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	-0.1	-1.4	13.8	-0.0	-34.1	-2.6
					Min F_x	8 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF X-	-3.4	-0.2	13.9	-0.0	-34.2	-0.4
					Max F_y, Max M_z	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	0.1	1.4	13.8	-0.0	-34.1	2.6
					Min F_z, Max M_y	10 1.0Gk + 1.5(1.0Qkwu) EHF X+	2.8	0.2	-0.8	0.0	0.4	0.3
				2	Min F_z	4 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF X-	1.7	-0.1	-8.0	0.0	-0.0	0.1
					Min F_x	6 1.25Gk + 1.5(0.5QkS + 1.0Qkwp) EHF X+	-2.9	0.1	-6.8	0.0	-0.0	-0.2
					Max F_y, Min M_z	7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	0.1	1.0	-6.8	0.0	-0.0	-1.5
					Max F_x	8 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF X-	3.4	-0.1	-6.9	0.0	-0.0	0.2
					Min F_y, Max M_z	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	-0.1	-1.0	-6.8	0.0	-0.0	1.5
					Max F_z	10 1.0Gk + 1.5(1.0Qkwu) EHF X+	-2.8	0.1	-0.6	-0.0	0.0	-0.2
SB 1/D/2-1/D/3	1	UB 406x140x39	S355	1	Max F_x	7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	3.0	0.2	21.3	0.0	-64.0	0.2

Reference	Span	Section	Grade	End	Condition	Combination	F_x [kN]	F_y [kN]	F_z [kN]	M_x [kNm]	M_y [kNm]	M_z [kNm]
					Min F_y, Min M_z	8 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF X-	0.1	-0.7	21.3	0.0	-64.1	-1.4
					Min F_x	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	-3.2	-0.2	21.4	0.0	-64.4	-0.3
					Min F_z, Max M_y	11 1.0Gk + 1.5(1.0Qkwu) EHF Y+	3.0	0.2	-1.3	0.0	2.6	0.2
					Max F_z, Min M_y	29 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(1.0Qks_{sup} + 0.5$Qkwp_{sup}$) EHF Y-	-1.6	-0.1	25.7	0.0	-77.2	-0.1
					Max F_y, Max M_z	30 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp) EHF X+	-0.1	0.7	21.4	-0.0	-64.7	1.4
				2	Min F_x	7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	-3.0	-0.2	-14.3	-0.0	-0.0	0.4
					Max F_y, Min M_z	8 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF X-	-0.1	0.7	-14.3	-0.0	-0.0	-1.0
					Max F_x	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	3.2	0.2	-14.4	-0.0	-0.0	-0.5
					Max F_z	11 1.0Gk + 1.5(1.0Qkwu) EHF Y+	-3.0	-0.2	0.2	-0.0	-0.0	0.4
					Min F_z	29 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(1.0Qks_{sup} + 0.5$Qkwp_{sup}$) EHF Y-	1.6	0.1	-17.2	-0.0	-0.0	-0.2
					Min F_y, Max M_z	30 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp) EHF X+	0.1	-0.7	-14.5	0.0	-0.0	1.0
SB 1/D/3-1/C/3	1	UB 305x102x25	S355	1	Max F_z	5 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF Y-	0.2	-0.8	8.9	-0.0	-16.8	-0.7
					Max F_y, Max M_z	7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	-0.3	1.4	7.4	-0.0	-14.3	1.3
					Max F_x	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	0.4	-1.5	7.5	-0.0	-14.3	-1.3
					Min F_z	11 1.0Gk + 1.5(1.0Qkwu) EHF Y+	-0.3	1.4	-0.3	-0.0	-0.4	1.3
					Max M_y	12 1.0Gk + 1.5(1.0Qkwu) EHF X-	-0.4	0.4	-0.3	-0.0	-0.3	0.5
					Min M_y	26 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(1.0Qks_{sup} + 0.5$Qkwp_{sup}$) EHF X+	0.1	-0.2	8.8	-0.0	-17.8	-0.3
					Min F_x	32 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp) EHF X-	-0.4	0.4	7.4	-0.0	-15.0	0.5
					Min F_y, Min M_z	33 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp) EHF Y-	0.3	-1.5	7.4	-0.0	-15.0	-1.4
				2	Min F_x, Min F_y, Max M_z	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	-0.4	-1.5	4.6	0.0	5.6	1.3
					Min F_z, Min M_y	13 1.0Gk + 1.5(1.0Qkwu) EHF Y-	-0.3	-1.4	-0.8	0.0	-1.3	1.2
					Max F_z, Max M_y	27 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(1.0Qks_{sup} + 0.5$Qkwp_{sup}$) EHF Y+	0.2	0.7	5.8	0.0	8.9	-0.7

Reference	Span	Section	Grade	End	Condition	Combination	F_x [kN]	F_y [kN]	F_z [kN]	M_x [kNm]	M_y [kNm]	M_z [kNm]
					Max F_y, Min M_z	31 1.25Gk$_{sup}$ + 1.0Gk$_{inf}$ + 1.5(0.5Qks$_{sup}$ + 1.0Qkwp) EHF Y+	0.4	1.4	4.8	0.0	7.2	-1.3
					Max F_x	32 1.25Gk$_{sup}$ + 1.0Gk$_{inf}$ + 1.5(0.5Qks$_{sup}$ + 1.0Qkwp) EHF X-	0.4	-0.4	4.7	0.0	7.0	0.5
SB 1/E/1-1/E/1a	1	UB 305x102x25	S355	1	Max F_z	2 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF X+	-0.0	0.3	1.0	0.0	0.0	0.0
					Max F_y	6 1.25Gk + 1.5(0.5QkS + 1.0Qkwp) EHF X+	-0.0	0.6	0.9	0.0	0.0	0.0
					Min F_x	7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	-0.6	0.3	0.8	0.0	0.0	0.0
					Min F_y	8 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF X-	0.0	-0.7	0.8	0.0	0.0	0.0
					Max F_x	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	0.5	-0.3	0.9	0.0	0.0	0.0
					Min F_z	36 1.0Gk + 1.5(1.0Qkwu$_{sup}$) EHF X-	0.0	-0.7	-0.2	0.0	0.0	0.0
				2	Max F_z, Max M_y	4 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF X-	-0.0	-0.8	3.8	-0.0	4.3	0.7
					Max F_y, Min M_z	6 1.25Gk + 1.5(0.5QkS + 1.0Qkwp) EHF X+	0.0	1.3	3.2	-0.0	3.7	-1.1
					Max F_x	7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	0.6	-0.3	3.2	-0.0	3.7	0.8
					Min F_y, Max M_z	8 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF X-	-0.0	-1.5	3.2	-0.0	3.7	1.3
					Min F_x	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	-0.5	0.3	3.2	-0.0	3.7	-0.8
					Min F_z, Min M_y	10 1.0Gk + 1.5(1.0Qkwu) EHF X+	0.0	1.3	0.3	0.0	0.4	-1.1
SB 1/E/1a-1/E/3	1	UB 305x102x25	S355	1	Max F_z, Min M_y	4 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF X-	-0.1	-0.9	4.2	-0.0	-4.3	-0.8
					Max F_y, Max M_z	6 1.25Gk + 1.5(0.5QkS + 1.0Qkwp) EHF X+	0.1	1.6	3.6	-0.0	-3.7	1.3
					Max F_x	7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	0.5	0.2	3.6	-0.0	-3.7	0.6
					Min F_y, Min M_z	8 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF X-	-0.1	-1.8	3.6	-0.0	-3.7	-1.5
					Min F_x	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	-0.6	-0.2	3.6	-0.0	-3.7	-0.6
					Min F_z, Max M_y	10 1.0Gk + 1.5(1.0Qkwu) EHF X+	0.1	1.5	0.3	0.0	-0.4	1.3
				2	Max F_y	6 1.25Gk + 1.5(0.5QkS + 1.0Qkwp) EHF X+	-0.1	0.9	1.8	0.0	0.0	0.0
					Min F_x	7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	-0.5	-0.2	1.8	0.0	0.0	0.0
					Min F_y	8 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF X-	0.1	-1.1	1.8	0.0	0.0	0.0
					Max F_x	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	0.6	0.2	1.8	0.0	0.0	0.0
					Min F_z	12 1.0Gk + 1.5(1.0Qkwu) EHF X-	0.1	-1.1	0.1	-0.0	0.0	0.0
					Max F_z	26 1.25Gk$_{sup}$ + 1.0Gk$_{inf}$ + 1.5(1.0Qks$_{sup}$ + 0.5Qkwp$_{sup}$) EHF X+	-0.1	0.5	2.4	0.0	0.0	0.0

Reference	Span	Section	Grade	End	Condition	Combination	F_x [kN]	F_y [kN]	F_z [kN]	M_x [kNm]	M_y [kNm]	M_z [kNm]
SB 1/E/3-1/D/3	1	UB 305x102x25	S355	1	Max F_x	6 1.25Gk + 1.5(0.5QkS + 1.0Qkwp) EHF X+	0.9	0.1	-1.8	0.0	-0.0	0.0
					Max F_y	7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	-0.2	0.5	-1.8	0.0	-0.0	0.0
					Min F_x	8 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF X-	-1.1	-0.1	-1.8	0.0	-0.0	0.0
					Min F_y	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	0.2	-0.6	-1.8	0.0	-0.0	0.0
					Max F_z	12 1.0Gk + 1.5(1.0Qkwu) EHF X-	-1.1	-0.1	-0.1	0.0	0.0	0.0
					Min F_z	26 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(1.0Qks_{sup} + 0.5$Qkwp_{sup}$) EHF X+	0.5	0.1	-2.4	0.0	-0.0	0.0
				2	Min F_x	6 1.25Gk + 1.5(0.5QkS + 1.0Qkwp) EHF X+	-0.9	0.4	6.9	0.0	14.3	-0.5
					Max F_y, Min M_z	7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	0.2	1.6	6.9	0.0	14.3	-1.8
					Max F_x	8 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF X-	1.1	-0.4	6.9	0.0	14.3	0.4
					Min F_y, Max M_z	9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	-0.2	-1.7	6.9	0.0	14.3	1.8
					Min F_z, Min M_y	12 1.0Gk + 1.5(1.0Qkwu) EHF X-	1.1	-0.4	0.1	0.0	0.3	0.4
					Max F_z, Max M_y	26 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(1.0Qks_{sup} + 0.5$Qkwp_{sup}$) EHF X+	-0.5	0.2	8.4	0.0	17.8	-0.2

Foundation Reactions

Base Reactions

Foundation Reactions by Load case (Unfactored), First-order linear

Supports

Reference	Size	Loadcase	Reactions					
			F_x [kN]	F_y [kN]	F_z [kN]	M_x [kNm]	M_y [kNm]	M_z [kNm]
SC B/2	RHS 400x200x10.0	1 Self weight - excluding slabs	-0.0	-0.0	17.5	-1.1	-0.0	-0.0
		3 Roof Dead	-0.0	-0.0	14.2	-0.1	-0.0	-0.0
		4 Roof Dead (unfavourable)	-0.0	0.1	7.9	13.3	-0.0	0.0
		5 Roof Dead (favourable)	0.0	-0.1	6.3	-13.3	0.0	-0.0
		6 Roof Services	-0.0	-0.0	2.5	-0.0	-0.0	-0.0
		7 Roof Services (unfavourable)	-0.0	0.0	1.4	2.0	-0.0	0.0
		8 Roof Services (favourable)	-0.0	-0.0	1.1	-2.0	0.0	-0.0
		9 Roof Imposed	-0.0	-0.0	29.9	-0.1	-0.0	-0.0
		10 Roof Imposed (unfavourable)	-0.0	0.1	17.0	24.5	-0.0	0.0
		11 Snow	-0.0	-0.0	25.9	-0.1	-0.0	-0.0
		12 Snow (unfavourable)	-0.0	0.0	14.8	21.2	-0.0	0.0
		13 Wind Pressure Wkp	-0.0	-0.0	8.0	-0.0	-0.0	-0.0
		14 Wkp (unfavourable)	-0.0	0.0	4.5	6.5	-0.0	0.0
		15 Wind Suction Wku	0.0	0.0	-19.9	0.0	0.0	0.0
		16 Wku (unfavourable)	0.0	0.0	-8.6	16.4	-0.0	0.0
		17 Lateral Wind Wk X+	-4.8	0.0	-0.0	-0.1	-29.9	0.1
		18 Lateral Wind Wk Y+	-0.0	-8.5	0.0	52.8	-0.1	0.0
		19 Lateral Wind Wk X-	4.8	-0.0	0.0	0.1	29.9	-0.1
		20 Lateral Wind Wk Y-	0.0	8.5	-0.0	-52.8	0.1	-0.0
		21 Accidental Load Ax-x	-75.0	0.0	-0.0	0.0	-112.4	0.0
		22 Accidental Load Ay-y	0.0	-75.0	0.0	112.5	0.0	0.0
SC C/2	RHS 400x200x10.0	1 Self weight - excluding slabs	0.0	0.0	10.4	-0.8	0.0	0.0
		3 Roof Dead	0.0	0.0	6.0	0.1	0.0	0.0
		4 Roof Dead (unfavourable)	0.0	-0.1	3.3	10.7	0.0	0.0
		5 Roof Dead (favourable)	0.0	0.1	2.8	-10.6	0.0	0.0
		6 Roof Services	0.0	0.0	1.7	0.0	0.0	0.0
		7 Roof Services (unfavourable)	0.0	-0.0	1.0	1.8	0.0	0.0
		8 Roof Services (favourable)	0.0	0.0	0.7	-1.8	0.0	0.0
		9 Roof Imposed	0.0	0.0	20.6	0.1	0.0	0.0
		10 Roof Imposed (unfavourable)	0.0	-0.1	11.7	21.9	0.0	0.0
		11 Snow	0.0	0.0	17.9	0.1	0.0	0.0
		12 Snow (unfavourable)	0.0	-0.1	10.2	19.0	0.0	0.0
		13 Wind Pressure Wkp	0.0	0.0	5.5	0.0	0.0	0.0
		14 Wkp (unfavourable)	0.0	-0.0	3.1	5.8	0.0	0.0
		15 Wind Suction Wku	0.0	-0.0	-13.8	-0.1	0.0	0.0

Reference	Size	Loadcase	Reactions					
			F_x [kN]	F_y [kN]	F_z [kN]	M_x [kNm]	M_y [kNm]	M_z [kNm]
		16 Wku (unfavourable)	0.0	-0.1	-6.0	14.5	0.0	0.0
		17 Lateral Wind Wk X+	-4.8	0.0	-0.0	-0.0	-29.9	0.1
		18 Lateral Wind Wk Y+	0.0	-8.2	-0.0	51.3	0.0	0.0
		19 Lateral Wind Wk X-	4.8	0.0	-0.0	-0.0	29.9	-0.1
		20 Lateral Wind Wk Y-	0.0	8.2	0.0	-51.3	0.0	0.0
		21 Accidental Load Ax-x	-75.0	0.0	0.0	0.0	-112.4	-0.0
		22 Accidental Load Ay-y	0.0	-75.0	0.0	112.5	0.0	0.0
SC D/2	RHS 400x200x10.0	1 Self weight - excluding slabs	0.0	-0.0	17.5	-1.1	0.0	0.0
		3 Roof Dead	0.0	-0.0	14.2	-0.1	0.0	0.0
		4 Roof Dead (unfavourable)	0.0	0.1	7.9	13.3	0.0	-0.0
		5 Roof Dead (favourable)	-0.0	-0.1	6.3	-13.3	-0.0	0.0
		6 Roof Services	0.0	-0.0	2.5	-0.0	0.0	0.0
		7 Roof Services (unfavourable)	0.0	0.0	1.4	2.0	0.0	-0.0
		8 Roof Services (favourable)	0.0	-0.0	1.1	-2.0	-0.0	0.0
		9 Roof Imposed	0.0	-0.0	29.9	-0.1	0.0	0.0
		10 Roof Imposed (unfavourable)	0.0	0.1	17.0	24.5	0.0	-0.0
		11 Snow	0.0	-0.0	25.9	-0.1	0.0	0.0
		12 Snow (unfavourable)	0.0	0.0	14.8	21.2	0.0	-0.0
		13 Wind Pressure Wkp	0.0	-0.0	8.0	-0.0	0.0	0.0
		14 Wkp (unfavourable)	0.0	0.0	4.5	6.5	0.0	-0.0
		15 Wind Suction Wku	-0.0	0.0	-19.9	0.0	-0.0	-0.0
		16 Wku (unfavourable)	-0.0	0.0	-8.6	16.4	0.0	-0.0
		17 Lateral Wind Wk X+	-4.8	-0.0	0.0	0.1	-29.9	0.1
		18 Lateral Wind Wk Y+	0.0	-8.5	0.0	52.8	0.1	-0.0
		19 Lateral Wind Wk X-	4.8	0.0	-0.0	-0.1	29.9	-0.1
		20 Lateral Wind Wk Y-	-0.0	8.5	-0.0	-52.8	-0.1	0.0
		21 Accidental Load Ax-x	-75.0	0.0	0.0	-0.0	-112.4	0.0
		22 Accidental Load Ay-y	0.0	-75.0	0.0	112.5	0.0	0.0

Note: When considering wind pressure, Wkp (+ve wind) and wind uplifts, Wku (-ve wind) load is applied in conjunction with the horizontal wind loads in the desired direction (Wk X+, Wk Y+, Wk X-, Wk Y-).

Appendix D

Base Reactions

Foundation Reactions by Load case (Unfactored), First-order linear

Supports

Reference	Size	Combination	Reactions					
			F_x [kN]	F_y [kN]	F_z [kN]	M_x [kNm]	M_y [kNm]	M_z [kNm]
SC B/2	RHS 400x200x10.0	1 1.25Gk + 1.5(1.0Qki)	-0.0	-0.0	87.5	-1.5	-0.0	-0.0
		2 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF X+	-4.2	-0.0	87.8	-1.6	-25.9	0.1
		3 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF Y+	-0.0	-7.2	87.8	42.7	-0.1	0.0
		4 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF X-	4.2	-0.0	87.8	-1.5	23.6	-0.0
		5 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF Y-	-0.0	7.1	87.8	-43.3	0.0	-0.0
		6 1.25Gk + 1.5(0.5QkS + 1.0Qkwp) EHF X+	-7.8	0.0	74.4	-1.6	-48.3	0.1
		7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	-0.0	-13.6	74.5	82.7	-0.1	0.1
		8 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF X-	7.8	-0.0	74.5	-1.4	46.6	-0.1
		9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	0.0	13.6	74.5	-83.9	0.1	-0.1
		10 1.0Gk + 1.5(1.0Qkwu) EHF X+	-7.5	0.0	1.2	-1.2	-46.4	0.1
		11 1.0Gk + 1.5(1.0Qkwu) EHF Y+	-0.0	-13.2	1.3	80.5	-0.1	0.1
		12 1.0Gk + 1.5(1.0Qkwu) EHF X-	7.5	-0.0	1.3	-0.9	45.7	-0.1
		13 1.0Gk + 1.5(1.0Qkwu) EHF Y-	0.0	13.2	1.2	-81.8	0.1	-0.1
		14 1.0Gk + 1.3(1.0Qki)	-0.0	-0.0	72.9	-1.2	-0.0	-0.0
		15 1.0Gk + 1.3(1.0Qks + 0.5Qkwp) EHF X+	-3.6	-0.0	73.2	-1.3	-22.1	0.0
		16 1.0Gk + 1.3(1.0Qks + 0.5Qkwp) EHF Y+	-0.0	-6.2	73.2	36.6	-0.1	0.0
		17 1.0Gk + 1.3(1.0Qks + 0.5Qkwp) EHF X-	3.6	-0.0	73.2	-1.2	20.3	-0.0
		18 1.0Gk + 1.3(1.0Qks + 0.5Qkwp) EHF Y-	-0.0	6.1	73.2	-37.1	0.0	-0.0
		19 1.0Gk + 1.3(0.5Qks + 1.0Qkwp) EHF X+	-6.7	0.0	61.6	-1.3	-41.5	0.1
		20 1.0Gk + 1.3(0.5Qks + 1.0Qkwp) EHF Y+	-0.0	-11.7	61.6	71.2	-0.1	0.0
		21 1.0Gk + 1.3(0.5Qks + 1.0Qkwp) EHF X-	6.7	-0.0	61.7	-1.1	40.1	-0.1
		22 1.0Gk + 1.3(0.5Qks + 1.0Qkwp) EHF Y-	0.0	11.7	61.6	-72.1	0.1	-0.1
		23 1.0Gk + 1.0Ax-x	-75.0	-0.0	34.1	-1.1	-112.4	-0.0
		24 1.0Gk + 1.0Ay-y	-0.0	-75.0	34.1	111.4	-0.0	-0.0
		25 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(1.0Qki_{sup})	-0.0	0.1	66.4	39.2	-0.0	0.0
		26 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(1.0Qks_{sup} +	-4.1	0.1	66.5	39.3	-25.0	0.1
		27 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(1.0Qks_{sup} +	-0.0	-6.9	66.5	82.4	-0.1	0.0
		28 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(1.0Qks_{sup} +	4.0	0.1	66.5	39.4	23.3	-0.0
		29 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(1.0Qks_{sup} +	-0.0	7.1	66.5	-1.9	0.0	-0.0
		30 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} +	-7.7	0.1	58.9	28.3	-47.6	0.1
		31 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} +	-0.0	-13.4	58.9	111.7	-0.1	0.1
		32 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} +	7.7	0.0	59.0	28.6	46.3	-0.1
		33 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} +	0.0	13.5	58.9	-53.3	0.1	-0.0
		34 1.0Gk + 1.5(1.0$Qkwu_{sup}$) EHF X+	-7.5	0.1	18.5	23.8	-46.5	0.1
		35 1.0Gk + 1.5(1.0$Qkwu_{sup}$) EHF Y+	-0.0	-13.2	18.6	105.5	-0.1	0.1

Reference	Size	Combination	Reactions					
			F_x [kN]	F_y [kN]	F_z [kN]	M_x [kNm]	M_y [kNm]	M_z [kNm]
		36 1.0Gk + 1.5(1.0Qkwu$_{sup}$) EHF X-	7.5	0.0	18.6	24.0	45.7	-0.1
		37 1.0Gk + 1.5(1.0Qkwu$_{sup}$) EHF Y-	0.0	13.3	18.6	-56.8	0.1	-0.0
SC C/2	RHS 400x200x10.0	1 1.25Gk + 1.5(1.0Qki)	0.0	0.0	53.7	-0.7	0.0	0.0
		2 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF X+	-4.2	0.0	54.0	-0.7	-25.8	0.0
		3 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF Y+	0.0	-6.7	53.9	41.6	0.0	0.0
		4 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF X-	4.2	0.0	54.0	-0.7	23.6	-0.0
		5 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF Y-	0.0	6.8	54.0	-41.3	0.0	0.0
		6 1.25Gk + 1.5(0.5QkS + 1.0Qkwp) EHF X+	-7.8	0.0	44.8	-0.8	-48.2	0.1
		7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	0.0	-13.0	44.7	80.5	0.0	0.0
		8 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF X-	7.8	0.0	44.8	-0.8	46.6	-0.1
		9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	0.0	13.0	44.8	-80.8	0.0	0.0
		10 1.0Gk + 1.5(1.0Qkwu) EHF X+	-7.5	0.0	-4.5	-0.9	-46.4	0.1
		11 1.0Gk + 1.5(1.0Qkwu) EHF Y+	0.0	-12.6	-4.6	78.1	0.0	0.0
		12 1.0Gk + 1.5(1.0Qkwu) EHF X-	7.5	0.0	-4.5	-0.9	45.7	-0.1
		13 1.0Gk + 1.5(1.0Qkwu) EHF Y-	0.0	12.7	-4.5	-79.3	0.0	0.0
		14 1.0Gk + 1.3(1.0Qki)	0.0	0.0	45.0	-0.5	0.0	0.0
		15 1.0Gk + 1.3(1.0Qks + 0.5Qkwp) EHF X+	-3.6	0.0	45.2	-0.5	-22.1	0.0
		16 1.0Gk + 1.3(1.0Qks + 0.5Qkwp) EHF Y+	0.0	-5.8	45.2	35.8	0.0	0.0
		17 1.0Gk + 1.3(1.0Qks + 0.5Qkwp) EHF X-	3.6	0.0	45.2	-0.5	20.3	-0.0
		18 1.0Gk + 1.3(1.0Qks + 0.5Qkwp) EHF Y-	0.0	5.8	45.2	-35.4	0.0	0.0
		19 1.0Gk + 1.3(0.5Qks + 1.0Qkwp) EHF X+	-6.7	0.0	37.2	-0.6	-41.4	0.1
		20 1.0Gk + 1.3(0.5Qks + 1.0Qkwp) EHF Y+	0.0	-11.2	37.2	69.3	0.0	0.0
		21 1.0Gk + 1.3(0.5Qks + 1.0Qkwp) EHF X-	6.7	0.0	37.2	-0.6	40.1	-0.1
		22 1.0Gk + 1.3(0.5Qks + 1.0Qkwp) EHF Y-	0.0	11.2	37.2	-69.5	0.0	0.0
		23 1.0Gk + 1.0Ax-x	-75.0	0.0	18.2	-0.7	-112.4	-0.0
		24 1.0Gk + 1.0Ay-y	0.0	-75.0	18.2	111.8	0.0	0.0
		25 1.25Gk$_{sup}$ + 1.0Gk$_{inf}$ + 1.5(1.0Qki$_{sup}$)	0.0	-0.2	39.5	35.1	0.0	0.0
		26 1.25Gk$_{sup}$ + 1.0Gk$_{inf}$ + 1.5(1.0Qks$_{sup}$ + 0.5Qkwp$_{sup}$) EHF X+	-4.0	-0.2	39.5	35.3	-24.9	0.0
		27 1.25Gk$_{sup}$ + 1.0Gk$_{inf}$ + 1.5(1.0Qks$_{sup}$ + 0.5Qkwp$_{sup}$) EHF Y+	0.0	-6.8	39.5	76.6	0.0	0.0
		28 1.25Gk$_{sup}$ + 1.0Gk$_{inf}$ + 1.5(1.0Qks$_{sup}$ + 0.5Qkwp$_{sup}$) EHF X-	4.0	-0.2	39.5	35.3	23.3	-0.0
		29 1.25Gk$_{sup}$ + 1.0Gk$_{inf}$ + 1.5(1.0Qks$_{sup}$ + 0.5Qkwp$_{sup}$) EHF Y-	0.0	6.4	39.6	-4.8	0.0	0.0
		30 1.25Gk$_{sup}$ + 1.0Gk$_{inf}$ + 1.5(0.5Qks$_{sup}$ + 1.0Qkwp) EHF X+	-7.7	-0.1	34.3	25.5	-47.6	0.1
		31 1.25Gk$_{sup}$ + 1.0Gk$_{inf}$ + 1.5(0.5Qks$_{sup}$ + 1.0Qkwp) EHF Y+	0.0	-13.0	34.3	106.0	0.0	0.0
		32 1.25Gk$_{sup}$ + 1.0Gk$_{inf}$ + 1.5(0.5Qks$_{sup}$ + 1.0Qkwp) EHF X-	7.7	-0.1	34.3	25.5	46.3	-0.1
		33 1.25Gk$_{sup}$ + 1.0Gk$_{inf}$ + 1.5(0.5Qks$_{sup}$ + 1.0Qkwp) EHF Y-	0.0	12.8	34.4	-54.0	0.0	0.0
		34 1.0Gk + 1.5(1.0Qkwu$_{sup}$) EHF X+	-7.5	-0.1	7.4	21.5	-46.4	0.1
		35 1.0Gk + 1.5(1.0Qkwu$_{sup}$) EHF Y+	0.0	-12.7	7.4	100.4	0.0	0.0
		36 1.0Gk + 1.5(1.0Qkwu$_{sup}$) EHF X-	7.5	-0.1	7.4	21.5	45.7	-0.1
		37 1.0Gk + 1.5(1.0Qkwu$_{sup}$) EHF Y-	0.0	12.5	7.4	-57.0	0.0	0.0
SC D/2	RHS 400x200x10.0	1 1.25Gk + 1.5(1.0Qki)	0.0	-0.0	87.5	-1.5	0.0	0.0
		2 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF X+	-4.2	-0.0	87.8	-1.5	-25.8	0.1

Reference	Size	Combination	Reactions					
			F_x [kN]	F_y [kN]	F_z [kN]	M_x [kNm]	M_y [kNm]	M_z [kNm]
		3 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF Y+	0.0	-7.2	87.8	42.7	0.1	-0.0
		4 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF X-	4.2	-0.0	87.8	-1.6	23.7	-0.0
		5 1.25Gk + 1.5(1.0Qks + 0.5Qkwp) EHF Y-	0.0	7.1	87.8	-43.3	-0.0	0.0
		6 1.25Gk + 1.5(0.5QkS + 1.0Qkwp) EHF X+	-7.8	-0.0	74.5	-1.4	-48.2	0.1
		7 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y+	0.0	-13.6	74.5	82.7	0.1	-0.1
		8 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF X-	7.8	0.0	74.4	-1.6	46.6	-0.1
		9 1.25Gk + 1.5(0.5Qks + 1.0Qkwp) EHF Y-	-0.0	13.6	74.5	-83.9	-0.1	0.1
		10 1.0Gk + 1.5(1.0Qkwu) EHF X+	-7.5	-0.0	1.3	-0.9	-46.4	0.1
		11 1.0Gk + 1.5(1.0Qkwu) EHF Y+	0.0	-13.2	1.3	80.5	0.1	-0.1
		12 1.0Gk + 1.5(1.0Qkwu) EHF X-	7.5	0.0	1.2	-1.2	45.7	-0.1
		13 1.0Gk + 1.5(1.0Qkwu) EHF Y-	-0.0	13.2	1.2	-81.8	-0.1	0.1
		14 1.0Gk + 1.3(1.0Qki)	0.0	-0.0	72.9	-1.2	0.0	0.0
		15 1.0Gk + 1.3(1.0Qks + 0.5Qkwp) EHF X+	-3.6	-0.0	73.2	-1.2	-22.1	0.1
		16 1.0Gk + 1.3(1.0Qks + 0.5Qkwp) EHF Y+	0.0	-6.2	73.2	36.6	0.1	-0.0
		17 1.0Gk + 1.3(1.0Qks + 0.5Qkwp) EHF X-	3.6	-0.0	73.2	-1.3	20.3	-0.0
		18 1.0Gk + 1.3(1.0Qks + 0.5Qkwp) EHF Y-	0.0	6.1	73.2	-37.1	-0.0	0.0
		19 1.0Gk + 1.3(0.5Qks + 1.0Qkwp) EHF X+	-6.7	-0.0	61.7	-1.1	-41.4	0.1
		20 1.0Gk + 1.3(0.5Qks + 1.0Qkwp) EHF Y+	0.0	-11.7	61.6	71.2	0.1	-0.0
		21 1.0Gk + 1.3(0.5Qks + 1.0Qkwp) EHF X-	6.7	0.0	61.6	-1.3	40.1	-0.1
		22 1.0Gk + 1.3(0.5Qks + 1.0Qkwp) EHF Y-	-0.0	11.7	61.6	-72.1	-0.1	0.1
		23 1.0Gk + 1.0Ax-x	-75.0	-0.0	34.2	-1.1	-112.4	0.0
		24 1.0Gk + 1.0Ay-y	0.0	-75.0	34.1	111.4	0.0	0.0
		25 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(1.0Qki_{sup})	0.0	0.1	66.4	39.2	0.0	-0.0
		26 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(1.0Qks_{sup} + 0.5Qkwp) EHF Y+	-4.0	0.1	66.5	39.4	-24.9	0.0
		27 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(1.0Qks_{sup} + 0.5Qkwp) EHF Y+	0.0	-6.9	66.5	82.4	0.1	-0.0
		28 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(1.0Qks_{sup} + 0.5Qkwp) EHF X-	4.1	0.1	66.5	39.3	23.4	-0.1
		29 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(1.0Qks_{sup} + 0.5Qkwp) EHF X-	0.0	7.1	66.5	-1.9	-0.0	0.0
		30 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp) EHF Y+	-7.7	0.0	59.0	28.6	-47.6	0.1
		31 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp) EHF Y+	0.0	-13.4	58.9	111.7	0.1	-0.1
		32 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp) EHF X-	7.7	0.1	58.9	28.3	46.3	-0.1
		33 1.25Gk_{sup} + 1.0Gk_{inf} + 1.5(0.5Qks_{sup} + 1.0Qkwp) EHF X-	-0.0	13.5	58.9	-53.3	-0.1	0.0
		34 1.0Gk + 1.5(1.0$Qkwu_{sup}$) EHF X+	-7.5	0.0	18.6	24.0	-46.4	0.1
		35 1.0Gk + 1.5(1.0$Qkwu_{sup}$) EHF Y+	0.0	-13.2	18.6	105.5	0.1	-0.1
		36 1.0Gk + 1.5(1.0$Qkwu_{sup}$) EHF X-	7.5	0.1	18.5	23.8	45.7	-0.1
		37 1.0Gk + 1.5(1.0$Qkwu_{sup}$) EHF Y-	-0.0	13.3	18.6	-56.8	-0.1	0.0

Accidental Loads have been neglected when designing the base plate, under the provision that column protection will be provided (ring bollards).

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Job Ref	**: 45767**
Sheet	**: App_E /**
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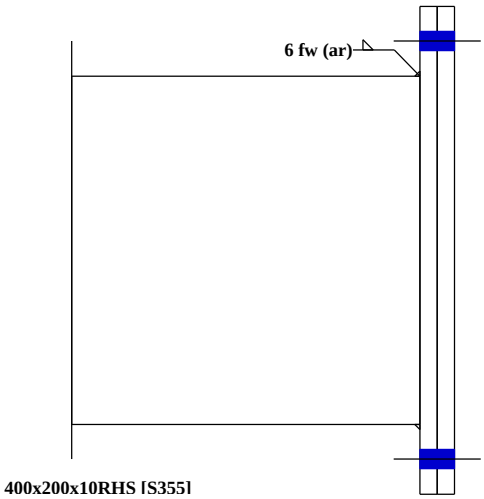
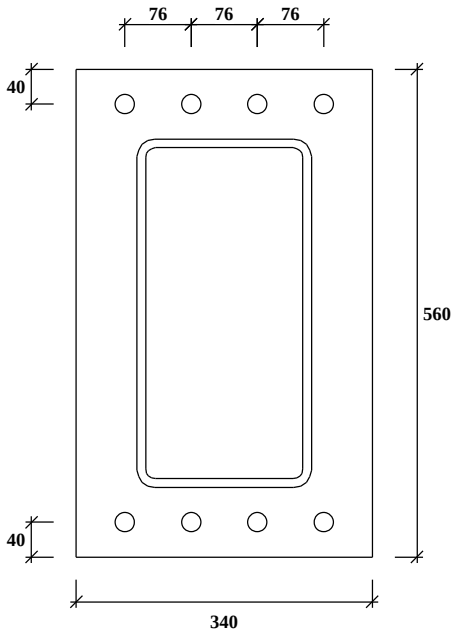
Date	**: 19 September 2023 / Ver. 2022.16.24**
Checked	**: JI**
Approved	**: RM**



400x200x10RHS [S355]
End-Plate 560x340x20 mm (30 kg)
Plates S 275
8 No. M20 Grade 8.8 Bolts in 22 mm holes



Cap Plate
Hollow Section Splice Connection to EC 3 (UK NAD)
Loading Case 001 Max Axial
Basic Data

User Defined Applied Forces at Interface

Applied Forces	F = +85.0 kN (C), Fv_{xx} = +10.0 kN, M_{xx} = +5.0 kNm,
Design to	EC 3: Part 1-8: 2005 Design of Connections

Basic Dimensions

Beam-400x200x10RHS [S 355]	D=400.0, B=200.0, T=10.0, py=355
Bolts 20 mm Ø in 22 mm holes	Grade 8.8 Bolts
Plates S 275	All weld grades provided to suit minimum connected steel grade

Summary of Results (Unity Ratios)

Side: Welds		0.01	OK
Section Capacity	0.02, 0.01, 0.03	0.03	OK

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Cap Plate
Hollow Section Splice Connection to EC 3 (UK NAD)
Loading Case 002 Max Moment
Basic Data

User Defined Applied Forces at Interface

Applied Forces	F = +60.0 kN (C), Fv_{xx} = +10.0 kN, M_{xx} = +45.0 kNm,
Design to	EC 3: Part 1-8: 2005 Design of Connections

Summary of Results (Unity Ratios)

T&B: End-Plate & Bolts	0.18, 0.13	0.18	OK
T&B: Welds		0.37	OK
Side: Welds		0.01	OK
Section Capacity	0.01, 0.09, 0.10	0.10	OK

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Cap Plate
Hollow Section Splice Connection to EC 3 (UK NAD)
Loading Case 003 Max Uplift
Basic Data

User Defined Applied Forces at Interface

Applied Forces	F = -15.0 kN (T), Fv_{xx} = +5.0 kN, M_{xx} = +25.0 kNm,
Design to	EC 3: Part 1-8: 2005 Design of Connections

Summary of Results (Unity Ratios)

T&B: End-Plate & Bolts	0.16, 0.12	0.16	OK
T&B: Welds		0.31	OK
Side: Welds		0.01	OK
Net Shear Capacity		0.01	OK
Section Capacity	0.05, 0.05	0.05	OK

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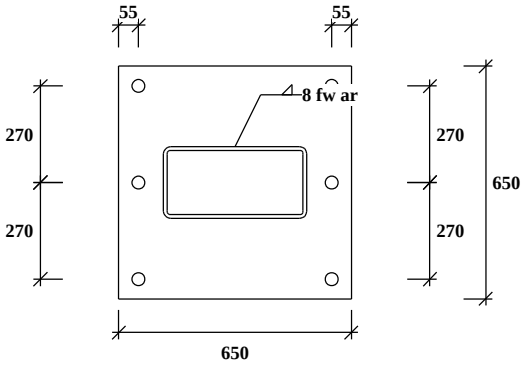
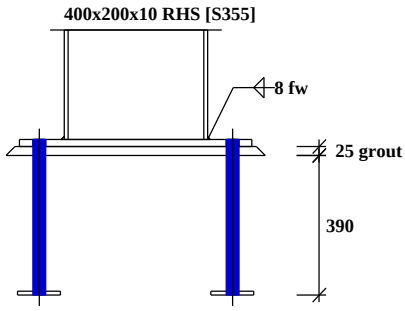


Base-Plate 650 x 650 x 20 mm (66 kg)
With 6 No. 36 mm holes
For 24 mm Grade 8.8 Bolts.



No Void: Bolts Fully Embedded in Base
Washers 120 x 120 x 10 mm thick
All Plates S 275

Base Plate
Base-Plate Connection to EC 3 (UK NAD)
Loading Case 001 Max Axial
Basic Data

User Defined Applied Forces at Interface

Resultant Forces M, Fv, F	Moment +45.0 kNm, Shear +10.0 kN, Axial +90.0 kN (Left side in tension, Axial Compression)

Basic Dimensions

Column: 400x200x10RHS [36]	D=400.0, B=200.0, T=10.0, py=355		
Bolts 24 mm Ø in 36 mm holes	Grade 8.8 Bolts		
Plates S 275	All weld grades provided to suit minimum connected steel grade		
Concrete edge dist. from plate	Left unlimited, Right unlimited, Bottom unlimited, Top unlimited		
Grout Fck, Conc Fck, Conc depth	12 N/mm², 25 N/mm²,0 mm		
Design to	EC 3: Part 1-8: 2005 Design of Connections		
Column Capacities Mc, Fvc, Fc	533.2 kN.m, 1585.0 kN, 4118.0 kN	Mc = 533.2 kN.m	OK

Summary of Results (Unity Ratios)

Bolt Tension		0.08	OK
Base-Plate thickness in Compression		0.94	OK
Plate Tension Bending	0.18	0.18	OK
Concrete Embedment		0.18	OK
Pullout Cones	0.06, 0.13	0.13	OK
Fastener Pull-out		0.01	OK
Horizontal Shear		0.10	OK
Flange & Web Welds	0.32, 0.01	0.32	OK

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Base Plate
Base-Plate Connection to EC 3 (UK NAD)
Loading Case 002 Max Moment
Basic Data

User Defined Applied Forces at Interface

Resultant Forces M, Fv, F	Moment +115.0 kNm, Shear +15.0 kN, Axial +60.0 kN (Left side in tension, Axial Compression)		
Design to	EC 3: Part 1-8: 2005 Design of Connections		
Column Capacities Mc, Fvc, Fc	533.2 kN.m, 1585.0 kN, 4118.0 kN	Mc = 533.2 kN.m	OK

Summary of Results (Unity Ratios)

Bolt Tension		0.34	OK
Base-Plate thickness in Compression		1.00	OK
Plate Tension Bending	0.77	0.77	OK
Concrete Embedment		0.52	OK
Pullout Cones	0.28, 0.56	0.56	OK
Fastener Pull-out		0.04	OK
Horizontal Shear		0.17	OK
Flange & Web Welds	0.91, 0.02	0.91	OK

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Base Plate
Base-Plate Connection to EC 3 (UK NAD)
Loading Case 003 Max Uplift
Basic Data

User Defined Applied Forces at Interface

Resultant Forces M, Fv, F	Moment +110.0 kNm, Shear +15.0 kN, Axial +20.0 kN (Left side in tension, Axial Compression)		
Design to	EC 3: Part 1-8: 2005 Design of Connections		
Column Capacities Mc, Fvc, Fc	533.2 kN.m, 1585.0 kN, 4118.0 kN	Mc = 533.2 kN.m	OK

Summary of Results (Unity Ratios)

Bolt Tension		0.35	OK
Base-Plate thickness in Compression		1.00	OK
Plate Tension Bending	0.79	0.79	OK
Concrete Embedment		0.53	OK
Pullout Cones	0.29, 0.58	0.58	OK
Fastener Pull-out		0.04	OK
Horizontal Shear		0.20	OK
Flange & Web Welds	0.89, 0.02	0.89	OK

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Base Plate
Base-Plate Connection to EC 3 (UK NAD)
Loading Case 004 Uplift (net uplift)
Basic Data

User Defined Applied Forces at Interface

Resultant Forces M, Fv, F	Moment +80.0 kNm, Shear +15.0 kN, Axial -5.0 kN (Left side in tension, Axial Up-Lift)		
Design to	EC 3: Part 1-8: 2005 Design of Connections		
Column Capacities Mc, Fvc, Fc	533.2 kN.m, 1585.0 kN, 4118.0 kN	Mc = 533.2 kN.m	OK

Summary of Results (Unity Ratios)

Bolt Tension		0.27	OK
Base-Plate thickness in Compression		0.97	OK
Plate Tension Bending	0.60	0.60	OK
Concrete Embedment		0.44	OK
Pullout Cones	0.22, 0.45	0.45	OK
Fastener Pull-out		0.03	OK
Horizontal Shear		0.21	OK
Flange & Web Welds	0.66, 0.02, 0.00, 0.02, 0.00	0.66	OK

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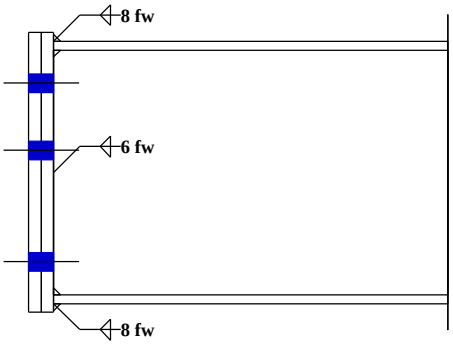
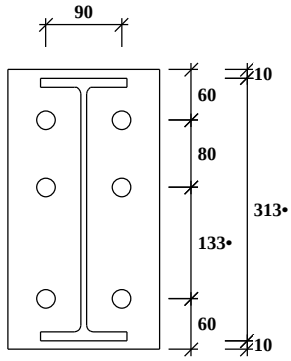


Plates S 275
Beam 305x102 UB 33 [S355]



End-Plate 333 x 180 x 15 mm (7 kg)
6 No. M20 Grade 8.8 Bolts in 22 mm holes

Rafter End Connection
Beam to Beam End-Plated Connection to EC 3 (UK NAD)
Loading Case 001 Max Moment
Basic Data

User Defined Applied Forces at End-plate Interface

Resultant Forces M, Fv, F	40.0 kNm, 20.0 kN, 5.0 kN
Load directions	Top of Connection in Tension, Rafter moving Down and in Compression.
Design to	EC 3: Part 1-8: 2005 Design of Connections
Weld Grades	All weld grades provided to suit minimum connected steel grade

Basic Dimensions

Beam-305x102UB33 [S 355]	D=312.7, B=102.4, T=10.8, t=6.6, r=7.6, py=355		
Bolts 20 mm Ø in 22 mm holes	Grade 8.8 Bolts		
Plates S 275	All weld grades provided to suit minimum connected steel grade		
Rafter Capacities Mc, Fvc, Fc	170.7 kN.m, 452.1 kN, 1484.6 kN	Mc = 170.7 kN.m	OK

Summary of Results (Unity Ratios)

Moment Capacity 94.8 kNm (for 2 rows of bolts) (Modified Applied Mom. M_{mod}=39.2 kNm)		0.41	OK
Moment Capacity 61.9 kNm (for the 1 rows of bolts required in the tension zone)		0.63	OK
Shear Capacity		0.05	OK
Flange Welds	0.54	0.54	OK
Web Welds	0.45, 0.06	0.45	OK

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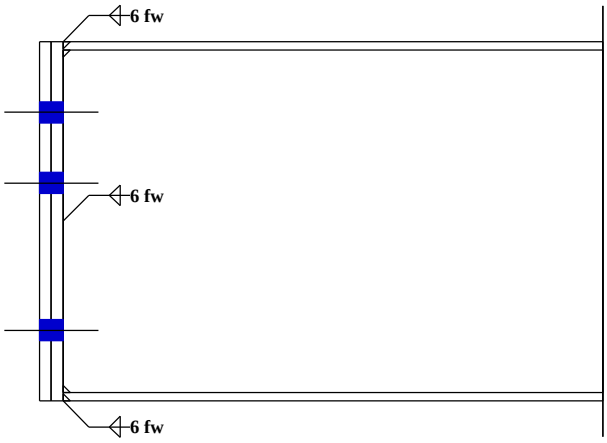
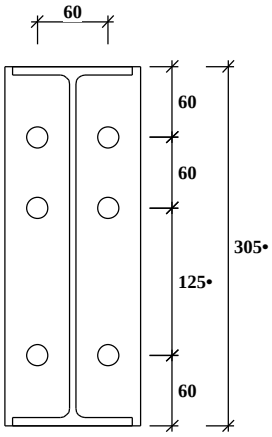


Plates S 275
Beam 305x102 UB 25 [S355]



End-Plate 305 x 115 x 10 mm (3 kg)
6 No. M16 Grade 8.8 Bolts in 18 mm holes

Fascia Splice Connection
Beam to Beam End-Plated Connection to EC 3 (UK NAD)
Loading Case 001 Max Moment
Basic Data

User Defined Applied Forces at End-plate Interface

Resultant Forces M, Fv, F	15.0 kNm, 10.0 kN, 5.0 kN
Load directions	Top of Connection in Tension, Rafter moving Down and in Compression.
Design to	EC 3: Part 1-8: 2005 Design of Connections
Weld Grades	All weld grades provided to suit minimum connected steel grade

Basic Dimensions

Beam-305x102UB25 [S 355]	D=305.1, B=101.6, T=7.0, t=5.8, r=7.6, py=355		
Bolts 16 mm Ø in 18 mm holes	Grade 8.8 Bolts		
Plates S 275	All weld grades provided to suit minimum connected steel grade		
Rafter Capacities Mc, Fvc, Fc	121.4 kN.m, 386.3 kN, 1121.8 kN	Mc = 121.4 kN.m	OK

Summary of Results (Unity Ratios)

Moment Capacity 57.2 kNm (for 2 rows of bolts) (Modified Applied Mom. M_{mod}=14.3 kNm)		0.25	OK
Moment Capacity 36.0 kNm (for the 1 rows of bolts required in the tension zone)		0.40	OK
Shear Capacity		0.04	OK
Flange Welds	0.27	0.27	OK
Web Welds	0.45, 0.03	0.45	OK

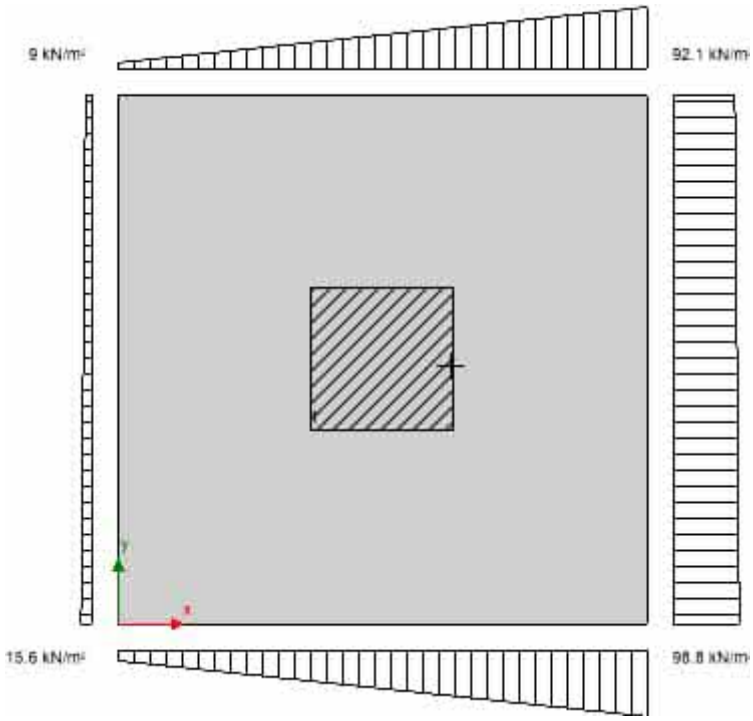
FOUNDATION ANALYSIS

In accordance with EN1997-1:2004 + A1:2013 incorporating corrigendum February 2009 and the UK National Annex incorporating corrigendum No.1

Tedds calculation version 3.3.05

Pad foundation details

Length of foundation	L_x = **2400** mm
Width of foundation	L_y = **2400** mm
Foundation area	$A = L_x \times L_y$ = **5.760** m^2
Depth of foundation	h = **900** mm
Depth of soil over foundation	h_{soil} = **1000** mm
Level of water	h_{water} = **0** mm
Density of water	γ_{water} = **9.8** kN/m^3
Density of concrete	γ_{conc} = **24.5** kN/m^3



Column no.1 details

Length of column	l_{x1} = **650** mm
Width of column	l_{y1} = **650** mm
position in x-direction	x_1 = **1200** mm
position in y-direction	y_1 = **1200** mm

Soil properties

Density of soil	γ_{soil} = **20.0** kN/m^3
Characteristic cohesion	c'_k = **0** kN/m^2
Characteristic effective shear resistance angle	ϕ'_k = **25** deg
Characteristic friction angle	δ_k = **19.3** deg

Foundation loads

Self weight $F_{swt} = h \times \gamma_{conc} =$ **22.1** kN/m²

Soil weight $F_{soil} = h_{soil} \times \gamma_{soil} =$ **20.0** kN/m²

Column no.1 loads

Permanent axial load $F_{Gz1} =$ **34.2** kN

Wind horizontal load in y-direction $F_{Wy1} =$ **-8.5** kN

Wind axial load $F_{Wz1} =$ **8.0** kN

Snow axial load $F_{Sz1} =$ **25.9** kN

Permanent moment in x-direction $M_{Gx1} =$ **15.3** kNm

Wind moment in x-direction $M_{Wx1} =$ **59.3** kNm

Snow moment in x-direction $M_{Sx1} =$ **21.2** kNm

Bearing resistance (Section 6.5.2)

Forces on foundation

Force in y-direction $F_{dy} = F_{Wy1} =$ **-8.5** kN

Force in z-direction $F_{dz} = A \times (F_{swt} + F_{soil}) + F_{Gz1} + F_{Wz1} + F_{Sz1} =$ **310.3** kN

Moments on foundation

Moment in x-direction $M_{dx} = A \times (F_{swt} + F_{soil}) \times L_x / 2 + F_{Gz1} \times x_1 + M_{Gx1} + F_{Wz1} \times x_1 + M_{Wx1} + F_{Sz1} \times x_1 + M_{Sx1} =$ **468.2** kNm

Moment in y-direction $M_{dy} = A \times (F_{swt} + F_{soil}) \times L_y / 2 + F_{Gz1} \times y_1 + F_{Wz1} \times y_1 + F_{Wy1} \times h + F_{Sz1} \times y_1 =$ **364.7** kNm

Eccentricity of base reaction

Eccentricity of base reaction in x-direction $e_x = M_{dx} / F_{dz} - L_x / 2 =$ **309** mm

Eccentricity of base reaction in y-direction $e_y = M_{dy} / F_{dz} - L_y / 2 =$ **-25** mm

Pad base pressures

$q_1 = F_{dz} \times (1 - 6 \times e_x / L_x - 6 \times e_y / L_y) / (L_x \times L_y) =$ **15.6** kN/m²

$q_2 = F_{dz} \times (1 - 6 \times e_x / L_x + 6 \times e_y / L_y) / (L_x \times L_y) =$ **9** kN/m²

$q_3 = F_{dz} \times (1 + 6 \times e_x / L_x - 6 \times e_y / L_y) / (L_x \times L_y) =$ **98.8** kN/m²

$q_4 = F_{dz} \times (1 + 6 \times e_x / L_x + 6 \times e_y / L_y) / (L_x \times L_y) =$ **92.1** kN/m²

Minimum base pressure $q_{min} = \min(q_1, q_2, q_3, q_4) =$ **9** kN/m²

Maximum base pressure $q_{max} = \max(q_1, q_2, q_3, q_4) =$ **98.8** kN/m²

Presumed bearing capacity

Presumed bearing capacity $P_{bearing} =$ **100.0** kN/m²

PASS - Presumed bearing capacity exceeds design base pressure

Design approach 1

Partial factors on actions - Combination1

Partial factor set A1

Permanent unfavourable action - Table A.3 $\gamma_G =$ **1.35**

Permanent favourable action - Table A.3 $\gamma_{Gf} =$ **1.00**

Variable unfavourable action - Table A.3 $\gamma_Q =$ **1.50**

Variable favourable action - Table A.3 $\gamma_{Qf} =$ **0.00**

Partial factors for spread foundations - Combination1

Resistance factor set R1

Bearing - Table A.5 $\gamma_{R.v} =$ **1.00**

Sliding - Table A.5 $\gamma_{R.h} =$ **1.00**

Forces on foundation

Force in y-direction: $F_{dy} = \gamma_Q \times F_{wy1}$ = **-12.7** kN

Force in z-direction: $F_{dz} = \gamma_G \times (A \times (F_{swt} + F_{soil}) + F_{Gz1}) + \gamma_Q \times F_{wz1} + \gamma_Q \times \psi_{S0} \times F_{Sz1}$ = **404.6** kN

Moments on foundation

Moment in x-direction: $M_{dx} = \gamma_G \times (A \times (F_{swt} + F_{soil}) \times L_x / 2 + F_{Gz1} \times x_1) + \gamma_G \times M_{Gx1} + \gamma_Q \times F_{wz1} \times x_1 + \gamma_Q \times M_{wx1} + \gamma_Q \times \psi_{S0} \times F_{Sz1} \times x_1 + \gamma_Q \times \psi_{S0} \times M_{Sx1}$ = **611.0** kNm

Moment in y-direction: $M_{dy} = \gamma_G \times (A \times (F_{swt} + F_{soil}) \times L_y / 2 + F_{Gz1} \times y_1) + \gamma_Q \times F_{wz1} \times y_1 + \gamma_Q \times \psi_{S0} \times F_{Sz1} \times y_1 + (\gamma_Q \times F_{wy1}) \times h$ = **474.0** kNm

Eccentricity of base reaction

Eccentricity of base reaction in x-direction: $e_x = M_{dx} / F_{dz} - L_x / 2$ = **310** mm

Eccentricity of base reaction in y-direction: $e_y = M_{dy} / F_{dz} - L_y / 2$ = **-28** mm

Effective area of base

Effective length: $L'_x = L_x - 2 \times e_x$ = **1780** mm

Effective width: $L'_y = L_y + 2 \times e_y$ = **2343** mm

Effective area: $A' = L'_x \times L'_y$ = **4.170** m^2

Pad base pressure

Design base pressure: $f_{dz} = F_{dz} / A'$ = **97** kN/m^2

Sliding resistance (Section 6.5.3)

Forces on foundation

Force in y-direction: $F_{dy} = \gamma_Q \times F_{wy1}$ = **-12.7** kN

Force in z-direction: $F_{dz} = \gamma_{Gf} \times (A \times (F_{swt} + F_{soil}) + F_{Gz1}) + \gamma_{Qf} \times F_{wz1} + \gamma_{Qf} \times \psi_{S0} \times F_{Sz1}$ = **276.4** kN

Sliding resistance verification (Section 6.5.3)

Horizontal force on foundation: $H = abs(F_{dy})$ = **12.8** kN

Design friction angle: $\delta_d = atan(tan(\delta_k) / \gamma_{\phi'})$ = **19.3** deg

Sliding resistance (exp.6.3a): $R_{H.d} = F_{dz} \times tan(\delta_d)$ = **96.8** kN

$H / R_{H.d}$ = **0.132**

PASS - Foundation is not subject to failure by sliding

Design approach 1

Partial factors on actions - Combination2

Partial factor set: A2

Permanent unfavourable action - Table A.3: γ_G = **1.00**

Permanent favourable action - Table A.3: γ_{Gf} = **1.00**

Variable unfavourable action - Table A.3: γ_Q = **1.30**

Variable favourable action - Table A.3: γ_{Qf} = **0.00**

Partial factors for spread foundations - Combination2

Resistance factor set: R1

Bearing - Table A.5: $\gamma_{R.v}$ = **1.00**

Sliding - Table A.5: $\gamma_{R.h}$ = **1.00**

Forces on foundation

Force in y-direction: $F_{dy} = \gamma_Q \times F_{wy1}$ = **-11.0** kN

Force in z-direction

$F_{dz} = \gamma_G \times (A \times (F_{swt} + F_{soil}) + F_{Gz1}) + \gamma_Q \times F_{Wz1} + \gamma_Q \times \psi_{S0} \times F_{Sz1} =$ **303.6** kN

Moments on foundation

Moment in x-direction

$M_{dx} = \gamma_G \times (A \times (F_{swt} + F_{soil}) \times L_x / 2 + F_{Gz1} \times x_1) + \gamma_G \times M_{Gx1} + \gamma_Q \times F_{Wz1} \times x_1 + \gamma_Q \times M_{Wx1} + \gamma_Q \times \psi_{S0} \times F_{Sz1} \times x_1 + \gamma_Q \times \psi_{S0} \times M_{Sx1} =$ **470.5** kNm

Moment in y-direction

$M_{dy} = \gamma_G \times (A \times (F_{swt} + F_{soil}) \times L_y / 2 + F_{Gz1} \times y_1) + \gamma_Q \times F_{Wz1} \times y_1 + \gamma_Q \times \psi_{S0} \times F_{Sz1} \times y_1 + (\gamma_Q \times F_{Wy1}) \times h =$ **354.4** kNm

Eccentricity of base reaction

Eccentricity of base reaction in x-direction

$e_x = M_{dx} / F_{dz} - L_x / 2 =$ **350** mm

Eccentricity of base reaction in y-direction

$e_y = M_{dy} / F_{dz} - L_y / 2 =$ **-33** mm

Effective area of base

Effective length

$L'_x = L_x - 2 \times e_x =$ **1701** mm

Effective width

$L'_y = L_y + 2 \times e_y =$ **2334** mm

Effective area

$A' = L'_x \times L'_y =$ **3.970** m^2

Pad base pressure

Design base pressure

$f_{dz} = F_{dz} / A' =$ **76.5** kN/m^2

Sliding resistance (Section 6.5.3)

Forces on foundation

Force in y-direction

$F_{dy} = \gamma_Q \times F_{Wy1} =$ **-11.0** kN

Force in z-direction

$F_{dz} = \gamma_{Gf} \times (A \times (F_{swt} + F_{soil}) + F_{Gz1}) + \gamma_{Qf} \times F_{Wz1} + \gamma_{Qf} \times \psi_{S0} \times F_{Sz1} =$ **276.4** kN

Sliding resistance verification (Section 6.5.3)

Horizontal force on foundation

$H = abs(F_{dy}) =$ **11.1** kN

Design friction angle

$\delta_d = atan(tan(\delta_k) / \gamma_{\phi'}) =$ **15.651** deg

Sliding resistance (exp.6.3a)

$R_{H.d} = F_{dz} \times tan(\delta_d) =$ **77.4** kN

$H / R_{H.d} =$ **0.143**

PASS - Foundation is not subject to failure by sliding

MILLARD & PARTNERS Ltd. **TEL: 01277 375888**
Consulting Structural Engineers
Jubilee House
3 THE DRIVE
BRENTWOOD CM13 3FR

SHEET NO. 01
JOB NO. A0757
DATE. OCT '23

ESSO CHESTERFIELD EXPRESS, NEWBOLD ROAD, CHESTERFIELD

ALL DESIGN & CONSTRUCTION TO BE IN ACCORDANCE WITH
"THE BUILDING REGULATIONS 2020"

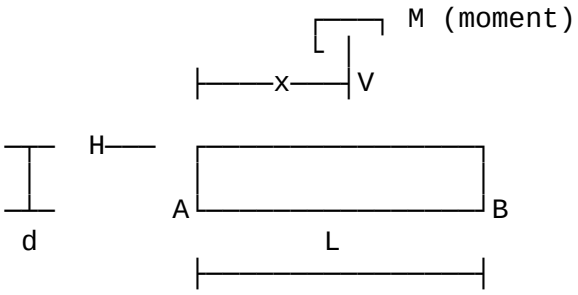
MATERIALS

CONCRETE	(FOR R.C. USE) fc = $35^{N}/mm^{2}$, fy = $460^{N}mm^{2}$ DESIGN IN ACCORDANCE WITH B.S. 8110
STEELWORK	TO BE GRADED 43, MILD STEEL DESIGN IN ACCORDANCE WITH B.S. 5950
TIMBER	TO BE STRENGTH CLASS C24 (DRY) DESIGN IN ACCORDANCE WITH B.S. 5268 (REGULARISED TIMBER TO BE ADOPTED TABLE 100)
MASONRY	COMP. STRENGTHS TO BE SPECIFIED DESIGN IN ACCORDANCE WITH B.S. 5628
WIND	DESIGN IN ACCORDANCE WITH B.S. 6399 PART 2. CODE OF PRACTICE FOR WIND LOADS

NO WORK TO COMMENCE/BEAMS ORDERED BEFORE BUILDING REGULATION APPROVALS OBTAINED IN WRITING

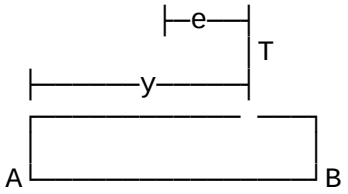
ALTERNATIVE SIZED CANOPY COLUMN FOUNDATION BASE ADJACENT TANKS

Location: BASE DESIGN DL+LL+WIND LOADINGS BY 'GMSI.'



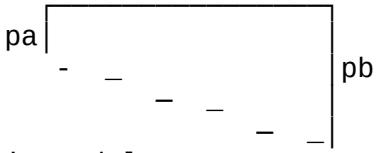
Pad base with vertical and horizontal loads (V & H) and overturning moment (M)

Characteristic bending moment	M=68 kNm
Characteristic vertical force	V=209 kN
Characteristic horizontal shear	H=0 kN
Width of base (into figure)	b=1.5 m
Depth of base	d=1 m
Length of base	L=2.9 m
Distance to load position	x=1.45 m
Combining moment and shear	Mc=M+H*d=68+0*1=68 kNm
Density of concrete taken as	dc=24 kN/m⌐
Self weight of foundation	Sw=L*b*d*dc=2.9*1.5*1*24 =104.4 kN
Total load	T=V+Sw=209+104.4=313.4 kN
Moments about A to combine	y=(V*x+Mc+Sw*L/2)/T =(209*1.45+68+104.4*2.9/2)/313.4 =1.667 m



Eccentricity e=y-L/2=1.667-2.9/2=0.21698 m

Centroid of load lies within middle third. Pressure varies from a minimum of pa at A to a maximum of pb at B.



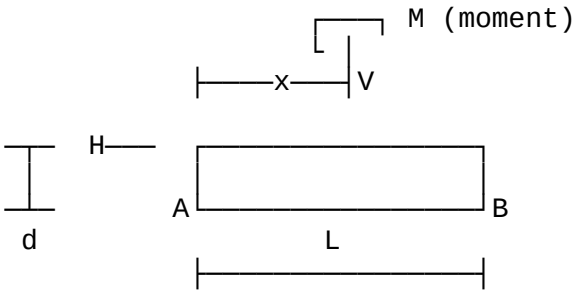
Elastic modulus	z=b*L^2/6=1.5*2.9^2/6=2.1025 m⌐
Pressure at end A	pa=T/(L*b)-T*e/z =313.4/(2.9*1.5)-313.4*0.21698 /2.1025 =39.704 kN/m²
Pressure at end B	pb=T/(L*b)+T*e/z =313.4/(2.9*1.5)+313.4*0.21698 /2.1025 =104.39 kN/m²

Allowable ground pressure p=110 kN/m² (+10% WIND)
Since (104.39 ≤ 110) pressure beneath base within allowable.

Overturning

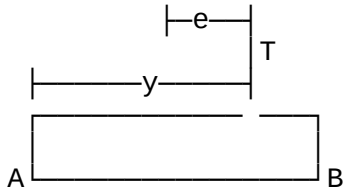
Overturning moment Mot=M+H*d=68+0*1=68 kNm
Rotation assumed about lowest forward edge of base.
Restraining moment Mre=Sw*L/2+V*(L-x)
=104.4*2.9/2+209*(2.9-1.45)
=454.43 kNm
F.O.S. against overturning FOSOT=Mre/Mot=454.43/68
=6.6828

Location: CANOPY COLUMN BASE DL + WIND (uplift)



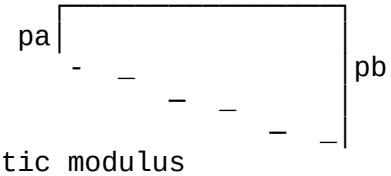
Pad base with vertical and horizontal loads (V & H) and overturning moment (M)

Characteristic bending moment	M=17 kNm
Characteristic vertical force	V=79 kN
Characteristic horizontal shear	H=0 kN
Width of base (into figure)	b=1.5 m
Depth of base	d=1 m
Length of base	L=2.9 m
Distance to load position	x=1.45 m
Combining moment and shear	Mc=M+H*d=17+0*1=17 kNm
Density of concrete taken as	dc=24 kN/m⌐
Self weight of foundation	Sw=L*b*d*dc=2.9*1.5*1*24 =104.4 kN
Total load	T=V+Sw=79+104.4=183.4 kN
Moments about A to combine	y=(V*x+Mc+Sw*L/2)/T =(79*1.45+17+104.4*2.9/2)/183.4 =1.5427 m



Eccentricity e=y-L/2=1.5427-2.9/2=0.092694 m

Centroid of load lies within middle third. Pressure varies from a minimum of pa at A to a maximum of pb at B.



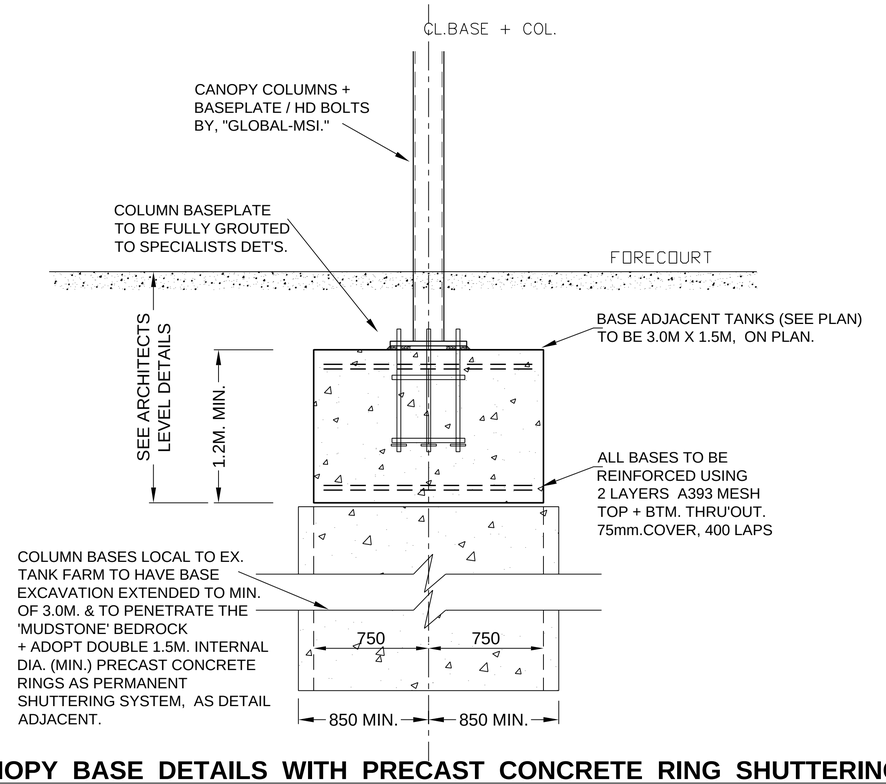
Elastic modulus	z=b*L^2/6=1.5*2.9^2/6=2.1025 m⌐
Pressure at end A	pa=T/(L*b)-T*e/z =183.4/(2.9*1.5)-183.4*0.092694 /2.1025 =34.075 kN/m²
Pressure at end B	pb=T/(L*b)+T*e/z =183.4/(2.9*1.5)+183.4*0.092694 /2.1025 =50.247 kN/m²

Allowable ground pressure p=110 kN/m²
Since (50.247 ≤ 110) pressure beneath base within allowable.

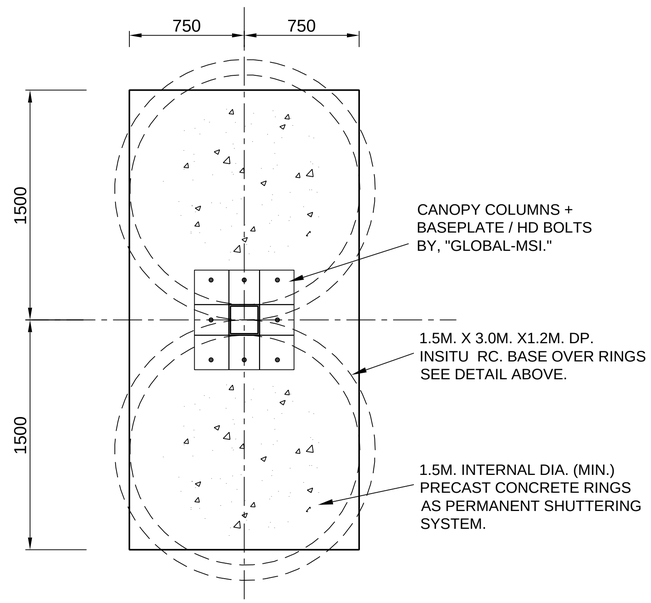
Overturning

Overturning moment Mot=M+H*d=17+0*1=17 kNm
Rotation assumed about lowest forward edge of base.
Restraining moment Mre=Sw*L/2+V*(L-x)
=104.4*2.9/2+79*(2.9-1.45)
=265.93 kNm
F.O.S. against overturning FOSOT=Mre/Mot=265.93/17
=15.643

PROVIDE 2.9M X 1.5M BASE.



CANOPY BASE DETAILS WITH PRECAST CONCRETE RING SHUTTERING



PLAN OF CANOPY BASE DETAILS + PRECAST CONCRETE RING SHUTTERING WHERE ADJACENT TO TANK FARM

CANOPY COLUMN ADJACENT TANK EXCAVATION
CONSTRUCTION SPECIFICATON FOR FOUNDATION BASE

* WITH REFERENCE TO ADJ. BASE LAYOUT PLAN + 'FOUNDATION EXCAVATION SPECIFICATION.'
* EXCAVATION TO PENETRATE VIRGIN 'MUDSTONE' BEDROCK SOIL AT APPROX. 3.0M DEPTH BELOW EXISTING GROUND LEVEL (NEW TANK LOCATION).
* BLIND BASE OF EXCAVATION WITH 150MM MASS CONCRETE (C20 SEMI-DRY MIX).
* INSTALL PRECAST CONCRETE RINGS AS SHUTTERING SYSTEM, POSITIONED AS INDICATED ON LAYOUT.
* MASS CONCRETE FILL RINGS (C30 MIX) TO A LEVEL TO ALLOW A 1.2M DEEP BASE OVER, FOR HOLDING DOWN BOLT CAGE.
* FORM 3.0M X 1.5M X 1.2M DP (MIN) CONCRETE BASE WITH 2 – LAYERS OF A393 MESH REINFORCEMENT TOP AND BOTTOM (75MM COVER), CONCRETE MIX TO BE RC. 35 MIX TO DC-1 MIX REQUIREMENTS.

NOTES
1 THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECT'S & SPECIALISTS DRAWINGS FOR WORKING OUT AND LEVELS.

2 ALL WORKMANSHIP TO BE IN ACCORDANCE WITH THE SPECIFICATION FOR EXCAVATIONS AND FOUNDATIONS.

3 ALL DIMENSIONS AND SETTING OUT TO BE CHECKED AND CONFIRMED BY CONTRACTOR PRIOR TO COMMENCEMENT OF WORKS.

4 THE MAIN CONTRACTOR IS RESPONSIBLE FOR TEMPORARY WORKS.

5 DO NOT SCALE THIS DRAWING.

6 CONCRETE MIX

REINFORCED BASES RC35 MIX TO DC-1 REQUIREMENTS & TO BE FULLY COMPACTED BY IMMERSION VIBRATORS.

MASS CONCRETE FOOTINGS (+ FILLING OF PC. RINGS) GEN.3 CONCRETE MIX TO DC-1 REQUIREMENTS HAVING A 125mm. SELF COMPACTING SLUMP UNLESS TO BE FULLY COMPACTED BY IMMERSION VIBRATORS.

7 ALL REINFORCEMENT TO BE FREE FROM DIRT, RUST, GREASE, ETC.

8 FIXED REINFORCEMENT SHOULD BE CHECKED BY THE ENGINEER PRIOR TO CONCRETING OF GROUND BEAMS.

9 ALL FOUNDATIONS HAVE BEEN DESIGNED TO A MAXIMUM SOIL PRESSURE OF 110 KN/M2 AT A DEPTH OF 3.0M.(SEE SOIL REPORT). ALL TO BUILDING CONTROL INSPECTORS APPROVAL.

NOTE:
FOUNDATION SIZES INDICATED ARE THE MINIMUM REQ'D FOR DESIGN. THE MAIN CONTRACTOR MUST EITHER ALLOW FOR SHUTTERING OF ALL FOUNDATIONS OR OVERSIZED EXCAVATIONS WHEN DIGGING THROUGH THE MADE GROUND. CDM REGULATIONS MUST APPLY FOR ALL DEEP TRENCHES.

EXISTING SERVICES:
MAIN CONTRACTOR TO REFER TO SUB-SCAN SURVEY DRAWING BUT ALSO CARRY OUT ON-SITE CENSOR SWEEP ACROSS WORKING AREA PRIOR TO CARRYING OUT EXCAVATIONS.

NOTE:
SITE OPERATIVES ARE NOT TO ENTER EXCAVATIONS EXCEEDING 1.0M, IN DEPTH UNLESS EXCAVATION IS FIRST PROVIDED WITH ADEQUATE TEMPORARY SHORING.

PROJECT
CHESTERFIELD EXPRESS
NEWBOLD ROAD, CHESTERFIELD.

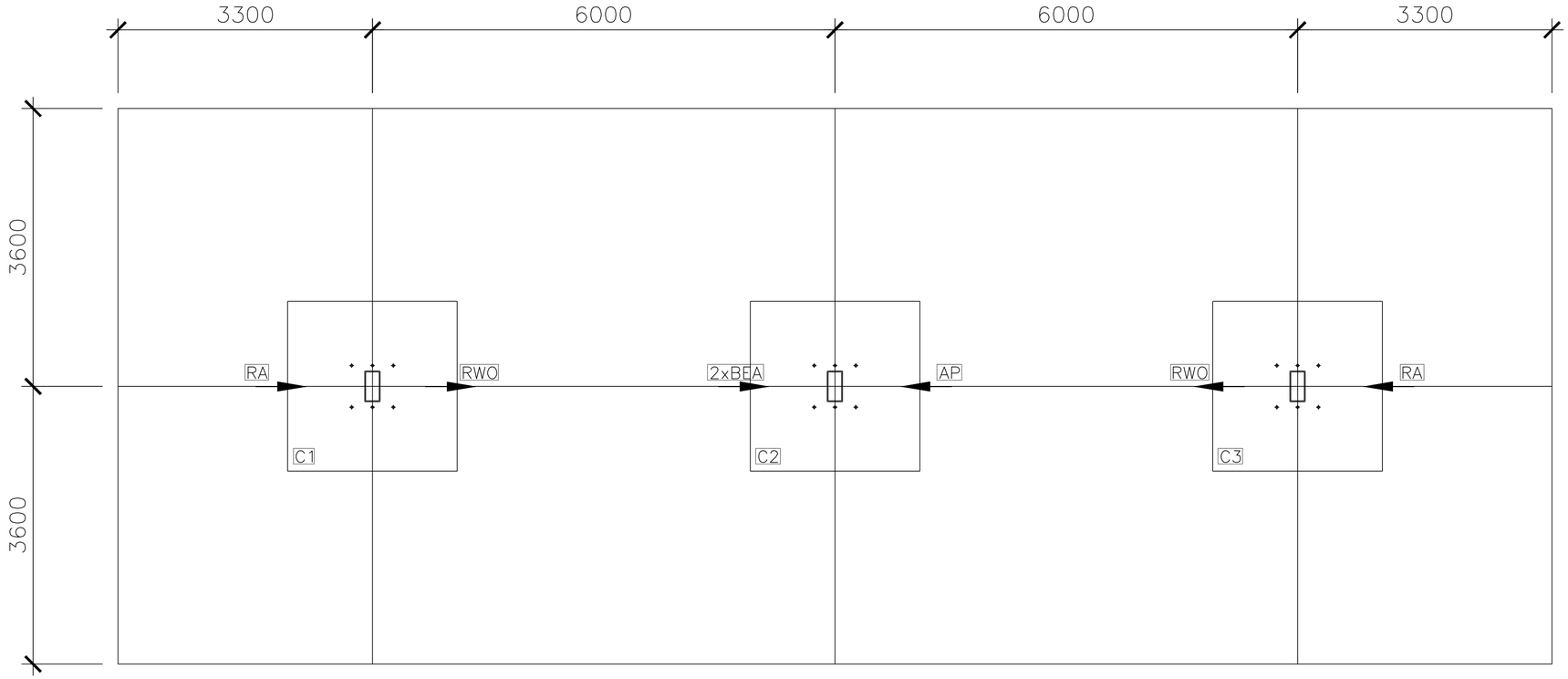
TITLE
CANOPY COLUMN BASE DETAILS
ADJACENT TO TANK FARM

CLIENT
ESSO PETROLEUM CO. LTD.

SCALE: 1:20 (@A1)	DRG No: A0757-1.
DATE: SEP.'23	DRG BY: CG

MILLARD & PARTNERS LTD.
CONSULTING STRUCTURAL ENGINEERS
JUBILEE HOUSE
3, THE DRIVE
BRENTWOOD
ESSEX CM13 3FR
TEL: 01277 375888
E-MAIL: OFFICE@MILLARD-PARTNERS.CO.UK

– ALL DIMENSIONS IN MM – IF IN DOUBT ASK – DO NOT SCALE –



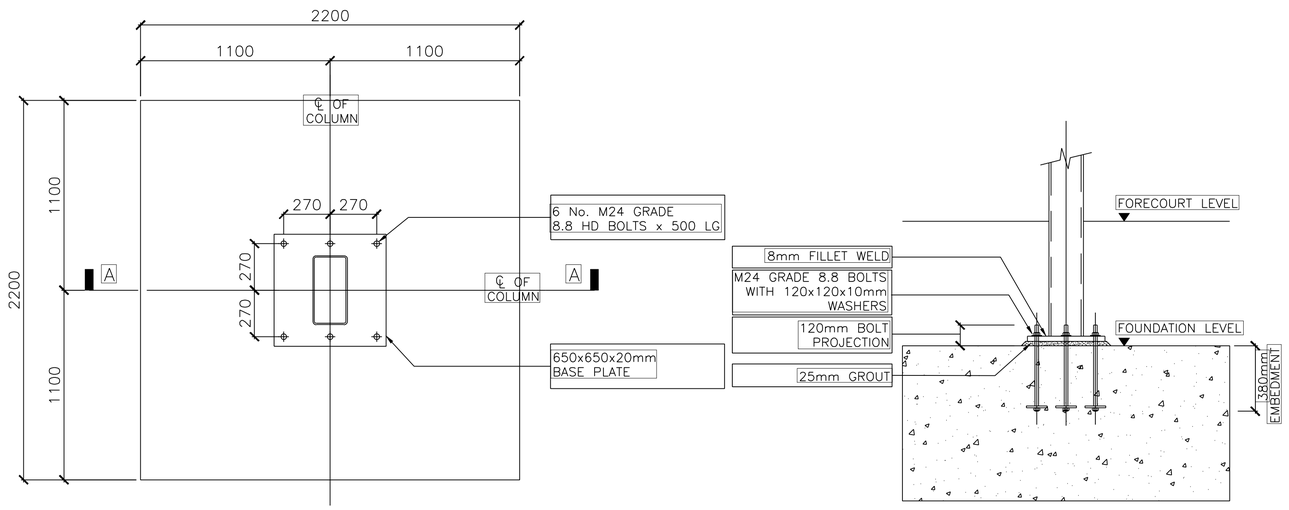
FOUNDATION NOTES

1. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR THE CORRECT SETTING OUT AND LEVELS OF ALL FOUNDATIONS AND HOLDING DOWN BOLTS.
2. FOR ALL FOUNDATIONS USE FND 02 CONCRETE
3. FOUNDATION DESIGN IS BASED ON AN ALLOWABLE GROUND BEARING PRESSURE OF 100kN/m². THIS SHOULD BE CONFIRMED BY THE LOCAL AUTHORITY/SUPERVISING ENGINEER PRIOR TO CASTING FOUNDATIONS.
4. 'GROUT' AS NOTED ON THIS DRAWING IS TO BE FINE CONCRETE OF A MIX OF CEMENT, SAND, COARSE AGGREGATE & WATER IN PROPORTIONS OF 1:1.25:2:0.4 BY WEIGHT. MAX AGGREGATE SIZE TO BE 10mm.
5. ALL GROUT TO BASES TO BE WELL COMPACTED
6. ALL STEEL BELOW FORECOURT LEVEL TO HAVE 100mm MINIMUM CONCRETE COVER.
7. ALL BOLTS TO BE CAST SOLID WITHOUT THE AID OF SLEEVES. NO MEDIUM TO BE USED THAT COULD BREAK BOND BETWEEN BOLT SHAFT AND CONCRETE U.N.O.
8. MAXIMUM TOLERANCE ON SETTING OUT DIMENSIONS GIVEN FOR FOUNDATIONS AND HOLDING DOWN BOLTS ±7mm.
9. ALL LEVELS TO BE CONFIRMED TO STEELWORK SUPPLIER BY GENERAL CONTRACTOR/SUPERVISING ENGINEER IN WRITING PRIOR TO FABRICATION OF COLUMNS.

	COLUMN LEVELS		
	C1	C2	C3
TOP OF CONCRETE FOUNDATION LVL.	123.150	123.150	123.150
RAIN WATER PIPE INVERT LVL.	123.600	–	123.600
BTM. ELECTRICAL INVERT LVL.	–	123.600	–
TOP OF PUMP ISLAND LVL.	124.180	124.180	124.180
RODDING/ACCESS INVERT LVL	124.550	124.550	124.550

BASE PLATE LAYOUT

→ RWO – DENOTES DIRECTION OF RAIN WATER PIPE OUT OF COLUMN FACE
→ BEA – DENOTES DIRECTION OF BOTTOM ELECTRICAL ACCESS INTO COLUMN FACE
→ RA – DENOTES DIRECTION OF RODDING ACCESS COVER TO COLUMN FACE
→ AP – DENOTES DIRECTION OF ACCESS PANEL INTO COLUMN FACE



BASE PLATE/H.D. BOLT DETAIL AT COLUMNS REF: C1–C3

FOUNDATION SIZE: 2200mm x 2200mm x 900mm DEEP
FOR BOLT GROUP ORIENTATION SEE FOUNDATION LAYOUT

REV	DATE	DESCRIPTION	DRN	CHK'D
P1	07/09/23	ISSUED FOR COMMENT	JW	IS
A	15/09/23	ISSUED FOR APPROVAL	JW	IS
B	26-09-23	LEVELS ADDED		

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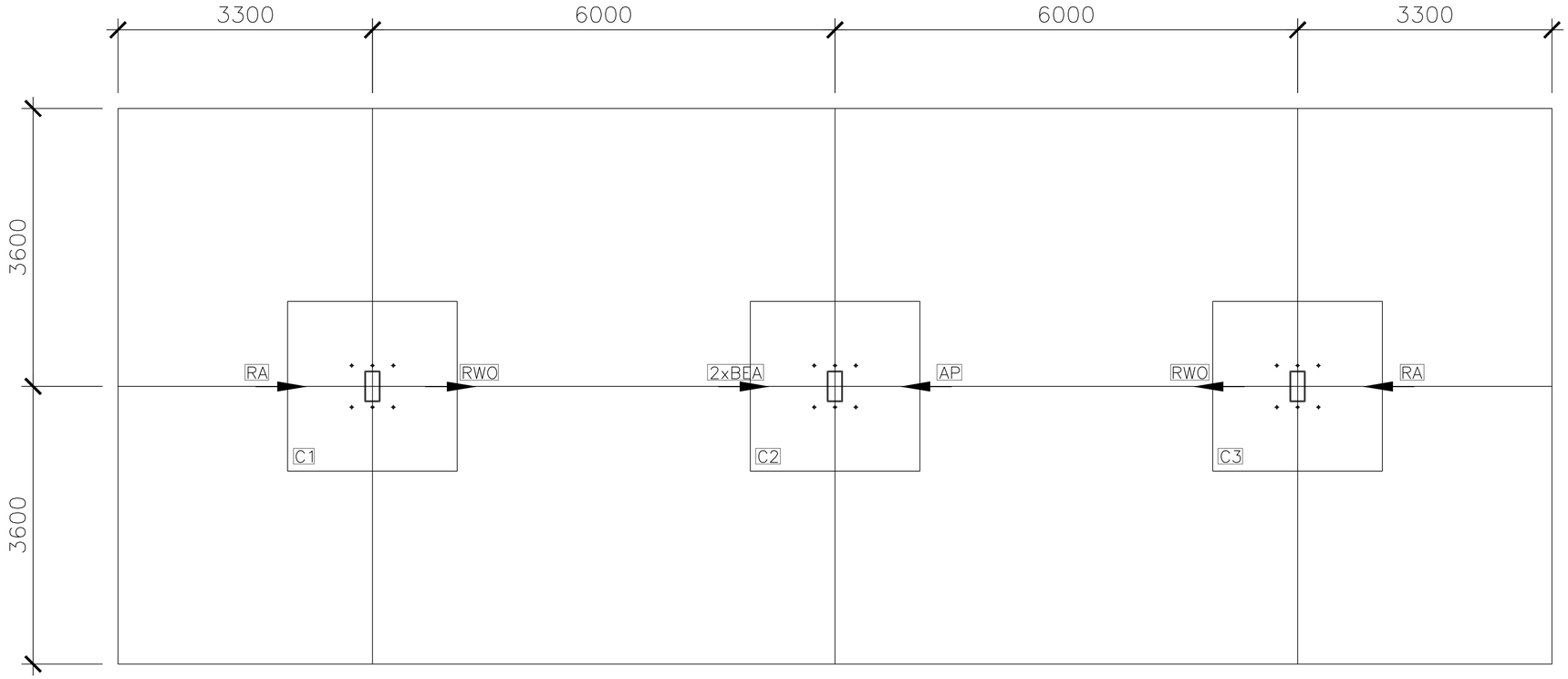
CLIENT: ESSO
COUNTRY: UK
CONTRACT NAME: ESSO CHESTERFIELD
SITE ADDRESS: CHESTERFIELD EXPRESS, NEWBOLD ROAD, CHESTERFIELD, S41 7AL

DRN	CHK'D	SCALE
JW	IS	N/A
DATE: 08/09/23	PROJECT TYPE: CANOPY	

DRG No.: CP/45797/2
REV: B

BORDER GB001

– ALL DIMENSIONS IN MM – IF IN DOUBT ASK – DO NOT SCALE –



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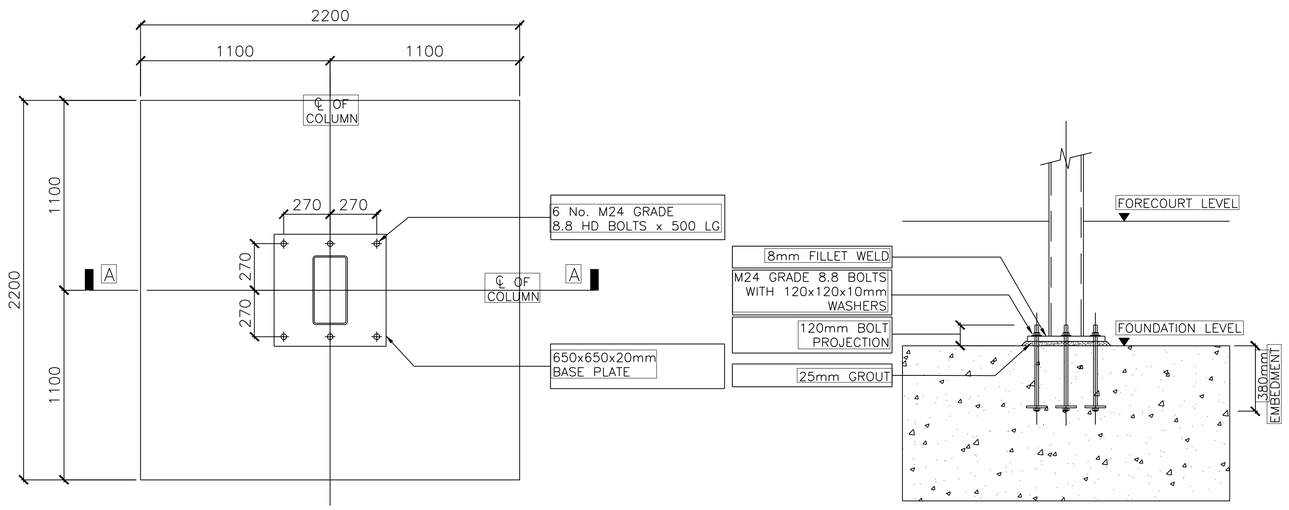

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