
BASELINE SITE CONDITION REPORT

117478

PONT-Y-FELIN INSULATION WORKS



FINAL

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SWECO UK LIMITED

KNAUF INSULATION

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Change list

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1	04.12.2018	FINAL	JW	TV

Executive Summary

The installation at Pont-y-Felin near Cwmbran is operated by Knauf Insulation Ltd (the Operator). The process involves the manufacture of glass fibre - light and heavy density glass mineral wool rolls, batts and loose fibre products, which are produced for use as thermal and acoustic insulation material. This activity falls under Section 3.4 Part A(1)(a) of The Environmental Permitting Regulations (2013 amendment).

The Operator has held a Permit (reference EPR/BR8212IK) since May 2003, which has over time been subject to a number of Variations. The most recent of these (31/07/2015) was issued by Natural Resources Wales (NRW) following a statutory review of permits in the glass and mineral fibre sector in 2014 in response to the changes required by the Industrial Emissions Directive (IED), which came into force on 7th January 2014.

Under the most recent Variation, an improvement condition (IC) is included within the Permit requiring the Operator to submit a report on the baseline conditions of soil and groundwater at the installation.

The report is to contain the information necessary to determine the state of soil and groundwater contamination so as to make a quantified comparison with the state upon definitive cessation of activities provided for in Article 22(3) of the IED. The report shall contain information, supplementary to that already provided in the application Site Condition Report, needed to meet the information requirements of Article 22(2) of the IED.

This Site Condition Report (SCR) has been completed in order to satisfy IC-2 set out in the July 2015 Variation support of the permit variation application.

The SCR builds on the information collated and submitted to the relevant regulator at the time of initial Permit application and summarises key developments and changes relevant to the operational phase since initial grant of Permit. In developing the SCR, the Operator has taken into account best practice and information provided in the NRW publications, "Environmental Permitting Regulations Guidance for applicants H5 Site condition report – guidance and templates" and "Environmental Permitting Regulations (England and Wales) 2014 Regulatory Guidance Note, RGN 9: Surrender".

This report has been developed with reference to the European Commission Guidance concerning baseline reports under Article 22(2) of Directive 2010/75/EU on industrial emissions (2104/C 136/03), taking into account comments included by NRW in their Compliance Assessment Report, dated 3rd September 2018.

For the avoidance of doubt, Sweco have structured this report to reflect the key stages set out in the guidance, incorporating relevant information as required, in the most logical format reflecting the development history of the installation. Whilst these stages are numbered in the guidance 1-8 for ease of reference, the guidance recognises that the stages may be undertaken in a different order or simultaneously

Table of contents

1	Introduction	3
1.1	Details of the Activity	3
1.2	Objectives	3
2	Identification of Hazardous Substances	4
2.1	Process and Raw Materials Changes	4
3	Relevant Hazardous Substances	6
4	Relevant Hazardous Substances Potential Pollution Risk	11
5	Site History and Current Activities	16
5.1	Changes to the Permitted Activity	17
5.2	Process and Materials Change	17
5.3	Environmental Benefits	18
5.3.1	2007 Environmental Performance Improvements	18
5.3.2	2009 Environmental Performance Improvements	18
5.4	Accidental Releases and Spillages	18
5.5	Potential Historical Contamination from On-site Sources	19
5.6	Potential Historical Contamination from Off-site Sources	20
5.6.1	Pollution Incidents / Spillages	20
5.7	Previous Investigation and Reports	21
6	Environmental Setting	23
6.1	Geology	23
6.2	Hydrogeology	23
6.3	Hydrology	24
6.4	Flood Risk	25
7	Conceptual Site Model	26
7.1	Methodology	27
7.2	Source – Pathway – Receptor Relationships	27
7.2.1	Sources	27
7.2.2	Pathways	28
7.2.3	Receptors	28
7.3	Review of Site Investigation Data	28
7.3.1	Chemical Analyses Results & Screening Criteria	29
7.4	Key Findings and Conclusions	30
7.5	Revised Risk Assessment	34
8	Site Investigation	37
9	Baseline Site Condition Report	38
9.1	Introduction	39

9.2	Improvement Condition IC-2	39
9.3	Site Condition Report (SCR)	39
9.4	Data Used to Establish the State of the Soil and Groundwater	40
9.5	Methods used to Sample and Analyse the Substrata	41
9.6	Evaluation of Data	41
9.7	Baseline Condition of the IPPC Installation	42

Appendices

Appendix A:	Raw Materials & Chemicals in Use
Appendix B:	Relevant Hazardous Materials Assessment
Appendix C:	Previous Site Investigation Borehole Locations
Appendix D	Site Condition Report 2003

1 Introduction

This Site Condition Report (SCR) has been completed by Sweco on behalf of Knauf Insulation Limited (Knauf) and has been prepared in order to satisfy Improvement Condition (IC-2) set out in the July 2015 Permit Variation (EPR/BR8212IK/V004) issued by Natural Resources Wales (NRW).

In this regard, this report supplements the Site Condition Report prepared for the activities carried out at the Knaufalcopor, Pont-Y-Felin, Cwmbran (now Knauf Insulation) site in June 2002, by Carl Bro Group Limited (now Sweco) and the further site investigation report for the site also prepared by Carl Bro and submitted in April 2003 in support of the original Permit application.

Where relevant, reference has been made to these reports, together with the original Permit application (Knauf Cwmbran IPPC Application Final, 2002) and subsequent permit Variations.

In developing the SCR, the Operator has taken into account best practice and information provided in the NRW publications, "Environmental Permitting Regulations Guidance for applicants H5 Site condition report – guidance and templates" and "Environmental Permitting Regulations (England and Wales) 2014 Regulatory Guidance Note, RGN 9: Surrender".

This report has been developed with reference to the European Commission Guidance concerning baseline reports under Article 22(2) of Directive 2010/75/EU on industrial emissions (2104/C 136/03), taking into account comments included by NRW in their Compliance Assessment Report, dated 3rd September 2018.

1.1 Details of the Activity

A summary of the activities carried out is presented in the Introductory note which accompanies the Permit number EPR/BR8212IK dated 31 July 2015.

Briefly, the installation at Pont-y-Felin near Cwmbran is operated by Knauf Insulation Ltd (see Figure 1). The process involves the manufacture of glass fibre - light and heavy density glass mineral wool rolls and batts and loose fibre products which are produced for use as thermal and acoustic insulation material. This falls under Section 3.4 Part A(1)(a) of The Environmental Permitting Regulations (2013 amendment).

The activities included under the Permit are illustrated in Figure 2.

1.2 Objectives

This document is intended to satisfy improvement condition (IC-2) included within the Permit requiring the Operator to submit a report on the baseline conditions of soil and groundwater at the installation.

Specifically, the report is to contain the information necessary to determine the state of soil and groundwater contamination so as to make a quantified comparison with the state upon definitive cessation of activities provided for in Article 22(3) of the IED. The report shall contain information, supplementary to that already provided in the application Site Condition Report, needed to meet the information requirements of Article 22(2) of the IED.

2 Identification of Hazardous Substances

Box 2.1 Main stages of preparing the baseline report: Stage 1

Activity	Objective
Identify which hazardous substances are used, produced or released at the installation and produce a list of these hazardous substances.	Determine whether or not hazardous substances are used, produced or released in view of deciding on the need to prepare and submit a baseline report.

Appendix A presents an inventory of all substances used on the site, broken down for the principal activities subject to Permit.

This listing reflects the substances in current use and also identifies those chemicals no longer used. These details are of particular relevance for the establishment of the 2018 baseline condition report.

The following sections provide commentary on process changes made since the original Permit was granted. These changes have led to phase out of certain substances previously considered relevant to the hazardous substances assessment and included within the site investigation / testing work carried out.

2.1 Process and Raw Materials Changes

Since the original Permit was granted in 2003, two permit Variations have been granted (see Section 5.1).

The first of these in 2007 included additional production of glass mineral wool products, namely an unbound cavity wall insulating material (white wool).

The processes required to produce this product required new process lines and plant to be installed, however, the principal manufacturing steps were unchanged from those subject to original permit.

As a result, the only change to chemical substance use related to the use of a silicone based emulsion sprayed onto the formed fibres in the hot end. The existing small gas fired boilers were decommissioned and replaced with a new single gas fired boiler which (alongside its single gas fired boiler backup) has been subsequently decommissioned. As such, a new potential source of contamination was included under the 2007 Variation, although the installation had previously used similar hydrocarbon products.

Section 5.2 provides commentary on the introduction of water treatment chemicals following the change from traditional binders to the Ecosol binder system confirmed under the 2009 permit Variation.

The following dangerous substances have been removed from the permitted activity since 2003 as a result of process/technological change or availability of suitable alternatives:

Raw Material	Chemical Composition	Previous Function
Ammonium Hydroxide	NH ₄ OH	Binder raw material
Dye (Kenazol Paper Red D-2BDC liquid)	Diazo dyes	Binder raw material
Resin	Aqueous phenol formaldehyde resin	Binder raw material
Urea solution	Co(NH ₂) ₂	Binder raw material

Raw Material	Chemical Composition	Previous Function
Ammonium Lignosulphonate	Lignosulphonic ammonium salt	Binder raw material
Mineral Oil		Binder raw material
NDT treatment 2501	Sodium Sulphite	Boiler Water O ₂ Scavenger
Envirotrat 5117	Neutralised phosphono-carboxylic 1-10 ac	Wash Water Treatment
Microtrat 3110	1-Bromo-3-chloro-5,5-dimethylhydantoin	Wash Water Treatment
Solerpon KD116	Sodium hydroxide	Wash Water Treatment
Nalco 2504	Polyglycol	Wash Water Treatment

With respect to the baseline soil and groundwater conditions, the changes in the permitted activity since 2003 have produced a limited number of new dangerous substances including:

- 2007 - silicone based emulsion (BC2631, BC89-175 and BRB Sempure),
- 2009 – biocide & Caustic Soda liquor (5 % to 50 %)

The potential for the storage and use of these substances to have impacted soil and groundwater conditions is considered to be low in view of the site management controls across the installation, which include storage and containment of potentially dangerous substances in accordance with prevailing regulations and best practice in designated locations. However, these chemicals have been included in our assessment.

3 Relevant Hazardous Substances

Box 3.1 Main stages of preparing the baseline report: Stage 2

Activity	Objective
Identify which of the hazardous substances from Stage 1 are 'relevant hazardous substances'. Discard those hazardous substances that are incapable of contaminating soil or groundwater. Justify and record the decisions taken to exclude certain hazardous substances.	To restrict further consideration to only the relevant hazardous substances in view of deciding on the need to prepare and submit a baseline report.

'Relevant hazardous substances' (Article 3(18) and Article 22(2), first subparagraph) are those substances or mixtures defined within Article 3 of Regulation (EC) No 1272/2008 on the classification, labelling and packaging of substances and mixtures (CLP Regulation) which, as a result of their hazardousness, mobility, persistence and biodegradability (as well as other characteristics), are capable of contaminating soil or groundwater and are used, produced and/or released by the installation.

Appendix B provides details of the approach taken in arriving at this assessment, together with the evidence-based justification for the decision reached.

The following Tables provide summary details of the relevant hazardous substances identified by Sweco in completion of this stage of the assessment.

Table 3.1 Relevant Hazardous Substances: Batch Plant

Raw Material	Chemical Composition	Hazardous substance classification according to Regulation (EC) No. 1272/2008.	Relevant Hazardous Substance
Soda Ash	Sodium Carbonate Na_2CO_3	H314 - Causes serious eye irritation	- High concentrations in receiving waters can cause long term adverse effects on the aquatic environment by raising pH. - Low toxicity to fish
Borax Pentahydrate	Di- sodium tetraborate pentahydrate	H360FD : May damage fertility. May damage the unborn child.	Boron is naturally occurring in the environment and is a plant nutrient. Potentially phytotoxic at high concentrations.
EP Dust	Recycled material, mixture of alkaline and boron compounds	No specific data available. Considered to meet hazardous substances definition given presence of boron (see entry for Borax Pentahydrate)	Boron is naturally occurring in the environment and is a plant nutrient. Potentially phytotoxic at high concentrations.
Mangagran	Manganese dioxide	H302 : Harmful if swallowed H332 : Harmful if inhaled.	May be hazardous in the environment; special attention should be given to aquatic organisms

Table 3.2 Relevant Hazardous Substances: Binder Plant

Raw Material	Chemical Composition	Hazardous substance classification according to Regulation (EC) No. 1272/2008.	Relevant Hazardous Substance
Ammonia, aqueous solution	NH ₃ (aqueous)	H314: Causes severe skin burns and eye damage H400: Very toxic to aquatic life. H225: Highly flammable H315: Causes skin irritation H319: Causes serious eye irritation	· Hazardous to aquatic life, impairs groundwater quality in high concentrations but is readily biodegradable. · In soil: Ammonia is rapidly biodegraded in soil by the process of ammonification or mineralisation.
L-219 Black Ink	Contains Methyl Ethyl Ketone , Isopropanol	H336: May cause drowsiness or dizziness	· Slightly soluble in water, may affect drinking water supplies. · May effect germination and growth rates of plants if soil contamination occurs. · The substance will remain dissolved in water retained in the soil. It has a low adsorption to solids in the ground and sediments. · May travel through the soil layers if discharged in large or continuous amounts
JAM3000 Black ink	Water based ink with <1% Glutaraldehyde	Glutaraldehyde: H317: May cause an allergic skin reaction. H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled.	· Very toxic (acute effect) to aquatic organisms. · Low bioaccumulation potential. In contact with water the substance will hydrolyse slowly. · The substance will not evaporate into the atmosphere from the water surface. · Adsorption to solid soil phase is possible

Table 3.2 Relevant Hazardous Substances: Other Chemical Use

Raw Material	Chemical Composition	Hazardous substance classification according to Regulation (EC) No. 1272/2008.	Relevant Hazardous Substance
Diesel fuel	C10H20 to C15H28	H226: Flammable liquid and vapor. H304: May be fatal if swallowed and enters airways. H315: Causes skin irritation. H332: Harmful if inhaled. H351: Suspected of causing cancer. H373: May cause damage to organs through prolonged or repeated exposure. H411: Toxic to aquatic life with long lasting effects.	· Expected to be toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment. · Expected to be inherently biodegradable · More volatile component -- Highly volatile, will partition rapidly to air. Not expected to partition to sediment and wastewater solids. · Less volatile component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids · Majority of components -- Low potential to migrate through soil. · This product is not, or does not contain, a substance that is a PBT or a vPvB.
Belt Dressing (Rocol)	Cyclopentane, CO2 aerosol propellant	H225: Highly flammable H412: Harmful to aquatic life with long lasting effects	· Insoluble in water · Readily absorbed into soil. · This product is not identified as a PBT/vPvB substance. Harmful to aquatic organisms.

Table 3.2 Relevant Hazardous Substances: Other Chemical Use

Raw Material	Chemical Composition	Hazardous substance classification according to Regulation (EC) No. 1272/2008.	Relevant Hazardous Substance
Loctite 7063 Cleaner Spray	Naphtha, hydrotreated light, <0,1% benzene	H222: Extremely flammable aerosol H229: Pressurised container: May burst if heated H315: Causes skin irritation H336: May cause drowsiness or dizziness H411: Toxic to aquatic life with long lasting effects	- Contains a substance which is harmful to aquatic organisms and which may cause long term adverse effects in the aquatic environment - The product evaporates readily - This product is not identified as a PBT/vPvB substance
Linemarker aerosol paint	Butane, Propane Acetone, Butyl acetate, Solvent naphtha, Trimethylbenzene, Cumene, Mesitylene	H220: Extremely flammable gas H225: Highly flammable liquid and vapour H304: May be fatal if swallowed and enters airways. H315: Causes skin irritation H319: Causes serious eye irritation. H332: Harmful if inhaled. H336: May cause drowsiness or dizziness. H411: Toxic to aquatic life with long lasting effects.	- Contains a substance which is harmful to aquatic organisms and which may cause long term adverse effects in the aquatic environment - This product is not identified as a PBT/vPvB substance.
Araldite Rapid G Resin	Bisphenol A-Epichlorohydrin Epoxy Resin, Butanedioldiglycidyl Ether	H312: Harmful in contact with skin H315: Causes skin irritation H317: May cause an allergic skin reaction. H319: Causes serious eye irritation H332: Harmful if inhaled. H411: Toxic to aquatic life with long lasting effects	Contains a substance which is harmful to aquatic organisms and which may cause long term adverse effects in the aquatic environment
Araldite Rapid G Hardener	epoxy resin	H315: Causes skin irritation H317: May cause an allergic skin reaction. H319: Causes serious eye irritation. H411: Toxic to aquatic life with long lasting effects	Contains a substance which is harmful to aquatic organisms and which may cause long term adverse effects in the aquatic environment
Belzona 1111 Super Metal - Base	Epoxy Phenol Novolac Resin, bisphenol A-(epichlorhydrin);	H315: Causes skin irritation H317: May cause an allergic skin reaction. H320: Causes eye irritation H411: Toxic to aquatic life with long lasting effects	Contains a substance which is harmful to aquatic organisms and which may cause long term adverse effects in the aquatic environment.
Belzona 1111 Super Metal - Solidifier	Epoxy Phenol Novolac Resin, bisphenol A-(epichlorhydrin);	H315: Causes skin irritation H317: May cause an allergic skin reaction. H320: Causes eye irritation H411: Toxic to aquatic life with long lasting effects	Contains a substance which is harmful to aquatic organisms and which may cause long term adverse effects in the aquatic environment.
Fastglas Resin	Polyester resin containing styrene	H225: Highly flammable liquid and vapour H320: Causes serious eye irritation H332: Harmful if inhaled. H335: May cause respiratory irritation	- Contains a substance which is harmful to aquatic organisms and which may cause long term adverse effects in the aquatic environment - Polyester resins are viscous liquids which lose solvents by evaporation or polymerisation, leaving a relatively inert residue which will not degrade significantly. - Toxic to aquatic organisms.

Table 3.2 Relevant Hazardous Substances: Other Chemical Use

Raw Material	Chemical Composition	Hazardous substance classification according to Regulation (EC) No. 1272/2008.	Relevant Hazardous Substance
Plus Gas Aerosol	Kerosene Hydrosulphurised mineral oil	H222: Extremely flammable aerosol H229: Pressurised container: May burst if heated H315: Causes skin irritation H336: May cause drowsiness or dizziness H411: Toxic to aquatic life with long lasting effects	- Contains a substance which is harmful to aquatic organisms and which may cause long term adverse effects in the aquatic environment - This substance is not classified as PBT or vPvB according to current EU criteria - The product has poor water-solubility, is readily biodegradable and not bioaccumulating
Plus Gas Lubricant	Blend of hydrocarbon distillate and mineral oil	H304: May be fatal if swallowed and enters airways. H315: Causes skin irritation H336: May cause drowsiness or dizziness H411: Toxic to aquatic life with long lasting effects	- Contains a substance which is harmful to aquatic organisms and which may cause long term adverse effects in the aquatic environment - The product has poor water-solubility, is readily biodegradable and not bioaccumulating - This substance is not classified as PBT or vPvB according to current EU criteria
Rocol Metal Repair Compound	Epoxy resin 10-30%	H315: Causes skin irritation H317: May cause an allergic skin reaction. H319: Causes serious eye irritation. H411: Toxic to aquatic life with long lasting effects	- Contains a substance which is harmful to aquatic organisms and which may cause long term adverse effects in the aquatic environment - This product is not identified as a PBT substance. - Non-volatile. Insoluble in water. Absorbed only slowly into soil.
Tippex correction fluid	Titanium Oxide, Naphtha (petroleum), hydrotreated light	H225: Highly flammable liquid and vapour H315: Causes skin irritation H336: May cause drowsiness or dizziness H411: Toxic to aquatic life with long lasting effects	Contains a substance which is harmful to aquatic organisms and which may cause long term adverse effects in the aquatic environment
Tygris R-202 Brake cleaner	Naptha, Butane, Propane, Isobutane	H222: Extremely flammable aerosol H315: Causes skin irritation H336: May cause drowsiness or dizziness H411: Toxic to aquatic life with long lasting effects	Contains a substance which is harmful to aquatic organisms and which may cause long term adverse effects in the aquatic environment

Table 3.2 Relevant Hazardous Substances: Other Chemical Use

Raw Material	Chemical Composition	Hazardous substance classification according to Regulation (EC) No. 1272/2008.	Relevant Hazardous Substance
Jeyes Parozone Bleach	Sodium hypochlorite, sodium hydroxide	H314: Causes severe skin burns and eye damage H400: Very toxic to aquatic life	Contains a substance which is harmful to aquatic organisms and which may cause long term adverse effects in the aquatic environment
Tygris R214 Cutting and Tapping Fluid	Naptha (light) , Butane, Propane, Isobutane, Mineral Oil, Chlorinated Paraffin, White Spirit	H222: Extremely flammable aerosol H336: May cause drowsiness or dizziness H411: Toxic to aquatic life with long lasting effects	Contains a substance which is harmful to aquatic organisms and which may cause long term adverse effects in the aquatic environment

Table 3.2 Relevant Hazardous Substances: Other Chemical Use

Raw Material	Chemical Composition	Hazardous substance classification according to Regulation (EC) No. 1272/2008.	Relevant Hazardous Substance
Evo-stik Pistoprene CY110R	Acetone, Light Naptha	H225: Highly flammable liquid and vapour H304: May be fatal if swallowed and enters airways H315: Causes skin irritation H319: Causes serious eye irritation. H336: May cause drowsiness or dizziness H411: Toxic to aquatic life with long lasting effects	Contains a substance which is harmful to aquatic organisms and which may cause long term adverse effects in the aquatic environment
Mectar Citrus	Petroleum distillates, Limonene	H304: May be fatal if swallowed and enters airways H315: Causes skin irritation H317: May cause an allergic skin reaction. H319: Causes serious eye irritation. H411: Toxic to aquatic life with long lasting effects	Contains a substance which is harmful to aquatic organisms and which may cause long term adverse effects in the aquatic environment

4 Relevant Hazardous Substances Potential Pollution Risk

Box 4.1 Main stages of preparing the baseline report: Stage 3

Activity	Objective
For each relevant hazardous substance brought forward from Stage 2, identify the actual possibility for soil or groundwater contamination at the site of the installation, including the probability of releases and their consequences, and taking particular account of: - the quantities of each hazardous substance or groups of similar hazardous substances concerned; - how and where hazardous substances are stored, used and to be transported around the installation; - where they pose a risk to be released; In case of existing installations also the measures that have been adopted to ensure that it is impossible in practice that contamination of soil or groundwater takes place.	To identify which of the relevant hazardous substances represent a potential pollution risk at the site based on the likelihood of releases of such substances occurring. For these substances, information must be included in the baseline report.

The following tables assess the likely potential pollution risk presented by the relevant hazardous substances identified. This assessment considers the volume of material used and stored, the relative significance of potential impact on the environment in the event of accidental release and the site management procedures and controls in place to prevent this possibility.

Table 4.1 Batch Plant

Relevant Hazardous Substance	Possibility of soil and groundwater contamination at the site of the installation			
	Low possibility based on volumes used	Significance of impact on Environmental Sensitivity	Site Pollution Prevention Controls and Mitigation	Potential for emission of hazardous substances to soil or groundwater
Soda Ash	No	Moderate	Automated transfer of dry raw material to plant. Appropriate storage and containment provided. Maintained building and hardcover areas will reduce the likelihood of infiltration to soil / groundwater in the event of spillage.	Low
Borax Pentahydrate	No	Moderate	Appropriate storage and containment provided. Maintained building and hardcover areas will reduce the likelihood of infiltration to soil / groundwater in the event of spillage. Automated transfer and mixing.	Low
EP Dust	No	Moderate	Automated movement and bagging of EP dust. Appropriate storage and containment provided. Maintained building and hardcover areas will reduce the likelihood of infiltration to soil / groundwater in the event of spillage. EP dust is recycled in to the batch process.	Low
Mangagran	No	Low	Appropriate storage and containment provided. Maintained building and hardcover areas will reduce the likelihood of infiltration to soil / groundwater in the event of spillage	Low

Table 4.2 Binder Plant

Relevant Hazardous Substance	Possibility of soil and groundwater contamination at the site of the installation			
	Low possibility based on volumes used	Significance of impact on Environmental Sensitivity	Site Pollution Prevention Controls and Mitigation	Potential for emission of hazardous substances to soil or groundwater
Ammonia aqueous solution	No	Moderate - High	Automated application of binder compounds. Storage in bunded bulk tank. Maintained building and hardcover areas will reduce the likelihood of infiltration	Low
L-219 Black Ink	Yes. Small quantities stored and used. Active ingredient, Methyl Ethyl Ketone , Isopropanol	Low to Moderate	Appropriate storage and containment measures adopted. Material used in small quantities in dedicated internal location. Limited potential for spillage to occur and any release would be unlikely to contact soil / groundwater	Very Low
JAM3000 Black ink	Yes. Small quantities stored and used. Water based ink with active ingredient <1% Glutaraldehyde			

Table 4.3 Other Chemical Use

Relevant Hazardous Substance	Possibility of soil and groundwater contamination at the site of the installation			
	Low possibility based on volumes used	Significance of impact on Environmental Sensitivity	Site Pollution Prevention Controls and Mitigation	Potential for emission of hazardous substances to soil or groundwater
Diesel	No	Moderate - High	Appropriate storage and containment measures adopted. Materials stored in a small number of dedicated double skinned relatively small capacity tanks. Limited potential for spillage to occur and any release would be unlikely to contact soil / groundwater	Low
Linemarker aerosol paint	Yes	Low to Moderate	Appropriate storage and containment measures adopted. Material used in small quantities in dedicated internal location. Limited potential for spillage to occur and any release would be unlikely to contact soil / groundwater	Very Low
Loctite 7063 Cleaner Spray				
Araldite Rapid G Resin				
Araldite Rapid G Hardener				
Belt Dressing (Rocol)				
Belzona 1111 Super Metal - Base				

Table 4.3 Other Chemical Use

Relevant Hazardous Substance	Possibility of soil and groundwater contamination at the site of the installation			
	Low possibility based on volumes used	Significance of impact on Environmental Sensitivity	Site Pollution Prevention Controls and Mitigation	Potential for emission of hazardous substances to soil or groundwater
Belzona 1111 Super Metal - Solidifier	Yes	Low to Moderate	Appropriate storage and containment measures adopted. Material used in small quantities in dedicated internal location. Limited potential for spillage to occur and any release would be unlikely to contact soil / groundwater	Very Low
Fastglas Resin				
Plus Gas Aerosol				
Plus Gas Lubricant				
Rocol Metal Repair Compound				
Tippex correction fluid				
Tygris R-202 Brake cleaner				
Tygris R214 Cutting and Tapping Fluid				
Evo-stik Pistoprene CY110R				
Mectar Citrus				
Jeyes Parozone Bleach				

4.1 Measures Taken to Protect Land

The installation achieved ISO 14001 certification in 1999 and is subject to independent audit, supplemented by internal audit to ensure compliance with the site operating permit, the ISO 14001 standard, wider Corporate governance and best practice.

Details of the approach to environmental management are presented in relevant sections of the IPPC application document 2002.

The key elements of the site EMS are set out below:

- **Environmental policy** – Including a statement of Knauf's commitment to the environment. The policy provides a framework for planning and action.
- **Environmental aspects** – The environmental attributes of Knauf's products, activities and services have been identified and the impacts of these on the environment determined.
- **Legal and other requirements** – Identifies and ensures access to all relevant laws and regulations applicable to business operations.
- **Objectives and targets** – Establishes environmental goals, in line with policy, environmental impacts, together with the views of interested parties and other factors.

- **Environmental management program** – Plan actions necessary to achieve stated objectives and targets.
- **Structure and responsibility** – Establishes roles and responsibilities for environmental management and provides appropriate resources.
- **Training, awareness and competence** – Ensures that employees are trained and capable of carrying out their environmental responsibilities.
- **Communication** – Establishes processes for internal and external communications on environmental management issues.
- **EMS documentation** – Maintains information on the EMS and related documents.
- **Document control** – Ensures effective management of procedures and other system documents.
- **Operational control** – Identifies, plans and manages operations and activities in line with policy, objectives and targets.
- **Emergency preparedness and response** – Identifies potential emergencies and develops procedures for preventing and responding to them.
- **Monitoring and measurement** – Monitors key activities and tracks performance. Captures findings of periodic assessments of compliance with legal requirements.
- **Non-conformance and corrective and preventive action** – Identifies and corrects problems and prevents their recurrence.
- **Records** – Maintain and manage records of EMS performance.
- **EMS audit** – Sets out the measures for periodic verification that the EMS is operating as intended.
- **Management review** – Periodic review of the EMS with an eye to continual improvement.

Of principal importance in this instance is the assessment of the potential for hazardous materials and chemicals handling, storage and use, together with wastes generated to cause impact to soil and groundwater.

In order to achieve maximum operational efficiency, use of raw materials is kept to a minimum and wastage avoided wherever possible as part of Knauf Insulation's continuous improvement programme. This is exemplified in 2011 where consumption of potable water was noted to have significantly increased between two periods of water bills. An investigation was undertaken by Knauf Insulation, during which a leak was identified and subsequently repaired.

Some process residues, Electrostatic Precipitator dust (EP dust), Cullet, wet fibre waste and edge trimmings are recycled as a source of raw materials.

All materials and substances used are approved for use on site and records kept in accordance with the Control of Substances Hazardous to Health Regulations (CoSHH).

These records can be accessed through the site computer system and hard copy files. A comprehensive database of product material safety data sheets (MSDS) is available in both electronic and paper formats. These files are regularly reviewed and updated.

Records of consumption of raw materials are also kept within the Computerised purchasing and accounting system (SAP).

Principle raw materials used have written specifications. The site has procedures to ensure the quality and quantity of the materials that are received from suppliers are verified and recorded.

Storage and containment of potentially dangerous substances is undertaken in accordance with prevailing regulations and best practice in designated locations, appropriately signed and using appropriate containers with secondary containment where required. For example, the **Tank Farm** currently contains ten above ground storage tanks within a bunded area. All of these tanks have high and low-level alarms and the fill points are located within the bund.

Site drainage around bulk storage areas is designed so that spillages are not transmitted to the nearby surface water course but are directed to the site foul drainage system and thence off site via the effluent treatment plant.

Notwithstanding the routing of the site drainage flows, Knauf Insulation operate generic spillage procedures and spillage kits are located in key areas around site that are maintained by an external company who also provide a 24 hour call out assistance.

The site drainage system is included on the site maintenance and inspection schedule and was subject to a limited condition survey within the last 10 years (unknown date). Knauf Insulation are understood to be in the process of procuring an up-to-date condition survey.

No significant repairs or replacements to site drains have been required and the integrity and function of the drainage system is understood to be good. The surface water drains are cleaned annually as is the effluent drainage system by a local contractor.

5 Site History and Current Activities

Box 5.1 Main stages of preparing the baseline report: Stage 4

Activity	Objective
Provide a site history. Consider available data and information: - In relation to the present use of the site, and on emissions of hazardous substances which have occurred and which may give rise to pollution. In particular, consider accidents or incidents, drips or spills from routine operations, changes in operational practice, site surfacing, changes in the hazardous substances used. - Previous uses of the site that may have resulted in the release of hazardous substances, be they the same as those used, produced or released by the existing installation, or different ones. Review of previous investigation reports may assist in compiling this data.	Identify potential sources which may have resulted in the hazardous substances identified in Stage 3 being already present on the site of the installation.

A summary of the development history of the site and surroundings is presented in Table 5.1 below, together with an assessment of the likelihood of these activities giving rise to contamination.

Assessment of the likelihood that the historical activities documented have led to the generation of contamination is based on an evaluation of the typical raw materials/chemicals used, by-products and wastes generated by the basic industrial processes associated with the broad land use description given.

Table 5.1 – Summary of on Site Historical Development

Date	Historical Activity	Potential Contaminants	Likelihood of Contamination
1882 - 1975	The site is shown to be undeveloped, appearing as open fields with field boundaries and footpaths indicated. A small sewage tank is shown in the north of the site on the 1922 historical map, but is no longer shown from 1965 onwards. This feature was located outside of the Permit installation boundary. Anecdotal evidence from site representatives suggests that development of the works took place in the mid-1970's.	Limited potential for documented land uses to have used or generated contaminants	Very Low
1976 - Present	The site is understood to have been opened in 1976 and has been involved in the manufacture of glass mineral wool for thermal and acoustic insulation. Since this time the site has undergone a number of plant rebuilds and technological changes, but has continued to manufacture insulation materials. In 2009, a process change was introduced with the traditional binding agent based on urea extended phenol formaldehyde resins scaled back and replaced with an alternative binding agent principally derived from natural sustainable vegetable sources.	Storage, handling and use of a range of chemicals and raw materials, together with generation of solid / liquid wastes. Potential contaminants may include, hydrocarbons, resins, inorganic chemicals	Low to moderate

5.1 Changes to the Permitted Activity

The original permit was determined on 30 May 2003 (reference BR 8212) to cover operations listed in Part 1 to Schedule 1 of the Pollution Prevention and Control Regulations 2000.

The 2003 permit was subject to a permit variation in 2007 (reference MP3038MP) issued on 20 February 2007. The permit variation was required to reflect the construction of a new process line, together with improvements to other areas of the existing (2003) process.

A further variation was granted on 23 September 2009 (reference EPR/BR8212IK/V003) in respect of the introduction of the dextrose based Ecosol binder system.

Following the NRW Glass Sector Review in 2014, a permit variation was issued by the Regulator (reference EPR/BR8212IK/V004, 31/07/2015) to include the changes introduced under the implementation of the Industrial Emissions Directive (IED). A subsequent Regulator-led variation was made on 3 March 2016 (reference EPR/BR8212IK/V005) to make changes to soil and groundwater conditions and air emission monitoring standards and limits.

5.2 Process and Materials Change

The activities undertaken are confirmed under the terms of the current Environmental Permit issued on 3rd March 2016 (EPR/BR8212IK/V005).

5.1.1.1 Original Permit

The original permit was determined on 30 May 2003 to cover operations summarised as follows:

“Knauf Insulation produces light density glass mineral wool rolls on a single main production line for use as an insulation material. The product range varies from rolls of 25mm to 200mm nominal thickness. The site also produces loose fibre products.

The continuous process produces glass mineral wool in two stages. Firstly the glass fibre is produced by melting glass and turning it into fibres. Then, the fibres are bound together in a forming process to give glass mineral wool mat.”

5.1.1.2 Permit Variations

The 2003 permit was subject to a permit variation in 2007 (MP3038MP issued on 20th February 2007).

The permit variation was required to reflect the construction of a new process line, together with improvements to other areas of the existing (2003) process.

The variation issued covered a number of changes to process areas, namely:

- Binder plant upgrade and automation;
- Furnace modifications, refurbishment and enlargement;
- Installation of the white wool line;
- Curing oven extension and refurbishment;
- Cooling zone enlargement;
- Production line extension;

- Wash water system improvements, and;
- Decommissioning and replacement of gas fired boilers.

A further variation was granted on 23rd September 2009 (EPR/BR8212IK/V003) in respect of the introduction of the Ecosol binder, an alternative dextrose-based binder, which entirely replaces the previous urea extended phenol formaldehyde resin binder.

A new storage vessel was installed at the binder plant to replace the traditional binding agent.

5.3 Environmental Benefits

The evolution of the Knauf Insulation site, process changes, controls and ongoing improvement in environmental performance serves to limit environmental impacts and is considered to have led to an overall nett environmental benefit. Examples include:

5.3.1 2007 Environmental Performance Improvements

- Automation of the binder plant, materials weighing and emissions abatement;
- New plant, buildings and infrastructure upgrade associated with the furnace modifications and white wool line, together with air emissions abatement control, and;
- Increased capacity of the wash water system allowing greater recycling.

5.3.2 2009 Environmental Performance Improvements

- The dextrose-based Ecosol binder system introduced a nett environmental benefit, with a scaling back in the use of more harmful chemical substances, including phenol and formaldehyde which are no longer used at the installation. It is expected that since 2009, there has been no release of these chemicals to the soil or groundwater beneath the installation.
- Prior to the introduction of the Ecosol system, the microbiological content of the wash water was controlled by absorption of phenol and formaldehyde. The new Ecosol system requires a biocide dosing system, which uses water treatment chemicals (caustic soda) for the control of the bacteria (legionella) found in the water system. The chemicals used are widely adopted in similar technology, are used at low concentration and are readily biodegradable. There will be no risk of groundwater contamination because the water systems are fully contained.
- The new storage facilities for the biocide used are consistent with best practice (including storage on bunds/drip trays) and are included under with the site EMS / operational procedures.
- The 2009 improvements included upgrade to the existing tank farm bunding (re-lined) and provision of a new dedicated storage container for the Ecosol binder.

5.4 Accidental Releases and Spillages

The site has operated under an Environmental Management System in accordance with ISO 14001 certification since 1999, with this approach carried forward under the original Permit

granted in 2003. Under the EMS measures are in place for the management of materials and for the prevention of accidental releases. This includes a procedure for recording and investigating pollution incidents/spillages, together with the implementation of corrective action to minimise re-occurrence.

During the period of operation under Environmental Permit only one incident has been recorded:

- A small quantity of wash water entered the contained surface water drains into surface water sump W1 on 29 January 2009. No impact to soil groundwater and surface water is suspected. The root cause of the spillage was identified and corrective measures implemented (including repairs to the plant, changes to the drainage system and the provision of spill kits).

Table 5.2 – Summary of off Site Historical Development

Date	Historical Activity	Potential Contaminants	Likelihood of Contamination
1882 - 1902	The immediate areas surrounding the site are indicated to be undeveloped. Land use in the wider vicinity of the site is characterised by heavy industrial use (Steel works and Tin works are located within 250m NW and SE) and residential development Sebastapol, ~500m west). A gasometer is located ~125m SE of the site. A railway line lies to the west of the site.	Limited potential for documented land uses to have used or generated contaminants	Very Low
1902 - 1922	This broad land use continues, with some expansion of the industrial activity to the NW. The gasometer is no longer shown.	Storage, handling and use of a range of chemicals and raw materials, together with generation of solid / liquid wastes. Potential contaminants may include, hydrocarbons, resins, inorganic chemicals	Low to moderate
1922 -1954	The 1922 historical map shows sewage tanks located 200m west of the site. The steel works has extended southwards and is now located approximately 100m west of the north west corner of the site.	Limited potential for documented land uses to have used or generated contaminants	Very Low
1954 - Present	On the 1954 maps, the tin-works is indicated as disused. By 1964, maps indicate the southern-most part of the expanded steel works closest to the Knauf site (~100m NW) to be a slag heap (steel). Later maps shows the expansion of this feature towards the Knauf Insulation site. By the 1970's the heavy industrial use is in decline with many of the former works buildings redeveloped as the Avondale Industrial Estate. The Steel works activities are scaled back with final closure in 2004. Regeneration of the former steel works has since taken place with this area now under residential use. The village of Sebastopol has expanded.	Limited history of industrial land use adjacent to part of the Knauf Insulation site including a waste materials tip, with scaling back of activity over time and subsequent redevelopment for housing and light industrial/ commercial activity. Low potential for likely limited contamination impact from heavy metals, hydrocarbons, inorganic and organic chemical /residues.	Low

5.5 Potential Historical Contamination from On-site Sources

Prior to its development for the manufacture of glass-fibre products, no potential significant historical sources of contaminants have been identified.

Between first development in 1976 and 2002 certain site operations have been changed or discontinued. Evolution in the site has also led to the relocation of some activities. On this basis, the following potential contaminants may be identified as associated with pre-permitted site operations, which no longer take place in the originally specified areas of the site:

Table 5.3 - Potential contaminants associated with pre-permitted site operations

Location	Description of Activity	Potential Contaminant
Zone 1 Binder Tank Farm	Movement and handling	Previous contents (phenol, formaldehyde, ammonium lignosulphonate, urea, resin, ammonium hydroxide, mineral, sodium hydroxide and sulphuric acid)
Zone 1 Resin Plant	Movement and handling	Ammonium hydroxide, mineral oil, ammonium sulphate, lignosulphonate, dye, urea, silane, phenol, formaldehyde and ammonia
Zone 1 Former resin mixing tanks outside resin plant	Movement and handling	Ammonia solution, formaldehyde, phenol
Zones 1 & 2 Various	Storage and use	Diesel / gas oil

5.6 Potential Historical Contamination from Off-site Sources

The general area around the installation has an extended history of heavy industrial land use with some potential to have resulted in contamination of regional soils and groundwater, although few potentially contaminative activities are associated with land immediately adjacent to the site. On this basis, no significant historical sources of possible off-site contamination with potential to cause significant on-site impact are identified.

5.6.1 Pollution Incidents / Spillages

Since 1999, the site has operated under an Environmental Management System (EMS) in accordance with ISO 14001 certification. Under the EMS, measures are in place for the management of materials and for the prevention of accidental releases. This includes a procedure for recording and investigating pollution incidents/spillages, together with the implementation of corrective action to minimise re-occurrence.

The following incidents have been recorded:

- In 1992, oily waters in the binder plant overflowed the floor drain sump, entered the storm water system and reached the river.
- In 2000 a dye spillage occurred to the north of the effluent pit and red dye reached the local sewage works
- A minor spillage of wash water was recorded on 29th January 2009. A small quantity of wash water entered the surface water drains and thence into surface water sump W1. Following investigation, the wash water was deemed to have been retained within the site drainage system and is unlikely to have entered the Afon Llwyd. The root cause of the spillage was identified and corrective measures implemented.

5.7 Previous Investigation and Reports

The installation has been subject to a number of intrusive investigations/reports in recent years including:

Table 5.4 – Summary of Previous Investigations and Reports

Date	Report Title	Author	Reason for Investigation
June 1994	Environmental Assessment of Three Facilities: Ravenhead, Queensferry and Pont-y-Felin. (Owens-Corning Fibreglass Corporation).	ERM EnviroClean Ltd	Review of the potential for current (1994) or past operational practices at the installation to create environmental liabilities.
October 1994	Phase II Site Investigation Programme: Fibreglass Insulation Manufacturing Facility- Pont-y-Felin. (Owens-Corning/Pilkington).		A phase II site investigation within Zones 1 and 2 of the IPPC installation to target potential contamination sources.
June 1995	Further Phase II Investigations: Fibreglass Insulation Manufacturing Facility – Pont-y-Felin (Owens-Corning/Pilkington).		Soil / groundwater sampling undertaken targeting an area between the ammonia plant and the River Afon Llwyd, where ammonia and phenol contamination has previously been identified. The investigation was also designed to determine groundwater quality down gradient of the operational areas, between the identified ammonia/phenol contaminated groundwater locations and the river.
November 1999	Phase I Environmental Site Assessment. Owens Corning Building Products (UK) Limited Pont-y-Felin, UK	ARCADIS	Phase 1 Environmental Assessment of the installation, including: Regulatory review of the site, summary of site history and environmental setting, site reconnaissance and audit / review of the previous ERM investigations.
June 2002	Site Condition Report (Combined 1A/1B)	Carl Bro (now Sweco)	The PPC Regulations required the applicant submit a SCR as part of the permit application to operate a Part A(1) installation.
April 2003	Further Site Investigation Report (Combined 1A/1B)		

The key points from each report relevant to the study site are summarised below.

Table 5.5 - Previous Investigations and Reports Key Findings

Report	Findings
ERM EnviroClean Ltd June 1994	Details of the report are provided within the Carl Bro Further Site Investigation Report (Combined 1A/1B) 2003. Further investigation was recommended by ERM.
ERM EnviroClean Ltd October 1994	Summaries of the investigations are provided within the Carl Bro Further Site Investigation Report (Combined 1A/1B) 2003. As the ERM data was collected for a different purpose, further data was deemed necessary to ensure full coverage of potential sources of contamination in Zones 1 to 3 within the IPPC installation boundary.
ERM EnviroClean Ltd June 1995	Summaries of the investigations are provided within the Carl Bro Further Site Investigation Report (Combined 1A/1B) 2003. As the ERM data was collected for a different purpose, further data was deemed necessary to ensure full coverage of potential sources of contamination in Zones 1 to 3 within the IPPC installation boundary.

Table 5.5 - Previous Investigations and Reports Key Findings

Report	Findings
ARCADIS November 1999	Relevant information from the report was included as appropriate in the Carl Bro Further Site Investigation Report (Combined 1A/1B) 2003.
Carl Bro June 2002 / Carl Bro April 2003	Investigations were designed to supplement previous investigations and to set IPPC baseline conditions in support of the application for IPPC Authorisation (BR8212). Following discussions with the Environment Agency, it was agreed that previous site investigations would be used to establish the ground conditions present within the installation, but not the baseline with respect to contaminant concentrations. Full details of the investigations are provided within the Carl Bro Further Site Investigation Report (Combined 1A/1B) 2003. A summary of the key finding submitted in support of IPPC Authorisation (BR8212) are as follows. • The general sequence of natural strata beneath the made ground comprised dark brown silty clay (localised relict topsoil and subsoil) underlain by sands and gravels, beneath which is a red silty clay and bedrock comprising weathered mudstone and sandstone. The complete sequence of deposits was not observed in all exploratory holes and in many the made ground was directly underlain by sands and gravels. • The intrusive investigation undertaken confirms that the site is underlain by made ground comprising sand and gravel of limestone, clinker, grey shale and red shale to a maximum depth of 2.8 mbgl. The base of the made ground was proven at each location except WS105, WS106 and GP6. • Natural ground was encountered between ground level and 2.8 mbgl and comprised silty clay and sands and gravels underlain by red silty clay. Bedrock of sandstone and weathered mudstone was also encountered at between 1.9 m and 5.2 mbgl. • Shallow groundwater recorded at depths between 1.4 m and 3.5 mbgl. • No visual or olfactory evidence of contamination was noted during the Carl Bro 2002/2003 investigations. • During the previous investigations a slight oil sheen was noted on perched water in PF3 (Oil Storage Tank) and a strong hydrocarbon odour within the made ground. • In PF10 (Compressor House), black staining was noted immediately below the surface layer of clean aggregate with free phase mineral oils and greases encountered between 0.1 m and 0.3 m bgl. Arcadis (1999) reported that this area had been excavated and replaced with clean fill. • Yellow staining and an ammonia odour was observed whilst drilling PF5 (Binder Tank Farm - adjacent to the vent pipe from the ammonia header tank, adjacent to the resin plant). A strong hydrocarbon odour (decreasing with depth) was noted between 1.0 m and 1.2 mbgl to as deep as 3.6 mbgl. A water grab sample at 2.1m depth revealed an oily sheen with hydrocarbon / ammonia odours. A slight hydrocarbon odour was noted in GP1 (binder Plant Vent) during groundwater sampling. • No visual or olfactory evidence of contamination of the River Afon Llwyd was observed. • The nature, extent and distribution of contamination across the whole IPPC installation has been investigated. The baseline concentrations of contaminants associated with activities that will be operated under the forthcoming PPC process is presented. • Relatively low levels of metals, organic and inorganic contaminants have been identified in the made ground and natural ground beneath the site. Concentrations of phenol, ammonia and formaldehyde within the soils reflect the levels present prior to the commencement of the IPPC permit. Chemical analysis of groundwater detected the presence of ammonia, formaldehyde and phenol, but no other organic compounds. Groundwater samples were recovered from BH1, BH2 and BH3 for analysis, results show that there were very low concentrations of metals in the boreholes, leachate results show that contaminants are generally not mobile within soils beneath the site

Appendix C contains a series of Figures showing the location of the various ground investigation locations advanced during the course of completion of the above referenced site investigations. A full copy of the June 2002 / April 2003 report is presented in **Appendix D**.

6 Environmental Setting

Box 6.1 Main stages of preparing the baseline report: Stage 5

Activity	Objective
Identify the site's environmental setting including: - Topography; - Geology; - Direction of groundwater flow; - Other potential migration pathways such as drains and service channels; - Environmental aspects (e.g. particular habitats, species, protected areas etc.); and - Surrounding land use.	Determine where hazardous substances may go if released and where to look for them. Also identify the environmental media and receptors that are potentially at risk and where there are other activities in the area which release the same hazardous substances and may cause them to migrate onto the site.

An evaluation of the environmental setting of the site and surroundings has been determined by Sweco from a study of the geological map and environmental data. The sensitivity of each of the identified receptors in the vicinity of the site to contamination together with pathways from the site is summarised below:

6.1 Geology

According to the maps and publications of the British Geological Survey, together with the findings of previous investigations, the site is underlain by the sequence summarised in Table 6.1. In addition to the published BGS maps, information on the geology beneath the site has been obtained from BGS published Memoirs.

Table 6.1 – Geology

Unit	Age	Thickness and Composition
Made Ground	Recent	Previous intrusive site investigations have revealed Made Ground which was encountered in the majority of the exploratory holes, with proven depths ranging between 0.1 m and 3.0 mbgl. The Made Ground generally comprised brown sandy topsoil and subsoils over loose brown sand and gravel with brick fragments, concrete, sandstone and clay or comprising sand and gravels of ash, clinker, brick and concrete.
Alluvium Superficial Deposits	Quaternary Period	Based on available mapping data, River Alluvium is reported to be present beneath the site. This was confirmed during previous site investigation, with superficial deposits comprising relict topsoil and subsoil encountered along the southern boundary of the installation at depths ranging between 0.85 m and 2.57 mbgl. The general sequence of natural strata beneath the site comprised dark brown silty clay (to between 0.8 m and 2.7 mbgl) underlain by sands and gravels (to between 1.2 m and 5.2 mbgl). The complete sequence of deposits was not observed in all exploratory holes and in many locations, the made ground was directly underlain by sands and gravels.
Raglan Mudstone	Silurian Period	The solid geology beneath the site is described as interbedded mudstone and sandstone (Sedimentary Bedrock). Site investigation encountered bedrock at depths of between 1.9 mbgl and 5.2 mbgl (depth not proven) which generally comprised sandstone, green mudstone with red shale or dark grey and brown mudstone.

6.2 Hydrogeology

Geological map data indicate the following groundwater sensitivities:

Table 6.2 – Hydrogeology

Geology	Aquifer Status	Licensed Groundwater Abstractions	Groundwater Source Protection Zones	Potential for Infiltration and Baseflow	Sensitivity Assessment
Alluvium Superficial Deposits	Secondary Undifferentiated (Former Non-aquifer)	None within 1km indicated on web based data sources	N/A	There is a low likelihood of infiltration given the presence of hardstanding and buildings (approximately 95 %) across the installation. The underlying geology is likely to be variably permeable and more granular horizons may be expected to have some potential to promote baseflow.	Low - Moderate Superficial deposits likely to be variably permeable. Water strikes within exploratory holes indicate that they are water bearing. Sand/gravel horizons may provide a pathway for groundwater migration.
Raglan Mudstone	Secondary A Aquifer (Former Minor Aquifer)	None within 500m indicated on web based data sources			Moderate Potential for the water body to support local abstraction, although available data does not indicate abstraction in the immediate vicinity of the site. Not likely to support strategic abstractions. The underlying Raglan Mudstone aquifer may be afforded some protection from more cohesive deposits where present within the Alluvial deposits, although the nature extent and thickness of these deposits is variable.

6.3 Hydrology

A review of topographical maps and NRW data indicate the following surface water sensitivities:

Table 6.3 – Hydrology

Water course [Direction and Distance from Site]	River Quality Objective [Abstractions]	Potential for Baseflow	Potential to receive Runoff	Sensitivity Assessment
Afon Llwyd [Approximately 5 m to 10 m east of the installation at its closest location]	Water Framework Directive (WFD) classification (Second Management Cycle): Eco Potential (Current): Good Chemical Status (Current): Good Overall Status (Current): Good [None within 1km indicated on web based data sources]	<i>Moderate to Low</i> – The Afon Llwyd may derive some baseflow from sandy gravelly horizons within the Alluvium superficial deposits beneath the installation (where present and if laterally extensive).	<i>Low</i> – Site drainage across the permit boundary is designed so that spillages are not transmitted to the Afon Llwyd. Surface water is collected in surface water sump W1 (via an oil interceptor) and pumped into an above ground tank for re-use in the wash water system.	Moderate The site is located adjacent to an important surfacewater course although there are no direct outfalls or connections from the site to the River.

6.4 Flood Risk

Flood risk issues are summarised in Table 6.4 below.

Table 6.4 – Flood risk

Flood Risk Zone	Flood Defences / Alleviation	Flood Risk Assessment	Control of Run-off	Sensitivity Assessment
The installation falls within an area at Medium to Low risk of flooding from the Afon Llwyd (Flood Zone 2). The majority of the installation falls within a flood warning issue area.	Flood defences were installed along the western bank of the Afon Llwyd adjacent to the installation circa 2005.	A flood risk assessment has not been completed by Knauf.	Surface water drainage discharges into the Afon Llwyd at the southern end of the installation. The installation's permit boundary is predominantly covered with hardstanding and serviced by a drainage system that flows into surface water sump W1 via an interceptor before being predominantly recycled back into the wash water system.	Low - Moderate The installation is located in an area that has an elevated chance of flooding although will be afforded some protection from local flood defences

7 Conceptual Site Model

Box 7.1 Main stages of preparing the baseline report: Stage 6

Activity	Objective
Use the results of Stages 3 to 5 to describe the site, in particular demonstrating the location, type, extent and quantity of historic pollution and potential future emissions sources noting the strata and groundwater likely to be affected by those emissions – making links between sources of emissions, the pathways by which pollution may move and the receptors likely to be affected.	Identify the location, nature and extent of existing pollution on the site and to determine which strata and groundwater might be affected by such pollution. Compare with potential future emissions to see if areas are coincident.

UK legislation and guidance on assessing potentially contaminated land recommends use of a risk assessment process based on a review of source/pathway/receptor relationships for various environmental media.

A key component of the overall risk assessment process is the identification of potential “pollutant linkages” between a contaminant and a receptor. This can be done through the development of the Site-specific Conceptual Site Model (CSM) in which the potential contaminants, pathways and receptor (element) identified on-site are described.

Each element can be defined as follows:

Contaminants:	A substance either on, or under the land, and which has the potential to cause harm or pollution to human or environmental receptors.
Pathway:	A route or means by which a receptor can be exposed to or affected by a source.
Receptor:	A living organism or an ecological system or, controlled water, or property including buildings, crops, livestock.

In this report, a formalised system is used to classify both the:

- probability of a hazard occurring, and;
- potential severity of the hazard occurring.

Table 7.1 – Categorisation of Risk and Probability

Term	Description
Very High Risk	There is a high probability that severe harm could arise to a designated receptor from an identified hazard at the Site without appropriate remedial action.
High Risk	Harm is likely to arise to a designated receptor from an identified hazard at the Site without appropriate remedial action.
Moderate Risk	It is possible that without appropriate remedial action, harm could arise to a designated receptor but it is relatively unlikely that any such harm would be severe and if any harm were to occur it is more likely that such harm would be relatively mild.
Low Risk	It is possible that harm could arise to a designated receptor from an identified hazard but it is likely that at worst, that this harm, if realised, would normally be mild.
Negligible Risk	The presence of an identified hazard does not give rise to the potential to cause significant harm.

Individual risk elements may be further broken down in accordance with the following matrix to give a level of risk for each potential risk scenario.

Table 7.2 Individual Risk Matrix

		Potential Severity				
		Negligible	Minor	Mild	Moderate	Severe
Probability of Risk	Very High	Very Low	Moderate	High	Very High	Very High
	High	Very Low	Low to Moderate	Moderate	High	Very High
	Moderate	Very Low	Low	Low to Moderate	Moderate	High
	Low	Very Low	Low	Low	Low to moderate	Moderate
	Negligible	Very Low	Very Low	Very Low	Very Low	Very Low

7.1 Methodology

Based upon evaluation of information collated during the study and described in the preceding chapters, a risk assessment has been undertaken in line with the best practice methodology set out by the Department of Environment, Food and Rural Affairs (DEFRA) and the Environment Agency. The assessment is based on a source – pathway – receptor model.

In accordance with the adopted methodology, the classification terms of potential risk are therefore used to reflect both the probability of an event occurring and the magnitude of possible effects.

7.2 Source – Pathway – Receptor Relationships

The most significant potential environmental risks identified based upon historical and on-going current use are summarised below.

7.2.1 Sources

The potential sources of contamination identified in this study are summarised as follows:

- **Raw Materials Storage and Handling** – EP dust, soda ash, borax pentahydrate and manganese dioxide within the electrostatic precipitator plant, batch plant and above ground transfer pipework.
- **Product Manufacture** (Furnace operations, binding plant, curing oven and cutting, fiberizing, forming, white wool forming and packaging, wrapping, silicone mixing building, manual bagging area, stores, side of line and engineering workshop) – ammonia solution, silane, silicone emulsions and binding agents, hydrophobic agents, sulphuric acid, hydrocarbons associated with various oils, lubricants and grease, inks, various cleaning solutions and anti-statics.
- **Wash Water Plant and Water Treatment Areas (including wash water pit)** – Antifoam 1510, caustic soda liquor (5 % to 50 %) and various biocides.

- **Fuel Oil and Waste Oil Storage Areas** – Various hydrocarbons associated with fuel Oil (20,000 L diesel tank and several small volume day tanks) and waste oils, grease and lubricants from the manufacturing process.

7.2.2 Pathways

The transport mechanisms for potential contaminant migration will be similar across the whole of the installation area and may be considered to include:

- Building and roadways form a significant proportion of the total site area, providing a barrier between materials stored / used, process areas and underlying soils;
- Hardstanding is generally in good condition across the site, but it is possible that potential contaminants could migrate into underlying soils and groundwater in areas which are cracked or where hardstanding is absent.
- Subsurface contamination may migrate into faulty or damaged surface water drains and reach the nearby river.
- Subsurface contamination may also be transmitted to the nearby river via baseflow within the alluvial deposits beneath the site. The infiltration of spillages into the subsurface may also have affected groundwater quality within the Alluvium beneath the site.

7.2.3 Receptors

The following receptors are identified:

The site is underlain by Alluvium which is classified as a Secondary Undifferentiated aquifer, beneath which is The Raglan Mudstone Formation, a Secondary A aquifer. The nearest groundwater abstraction is located 500m north of the site and is used for process water.

- The River Afon Llwyd is located adjacent to the eastern site boundary is of good quality (Class B).
- Groundwater is considered to be of low to moderate sensitivity and surface water of high sensitivity.
- There are no recognised ecologically sensitive receptors nature reserves or SSSIs, within 1 km of the site.

Groundwater and surface water have therefore been identified as significant environmental receptors in the vicinity of the site.

7.3 Review of Site Investigation Data

A number of site investigations have been completed at the site as set out in Section 5.7. The most recent site investigation data was recovered by Carl Bro (now Sweco) in support of the original permit application. This combined information has been re-assessed in conjunction with the change in operations over time and importantly to take account of phase out of certain relevant hazardous substances previously considered. The opportunity has also been taken to compare the available data with current screening criteria for a range of commonly encountered contaminants in soils and waters. This approach allows the chemical analyses data to be

presented in an appropriate context. Based on this integrated process of data evaluation, further refinement of the initial conceptual model established at the time of the original permit application has been made.

7.3.1 Chemical Analyses Results & Screening Criteria

Chemical analysis results obtained from the intrusive investigations are assessed to establish whether they may represent a source of contamination with respect to identified receptors at the Site and the surrounding area. In the case of groundwater and surface water analysis results, it may also be possible to use the chemical analysis results to establish whether there is an existing measureable impact on the receptor.

In order to put the soil chemical analysis results into context, the site investigation data has initially been assessed (screened) in relation to the guidelines currently used for the characterisation of contaminated land and which relate to risk to human health from soil-based contaminants. In this case Generic Assessment Criteria (GAC) for Commercial land use has been used to provide context.

Where the available assessment criteria are determined based on soil organic matter (SOM) content, an SOM content of 1% has been assumed as representative for the ground conditions encountered

Analysis of soil leachability provides an indication of the potential for contaminants to be mobilised from soils, potentially impacting controlled waters via migration through the unsaturated zone. This enables the risk to controlled waters posed by soil contaminants to be assessed with greater confidence.

For assessing impacts on groundwater, the reported leachability analysis results have been compared against the UK Drinking Water Standards (DWS). These are documented in The Water Supply (Water Quality) Regulations 2016. Where an appropriate DWS is not available, other relevant guidelines (including for example, freshwater Environmental Quality Standards (EQS), and Water Framework Directive (WFD) inland surface waters) have been used as the Generic Quantitative Risk Assessment (GQRA) screening criteria.

In addition to screening against the above standards, guidance on groundwater protection, as given in EA document 'Groundwater protection: Principles and Practice' (GP3) version 1.1 (dated August 2013), has been considered. This concerns the prevention of hazardous substances further entering groundwater and the limitation of non-hazardous pollutants into groundwater so as to prevent pollution, as well as dealing with currently impacted groundwater.

The guidance given within GP3 is considered current good practice with regard to groundwater protection principals of the Water Framework Directive (2000/60/EC) and The Groundwater Daughter Directive (2006/118/EC). The Water Framework Directive and the Groundwater Daughter Directive consider a wide range of potential pollutants and refer to them as hazardous substances or non-hazardous pollutants. Hazardous substances are the most toxic and must be prevented from entering groundwater, whereas non-hazardous pollutants are less dangerous and their entry into groundwater must be limited so that it does not cause pollution

In order to assess potential impacts on groundwater beneath the Site, the groundwater analytical results have been compared against the DWS and World Health Organisation (WHO)

groundwater quality standards, where DWS are not available. As stated above, consideration has also been given to guidance presented in GP3

7.4 Key Findings and Conclusions

The intrusive investigations undertaken confirm that the site is underlain by made ground comprising sand and gravel of limestone, clinker, grey shale and red shale to a maximum depth of 2.8 m. The base of the made ground was proven at each location except WS105, WS106 and GP6. Natural ground was encountered between ground level and 2.8 mbgl and comprised of silty clay and sands and gravels underlain by red silty clay. Bedrock of sandstone and weathered mudstone was also encountered at between 1.9 m and 5.2 mbgl. Groundwater was encountered during the site investigation at between 72.06 m and 75.05 mAoD.

The results of the soil analyses confirm trace levels of metals, within typical ranges expected for naturally occurring soils. Comparison against threshold criteria for commercial land use reveals concentrations well below screening limits where available. On this basis, the baseline soil quality with respect to metals is not considered to reflect specific contamination from processes undertaken or from relevant hazardous substances in use.

Similarly, low levels of potential organic and inorganic contaminants have been identified in the made ground and natural ground beneath the site

The Table presented below shows the range of concentrations of contaminants encountered. Only those contaminants encountered over laboratory detection limits are shown here (in mg/kg).

The nature of contamination detected can be categorised as industrial contaminants likely to be from the above ground site activities.

Laboratory certificates and methodologies, limits of detection and details of all samples taken and analysed are included in **Appendix D**.

Table 7.3 - Summary of Soil Results – Metals and Inorganic Compounds

Determinands	Range of Contaminant Concentrations (mg/kg)		Screening Criteria (mg/kg)	Reference [Exceedances]
	Min	Max		
Arsenic	10	59	640	Commercial S4UL/SS4UL1% SOM [No exceedances]
Boron (water soluble)	<1	8	240000	
Cadmium	<1	4	190	
Chromium	9	162	8600	
Copper	4	45	68000	
Mercury	<1	<1	1100	
Nickel	11	49	980	
Lead	13	108	-	
Selenium	<1	2	12000	
Zinc	36	358	730000	
Acid soluble sulphide	<1	508	-	
Thiocyanate	<1	<1	-	
Ammoniacal Nitrogen	6.9	60.4	-	

Table 7.3 - Summary of Soil Results – Metals and Inorganic Compounds

Determinands	Range of Contaminant Concentrations (mg/kg)		Screening Criteria (mg/kg)	Reference [Exceedances]
	Min	Max		
Hexavalent chromium	<0.1	<0.1	33	Commercial S4UL/SS4UL1% SOM [No exceedances]
Total Sulphur	0.01	0.97	-	
Acid soluble sulphate	<10	25000	-	
pH value in soil	5.51	9.16		
Total cyanide	<2.5	<2.5	500	Sweco Acute Criteria [No exceedances]
Free cyanide soil	<2.5	<2.5	30	

Table 7.4 - Summary of Soil Results – Organic Compounds

Determinands	Range of Contaminant Concentrations (mg/kg)		Screening Criteria (mg/kg)	Reference [Exceedances]
	Min	Max		
Formaldehyde	<1	13	-	
Total phenols HPLC	<0.01	0.1	440	Commercial S4UL/SS4UL1% SOM [No exceedances]
Diesel range organics	9	217	-	
Petrol Range Organics	<0.01	0.3	-	
Benzene	<0.01	0.02	27	Commercial S4UL/SS4UL1% SOM [No exceedances]
Toluene	<0.01	0.097	56000	
Ethylbenzene	<0.01	0.02	5700	
Xylene	<0.01	0.2	6600	
Acenaphthene	0.036	0.219	84000	
Acenaphthylene	0.01	1.27	83000	
Anthracene	0.012	0.39	520000	
Benzo(a)anthracene	0.012	0.98	170	
Benzo(a)pyrene	0.011	1.13	35	
Benzo(b)fluoranthene	0.026	1.78	44	
Benzo(ghi)perylene	0.01	0.89	3900	
Benzo(k)fluoranthene	0.011	1.29	1200	
Chrysene	0.022	1.35	350	
Dibenzo(ah)anthracene	0.009	0.46	3.5	
Fluoranthene	0.021	2.25	23000	
Fluorene	0.036	0.184	63000	
Indeno(1,2,3cd)pyrene	0.006	1.06	500	
Naphthalene	0.143	1.097	190	
Phenanthrene	0.057	1.81	22000	
Pyrene	0.02	1.73	54000	

Selected samples recovered from targeted locations were scheduled for analyses for a wide range of volatile organic compounds (VOC) and semi-volatile organic compounds (SVOC's).

The results of the VOC analyses on soils showed that for a total of 60 individual determinands all were below the detection level for the analytical method employed with the exception of trace levels of toluene in one sample recovered from each of WS-106 and WS-107.

Maximum concentrations recorded were considerably below screening limits and unlikely to suggest contamination impact.

Analyses for 59 SVOCs also recorded concentrations below respective limits of detection for the vast majority of determinands. Certain individual polyaromatic hydrocarbons (PAH) recorded trace concentrations, also in WS-106 and WS-107. Maximum recorded concentrations are again well below comparison screening limits and are not considered to indicate widespread of significant contamination. The results are summarised in Appendix D.

The following table shows the range of metals and inorganic compounds encountered in groundwater within the installation.

Table 7.5 - Summary of Groundwater Results: Metals & Inorganic Compounds

Determinands	Range of Contaminant Concentrations (mg/L)		Screening Criteria (mg/L)	Reference [Exceedances]
	Min	Max		
Arsenic	0.001	0.003	0.01	England and Wales DWS (2000 as amended) [No exceedances]
Boron (water soluble)	0.025	0.366	1	
Cadmium	<0.0004	0.0038	0.005	
Chromium	0.003	0.015	0.05	
Copper	<0.001	0.031	2	
Mercury	<0.0005	0.00012	0.001	
Nickel	0.004	0.018	0.02	
Lead	0.002	0.004	0.01	
Selenium	<0.001	0.002	0.01	
Zinc	0.06	0.744	-	
Sulphide in Water	<0.05	<0.05	-	
Ammoniacal Nitrogen	0.4	0.8	0.5	England and Wales DWS (2000 as amended) [One exceedance]
Hexavalent Chrome	<0.03	<0.03	-	
Thiocyanate	<0.2	<0.2	-	
Free sulphur	<0.05	<0.05	-	
Acid soluble sulphate	71	226	250	England and Wales DWS (2000 as amended) [No exceedances]
pH	7.31	8.37	-	
Total cyanide	<0.05	<0.05	0.05	England and Wales DWS (2000 as amended) [No exceedances]
Free cyanide	<0.05	<0.05	-	

Groundwater analysis results show that there were very low concentrations of metals in the samples taken from the installed boreholes. Where concentrations were recorded above detection limits, with the exception of marginally elevated concentrations of Ammonium in one location, results were below the stringent screening level applied. The presence of widespread significant site derived contamination of the shallow groundwater beneath the site is not supported by the data.

With respect to organic compounds, a wide range of hydrocarbons, PAHs, VOCs and SVOCs and other relevant parameters were subject to laboratory analyses. With the rare exception of a

marginally elevated concentration of petroleum range organics in one location, results returned are below the limit of detection for the analytical methods employed. Applying the stringent screening criteria for certain individual parameters, the limit of detection are above the screening limits. On balance, and taking into account the soil data, in such cases it is reasonable to conclude that very low (or no) contamination presence is confirmed.

Table 7.6 - Summary of Groundwater Results: Organic Compounds

Determinands	Range of Contaminant Concentrations (mg/L)		Screening Criteria (mg/L)	Reference [Exceedances]
	Min	Max		
Formaldehyde	<0.05	<0.05	-	
Diesel range organics	<0.01	0.016	-	
Petrol Range Organics	<0.01	<0.01	-	
Phenol	<0.0005	<0.0005	-	
Benzene	<0.01	<0.01	0.01	England and Wales DWS (2000 as amended) [No exceedances]
Toluene	<0.01	<0.01	0.074	WHO DWS 2011 (4th Edition) [No exceedances]
Ethylbenzene	<0.01	<0.01	0.02	
Xylene	<0.01	<0.01	-	
Acenaphthene	<0.01	<0.01	-	
Acenaphthylene	<0.01	<0.01	-	
Anthracene	<0.01	<0.01	-	
Benzo(a)anthracene	<0.01	<0.01	-	
Benzo(a)pyrene	<0.01	<0.01	0.00001	England and Wales DWS (2000 as amended) [See text]
Benzo(b)fluoranthene	<0.01	<0.01	-	
Benzo(ghi)perylene	<0.01	<0.01	-	
Benzo(k)fluoranthene	<0.01	<0.01	-	
Chrysene	<0.01	<0.01	-	
Dibenzo(ah)anthracene	<0.01	<0.01	-	
Fluoranthene	<0.01	<0.01	-	
Fluorene	<0.01	<0.01	-	
Indeno(1,2,3cd)pyrene	<0.01	<0.01	-	
Naphthalene	<0.01	<0.01	-	
Phenanthrene	<0.01	<0.01	-	
Pyrene	<0.01	<0.01	-	

Table 7.7 - Summary of Soil Leachability Screening Assessment - Groundwater

Determinands	Range of Contaminant Concentrations (mg/l)		Screening Criteria (mg/l)	Reference
	Min	Max		
Arsenic	<0.05	<0.05	0.01	England and Wales DWS (2000 as amended) [See text]
Boron (water soluble)	0.09	0.32	1	
Cadmium	<0.0004	<0.0004	0.005	
Chromium	<0.05	<0.05	0.05	
Copper	<0.05	<0.05	2	
Mercury	<0.00005	<0.00005	0.001	
Nickel	<0.05	<0.05	0.02	
Lead	<0.05	0.08	0.01	
Selenium	<0.05	<0.05	0.01	
Zinc	<0.05	<0.05	-	
Ammoniacal Nitrogen	<0.2	1.6	0.5	England and Wales DWS (2000 as amended) [One exceedance]
Formaldehyde	<0.05	<0.05	-	
Total phenols HPLC	<0.01	0.03	-	
2-isopropyl phenol	<0.01	0.03	-	
Catechol	<0.01	<0.01	-	
Cresols	<0.01	<0.01	-	
Napthol	<0.01	<0.01	-	
Phenol	<0.01	<0.01	-	
Resorcinol	<0.01	<0.01	-	
Trimethyl phenol	<0.01	<0.01	-	
Xylenols	<0.01	<0.01	-	
pH value of leachate	7.38	7.63		

The leachate results show that contaminants are generally not mobile within soils beneath the site. However, very low levels of leachable metals and ammonium were identified at isolated locations beneath the site.

7.5 Revised Risk Assessment

The following Tables present the revised risk assessment for the site taking into account process changes since initial grant of Permit in 2003, the results of all available site investigation information and the reduction in the number and / or quantity of relevant hazardous substances currently used in the process.

Table 7.5 – Summary of Risk Assessment

Sources (Identified and Potential)	Pathways (Potential) [Likelihood of hazard-receptor linkage]	Receptors (Potential) [Consequence of hazard-receptor linkage]	Risk Level	Mitigation / Control	Residual Risk
Raw Materials Storage and Handling EP dust, soda ash, borax pentahydrate and manganese dioxide.	Migration into underlying soils and groundwater in areas of cracked or absent hardstanding. [Low Likelihood]	Alluvium (Secondary Undifferentiated aquifer) Raglan Mudstone Formation (Secondary A aquifer) The Afon Llwyd (good quality (Class B)). [Low to Moderate]	Low to moderate	Installation operates under an EMS in accordance with ISO 14001 certification (since 1999) where measures are in place for the management of materials and for the prevention of accidental releases. Storage and containment of potentially dangerous substances is undertaken in accordance with prevailing regulations and best practice in designated locations, appropriately signed and using appropriate containers with secondary containment where required. Knauf operate generic spillage procedures, including the use of spill kits. Substances used in the wash water system are not considered to pose a significant risk as the system is fully contained. Site drainage designed so spillages are not transmitted to the Afon Llwyd. Surface water is collected in surface water sump W1 (via an oil interceptor) and pumped into an above ground tank for re-use in the wash water system.	Very Low
	Subsurface contamination may migrate into faulty or damaged surface water drains and reach the Afon Llwyd. [Low Likelihood]		Low to moderate		Very Low
	Subsurface contamination transmitted to the Afon Llwyd via baseflow within the Alluvial deposits beneath the site. The infiltration of spillages into the subsurface may also have affected groundwater quality within the Alluvium beneath the site. [Low Likelihood]		Low to moderate		Very Low
Product Manufacture Ammonia solution, silane, silicone emulsions and binding agents, hydrophobic agents, sulphuric acid, hydrocarbons associated with various oils, lubricants and grease, inks, various cleaning solutions and antistatics.	Migration into underlying soils and groundwater in areas of cracked or absent hardstanding. [Low Likelihood]	Alluvium (Secondary Undifferentiated aquifer) Raglan Mudstone Formation (Secondary A aquifer) The Afon Llwyd (good quality (Class B)). [Low to Moderate]	Low to moderate	The site drainage system is included on the site maintenance and inspection schedule. No significant repairs/replacements required to date with its integrity and function understood to be good. Maintained building and hardcover areas will reduce the likelihood of infiltration. Site investigation and chemical data for the soil and groundwater regime does not indicate the presence of significant or widespread presence of contamination for individual parameters or representative grouping of substances. The overall quality of controlled waters is considered to be good.	Very Low
	Subsurface contamination may migrate into faulty or damaged surface water drains and reach the Afon Llwyd. [Low Likelihood]		Low to moderate		Very Low
	Subsurface contamination transmitted to the Afon Llwyd via baseflow within the alluvial deposits beneath the site. The infiltration of spillages into the subsurface may also have affected groundwater quality within the Alluvium beneath the site. [Low Likelihood]		Low to moderate		Very Low

Sources (Identified and Potential)	Pathways (Potential) [Likelihood of hazard-receptor linkage]	Receptors (Potential) [Consequence of hazard-receptor linkage]	Risk Level	Mitigation / Control	Residual Risk
Wash Water Plant and Water Treatment Areas (including wash water pit) Antifoam 1510, caustic soda liquor (5 % to 50 %) and various biocides.	Migration into underlying soils and groundwater in areas of cracked or absent hardstanding. [Low Likelihood]	Alluvium (Secondary Undifferentiated aquifer) Raglan Mudstone Formation (Secondary A aquifer) The Afon Llwyd (good quality (Class B)). [Low to Moderate]	Low to moderate	Installation operates under an EMS in accordance with ISO 14001 certification (since 1999) where measures are in place for the management of materials and for the prevention of accidental releases. Storage and containment of potentially dangerous substances is undertaken in accordance with prevailing regulations and best practice in designated locations, appropriately signed and using appropriate containers with secondary containment where required. Knauf operate generic spillage procedures, including the use of spill kits. Substances used in the wash water system are not considered to pose a significant risk as the system is fully contained.	Very Low
	Subsurface contamination may migrate into faulty or damaged surface water drains and reach the Afon Llwyd. [Low Likelihood]		Low to moderate		Very Low
	Subsurface contamination transmitted to the Afon Llwyd via baseflow within the alluvial deposits beneath the site. The infiltration of spillages into the subsurface may also have affected groundwater quality within the Alluvium beneath the site. [Low Likelihood]		Low to moderate		Very Low
Fuel Oil and Waste Oil Storage Areas Various hydrocarbons associated with fuel Oil (20,000 L diesel tank and several small volume day tanks) and waste oils, grease and lubricants from the manufacturing process.	Migration into underlying soils and groundwater in areas of cracked or absent hardstanding. [Low Likelihood]	Alluvium (Secondary Undifferentiated aquifer) Raglan Mudstone Formation (Secondary A aquifer) The Afon Llwyd (good quality (Class B)). [Low to Moderate]	Low to moderate	Site drainage designed so spillages are not transmitted to the Afon Llwyd. Surface water is collected in surface water sump W1 (via an oil interceptor) and pumped into an above ground tank for re-use in the wash water system. The site drainage system is included on the site maintenance and inspection schedule. No significant repairs/replacements required to date with its integrity and function understood to be good. Maintained building and hardcover areas will reduce the likelihood of infiltration. Site investigation and chemical data for the soil and groundwater regime does not indicate the presence of significant or widespread presence of contamination for individual parameters or representative grouping of substances. The overall quality of controlled waters is considered to be good.	Very Low
	Subsurface contamination may migrate into faulty or damaged surface water drains and reach the Afon Llwyd. [Low Likelihood]		Low to moderate		Very Low
	Subsurface contamination transmitted to the Llwyd via baseflow within the alluvial deposits beneath the site. The infiltration of spillages into the subsurface may also have affected groundwater quality within the Alluvium beneath the site. [Low Likelihood]		Low to moderate		Very Low

8 Site Investigation

Box 8.1

Main stages of preparing the baseline report: Stage 7

Activity	Objective
If there is sufficient information to quantify the state of soil and groundwater pollution by relevant hazardous substances on the basis of Stages (1) to (6) then go directly to Stage 8. If insufficient information exists then intrusive investigation of the site will be required in order to gather such information. The details of such investigation should be clarified with the competent authority.	Collect additional information as necessary to allow a quantified assessment of soil and groundwater pollution by relevant hazardous substances.

Based on the information presented in Stages 1 to 6 it is considered that sufficient information is available in order to demonstrate and quantify the state of soil and groundwater pollution.

9 Baseline Site Condition Report

Box 8.1 Main stages of preparing the baseline report: Stage 8

Activity	Objective
Produce a baseline report for the installation that quantifies the state of soil and groundwater pollution by relevant hazardous substances. The purpose of this stage is to summarise all of the evaluated information collected in Stages 1-7 to produce a report which identifies the state of soil and groundwater contamination by relevant hazardous substances.	Provide a baseline report in line with the IED.

The baseline report itself should provide an accurate and clear description about

what data has been used to establish the state of the soil and groundwater,

what methods have been used to sample and analyse the substrata and how the results have been verified, statistically or methodologically.

It should, in essence, clearly outline a series of actions that are fully reproducible at site cessation together with the results so as to enable a quantified comparison.

Where potentially polluting substances are present the baseline report should identify which strata or groundwater bodies they are associated with and describe their concentration, nature and extent. Providing a clear statement of which relevant hazardous substances are not present is just as important as identifying those which are.

The baseline report should:

- Be presented in a logical and structured format;
- Contain sufficient information to establish the scope and impact of the current activity or activities covered by the permit, including the dates of all relevant soil and groundwater measurements;
- Provide a clear and accurate description of the approaches used and the results obtained by the assessment as well as the location of any intrusive works, wells, boreholes and other sampling points in accordance with a standardised geographic referencing system;
- Provide a clear description of the analytical techniques used to establish the concentrations of hazardous substances in soil and groundwater with reference where appropriate to national or international standards used as well as any guidance provided by Member States that existed at the time of the investigation;
- State the scientific uncertainties and limitations of the approach taken in preparing the report;
- Include all relevant technical data (measurements, calibration certificates, analytical standards, accreditations, maps, sampling logs etc.) so as to ensure, at final cessation, a valid quantified comparison can be made.

9.1 Introduction

The installation at Pont-y-Felin near Cwmbran is operated by Knauf Insulation Ltd (the Operator). The process involves the manufacture of glass fibre - light and heavy density glass mineral wool rolls, batts and loose fibre products, which are produced for use as thermal and acoustic insulation material. This activity falls under Section 3.4 Part A(1)(a) of The Environmental Permitting Regulations (2013 amendment).

The Operator has held a Permit (reference EPR/BR8212IK) since May 2003, which has over time been subject to a number of Variations. The most recent of these (31/07/2015) was issued by Natural Resources Wales (NRW) following a statutory review of permits in the glass and mineral fibre sector in 2014 in response to the changes required by the Industrial Emissions Directive (IED), which came into force on 7th January 2014.

Under the most recent Variation, an improvement condition (IC) is included within the Permit requiring the Operator to submit a report on the baseline conditions of soil and groundwater at the installation.

9.2 Improvement Condition IC-2

This IC requires that a baseline site condition report shall contain the information, supplementary to that already provided in the application Site Condition Report, needed to meet the information requirements of Article 22(2) of the IED.

The report is to contain the information necessary to determine the state of soil and groundwater contamination at the time of the original grant of permit so as to allow a quantified comparison to be made between this confirmed state and with that determined upon definitive cessation of activities provided for in Article 22(3) of the IED. This report shall contain information, supplementary to that already provided in the application Site Condition Report, needed to meet the information requirements of Article 22(2) of the IED.

9.3 Site Condition Report (SCR)

This SCR has been completed in order to satisfy IC-2 set out in the July 2015 Variation support of the permit variation application.

The SCR builds on the information collated and submitted to the relevant regulator at the time of initial Permit application and summarises key developments and changes relevant to the operational phase since initial grant of Permit. In developing the SCR, the Operator has taken into account best practice and information provided in the NRW publications, "Environmental Permitting Regulations Guidance for applicants H5 Site condition report – guidance and templates" and "Environmental Permitting Regulations (England and Wales) 2014 Regulatory Guidance Note, RGN 9: Surrender".

This report has been developed with reference to the European Commission Guidance concerning baseline reports under Article 22(2) of Directive 2010/75/EU on industrial emissions (2104/C 136/03), taking into account comments included by NRW in their Compliance Assessment Report, dated 3rd September 2018.

Full details of the information used to develop this SCR are set out in Sections 2-8 of this report. Within these Sections, reference is made to a series of Appendices which include site investigation data, chemical analyses boreholes logs and other relevant information. This

information was previously submitted to the relevant authority in support of the original determination of the Permit application. Reference to this documentation is recommended should scrutiny of the raw data be required.

9.4 Data Used to Establish the State of the Soil and Groundwater

The baseline SCR is required to provide an accurate and clear description about the data that has been used to establish the state of the soil and groundwater.

A number of data sources have been used to develop a robust understanding of site conditions and relationships and how these have evolved over time.

The data assembled includes findings from a series of site investigation reports and environmental studies prepared prior to introduction of the IPCC (now EPR) Regime in 2000, further site characterisation and benchmarking completed in support of the initial pre-permit application site condition report prepared in 2002 (and supplemented in 2003).

Additional independent environmental audit and inspection was completed in 2016, benchmarking site conditions, management systems and controls. Further evaluation of the degree to which the installation uses, produces or releases hazardous substances was undertaken in 2017. From this assessment, a sub-set of relevant hazardous substances was identified focussed on confirming the actual possibility for soil or groundwater contamination at the site of the installation. These relevant hazardous substances have been carried forward for detailed risk-based assessment.

This data complements the regular site inspections, planned maintenance regime and record keeping routinely required in support of the site ISO 14001 EMS, operated since 1999.

These combined data sources include desk study information, site reconnaissance data, process and operational data, commentary from site representatives obtained during interviews with key staff, site investigation data, together with physical and chemical analyses data on representative soil and groundwater samples.

The following principal information sources have been used:

Date	Report Title	Author
June 1994	Environmental Assessment of Three Facilities: Ravenhead, Queensferry and Pont-y-Felin. (Owens-Corning Fibreglass Corporation).	ERM EnviroClean Ltd
October 1994	Phase II Site Investigation Programme: Fibreglass Insulation Manufacturing Facility- Pont-y-Felin. (Owens-Corning/Pilkington).	ERM EnviroClean Ltd
June 1995	Further Phase II Investigations: Fibreglass Insulation Manufacturing Facility – Pont-y-Felin (Owens-Corning/Pilkington).	ERM EnviroClean Ltd
November 1999	Phase I Environmental Site Assessment. Owens Corning Building Products (UK) Limited Pont-y-Felin, UK	ARCADIS
June 2002	Site Condition Report (Combined 1A/1B)	Carl Bro (now Sweco)
April 2003	Further Site Investigation Report (1B)	Carl Bro (now Sweco)

In addition to the above, the following tasks have been completed in order to pull together relevant data sources:

- 1) Data review of the initial site condition report and its findings, including assessment of the data against relevant 2016 screening criteria for soils and controlled waters;
- 2) Evaluation of the impact of process changes, evolution of the Permitted operation over time and effect of any changes in use of raw materials and chemicals on the site condition and baseline environmental condition;
- 3) Updated relevant hazardous substances assessment;
- 4) Assessment of soil and groundwater hazards and risks associated with the current permitted activities;
- 5) Review of existing controls and management practices including site audit and inspection of the condition of existing monitoring points to gauge suitability for continued use;
- 6) Data gap assessment and status summary report, and;
- 7) Discussion with NRW regarding the approach and outline findings.

9.5 Methods used to Sample and Analyse the Substrata

Details of the methods and techniques used to analyse the soil and groundwater conditions beneath the site are included in the individual site investigation reports.

To the best of our knowledge, the design and execution of the intrusive site investigations completed by others was carried out in accordance with prevailing industry guidance and best practice, supported by internal company QA / QC procedures and standard operating procedures.

This approach is confirmed for the work undertaken by Carl Bro (now Sweco). Relevant standards available and adhered to for the investigations in 2002 / 2003 included:

- 1) **BS5930: 1999 Code of practice for ground investigations**, and;
- 2) **BS 10175:2001 (Investigation of Potentially Contaminated Sites – Code of Practice)**.

Appropriately qualified and experience sub-contractors were engaged under the supervision of technically competent engineers.

Sampling of soil and groundwater was carried out on representative samples in accordance with the published guidelines referenced above, with samples sent to appropriately accredited external laboratories for independent analyses.

9.6 Evaluation of Data

The results of the chemical analyses carried out have been published by the various laboratories contracted following completion of various stages of the in-house QA / QC processes required to support the externally verified analytical techniques used.

On this basis, the data provided is considered to be verified as accurate and reliable within the overall constraints inherently associated with site investigation.

The data collated has then been assembled to present the baseline condition of the soil and groundwater. As required under NRW guidance the data has been used to help develop an environmental risk assessment (see Part 1 of our guidance on Environmental risk assessment – H1).

This process has also included development of a Conceptual Site Model in line with the best practice methodology set out by the Department of Environment, Food and Rural Affairs (DEFRA) and the Environment Agency. The assessment is based on a source – pathway – receptor model.

The operator has also commissioned an independent environmental audit of the operations and activities undertaken at the site. The objective of this exercise was to confirm current operations, together with the use of hazardous substances and wastes, in order to evaluate whether previously assessed risks and impacts remain unchanged, have improved or worsened.

Our inputs included assessment as to whether any changes in operations since initial benchmarking have been fully reflected in assessment of the chemical substances and mixtures used and their hazard impact/risk profile determined.

We also examined the existing management procedures in order to evaluate whether regular review of contamination risk in response to change and as a part of routine audit of the EMS/accident management plan has been completed.

To meet these objectives, our audit was carried out in a manner that is systematic, documented, evidence-based and follows set procedures.

9.7 Baseline Condition of the IPPC Installation

Site investigation data recovered in support of the original permit application has been undertaken, which allows further refinement of the conceptual model and provides appropriate analytical data to define the baseline condition of the Permitted installation. The opportunity has been taken to review the available analytical data in the context of current applicable guidance and best practice.

The intrusive investigation undertaken confirms that the site is underlain by made ground comprising sand and gravel of limestone, clinker, grey shale and red shale to a maximum depth of 2.8 m. The base of the made ground was proven at each location except WS105, WS106 and GP6. Natural ground was encountered between ground level and 2.8 mbgl and comprised of silty clay and sands and gravels underlain by red silty clay. Bedrock of sandstone and weathered mudstone was also encountered at between 1.9 m and 5.2 mbgl. Groundwater was encountered during the site investigation at between 72.06 m and 75.05 mAoD.

The results of the soil analyses confirm trace levels of metals, within typical ranges expected for naturally occurring soils. Comparison against threshold criteria for commercial land use reveals concentrations well below screening limits where available. On this basis, the baseline soil quality with respect to metals is not considered to reflect specific contamination from processes undertaken or from relevant hazardous substances in use.

Similarly, low levels of potential organic and inorganic contaminants have been identified in the made ground and natural ground beneath the site

The results of the VOC analyses on soils showed that for a total of 60 individual determinands all were below the detection level for the analytical method employed with the exception of trace levels of toluene in one sample recovered from each of WS-106 and WS-107.

Maximum concentrations recorded were considerably below screening limits and unlikely to suggest contamination impact.

Analyses for 59 SVOCs also recorded concentrations below respective limits of detection for the vast majority of determinands. Certain individual polyaromatic hydrocarbons (PAH) recorded trace concentrations, also in WS-106 and WS-107. Maximum recorded concentrations are again well below comparison screening limits and are not considered to indicate widespread of significant contamination.

Groundwater analysis results show that there were very low concentrations of metals in the samples taken from the installed boreholes. Where concentrations were recorded above detection limits, with the exception of marginally elevated concentrations of Ammonium in one location, results were below the stringent screening level applied. The presence of widespread significant site derived contamination of the shallow groundwater beneath the site is not supported by the data.

With respect to organic compounds, a wide range of hydrocarbons, PAHs, VOCs and SVOCs and other relevant parameters were subject to laboratory analyses. With the rare exception of a marginally elevated concentration of petroleum range organics in one location, results returned are below the limit of detection for the analytical methods employed. Applying the stringent screening criteria for certain individual parameters, the limit of detection are above the screening limits. On balance, and taking into account the soil data, in such cases it is reasonable to conclude that very low (or no) contamination presence is confirmed.

The leachate results show that contaminants are generally not mobile within soils beneath the site. However, very low levels of leachable metals and ammonium were identified at isolated locations beneath the site.

APPENDIX A

Raw Materials and Chemicals Inventory

Appendix A: Relevant Hazardous Substances Assessment

Section 3.3 Part A(1)(a) Manufacturing glass fibre with a melting capacity exceeding 20 tonnes / day

Raw Material / Chemicals Use 2003 - Present

Batch Plant

Raw Material	Chemical Composition	Use [Process / Location]	Annual Quantity Used / Stored	Maximum Storage Capacity	Storage Method	Hazardous substance classification according to Regulation (EC) No. 1272/2008.	Relevant Hazardous Substance	Include in Assessment of the site specific pollution possibility
Silica Sand	SiO ₂	Glass raw Material [Batch Plant]	4000	350	Powder, Bulk Silo	No	No	No
Dolomite	CaMg(CO ₃) ₂	Glass raw material [Batch Plant]	800	200	Powder, Bulk Silo	H315: Causes skin irritation H318: Causes serious eye damage H335: May cause respiratory irritation	Low solubility and mobility in most soils. No bioaccumulation effect or food chain concentration toxicity. High pH values will rapidly decrease over time as a result of recarbonation.	No
Bottle / Plate Cullet	Recycled glass	Glass raw material [Glass Recycling Area]	59000	1550	Bulk	No	No	No
Mobilube HD 80W-90 / Castrol 80W-90	Base Oil and Additives	heavy duty gear lubricant [Oil stores / Engineering (Batch Plant)]	4	5	25 l Drum	No	No	No
EP90 Gear Oil		Gear lubricant [Oil stores / Engineering (Batch Plant)]	4	5	25 l Drum	No	No	No

Furnace Plant

Raw Material	Chemical Composition	Use [Process / Location]	Annual Quantity Used / Stored	Maximum Storage Capacity	Storage Method	Hazardous substance classification according to Regulation (EC) No. 1272/2008.	Relevant Hazardous Substance	Include in Assessment of the site specific pollution possibility
Liquid Oxygen	O ₂	Melting & Conditioning [Furnace]	10000000 M ³	26.4	Bulk	H270: Oxidising Gases, Category 1 Gases under pressure : H281: Refrigerated liquefied gas	No No ecological damage caused by this product.	No

Fiberising

Raw Material	Chemical Composition	Use [Process / Location]	Annual Quantity Used / Stored	Maximum Storage Capacity	Storage Method	Hazardous substance classification according to Regulation (EC) No. 1272/2008.	Relevant Hazardous Substance	Include in Assessment of the site specific pollution possibility
Q8 Heller 22 / Castrol Hyspin AWS 22	Distillates (petroleum), solvent-dewaxed heavy and light paraffinic	Lubricating oil for hydraulic equipment [Fiberising]	300 l	2600 l	Drums	No	No	No

Binder Plant

Raw Material	Chemical Composition	Use [Process / Location]	Annual Quantity Used / Stored	Maximum Storage Capacity	Storage Method	Hazardous substance classification according to Regulation (EC) No. 1272/2008.	Relevant Hazardous Substance	Include in Assessment of the site specific pollution possibility
Ammonium Sulphate 40%	(NH ₄) ₂ SO ₄	Binder raw material [Binder Plant]	2000 t	100 t	Bulk Tank	No	No	No
JAM 1002 Blue Ink	N-Propanol	Product Colouring [Binder plant, side of production line]	50 drums	210 drums	Drums (20 L banded)	H225: Highly flammable liquid and vapor H318: Causes serious eye damage H336: May cause drowsiness or dizziness	No Not likely to accumulate in the food chain (bioconcentration potential is low). This material is practically non-toxic to fish and other aquatic organisms on an acute basis (exposure to a single, large concentration).	No

Binder Plant

Raw Material	Chemical Composition	Use [Process / Location]	Annual Quantity Used / Stored	Maximum Storage Capacity	Storage Method	Hazardous substance classification according to Regulation (EC) No. 1272/2008.	Relevant Hazardous Substance	Include in Assessment of the site specific pollution possibility
BRB Silanil 919	3-Aminopropyltriethoxysilane.	Adhesion promoter [Binder Plant]	10 t	3 t	IBC (bunded)	H226: Flammable liquid and vapour H314: Causes severe skin burns and eye damage H412: Harmful to aquatic life with long lasting effects	No Low toxicity to aquatic organisms. Based on the bioaccumulation assessment (hydrolysis) and toxicity assessment (not classified for long-term human health effects or for aquatic toxicity) the substance does not meet the criteria for PBT or vPvB	No
Dextrose (Glucose syrup 74/968)	C ₆ H ₁₄ O ₇	[Binder Plant]	4500 t	250 t	Bulk tank	No	No	No
Hydrowax 88	wax – oil blends,	insulation / dust binder [Binder plant]	800 t	50 t	Bulk tank	No	No	No
Sulphuric Acid 20%	H ₂ SO ₄	Neutralising ammonia in the ammonia scrubber [Binder Plant]	5 t	2 t	IBC (bunded)	H314: Causes severe skin burns and eye damage	No Not classified as hazardous to the environment but may create a local pH change in soil and water systems. Minerals in the soil tend to neutralise acid contamination	No
BRB Sempure HJS	Siloxane based emulsion	hydrophobising properties to various substrates and binder systems [Side-of-Line]	8 t	2 t	IBC (bunded)	H315: Causes skin irritation H319: Causes serious eye irritation H335: May cause respiratory irritation.	No Not classified as hazardous to the environment	No

Forming

Raw Material	Chemical Composition / Principal component	Use	Annual Quantity Used / Stored	Maximum Storage Capacity	Storage Method	Hazardous substance classification according to Regulation (EC) No. 1272/2008.	Relevant Hazardous substance	Include in Assessment of the site specific pollution possibility
Mobilux EP 2 lithium grease	lithium hydroxystearate	General lubrication [Forming (oil Stores / Engineering)]	75 l	50 l	Drums	No	No	No
Sogelub R635 SP ISO 68	semi-synthetic base oil	Lubricant [Forming]	3600 l	1200 l	Drums	No	No	No
Castrol Spheerol SX2 Oil	Highly refined base oil	Grease for industrial applications [Oil stores, White Wool Forming]	25 l	25 l	Drums	No	No	No
Sogelub MDR ISO 150S	Lubricant oil	Lubricant [White Wool Forming]	400 l	400 l	Drums	No	No	No
BC 89-175 Silicone Emulsion	Water based methyl hydrogen silicone polymer	Water proofing Silicone mixing building [White Wool Forming]	50 t	8 t	IBC (bunded)	H315: Causes skin irritation H318: Causes serious eye damage	No Non-hazardous with a very low order of toxicity to environmental receptors	No

Curing / Cooling

Raw Material	Chemical Composition / Principal component	Use	Annual Quantity Used / Stored	Maximum Storage Capacity	Storage Method	Hazardous substance classification according to Regulation (EC) No. 1272/2008.	Relevant Hazardous substance	Include in Assessment of the site specific pollution possibility
Fuchs Stabl EHT 2	Thermally stable ester oil with PTFE thickener	Lubricant [Curing oven]	23 drums	5 drums	5 kg Drums	No	No	No
ESTAR 250 SUPER	synthetic based ester oils	Lubricant [Curing oven, Stores, Engineering workshop]	9 t	4 t	IBC (bunded)	No	No	No

Curing / Cooling

Raw Material	Chemical Composition / Principal component	Use	Annual Quantity Used / Stored	Maximum Storage Capacity	Storage Method	Hazardous substance classification according to Regulation (EC) No. 1272/2008.	Relevant Hazardous substance	Include in Assessment of the site specific pollution possibility
MSS Caustic	32% NaOH	pH controller [Cooling Zone]	6	1	IBC (bunded)	H314: Causes severe skin burns and eye damage H290: May be corrosive to metals.	No Not identified as a PBT substance. There is no evidence of bioaccumulation. Components will degrade in water and soil. Soils: Non-volatile. Soluble in water.	No
SCP - 702 Red (FD) Ink	Methyl Ethyl Ketone (Isopropanol, N-propanol)	Product marking and coding [Main Production Hall]	100 l	60 l	Bottle 1 l (bunded)	H225: Highly flammable liquid and vapour H318: Causes serious eye damage H336: May cause drowsiness or dizziness	No Environmental hazards not classified	No

Packaging

Raw Material	Chemical Composition / Principal component	Use	Annual Quantity Used / Stored	Maximum Storage Capacity	Storage Method	Hazardous substance classification according to Regulation (EC) No. 1272/2008.	Relevant Hazardous substance	Include in Assessment of the site specific pollution possibility
Castrol Hyspin AWS 32	Highly refined base oil	Hydraulic fluid [Oil stores, White Wool Packaging]	300 l	2600 l	Drums	No	No	No
Pionier 4197	Highly refined mineral oil.	General lubrication [White Wool Packaging]	60 m3	20 m3	Bulk	No	No	No
Thermomelt FP872	Hot-melt (EVA-based) adhesives	Packaging adhesive [Wrapper 3]	2500 kg	1500 kg	Boxes	No	No	No

Packaging

Raw Material	Chemical Composition / Principal component	Use	Annual Quantity Used / Stored	Maximum Storage Capacity	Storage Method	Hazardous substance classification according to Regulation (EC) No. 1272/2008.	Relevant Hazardous substance	Include in Assessment of the site specific pollution possibility
L-200 Cleaner	Methyl Ethyl Ketone	Product marking and coding [Manual Bagger Area, White Wool Packaging]	30 l	20 l	5 l Container (bunded)	H225: Highly flammable liquid and vapour H319: Causes serious eye irritation H336: May cause drowsiness or dizziness	No Environmental hazards not classified	No
L-9219 Make-Up Solution	Methyl Ethyl Ketone	Product marking and coding [Manual Bagger Area, White Wool Packaging]	25 l	9 l	Bottle 0.5l (bunded)	H225: Highly flammable liquid and vapour H319: Causes serious eye irritation H336: May cause drowsiness or dizziness	No Environmental hazards not classified	No
Tanastat Pes	Anionic surfactant	Antistatic agent for dyed polyester [White Wool Forming & Packaging]	35	6	IBC (bunded)	No	No	No
Tanastat EP 3015 (Tinted)	Anionic surfactant	Antistatic agent for dyed polyester [White Wool Forming & Packaging]	2	2	IBC (bunded)	No	No	No
SCP - 700A Black (FD) Ink	Methyl Ethyl Ketone (Isopropanol, N-propanol)	Product marking and coding [Manual Bagger Area, White Wool Packaging]	50 l	15 l	Bottle 1 l (bunded) & 20 l drums	H225: Highly flammable liquid and vapour H318: Causes serious eye damage H336: May cause drowsiness or dizziness	No Environmental hazards not classified	No
SCP - 700C (FD) Cleaner	Methyl Ethyl Ketone (Isopropanol)	Product marking and coding [Wrapping machines, Master Bagger, MPS, Stores]	100 l	25 l	Bottle 1 l (bunded)	H225: Highly flammable liquid and vapour H318: Causes serious eye damage H336: May cause drowsiness or dizziness	No Environmental hazards not classified	No

Washwater / Water Treatment

Raw Material	Chemical Composition / Principal component	Use	Annual Quantity Used / Stored	Maximum Storage Capacity	Storage Method	Hazardous substance classification according to Regulation (EC) No. 1272/2008.	Relevant Hazardous substance	Include in Assessment of the site specific pollution possibility
Hydrosort granular salt / Rock salt	NaCl	Water treatment Road treatment [Washwater building]	2 t	1 t	20kg bags	No	No	No
Antifoam 1510	Silicone Emulsion	Foam inhibitor [Washwater]	De-minimus	De-minimus	Drum (bunded)	No	No	No
Caustic Soda Liquor 5-50% (for supply tanks)	Sodium Hydroxide	Effluent Treatment. pH Adjustment [Washwater building]	200 t	8 t	4000l tanks	H314: Causes severe skin burns and eye damage H290: May be corrosive to metals.	No Not identified as a PBT substance. There is no evidence of bioaccumulation. Components will degrade in water and soil. Soils: Non-volatile. Soluble in water.	No
Brentacide DDQ 50	Didecyltrimethylammonium chloride (50%)	Biocide Washwater	12 t	1 t	IBC (bunded)	H226: Flammable vapour and liquid H290: May be corrosive to metals H302: Harmful if swallowed H314: Causes severe skin burns and eye damage. H336: May cause drowsiness or dizziness. H400: Very toxic to aquatic life	No Not identified as a PBT substance. There is no evidence of bioaccumulation Components will degrade in water and soil.	No
MSS 7.5% Chlorite	NaClO ₂	Disinfectant. Mixed with Activator (see below) to make chlorine dioxide biocide Water treatment	6 t	2 t	Drum (bunded) Mixed together to make chlorine dioxide biocide	H271: May cause fire or explosion, strong oxidiser H302: Harmful if swallowed H318: Causes serious eye damage. H373: May cause damage to organs through prolonged or repeated exposure. H400: Very toxic to aquatic life	No Sodium chlorite is highly water soluble with a low potential for bioaccumulation. Sodium chlorite is a strong oxidizing agent and under proper reducing conditions is readily reduced to chloride, and to a lesser extent, chlorate. Readily biodegradable. The substance is not considered as PBT / vPvB.	No

Washwater / Water Treatment

Raw Material	Chemical Composition / Principal component	Use	Annual Quantity Used / Stored	Maximum Storage Capacity	Storage Method	Hazardous substance classification according to Regulation (EC) No. 1272/2008.	Relevant Hazardous substance	Include in Assessment of the site specific pollution possibility
MSS 9% Activator	9% HCL	Chemical Activator. Mixed with Chlorite (see above) to make chlorine dioxide biocide Water treatment (White Wool Forming)	6 t	2 t	Drum (bunded)	H290: May be corrosive to metals H315: Causes skin irritation. H319: Causes serious eye irritation H335: May cause respiratory irritation	No Substance is biodegradable Bioaccumulation is not expected. The substance is not considered as PBT / vPvB	No
MSS Biocide BN	2-bromo-2-nitropropane-1,3-diol	Biocide [Water treatment]	1500 l	500 l	500l tank	H301: Toxic if swallowed. H318: Causes serious eye damage. H400: Very toxic to aquatic life.	No Substance is biodegradable Bioaccumulation low potential The substance is not considered as PBT / vPvB	No
MSS Biocide IS	5-chloro-2-methyl-sh-isothiazol-3-one 5, 2-methyl-2h-isothiazol-3-one	Biocide [Water treatment]	1500 l	500 l	500l tank	H315: Causes skin irritation. H317: May cause an allergic skin reaction. H319: Causes serious eye irritation. H400: Very toxic to aquatic life	No Substance is biodegradable Bioaccumulation is not expected. The substance is not considered as PBT / vPvB	No
MSS Coolhib	Potassium hydroxide, phosphonobutane tricarboxylic acid, maleic acid copolymer	Cooling system scale inhibitor [Water treatment]	200 l	100 l	Drum (bunded)	H302: Harmful if swallowed. H314: Causes severe skin burns and eye damage.	No Substance is slightly biodegradable & bioaccumulative Soluble in water The substance is not considered as PBT / vPvB	No
MSS Enviro NM	Sodium nitrate, sodium nitrite, sodium molybdate dihydrate	Corrosion inhibitor for multimetal systems [Water treatment]	1500 l	500 l	500l tank	H272: May intensify fire; oxidiser. H301: Toxic if swallowed. H302: Harmful if swallowed. H400: Very toxic to aquatic life.	No Substance is slightly biodegradable with no bioaccumulative Soluble in water The substance is not considered as PBT / vPvB	No

Washwater / Water Treatment

Raw Material	Chemical Composition / Principal component	Use	Annual Quantity Used / Stored	Maximum Storage Capacity	Storage Method	Hazardous substance classification according to Regulation (EC) No. 1272/2008.	Relevant Hazardous substance	Include in Assessment of the site specific pollution possibility
MSS Sodium Hypochlorite	NaClO	Biocide [Water treatment-]	8 t	2 t	IBC (bunded)	H290: May be corrosive to metals H314: Causes severe skin burns and eye damage. H318: Causes serious eye damage. H335: May cause respiratory irritation H400: Very toxic to aquatic life H410: Very toxic to aquatic life with long lasting effects.	No Sodium hypochlorite is harmful to the aquatic environment, but exposure rarely occurs due to the rapid reaction of the substance with organic matter. Bioaccumulation is not expected. Mobile in water environment. No known PBT or vPvB chemicals present	No

Other Chemical Use

Raw Material	Chemical Composition / Principal component	Use	Annual Quantity Used / Stored	Maximum Storage Capacity	Storage Method	Hazardous substance classification according to Regulation (EC) No. 1272/2008.	Relevant Hazardous substance	Include in Assessment of the site specific pollution possibility
Castrol Alpha SP 320	Highly refined base oil	Gear lubricant [Oil stores]	1 t	2 t	20 l drum	No	No	No
Castrol Hyspin AWS 46 / Morris Triad 46	Highly refined base oil	Hydraulic fluid [Oil stores]	1 t	2 t	25 l drum	No	No	No
Castrol Magnaglide D68	Highly refined base oil	Machinery Lubricant [Oil stores]	1 t	2 t	20 l drum	No	No	No

Other Chemical Use

Raw Material	Chemical Composition / Principal component	Use	Annual Quantity Used / Stored	Maximum Storage Capacity	Storage Method	Hazardous substance classification according to Regulation (EC) No. 1272/2008.	Relevant Hazardous substance	Include in Assessment of the site specific pollution possibility
Mobil ATF 320 / Morris Lodexol 320	Highly refined base oil	Oil stores / [Engineering (Choppers)]	1 t	2 t	Various drums specific to individual plant on drip trays and bunds. 180L capacity max.	No	No	No
Mobil Delvac MX 15W - 40	Base oil & additives	Engine oil [Oil stores / Engineering (Diesel Eqpt)]	75 l	100 l	Various drums specific to individual plant on drip trays and bunds. 180L capacity max.	No	No	No
Mobilgear 600 XP 220	Base oil & additives	Gear Oil [Oil stores / Engineering (Multiple locations)]	75 l	100 l	Various drums specific to individual plant on drip trays and bunds. 180L capacity max.	No	No	No
Mobilgear 600 XP 680	Base oil & additives	Gear Oil [Oil stores / Engineering (Multiple locations)]	50 l	50 l	Various drums specific to individual plant on drip trays and bunds. 180L capacity max.	No	No	No
Mobil Grease XHP 222	Base oil & additives	Grease [Oil stores / Engineering (Multiple locations)]	3	5	18 l drum	No	No	No

Other Chemical Use

Raw Material	Chemical Composition / Principal component	Use	Annual Quantity Used / Stored	Maximum Storage Capacity	Storage Method	Hazardous substance classification according to Regulation (EC) No. 1272/2008.	Relevant Hazardous substance	Include in Assessment of the site specific pollution possibility
Mobilux EP 004	Lithium hydroxystearate grease.	Grease [Oil stores / Engineering (Multiple locations)]	25 l	25 l	Various drums specific to individual plant on drip trays and bunds. 180L capacity max.	No	No	No
2001 Safety Clean	Sodium metasilicate, surfactants, ethers	Commercial cleaning fluid [White Wool Packaging, Wrapping Machines]	450 l	25 l	5 l drum	No	No	No
Ambersil Chain Lube FG	Hydrocarbons, C9-12, n-alkanes, isoalkanes, cyclic	Food Grade aerosol lubricant [MPS]	10 l	10 l	Drums	No	No	No
Acetylene cylinders (BOC)	C ₂ H ₂	Fuel gas for welding, cutting, heating, brazing and soldering applications [Batch Plant, Forming Fan House, Compressor/Boiler House, Engineering]	De minimis	De minimis	Gas cylinders	H220: Extremely flammable gas H230: May react explosively even in the absence of air H280: Contains gas under pressure; may explode if heated	No The product is expected to biodegrade and is not expected to persist for long periods in an aquatic environment. Because of its high volatility, the product is unlikely to cause ground or water pollution.	No
Deb Jizer	Light petroleum hydrocarbon distillates	Commercial hand cleaner degreaser [Warehouse, Stores, Wrapping Machines, Engineering workshop]	De minimis	De minimis	small tubes, tubs and aerosol cans kept in bunded cabinets on drip trays/bunds	H304: May be fatal if swallowed and enters airways. H319: Causes serious eye irritation	No Not regarded as dangerous for the environment. The product is biodegradable. This product does not contain any substances classified as PBT or vPvB.	No

Other Chemical Use

Raw Material	Chemical Composition / Principal component	Use	Annual Quantity Used / Stored	Maximum Storage Capacity	Storage Method	Hazardous substance classification according to Regulation (EC) No. 1272/2008.	Relevant Hazardous substance	Include in Assessment of the site specific pollution possibility
Deb Sceptre Hand and Body Lotion Soap	Sodium salts of fatty acids	Commercial skin care [Stores, Cleaners' Store]	De minimis	De minimis	small tubes, tubs and aerosol cans kept in banded cabinets on drip trays/bunds	No	No	No
Delta Adhesives Superglue Extra	Cyanoacrylate adhesive	Adhesive [Engineering]	De minimis	De minimis	small tubes, tubs and aerosol cans kept in banded cabinets on drip trays/bunds	H315: Causes skin irritation H319: Causes serious eye irritation. H335: May cause respiratory irritation	No Biodegradable. This substance is not identified as a PBT substance.	No
Leak Detector Spray	CO ₂ Foam spray	Leak Detector [Engineering]	De minimis	De minimis	small tubes, tubs and aerosol cans kept in banded cabinets on drip trays/bunds	H229: Pressurised container: May burst if heated H319: Causes serious eye irritation.	No This product is not identified as a PBT/vPvB substance.	No
Loctite 401 Glue	Cyanoacrylate adhesive	Adhesive [Engineering]	De minimis	De minimis	small tubes, tubs and aerosol cans kept in banded cabinets on drip trays/bunds	H315: Causes skin irritation H319: Causes serious eye irritation. H335: May cause respiratory irritation	No Biodegradable. This substance is not identified as a PBT substance.	No
Loctite 577 Pipe Sealant	Acetic acid, 2-phenylhydrazide, Maleic acid N, N'-Ethane-1,2-diylbis(12-hydroxyoctadecan-1- amide)	Adhesive sealant [Engineering]	De minimis	De minimis	small tubes, tubs and aerosol cans kept in banded cabinets on drip trays/bunds	H317: May cause an allergic skin reaction	No Cured adhesives are immobile, not biodegradable This product is not identified as a PBT/vPvB substance	No
Argoshield Light	Mixture of Ar, CO ₂ and O ₂ .	Shielding gas in gas welding [Engineering]	De minimis	De minimis	small tubes, tubs and aerosol cans kept in banded cabinets on drip trays/bunds	H280: Contains gas under pressure; may explode if heated.	No Not classified as PBT or vPvB.	No

Other Chemical Use

Raw Material	Chemical Composition / Principal component	Use	Annual Quantity Used / Stored	Maximum Storage Capacity	Storage Method	Hazardous substance classification according to Regulation (EC) No. 1272/2008.	Relevant Hazardous substance	Include in Assessment of the site specific pollution possibility
Bondit HT30 high temperature silicone sealant	Methyltriacetoxysilane 0.5 - 1% Triacetoxysilane 0.5 - 1%	Building chemical [Engineering]	De minimis	De minimis	small tubes, tubs and aerosol cans kept in bunded cabinets on drip trays/bunds	No	No	No
Bondloc Bearing Fit	2-hydroxypropyl methacrylate and trimethylolpropane triacrylate.	Anaerobic securing compound [Engineering]	De minimis	De minimis	small tubes, tubs and aerosol cans kept in bunded cabinets on drip trays/bunds	H315: Causes skin irritation H317: May cause an allergic skin reaction. H320: Causes eye irritation H335: May cause respiratory irritation	No Not classified as hazardous to the environment	No
Clear-a-Drain	Potassium hydroxide, sodium hydroxide	Concentrated heavy duty alkaline cleaner [Engineering]	De minimis	De minimis	small tubes, tubs and aerosol cans kept in bunded cabinets on drip trays/bunds	H302: Harmful if swallowed. H314: Causes severe skin burns and eye damage	No Not biodegradable. Readily dissociates on dilution into harmless components. Low bioaccumulation potential. Readily absorbed into soil.	No
Fastglas Hardener	Hardener containing Benzoyl Peroxide	Repairs [Engineering, Melting and Conditioning]	De minimis	De minimis	small tubes, tubs and aerosol cans kept in bunded cabinets on drip trays/bunds	H241: Heating may cause a fire or explosion H315: Causes skin irritation H317: May cause an allergic skin reaction.	No	No
Molyslip Copaslip Paste		Anti-sieze compound [Engineering Workshop, Fiberising]	De minimis	De minimis	small tubes, tubs and aerosol cans kept in bunded cabinets on drip trays/bunds	No	No	No
Molyslip Copaslip Aerosol	Butane, Propane , solvent, bentone	Anti-sieze spray [Engineering, Fiberising]	De minimis	De minimis	small tubes, tubs and aerosol cans kept in bunded cabinets on drip trays/bunds	H220: Extremely flammable gas H225: Highly flammable liquid and vapour H229: Pressurised container: May burst if heated H315: Causes skin irritation	No Not classified as hazardous to the environment	No

Other Chemical Use

Raw Material	Chemical Composition / Principal component	Use	Annual Quantity Used / Stored	Maximum Storage Capacity	Storage Method	Hazardous substance classification according to Regulation (EC) No. 1272/2008.	Relevant Hazardous substance	Include in Assessment of the site specific pollution possibility
Nitrogen	N ₂	Fiberising	De minimis	De minimis	small tubes, tubs and aerosol cans kept in bunded cabinets on drip trays/bunds	H280: Contains gas under pressure; may explode if heated	No Not classified as hazardous to the environment	No
P18 Plumbers Gas Leak Detector	Micro porous foam	Leak detection [Engineering]	De minimis	De minimis	small tubes, tubs and aerosol cans kept in bunded cabinets on drip trays/bunds	H229: Pressurised container: May burst if heated H319: Causes serious eye irritation.	No This product is not identified as a PBT/vPvB substance.	No
Rocol Ultracut 370 Plus	Mineral Oil, 2-(2-butoxyethoxy)ethanol (1 – 10%), Carboxymethylated Polyglycol Ether (<1%), Ethoxylated Alcohols, Boric Acid	Water miscible metalworking fluid [Engineering Workshop]	De minimis	De minimis	small tubes, tubs and aerosol cans kept in bunded cabinets on drip trays/bunds	H315: Causes skin irritation H318: Causes serious eye damage H319: Causes serious eye irritation.	No Slightly biodegradable. No bioaccumulation potential. Non-volatile. Absorbed only slowly into soil. This product is not identified as a PBT substance.	No
Rust-oleum aerosol paint	Solvent based paint with gas delivery system	Topcoat/Aerosols [Engineering]	De minimis	De minimis	small tubes, tubs and aerosol cans kept in bunded cabinets on drip trays/bunds	H222: Extremely flammable aerosol H319: Causes serious eye irritation H336: May cause drowsiness or dizziness	No The product is not expected to be hazardous to the environment	No
Steri-7 Sporicidal Hand Soap	Didecylidmonium Chloride, Cocamidopropyl betaine, Cocamine oxide, Methylisothiazolinone, Aqua	Hygiene [Cleaners' Store Room]	De minimis	De minimis	small tubes, tubs and aerosol cans kept in bunded cabinets on drip trays/bunds	No	No	No

Other Chemical Use

Raw Material	Chemical Composition / Principal component	Use	Annual Quantity Used / Stored	Maximum Storage Capacity	Storage Method	Hazardous substance classification according to Regulation (EC) No. 1272/2008.	Relevant Hazardous substance	Include in Assessment of the site specific pollution possibility
Tygris R212 Clear Penetrating Oil 104865	Naptha (Heavy) , Butane, Propane, Isobutane	Metal work [Engineering]	De minimis	De minimis	small tubes, tubs and aerosol cans kept in banded cabinets on drip trays/bunds	H222: Extremely flammable aerosol H336: May cause drowsiness or dizziness	Not classified No	No
Tygris R-213 WD Anti-Rust Agent	Naptha (Heavy) , Butane, Propane, Isobutane	Metal work [Engineering]	De minimis	De minimis	small tubes, tubs and aerosol cans kept in banded cabinets on drip trays/bunds	H222: Extremely flammable aerosol H336: May cause drowsiness or dizziness	Not classified No	No
WD - 40 Aerosol	hydrocarbons C-9 to C-11	Corrosion protection, lubricant [Engineering, Warehouse]	De minimis	De minimis	small tubes, tubs and aerosol cans kept in banded cabinets on drip trays/bunds	H222: Extremely flammable aerosol H229: Pressurised container: May burst if heated H336: May cause drowsiness or dizziness	Not classified No	No
Oxygen cylinders	O2	Combustion, melting and cutting processes. [Batch Plant, Forming Fan House, Gas cylinder storage compound, Melting & Conditioning,	De minimis	De minimis	Pressurised cylinders located on trolleys, or in dedicated secure storage	H270: May cause or intensify fire; oxidiser. H280: Contains gas under pressure; may explode if heated.	Not classified No	No

Other Chemical Use

Raw Material	Chemical Composition / Principal component	Use	Annual Quantity Used / Stored	Maximum Storage Capacity	Storage Method	Hazardous substance classification according to Regulation (EC) No. 1272/2008.	Relevant Hazardous substance	Include in Assessment of the site specific pollution possibility
Nat-Sil Extra	Hydrocarbon propellant, polymethylsiloxane	Silicone lubricant [Engineering]	De minimis	De minimis	small tubes, tubs and aerosol cans kept in banded cabinets on drip trays/bunds	H226: Flammable liquid and vapour H315: Causes skin irritation. H318: Causes serious eye damage. H335: May cause respiratory irritation	Not classified No	No
Hylomar Universal Blue Jointing Compound	Dichlormethane 25 - 65%	Gasket & jointing compound [Engineering]	De minimis	De minimis	small tubes, tubs and aerosol cans kept in banded cabinets on drip trays/bunds	H302 - Harmful if swallowed H315: Causes skin irritation. H319: Causes serious eye irritation. H351 - Suspected of causing cancer H373 - May cause damage to organs (Central nervous system)	Not classified for hazards to the environment. No	No
Silica Gel	Silica Gel	Drying agent [Engineering]	De minimis	De minimis	small tubes, tubs and aerosol cans kept in banded cabinets on drip trays/bunds	No	No	No

APPENDIX B

Relevant Hazardous Materials Assessment

Appendix B: Relevant Hazardous Substances Assessment

Section 3.3 Part A(1)(a) Manufacturing glass fibre with a melting capacity exceeding 20 tonnes / day

Consideration of the relevant hazardous substances for the purposes of deciding on the need to prepare and submit a baseline report

Batch Plant

Raw Material	Chemical Composition	Use [Process / Location]	Hazardous substance classification according to Regulation (EC) No. 1272/2008.	Relevant Hazardous Substance	Include in Assessment of the site specific pollution possibility
Soda Ash	Sodium Carbonate Na_2CO_3	Glass raw Material [Batch Plant]	H314 - Causes serious eye irritation	Yes High concentrations in receiving waters can cause long term adverse effects on the aquatic environment by raising pH. Low toxicity to fish	Yes
Borax Pentahydrate	Di- sodium tetraborate pentahydrate	Glass raw material [Batch Plant]	H360FD : May damage fertility. May damage the unborn child.	Yes Boron is naturally occurring in the environment and is a plant nutrient. Potentially phytotoxic at high concentrations.	Yes
EP Dust	Recycled material, mixture of alkaline and boron compounds	Glass raw material [Batch Plant]	No specific data available. Considered to meet hazardous substances definition given presence of boron (see entry for Borax Pentahydrate)	Yes Boron is naturally occurring in the environment and is a plant nutrient. Potentially phytotoxic at high concentrations.	Yes
Mangagran	Manganese dioxide	Reduces SO ₂ levels, catalyst for the glass melt [Batch Plant]	H302 : Harmful if swallowed H332 : Harmful if inhaled.	Yes May be hazardous in the environment; special attention should be given to aquatic organisms.	Yes

Binder Plant

Raw Material	Chemical Composition / Principal component	Use [Process / Location]	Hazardous substance classification according to Regulation (EC) No. 1272/2008.	Relevant Hazardous substance	Include in Assessment of the site specific pollution possibility
Ammonia, aqueous solution	NH ₃ (aqueous)	Binder raw material [Binder Plant]	H314: Causes severe skin burns and eye damage, H400: Very toxic to aquatic life. H225: Highly flammable H315: Causes skin irritation H319: Causes serious eye irritation	Yes Hazardous to aquatic life, impairs groundwater quality in high concentrations but is readily biodegradable. In soil: Ammonia is rapidly biodegraded in soil by the process of ammonification or mineralisation.	Yes
L-219 Black Ink	Contains Methyl Ethyl Ketone, Isopropanol	Product Colouring [Binder Plant, Manual Bagger Area, White Wool Packaging]	H336: May cause drowsiness or dizziness	Yes Slightly soluble in water, may affect drinking water supplies. May effect germination and growth rates of plants if soil contamination occurs. The substance will remain dissolved in water retained in the soil. It has a low adsorption to solids in the ground and sediments. May travel through the soil layers if discharged in large or continuous amounts	Yes
JAM3000 Black ink	Water based ink with <1% Glutaraldehyde	Product Colouring [Binder plant, wrapping machines, master baggers & MPS area]	Glutaraldehyde: H317: May cause an allergic skin reaction. H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled.	Yes Very toxic (acute effect) to aquatic organisms. Low bioaccumulation potential. In contact with water the substance will hydrolyse slowly. The substance will not evaporate into the atmosphere from the water surface. Adsorption to solid soil phase is possible.	Yes

Other Chemical Use

Raw Material	Chemical Composition / Principal component	Use	Hazardous substance classification according to Regulation (EC) No. 1272/2008.	Relevant Hazardous substance	Include in Assessment of the site specific pollution possibility
Diesel fuel	C10H20 to C15H28	Back-up Generator fuel [External to production buildings (Sprinkler House/Tank Farm)]	H226: Flammable liquid and vapor. H304: May be fatal if swallowed and enters airways. H315: Causes skin irritation. H332: Harmful if inhaled. H351: Suspected of causing cancer. H373: May cause damage to organs through prolonged or repeated exposure. H411: Toxic to aquatic life with long lasting effects.	Yes Expected to be toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment. Expected to be inherently biodegradable More volatile component -- Highly volatile, will partition rapidly to air. Not expected to partition to sediment and wastewater solids. Less volatile component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids. Majority of components -- Low potential to migrate through soil. This product is not, or does not contain, a substance that is a PBT or a vPvB.	Yes
Linemarker aerosol paint	Butane, Propane Acetone, Butyl acetate, Solvent naphtha, Trimethylbenzene, Cumene, Mesitylene	Paint [Engineering]	H220: Extremely flammable gas H225: Highly flammable liquid and vapour H304: May be fatal if swallowed and enters airways. H315: Causes skin irritation H319: Causes serious eye irritation. H332: Harmful if inhaled. H336: May cause drowsiness or dizziness. H411: Toxic to aquatic life with long lasting effects.	Yes Contains a substance which is harmful to aquatic organisms and which may cause long term adverse effects in the aquatic environment This product is not identified as a PBT/vPvB substance.	Yes
Loctite 7063 Cleaner Spray	Naphtha, hydrotreated light, <0,1% benzene	Solvent cleaner [Engineering]	H222: Extremely flammable aerosol H229: Pressurised container: May burst if heated H315: Causes skin irritation H336: May cause drowsiness or dizziness H411: Toxic to aquatic life with long lasting effects	Yes Contains a substance which is harmful to aquatic organisms and which may cause long term adverse effects in the aquatic environment The product evaporates readily This product is not identified as a PBT/vPvB substance	Yes

Other Chemical Use

Raw Material	Chemical Composition / Principal component	Use	Hazardous substance classification according to Regulation (EC) No. 1272/2008.	Relevant Hazardous substance	Include in Assessment of the site specific pollution possibility
Araldite Rapid G Resin	Bisphenol A-Epichlorohydrin Epoxy Resin, Butanedioldiglycidyl Ether	Two component epoxy based adhesive [Engineering]	H312: Harmful in contact with skin H315: Causes skin irritation H317: May cause an allergic skin reaction. H319: Causes serious eye irritation. H332: Harmful if inhaled. H411: Toxic to aquatic life with long lasting effects	Yes Contains a substance which is harmful to aquatic organisms and which may cause long term adverse effects in the aquatic environment	Yes
Araldite Rapid G Hardener	epoxy resin	Resin for adhesive systems [Engineering]	H315: Causes skin irritation H317: May cause an allergic skin reaction. H319: Causes serious eye irritation. H411: Toxic to aquatic life with long lasting effects	Yes Contains a substance which is harmful to aquatic organisms and which may cause long term adverse effects in the aquatic environment	Yes
Belt Dressing (Rocol)	Cyclopentane, CO2 aerosol propellant	Belt Conditioning and Antislip material [Engineering, MPS]	H225: Highly flammable H412: Harmful to aquatic life with long lasting effects	Yes Insoluble in water Readily absorbed into soil. This product is not identified as a PBT/vPvB substance. Harmful to aquatic organisms.	Yes
Belzona 1111 Super Metal - Base	Epoxy Phenol Novolac Resin, bisphenol A-(epichlorohydrin);	Resin for adhesive systems [Engineering]	H315: Causes skin irritation H317: May cause an allergic skin reaction. H320: Causes eye irritation H411: Toxic to aquatic life with long lasting effects	Yes Contains a substance which is harmful to aquatic organisms and which may cause long term adverse effects in the aquatic environment	Yes
Belzona 1111 Super Metal - Solidifier	Epoxy Phenol Novolac Resin, bisphenol A-(epichlorohydrin);	Resin for adhesive systems [Engineering]	H315: Causes skin irritation H317: May cause an allergic skin reaction. H320: Causes eye irritation H411: Toxic to aquatic life with long lasting effects	Yes Contains a substance which is harmful to aquatic organisms and which may cause long term adverse effects in the aquatic environment	Yes

Other Chemical Use

Raw Material	Chemical Composition / Principal component	Use	Hazardous substance classification according to Regulation (EC) No. 1272/2008.	Relevant Hazardous substance	Include in Assessment of the site specific pollution possibility
Fastglas Resin	Polyester resin containing styrene	Repairs [Engineering, Melting and Conditioning]	H225: Highly flammable liquid and vapour H320: Causes serious eye irritation H332: Harmful if inhaled. H335: May cause respiratory irritation.	Yes Contains a substance which is harmful to aquatic organisms and which may cause long term adverse effects in the aquatic environment Polyester resins are viscous liquids which lose solvents by evaporation or polymerisation, leaving a relatively inert residue which will not degrade significantly. Toxic to aquatic organisms.	Yes
Plus Gas Aerosol	Kerosene Hydrodesulphurised, mineral oil	Lubricant [Engineering]	H222: Extremely flammable aerosol H229: Pressurised container: May burst if heated H315: Causes skin irritation H336: May cause drowsiness or dizziness H411: Toxic to aquatic life with long lasting effects	Yes Contains a substance which is harmful to aquatic organisms and which may cause long term adverse effects in the aquatic environment	Yes
Plus Gas Lubricant	Blend of hydrocarbon distillate and mineral oil	penetrates and releases siezed components [Engineering]	H304: May be fatal if swallowed and enters airways. H315: Causes skin irritation H336: May cause drowsiness or dizziness H411: Toxic to aquatic life with long lasting effects	This substance is not classified as PBT or vPvB according to current EU criteria The product has poor water-solubility, is readily biodegradable and not bioaccumulating	Yes
Rocol Metal Repair Compound	Epoxy resin 10-30%	Repair compound, filler, putty [Engineering]	H315: Causes skin irritation H317: May cause an allergic skin reaction. H319: Causes serious eye irritation. H411: Toxic to aquatic life with long lasting effects	Yes Contains a substance which is harmful to aquatic organisms and which may cause long term adverse effects in the aquatic environment This product is not identified as a PBT substance. Non-volatile. Insoluble in water. Absorbed only slowly into soil.	Yes

Other Chemical Use

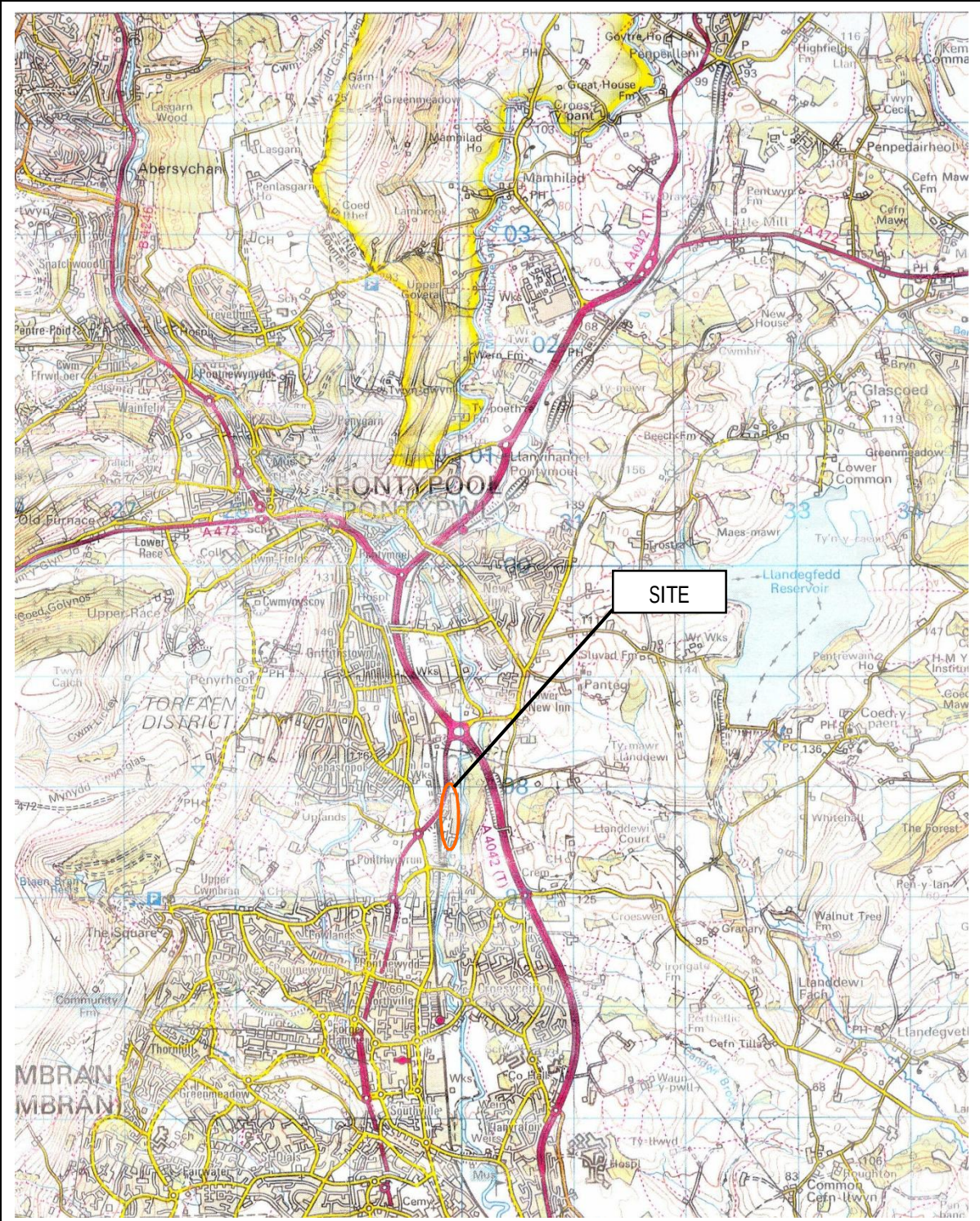
Raw Material	Chemical Composition / Principal component	Use	Hazardous substance classification according to Regulation (EC) No. 1272/2008.	Relevant Hazardous substance	Include in Assessment of the site specific pollution possibility
Tippex correction fluid	Titanium Oxide, Naphtha (petroleum), hydrotreated light	Correction fluid [Office]	H225: Highly flammable liquid and vapour H315: Causes skin irritation H336: May cause drowsiness or dizziness H411: Toxic to aquatic life with long lasting effects	Yes Contains a substance which is harmful to aquatic organisms and which may cause long term adverse effects in the aquatic environment	Yes
Tygris R-202 Brake cleaner	Naptha, Butane, Propane, Isobutane	Brake and clutch cleaner [Engineering]	H222: Extremely flammable aerosol H315: Causes skin irritation H336: May cause drowsiness or dizziness H411: Toxic to aquatic life with long lasting effects		Yes
Tygris R214 Cutting and Tapping Fluid	Naptha (light) , Butane, Propane, Isobutane, Mineral Oil, Chlorinated Paraffin, White Spirit	Metal work [Engineering]	H222: Extremely flammable aerosol H336: May cause drowsiness or dizziness H411: Toxic to aquatic life with long lasting effects		Yes
Evo-stik Pistoprene CY110R	Acetone, Light Naptha	Adhesive [Side-of-Line/Wrapper 2]	H225: Highly flammable liquid and vapour H304: May be fatal if swallowed and enters airways H315: Causes skin irritation H319: Causes serious eye irritation. H336: May cause drowsiness or dizziness H411: Toxic to aquatic life with long lasting effects		Yes
Mectar Citrus	Petroleum distillates, Limonene	Washing and cleaning products [Stores]	H304: May be fatal if swallowed and enters airways H315: Causes skin irritation H317: May cause an allergic skin reaction. H319: Causes serious eye irritation. H411: Toxic to aquatic life with long lasting effects		Yes

Other Chemical Use

Raw Material	Chemical Composition / Principal component	Use	Hazardous substance classification according to Regulation (EC) No. 1272/2008.	Relevant Hazardous substance	Include in Assessment of the site specific pollution possibility
Jeyes Parozone Bleach	Sodium hypochlorite, sodium hydroxide	Household bleaching and disinfecting [Stores]	H314: Causes severe skin burns and eye damage H400: Very toxic to aquatic life	Yes Contains a substance which is harmful to aquatic organisms and which may cause long term adverse effects in the aquatic environment	Yes

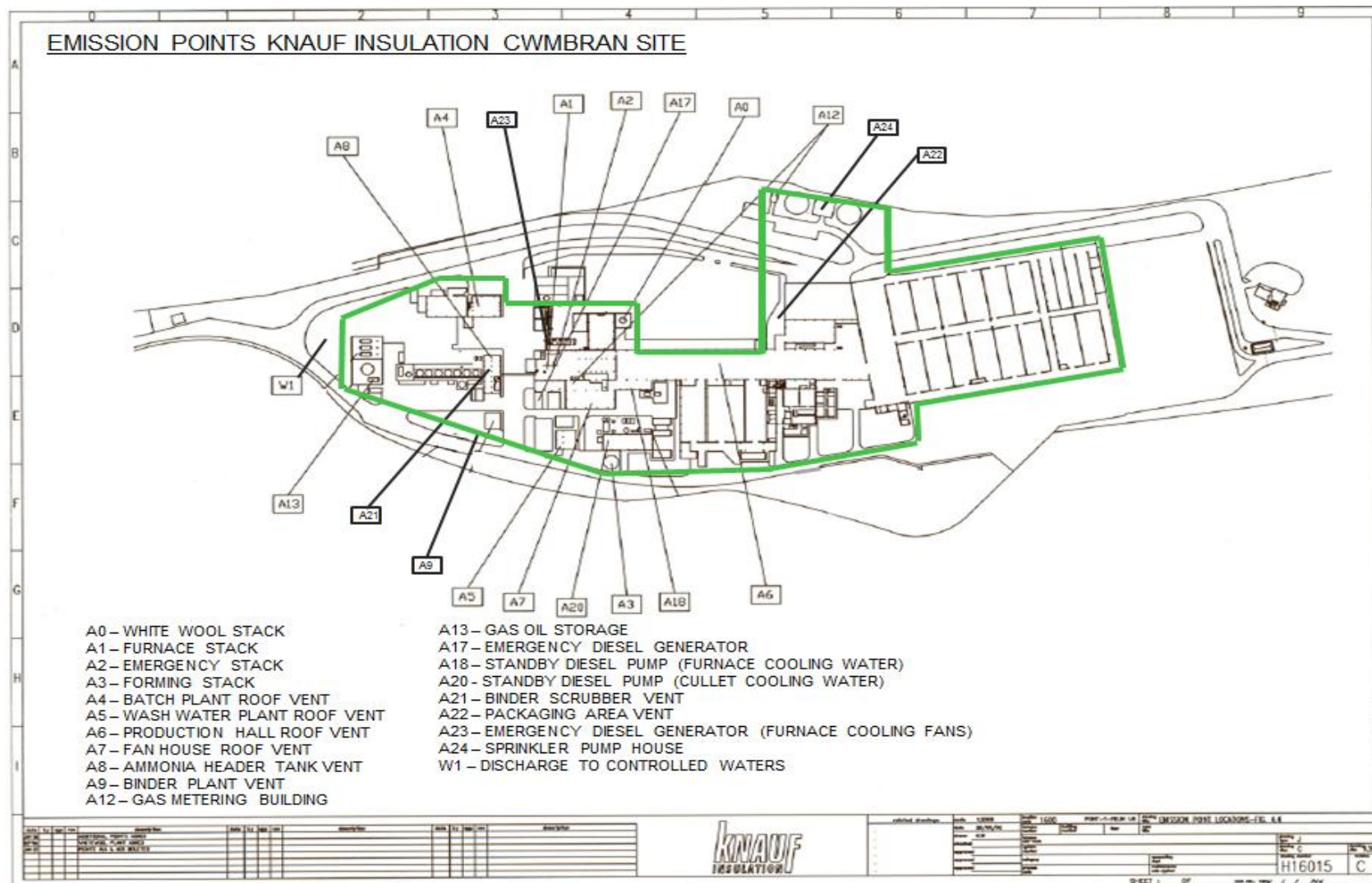
APPENDIX C

Previous Site Investigations Borehole Locations



PROJECT: Pont-y-Felin Works Cwmbran	CLIENT: Knauf Insulation
SCALE: Not to Scale	GRID REFERENCE: 329920 197660
JOB NUMBER:117478	TITLE: Site Location Map
Reproduced from Ordnance Survey Map under licence 100055021 with permission from the Controller of HMSO, Crown Copyright	

Figure 2: Site Layout Plan (Extracted from Permit Variation EPR/BR8212IK)



Note: — Installation Boundary



NOTES

KEY

- IPPC INSTALLATION BOUNDARY
- ZONE 1
- ZONE 2
- ZONE 3
- PF1
ERM 1994 PROBEHOLES

FIRST ISSUE				
REV	AMENDMENTS	BY	CHKD	APPRD
				DATE

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CLIENT

KNAUFALCOPOR

KnaufALCOPOR

PROJECT

PONT-Y-FELIN WORKS

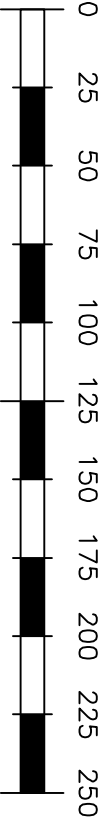
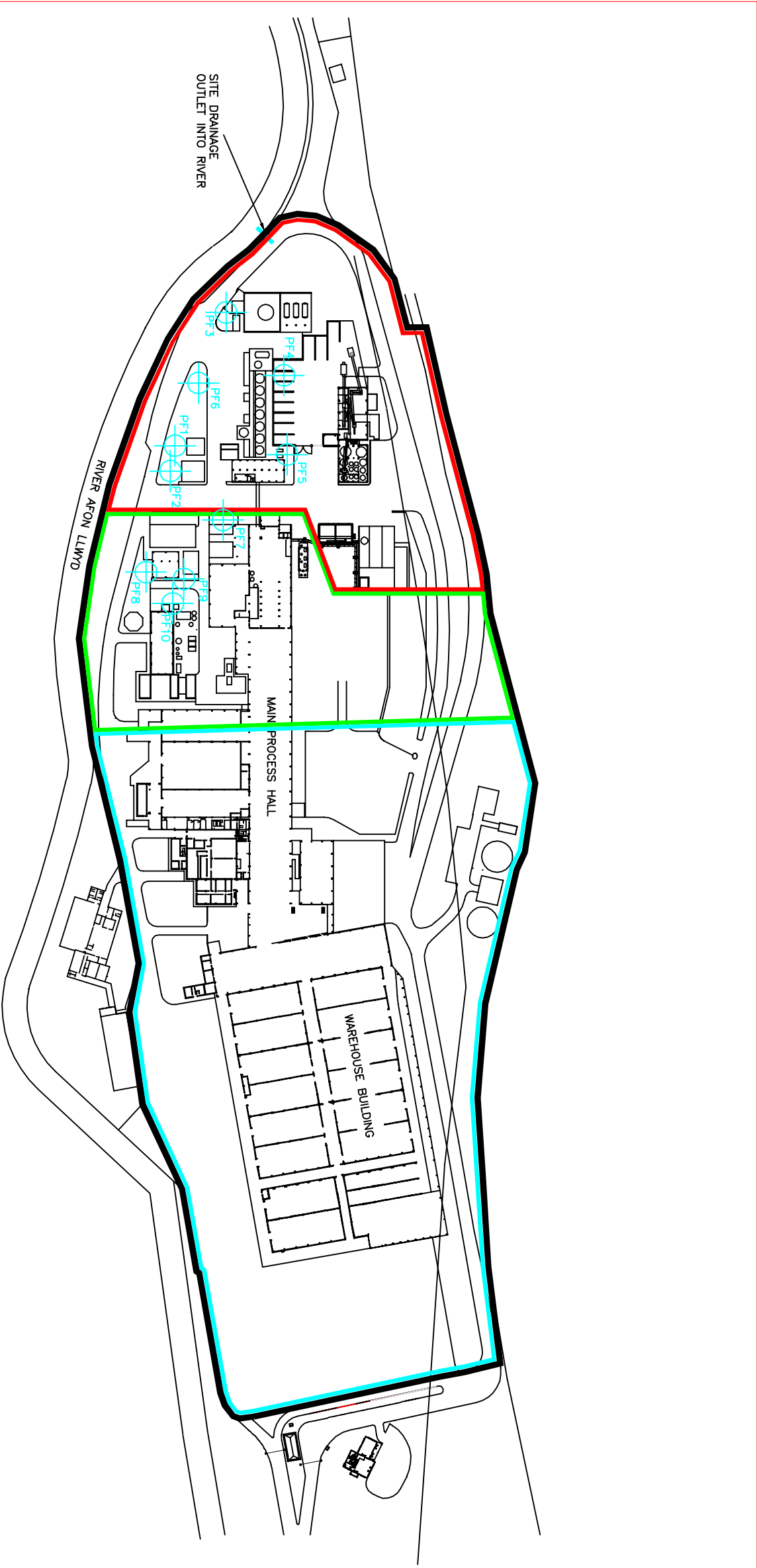
TITLE

**FIGURE 4 – EXPLORATORY HOLE
LOCATION FROM PREVIOUS
INVESTIGATION**

DRAWING STATUS

DRAWN	CHECKED	APPROVED
TM		
DATE	DATE	DATE
18.03.03		
SCALE	ORIGINAL DRAWING SIZE	
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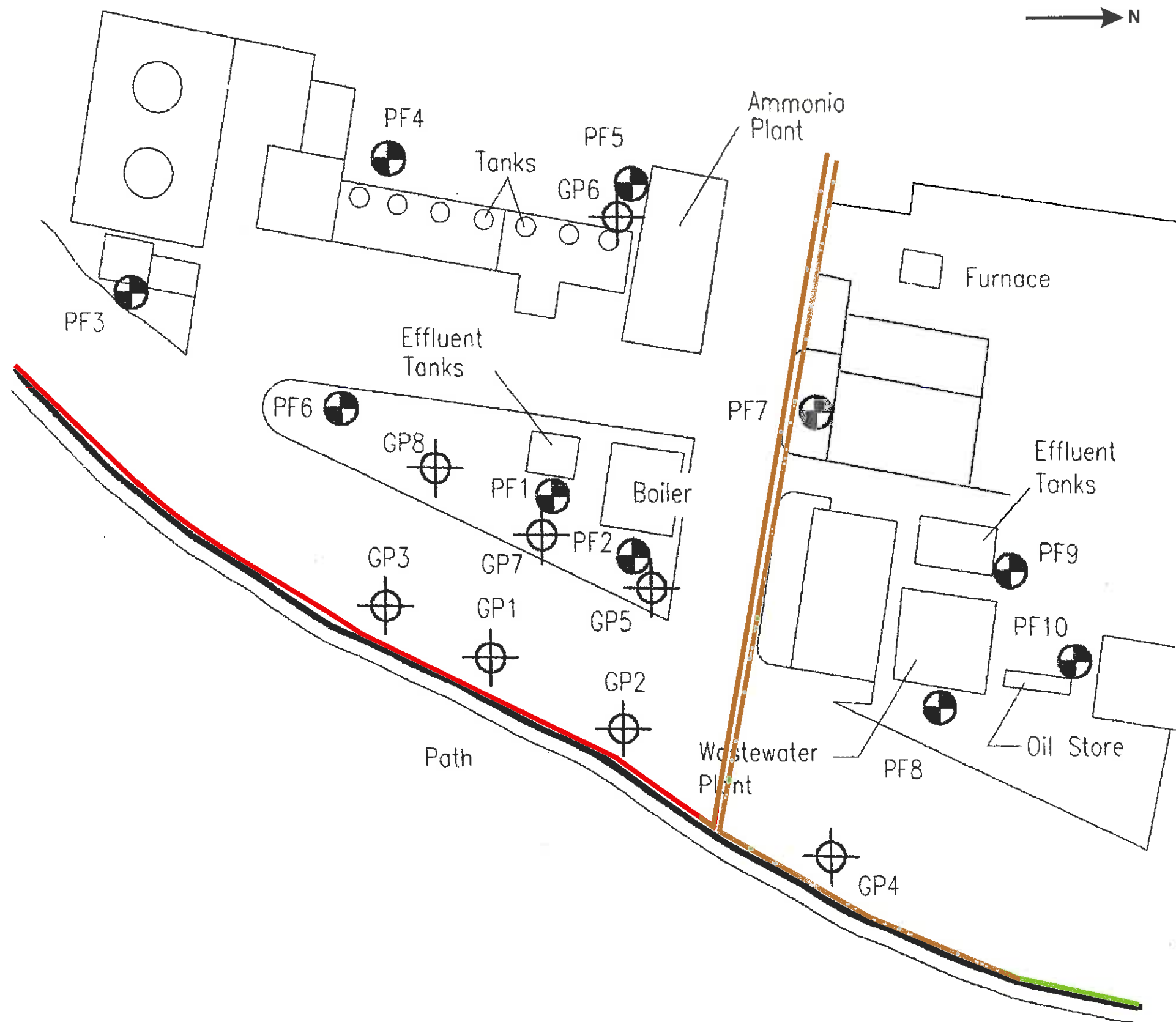
DRAWING NO **73.1340.04-004** REV. **0**



METRES

KEY :

-  PF 1 ERM 1994 Probe Holes
 GP 1 ERM 1995 Probe Holes
 Zone 1
 Zone 2
 Zone 3
 IPPC Installation boundary



0	FIRST ISSUE:			
Rev.	Amendments	By	Appt.	Date

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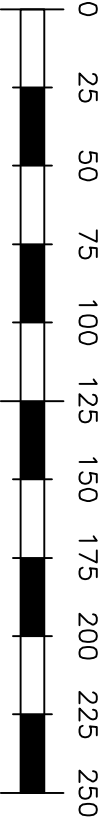
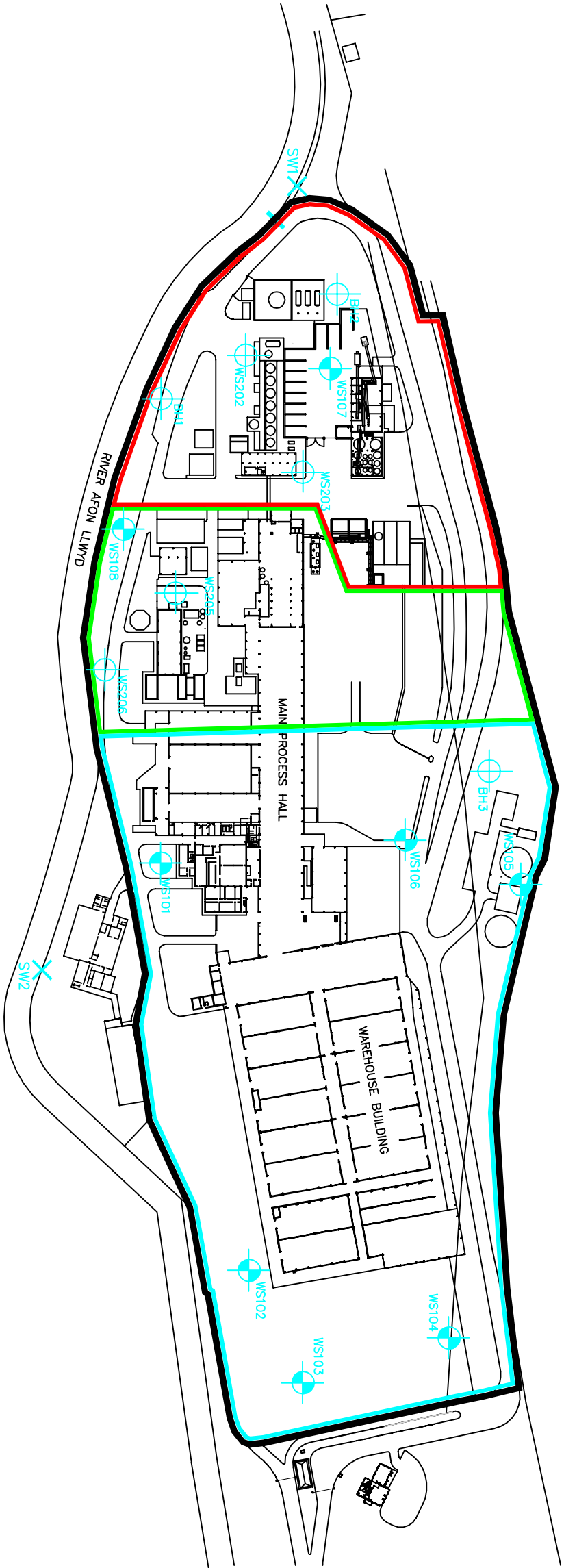
Leeds London Edinburgh

CLIENT
KnaufAlcopor

PROJECT
**Pont-y-felin,
Cwmbran**

TITLE
**Figure 4A:
 Exploratory Hole Locations
 From Previous Site Investigations**

DRAWN	CHECKED	APPROVED
KSA	EAK	
DATE	DATE	DATE
21/03/03		
SCALE	FIGURE NO.	REV
NTS	73.1340.04	



NOTES

KEY

- IPPC INSTALLATION BOUNDARY
- ZONE 1
- ZONE 2
- ZONE 3
- WS202
CARL BRO WINDOW SAMPLE LOCATION 2003
- WS101
CARLBRO WINDOW SAMPLE LOCATION 2002
- SW1
SURFACE WATER SAMPLING POINT

FIRST ISSUE				
REV	AMENDMENTS	BY	CHKD	APPRD
				DATE

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CLIENT

KNAUFALCOPOR

KnaufALCOPOR

PROJECT

PONT-Y-FELIN WORKS

TITLE

**FIGURE 5 – EXPLORATORY HOLE
LOCATION PLAN**

DRAWING STATUS

DRAWN	CHECKED	APPROVED
TM		
DATE	DATE	DATE
18.03.03		
SCALE	ORIGINAL DRAWING SIZE	
1:2500	297 x 420 - A3	
DRAWING NO		REV.

73.1340.05-004

0

APPENDIX D

Site Condition Report, 2003

FURTHER SITE INVESTIGATION REPORT

**KNAUF INSULATION
PONT-Y-FELIN
CWMBRAN**

Prepared for:
KNAUF INSULATION
CWMBRAN

Prepared by:
CARL BRO GROUP LIMITED
LEEDS

APRIL 2003
Project No: 73.1340.05

PROJECT QUALITY ASSURANCE

INFORMATION SHEET

Report Status:	Final
Job No:	73.1340.05
Prepared by:	_____ Emma King and Ann-Marie Deloughry
Project Reviewer:	_____ Colin Macdonald
Quality Checker:	_____ Katie Fagan

TABLE OF CONTENTS

	Page No:
1.0 INTRODUCTION AND PURPOSE OF STUDY	3
1.1 Objective of Phase 1b Assessment.....	3
2.0 SUMMARY OF PREVIOUS SITE INVESTIGATIONS	4
2.1 ERM EnviroClean. October 1994. Phase II Site Investigation Programme	4
2.1.1 Scope of Works	4
2.1.2 Fieldwork Methodology.....	5
2.1.3 Sampling Methodology	5
2.1.4 Chemical Testing Programme	6
2.1.5 Chemical Testing Results.....	6
2.2 ERM EnviroClean. June 1995. Further Phase II Investigations	7
2.2.1 Scope of Works	7
2.2.2 Fieldwork Methodology.....	7
2.2.3 Sampling Methodology	7
2.2.4 Chemical Testing Programme	7
2.2.5 Chemical Testing Results.....	7
3.0 ADDITIONAL CARL BRO SITE INVESTIGATIONS	8
3.1 Objectives.....	8
3.1.1 Scope of Fieldworks	8
3.2 Health and Safety	9
3.3 Fieldwork Methodology	9
3.3.1 Window Sampling.....	9
3.3.2 Mini Rotary Rig.....	9
3.3.3 Cable Percussion Boreholes	9
3.4 Site Accessibility and Exploratory Hole Limitations	10
3.5 Sampling Methodology.....	10
3.6 Groundwater Sampling	10
3.7 Chemical Testing Programme.....	11
3.7.1 Soils Analysis	11
3.7.2 Groundwater	11
3.7.3 Surface Water	11
4.0 GROUND CONDITIONS	12
4.1 Made Ground.....	12
4.2 Natural Ground	13
4.3 Groundwater	13
4.4 Visual and Olfactory Contamination	14
5.0 CHEMICAL RESULTS FROM CARL BRO SITE	16
5.1 Soil Analysis Results.....	16
5.2 Groundwater Analysis Results	16
5.3 Surface Water Analysis Results	17
6.0 CONCEPTUAL SITE MODEL AND BASELINE CONDITION OF THE IPPC INSTALLATION.....	18
6.1 Summary of Conceptual Model.....	18
6.2 Baseline Condition of the IPPC Installation	19
7.0 DISCUSSION AND CONCLUSIONS.....	21
8.0 REFERENCES.....	22

LIST OF FIGURES

FIGURE 1	SITE LOCATION PLAN
FIGURE 2	SITE LAYOUT PLAN
FIGURE 3	CONCEPTUAL SITE MODEL
FIGURE 4/4a	EXPLORATORY HOLE LOCATIONS FROM PREVIOUS SITE INVESTIGATIONS
FIGURE 5	EXPLORATORY HOLE LOCATIONS FROM CARL BRO SITE INVESTIGATIONS

LIST OF APPENDICES

APPENDIX A	EXPLORATORY HOLE LOGS
APPENDIX B	SUMMARY OF CHEMICAL ANALYSIS FROM PREVIOUS SITE INVESTIGATIONS
APPENDIX C	CHEMICAL ANALYSIS RESULTS FROM CARL BRO SITE INVESTIGATIONS
APPENDIX D	CD CONTAINING QA/QC DATA FOR LABORATORY ANALYSIS

1.0 INTRODUCTION AND PURPOSE OF STUDY

Knauf Insulation (formerly known as KnaufAlcopor) manufacture glass mineral wool for thermal and acoustic insulation solutions for building merchants and the retail sector. The glass fibre production process falls within the definition of a part A(1) process of the Pollution, Prevention and Control Regulations (PPC) 2000 and amendments. The PPC Regulations require that an applicant submit a Site Condition Report as part of the permit application to operate a Part A(1) installation. Knauf Insulation commissioned Carl Bro Group Limited to undertake an investigation of the Pont-y-Felin Works site to produce an initial Site Condition Report.

This report presents data relating to the 'initial' baseline conditions at the Pont-y-Felin Works IPPC Installation, as required for the IPPC permit application, and allows reference points for comparison with site conditions at cessation of operations. It supplements the site investigation undertaken by Carl Bro during 2002 and presents a revised baseline for the site in response to a Schedule 4 Information Notice issued by the Environment Agency on 16th December 2002. The study has been completed by Carl Bro in accordance with our proposal to KnaufAlcopor UK Limited (now Knauf Insulation) dated 3rd January 2003. The site location and site layout are shown on Figures 1 and 2 respectively.

1.1 Objective of Phase 1b Assessment

The objective of Phase 1b for the production of an "initial" site report is to refine the preliminary conceptual site model developed during Phase 1a to gain a better understanding of the site and the contamination present, i.e. collect further information on the nature, location and behaviour of contaminants present at the site. The preliminary conceptual site model is included in this report as **Figure 3**. This Phase 1b assessment utilises previous site investigation data obtained by others and also additional information obtained from the site investigation undertaken by Carl Bro to provide a fuller representation of the ground conditions within the IPPC installation boundary. The baseline with respect to contaminant concentrations has been defined only using the chemical analysis results from the Carl Bro site investigations undertaken during 2002 and 2003.

A review of previous site investigation data has been undertaken and a summary provided in section 2.0. Following discussions with the Environment Agency, it has been agreed that previous site investigations will be used to establish the ground conditions present within the installation, but not the baseline with respect to contaminant concentrations. The site investigations undertaken by Carl Bro are described in section 3.0. Information obtained from all site investigations is used to describe the ground conditions within the installation in section 4.0. A summary of chemical analysis undertaken as part of the Carl Bro site investigations is provided in section 5.0. Only chemical analysis from exploratory holes completed by Carl Bro has been used to provide baseline information for the site presented in section 6.0. The conceptual model developed as part of the Phase 1a site report is also re-visited in section 6.0 to take account of any additional information obtained from further site investigation.

2.0 SUMMARY OF PREVIOUS SITE INVESTIGATIONS

Previous site investigations and environmental reviews were undertaken at the Pont-y-Felin Works between 1993 and 1999. Reports on these site investigations are listed below:

- ERM EnviroClean Limited. June 1994. Environmental Assessment of Three Facilities: Ravenhead, Queensferry and Pont-y-Felin. (Owens-Corning Fibreglass Corporation).

This report provides a review of the potential for current (1994) or past operational practices at the Pont-y-Felin site to have created environmental liabilities associated with soil and/or groundwater contamination. The relevant information for the purpose of this IPPC report has been considered and included as appropriate in the Phase 1a site report produced by Carl Bro. Site investigation works were recommended and are detailed in the review of the following listed ERM reports.

- ERM EnviroClean Ltd. October 1994. Phase II Site Investigation Programme: Fibreglass Insulation Manufacturing Facility- Pont-y-Felin. (Owens-Corning/Pilkington)

This report is discussed in detail in Section 2.1 below.

- ERM EnviroClean Ltd. June 1995. Further Phase II Investigations: Fibreglass Insulation Manufacturing Facility – Pont-y-Felin (Owens-Corning/Pilkington)

This report is discussed in detail in Section 2.2 below.

- ARCADIS Geraghty & Miller International Inc. November 1999. Phase I Environmental Site Assessment. Owens Corning Building Products (UK) Limited Pont-y-Felin, UK

This report presents a Phase 1 Environmental Assessment of the Pont-y-Felin Works which includes a regulatory review of the site, summary of site history and environmental setting, site reconnaissance and audit and review of the ERM investigations conducted in 1994 and 1995. The relevant information for the purpose of this IPPC report has been considered and included as appropriate in the relevant Phase 1a and 1b Site Reports produced by Carl Bro.

A brief summary of the fieldworks relevant to establishing the baseline within the IPPC installation undertaken by ERM EnviroClean is provided below. The ground conditions encountered are described in section 4.0 of this report. Contaminant concentrations recorded in the ERM investigations have not been utilised to establish the baseline condition for the site but have been described in this section to provide background information on contaminant concentrations within the IPPC installation. The ERM investigations were undertaken during 1994 and 1995 and the data is considered to be too old to provide an appropriate baseline for the site.

2.1 ERM EnviroClean. October 1994. Phase II Site Investigation Programme

2.1.1 Scope of Works

A phase II site investigation was undertaken by ERM EnviroClean during August 1st and 2nd 1994. The fieldwork comprised the drilling of 11 exploratory holes to a maximum depth of 5.2m below ground level.

These exploratory holes were located within Zones 1 and 2 of the IPPC installation to target potential sources of contamination.

2.1.2 Fieldwork Methodology

The exploratory hole locations are shown on **Figure 4** and were situated in the following locations to investigate potential sources of contamination identified by ERM:

Borehole Number	Reason/ potential source of contamination
PF1	Located down gradient of waste water effluent pit
PF2	Located down gradient of chemical bulk storage tank farm
PF3	Located down gradient of bulk oil storage area and oil drum storage building
PF4	Located up gradient, but adjacent to the chemical bulk storage tank farm
PF5	Located at the vent pipe from ammonia header tank, adjacent to the resin plant, which showed evidence of vegetation stress
PF7	Located in central area to identify any general contamination arising from releases of washwater from operations within the main building.
PF8	Located down gradient of the underground wash water effluent tanks
PF9	Located adjacent to the underground wash water effluent tanks
PF10	Located adjacent to the former oil store
PF11	Located down gradient of the former rubble disposal area in the north of the site (outside of the IPPC installation)

These exploratory holes are situated in the vicinity of many of the potential sources of contamination identified in section 4.5 of the Carl Bro Phase 1a Site Report.

Probe holes were progressed by ERM EnviroClean by means of a 1.2m long, 50mm diameter soil sampler tube driven from the ERM 'Geoprobe system'. This contained a dedicated acetate liner. After drilling the first meter interval, the soil sampler was pulled out and the soil core contained in the sampler recovered. The liner was cut open and the soil material at a selected depth was transferred quickly into a 'headspace' bottle. After collecting the soil sample from the first metre interval, the soil sampler was driven deeper to determine the underlying ground conditions and obtain further soil samples.

The report stated that drilling was continued until samples of natural ground were observed, or further penetration was prevented by an obstruction or no returns were being obtained. At this point the probe-holes were backfilled and a concrete seal installed.

Full visual and olfactory assessments of the soil borings were made, including field screening for Total Organic Vapours (TOC) using a Photoionisation Detector (PID) and for hydrocarbons using a Hnu Hanby field kit.

Copies of the ERM EnviroClean exploratory hole logs are contained in **Appendix A**.

2.1.3 Sampling Methodology

Soil Screening

The report stated that soil samples were taken by ERM at approximately 1.0 metre intervals or at locations with visual, olfactory or field screening evidence of contamination, changes of horizons or at any perched water interface. Soil samples were immediately transferred to a sealed bottle to allow a 'headspace' measurement to be made using a hand-held portable PID Microtip with a 9.5eV lamp.

Further screening of some samples was undertaken using a Hnu Hanby field test kit. ERM stated that this method was used as a generic screening technique, following which soil samples were selected for laboratory analysis.

Soil Sampling

Soil samples were obtained from the liner to provide a discrete sample at a known depth, and transferred to a pre-labelled laboratory bottle following screening. ERM report that sample bottles were then transferred to coolers containing frozen ice packs and dispatched to the laboratory within 72 hours of sampling.

Groundwater Sampling

During the soil borings, groundwater was encountered at 7 exploratory hole locations. Groundwater samples were obtained from PF2, PF3, PF5, PF9 and PF11. Sampling of water was undertaken by ERM EnviroClean utilising the 'Geoprobe' well screen which consists of a stainless steel, slotted screen which was driven down the bore to the groundwater to allow sampling. If possible a minimum of 5 litres was purged prior to sampling, to give a representative sample of the surrounding groundwater.

2.1.4 Chemical Testing Programme

A total of 11 soil samples and 5 water samples were collected from a range of depths and analysed for VOC (volatile organic compounds), SVOC (semi-volatile organic compounds), phenol, ammonia, formaldehyde, metals and TPH (total petroleum hydrocarbon), dependent on location and visual/olfactory observations.

The analysis undertaken is detailed as follows:

- 6 soil samples and 4 groundwater samples for SVOCs
- 5 soil samples and 5 groundwater samples for VOCs
- 10 soil samples and 5 groundwater samples for speciated phenols
- 7 soil samples and 5 groundwater samples for ammonia and formaldehyde
- 3 soil samples for TPH

Quality Assurance/Quality Control (QA/QC)

As part of the overall sampling QA/QC package, 'Chain of Custody' travel documents were completed for each sample.

Chemical analysis was undertaken by Analytical Environmental Services (AES) of Consett, County Durham who are NAMAS accredited.

2.1.5 Chemical Testing Results

Tables summarising the chemical analysis results recorded during this site investigation are included in **Appendix B**.

2.2 ERM EnviroClean. June 1995. Further Phase II Investigations

2.2.1 Scope of Works

A second phase of soil and groundwater sampling was undertaken by ERM during January 1995 based on recommendations for additional works derived from the previous investigations in 1994.

Further site investigation works were undertaken within Zones 1 and 2 of the IPPC installation, targeting the area between the ammonia plant and the River Afon Llwyd. The objective of the additional site investigation was to try to identify the source of ammonia and phenol contamination identified in the 1994 site investigation. The investigation was also designed to determine groundwater quality down gradient of the operational areas, between the identified ammonia/phenol contaminated groundwater locations and the river.

2.2.2 Fieldwork Methodology

The site investigation comprised eight exploratory holes drilled using the ERM 'Geoprobe system'. The probe holes were drilled to depths of between 1.8 and 4.5m below ground level. The exploratory hole locations are shown on **Figure 4A**. The exploratory holes were positioned to investigate the following sources of contamination identified by ERM:

Borehole Number	Reason/potential source of contamination
GP1 to GP4	Located down hydraulic gradient of operations, along the eastern perimeter of the site and adjacent to the River Afon Llwyd. Positioned to assess the extent of contaminant migrations and clarify the risk to the river.
GP5	Located down gradient of former exploratory hole PF2, between the resin plant and the river.
GP6	Located down gradient of the vent pipe from the ammonia header tank and adjacent to storage tanks and the resin plant. Immediately down gradient of former location PF5.
GP7	Located immediately down gradient and adjacent to the waste water effluent tanks and also down gradient of the tank farm and resin plant.
GP8	Located down gradient of the bulk storage tanks. Located between former locations PF6 and PF1 to provide further coverage of this area.

Copies of the ERM EnviroClean exploratory hole logs are contained in Appendix A.

2.2.3 Sampling Methodology

Soil and groundwater sampling methodologies and QA/QC were the same as those described for the 1994 ERM site investigation.

2.2.4 Chemical Testing Programme

A total of 10 soil samples and 8 water samples were collected from range of depths and analysed for phenol and ammonia. QA/QC procedures were the same as for the 1994 ERM site investigation described above.

2.2.5 Chemical Testing Results

Tables summarising the chemical analysis results recorded during this site investigation are included in Appendix B.

3.0 ADDITIONAL CARL BRO SITE INVESTIGATIONS

3.1 Objectives

Carl Bro undertook fieldwork activities at the site on two separate occasions to provide information on contamination concentrations within the IPPC installation. The Carl Bro investigations were designed to supplement the information on ground conditions obtained from the ERM EnviroClean investigations and to provide contaminant concentrations in soil and groundwater required to demonstrate IPPC baseline conditions. The exploratory hole locations were selected to target potential sources of contamination identified by the Phase 1a Study, but also to provide representative coverage of the IPPC installation.

The first phase of site works was completed at the study site between 25th March and 26th March 2002. Additional site works were completed on 19th February and 20th February 2003.

The scope of works for the second phase of site works was developed to meet the requirements of a Schedule 4 Information Notice received from the Environment Agency. Consultation with the Environment Agency was undertaken prior to commencement of site works. Field activities were co-ordinated and observed by a Carl Bro Engineer.

3.1.1 Scope of Fieldworks

The first phase of fieldworks included:

- Drilling eight exploratory window sampling holes.
- River water sampling from the River Afon Llwyd upstream and downstream of the surface water drainage discharge point from the site.

The additional fieldworks comprised the following activities:

- Drilling of four window sampling holes (original scope of works included six additional window sample holes, but slow progress due to ground conditions prevented the completion of two of the holes)
- Drilling of three boreholes.
- Levelling of borehole elevations to mAoD.

Exploratory Hole	Explanation of location
WS101	East of the main process building.
WS102	HGV parking area.
WS103	HGV parking area.
WS104	HGV parking area.
WS105	Adjacent to oil storage tank.
WS106	West of main process building.
WS107	Location of proposed cullet plant.
WS108	Eastern boundary of Zone 2 adjacent to wash water plant.
WS202	East of main tank farm.
WS203	West of resin plant (binder plant).
WS205	North of the wash water plant and south of the compressor house.
WS206	Eastern boundary of Zone 2.
BH1	Eastern boundary of Zone 1.
BH2	South of Zone 1.
BH3	West of Zone 3.

The previous and recent Carl Bro exploratory hole locations are shown on Figures 5.

3.2 Health and Safety

All investigative works were undertaken in accordance with the site specific Health and Safety Plan and Method Statement produced by Carl Bro prior to commencement of site works. Exploratory hole locations were established on site following consultation with site staff and scanning each location with a Cable Avoidance Tool (CAT).

3.3 Fieldwork Methodology

3.3.1 Window Sampling

Due to the operational status of the site, window sampling equipment was used to obtain soil samples in the March 2002 investigation. Window sample holes were advanced using boring techniques with 80mm diameter tubes, reduced to 50mm diameter tubes below depths of 2m.

A total of eight exploratory holes (WS101, WS102, WS103, WS104, WS105, WS106, WS107 & WS108) were advanced to depths of between 1.5m and 4.0mbgl. The window sample holes were logged by a suitably qualified Carl Bro engineer to BS5930: 1999. Logs are presented in Appendix A.

Once all soil samples had been taken, the holes were backfilled with arisings and gravel and reinstated as the original site surface.

3.3.2 Mini Rotary Rig

Due to the dense ground conditions previously encountered, a mini rotary tracked 'pioneer' rig was used to obtain soil samples in the February 2003 investigation. This equipment was used to create window sample holes which were advanced using both boring techniques and where necessary rotary techniques.

A total of four exploratory holes (WS202, WS203, WS205 & WS206) were advanced to depths of between 1.0m and 3.2mbgl. The window sample holes were logged by a suitably qualified Carl Bro engineer to BS5930: 1999. Logs are presented in Appendix A.

Once all soil samples had been taken, the holes were backfilled with arisings and gravel and reinstated as the original site surface.

3.3.3 Cable Percussion Boreholes

A total of three boreholes (BH1, BH2 & BH3) were advanced to depths of between 2.7m and 4.0mbgl using cable percussion techniques with 150mm diameter casing. The boreholes were logged by a suitably qualified Carl Bro engineer to BS5930: 1999. Logs are presented in Appendix A.

Boreholes were completed with standpipe comprising HDPE 50mm internal diameter with a 1.7m to 3m response zone at the base of the borehole. The annulus between the slotted standpipe and the borehole wall was backfilled with washed silica gravel followed by 0.7m of bentonite to seal the groundwater response zone. The bentonite seal was then capped by 0.3m of concrete and completed with a lockable cover.

It was not possible to design the monitoring installations with response zones entirely within the drift deposits as bedrock was shallow. A maximum length of slotted standpipe was installed to ensure that groundwater samples were obtained.

3.4 Site Accessibility and Exploratory Hole Limitations

Some areas of the site were not accessible for investigation due to operational activities, obstruction by equipment or structures or the presence of underground services. All holes were backfilled with any arisings and the concrete reinstated.

3.5 Sampling Methodology

Soil samples were recovered in accordance with BS 10175:2001 (Investigation of Potentially Contaminated Sites – Code of Practice) and at suitable intervals to allow for visual characterisation and subsequent screening and chemical analysis. All soil samples were inspected for visual and olfactory evidence of contamination. A stainless steel trowel was used to obtain samples and this was cleaned between each sample to restrict cross contamination between locations.

Small disturbed soil samples were collected in 1kg sealed plastic tubs for general contaminant analysis and additional soil samples taken in glass jars for organic analysis. In total forty-three soil samples were recovered, of which twenty-seven were selected for chemical analysis. All samples were recovered by a Carl Bro Engineer, recorded in a log book, labelled and entered onto a chain of custody form. Samples scheduled for chemical analysis were kept in cool boxes and dispatched by daily courier to the laboratory.

Two surface water samples were taken from the River Afon Llwyd upstream and downstream of the surface water drainage discharge point from the site during the March 2002 site investigation.

3.6 Groundwater Sampling

It was not possible to obtain groundwater samples from the window sample holes during drilling. In window samples holes where groundwater was encountered the ground conditions were such that the holes collapsed once the tubing was retrieved from the holes.

Groundwater samples were obtained from the 3 cable percussive boreholes which were completed with monitoring installations, using the following protocol:

1. The volume of water standing in the well was calculated from the depth of water measured on site together with the internal diameter of the standpipe casing.
2. The stagnant water within the well was evacuated using a 'Waterra' Bailer. Three times the volume of the water standing in the well was removed and the purged water was placed with the permission of site staff in the site foul drainage system.
3. A period of time was allowed for ground water to re-enter the slotted standpipe.
4. Groundwater samples were recovered in containers provided by the analytical laboratory.

All samples were sent to Alcontrol Geochem in Chester by courier on the day of sampling and were tracked using Chain of Custody forms provided by the analytical laboratory.

3.7 Chemical Testing Programme

The selected suite of chemical analytes for the Carl Bro samples was intended to assess a broad range of organic, inorganic and metallic contaminants associated with the range of potential contaminants identified during the Phase 1a study. The final number of samples analysed was based upon field observations.

Our approach towards selecting soil samples for chemical analysis was designed to include representative soil types and a wide distribution of sample locations and depths. Soil samples were screened on site using a photo-ionisation detector (PID) to identify volatile organic contaminants and target laboratory analysis.

3.7.1 Soils Analysis

A total of twenty-six soil samples were selected from both the previous and recent Carl Bro investigation and submitted for chemical analysis for the following contaminants:

- Total of 27 samples for arsenic, boron, cadmium, chromium, copper, mercury, nickel, lead, selenium, zinc, mercury, cadmium total sulphur, acid soluble sulphate and pH;
- Total of 25 samples for hexavalent chromium, thiocyanate, free cyanide, total cyanide and acid soluble sulphide
- Total of 25 samples for formaldehyde and ammoniacal nitrogen;
- Total of 25 samples for total phenol and 16 for speciated phenols;
- Total of 18 samples for speciated Total Petroleum Hydrocarbons (TPH);
- Total of 26 samples for speciated Polycyclic Aromatic Hydrocarbons (PAH);
- Total of 16 samples for volatile Organic Compounds (VOCs) and Semi-volatile Organic Compounds (SVOCs)

A total of eight samples were submitted for leachability testing for pH, formaldehyde, ammonia, speciated phenol and metals.

3.7.2 Groundwater

A total of three groundwater samples were taken from the recent Carl Bro investigation and submitted for chemical analysis for the following contaminants:

3.7.3 Surface Water

Two surface water samples were taken from the River Afon Llwyd upstream and downstream of the surface water drainage discharge point from the site. The sample locations are shown on Figure 5. Analysis was undertaken for the same suite as the soil samples, including metals, PAH, TPH, VOCs and SVOCs.

4.0 GROUND CONDITIONS

Details of the descriptions of the ground conditions at each exploratory hole undertaken by Carl Bro and ERM are presented in the logs contained in Appendix A. The following is a summary of subsurface conditions encountered during the previous site investigations by ERM EnviroClean, summarised in Section 2.0, and the Carl Bro site investigations described in Section 3.0.

4.1 Made Ground

Made ground was encountered in almost all exploratory holes undertaken to date to a maximum depth of 3m. Made ground containing ash and clinker was encountered in all three zones. The nature of the made ground present in each zone is described in more detail below:

Zone 1

Made ground was encountered in almost all of the exploratory hole locations and comprised brown sandy topsoil and subsoil to a depth of between 0.1m and 0.8 bgl in PF1, PF2, PF4, PF5, PF6, GP1, GP2, GP3, GP5, GP6, GP7, GP8, WS107, BH1 and BH2. This was underlain by made ground comprising loose brown sand and gravel with brick fragments, concrete, sandstone and clay to a depth of between 0.1m and 2.8m bgl in PF1, PF2, PF3, PF4, PF5, WS202, WS203 and BH2. Made ground comprising sand and gravel of ash, clinker, brick and concrete was encountered in PF2, PF5, PF6, GP1, GP2, GP3, GP5, GP6, GP7, GP8 to depths of between 0.7m and 2.3m bgl.

In exploratory holes where the base of the made ground was proven, the depth within Zone 1 ranged between 0.4m bgl in PF4 to 2.8m bgl in BH1.

Zone 2

Made ground was encountered in PF9, PF10, GP4, WS108, WS205 and WS206. In PF9, PF10 and WS205 between ground level and 0.3mbgl. In GP4 the made ground comprised 0.6m of topsoil underlain by sand and gravel of ash and clinker beneath which was clay containing sand and gravel of coal, ash and clinker to a depth of 1.9m bgl. In WS108 the made ground comprised topsoil containing gravel of clinker and sandstone. In WS205 the aggregate is underlain by made ground comprising medium to coarse angular gravel encountered between 0.3m and 0.7mbgl. In WS206 the made ground comprised 0.9m of topsoil containing sandy silty clay and gravels, a layer of vegetation fibres was encountered at 0.6m. The maximum depth of made ground encountered in Zone 2 was 1.9m bgl in GP4.

Zone 3

Made ground was encountered in all exploratory hole locations within Zone 3. In WS101 and WS106 the made ground comprised topsoil encountered to 0.05m bgl overlying sand and gravel of limestone shale, and clinker encountered to 1.25m and 1.5m bgl respectively. In WS102, WS103 and WS104 the made ground comprised concrete to a depth of between 0.1m and 0.17m bgl. In WS102 this was underlain by limestone hardcore to 0.85m depth and in WS103 it was underlain by gravel of grey and red shale to 0.8m depth. In WS105, made ground comprised limestone hardcore overlying gravel and cobbles of limestone, shale and concrete to 2.1m depth. In BH3 made ground comprised clay with cobbles of sandstone to a depth of 1.7m.

The maximum depth of made ground was encountered in WS105 at a depth of 2.1m bgl, although the base of made ground was not proven in this location.

4.2 Natural Ground

Natural ground was encountered in all locations except WS105, WS106 and GP6 which were abandoned at relatively shallow depths.

Relict topsoil and subsoil were encountered in WS101, WS102, WS108 and WS206 to a maximum depth of 2.57m bgl. The general sequence of natural strata beneath the site comprised dark brown silty clay underlain by sands and gravels, beneath which is a red silty clay and bedrock comprising weathered mudstone and sandstone. The complete sequence of deposits was not observed in all exploratory holes and in many the made ground was directly underlain by sands and gravels.

Soft to stiff brown clayey silt and silty clay was encountered in PF1, PF2, PF6, GP1, GP7, GP8, PF8, WS101, WS102, WS103, WS104, WS203 and BH1 to between 0.8m and 2.7m bgl. In a few exploratory holes this deposit contained flecks of coal.

Brown clayey silty sand was encountered in PF2, GP1, GP7, GP8, WS107, GP4, WS108, WS101, WS103, WS206 and BH3 to between 1.5m and 3.7m bgl. GP8, WS101 and WS108 contained sandstone and siltstone gravel and cobbles.

Light brown sandy clayey gravel of sandstone and marl was encountered in PF1, PF2, PF3, PF4, PF5, PF6, GP2, PF8, PF9, PF10, GP4, WS202, WS203, WS205 and BH3 to a depth of between 0.9m and 5.2m bgl. The base of the gravel deposits was only proven in PF1, PF3, PF7, PF8 and WS104 at between 1.9m and 5.2m bgl. In WS203 and PF5 the gravels were underlain by stiff red silty clay containing sandstone gravel to a depth of 2.9m and 3.6m bgl respectively. In GP3, GP5, GP7, GP8, WS107, WS102, WS103 and BH1 sands and gravels containing sandstone and marl were encountered to depth of between 1.8m and 4.5m bgl. The light brown sandy gravel was interbedded with stiff reddish brown mottle clay within PF7 and encountered to 1.9m bgl.

Bedrock was encountered at depths of between 1.9m bgl in PF7 and 5.2m bgl in PF1. In PF1, PF7 and PF8, bedrock comprised sandstone and in WS104 it comprised green mudstone with red shale. In WS205, WS206 and BH3 dark grey and brown mudstone was encountered.

4.3 Groundwater

Groundwater has been encountered in a total of 21 exploratory holes. The window sampling holes drilled by Carl Bro collapsed shortly after drilling and therefore it was not possible to recover any water samples from the window sample locations. Groundwater samples were recovered from PF2, PF3, PF5, PF9 and PF11 during the previous site investigations. Groundwater samples were taken from BH1, BH2 and BH3 one week after the boreholes were installed and groundwater levels measured during this site visit. The following table summarises the depth of water strikes in each exploratory hole.

**Levels of Groundwater Below Ground Level Measured During Site Visit
by Carl Bro and Others**

ERM Data 1994

Window sample location	PF1	PF2	PF3	PF4	PF5	PF6	PF7	PF8	PF9	PF10
Water Level in 1994 (Metres bgl)	3.35	2.4	3.5	ND	2.1	ND	ND	2.1	1.4	ND

ERM Data 1995

Window sample location	GP1	GP2	GP3	GP4	GP5	GP6	GP7	GP8
Water Level in 1995 (Metres bgl)	2.8	3.0	3.2	3.4	3.1	1.7	2.5	ND

Carl Bro Data 2002

Window sample location	WS101	WS102	WS103	WS104	WS105	WS106	WS107	WS108
Water Level in 2002 (Metres bgl)	ND	2.55	2.65	2.55	1.50	ND	ND	3.1

Carl Bro Data 2003

Window sample location	BH1	BH2	BH3
BH Elevation (mAoD)	75.35	74.72	76.31
Water Level in 2003 (Metres bgl)	3.29	2.31	1.26
Groundwater Elevation (mAoD)	72.06	72.41	75.05

ND= None Detected

4.4 Visual and Olfactory Contamination

There was no visual or olfactory evidence of significant contamination noted during the window sampling site investigation works undertaken by Carl Bro. Clinker was found within made ground in several boreholes.

During the previous site investigations at the site the following observations were made by ERM EnviroClean:

- A slight oil sheen was noted on perched water in PF3 and a strong hydrocarbon odour within the made ground.

- In PF10, black staining was noted immediately below the surface layer of clean aggregate. PF10 free phase mineral oils and greases were encountered between 0.1 and 0.3m depth. The Environmental Site Assessment undertaken by Geraghty and Miller in 1999 reports that this has been excavated and replaced with clean fill.
- Yellow staining and dieback of vegetation and an ammonia odour was observed during the boring of PF5. This was located adjacent to the vent pipe from the ammonia header tank, adjacent to the resin plant. A strong hydrocarbon odour was also noted in this exploratory hole at between 1.0m and 1.2m depth. The odour decreased with depth but was still present at 3.6m below ground level. A water sample taken at 2.1m depth was noted to have an oil sheen and hydrocarbon and ammonia odours.
- A slight hydrocarbon odour was noted in GP1 during groundwater sampling.

No visual or olfactory evidence of contamination of the adjacent River Afon Llwyd was observed during the site works.

5.0 CHEMICAL RESULTS FROM CARL BRO SITE

The summary of chemical analysis presented in this section is based on data obtained from the two Carl Bro site investigations undertaken during March 2002 and February 2003.

5.1 Soil Analysis Results

A summary of the analytical results from previous ERM investigation is contained in Appendix B. These results provided background information on contamination concentrations but have not been used to establish the baseline.

A full copy of the analytical results from the Carl Bro investigation is presented in **Appendix C** and a CD containing the QA/QC data is included in **Appendix D**.

Tables 1 to 19 showing full results of all chemical analysis for the Carl Bro investigations undertaken at the site can be found at the end of this report and are detailed as below:

- Tables 1 shows metals and other inorganic determinands with a statistical summary;
- Tables 2 shows DRO, PRO and BTEX results including a statistical summary;
- Tables 3 shows PAH results including a statistical summary;
- Table 4 shows Phenol results including a statistical summary;
- Tables 5 shows VOC analysis results;
- Table 6 shows sVOC results;
- Tables 19 shows leachate analysis results.

Statistical summaries are not given for VOC or sVOC results due to the majority of the results being below laboratory detection limits. In addition, leachate analysis has only been conducted on eight samples per analytical suite therefore results in Table 19 also have no statistical summaries for each zone.

Laboratory detection limits have been exceeded in the majority of soil samples analysed. The only exceptions were concentrations of mercury, hexavalent chromium, thiocyanate, total cyanide, free cyanide and many of the compounds included in the VOC and SVOC suites.

5.2 Groundwater Analysis Results

Tables 7 to 12 showing full results of the chemical analysis undertaken on groundwater samples from the site are presented at the end of this report.

- Table 7 shows inorganic determinands with a statistical summary;
- Table 8 shows DRO, PRO and BTEX results including a statistical summary;
- Tables 9 show PAH results;
- Table 10 shows Volatile Organic Compounds;
- Table 11 shows Semi Volatile Organic Compounds;
- Table 12 shows Phenol analysis.

Laboratory detection limits for ammoniacal nitrogen, formaldehyde and phenol were exceeded in most of the groundwater samples analysed. Concentrations of the compounds included in the VOC and SVOC suites were generally below the detection limit for the analysis.

5.3 **Surface Water Analysis Results**

Tables 13 to 18 showing full results of the chemical analysis undertaken on surface water samples from the site are presented at the end of this report.

6.0 CONCEPTUAL SITE MODEL AND BASELINE CONDITION OF THE IPPC INSTALLATION

6.1 Summary of Conceptual Model

The conceptual model for the site, updated with Carl Bro investigation results is shown on Figure 3. Site investigation has been undertaken to further refine the conceptual model and obtain appropriate analytical data to define the baseline condition of the IPPC installation.

Potential sources of contamination have been identified associated with raw materials and chemicals used within the IPPC installation and these are detailed in Section 4.5 of the combined Phase 1a and Phase 1b Site Report. Chemical analysis of soil and groundwater samples has been undertaken to confirm the range of concentrations present and define the IPPC baseline condition and is summarised in Section 6.2 below.

Pathways for the migration of potential contaminants were identified as migration into the underlying soils and groundwater in areas cracked hardstanding or where hardstanding is absent, although in general hardstanding was in good condition across the site. Site drainage around bulk storage areas is designed so that spillages are not transmitted to the nearby surface water course. Hydrocarbon spillages on the perimeter roadway may also be transmitted to surface water via site drainage as it does not pass through an interceptor prior to discharge. Subsurface contamination may migrate into faulty or damaged surface water drains and reach the nearby river. Subsurface contamination may also be transmitted to the nearby river via baseflow within the alluvial deposits beneath the site. The infiltration of spillages into the subsurface may also have affected groundwater quality within the Alluvium beneath the site soils beneath the IPPC installation, leaching into groundwater and via site drainage.

The Alluvium underlying the site is classified as a Non Aquifer. The underlying Raglan Mudstone Formation, part of the Devonian Lower Old Red Sandstone, is classified as a Minor Aquifer.

The intrusive investigation undertaken confirms that the site is underlain by made ground comprising sand and gravel of limestone, clinker, grey shale and red shale to a maximum depth of 2.8m. The base of the made ground was proven at each location except WS105, WS106 and GP6. Natural ground was encountered between ground level and 2.8mbgl and comprised of silty clay and sands and gravels underlain by red silty clay. Bedrock of sandstone and weathered mudstone was also encountered at between 1.9m and 5.2mbgl. Groundwater was encountered during the site investigation at between 72.06 and 75.05mAoD.

The River Afon Llwyd is located adjacent to the eastern site boundary and is of good quality.

There are no nature reserves or SSSIs within 1km of the site.

Groundwater and surface water have therefore been identified as significant environmental receptors in the vicinity of the site.

6.2 Baseline Condition of the IPPC Installation

The nature, extent and distribution of contamination across the whole IPPC installation have been investigated. The baseline concentrations of contaminants associated with activities that will be operated under the forthcoming PPC process are presented.

Relatively low levels of metals, organic and inorganic contaminants have been identified in the made ground and natural ground beneath the site, with the exception of elevated TPH and PAH within WS107 (Zone 3). Groundwater samples were recovered from BH1, BH2 and BH3 for analysis results show that there were very low concentrations of metals in the boreholes, leachate results show that contaminants are generally not mobile within soils beneath the site. However, very low levels of leachable metals and ammonium were identified at isolated locations beneath the site.

Table 1 presented below shows the range of concentrations of contaminants for each zone within the installation. Only those contaminants encountered over laboratory detection limits are shown here (in mg/kg). SVOC and VOC results have not been included in the summary table due to the large number of compounds included in the suite of analysis. Full analytical results are shown in Appendix C.

The toxicity, environmental fate and behaviour of the contaminants identified are discussed in section 4.6 of the combined Phase 1a and Phase 1b site report. The nature of contamination detected can be categorised as industrial contaminants likely to be from the above ground site activities.

Summary of Soil Results

Determinands	Range of Contaminant Concentrations (mg/kg)					
	Zone 1		Zone 2		Zone 3	
	Min	Max	Min	Max	Min	Max
Arsenic	<1	57	3	22	6	59
Boron (water soluble)	<1	8	<1	2	<1	4
Cadmium	<1	1	<1	4	<1	4
Chromium	9	162	8	41	9	75
Copper	6	38	10	32	4	45
Mercury	<1	<1	<1	<1	<1	<1
Nickel	10	33	3	37	14	49
Lead	<1	69	16	63	13	108
Selenium	<1	2	<1	2	<1	2
Zinc	36	371	66	256	50	358
Acid soluble sulphide	<5	190	<5	32	<1	508
Ammoniacal Nitrogen	5.2	22	7.9	21.3	6.9	60.4
Hexavalent chromium	<0.1	<3.0	<0.1	<3.0	<0.1	<0.3
Formaldehyde	8	28	7	21	<1	13
Thiocyanate	<1	<1	<1	<1	<1	<1
Total phenols HPLC	<0.01	10	<0.01	<0.01	<0.01	0.1
Total Sulphur	0.01	0.7	0.02	0.05	0.01	0.97
Acid soluble sulphate	<5	17700	<100	200	100	25000
pH value in soil	6.84	8.75	7.49	8.4	5.51	9.16
Total cyanide	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
Free cyanide soil	<1	<2.5	<1	<2.5	<1	<2.5
Diesel range organics	19	189	22	180	9	217
Petrol Range Organics	<0.01	0.2	<0.01	0.04	<0.01	0.3
Benzene	<0.01	<0.01	<0.01	<0.01	<0.01	0.02
Toluene	<0.01	0.097	<0.01	<0.019	<0.01	0.03
Ethylbenzene	<0.01	0.02	<0.01	<0.01	<0.01	0.02
Xylene	<0.01	0.1	<0.01	0.02	<0.01	0.2
TPH	43	101	N/A	N/A	N/A	N/A
Total 16PAHs	0.4	16.3	0.7	11.5	0.37	11.8
Phenol	0.002	0.01	<0.001	0.003	<0.001	0.006

The following table shows the range of contaminants encountered in groundwater within the installation.

Range of Concentrations (mg/l)		
Determinands	Zone 1 & 2	
	Min	Max
Arsenic	0.001	0.003
Boron (water soluble)	0.025	0.366
Cadmium	<0.0004	0.0038
Chromium	0.003	0.015
Copper	<0.001	0.031
Mercury	<0.0005	0.00012
Nickel	0.004	0.018
Lead	0.002	0.004
Selenium	<0.001	0.002
Zinc	0.06	0.744
Sulphide in Water	<0.05	<0.05
Ammoniacal Nitrogen	0.4	0.8
Hexavalent Chrome	<0.03	<0.03
Formaldehyde	<0.05	<0.05
Thiocyanate	<0.2	<0.2
Total phenols	<0.01	<0.01
Free sulphur	<0.05	<0.05
Sulphate (soluble)	71	226
pH Value	7.31	8.37
Total cyanide	<0.05	<0.05
Free cyanide in water	<0.05	<0.05
Diesel Range Organics	<0.01	0.016
Petrol Range Organics	<0.01	<0.01
Phenol	<0.0005	<0.0005

7.0 DISCUSSION AND CONCLUSIONS

This report sets out the condition of the site (including a conceptual site model) and contamination present prior to operation of the installation under the IPPC permit. This initial condition will provide an effective reference point for comparison with the condition of the site at cessation of operations. A conceptual model has been developed for the site and ground conditions established within the installation boundary. The baseline concentrations of potential contaminants that may arise from operation of the IPPC installation have been established.

Completeness

A reasonable minimum amount of information has been collected from site investigation works and chemical analysis results to determine a baseline condition for the Knauf Insulation Pont-y-Felin facility.

Relevance

The presence of all likely contaminants associated with the activities of the installation has been investigated.

Reliability

The locations of the exploratory holes were somewhat restricted due to the constraints of working on an operational site, i.e. locations of fixed plant, storage areas and transport routes. However, it is considered that the exploratory hole locations in the Carl Bro investigation were representative of the whole installation. Soil samples were appropriately collected, transported and stored prior to laboratory testing by a UKAS accredited laboratory. It is considered that the scope of the investigative works was sufficient to provide an initial baseline condition of the site. Some gaps in the data set were unavoidable due to the operational status of the site. Ground conditions found during the investigation show some variation across the site, but overall no further investigations are considered necessary to further characterise this variability.

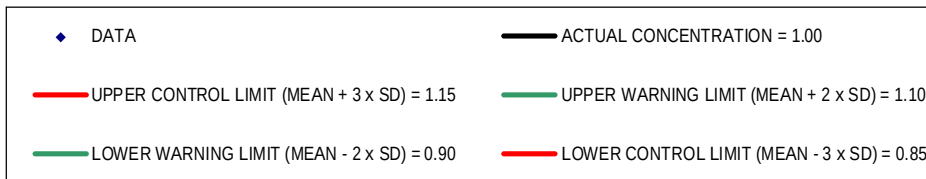
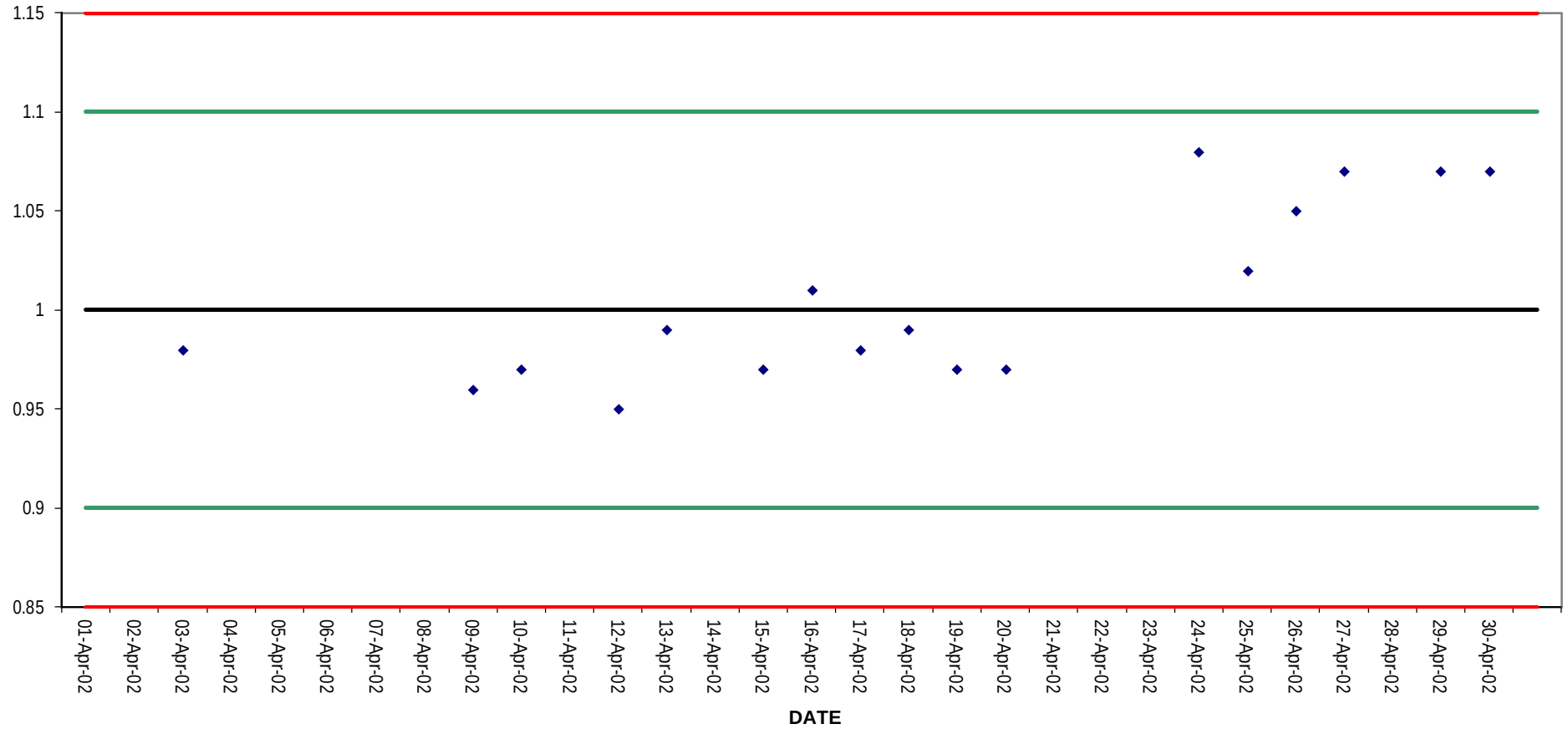
8.0 REFERENCES

The following sources of information have been consulted as part of the compilation of this report:

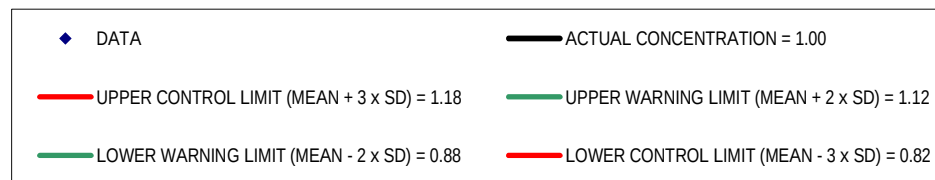
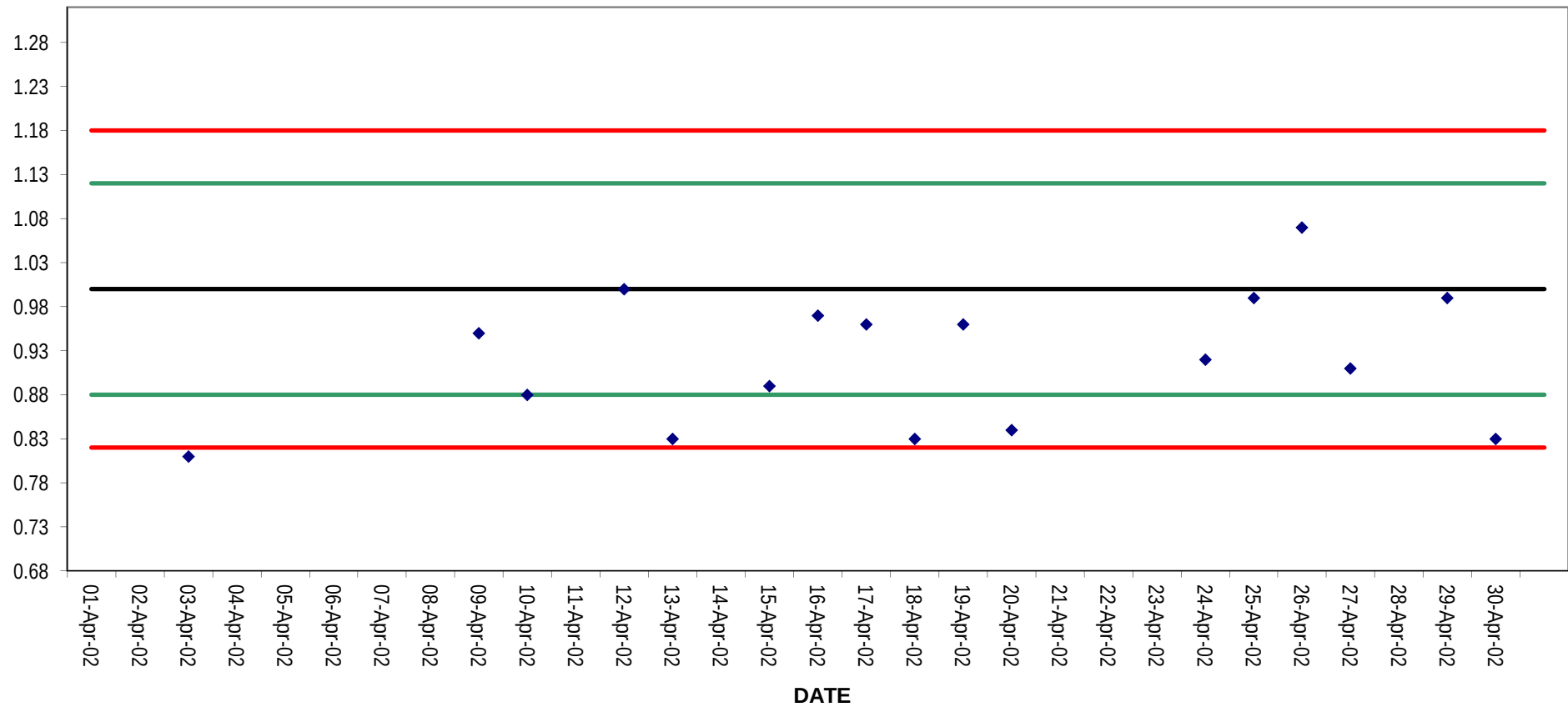
- (1) ERM EnviroClean Limited. June 1994. Environmental Assessment of Three Facilities: Ravenhead, Queensferry and Pont-y-Felin. (Owens-Corning Fibreglass Corporation).
- (2) Phase II Site Investigation Programme: Fibreglass Insulation Manufacturing Facility- Pont-y-Felin. ERM EnviroClean Ltd. October 1994.
- (3) Further Phase II Investigations: Fibreglass Insulation Manufacturing Facility- Pont-y-Felin. ERM EnviroClean Ltd. June 1995.
- (4) Phase 1 Environmental Site Assessment. Owens Corning Building Products (UK) Ltd. Pont-y-Felin, UK. Arcadis Geraghty and Miller International Inc. November 1999.
- (5) Summary Report in response to Phase 1 Audits. Environmental Resources Management. March 2000.
- (6) Guidance on the Preparation of a Site Report in a Permit Application (Part 1(A) installations), Environment Agency.

TABLES

AQC Naphthalene 1.0 mg/l



AQC Indeno(123cd)pyrene1.0 mg/l



AQC Pyrene 1.0 mg/l

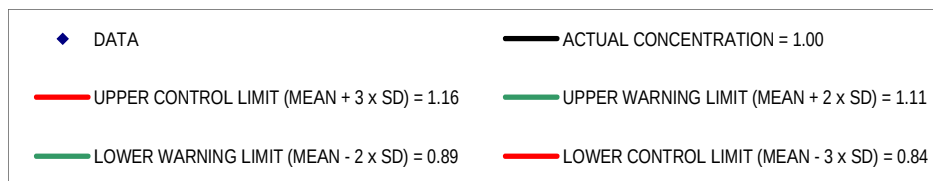
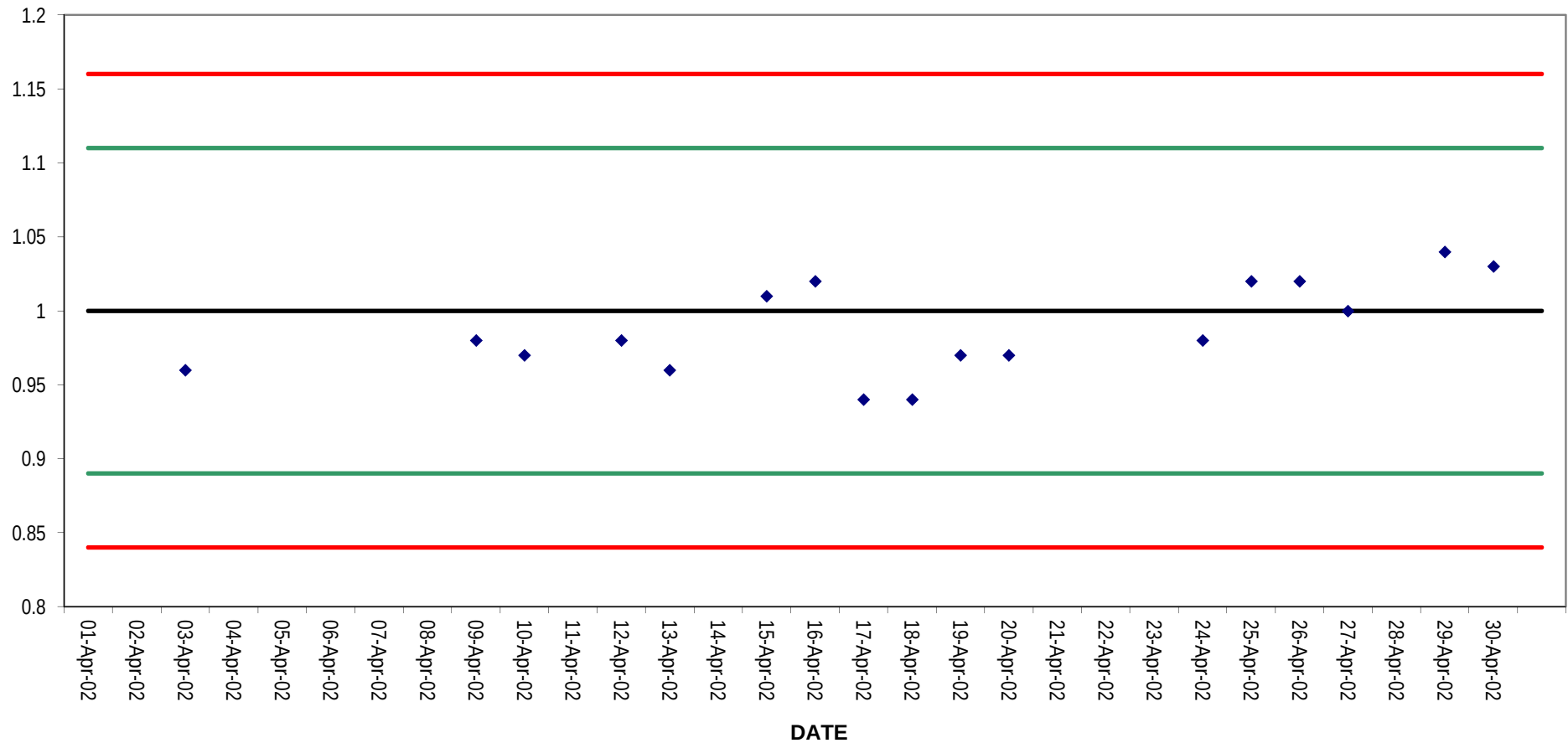


Table 1 Soils: Metals and Other Inorganic Determinands										
	Zone 1									
Determinands	WS107	WS107	WS202	WS202	WS203	BH1	BH2	MIN	MAX	MEAN
	0.5-0.8	1-1.4	0.5	1.5	0.7	1.0	2.7			
Arsenic	57	14	6	4	<1	7	<1	<1	57	12.9
Boron (water soluble)	8	<1	2	2	<1	2	2	<1	8	2.6
Cadmium	<1	<1	<1	<1	1	<1	<1	<1	1	N/A
Chromium	162	15	26	17	18	21	9	9	162	38.3
Copper	26	6	13	30	27	38	10	6	38	21.4
Mercury	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A
Nickel	26	11	32	33	26	29	10	10	33	23.9
Lead	56	32	<1	37	28	69	55	<1	69	39.7
Selenium	<1	2	2	<1	<1	1	<1	<1	2	1.3
Zinc	112	36	79	124	371	143	209	36	371	153
Acid Soluble Sulphide	190	22	<5	<5	<5	<5	<5	<5	190	34
Ammoniacal Nitrogen/Ammonia	20.5	22	13.9	6.8	11.3	5.2	8.5	5.2	22	12.6
Hexavalent Chrome	<0.1	<0.1	<0.3	<3.0	<0.3	<3.0	<3.0	<0.1	<3	N/A
Formaldehyde	8	9	14	11	28	19	8	8	28	13.9
Total Phenol	<0.01	<0.01	<0.01	<0.01	<0.01	2	10	<0.01	10	1.7
Thiocyanate	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A
Total sulphur	0.7	0.01	0.01	0.06	0.02	0.03	0.03	0.01	0.7	0.12
Acid soluble sulphate	17700	100			<5	<5	<5	<5	17700	3563
pH value in soil	8.75	7.42	8.33	6.84	8.22	6.88	7.85	6.84	8.75	7.76
Total cyanide	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	N/A
Free cyanide soil	<2.5	<2.5	<1	<1	<1	<1	<1	<1	<2.5	N/A

	Zone 2								
Determinands	WS108	WS108	WS108	WS205	WS206	WS206	MIN	MAX	MEAN
	0.55-0.8	1.4-1.57	2.1-2.4	0.9	0.5	2.8			
Arsenic	22	15	13	3	6	11	3	22	11.67
Boron (water soluble)	<1	<1	<1	2	2	<1	<1	2	1.30
Cadmium	<1	<1	<1	4	<1	<1	<1	4	1.5
Chromium	30	15	27	8	41	28	8	41	24.8
Copper	28	28	11	19	32	10	10	32	21.3
Mercury	<1	<1	<1	<1	<1	<1	<1	<1	N/A
Nickel	34	37	28	3	36	23	3	37	26.8
Lead	63	32	29	45	66	16	16	66	41.8
Selenium	<1	2	2	<1	2	<1	<1	2	1.5
Zinc	114	117	66	256	143	64	64	256	126.7
Acid Soluble Sulphide	14	2	2	<5	32	<5	<5	32	10.0
Ammoniacal Nitrogen/Ammonia	14.4	17	21.3	7.9	2.6	12.6	2.6	21.3	12.6
Hexavalent Chrome	<0.1	<0.1	<0.1	<0.3	<3.0	<0.3	<0.1	<3.0	N/A
Formaldehyde	8	7	7	21	16	10	7	21	11.5
Total Phenol	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	N/A
Thiocyanate	<1	<1	<1	<1	<1	<1	<1	<1	N/A
Total sulphur	0.02	0.05	0.02	0.02	0.04	0.02	0.02	0.05	0.03
Acid soluble sulphate	<100	<100	200				<100	200	N/A
pH value in soil	8.1	7.61	7.64	8.4	7.26	7.49	7.26	8.4	7.80
Total cyanide	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	N/A
Free cyanide soil	<2.5	<2.5	<2.5	<1	<1	<1	<1	<2.5	N/A

	Zone 3																
Determinands	WS101	WS101	WS101	WS102	WS102	WS102	WS103	WS103	WS104	WS104	WS105	WS106	WS106	BH3	MIN	MAX	MEAN
	0.45-0.6	1.25-1.5	2.7-2.9	0.85-1.00	1.5-1.8	3.1-3.3	0.77-0.95	1.5-1.8	0.6	1.7	0.7-1.0	0.5-0.8	1.3-1.5	2.0			
Arsenic	17	14	10	20	11	12	15	11	28	14	15	14	59	6	6	59	17.57
Boron (water soluble)	<1	<1	<1	<1	<1	<1	<1	<1	2	<1	<1	<1	4	2	<1	4	1.36
Cadmium	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	4	2	<1	<1	<1	4	1.28
Chromium	19	19	9	17	12	50	13	12	45	20	26	13	75	25	9	75	25.36
Copper	19	26	8	36	30	12	36	36	11	45	18	13	4	12	4	45	21.86
Mercury	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A
Nickel	27	32	49	36	29	27	36	33	32	30	17	14	15	24	14	49	28.64
Lead	39	36	18	46	30	33	39	34	24	13	104	108	44	13	13	108	41.50
Selenium	<1	<1	2	<1	<1	2	2	<1	<1	<1	<1	<1	<1	<1	<1	2	1.20
Zinc	108	94	99	109	91	72	93	93	60	50	358	161	65	69	50	358	108.71
Acid Soluble Sulphide	14	<1	2	16	<1	12			14	2	26	18	508	<5	<1	508	18.73
Ammoniacal Nitrogen/Ammonia	6.9	22.6	15.1	28.4	22.6	21.9			60.4	20	18.9	20.7	16.1	19	6.9	60.4	22.72
Hexavalent Chrome	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.1	<0.3	N/A
Formaldehyde	9	7	7	13	11	6			<1	8	5	7	2	10	<1	13	7.17
Total Phenol	<0.01	<0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.1	<0.01	<0.01	0.1	0.02
Thiocyanate	<1	<1	<1	<1	<1	<1			<1	<1	<1	<1	<1	<1	<1	<1	N/A
Total sulphur	0.03	0.05	0.01	0.04	0.03	0.04	0.04	0.04	0.19	0.05	0.21	0.14	0.97	0.02	0.01	0.97	0.13
Acid soluble sulphate	500	800	200	800	200	200	664	699	380	100	3400	1400	25000		100	25000	2642
pH value in soil	7.86	7.77	6.76	7.03	7.45	5.51	7.77	7.27	7.94	7.21	8.44	8.63	9.16	7.94	5.51	9.16	7.62
Total cyanide	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5			<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	N/A
Free cyanide soil	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5			<2.5	<2.5	<2.5	<2.5	<2.5	<1	<1.0	<2.5	N/A

all results in ppm (mg/kg)

Note 1 Where concentrations are recorded below the detection limit, the detection limit has been used to calculate the mean concentration.

Note 2 N/A shown where too many samples recorded a concentration below the detection limit for the mean concentration to be a useful statistic

TABLE 2: Soils: TPH (DRO/GRO/BTEX)

	Zone 1								
Determinands	WS107	WS202	WS202	WS203	BH1	BH2	MIN	MAX	MEAN
	0.5-0.8	0.5	1.5	0.7	1.0	2.7			
TPH					101	43	43	101	72
Diesel Range Organics	189	47	22	19			19	189	104
Petrol Range Organics	10	<10	<10	35	239	12	<10	239	52.7
Benzene	< 10	<10	<10	<10	<10	<10	<10	<10	N/A
Toluene	10	<10	<10	19	97	<10	<10	97	26
Ethylbenzene	< 10	<10	<10	<10	23	<10	<10	23	12.2
Xylene	< 10	<10	<10	16	119	12	<10	119	25.5

	Zone 2						
Determinands	WS108	WS205	WS206	WS206	MIN	MAX	MEAN
	0.55-0.8	0.9	0.5	2.8			
TPH					-	-	N/A
Diesel Range Organics	180	22	198	33	22	180	84.33333
Petrol Range Organics	<10	<10	<10	38	<10	38	17
Benzene	< 10	<10	<10	<10	<10	<10	N/A
Toluene	< 10	<10	<10	19	<10	19	12.25
Ethylbenzene	< 10	<10	<10	<10	<10	<10	N/A
Xylene	< 10	<10	<10	19	<10	19	12.25

	Zone 3										
Determinands	WS101	WS102	WS103	WS104	WS105	WS106	WS106	BH3	MIN	MAX	MEAN
	1.25-1.5	0.85-1.0	0.77-0.95	0.6	0.7-1.0	0.5-0.8	1.3-1.5	2.0			
TPH										0	
Diesel Range Organics	112	217	173	9	80	60	137	63	9	217	113
Petrol Range Organics	29	42	305	<10	<10	<10	<10	348	<10	348	95.5
Benzene	14	19	21	<10	< 10	< 10	< 10	<10	<10	21	13
Toluene	15	23	29	<10	< 10	< 10	< 10	<10	<10	29	14.6
Ethylbenzene	< 10	< 10	10	<10	< 10	< 10	< 10	23	<10	23	11.6
Xylene	< 10	< 10	17	<10	< 10	< 10	< 10	162	<10	162	29.9

TPH and DRO reported in ppm (mg/kg)

PRO and BTEX reported in ppb (µg/kg)

Note 1 Where concentrations are recorded below the detection limit, the detection limit has been used to calculate the mean concentration.

Note 2 N/A shown where too many samples recorded a concentration below the detection limit for the mean concentration to be a useful statistic

TABLE 3: SOIL: PAH ANALYSIS

	Zone1									
Determinands	WS107	WS107	WS202	WS202	WS203	BH1	BH2	MIN	MAX	AVERAGE
	0.5-0.8	1.0-1.4	0.5	1.5	0.7	1.0	2.7			
Naphthalene	580	180	90	4760	58	81	42	42	4760	827.3
Acenaphthylene	101	1273	8	206	6	3	2	2	1273	228.4
Acenaphthene	156	46	21	61	16	3	20	3	156	46.1
Fluorene	122	126	19	141	17	3	12	3	141	62.9
Phenanthrene	1811	128	119	700	91	29	70	29	1811	421.1
Anthracene	387	25	26	60	17	15	21	15	387	78.7
Fluoranthene	2247	76	87	9	66	58	70	9	2247	373
Pyrene	1734	54	63	107	49	44	49	44	1734	300.0
Benz(a)anthracene	975	26	53	51	41	60	31	26	975	176.7
Chrysene	1350	45	56	146	55	41	25	25	1350	245
Benzo(b)fluoranthene	1784	92	52	83	51	37	27	27	1784	304
Benzo(k)fluoranthene	1287	17	19	23	19	17	11	11	1287	199.0
Benzo(a)pyrene	1313	21	32	28	32	28	18	18	1313	210.3
Indeno(123cd)pyrene	1063	17	19	11	24	14	10	10	1063	165.4
Dibenzo(ah)anthracene	458	11	8	8	9	6	3	3	458	71.9
Benzo(ghi)perylene	893	17	21	45	29	15	11	11	893	147.3
Total PAH	16262	2154	694	6522	579	452	421	421	16262	3869

	Zone 2								
Determinands	WS108	WS108	WS108	WS205	WS206	WS206	MIN	MAX	AVERAGE
	0.55-0.8	1.4-1.57	2.1-2.4	0.9	0.5	2.8			
Naphthalene	816	1097	269	86	3528	164	86	3528	993
Acenaphthylene	75	67	18	20	250	12	12	250	74
Acenaphthene	198	219	51	24	109	23	23	219	104
Fluorene	184	146	41	36	234	23	23	234	111
Phenanthrene	856	1006	169	426	978	283	169	1006	620
Anthracene	139	62	12	106	181	24	12	181	87
Fluoranthene	831	128	21	454	1134	53	21	1134	437
Pyrene	632	139	21	326	830	47	21	830	333
Benz(a)anthracene	476	135	11	170	600	28	11	600	237
Chrysene	646	257	41	148	759	80	41	759	322
Benzo(b)fluoranthene	475	223	27	164	1209	23	23	1209	354
Benzo(k)fluoranthene	406	36	13	53	316	12	12	406	139
Benzo(a)pyrene	526	79	15	101	571	13	13	571	218
Indeno(123cd)pyrene	350	26	6	39	317	<1	<1	350	148
Dibenzo(ah)anthracene	171	25	6	9	105	<1	<1	171	63
Benzo(ghi)perylene	348	79	12	37	446	<1	<1	446	184
Total PAH	7130	3725	733	2195	11569	785	733	11569	4356

	Zone 3														
Determinands	WS101	WS101	WS101	WS102	WS102	WS102	WS104	WS104	WS105	WS106	WS106	BH3	MIN	MAX	AVERAGE
	0.45-0.6	1.25-1.5	2.7-2.9	0.85-1.0	1.5-1.8	3.1-3.3	0.6	1.7	0.7-1.0	0.5-0.8	1.3-1.5	2.0			
Naphthalene	306	542	75	505	484	358	188	143	407	164	474	158	143	474	275
Acenaphthylene	25	39	6	44	18	19	36	15	12	10	71	12	10	71	29
Acenaphthene	68	93	23	119	84	51	54	36	98	52	154	50	36	154	79
Fluorene	39	80	19	100	56	48	109	36	79	49	138	47	36	138	82
Phenanthrene	171	658	64	700	290	356	634	57	216	134	1116	427	57	1116	431
Anthracene	38	65	14	76	25	24	157	13	32	28	271	77	13	271	100
Fluoranthene	233	184	30	142	53	47	563	29	106	108	1627	366	29	1627	487
Pyrene	193	174	26	136	57	52	350	20	70	91	1159	282	20	1159	338
Benz(a)anthracene	133	215	14	126	39	43	201	12	14	54	726	123	12	726	201
Chrysene	197	266	22	229	100	99	287	22	47	70	1010	203	22	1010	287
Benzo(b)fluoranthene	142	266	13	40	15	36	421	26	51	49	990	234	26	990	307
Benzo(k)fluoranthene	139	66	14	99	31	28	171	11	23	48	771	66	11	771	205
Benzo(a)pyrene	139	86	11	141	45	49	216	11	33	53	1230	126	11	1230	309
Indeno(123cd)pyrene	138	65	12	71	23	29	156	12	19	47	820	61	12	820	211
Dibenzo(ah)anthracene	67	44	14	54	18	42	58	9	13	26	450	20	9	450	111
Benzo(ghi)perylene	134	132	10	140	28	40	149	10	24	48	758	68	10	758	198
Total PAH	2161	2974	367	2723	1364	1322	3749	464	1244	1030	11765	2321	367	11765	2651

Reported as ppb (µg/kg)

Note 1 Where concentrations are recorded below the detection limit, the detection limit has been used to calculate the mean concentration.

Note 2 N/A shown where too many samples recorded a concentration below the detection limit for the mean concentration to be a useful statistic

Table 4 Soils: Target Phenols

	Zone 1								
Determinands	W S107 0.5-0.8	W S202 0.5	W S202 1.5	W S203 0.7	BH1 1.0	BH2 2.7	MIN	MAX	MEAN
Phenol	3	3	3	3	2	8	2	8	4
2-Chlorophenol	<1	<1	<1	<1	<1	<1	<1	<1	N/A
2-Nitrophenol	<1	<1	<1	<1	<1	<1	<1	<1	N/A
2,4-Dimethylphenol	<1	<1	<1	<1	<1	<1	<1	<1	N/A
2,4-Dichlorophenol	<1	<1	<1	<1	<1	<1	<1	<1	N/A
4-Chloro-3-methyl-phenol	<1	<1	<1	<1	<1	2	<1	2	1
2,4,6-trichlorophenol	<1	<1	<1	<1	<1	<1	<1	<1	N/A
4-Nitrophenol	<1	<1	<1	<1	<1	<1	<1	<1	N/A
Pentachlorophenol	<1	<1	<1	<1	<1	<1	<1	<1	N/A
Total	3	3	3	3	2	10	2	10	4

	Zone 2						
Determinands	W S108 0.55-0.8	W S205 0.9	W S206 0.5	W S206 2.8	MIN	MAX	MEAN
Phenol	3	3	<1	3	<1	3	2.5
2-Chlorophenol	<1	<1	<1	<1	<1	<1	N/A
2-Nitrophenol	<1	<1	<1	<1	<1	<1	N/A
2,4-Dimethylphenol	<1	<1	<1	<1	<1	<1	N/A
2,4-Dichlorophenol	<1	<1	<1	<1	<1	<1	N/A
4-Chloro-3-methyl-phenol	<1	<1	<1	<1	<1	<1	N/A
2,4,6-trichlorophenol	<1	<1	<1	<1	<1	<1	N/A
4-Nitrophenol	<1	<1	<1	<1	<1	<1	N/A
Pentachlorophenol	<1	<1	<1	<1	<1	<1	N/A
Total	3	3	<1	3	<1	3	2.5

	Zone 3								
Determinands	W S101 1.25-1.5	W S102 0.85-1.0	W S105 0.7-1.0	W S106 0.5-0.8	W S106 1.3-1.5	BH3 2.0	MIN	MAX	MEAN
Phenol	3	6	5	1	<1	5	<1	6	3.5
2-Chlorophenol	<1	<1	<1	<1	<1	<1	<1	<1	N/A
2-Nitrophenol	<1	<1	<1	<1	<1	<1	<1	<1	N/A
2,4-Dimethylphenol	<1	<1	<1	<1	<1	<1	<1	<1	N/A
2,4-Dichlorophenol	<1	<1	<1	<1	<1	<1	<1	<1	N/A
4-Chloro-3-methyl-phenol	<1	<1	<1	<1	<1	<1	<1	<1	N/A
2,4,6-trichlorophenol	<1	<1	<1	<1	<1	<1	<1	<1	N/A
4-Nitrophenol	<1	<1	<1	<1	<1	<1	<1	<1	N/A
Pentachlorophenol	<1	<1	<1	<1	<1	<1	<1	<1	N/A
Total	3	6	5	1	<1	5	<1	6	3.5

All results in ppb (µg/kg)

Note 1 Where concentrations are recorded below the detection limit, the detection limit has been used to calculate the mean concentration.

Note 2 N/A shown where too many samples recorded a concentration below the detection limit for the mean concentration to be a useful statistic

Table 5 Soils: Volatile Organic Compounds (VOCs)

	Zone 3						Zone 1							Zone 2			
Determinands	WS101	WS102	WS105	WS106	WS106	BH3	WS107	WS202	WS202	WS203	BH1	BH2	WS108	WS205	WS206	WS206	
	1.25-1.5	0.85-1.0	0.7-1.0	0.5-0.8	1.3-1.5	2.0	0.5-0.8	0.5	1.5	0.7	1.0	2.7	0.55-0.8	0.9	0.5	2.8	
Dichlorodifluoromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Chloromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Vinyl chloride	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Bromomethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Chloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Trichlorofluoromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
trans-1,2-Dichloroethene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Dichloromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Carbon disulphide	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
1,1-Dichloroethene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
1,1-Dichloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
tert-butyl methyl ether	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
cis-1,2-Dichloroethene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Bromochloromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Chloroform	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
2,2-Dichloropropane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
1,2-Dichloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
1,1,1-Trichloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
1,1-Dichloropropene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Benzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Carbontetrachloride	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Dibromomethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
1,2-Dichloropropane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Bromodichloromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Trichloroethene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
cis-1,3-Dichloropropene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
trans-1,3-Dichloropropene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
1,1,2-Trichloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Toluene	<1	<1	<1	<1	2	<1	2	<1	<1	<1	6	9	<1	<1	<1	<1	
1,3-Dichloropropane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Dibromochloromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
1,2-Dibromoethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Tetrachloroethene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
1,1,1,2-Tetrachloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Chlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Ethylbenzene	<1	<1	<1	<1	<1	2	<1	<1	<1	<1	3	4	<1	<1	<1	<1	
p/m-Xylene	<1	<1	<1	<1	<1	7	<1	<1	<1	<1	7	8	<1	<1	<1	<1	
Bromoforn	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Styrene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
1,1,2,2-Tetrachloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
o-Xylene	<1	<1	<1	<1	<1	3	<1	<1	<1	<1	2	3	<1	<1	<1	<1	
1,2,3-Trichloropropane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Isopropylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Bromobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
2-Chlorotoluene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Propylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
4-Chlorotoluene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
1,2,4-Trimethylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
4-Isopropyltoluene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
1,3,5-Trimethylbenzene	<1	<1	<1	<1	<1	1	<1	<1	<1	<1	2	3	<1	<1	<1	<1	
1,2-Dichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
1,4-Dichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
sec-Butylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
tert-Butylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
1,3-Dichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
n-Butylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
1,2-Dibromo-3-chloropropane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
1,2,4-Trichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Naphthalene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
1,2,3-Trichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Hexachlorobutadiene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	

All results in ppb (μg/kg)

Table 6 Soils: Semi-volatile Organic Compounds (SVOCs)

	Zone 1										Zone 3		Zone 2			
Determinands	WS101	WS102	WS105	WS106	WS106	WS202	WS202	WS203	BH1	BH2	WS107	BH3	WS108	WS205	WS206	WS206
	1.25-1.5	0.85-1.0	0.7-1.0	0.5-0.8	1.3-1.5	0.5	1.5	0.7	1.0	2.7	0.5-0.8	2.0	0.55-0.8	0.9	0.5	2.8
Phenol	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
2-Chlorophenol	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
2-Methylphenol	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
4-Methylphenol	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
2-Nitrophenol	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
4-Nitrophenol	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
2,4-Dichlorophenol	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
2,4-Dimethylphenol	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
4-Chloro-3-methylphenol	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
2,4,6-Trichlorophenol	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
2,4,5-Trichlorophenol	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Pentachlorophenol	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
1,3-Dichlorobenzene	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
1,4-Dichlorobenzene	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
1,2-Dichlorobenzene	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
1,2,4-Trichlorobenzene	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Nitrobenzene	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Azobenzene	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Hexachlorobenzene	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Naphthalene	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Acenaphthylene	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Acenaphthene	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Fluorene	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Phenanthrene	<100	136	<100	<100	269	<100	120	<100	126	<100	104	<100	<100	<100	<100	<100
Anthracene	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Fluoranthrene	<100	<100	<100	<100	468	<100	<100	<100	110	<100	192	<100	<100	<100	161	<100
Pyrene	<100	<100	<100	<100	352	<100	<100	<100	<100	<100	156	<100	<100	<100	118	<100
Benzo(a)anthracene	<100	<100	<100	<100	329	<100	<100	<100	<100	<100	122	<100	<100	<100	<100	<100
Chrysene	<100	<100	<100	<100	342	<100	<100	<100	<100	<100	151	<100	<100	<100	136	<100
Benzo(b)fluoranthrene	<100	<100	<100	<100	305	<100	<100	<100	<100	<100	150	<100	<100	<100	<100	<100
Benzo(k)fluoranthrene	<100	<100	<100	<100	249	<100	<100	<100	<100	<100	105	<100	<100	<100	<100	<100
Benzo(a)pyrene	<100	<100	<100	<100	293	<100	<100	<100	<100	<100	142	<100	<100	<100	<100	<100
Indeno(1,2,3-cd)pyrene	<100	<100	<100	<100	208	<100	<100	<100	<100	<100	113	<100	<100	<100	<100	<100
Dibenzo(a,h)anthracene	<100	<100	<100	<100	111	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Benzo(ghi)perylene	<100	<100	<100	<100	231	<100	<100	<100	<100	<100	110	<100	<100	<100	<100	<100
2-Chloronaphthalene	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
2-Methylnaphthalene	<100	126	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Carbazole	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Isophorone	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Dibenzofuran	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Dimethyl phthalate	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Diethyl phthalate	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Di-n-butylphthalate	<100	<100	<100	111	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Di-n-octylphthalate	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Bis(2-ethylhexyl)phthalate	<100	261	<100	168	225	1003	1154	<100	279	230	231	639	103	658	1093	883
Butylbenzylphthalate	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
4-Chloroaniline	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
2-Nitroaniline	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
3-Nitroaniline	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
4-Nitroaniline	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
2,4-Dinitrotoluene	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
2,6-Dinitrotoluene	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Bis(2-chloroethyl)ether	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
4-Bromophenylphenylether	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
4-Chlorophenylphenylether	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Hexachloroethane	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Hexachlorobutadiene	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Hexchlorocyclopentadiene	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Bis(2-chloroethoxy)methane	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
N-nitrosodi-n-propylamine	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100

All results in ppb (µg/kg)

Table 7 Groundwater: Inorganic Determinands

Determinands	ZONE1		ZONE 2	MIN	MAX	MEAN
	BH1	BH2	BH3			
Arsenic	0.003	0.003	0.001	0.001	0.003	0.002
Boron (water soluble)	0.025	0.366	0.185	0.025	0.366	0.192
Cadmium	<0.0004	0.0005	0.0038	<0.0004	0.0038	0.002
Chromium	0.003	0.004	0.015	0.003	0.015	0.007
Copper	<0.001	0.031	0.008	<0.001	0.031	0.013
Mercury	<0.0005	<0.0005	0.00012	<0.0005	0.00012	N/A
Nickel	0.018	0.004	0.012	0.004	0.018	0.011
Lead	0.003	0.004	0.002	0.002	0.004	0.003
Selenium	0.001	<0.001	0.002	<0.001	0.002	0.001
Zinc	0.085	0.06	0.744	0.06	0.744	0.296
Sulphide in water	<0.05	<0.05	<0.05	<0.05	<0.05	N/A
Ammoniacal Nitrogen	0.44	0.8	0.6	0.44	0.8	0.613
Hexavalent Chrome	<0.03	<0.03	<0.03	<0.03	<0.03	N/A
Formaldehyde	<0.5	<0.5	<0.5	<0.5	<0.5	N/A
Thiocyanate	<0.2	<0.2	<0.2	<0.2	<0.2	N/A
Total phenols HPLC	<0.01	<0.01	<0.01	<0.01	<0.01	N/A
Free sulphur	<0.05	<0.05	<0.05	<0.05	<0.05	N/A
Sulphate (soluble)	80	71	226	71	226	125.667
pH value	8.18	7.31	8.37	7.31	8.37	7.953
Total cyanide	<0.05	<0.05	<0.05	<0.05	<0.05	N/A
Free cyanide water	<0.05	<0.05	<0.05	<0.05	<0.05	N/A

All results in mg/l (ppm)

Note 1 Where concentrations are recorded below the detection limit, the detection limit has been used to calculate the mean concentration

Note 2 N/A shown where too many samples recorded a concentration below the detection limit for the mean concentration to be calculated

entrations.
a useful statistic

Table 8 Groundwater: TPH (DRO/GRO/BTEX)

	Zone 1		Zone 3
Determinands	BH1	BH2	BH3
Diesel Range Organics	<10	16	<10
Petrol Range Organics	<10	<10	<10
Benzene	<10	<10	<10
Toluene	<10	<10	<10
Ethylbenzene	<10	<10	<10
Xylene	<10	<10	<10

All results in µg/l (ppb)

Table 9 Groundwater: PAH

	Zone 1		Zone 3
Determinands	BH1	BH2	BH3
Naphthalene	115	<10	<10
Acenaphthylene	<10	<10	<10
Acenaphthene	<10	<10	<10
Fluorene	<10	<10	<10
Phenanthrene	<10	<10	<10
Anthracene	<10	<10	<10
Fluoranthene	<10	<10	<10
Pyrene	<10	<10	<10
Benz(a)anthracene	<10	<10	<10
Chrysene	<10	<10	<10
Benzo(b)fluoranthene	<10	<10	<10
Benzo(k)fluoranthene	<10	<10	<10
Benzo(a)pyrene	<10	<10	<10
Indeno(123cd)pyrene	<10	<10	<10
Dibenzo(ah)anthracene	<10	<10	<10
Benzo(ghi)perylene	<10	<10	<10

All results in ng/l

Table 10 Groundwater: VOCs

Determinands	Zone 1		Zone 3
	BH1	BH2	BH3
Dichlorodifluoromethane	<1	<1	<1
Chloromethane	<1	<1	<1
Vinyl chloride	<1	<1	<1
Bromomethane	<1	<1	<1
Chloroethane	<1	<1	<1
Trichlorofluoromethane	<1	<1	<1
trans-1,2-Dichloroethene	<1	<1	<1
Dichloromethane	<1	<1	<1
Carbon disulphide	<1	<1	<1
1,1-Dichloroethene	<1	<1	<1
1,1-Dichloroethane	<1	<1	<1
tert-butyl methyl ether	<1	<1	<1
cis-1,2-Dichloroethene	<1	<1	<1
Bromochloromethane	<1	<1	<1
Chloroform	<1	<1	<1
2,2-Dichloropropane	<1	<1	<1
1,2-Dichloroethane	<1	<1	<1
1,1,1-Trichloroethane	<1	<1	<1
1,1-Dichloropropene	<1	<1	<1
Benzene	<1	<1	<1
Carbontetrachloride	<1	<1	<1
Dibromomethane	<1	<1	<1
1,2-Dichloropropane	<1	<1	<1
Bromodichloromethane	<1	<1	<1
Trichloroethene	<1	<1	<1
cis-1,3-Dichloropropene	<1	<1	<1
trans-1,3-Dichloropropene	<1	<1	<1
1,1,2-Trichloroethane	<1	<1	<1
Toluene	<1	<1	9
1,3-Dichloropropane	<1	<1	<1
Dibromochloromethane	<1	<1	<1
1,2-Dibromoethane	<1	<1	<1
Tetrachloroethene	<1	<1	<1
1,1,1,2-Tetrachloroethane	<1	<1	<1
Chlorobenzene	<1	<1	<1
Ethylbenzene	<1	<1	1
p/m-Xylene	<1	<1	<1
Bromoform	<1	<1	<1
Styrene	<1	<1	<1
1,1,2,2-Tetrachloroethane	<1	<1	<1
o-Xylene	<1	<1	2
1,2,3-Trichloropropane	<1	<1	<1
Isopropylbenzene	<1	<1	<1
Bromobenzene	<1	<1	<1
2-Chlorotoluene	<1	<1	11
Propylbenzene	<1	<1	<1
4-Chlorotoluene	<1	<1	2
1,2,4-Trimethylbenzene	<1	<1	<1
4-Isopropyltoluene	<1	<1	<1
1,3,5-Trimethylbenzene	<1	<1	<1
1,2-Dichlorobenzene	<1	<1	<1
1,4-Dichlorobenzene	<1	<1	<1
sec-Butylbenzene	<1	<1	<1
tert-Butylbenzene	<1	<1	<1
1,3-Dichlorobenzene	<1	<1	<1
n-Butylbenzene	<1	<1	<1
1,2-Dibromo-3-chloropropane	<1	<1	<1
1,2,4-Trichlorobenzene	<1	<1	<1
Naphthalene	<1	<1	<1
1,2,3-Trichlorobenzene	<1	<1	<1
Hexachlorobutadiene	<1	<1	<1

All results in µg/l (ppb)

Table 11 Groundwater: SVOCs

Determinands	Zone 1		Zone 3
	BH1	BH2	BH3
Phenol	<1	<1	<1
2-Chlorophenol	<1	<1	<1
2-Methylphenol	<1	<1	<1
4-Methylphenol	<1	<1	<1
2-Nitrophenol	<1	<1	<1
4-Nitrophenol	<1	<1	<1
2,4-Dichlorophenol	<1	<1	<1
2,4-Dimethylphenol	<1	<1	<1
4-Chloro-3-methylphenol	<1	<1	<1
2,4,6-Trichlorophenol	<1	<1	<1
2,4,5-Trichlorophenol	<1	<1	<1
Pentachlorophenol	<1	<1	<1
1,3-Dichlorobenzene	<1	<1	<1
1,4-Dichlorobenzene	<1	<1	<1
1,2-Dichlorobenzene	<1	<1	<1
1,2,4-Trichlorobenzene	<1	<1	<1
Nitrobenzene	<1	<1	<1
Azobenzene	<1	<1	<1
Hexachlorobenzene	<1	<1	<1
Naphthalene	<1	<1	<1
Acenaphthylene	<1	<1	<1
Acenaphthene	<1	<1	<1
Fluorene	<1	<1	<1
Phenanthrene	<1	<1	<1
Anthracene	<1	<1	<1
Fluoranthrene	<1	<1	<1
Pyrene	<1	<1	<1
Benzo(a)anthracene	<1	<1	<1
Chrysene	<1	<1	<1
Benzo(b)fluoranthrene	<1	<1	<1
Benzo(k)fluoranthrene	<1	<1	<1
Benzo(a)pyrene	<1	<1	<1
Indeno(1,2,3-cd)pyrene	<1	<1	<1
Dibenzo(a,h)anthracene	<1	<1	<1
Benzo(ghi)perylene	<1	<1	<1
2-Chloronaphthalene	<1	<1	<1
2-Methylnaphthalene	<1	<1	<1
Carbazole	<1	<1	<1
Isophorone	<1	<1	<1
Dibenzofuran	<1	<1	<1
Dimethylphthalate	<1	<1	<1
Diethylphthalate	<1	<1	<1
Di-n-butylphthalate	<1	<1	<1
Di-n-octylphthalate	<1	<1	<1
Bis(2-ethylhexyl)phthalate	<1	<1	<1
Butylbenzylphthalate	<1	<1	<1
4-Chloroaniline	<1	<1	<1
2-Nitroaniline	<1	<1	<1
3-Nitroaniline	<1	<1	<1
4-Nitroaniline	<1	<1	<1
2,4-Dinitrotoluene	<1	<1	<1
2,6-Dinitrotoluene	<1	<1	<1
Bis(2-chloroethyl)ether	<1	<1	<1
4-Bromophenylphenylether	<1	<1	<1
4-Chlorophenylphenylether	<1	<1	<1
Hexachloroethane	<1	<1	<1
Hexachlorobutadiene	<1	<1	<1
Hexachlorocyclopentadiene	<1	<1	<1
Bis(2-chloroethoxy)methane	<1	<1	<1
N-nitrosodi-n-propylamine	<1	<1	<1

All results in µg/l (ppb)

Table 12 Groundwater: Phenols

	Zone 1		Zone 3
Determinands	BH1	BH2	BH3
Phenol	<0.5	<0.5	<0.5
2-Chlorophenol	<0.5	<0.5	<0.5
2-Nitrophenol	<0.5	<0.5	<0.5
2,4-Dimethylphenol	<0.5	<0.5	<0.5
2,4-Dichlorophenol	<0.5	<0.5	<0.5
4-Chloro-3-methyl-phenol	<0.5	<0.5	<0.5
2,4,6-trichlorophenol	<0.5	<0.5	<0.5
4-Nitrophenol	<0.5	<0.5	<0.5
Pentachlorophenol	<0.5	<0.5	<0.5
Total	<0.5	<0.5	<0.5

All results in µg/l ppb

Table 13 Surface Water: Metals and other Inorganic Determinands

Determinands	SW1	SW2
Arsenic	<0.05	<0.05
Boron (water soluble)	<0.05	<0.05
Cadmium	<0.05	<0.05
Chromium	<0.05	<0.05
Copper	<0.05	<0.05
Mercury	<0.05	<0.05
Nickel	0.34	0.32
Lead	<0.05	<0.05
Selenium	<0.05	<0.05
Zinc	<0.05	<0.05
Sulphide in water	0.02	0.03
Ammoniacal Nitrogen	0.2	0.2
Hexavalent Chrome	<0.03	<0.03
Formaldehyde	<0.05	<0.05
Thiocyanate	<0.2	<0.2
Total phenols HPLC	<0.01	<0.01
Free sulphur	<0.05	<0.05
Sulphate (soluble)	110	79
pH value	8.34	8.39
Total cyanide	<0.05	<0.05
Free cyanide water	<0.05	<0.05

All results in mg/l (ppm)

Table 14 Surface Water: TPH (DRO/GRO/BTEX)

Determinands	SW1	SW2
Diesel Range Organics	<10	<10
Petrol Range Organics	<10	<10
Benzene	<10	<10
Toluene	<10	<10
Ethylbenzene	<10	<10
Xylene	<10	<10

All results in µg/l (ppb)

Table 15 Surface Water PAH

Determinands	SW1	SW2
Naphthalene	<10	<10
Acenaphthylene	<10	<10
Acenaphthene	<10	<10
Fluorene	<10	<10
Phenanthrene	<10	<10
Anthracene	<10	<10
Fluoranthene	<10	<10
Pyrene	<10	<10
Benz(a)anthracene	<10	<10
Chrysene	<10	<10
Benzo(b)fluoranthene	<10	<10
Benzo(k)fluoranthene	<10	<10
Benzo(a)pyrene	<10	<10
Indeno(123cd)pyrene	<10	<10
Dibenzo(ah)anthracene	<10	<10
Benzo(ghi)perylene	<10	<10

All results in ng/l

Table 16 Surface Water: Phenols

Determinands		
	SW1	SW2
Phenol	<1	<1
2-Chlorophenol	<1	<1
2-Nitrophenol	<1	<1
2,4-Dimethylphenol	<1	<1
2,4-Dichlorophenol	<1	<1
4-Chloro-3-methyl-phenol	<1	<1
2,4,6-trichlorophenol	<1	<1
4-Nitrophenol	<1	<1
Pentachlorophenol	<1	<1

All results in µg/l (ppb)

Table 17 Surface Water: VOCs

Determinands		
	SW1	SW2
Dichlorodifluoromethane	<1	<1
Chloromethane	<1	<1
Vinyl chloride	<1	<1
Bromomethane	<1	<1
Chloroethane	<1	<1
Trichlorofluoromethane	<1	<1
trans-1,2-Dichloroethene	<1	<1
Dichloromethane	<1	<1
Carbon disulphide	<1	<1
1,1-Dichloroethene	<1	<1
1,1-Dichloroethane	<1	<1
tert-butyl methyl ether	<1	<1
cis-1,2-Dichloroethene	<1	<1
Bromochloromethane	<1	<1
Chloroform	<1	<1
2,2-Dichloropropane	<1	<1
1,2-Dichloroethane	<1	<1
1,1,1-Trichloroethane	<1	<1
1,1-Dichloropropene	<1	<1
Benzene	<1	<1
Carbontetrachloride	<1	<1
Dibromomethane	<1	<1
1,2-Dichloropropane	<1	<1
Bromodichloromethane	<1	<1
Trichloroethene	<1	<1
cis-1,3-Dichloropropene	<1	<1
trans-1,3-Dichloropropene	<1	<1
1,1,2-Trichloroethane	<1	<1
Toluene	<1	<1
1,3-Dichloropropane	<1	<1
Dibromochloromethane	<1	<1
1,2-Dibromoethane	<1	<1
Tetrachloroethene	<1	<1
1,1,1,2-Tetrachloroethane	<1	<1
Chlorobenzene	<1	<1
Ethylbenzene	<1	<1
p/m-Xylene	<1	<1
Bromoform	<1	<1
Styrene	<1	<1
1,1,2,2-Tetrachloroethane	<1	<1
o-Xylene	<1	<1
1,2,3-Trichloropropane	<1	<1
Isopropylbenzene	<1	<1
Bromobenzene	<1	<1
2-Chlorotoluene	<1	<1
Propylbenzene	<1	<1
4-Chlorotoluene	<1	<1
1,2,4-Trimethylbenzene	<1	<1
4-Isopropyltoluene	<1	<1
1,3,5-Trimethylbenzene	<1	<1
1,2-Dichlorobenzene	<1	<1
1,4-Dichlorobenzene	<1	<1
sec-Butylbenzene	<1	<1
tert-Butylbenzene	<1	<1
1,3-Dichlorobenzene	<1	<1
n-Butylbenzene	<1	<1

Table 18 Surface Water: SVOCs

Determinands		
	SW1	SW2
Phenol	<1	<1
2-Chlorophenol	<1	<1
2-Methylphenol	<1	<1
4-Methylphenol	<1	<1
2-Nitrophenol	<1	<1
4-Nitrophenol	<1	<1
2,4-Dichlorophenol	<1	<1
2,4-Dimethylphenol	<1	<1
4-Chloro-3-methylphenol	<1	<1
2,4,6-Trichlorophenol	<1	<1
2,4,5-Trichlorophenol	<1	<1
Pentachlorophenol	<1	<1
1,3-Dichlorobenzene	<1	<1
1,4-Dichlorobenzene	<1	<1
1,2-Dichlorobenzene	<1	<1
1,2,4-Trichlorobenzene	<1	<1
Nitrobenzene	<1	<1
Azobenzene	<1	<1
Hexachlorobenzene	<1	<1
Naphthalene	<1	<1
Acenaphthylene	<1	<1
Acenaphthene	<1	<1
Fluorene	<1	<1
Phenanthrene	<1	<1
Anthracene	<1	<1
Fluoranthrene	<1	<1
Pyrene	<1	<1
Benzo(a)anthracene	<1	<1
Chrysene	<1	<1
Benzo(b)fluoranthrene	<1	<1
Benzo(k)fluoranthrene	<1	<1
Benzo(a)pyrene	<1	<1
Indeno(1,2,3-cd)pyrene	<1	<1
Dibenzo(a,h)anthracene	<1	<1
Benzo(ghi)perylene	<1	<1
2-Chloronaphthalene	<1	<1
2-Methylnaphthalene	<1	<1
Carbazole	<1	<1
Isophorone	<1	<1
Dibenzofuran	<1	<1
Dimethyl phthalate	<1	<1
Diethyl phthalate	<1	<1
Di-n-butylphthalate	<1	<1
Di-n-octylphthalate	<1	<1
Bis(2-ethylhexyl)phthalate	<1	<1
Butylbenzylphthalate	<1	<1
4-Chloroaniline	<1	<1
2-Nitroaniline	<1	<1
3-Nitroaniline	<1	<1
4-Nitroaniline	<1	<1
2,4-Dinitrotoluene	<1	<1
2,6-Dinitrotoluene	<1	<1
Bis(2-chloroethyl)ether	<1	<1
4-Bromophenylphenylether	<1	<1
4-Chlorophenylphenylether	<1	<1
Hexachloroethane	<1	<1

1,2-Dibromo-3-chloropropane	<1	<1
1,2,4-Trichlorobenzene	<1	<1
Naphthalene	<1	<1
1,2,3-Trichlorobenzene	<1	<1
Hexachlorobutadiene	<1	<1

All results in µg/l (ppb)

Hexachlorobutadiene	<1	<1
Hexchlorocyclopentadiene	<1	<1
Bis(2-chloroethoxy)methane	<1	<1
N-nitrosodi-n-propylamine	<1	<1

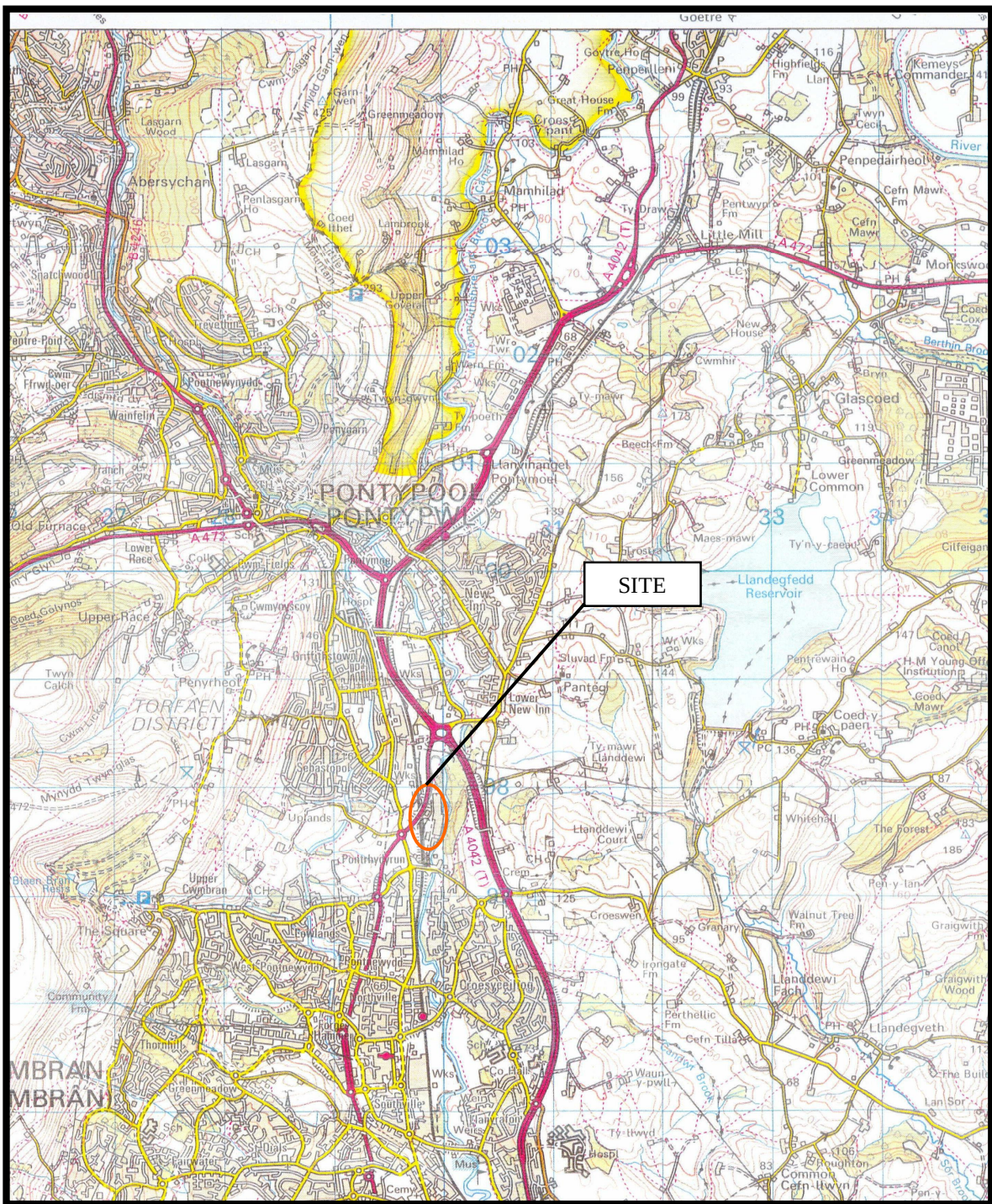
All results in µg/l (ppb)

Table 19 Leachability Analysis

Determinands	WS101 0.45-0.6	WS102 0.85-1.0	WS104 0.6	WS107 0.5-0.8	WS108 0.55-0.8	WS202 1.5	WS206 0.5	BH2 1.0
Arsenic	<0.05	<0.05	<0.05	<0.05	<0.05	0.003	0.003	<0.001
Boron (water soluble)	0.15	0.11	0.15	0.32	0.09	<0.01	<0.01	0.211
Cadmium	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.004	0.0004
Chromium	<0.05	<0.05	<0.05	<0.05	<0.05	0.001	0.002	<0.001
Copper	<0.05	<0.05	<0.05	<0.05	<0.05	<0.001	<0.001	0.01
Mercury	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Nickel	<0.05	<0.05	<0.05	<0.05	<0.05	0.002	0.002	0.004
Lead	<0.05	<0.05	<0.05	<0.05	0.08	0.003	0.002	0.009
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.001	<0.001	0.001
Zinc	<0.05	<0.05	<0.05	<0.05	<0.05	0.042	0.029	0.08
Ammoniacal Nitrogen	<0.2	1.1	<0.2	1.6		-	-	<0.2
Formaldehyde	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	0.0011
Total phenols HPLC	0.01	0.03	<0.01	<0.01	<0.01	-	-	<0.01
2-isopropyl phenol	<0.01	0.03	<0.01	<0.01	<0.01	-	-	<0.01
Catechol	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	<0.01
Cresols	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	<0.01
Napthol	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	<0.01
Phenol	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	<0.01
Resorcinol	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	<0.01
Trimethyl phenol	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	<0.01
Xylenols	0.01	<0.01	<0.01	<0.01	<0.01	-	-	<0.01
pH value of leachate	7.56	7.38	7.56	7.63	7.57	-	-	7.61
Phenol	-	-	-	-	-	<0.001	<0.001	<0.001
2-Chlorophenol	-	-	-	-	-	<0.001	<0.001	<0.001
2-Nitrophenol	-	-	-	-	-	<0.001	<0.001	<0.001
2,4-Dimethylphenol	-	-	-	-	-	<0.001	<0.001	<0.001
2,4-Dichlorophenol	-	-	-	-	-	<0.001	<0.001	<0.001
4-Chloro-3-methyl-phenol	-	-	-	-	-	<0.001	<0.001	<0.001
2,4,6-trichlorophenol	-	-	-	-	-	<0.001	<0.001	<0.001
4-Nitrophenol	-	-	-	-	-	<0.001	<0.001	<0.001
Pentachlorophenol	-	-	-	-	-	<0.001	<0.001	<0.001

All results in mg/l (ppm)

FIGURES



CARL BRO GROUP

PROJECT:
Pont-y-Felin Works
Cwmbran

CLIENT:
Knauf Insulation

SCALE:
1:50 000

GRID REFERENCE:
329920 197660

JOB NUMBER:
73.1340.04

TITLE:
Site Location Map

FIGURE 1

KEY

- IPPC INSTALLATION BOUNDARY
- ZONE 1
- ZONE 2
- ZONE 3

FIRST ISSUE				
REV	AMENDMENTS	BY	CHKD	APPRD

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CLIENT

KNAUFALCOPOR



PROJECT

**PONT-Y-FELIN WORKS
CWMBRAN**

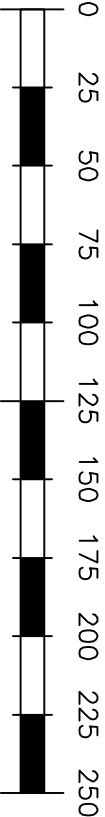
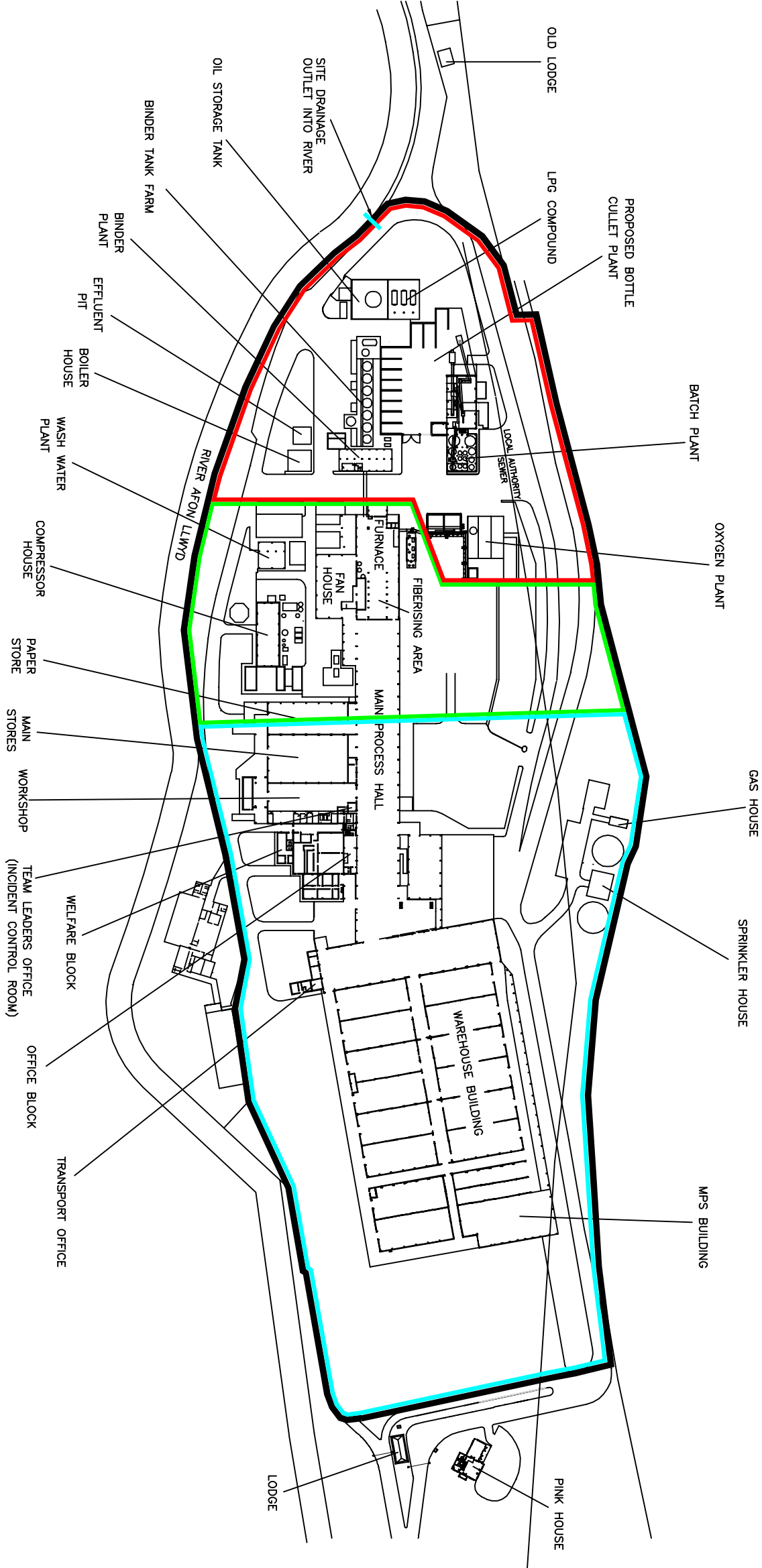
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FIGURE 2 – SITE LAYOUT PLAN

DRAWING STATUS

DRAWN	CHECKED	APPROVED
TM		
DATE	DATE	DATE
18.03.03		
SCALE	ORIGINAL DRAWING SIZE	
1:2500	297 x 420 - A3	

DRAWING NO **73.1340.05-002** REV. **0**





NOTES

KEY

- IPPC INSTALLATION BOUNDARY
- ZONE 1
- ZONE 2
- ZONE 3
- ERM 1994 PROBEHOLES

FIRST ISSUE				
REV	AMENDMENTS	BY	CHKD	APPRD

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CLIENT

KNAUFALCOPOR

KnaufALCOPOR

PROJECT

PONT-Y-FELIN WORKS

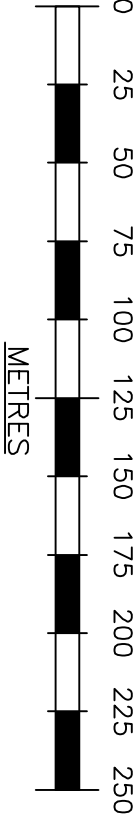
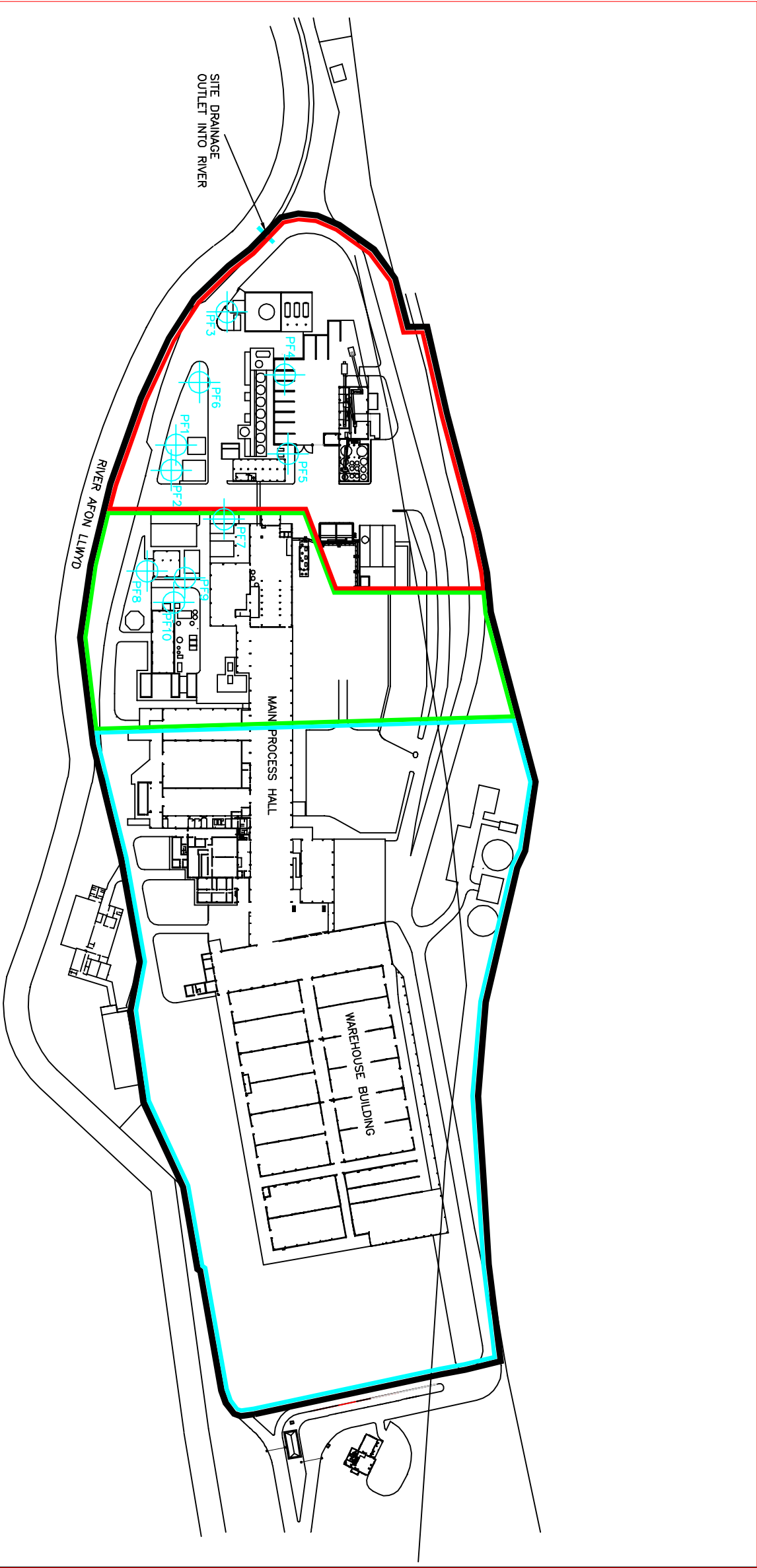
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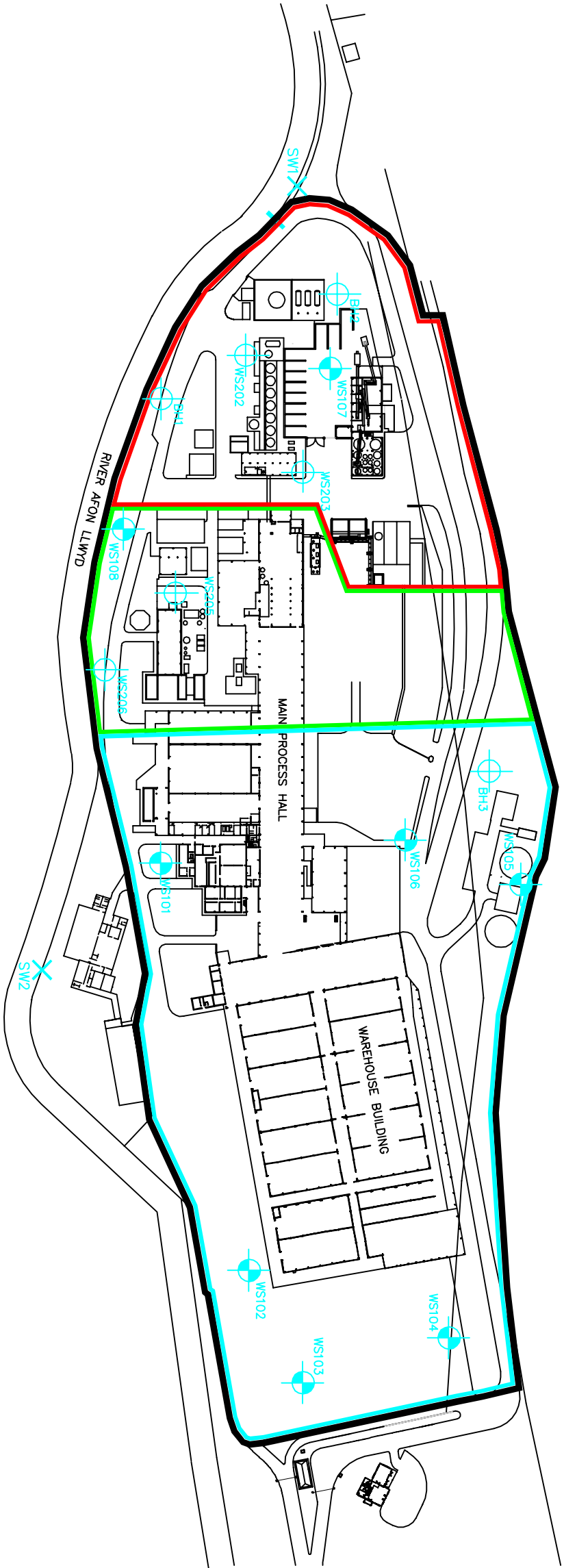
**FIGURE 4 – EXPLORATORY HOLE
LOCATION FROM PREVIOUS
INVESTIGATION**

DRAWING STATUS

DRAWN	CHECKED	APPROVED
TM		
DATE	DATE	DATE
18.03.03		
SCALE	ORIGINAL DRAWING SIZE	
1:2500	297 x 420 - A3	

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NOTES

KEY

- IPPC INSTALLATION BOUNDARY
- ZONE 1
- ZONE 2
- ZONE 3
- WS202
CARL BRO WINDOW SAMPLE LOCATION 2003
- WS101
CARLBRO WINDOW SAMPLE LOCATION 2002
- SW1
SURFACE WATER SAMPLING POINT

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PROJECT

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**FIGURE 5 – EXPLORATORY HOLE
LOCATION PLAN**

DRAWING STATUS

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TM		
DATE	DATE	DATE
18.03.03		
SCALE	ORIGINAL DRAWING SIZE	
1:2500	297 x 420 - A3	
DRAWING NO	73.1340.05-004	REV.
		0

APPENDIX A
EXPLORATORY HOLE LOGS

CABLE PERCUSSION

HOLE ID

BH1

PROJECT: Cwmbran Further Phase 1b

CLIENT: KnaufInsulation

JOB NUMBER: 73.1340.05

DATE: 19/02/2003

GROUND LEVEL: 75.35 m AOD

CO-ORDINATES: E N

Description	Depth (m)	Legend	Reduced Level	Samples Type	Samples Depth	SPT 'N' (V100)	Ground Water	Installation
MADE GROUND. Grass over black TOPSOIL.	0.20		(0.20) 75.15					
MADE GROUND. Dark brown slightly sandy SILT becoming more sandy with depth.	1.00		(0.80) 74.35	D	1.00			
MADE GROUND Light brown silty slightly gravelly CLAY with occasional pockets of blue grey clay. Gravel is firm to medium angular to sub-rounded. (Possible reworked Alluvium)	2.80		(1.80) 72.55	D	2.00			
Brown coarse gravelly SAND. Gravel is medium sub-angular to sub-rounded of sandstone and weathered mudstone.	4.00		(1.20) 71.35	D	3.00			
End of Borehole at 4.00 m								

GENERAL REMARKS:

Damp below 2.8m.

GROUNDWATER REMARKS:

DEPTH: m

FLOW:

CONTRACTOR: GeoTech

LOGGED BY: ADL

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CABLE PERCUSSION

HOLE ID

BH2

PROJECT: Cwmbran Further Phase 1b

CLIENT: KnaufInsulation

JOB NUMBER: 73.1340.05

DATE: 19/02/2003

GROUND LEVEL: 74.72 m AOD

CO-ORDINATES: E N

Description	Depth (m)	Legend	Reduced Level	Samples Type	Samples Depth	SPT 'N' (V100)	Ground Water	Installation
MADE GROUND. Grass over black TOPSOIL with large and small tree roots.	0.10		74.62 (0.10)					
MADE GROUND. Dark brown slightly clayey slightly gravelly SAND. Gravel is coarse sub-rounded. Occasional small coal fragments.			(0.70)					
MADE GROUND. Dark brown slightly sandy clayey GRAVEL. Gravel is fine to coarse sub-angular to angular of clinker and coal.	0.80		73.92					
			(1.20)	D	1.00			
Dark fine to coarse gravelly SAND. Gravel is of mixed lithology.	2.00		72.72	D	2.00			
			(0.70)					
Brown SAND with occasional cobbles.	2.70		72.02	D	2.70			
			(0.30)					
End of Borehole at 3.00 m	3.00		71.72	D	3.00			

GENERAL REMARKS:

GROUNDWATER REMARKS:

DEPTH: 2.70 m

FLOW:

CONTRACTOR: GeoTech

LOGGED BY: ADL

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CABLE PERCUSSION

HOLE ID

BH3

PROJECT: Cwmbran Further Phase 1b

CLIENT: KnaufInsulation

JOB NUMBER: 73.1340.05

DATE: 20/02/2003

GROUND LEVEL: 76.31 m AOD

CO-ORDINATES: E N

Description	Depth (m)	Legend	Reduced Level	Samples		SPT 'N' (V100)	Ground Water	Installation
				Type	Depth			
MADE GROUND. Grass over dark TOPSOIL.			(0.30)					
	0.30		76.01					
MADE GROUND. Dark brown CLAY with many cobbles of sandstone.				D	0.50			
			(1.40)	D	1.00			
	1.70		74.61					
Brown sandy slightly gravelly CLAY with occasional cobbles. Gravel and cobbles are of mixed lithology.				D	2.00			
			(0.90)					
	2.60		73.71					
Brown weathered MUDSTONE.			(0.10)					
End of Borehole at 2.70 m	2.70		73.61					

GENERAL REMARKS:

GROUNDWATER REMARKS:

DEPTH: 1.80 m

FLOW:

CONTRACTOR: Geotech

LOGGED BY: ADL

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WINDOW SAMPLE

HOLE ID

WS202

PROJECT: Cwmbran Further Phase 1b

CLIENT: KnaufInsulation

JOB NUMBER: 73.1340.05

DATE: 20/02/2003

GROUND LEVEL:-

m ASD

CO-ORDINATES:

E

N

Description	Depth (m)	Legend	Reduced Level	Samples		Ground Water	Installation
				Type	Depth		
MADE GROUND. CONCRETE.			(0.20)				
MADE GROUND. Red/brown very gravelly CLAY with occasional pockets of grey clay. Gravel is angular fine to medium of glass and mudstone.	0.20		(0.20)				
MADE GROUND. Sandy CLAY with slightly coarse angular to sub-rounded gravels.	0.40			D	0.50		
			(0.60)				
MADE GROUND. Yellow very gravelly SAND. Gravel is of mixed lithology with occasional fragments of coal.	1.00		(0.20)	D	1.00		
Dark brown slightly sandy CLAY.	1.20						
			(0.40)				
Dark brown fine to coarse sub-angular to angular GRAVEL of sandstone and mudstone.	1.60		(0.20)				
Dark brown slightly gravelly sandy CLAY. Gravel is fine angular to sub-angular.	1.80						
			(0.50)	D	2.00		
End of Borehole at 2.30 m	2.30						

GENERAL REMARKS:

Window sample dry.

GROUNDWATER REMARKS:

DEPTH: m

FLOW:

CONTRACTOR: GeoTechnical Engineering

LOGGED BY: ADL

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WINDOW SAMPLE

HOLE ID

WS203

PROJECT: Cwmbran Further Phase 1b

CLIENT: KnaufInsulation

JOB NUMBER: 73.1340.05

DATE: 20/02/2003

GROUND LEVEL:-

m ASD

CO-ORDINATES:

E

N

Description	Depth (m)	Legend	Reduced Level	Samples		Ground Water	Installation
				Type	Depth		
MADE GROUND. CONCRETE	0.18		(0.18)				
MADE GROUND. Brown slightly sandy coarse sub-rounded to angular GRAVEL of mixed lithology.			(0.82)	D	0.70		
MADE GROUND. Medium to coarse angular gravel of concrete. Thin layer of polythene sheet.	1.00		(0.10)				
	1.10		(0.20)				
MADE GROUND. Brown slightly clayey sandy GRAVEL. Gravel is fine to coarse angular to sub-angular of sandstone and mudstone.	1.30		(0.50)				
MADE GROUND. Dark brown slightly sandy clayey GRAVEL. Gravel is medium to coarse sub-angular to sub-rounded of mixed lithology.	1.80		(0.20)				
MADE GROUND. Light yellow/brown coarse SANDSTONE. (Possible sandstone flag)	2.00		(0.50)	D	2.00		
Brown sandy GRAVEL. Gravel is fine to coarse sub-angular of sandstone.							
Red friable slightly gravelly CLAY. Gravel is medium to coarse sub-angular to angular of sandstone.	2.50		(0.40)				
	2.90			D	2.90		
End of Borehole at 2.90 m							

GENERAL REMARKS:

Window sample dry.

GROUNDWATER REMARKS:

DEPTH: m

FLOW:

CONTRACTOR: GeoTechnical Engineering

LOGGED BY: ADL

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WINDOW SAMPLE

HOLE ID

WS205

PROJECT: Cwmbran Further Phase 1b

CLIENT: KnaufInsulation

JOB NUMBER: 73.1340.05

DATE: 20/02/2003

GROUND LEVEL:-

m ASD

CO-ORDINATES:

E

N

Description	Depth (m)	Legend	Reduced Level	Samples		Ground Water	Installation
				Type	Depth		
MADE GROUND. CONCRETE			(0.14)				
MADE GROUND. Brown coarse angular GRAVEL of brick and concrete.	0.14		(0.16)				
MADE GROUND. Brown medium to coarse angular GRAVEL.	0.30		(0.40)				
Dark grey slightly sandy fine to coarse angular GRAVEL of mixed lithology.	0.70		(0.20)				
Dark grey slightly weathered MUDSTONE.	0.90		(0.10)	D	0.90		
End of Borehole at 1.00 m	1.00						

GENERAL REMARKS:

Window sample dry.

GROUNDWATER REMARKS:

DEPTH: m

FLOW:

CONTRACTOR: GeoTechnical Engineering

LOGGED BY: ADL

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WINDOW SAMPLE

HOLE ID

WS206

PROJECT: Cwmbran Further Phase 1b

CLIENT: KnaufInsulation

JOB NUMBER: 73.1340.05

DATE: 20/02/2003

GROUND LEVEL:-

m ASD

CO-ORDINATES:

E

N

Description	Depth (m)	Legend	Reduced Level	Samples		Ground Water	Installation
				Type	Depth		
MADE GROUND. Grass over black TOPSOIL.	0.05		(0.05)				
MADE GROUND. Brown silty slightly sandy, slightly gravelly CLAY. Gravel is medium sub-rounded to sub-angular gravel of sandstone and mudstone. At 0.6m layer of vegetation (fibres).			(0.85)	D	0.50		
Red/brown gravelly SAND. Gravel is fine to medium angular of sandstone.	0.90 0.95		(0.05)	D	1.00		
Dark brown fine to medium clayey SAND.			(0.75)				
Firm red/brown gravelly CLAY. Gravel is medium to coarse angular sandstone.	1.70		(0.20)				
Brown sandy CLAY.	1.90			D	2.00		
			(0.70)				
Brown slightly clayey gravelly SAND. Gravel is coarse sub-rounded.	2.60		(0.20)				
Dark grey slightly weathered MUDSTONE.	2.80			D	2.80		
			(0.40)				
End of Borehole at 3.20 m	3.20						

GENERAL REMARKS:

Window sample dry.

GROUNDWATER REMARKS:

DEPTH: m

FLOW:

CONTRACTOR: GeoTechnical Engineering

LOGGED BY: ADL

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WINDOW SAMPLE

HOLE ID

WS 101

PROJECT: Cwmbran Phase 1B

CLIENT:

JOB NUMBER: 73.1340.04

DATE: 26/03/2002

GROUND LEVEL: - m ASD

CO-ORDINATES: E N

Description	Depth (m)	Legend	Reduced Level	Samples		Ground Water	Installation
				Type	Depth		
MADE GROUND : Sparse grass and topsoil.	0.01		(0.01)				
MADE GROUND : Compact red and grey shale with some grey clinker and brown sand.			(1.24)	D	0.45 0.60		
Very dense, very peaty relict TOPSOIL.	1.25		(1.32)	D	1.25 1.50		
Stiff, brown, slightly sandy CLAY.	2.57		(0.13)				
Medium to coarse grained brown SAND with sub-angular to angular gravel.	2.70		(1.00)	D	2.70 2.90		
End of Borehole at 3.70 m	3.70						

GENERAL REMARKS:

Refusal at 3.7m bgl.

GROUNDWATER REMARKS:

DEPTH: m

FLOW:

CONTRACTOR:

LOGGED BY: VTC

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WINDOW SAMPLE

HOLE ID

WS 102

PROJECT: Cwmbran Phase 1B

CLIENT:

JOB NUMBER: 73.1340.04

DATE: 25/03/2002

GROUND LEVEL: - m ASD

CO-ORDINATES: E N

Description	Depth (m)	Legend	Reduced Level	Samples		Ground Water	Installation
				Type	Depth		
MADE GROUND : CONCRETE.			(0.17)				
MADE GROUND : Buff SAND and limestone.	0.17		(0.68)				
Black silty relict TOPSOIL.	0.85		(0.15)	D	0.85		
Brown SILT with orange staining and coal flecks.	1.00		(1.53)	D	1.00		
					1.50		
					1.80		
Soft, brown silty, slightly gravelly CLAY. Gravel is of mixed lithology.	2.53		(0.77)	D			
					3.20		
Yellow and brown SAND and GRAVEL. Gravel is of mixed lithology.	3.30		(0.70)	D	3.30		
End of Borehole at 4.00 m	4.00						

GENERAL REMARKS:

GROUNDWATER REMARKS:

DEPTH: 2.55 m

FLOW:

CONTRACTOR:

LOGGED BY: VTC

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WINDOW SAMPLE

HOLE ID

WS 103

PROJECT: Cwmbran Phase 1B

CLIENT:

JOB NUMBER: 73.1340.04

DATE: 25/03/2002

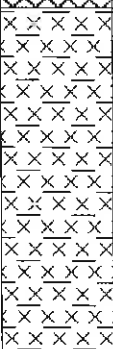
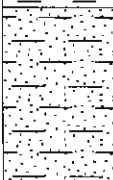
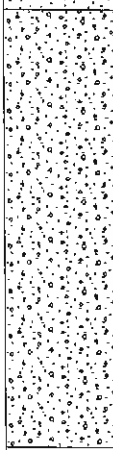
GROUND LEVEL: -

m ASD

CO-ORDINATES:

E

N

Description	Depth (m)	Legend	Reduced Level	Samples		Ground Water	Installation
				Type	Depth		
MADE GROUND : CONCRETE.	0.10		(0.10)				
MADE GROUND : Grey SLATE with some red shale.			(0.70)				
Brown slightly clayey SILT with orange staining.	0.80		(1.15)	D	0.77 0.95		
Brown and orange very clayey SAND.	1.95		(0.60)	D	1.50 1.80		
Yellow and brown SAND and sub-angular to angular GRAVEL.	2.55		(1.45)	D	2.35 2.55		
End of Borehole at 4.00 m	4.00						

GENERAL REMARKS:

GROUNDWATER REMARKS:

DEPTH: 2.65 m

FLOW:

CONTRACTOR:

LOGGED BY: VTC

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WINDOW SAMPLE

HOLE ID

WS 104

PROJECT: Cwmbran Phase 1B

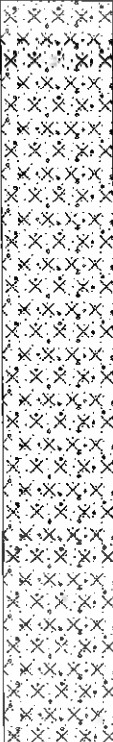
CLIENT:

JOB NUMBER: 73.1340.04

DATE: 25/03/2002

GROUND LEVEL: - m ASD

CO-ORDINATES: E N

Description	Depth (m)	Legend	Reduced Level	Samples		Ground Water	Installation
				Type	Depth		
MADE GROUND : CONCRETE.	0.12		(0.12)				
Brown and orange, very gravelly, sandy SILT with black staining.				D	0.60	⊙	
			(2.48)				
				D	1.70	⊙	
Green MUDSTONE, with some red shale.	2.60		(0.80)				
End of Borehole at 3.40 m	3.40						

GENERAL REMARKS:

Refusal at 3.4m bgl.

GROUNDWATER REMARKS:

DEPTH: 2.55 m

FLOW:

CONTRACTOR:

LOGGED BY: VTC

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WINDOW SAMPLE

HOLE ID

WS 105

PROJECT: Cwmbran Phase 1B

CLIENT:

JOB NUMBER: 73.1340.04

DATE: 25/03/2002

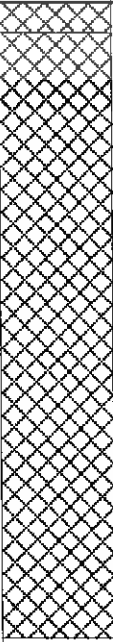
GROUND LEVEL: -

m ASD

CO-ORDINATES:

E

N

Description	Depth (m)	Legend	Reduced Level	Samples		Ground Water	Installation
				Type	Depth		
MADE GROUND : Buff limestone.	0.10		(0.10)	D			
MADE GROUND : Fine to medium sandy limestone and shale GRAVEL with some concrete COBBLES.			(2.00)		0.75 1.00		
End of Borehole at 2.10 m		2.10					

GENERAL REMARKS:

Refusal at 2.1m bgl.

GROUNDWATER REMARKS:

DEPTH: 1.50 m

FLOW:

CONTRACTOR:

LOGGED BY: vtc

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WINDOW SAMPLE

HOLE ID

WS 106

PROJECT: Cwmbran Phase 1B

CLIENT:

JOB NUMBER: 73.1340.04

DATE: 25/03/2002

GROUND LEVEL: - m ASD

CO-ORDINATES: E N

Description	Depth (m)	Legend	Reduced Level	Samples		Ground Water	Installation
				Type	Depth		
MADE GROUND : TOPSOIL with grass.	0.01		(0.01)				
MADE GROUND : Limestone GRAVEL with sand and much clinker.			(1.24)	D	0.50 0.80		
MADE GROUND : Grey black clinker and sand.	1.25		(0.25)	D	1.30		
End of Borehole at 1.50 m	1.50				1.50		

GENERAL REMARKS:

Refusal at 1.5m bgl.

GROUNDWATER REMARKS:

DEPTH: 0.00 m

FLOW: No waterstrike.

CONTRACTOR:

LOGGED BY: VTC

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WINDOW SAMPLE

HOLE ID

PROJECT: Cwmbran Phase 1B

WS 107

CLIENT:

JOB NUMBER: 73.1340.04

DATE: 26/03/2002

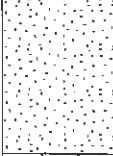
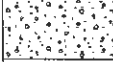
GROUND LEVEL: -

m ASD

CO-ORDINATES:

E

N

Description	Depth (m)	Legend	Reduced Level	Samples		Ground Water	Installation
				Type	Depth		
MADE GROUND : Brown slightly gravelly TOPSOIL with rootlets and rare cobbles. Cobbles and gravel are of siltstone and sandstone.	0.25		(0.25)				
MADE GROUND : Brown very silty SAND with some grey slate.	0.50		(0.25)				
MADE GROUND : Black ASH and CLINKER.	0.70		(0.20)				
Brown SILT with black staining.	0.80		(0.10)	D			
Dense yellow SAND.	1.00		(0.80)	D			
Yellow brown,very silty SAND and GRAVEL.	1.60		(0.20)				
End of Borehole at 1.80 m	1.80						

GENERAL REMARKS:

GROUNDWATER REMARKS:

DEPTH: 0.00 m

FLOW: No groundwater strike.

CONTRACTOR:

LOGGED BY: VTC

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WINDOW SAMPLE

HOLE ID

WS 108

PROJECT: Cwmbran Phase 1B

CLIENT:

JOB NUMBER: 73.1340.04

DATE: 26/03/2002

GROUND LEVEL: -

m ASD

CO-ORDINATES:

E

N

Description	Depth (m)	Legend	Reduced Level	Samples		Ground Water	Installation
				Type	Depth		
MADE GROUND : Brown, very silty, slightly sandy TOPSOIL with occasional rootlets and clinker.			(0.45)				
MADE GROUND : Brown, very silty, slightly gravelly TOPSOIL with sandstone gravel.	0.45		(0.65)	D	0.40 0.55 0.80		
Brown very silty relict TOPSOIL.	1.10		(0.40)				
Brown very clayey SILT (relict subsoil).	1.50		(0.87)		1.57 2.10		
Brown fine to medium very silty SAND.	2.37		(0.53)		2.40		
Orange brown medium to coarse SAND with siltstone gravel and cobbles.	2.90		(0.70)				
End of Borehole at 3.60 m	3.60						

GENERAL REMARKS:

Refusal at 3.6m bgl.

GROUNDWATER REMARKS:

DEPTH: 3.60 m

FLOW:

CONTRACTOR:

LOGGED BY: vtc

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Grove House
Mansion Gate Drive
Leeds
LS7 4DN
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SCALE: 1:25

Sheet 1 of 1

BOREHOLE LOG

Project Ref:	2802	Sheet 1 of 2			
Client:	Owens Corning	Water Sampling Date:			
Site Name:	Pont-y-Felin	Water Sampling Details:			
Location:	Cwmbran	Total Depth:	m bgl ¹		
Borehole No:	PF1	Depth to Water:	m bgl		
Boring Method:	Geoprobe	Initial h-nu:	ppm TOV ²		
Start Date:	1.8.94	Sample h-nu:	ppm TOV		
Borehole Diam:	50mm	Water Temp:	°C		
Total Well Dpt:	5.2m	Water pH:			
Ground Level:	mAOD	Electrical Conductivity:	mV		
Orientation Coordinates:	E: N:	Casing Head to GL³:	m		
Notes: 6.4m east of effluent pit. 8.2m south of boilerhouse. 5.8m west of road					
¹ mbgl: metres below ground level ² TOV: Total Organic Vapours ³ GL: Ground Level					
Samples					
Sample No.	Sample Depth (mbgl app)	Type	Sample Description	TOV	Analysis
PF1	1.4-2.0	Soil	SILT	3.0ppm	SVOC Phenol, Ammonia Formaldehyde

Stratigraphy				
Sample	Depth (m)	TOV	Strata Description	Graphic Log
PF1	0.0 - 0.1		Grass on surface. Loose light brown, sandy TOPSOIL.	
	0.1 - 1.35		Loose, light brown, dry, sandy, gravelly FILL with various angular sandstone gravels, some brick fragments and clay. No obvious odour.	
	0.85 - 1.0	2.0ppm	Loose, light grey clinker FILL with some yellow deposits and sulphorous odour.	
	1.35 - 2.0	3.0ppm	Soft, medium brown, clayey SILT.	
	2.0 - 3.35		Loose, light brown, sandy GRAVELS with pieces of light brown, angular, sandstone bedrock.	
	3.35 - 5.2		Loose, dark brown, sandy, angular sandstone GRAVELS saturated with black staining. Anaerobic condition and anoxic odour.	
	4.1-4.3	1.9ppm		
	5.2		Sandstone bedrock .end of borehole.	

BOREHOLE LOG

Project Ref:	2802	Sheet 1 of 3	
Client:	Owens Corning	Water Sampling Date:	1.8.94
Site Name:	Pont-y-Felin	Water Sampling Details:	Screen 3.2 - 3.6
Location:	Cwmbran	Total Depth:	3.6m bgl ¹
Borehole No:	PF2	Depth to Water:	approx. 2.4m bgl
Boring Method:	Geoprobe	Initial h-nu:	ppm TOV ²
Start Date:	1.8.94	Sample h-nu:	ppm TOV
Borehole Diam:	50mm	Water Temp:	°C
Total Well Dpt:	3.6m	Water pH:	
Ground Level:	mAOD	Electrical Conductivity:	mV
Orientation Coordinates:	E: N:	Casing Head to GL³:	m
Notes: 4.8m east of boiler house, 4.55m south of road, 6.8m west of road (main).			
¹ mbgl: metres below ground level ² TOV: Total Organic Vapours ³ GL: Ground Level			

Samples					
Sample No.	Sample Depth (mbgl app)	Type	Sample Description	TOV	Analysis
PF2	3.2 - 3.6	Water	Becoming clear with very fine silt. No obvious odour or sheen.	15.2ppm	SVOC, VOC, Phenol, Formaldehyde, Ammonia, TPH
PF2	2.0 - 2.5	Soil	Silt and sand.	18.3ppm	SVOC, VOC, Phenol, Formaldehyde, Ammonia, TPH

Stratigraphy				
Sample	Depth (m)	TOV	Strata Description	Graphic Log
PF2	0.0 - 0.25	10.1ppm	Loose, light brown, sandy TOPSOIL overlain by grass.	
	0.25 - 1.55		Loose, light brown, sandy, gravelly FILL with angular sandstone gravels and brick and concrete fragments.	
	0.8 - 1.0		Loose, grey clinker, FILL with sulphurous odour.	
	1.50		Perched water in gravelly fill overlying clayey silt.	
	1.55 - 2.2	18.3ppm	Soft, medium brown clayey SILT. No distinct odour becoming sandy with depth.	
	2.0-2.5		Medium brown, clayey silty SAND, becoming saturated with slight coal fragments.	
	2.2 - 2.4		Water strike.	
	2.4		Loose, light brown sandy GRAVEL. Angular sandstones (saturated).	
	2.4 - 3.05	23ppm	Loose, light brown sandy GRAVELS and COBBLES of sandstone with mixed sized sandstones. Some black staining with anoxic organic matter and clay.	
	3.0-3.1		End of borehole.	
	3.05 - 3.6			
	3.6			

Stratigraphy				
Sample	Depth (m)	TOV	Strata Description	Graphic Log
NOTES (Water Strikes, etc.) 1.5m bgl Perched water. 2.4m bgl main strike			Reinstatement Details: (Base to ground level (m bgl)) N/A	

BOREHOLE LOG

Project Ref:	2802	Sheet 1 of 3
Client:	Owens Corning	Water Sampling Date: 1.8.94
Site Name:	Pont-y-Felin	Water Sampling Details: Screen 3.5 - 4.5
Location:	Cwmbran	Total Depth: 4.5m bgl ¹
Borehole No:	PF3	Depth to Water: 3.5m bgl
Boring Method:	Geoprobe	Initial TOV: 103ppm TOV ²
Start Date:	1.8.94	Sample h-nu: ppm TOV
Borehole Diam:	50mm	Water Temp: °C
Total Well Dpt:	4.5	Water pH:
Ground Level:	mAOD	Electrical Conductivity: mV
Orientation Coordinates:	E: N:	Casing Head to GL³: m

Notes: Adjacent oil store. 2.2m east of building. 8.3m South of site road. 6.3m west of main road

¹mbgl: metres below ground level ²TOV: Total Organic Vapours ³GL: Ground Level

Samples

Sample No.	Sample Depth (mbgl app)	Type	Sample Description	TOV	Analysis
PF3	3.5 - 4.5	Water	Water becoming clearer. Sample fine dark brown sandstone. Slight oil sheen and slight organic odour, possibly kerosene.	103ppm	VOC, SVOC, Ammonia, Formaldehyde, Phenol, TPH
PF3	1.3 - 1.7	Soil	FILL	530ppm	VOC, SVOC, Ammonia, Formaldehyde, Phenol, TPH

Stratigraphy				
Sample	Depth (m)	TOV	Strata Description	Graphic Log
PF3	0.0 - 1.6	145ppm 530ppm	Loose, light brown, sandy, gravelly, FILL with angular gravels (aggregate) brick, concrete pieces. Kerosene odour.	
	0.2 - 0.7			
	1.4 - 1.5			
	1.6 - 4.5	47.4ppm	Loose, light brown, sandy angular, sandstone GRAVEL with some fragments of larger cobbles and some laminated sandstones.	
	2.0 - 2.2			
3.5		Water strike - saturated below.		
4.5		Hard bedrock :end of borehole.		

Stratigraphy				
Sample	Depth (m)	TOV	Strata Description	Graphic Log
NOTES (Water Strikes, etc.) 3.5m bgl Main strike			Reinstatement Details: (Base to ground level (m bgl))	

BOREHOLE LOG

Project Ref:	2802	Sheet 1 of 2		
Client:	Owens Corning	Water Sampling Date:		
Site Name:	Pont-y-Felin	Water Sampling Details:		
Location:	Cwmbran	Total Depth:	m bgl ¹	
Borehole No:	PF4	Depth to Water:	m bgl	
Boring Method:	Geoprobe	Initial h-nu:	ppm TOV ²	
Start Date:	1.8.94	Sample h-nu:	ppm TOV	
Borehole Diam:	50mm	Water Temp:	°C	
Total Well Dpt:	4.2m	Water pH:		
Ground Level:	mAOD	Electrical Conductivity:	mV	
Orientation Coordinates:	E:	N:	Casing Head to GL ³ :	m

Notes: 3.2m West of bund adjacent 2nd tank. 6.9m north of corner of bunds.

¹mbgl: metres below ground level ²TOV: Total Organic Vapours ³GL: Ground Level

Samples

Sample No.	Sample Depth (mbgl app)	Type	Sample Description	TOV	Analysis
PF4	0.2 - 0.4	Soil	FILL	0.2ppm	Phenol

Stratigraphy				
Sample	Depth (m)	TOV	Strata Description	Graphic Log
	0.0 - 0.25		Grass covering loose, dry, light brown, humic, organic SUBSOIL.	
	0.25 - 0.4	0.2ppm	Loose, light brown, sandy, gravelly FILL. No obvious odour.	
	0.4 - 1.65		Loose, light brown sandy GRAVEL sandstone, angular gravels with some large cobbles becoming more sandy and slightly clayey with depth.	
	1.55 - 1.65	3.2ppm		
	1.65 - 4.2		Hard no return. Probe caught between 2 boulders.	
	4.2		No water at 4.2m bgl. End of borehole.	

BOREHOLE LOG

Project Ref:	2802	Sheet 1 of 3
Client:	Owens Corning	Water Sampling Date: 2.8.94
Site Name:	Pont-y-Felin	Water Sampling Details: Screen 2.6 - 3.6
Location:	Cwmbran	Total Depth: 3.6m bgl ¹
Borehole No:	PF5	Depth to Water: 2.1m bgl
Boring Method:	Geoprobe	Initial h-nu: ppm TOV ²
Start Date:	2.8.94	Sample h-nu: ppm TOV
Borehole Diam:	50mm	Water Temp: °C
Total Well Dpt:	3.6m	Water pH:
Ground Level:	mAOD	Electrical Conductivity: mV
Orientation Coordinates:	E: N:	Casing Head to GL³: m
Notes: 1m south of ammonia building. 0.7m east of corner. 8.5m west of bund.		
¹ mbgl: metres below ground level ² TOV: Total Organic Vapours ³ GL: Ground Level		

Samples

Sample No.	Sample Depth (mbgl app)	Type	Sample Description	TOV	Analysis
PF5	2.1 - 3.6	Water	Brown, slight oil sheen Kerosene/paraffin odour.	151ppm	VOC, Ammonia, Phenol, Formaldehyde
PF5	0.6 - 1.2	Soil	FILL with slight kerosene/ petroleum odour.	635ppm	VOC, SVOC, TPH, Ammonia, Phenol, Formaldehyde

Stratigraphy				
Sample	Depth (m)	TOV	Strata Description	Graphic Log
PF5	0.0 - 0.25 0.2 - 0.4	67ppm	Grass on surface stained and yellow. Loose, light brown, humic organic TOPSOIL.	
	0.25 - 1.2 1.0 - 1.2	635ppm	Loose, light brown, sandy, gravelly FILL with angular sandstone gravels and some pieces of clinker fill material with small nodules of metallic silver. Slight kerosene/petroleum/paraffin type organic odour and slight ammonia odour.	
	2.0 - 2.20 2.10	210ppm	Perched water, dark black staining, oil sheen.	
	1.2 - 3.2 3.0 - 3.2	65ppm	Loose, light brown, sandy, silty GRAVELS with angular sandstone gravels and some larger cobbles in a matrix of silt suspended in perched water. Petroleum/kerosene odour.	
	3.2 - 3.6		Stiff, red, silty CLAY with mottled light grey. Contains some medium angular, red sandstone gravels. Slight petroleum odour.	

Stratigraphy				
Sample	Depth (m)	TOV	Strata Description	Graphic Log
NOTES (Water Strikes, etc.) Perched water at 2.1m bgl			Reinstatement Details: (Base to ground level (m bgl))	

BOREHOLE LOG

Project Ref:	2802	Sheet 1 of 2
Client:	Owens Corning	Water Sampling Date:
Site Name:	Pont-y-Felin	Water Sampling Details:
Location:	Cwmbran	Total Depth: m bgl ¹
Borehole No:	PF6	Depth to Water: m bgl
Boring Method:	Geoprobe	Initial h-nu: ppm TOV ²
Start Date:	2.8.94	Sample h-nu: ppm TOV
Borehole Diam:	50mm	Water Temp: °C
Total Well Dpt:	2.8m	Water pH:
Ground Level:	mAOD	Electrical Conductivity: mV
Orientation Coordinates:	E: N:	Casing Head to GL³: m

Notes: 6.9m west of main road. 2.9m east of filling area. 6.5m north of end grass.

¹mbgl: metres below ground level ²TOV: Total Organic Vapours ³GL: Ground Level

Samples

Sample No.	Sample Depth (mbgl app)	Type	Sample Description	TOV	Analysis
PF6	0.7 - 1.0	Soil	FILL	68.2ppm	Ammonia, Phenol, Formaldehyde

Stratigraphy				
Sample	Depth (m)	TOV	Strata Description	Graphic Log
PF6	0.0 - 0.2	68.2ppm	Loose, light brown, humic, organic SUBSOIL, overlain by long grass.	
	0.2 - 1.0		Loose, medium brown, dry FILL in a sandy, gravelly matrix with pieces of brick, concrete and clinker with slight sulphurous odour. Becoming clayey with depth.	
	0.8 - 1.0			
	1.0 - 2.05	33.3ppm 42.1ppm	Stiff, dark brown, silty CLAY with organic rootlets. No distinct odour.	
	2.05 - 3.0		Loose, light brown/yellow clayey, sandy GRAVELS, angular sandstones and some smaller mudstones with some larger cobbles.	
	2.05 - 2.10			
	2.7 - 2.8			
3.0		Large boulder encountered, cannot penetrate. .end of borehole.		

BOREHOLE LOG

Project Ref:	2802	Sheet 1 of 2	
Client:	Owens Corning	Water Sampling Date:	
Site Name:	Pont-y-Felin	Water Sampling Details:	
Location:	Cwmbran	Total Depth:	m bgl ¹
Borehole No:	PF7	Depth to Water:	m bgl
Boring Method:	Geoprobe	Initial h-nu:	ppm TOV ²
Start Date:	2.8.94	Sample h-nu:	ppm TOV
Borehole Diam:	50mm	Water Temp:	°C
Total Well Dpt:	1.9m	Water pH:	
Ground Level:	mAOD	Electrical Conductivity:	mV
Orientation Coordinates:	E:	N:	Casing Head to GL ³ : m

Notes: 4.5m from building. 1.7m west from edge of grass. 3.2m north from edge of grass.

¹mbgl: metres below ground level ²TOV: Total Organic Vapours ³GL: Ground Level

Samples

Sample No.	Sample Depth (mbgl app)	Type	Sample Description	TOV	Analysis
PF7	1.7 - 1.9	Soil	Gravels	7.3ppm	Phenol

Stratigraphy				
Sample	Depth (m)	TOV	Strata Description	Graphic Log
PF7	0.0 - 0.2	25.0ppm	Loose, light brown, grass covered, humic, organic TOPSOIL.	
	0.2 - 0.45		Loose, light brown, sandy GRAVELS with sub-angular sandstone and mudstone/marl gravels. No obvious odour.	
	0.45 - 0.8		Stiff, reddish brown, sandy CLAY with black organic mottles.	
	0.8 - 1.9	7.3ppm	Loose, light brown, sandy GRAVEL sub-angular sandstones and mudstones/marl.	
	1.7 - 1.9			
	1.9		Solid base probably sandstone bedrock :end of borehole.	

BOREHOLE LOG

Project Ref:	2802	Sheet 1 of 3			
Client:	Owens Corning	Water Sampling Date:			
Site Name:	Pont-y-Felin	Water Sampling Details:			
Location:	Cwmbran	Total Depth: m bgl ¹			
Borehole No:	PF8	Depth to Water: m bgl			
Boring Method:	Geoprobe	Initial h-nu: ppm TOV ²			
Start Date:	2.8.94	Sample h-nu: ppm TOV			
Borehole Diam:	50mm	Water Temp: °C			
Total Well Dpt:	4.9m	Water pH:			
Ground Level:	mAOD	Electrical Conductivity: mV			
Orientation Coordinates:	E: N:	Casing Head to GL ³ : m			
Notes: In front of wash building. 3.9m east of building. 6.2m west of main road. 2.5m south of NE corner of building.					
¹ mbgl: metres below ground level ² TOV: Total Organic Vapours ³ GL: Ground Level					
Samples					
Sample No.	Sample Depth (mbgl app)	Type	Sample Description	TOV	Analysis
PF8	0.45 - 0.65	Soil	Gravel	319ppm	Phenol, Ammonia, Formaldehyde, SVOC, VOC

Stratigraphy				
Sample	Depth (m)	TOV	Strata Description	Graphic Log
PF8	0.0 - 0.1	319ppm	Loose, light brown.	
	0.1 - 0.65		Loose, light brown, sandy GRAVEL, angular and laminated sandstone gravel and some angular marl pieces.	
	0.5 - 0.6			
	0.65 - 1.9		Stiff, dark brown, silty CLAY with small rootlets. No obvious odour.	
	1.9 - 2.15	46ppm	Loose, laminated, light brown, almost white SANDSTONE. No obvious contamination.	
	2.15 - 3.6		Loose, light brown, sandy GRAVELS, angular sandstones and mudstones (marls). No obvious contamination. Saturated below 2.1. Groundwater.	
	2.0 - 2.1	120ppm		
	3.0 - 3.1			
	3.1	Water sample attempted but no return. Continued to depth at 4.9m bgl, but still no water.		
4.9	Bedrock/sandstone. End of borehole.			

Stratigraphy				
Sample	Depth (m)	TOV	Strata Description	Graphic Log
NOTES (Water Strikes, etc.) Perched water 2.1m bgl. Main groundwater 3.1m bgl.			Reinstatement Details: (Base to ground level (m bgl))	

BOREHOLE LOG

Project Ref:	2802	Sheet 1 of 3
Client:	Owens Corning	Water Sampling Date: 2.8.94
Site Name:	Pont-y-Felin	Water Sampling Details: Screen 3.5 - 4.5
Location:	Cwmbran	Total Depth: 4.0m bgl ¹
Borehole No:	PF9	Depth to Water: 1.4m bgl
Boring Method:	Geoprobe	Initial h-nu: ppm TOV ²
Start Date:	2.8.94	Sample h-nu: ppm TOV
Borehole Diam:	50mm	Water Temp: °C
Total Well Dpt:	2.6m	Water pH:
Ground Level:	mAOD	Electrical Conductivity: mV
Orientation Coordinates:	E: N:	Casing Head to GL³: m

Notes: Effluent tank. 1.5m north of NE corner effluent tanks, 2.1m west of building.

¹mbgl: metres below ground level ²TOV: Total Organic Vapours ³GL: Ground Level

Samples

Sample No.	Sample Depth (mbgl app)	Type	Sample Description	TOV	Analysis
PF9	4.0 - 4.5	Water	Clear, no oil sheen or distinct odour with low suspended solids.	370ppm	VOC, SVOC, Phenol, Ammonia, Formaldehyde

Stratigraphy				
Sample	Depth (m)	TOV	Strata Description	Graphic Log
	0.0 - 0.15		Aggregate material.	
	0.15 - 2.6			
	0.2 - 0.3	366ppm	Loose, light brown, sandy, silty, GRAVEL, sub-angular mudstones (marl) with occasional sandstone gravels.	
	1.1 - 1.3	327ppm		
	1.4		Groundwater strike saturated below	
	2.6		End of borehole and no returns of material but continued with water sampling probe.	

Stratigraphy				
Sample	Depth (m)	TOV	Strata Description	Graphic Log
NOTES (Water Strikes, etc.) Main strike 1.4m bgl			Reinstatement Details: (Base to ground level (m bgl))	

BOREHOLE LOG

Project Ref:	2802	Sheet 1 of 2
Client:	Owens Corning	Water Sampling Date:
Site Name:	Pont-y-Felin	Water Sampling Details:
Location:	Cwmbran	Total Depth: m bgl ¹
Borehole No:	PF10	Depth to Water: m bgl
Boring Method:	Geoprobe	Initial h-nu: ppm TOV ²
Start Date:	2.8.94	Sample h-nu: ppm TOV
Borehole Diam:	50mm	Water Temp: °C
Total Well Dpt:	1.2m	Water pH:
Ground Level:	mAOD	Electrical Conductivity: mV
Orientation Coordinates:	E: N:	Casing Head to GL³: m

Notes: Former oil drum store. 1.1m north of gas store. 2.4m south of building.

¹mbgl: metres below ground level

²TOV: Total Organic Vapours

³GL: Ground Level

Samples

Sample No.	Sample Depth (mbgl app)	Type	Sample Description	TOV	Analysis
PF10	0.1 - 0.3	Soil	FILL Hnu Hanby test kit - 500-1000 ppm of fuel oil	150ppm	VOC, SVOC, Phenol, Formaldehyde, TPH

Stratigraphy				
Sample	Depth (m)	TOV	Strata Description	Graphic Log
PF10	0.0 - 0.1		Surface aggregates.	
	0.1 - 1.2		Loose, light brown, sandy, clayey GRAVELS, angular sandstones and mudstones.	
	0.1 - 0.3	150ppm	Obvious oil/grease contamination, stained black with oil sheen and free phase grease. Strong	
	1.1 - 1.2	116ppm	hydrocarbon oil odour.	
	1.2		Hard base, probably sandstone.: end of borehole.	

APPENDIX B

SUMMARY OF CHEMICAL ANALYSIS FROM PREVIOUS SITE INVESTIGATIONS

Table 1 Soils: Metals and Other Inorganic Determinands

	Zone 1																	
Determinands	GP1A	GP1B	GP2	GP3	GP5A	GP5B	GP6	GP7	GP8	PF1	PF2	PF3	PF4	PF5	PF6	MIN	MAX	MEAN
	2.3-2.6	2.6-2.8	1.75-1.85	2.8-3.2	1.1-1.4	3.0-3.2	1.7-1.9	0.9-1.2	0.8-1.0	1.4-2.0	2.0-2.5	1.3-1.7	0.2-0.4	0.6-1.2	0.7-1.0			
Ammoniacal Nitrogen/Ammonia	<2.5	<2.5	<2.5	24.5	<2.5	<2.5	23	24.5	22.5	7.5	<2.5	<2.5		<2.5	<2.5	<2.5	24.5	13.15
Formaldehyde										1.2	0.4	<0.2		0.4	<0.2	<0.2	1.2	2.77
Total Phenol	0.06	0.06	0.058	0.064	0.039	0.033	0.08	0.043	0.033	0.013			<0.001		<0.001	<0.01	0.08	0.04

Determinands	Zone 2					MIN	MAX	MEAN
	GP4	PF7	PF8	PF9	PF10			
	0.7-0.9	1.7-1.9	0.45-0.65	4.0-4.5	0.1-0.3			
Ammoniacal Nitrogen/Ammonia	<2.5		<2.5			0	0	#DIV/0!
Formaldehyde			<0.2		0.4	<0.2	0.4	4.52
Total Phenol	0.04	<0.001				<0.001	0.04	N/A

all results in ppm (mg/kg)
Note 1 Where concentrations are recorded below the detection limit, the detection limit has been used to calculate the mean concentration.
Note 2 N/A shown where too many samples recorded a concentration below the detection limit for the mean concentration to be a useful statistic

TABLE 2: Soils: TPH

Determinands	Zone 1		MIN	MAX	MEAN
	PF3	PF5			
	1.3-1.7	0.6-1.2			
TPH	730	740	730	740	735

TPH and DRO reported in ppm (mg/kg)
PRO and BTEX reported in ppb (µg/kg)
Note 1 Where concentrations are recorded below the detection limit, the detection limit has been used to calculate the mean concentration.
Note 2 N/A shown where too many samples recorded a concentration below the detection limit for the mean concentration to be a useful statistic

TABLE 3: Targeted Phenols

Determinands	Zone 1																MIN	MAX	MEAN
	PF1	PF2	PF3	PF4	PF5	PF6	GP1B	GP1A	GP2	GP3	GP5A	GP5B	GP6	GP7	GP8				
	1.4-2.0	2.0-2.5	1.3-1.7	0.2-0.4	0.6-1.2	0.7-1.0	2.6-2.8	2.3-2.6	1.75-1.85	2.8-3.2	1.1-1.4	3-3.2	1.7-1.9	0.9	1.2				
Phenol	13	13	<1	<1	<1	<1	59	58	57	59	39	33	80	43	33	<1	80	30.9	
2-Chlorophenol	<100	<100	<100	<100		<100										<1	<100	N/A	
2-Nitrophenol	<100	<100	<100	<100		<100										<1	<100	N/A	
2,4-Dimethylphenol	<100	<100	<100	<100		<100										<1	<100	N/A	
2,4-Dichlorophenol	<100	<100	<100	<100		<100										<1	<100	N/A	
4-Chloro-3-methyl-phenol	<100	<100	<100	<100		<100										<1	<100	N/A	
2,4,6-trichlorophenol	<100	<100	<100	<100		<100										<1	<100	N/A	
4-Nitrophenol																<1	<100	N/A	
Pentachlorophenol																<1	<100	N/A	

	Zone 2						
Determinands	PF7	PF8	PF10	GP4	MIN	MAX	MEAN
	1.7-1.9	0.45-0.65	0.1-0.3	0.7-0.9			
Phenol	<1	<1	<1	40	<1	40	N/A
2-Chlorophenol					<1	<1	N/A
2-Nitrophenol					<1	<1	N/A
2,4-Dimethylphenol					<1	<1	N/A
2,4-Dichlorophenol					<1	<1	N/A
4-Chloro-3-methyl-phenol					<1	<1	N/A
2,4,6-Trichlorophenol					<1	<1	N/A
4-Nitrophenol					<1	<1	N/A
Pentachlorophenol					<1	<1	N/A

All results in ppb (µg/kg)
Note 1 Where concentrations are recorded below the detection limit, the detection limit has been used to calculate the mean concentration.
Note 2 N/A shown where too many samples recorded a concentration below the detection limit for the mean concentration to be a useful statistic

Table 4 Soils: Volatile Organic Compounds (VOCs)

Determinands	Zone 1			Zone 2	
	PF2	PF3	PF5	PF8	PF10
	2.0-2.5	1.3-1.7	0.6-1.2	0.45-0.65	0.1-0.3
Dichlorodifluoromethane	<50	<50	<50	<50	<50
Chloromethane	<50	<50	<50	<50	<50
Vinyl chloride	<50	<50	<50	<50	<50
Bromomethane	<50	<50	<50	<50	<50
Chloroethane	<50	<50	<50	<50	<50
Trichlorofluoromethane	<50	<50	<50	<50	<50
trans-1,2-Dichloroethene	<50	<50	<50	<50	<50
Dichloromethane	<50	<50	<50	<50	<50
Carbon disulphide	<50	<50	<50	<50	<50
1,1-Dichloroethene	<50	<50	<50	<50	<50
1,1-Dichloroethane	<50	<50	<50	<50	<50
tert-butyl methyl ether	<50	<50	<50	<50	<50
cis-1,2-Dichloroethene	<50	<50	<50	<50	<50
Bromochloromethane	<50	<50	<50	<50	<50
Chloroform	<50	<50	<50	<50	<50
2,2-Dichloropropane	<50	<50	<50	<50	<50
1,2-Dichloroethane	<50	<50	<50	<50	<50
1,1,1-Trichloroethane	<50	<50	<50	<50	<50
1,1-Dichloropropene	<50	<50	<50	<50	<50
Benzene	<50	<50	<50	<50	<50
Carbontetrachloride	<50	<50	<50	<50	<50
Dibromomethane	<50	<50	<50	<50	<50
1,2-Dichloropropane	<50	<50	<50	<50	<50
Bromodichloromethane	<50	<50	<50	<50	<50
Trichloroethene	<50	<50	<50	<50	<50
cis-1,3-Dichloropropene	<50	<50	<50	<50	<50
trans-1,3-Dichloropropene	<50	<50	<50	<50	<50
1,1,2-Trichloroethane	<50	<50	<50	<50	<50
Toluene	<50	<50	150	<50	<50
1,3-Dichloropropane	<50	<50	<50	<50	<50
Dibromochloromethane	<50	<50	<50	<50	<50
1,2-Dibromoethane	<50	<50	<50	<50	<50
Tetrachloroethene	<50	<50	<50	<50	<50
1,1,1,2-Tetrachloroethane	<50	<50	<50	<50	<50
Chlorobenzene	<50	<50	<50	<50	<50
Ethylbenzene	<50	<50	<50	<50	<50
p/m-Xylene	<50	<50	<50	<50	<50
Bromoform	<50	<50	<50	<50	<50
Styrene	<50	<50	<50	<50	<50
1,1,2,2-Tetrachloroethane	<50	<50	<50	<50	<50
o-Xylene	<50	<50	<50	<50	<50
1,2,3-Trichloropropane	<50	<50	<50	<50	<50
Isopropylbenzene	<50	<50	<50	<50	<50
Bromobenzene	<50	<50	<50	<50	<50
2-Chlorotoluene	<50	<50	<50	<50	<50
Propylbenzene	<50	<50	<50	<50	<50
4-Chlorotoluene	<50	<50	<50	<50	<50
1,2,4-Trimethylbenzene	<50	<50	<50	<50	<50
4-Isopropyltoluene	<50	<50	<50	<50	<50
1,3,5-Trimethylbenzene	<50	<50	<50	<50	<50
1,2-Dichlorobenzene	<50	<50	<50	<50	<50
1,4-Dichlorobenzene	<50	<50	<50	<50	<50
sec-Butylbenzene	<50	<50	<50	<50	<50
tert-Butylbenzene	<50	<50	<50	<50	<50
1,3-Dichlorobenzene	<50	<50	<50	<50	<50
n-Butylbenzene	<50	<50	<50	<50	<50
1,2-Dibromo-3-chloropropane	<50	<50	<50	<50	<50
1,2,4-Trichlorobenzene	<50	<50	<50	<50	<50
Naphthalene	<50	<50	<50	<50	<50
1,2,3-Trichlorobenzene	<50	<50	<50	<50	<50
Hexachlorobutadiene	<50	<50	<50	<50	<50

All results in ppb (µg/kg)

Table 5 Soils: Semi-volatile Organic Compounds (SVOCs)

Determinands	Zone 3					Zone 2
	PF1	PF2	PF3	PF4	PF6	PF10
	2.0-2.5	1.3-1.7	0.6-1.2	0.2-0.4	0.7-1.0	0.1-0.3
Phenol	<100	<100	<100	<100	<100	<100
2-Chlorophenol	<100	<100	<100	<100	<100	<100
2-Methylphenol	<100	<100	<100	<100	<100	<100
4-Methylphenol	<100	<100	<100	<100	<100	<100
2-Nitrophenol	<100	<100	<100	<100	<100	<100
4-Nitrophenol	<100	<100	<100	<100	<100	<100
2,4-Dichlorophenol	<100	<100	<100	<100	<100	<100
2,4-Dimethylphenol	<100	<100	<100	<100	<100	<100
4-Chloro-3-methylphenol	<100	<100	<100	<100	<100	<100
2,4,6-Trichlorophenol	<100	<100	<100	<100	<100	<100
2,4,5-Trichlorophenol	<100	<100	<100	<100	<100	<100
Pentachlorophenol	<100	<100	<100	<100	<100	<100
1,3-Dichlorobenzene	<100	<100	<100	<100	<100	<100
1,4-Dichlorobenzene	<100	<100	<100	<100	<100	<100
1,2-Dichlorobenzene	<100	<100	<100	<100	<100	<100
1,2,4-Trichlorobenzene	<100	<100	<100	<100	<100	<100
Nitrobenzene	<100	<100	<100	<100	<100	<100
Azobenzene	<100	<100	<100	<100	<100	<100
Hexachlorobenzene	<100	<100	<100	<100	<100	<100
Naphthalene	<100	<100	<100	<100	<100	<100
Acenaphthylene	<100	<100	<100	<100	<100	<100
Acenaphthene	<100	<100	<100	<100	<100	<100
Fluorene	<100	<100	<100	<100	<100	<100
Phenanthrene	<100	<100	<100	<100	<100	<100
Anthracene	<100	<100	<100	<100	<100	<100
Fluoranthrene	<100	<100	<100	<100	<100	<100
Pyrene	<100	<100	<100	<100	<100	<100
Benzo(a)anthracene	<100	<100	<100	<100	<100	<100
Chrysene	<100	<100	<100	<100	<100	<100
Benzo(b)fluoranthrene	<100	<100	<100	<100	<100	<100
Benzo(k)fluoranthrene	<100	<100	<100	<100	<100	<100
Benzo(a)pyrene	<100	<100	<100	<100	<100	<100
Indeno(1,2,3-cd)pyrene	<100	<100	<100	<100	<100	<100
Dibenzo(a,h)anthracene	<100	<100	<100	<100	<100	<100
Benzo(ghi)perylene	<100	<100	<100	<100	<100	<100
2-Chloronaphthalene	<100	<100	<100	<100	<100	<100
2-Methylnaphthalene	<100	<100	<100	<100	<100	<100
Carbazole	<100	<100	<100	<100	<100	<100
Isophorone	<100	<100	<100	<100	<100	<100
Dibenzofuran	<100	<100	<100	<100	<100	<100
Dimethyl phthalate	<100	<100	<100	<100	<100	<100
Diethyl phthalate	<100	<100	<100	<100	<100	<100
Di-n-butylphthalate	<100	<100	<100	<100	<100	<100
Di-n-octylphthalate	<100	<100	<100	<100	<100	<100
Bis(2-ethylhexyl)phthalate	<100	<100	<100	<100	<100	<100
Butylbenzylphthalate	<100	<100	<100	<100	<100	<100
4-Chloroaniline	<100	<100	<100	<100	<100	<100
2-Nitroaniline	<100	<100	<100	<100	<100	<100
3-Nitroaniline	<100	<100	<100	<100	<100	<100
4-Nitroaniline	<100	<100	<100	<100	<100	<100
2,4-Dinitrotoluene	<100	<100	<100	<100	<100	<100
2,6-Dinitrotoluene	<100	<100	<100	<100	<100	<100
Bis(2-chloroethyl)ether	<100	<100	<100	<100	<100	<100
4-Bromophenylphenylether	<100	<100	<100	<100	<100	<100
4-Chlorophenylphenylether	<100	<100	<100	<100	<100	<100
Hexachloroethane	<100	<100	<100	<100	<100	<100
Hexachlorobutadiene	<100	<100	<100	<100	<100	<100
Hexchlorocyclopentadiene	<100	<100	<100	<100	<100	<100
Bis(2-chloroethoxy)methane	<100	<100	<100	<100	<100	<100
N-nitrosodi-n-propylamine	<100	<100	<100	<100	<100	<100

All results in ppb (µg/kg)

Table 6 Groundwater: Inorganic Determininds

Determinands	ZONE1										ZONE 2		MIN	MAX	MEAN
	PF2	PF3	PF5	GP1	GP2	GP3	GP5	GP6	GP7	GP8	PF9	GP4			
Ammoniacal Nitrogen	1.5	0.4	3.2	0.4	0.5	0.4	5.7	5.7	0.5	0.8	0.2	0.6	0.2	5.7	1.66
Formaldehyde	0.1	<0.1	0.1								0.9		<0.1	0.9	0.30
Total phenols	0.07	0.017	0.039	<0.001	<0.001	<0.001	0.068	0.02	<0.001	<0.001	0.013	0.01	0.01	0.07	N/A

All results in mg/l (ppm)
Note 1 Where concentrations are recorded below the detection limit, the detection limit has been used to calculate the mean concentration.
Note 2 N/A shown where too many samples recorded a concentration below the detection limit for the mean concentration to be a useful statistic

Table 7 Groundwater: TPH (DRO/GRO/BTEX)

Determinands	Zone 1			Zone 2
	PF2	PF3	PF5	PF9
Diesel Range Organics				
Petrol Range Organics				
Benzene	<10	<10	<10	<10
Toluene	<10	<10	<10	<10
Ethylbenzene	<10	<10	<10	<10
Xylene	<10	<10	<10	<10

All results in µg/l (ppb)

Table 8 Groundwater: PAH

Determinands	Zone 1		Zone 2
	PF2	PF3	PF9
Naphthalene	<10	<10	<10
Acenaphthylene	<10	<10	<10
Acenaphthene	<10	<10	<10
Fluorene	<10	<10	<10
Phenanthrene	<10	<10	<10
Anthracene	<10	<10	<10
Fluoranthene	<10	<10	<10
Pyrene	<10	<10	<10
Benz(a)anthracene	<10	<10	<10
Chrysene	<10	<10	<10
Benzo(b)fluoranthene	<10	<10	<10
Benzo(k)fluoranthene	<10	<10	<10
Benzo(a)pyrene	<10	<10	<10
Indeno(123cd)pyrene	<10	<10	<10
Dibenzo(ah)anthracene	<10	<10	<10
Benzo(ghi)perylene	<10	<10	<10

All results in ng/l

Table 9 Groundwater: VOCs

Determinands	Zone 1			Zone 2
	PF2	PF3	PF5	PF9
Dichlorodifluoromethane	<10	<10	<10	<10
Chloromethane	<10	<10	<10	<10
Vinyl chloride	<10	<10	<10	<10
Bromomethane	<10	<10	<10	<10
Chloroethane	<10	<10	<10	<10
Trichlorofluoromethane	<10	<10	<10	<10
trans-1,2-Dichloroethene	<10	<10	<10	<10
Dichloromethane	<10	<10	<10	<10
Carbon disulphide	<10	<10	<10	<10
1,1-Dichloroethene	<10	<10	<10	<10
1,1-Dichloroethane	<10	<10	<10	<10
tert-butyl methyl ether	<10	<10	<10	<10
cis-1,2-Dichloroethene	<10	<10	<10	<10
Bromochloromethane	<10	<10	<10	<10
Chloroform	<10	<10	<10	<10
2,2-Dichloropropane	<10	<10	<10	<10
1,2-Dichloroethane	<10	<10	<10	<10
1,1,1-Trichloroethane	<10	<10	<10	<10
1,1-Dichloropropene	<10	<10	<10	<10
Benzene	<10	<10	<10	<10
Carbontetrachloride	<10	<10	<10	<10
Dibromomethane	<10	<10	<10	<10
1,2-Dichloropropane	<10	<10	<10	<10
Bromodichloromethane	<10	<10	<10	<10
Trichloroethene	<10	<10	<10	<10
cis-1,3-Dichloropropene	<10	<10	<10	<10
trans-1,3-Dichloropropene	<10	<10	<10	<10
1,1,2-Trichloroethane	<10	<10	<10	<10
Toluene	<10	<10	<10	<10
1,3-Dichloropropane	<10	<10	<10	<10
Dibromochloromethane	<10	<10	<10	<10
1,2-Dibromoethane	<10	<10	<10	<10
Tetrachloroethene	<10	<10	<10	<10
1,1,1,2-Tetrachloroethane	<10	<10	<10	<10
Chlorobenzene	<10	<10	<10	<10
Ethylbenzene	<10	<10	<10	<10
p/m-Xylene	<10	<10	<10	<10
Bromoform	<10	<10	<10	<10
Styrene	<10	<10	<10	<10
1,1,2,2-Tetrachloroethane	<10	<10	<10	<10
o-Xylene	<10	<10	<10	<10
1,2,3-Trichloropropane	<10	<10	<10	<10
Isopropylbenzene	<10	<10	<10	<10
Bromobenzene	<10	<10	<10	<10
2-Chlorotoluene	<10	<10	<10	<10
Propylbenzene	<10	<10	<10	<10
4-Chlorotoluene	<10	<10	<10	<10
1,2,4-Trimethylbenzene	<10	<10	<10	<10
4-Isopropyltoluene	<10	<10	<10	<10
1,3,5-Trimethylbenzene	<10	<10	<10	<10
1,2-Dichlorobenzene	<10	<10	<10	<10
1,4-Dichlorobenzene	<10	<10	<10	<10
sec-Butylbenzene	<10	<10	<10	<10
tert-Butylbenzene	<10	<10	<10	<10
1,3-Dichlorobenzene	<10	<10	<10	<10
n-Butylbenzene	<10	<10	<10	<10
1,2-Dibromo-3-chloropropene	<10	<10	<10	<10
1,2,4-Trichlorobenzene	<10	<10	<10	<10
Naphthalene	<10	<10	<10	<10
1,2,3-Trichlorobenzene	<10	<10	<10	<10
Hexachlorobutadiene	<10	<10	<10	<10

All results in µg/l (ppb)

Table 10 Groundwater: SVOCs

Determinands	Zone 1			Zone 2
	PF2	PF3	PF5	PF9
Phenol	<10	<10	<10	<10
2-Chlorophenol	<10	<10	<10	<10
2-Methylphenol	<10	<10	<10	<10
4-Methylphenol	<10	<10	<10	<10
2-Nitrophenol	<10	<10	<10	<10
4-Nitrophenol	<10	<10	<10	<10
2,4-Dichlorophenol	<10	<10	<10	<10
2,4-Dimethylphenol	<10	<10	<10	<10
4-Chloro-3-methylphenol	<10	<10	<10	<10
2,4,6-Trichlorophenol	<10	<10	<10	<10
2,4,5-Trichlorophenol	<10	<10	<10	<10
Pentachlorophenol	<10	<10	<10	<10
1,3-Dichlorobenzene	<10	<10	<10	<10
1,4-Dichlorobenzene	<10	<10	<10	<10
1,2-Dichlorobenzene	<10	<10	<10	<10
1,2,4-Trichlorobenzene	<10	<10	<10	<10
Nitrobenzene	<10	<10	<10	<10
Azobenzene	<10	<10	<10	<10
Hexachlorobenzene	<10	<10	<10	<10
Naphthalene	<10	<10	<10	<10
Acenaphthylene	<10	<10	<10	<10
Acenaphthene	<10	<10	<10	<10
Fluorene	<10	<10	<10	<10
Phenanthrene	<10	<10	<10	<10
Anthracene	<10	<10	<10	<10
Fluoranthrene	<10	<10	<10	<10
Pyrene	<10	<10	<10	<10
Benzo(a)anthracene	<10	<10	<10	<10
Chrysene	<10	<10	<10	<10
Benzo(b)fluoranthrene	<10	<10	<10	<10
Benzo(k)fluoranthrene	<10	<10	<10	<10
Benzo(a)pyrene	<10	<10	<10	<10
Indeno(1,2,3-cd)pyrene	<10	<10	<10	<10
Dibenzo(a,h)anthracene	<10	<10	<10	<10
Benzo(ghi)perylene	<10	<10	<10	<10
2-Chloronaphthalene	<10	<10	<10	<10
2-Methylnaphthalene	<10	<10	<10	<10
Carbazole	<10	<10	<10	<10
Isophorone	<10	<10	<10	<10
Dibenzofuran	<10	<10	<10	<10
Dimethyl phthalate	<10	<10	<10	<10
Diethyl phthalate	<10	<10	<10	<10
Di-n-butylphthalate	<10	<10	<10	<10
Di-n-octylphthalate	<10	<10	<10	<10
Bis(2-ethylhexyl)phthalate	<10	<10	<10	<10
Butylbenzylphthalate	<10	<10	<10	<10
4-Chloroaniline	<10	<10	<10	<10
2-Nitroaniline	<10	<10	<10	<10
3-Nitroaniline	<10	<10	<10	<10
4-Nitroaniline	<10	<10	<10	<10
2,4-Dinitrotoluene	<10	<10	<10	<10
2,6-Dinitrotoluene	<10	<10	<10	<10
Bis(2-chloroethyl)ether	<10	<10	<10	<10
4-Bromophenylphenylether	<10	<10	<10	<10
4-Chlorophenylphenylether	<10	<10	<10	<10
Hexachloroethane	<10	<10	<10	<10
Hexachlorobutadiene	<10	<10	<10	<10
Hexachlorocyclopentadiene	<10	<10	<10	<10
Bis(2-chloroethoxy)methane	<10	<10	<10	<10
N-nitrosodi-n-propylamine	<10	<10	<10	<10

All results in µg/l (ppb)

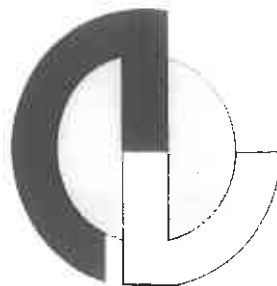
Table 11 Groundwater: Phenois

Determinands	PF2	PF3	PF5	PF9
Phenol	69	16	15	12
2-Chlorophenol	<10	<10		<10
2-Nitrophenol	<10	<10		<10
2,4-Dimethylphenol	<10	<10		<10
2,4-Dichlorophenol	<10	<10		<10
4-Chloro-3-methyl-phenol	<10	<10		<10
2,4,6-trichlorophenol	<10	<10		<10

All results in µg/l ppb

APPENDIX C

CHEMICAL ANALYSIS RESULTS FROM CARL BRO SITE INVESTIGATIONS



ALCONTROL GEOCHEM

REPORT 02/03344/02/02

**ANALYSIS OF SOIL AND WATER SAMPLES
FROM CWMBRAN**

REF: 73.1340.04

Prepared for

CARL BRO LTD

MAY 2002

CONTENTS

- 1.0 Log Sheets
- 2.0 Miscellaneous Data
- 3.0 C5-C35 Speciated TPH By GC
- 4.0 Diesel Range Organics
- 5.0 Gasoline Range Organics by GC
- 6.0 PAH by GCMS
- 7.0 Semivolatile Organic Compounds
- 8.0 Volatile Organic Compounds (EPA 624/8260)
- 9.0 Target Phenols Analysis



CERTIFICATE OF ANALYSIS

Client: Carl Bro Ltd
Grove House
Mansion Gate Drive
Leeds

LS7 4DN

Attention: Virginia Clydesdale

Date: 29 May, 2002

Our Reference: 02/03344/02/02

Your Reference: 73.1340.04

Location: Cwmbran

Supplement: 001 to Report Number: 02/03344/02/01.

Signed

Lisa Banks
Site Manager
Analytical Services

Compiled By

Pam Hudson

ALcontrol Geochem TEST SCHEDULE

JOB NUMBER : 02/3344/02 **BATCH NUMBER :** 1
CLIENT : Carl Bro Ltd **CLIENT REF/CODE :** 73.1340.04
CONTACT : Virginia Clydesdale **ORDER NUMBER :**
DATE OF RECEIPT : 27/03/02 **TURNAROUND :** 10 days
LOCATION : Cwmbran

Numeric values indicate additional scheduling

* indicates test subcontracted

UKAS Accredited ?																												
Sample Number	Sample Identity	P / V	Depth	Sample Type	Dry Crush	Wet Split	ICP ICRCL (9)	B (H2O Sol)	Cr VI	Total cyanide	Free CN Soil	Thiocyanate	Total sulphate	Total sulphur	Ac.Sol.Sulphide	pH (soil)	Phenol prep	Tot Phen HPLC	PAH by MS	Diesel rng orgs	Petrol rng orgs	BTEX by GC	Amm. N	Formaldehyde	SVOC inc TIC by MS	VOC inc TIC by MS	Spec. DRO GC	Spec. PRO GC
1	WS101	1 kg	0.45-0.60	SOIL																								
2	WS101	VOC	0.45-0.60	SOIL																								
3	WS101	1 kg	1.25-1.50	SOIL																								
4	WS101	VOC	1.25-1.50	SOIL																								
5	WS101	1 kg	2.70-2.90	SOIL																								
6	WS101	VOC	2.70-2.90	SOIL																								
7	WS102	1 kg	0.85-1.00	SOIL																								
8	WS102	VOC	0.85-1.00	SOIL																								
9	WS102	1 kg	1.50-1.80	SOIL																								
10	WS102	VOC	1.50-1.80	SOIL																								
11	WS102	1 kg	3.10-3.30	SOIL																								
12	WS102	VOC	3.10-3.30	SOIL																								
13	WS104	1 kg	0.60	SOIL																								
14	WS104	VOC	0.60	SOIL																								
15	WS104	1 kg	1.70	SOIL																								
16	WS104	VOC	1.70	SOIL																								
17	WS105	1 kg	0.70-1.00	SOIL																								
18	WS105	VOC	0.70-1.00	SOIL																								
19	WS106	1 kg	0.50-0.80	SOIL																								
20	WS106	VOC	0.50-0.80	SOIL																								
21	WS106	1 kg	1.30-1.50	SOIL																								
22	WS106	VOC	1.30-1.50	SOIL																								

Page 3 of 59

ALcontrol Geochem TEST SCHEDULE

JOB NUMBER : 02/3344/02
CLIENT : Carl Bro Ltd
CONTACT : Virginia Clydesdale
DATE OF RECEIPT : 27/03/02
LOCATION : Cwmbran

BATCH NUMBER : 1
CLIENT REF/CODE : 73.1340.04
ORDER NUMBER :
TURNAROUND : 10 days

Numeric values indicate additional scheduling
 * indicates test subcontracted

Sample Number	Sample Identity	P / V	Depth	Sample Type	UKAS Accredited ?	BTEX by GC	MTBE by GC	Phenol by MS	ICP ICRL	Cr VI Water	Total CN Water	Free CN Water	Thiocyanate	Sulphate Kone	Sulphide (H2O)	pH (water)	Free Sulphur (W)	Tot Phen HPLC	Amm. N (W)	NRA leach	pH of leachate	Phen Spec Leach	Fomaldehyde (L)	Amm N Leach	Hg Low DT Lch AA	Se LOW leach AA	Cd Leach ICP-USN	As on leach.	B on leach.
1	WS101	1 kg	0.45-0.60	SOIL	✓																								
2	WS101	VOC	0.45-0.60	SOIL	✓			Sample on Hold																					
3	WS101	1 kg	1.25-1.50	SOIL	✓			4																					
4	WS101	VOC	1.25-1.50	SOIL	✓																								
5	WS101	1 kg	2.70-2.90	SOIL	✓																								
6	WS101	VOC	2.70-2.90	SOIL	✓																								
7	WS102	1 kg	0.85-1.00	SOIL	✓			Sample on Hold																					
8	WS102	VOC	0.85-1.00	SOIL	✓			X																					
9	WS102	1 kg	1.50-1.80	SOIL	✓																								
10	WS102	VOC	1.50-1.80	SOIL	✓																								
11	WS102	1 kg	3.10-3.30	SOIL	✓																								
12	WS102	VOC	3.10-3.30	SOIL	✓																								
13	WS104	1 kg	0.60	SOIL	✓																								
14	WS104	VOC	0.60	SOIL	✓			6																					
15	WS104	1 kg	1.70	SOIL	✓																								
16	WS104	VOC	1.70	SOIL	✓																								
17	WS105	1 kg	0.70-1.00	SOIL	✓			Sample on Hold																					
18	WS105	VOC	0.70-1.00	SOIL	✓			X																					
19	WS106	1 kg	0.50-0.80	SOIL	✓																								
20	WS106	VOC	0.50-0.80	SOIL	✓																								
21	WS106	1 kg	1.30-1.50	SOIL	✓																								
22	WS106	VOC	1.30-1.50	SOIL	✓																								

JOB NUMBER : 02/3344/02
CLIENT : Carl Bro Ltd
CONTACT : Virginia Clydesdale
DATE OF RECEIPT : 27/03/02
LOCATION : Cwmbran

BATCH NUMBER : 1
CLIENT REF/CODE : 73.1340.04
ORDER NUMBER :
TURNAROUND : 10 days

Numeric values indicate additional scheduling
* indicates test subcontracted

Page 5 of 59

Printed : 27/05/02 11:01:25

Name : Anneli Fryer

Checked By

ALcontrol Geochem TEST SCHEDULE

JOB NUMBER : 02/3344/02
CLIENT : Carl Bro Ltd
CONTACT : Virginia Clydesdale
DATE OF RECEIPT : 27/03/02
LOCATION : Cwmbran

BATCH NUMBER : 1
CLIENT REF/CODE : 73.1340.04
ORDER NUMBER :
TURNAROUND : 10 days

Numeric values indicate additional scheduling
 * indicates test subcontracted

UKAS Accredited ?				Cr on leachate	Cu on leachate	Ni on leach.	Pb in leachate	Se in leachate	Zn in leachate
Sample Number	Sample Identity	P / V	Depth	Sample Type					
1	WS101	1 kg	0.45-0.60	SOIL	7	7	7	7	7
2	WS101	VOC	0.45-0.60	SOIL	Sample on Hold				
3	WS101	1 kg	1.25-1.50	SOIL					
4	WS101	VOC	1.25-1.50	SOIL					
5	WS101	1 kg	2.70-2.90	SOIL					
6	WS101	VOC	2.70-2.90	SOIL					
7	WS102	1 kg	0.85-1.00	SOIL	Sample on Hold				
8	WS102	VOC	0.85-1.00	SOIL	7	7	7	7	7
9	WS102	1 kg	1.50-1.80	SOIL					
10	WS102	VOC	1.50-1.80	SOIL	Sample on Hold				
11	WS102	1 kg	3.10-3.30	SOIL					
12	WS102	VOC	3.10-3.30	SOIL	Sample on Hold				
13	WS104	1 kg	0.60	SOIL	7	7	7	7	7
14	WS104	VOC	0.60	SOIL					
15	WS104	1 kg	1.70	SOIL					
16	WS104	VOC	1.70	SOIL	Sample on Hold				
17	WS105	1 kg	0.70-1.00	SOIL					
18	WS105	VOC	0.70-1.00	SOIL					
19	WS106	1 kg	0.50-0.80	SOIL					
20	WS106	VOC	0.50-0.80	SOIL					
21	WS106	1 kg	1.30-1.50	SOIL					
22	WS106	VOC	1.30-1.50	SOIL	Sample on Hold				

Checked By

Name : Anneli Fryer

Printed : 27/05/02 11:01:25

ALcontrol Geochem TEST SCHEDULE

JOB NUMBER : 02/3344/02 **BATCH NUMBER :** 1
CLIENT : Carl Bro Ltd **CLIENT REF/CODE :** 73.1340.04
CONTACT : Virginia Clydesdale **ORDER NUMBER :**
DATE OF RECEIPT : 27/03/02 **TURNAROUND :** 10 days
LOCATION : Cwmbran

Numeric values indicate additional scheduling

* Indicates test subcontracted

				UKAS Accredited ?						
Sample Number	Sample Identity	P / V	Depth	Sample Type	Cr on leachate	Cu on leachate	Ni on leach.	Pb in leachate	Se in leachate	Zn in leachate
23	WS107	1 kg	0.50-0.80	SOIL	7	7	7	7	7	7
24	WS107	VOC	0.50-0.80	SOIL						
25	WS107	1 kg	1.00-1.40	SOIL						
26	WS107	VOC	1.00-1.40	SOIL						
27	WS108	1 kg	0.55-0.80	SOIL	Sample on Hold	7	7	7	7	7
28	WS108	VOC	0.55-0.80	SOIL						
29	WS108	1 kg	1.40-1.57	SOIL						
30	WS108	VOC	1.40-1.57	SOIL	Sample on Hold	7	7	7	7	7
31	WS108	1 kg	2.10-2.40	SOIL						
32	WS108	VOC	2.10-2.40	SOIL	Sample on Hold	7	7	7	7	7
33	SW1	1glass	UNKNOWN	WATER						
34	SW1	250ml	UNKNOWN	WATER						
35	SW1	H2SO4	UNKNOWN	WATER						
36	SW1	Vial	UNKNOWN	WATER						
37	SW2	1glass	UNKNOWN	WATER						
38	SW2	250ml	UNKNOWN	WATER						
39	SW2	H2SO4	UNKNOWN	WATER						
40	SW2	Vial	UNKNOWN	WATER						
Total Number of Tests					5	5	5	5	5	5

Checked By

Name : Anneli Fryer

Printed : 27/05/02 11:01:25

Table Of Results

Validated

Client Ref. No.: 73.1340.04

Note: METHOD DETECTION LIMITS ARE NOT ALWAYS ACHIEVABLE DUE TO VARIOUS CIRCUMSTANCES BEYOND OUR CONTROL.

NFP = NO FIBRES PRESENT

Pam Hudson

ALcontrol Geochem Analytical Services

Table Of Results

☐ Preliminary
☒ Validated

Job Number: 02/03344/02/02
Client: Carl Bro Ltd
Date of Receipt: 27/03/02
(of first sample)

Sample Type: SOIL
Location: Cwmbran
Client Contact: Virginia Clydesdale
Client Ref. No.: 73.1340.04

UKAS Accredited		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
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Note: METHOD DETECTION LIMITS ARE NOT ALWAYS ACHIEVABLE DUE TO VARIOUS CIRCUMSTANCES BEYOND OUR CONTROL.

Checked By  Pam Hudson

NDP = NO DETERMINATION POSSIBLE
NFP = NO FIBRES PRESENT

Validated

Job Number:

Client:

Date of Receipt:

(of first sample)

NDP = NO DETERMINATION POSSIBLE

NFP = NO FIBRES PRESENT

Pam Hudson

Checked By

Note: METHOD DETECTION LIMITS ARE NOT ALWAYS ACHIEVABLE DUE TO VARIOUS CIRCUMSTANCES BEYOND OUR CONTROL.

ALcontrol Geochem Analytical Services

Table Of Results

☐ Preliminary

☒ Validated

Job Number: 02/03344/02/02
Client: Carl Bro Ltd
Date of Receipt: 27/03/02
 (of first sample)

Sample Type: WATER
Location: Cwmbran
Client Contact: Virginia Clydesdale
Client Ref. No.: 73.1340.04

Sample Number	Sample Identity	Depth (m)	UKAS Accredited														Total Cyanide on Water		
			Units																
			Detection Method																
Method Detection Limit			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
			ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm		
			ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	Spectro	Spectro		
			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05		
			Arsenic																
33		UNKNOWN	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05		
34		UNKNOWN	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05		
37		UNKNOWN	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05		
38		UNKNOWN	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05		
			Cadmium																
			<0.05																
			Boron																
			<0.05																
			Lead																
			<0.05																
			Selenium																
			<0.05																
			Zinc																
			<0.05																
			Hexavalent Chrome																
			<0.03																
			Formaldehyde																
			<0.5																
			Sulphide In Water																
			0.02																
			Sulphate (soluble)																
			110																
			Thiocyanate																
			<0.2																

NDP = NO DETERMINATION POSSIBLE
NFP = NO FIBRES PRESENT

Pam Hudson

Checked By

Note: METHOD DETECTION LIMITS ARE NOT ALWAYS ACHIEVABLE DUE TO VARIOUS CIRCUMSTANCES BEYOND OUR CONTROL.

☐ Preliminary

☒ Validated

Job Number:	02/03344/02/02	Sample Type:	WATER
Client:	Carl Bro Ltd	Location:	Cwmbran
Date of Receipt:	27/03/02	Client Contact:	Virginia Clydesdale
(of first sample)		Client Ref. No.:	73.1340.04

NDP = NO DETERMINATION POSSIBLE
NFP = NO FIBRES PRESENT

Pam Hudson

Checked By

Note: METHOD DETECTION LIMITS ARE NOT ALWAYS ACHIEVABLE DUE TO VARIOUS/CIRCUMSTANCES BEYOND OUR CONTROL.

C5C-5C HDL-polyols Speciated

By GC

Client: Carl Bro Ltd

Location: Cwmbran

Geochem Job No: 02/03344/02/01

Matrix: SOIL.

Units: $\mu\text{g}/\text{kg}$ [illegible]

*TPH is the sum of Aliphatics and Aromatics (C5-C35)

Diesel Range Organics by GC

Client : Carl Bro Ltd

Sample Type : WATER

Units : $\mu\text{g/l}$ Job Number: 02/03344/02/02

Diesel Range Organics by GC

Units : mg/kg

[illegible]

ALcontrol Geochem

BTEX (MTBE) Analysis by GC

Job Number : 02/03344/02/01

Client : Carl Bro Ltd

Ref : 73.1340.04

Sample Type : SOIL

Units : $\mu\text{g/kg}$ [illegible]

ALcontrol Geochem

Job Number : 02/03344/02/01

Client : Carl Bro Ltd

Ref : 73.1340.04

Method :	PAH by GCMS					
Sample Type :	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Units :	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
Depth :	0.45-0.6	1.25-1.5	2.7-2.9	0.85-1.0	1.5-1.8	3.1-3.3
Sample Identity :	WS101	WS101	WS101	WS102	WS102	WS102
Sample Number :	1	3	5	7	9	11

CAS N°	Compound	Cone	Cone	Cone	Cone	Cone	Cone
20-3	Naphthalene	306	542	75	505	484	358
98-96-8	Acenaphthylene	25	39	6	44	18	19
83-32-9	Acenaphthene	68	93	23	119	84	51
86-73-7	Fluorene	39	80	19	100	56	48
85-01-8	Phenanthrene	171	658	64	700	290	356
120-12-7	Anthracene	38	65	14	76	25	24
206-44-0	Fluoranthene	233	184	30	142	53	47
129-00-0	Pyrene	193	174	26	136	57	52
56-55-3	Benz(a)anthracene	133	215	14	126	39	43
218-01-9	Chrysene	197	266	22	229	100	99
205-99-2	Benzo(b)fluoranthene	142	266	13	40	15	36
207-08-9	Benzo(k)fluoranthene	139	66	14	99	31	28
50-32-8	Benzo(a)pyrene	139	86	11	141	45	49
193-39-5	Indeno(123cd)pyrene	138	65	12	71	23	29
53-70-3	Dibenzo(ah)anthracene	67	44	14	54	18	42
191-24-2	Benzo(ghi)perylene	134	132	10	140	28	40
Total 16 PAH		2161	2974	367	2723	1364	1322

ALcontrol Geochem

Job Number : 02/03344/02/01

Client : Carl Bro Ltd

Ref : 73.1340.04

Method :		PAH by GCMS					
Sample Type :		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Units :		µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
Depth :		0.6	1.7	0.7-1.0	0.5-0.8	1.3-1.5	0.5-0.8
Sample Identity :		WS104	WS104	WS105	WS106	WS106	WS107
Sample Number :		13	15	17	19	21	23
CAS N ^o	Compound	Conc	Conc	Conc	Conc	Conc	Conc
20-3	Naphthalene	188	143	407	164	474	580
78-96-8	Acenaphthylene	36	15	12	10	71	101
83-32-9	Acenaphthene	54	36	98	52	154	156
86-73-7	Fluorene	109	36	79	49	138	122
85-01-8	Phenanthrene	634	57	216	134	1116	1811
120-12-7	Anthracene	157	13	32	28	271	387
206-44-0	Fluoranthene	563	29	106	108	1627	2247
129-00-0	Pyrene	350	20	70	91	1159	1734
56-55-3	Benz(a)anthracene	201	12	14	54	726	975
218-01-9	Chrysene	287	22	47	70	1010	1350
205-99-2	Benzo(b)fluoranthene	421	26	51	49	990	1784
207-08-9	Benzo(k)fluoranthene	171	11	23	48	771	1287
50-32-8	Benzo(a)pyrene	216	11	33	53	1230	1313
193-39-5	Indeno(123cd)pyrene	156	12	19	47	820	1063
53-70-3	Dibenzo(ah)anthracene	58	9	13	26	450	458
191-24-2	Benzo(ghi)perylene	149	10	24	48	758	893
Total 16 PAH		3749	464	1244	1030	11765	16262

ALcontrol Geochem

Job Number : 02/03344/02/01

Client : Carl Bro Ltd

Ref : 73.1340.04

Method :		PAH by GCMS					
Sample Type :		SOIL	SOIL	SOIL	SOIL		
Units :		µg/kg	µg/kg	µg/kg	µg/kg		
Depth :		1.0-1.4	0.55-0.8	1.4-1.57	2.10-2.4		
Sample Identity :		WS107	WS108	WS108	WS108		
Sample Number :		25	27	29	31		
CAS N°	Compound	Conc	Conc	Conc	Conc	Conc	Conc
1-20-3	Naphthalene	180	816	1097	269		
1-23-8	Acenaphthylene	1273	75	67	18		
83-32-9	Acenaphthene	46	198	219	51		
86-73-7	Fluorene	126	184	146	41		
85-01-8	Phenanthrene	128	856	1006	169		
120-12-7	Anthracene	25	139	62	12		
206-44-0	Fluoranthene	76	831	128	21		
129-00-0	Pyrene	54	632	139	21		
56-55-3	Benzo(a)anthracene	26	476	135	11		
218-01-9	Chrysene	45	646	257	41		
205-99-2	Benzo(b)fluoranthene	92	475	223	27		
207-08-9	Benzo(k)fluoranthene	17	406	36	13		
50-32-8	Benzo(a)pyrene	21	526	79	15		
193-39-5	Indeno(123cd)pyrene	17	350	26	6		
53-70-3	Dibenzo(ah)anthracene	11	171	25	6		
191-24-2	Benzo(ghi)perylene	17	348	79	12		
Total 16 PAH		2154	7130	3725	733		

ALcontrol Geochem

Job Number : 02/03344/02/01

Client : Cari Bro Ltd

Ref : 73.1340.04

Method :		PAH by GCMS					
Sample Type :		WATER	WATER				
Units :		ng/l	ng/l				
Depth :							
Sample Identity :		SW1	SW2				
Sample Number :		33	37				
CAS N°	Compound	Conc	Conc	Conc	Conc	Conc	Conc
20-3	Naphthalene	<10	<10				
8-96-8	Acenaphthylene	<10	<10				
83-32-9	Acenaphthene	<10	<10				
86-73-7	Fluorene	<10	<10				
85-01-8	Phenanthrene	<10	<10				
120-12-7	Anthracene	<10	<10				
206-44-0	Fluoranthene	<10	<10				
129-00-0	Pyrene	<10	<10				
56-55-3	Benz(a)anthracene	<10	<10				
218-01-9	Chrysene	<10	<10				
205-99-2	Benzo(b)fluoranthene	<10	<10				
207-08-9	Benzo(k)fluoranthene	<10	<10				
50-32-8	Benzo(a)pyrene	<10	<10				
193-39-5	Indeno(123cd)pyrene	<10	<10				
53-70-3	Dibenzo(ah)anthracene	<10	<10				
191-24-2	Benzo(ghi)perylene	<10	<10				
Total 16 PAH		<10	<10				

ALcontrol Geochem Analytical Services

Semivolatile Organic Compounds

Sample Identity - 200203344-003/WS101/1.25-1.50

Client / Sample matrix - carl bro/soil

Date Acquired - 11/Apr/2002

Units - µg/kg

CAS Number	Compound	Concn.	CAS Number	Compound	Concn.
108-95-2	Phenol	<100	207-08-9	Benzo(k)fluoranthene	<100
95-57-8	2-Chlorophenol	<100	50-32-8	Benzo(a)pyrene	<100
95-48-7	2-Methylphenol	<100	193-39-5	Indeno(1,2,3-cd)pyrene	<100
106-44-5	4-Methylphenol	<100	53-70-3	Dibenzo(a,h)anthracene	<100
88-75-5	2-Nitrophenol	<100	191-24-2	Benzo(ghi)perylene	<100
100-02-7	4-Nitrophenol	<100	91-58-7	2-Chloronaphthalene	<100
120-83-2	2,4-Dichlorophenol	<100	91-57-6	2-Methylnaphthalene	<100
105-67-9	2,4-Dimethylphenol	<100	86-74-8	Carbazole	<100
59-50-7	4-Chloro-3-methylphenol	<100	78-59-1	Isophorone	<100
88-06-2	2,4,6-Trichlorophenol	<100	132-64-9	Dibenzofuran	<100
95-95-4	2,4,5-Trichlorophenol	<100	131-11-3	Dimethyl phthalate	<100
87-86-5	Pentachlorophenol	<100	84-66-2	Diethyl phthalate	<100
541-73-1	1,3-Dichlorobenzene	<100	84-74-2	Di-n-butylphthalate	<100
106-46-7	1,4-Dichlorobenzene	<100	117-84-0	Di-n-octylphthalate	<100
95-50-1	1,2-Dichlorobenzene	<100	117-81-7	Bis(2-ethylhexyl)phthalate	<100
120-82-1	1,2,4-Trichlorobenzene	<100	85-68-7	Butylbenzylphthalate	<100
98-95-3	Nitrobenzene	<100	106-47-8	4-Chloroaniline	<100
103-33-3	Azobenzene	<100	88-74-4	2-Nitroaniline	<100
118-74-1	Hexachlorobenzene	<100	99-09-2	3-Nitroaniline	<100
91-20-3	Naphthalene	<100	100-01-6	4-Nitroaniline	<100
208-96-8	Acenaphthylene	<100	121-14-2	2,4-Dinitrotoluene	<100
83-32-9	Acenaphthene	<100	606-20-2	2,6-Dinitrotoluene	<100
86-73-7	Fluorene	<100	111-44-4	Bis(2-chloroethyl)ether	<100
85-01-8	Phenanthrene	<100	101-55-3	4-Bromophenylphenylether	<100
120-12-7	Anthracene	<100	7005-72-3	4-Chlorophenylphenylether	<100
206-44-0	Fluoranthene	<100	67-72-1	Hexachloroethane	<100
129-00-0	Pyrene	<100	87-68-3	Hexachlorobutadiene	<100
56-55-3	Benzo(a)anthracene	<100	77-47-4	Hexchlorocyclopentadiene	<100
218-01-9	Chrysene	<100	111-91-1	Bis(2-chloroethoxy)methane	<100
205-99-2	Benzo(b)fluoranthene	<100	621-64-7	N-nitrosodi-n-propylamine	<100

ALcontrol Geochem Analytical Services

Semivolatile Organic Compounds

Sample Identity - 200203344-007/WS102/0.85-1.0

Client / Sample matrix - CARL BRO LTD/SOIL

Date Acquired - 7/Apr/2002

Units - µg/kg

CAS Number	Compound	Concn.	CAS Number	Compound	Concn.
108-95-2	Phenol	<100	207-08-9	Benzo(k)fluoranthene	<100
95-57-8	2-Chlorophenol	<100	50-32-8	Benzo(a)pyrene	<100
95-48-7	2-Methylphenol	<100	193-39-5	Indeno(1,2,3-cd)pyrene	<100
106-44-5	4-Methylphenol	<100	53-70-3	Dibenzo(a,h)anthracene	<100
88-75-5	2-Nitrophenol	<100	191-24-2	Benzo(ghi)perylene	<100
100-02-7	4-Nitrophenol	<100	91-58-7	2-Chloronaphthalene	<100
120-83-2	2,4-Dichlorophenol	<100	91-57-6	2-Methylnaphthalene	126
105-67-9	2,4-Dimethylphenol	<100	86-74-8	Carbazole	<100
59-50-7	4-Chloro-3-methylphenol	<100	78-59-1	Isophorone	<100
88-06-2	2,4,6-Trichlorophenol	<100	132-64-9	Dibenzofuran	<100
95-95-4	2,4,5-Trichlorophenol	<100	131-11-3	Dimethyl phthalate	<100
87-86-5	Pentachlorophenol	<100	84-66-2	Diethyl phthalate	<100
541-73-1	1,3-Dichlorobenzene	<100	84-74-2	Di-n-butylphthalate	<100
106-46-7	1,4-Dichlorobenzene	<100	117-84-0	Di-n-octylphthalate	<100
95-50-1	1,2-Dichlorobenzene	<100	117-81-7	Bis(2-ethylhexyl)phthalate	261
120-82-1	1,2,4-Trichlorobenzene	<100	85-68-7	Butylbenzylphthalate	<100
98-95-3	Nitrobenzene	<100	106-47-8	4-Chloroaniline	<100
103-33-3	Azobenzene	<100	88-74-4	2-Nitroaniline	<100
118-74-1	Hexachlorobenzene	<100	99-09-2	3-Nitroaniline	<100
91-20-3	Naphthalene	<100	100-01-6	4-Nitroaniline	<100
208-96-8	Acenaphthylene	<100	121-14-2	2,4-Dinitrotoluene	<100
83-32-9	Acenaphthene	<100	606-20-2	2,6-Dinitrotoluene	<100
86-73-7	Fluorene	<100	111-44-4	Bis(2-chloroethyl)ether	<100
85-01-8	Phenanthrene	136	101-55-3	4-Bromophenylphenylether	<100
120-12-7	Anthracene	<100	7005-72-3	4-Chlorophenylphenylether	<100
206-44-0	Fluoranthene	<100	67-72-1	Hexachloroethane	<100
129-00-0	Pyrene	<100	87-68-3	Hexachlorobutadiene	<100
56-55-3	Benzo(a)anthracene	<100	77-47-4	Hexchlorocyclopentadiene	<100
218-01-9	Chrysene	<100	111-91-1	Bis(2-chloroethoxy)methane	<100
205-99-2	Benzo(b)fluoranthene	<100	621-64-7	N-nitrosodi-n-propylamine	<100

Tentatively Identified Compounds

Sample Identity - 3344-007/WS102 0.85-1.0
Client / Sample matrix - Carl Bro Ltd/soil
Units - µg/kg

Compound	RetentionTime min	Concentration µg/kg
C16-30 Hydrocarbons	14.860	14860

ALcontrol Geochem Analytical Services

Semivolatile Organic Compounds

Sample Identity - 200203344-017/WS105/0.7-1.0
 Client / Sample matrix - CARL BRO LTD/SOIL
 Date Acquired - 7/Apr/2002
 Units - µg/kg

CAS Number	Compound	Concn.	CAS Number	Compound	Concn.
108-95-2	Phenol	<100	207-08-9	Benzo(k)fluoranthene	<100
95-57-8	2-Chlorophenol	<100	50-32-8	Benzo(a)pyrene	<100
95-48-7	2-Methylphenol	<100	193-39-5	Indeno(1,2,3-cd)pyrene	<100
106-44-5	4-Methylphenol	<100	53-70-3	Dibenzo(a,h)anthracene	<100
88-75-5	2-Nitrophenol	<100	191-24-2	Benzo(ghi)perylene	<100
100-02-7	4-Nitrophenol	<100	91-58-7	2-Chloronaphthalene	<100
120-83-2	2,4-Dichlorophenol	<100	91-57-6	2-Methylnaphthalene	<100
105-67-9	2,4-Dimethylphenol	<100	86-74-8	Carbazole	<100
59-50-7	4-Chloro-3-methylphenol	<100	78-59-1	Isophorone	<100
88-06-2	2,4,6-Trichlorophenol	<100	132-64-9	Dibenzofuran	<100
95-95-4	2,4,5-Trichlorophenol	<100	131-11-3	Dimethyl phthalate	<100
87-86-5	Pentachlorophenol	<100	84-66-2	Diethyl phthalate	<100
541-73-1	1,3-Dichlorobenzene	<100	84-74-2	Di-n-butylphthalate	<100
106-46-7	1,4-Dichlorobenzene	<100	117-84-0	Di-n-octylphthalate	<100
95-50-1	1,2-Dichlorobenzene	<100	117-81-7	Bis(2-ethylhexyl)phthalate	<100
120-82-1	1,2,4-Trichlorobenzene	<100	85-68-7	Butylbenzylphthalate	<100
98-95-3	Nitrobenzene	<100	106-47-8	4-Chloroaniline	<100
103-33-3	Azobenzene	<100	88-74-4	2-Nitroaniline	<100
118-74-1	Hexachlorobenzene	<100	99-09-2	3-Nitroaniline	<100
91-20-3	Naphthalene	<100	100-01-6	4-Nitroaniline	<100
208-96-8	Acenaphthylene	<100	121-14-2	2,4-Dinitrotoluene	<100
83-32-9	Acenaphthene	<100	606-20-2	2,6-Dinitrotoluene	<100
86-73-7	Fluorene	<100	111-44-4	Bis(2-chloroethyl)ether	<100
85-01-8	Phenanthrene	<100	101-55-3	4-Bromophenylphenylether	<100
120-12-7	Anthracene	<100	7005-72-3	4-Chlorophenylphenylether	<100
206-44-0	Fluoranthene	<100	67-72-1	Hexachloroethane	<100
129-00-0	Pyrene	<100	87-68-3	Hexachlorobutadiene	<100
56-55-3	Benzo(a)anthracene	<100	77-47-4	Hexchlorocyclopentadiene	<100
218-01-9	Chrysene	<100	111-91-1	Bis(2-chloroethoxy)methane	<100
205-99-2	Benzo(b)fluoranthene	<100	621-64-7	N-nitrosodi-n-propylamine	<100

Tentatively Identified Compounds

Sample Identity - 3344-017/WS105 0.7-1.0
Client / Sample matrix - Carl Bro Ltd / Soil
Units - µg/kg

Compound	RetentionTime min	Concentration µg/kg
C16-26 Hydrocarbons	4170	

ALcontrol Geochem Analytical Services

Semivolatile Organic Compounds

Sample Identity - 200203344-019/WS106/0.5-0.8

Client / Sample matrix - CARL BRO LTD/SOIL

Date Acquired - 7/Apr/2002

Units - µg/kg

CAS Number	Compound	Concn.	CAS Number	Compound	Concn.
108-95-2	Phenol	<100	207-08-9	Benzo(k)fluoranthene	<100
95-57-8	2-Chlorophenol	<100	50-32-8	Benzo(a)pyrene	<100
95-48-7	2-Methylphenol	<100	193-39-5	Indeno(1,2,3-cd)pyrene	<100
106-44-5	4-Methylphenol	<100	53-70-3	Dibenzo(a,h)anthracene	<100
88-75-5	2-Nitrophenol	<100	191-24-2	Benzo(ghi)perylene	<100
100-02-7	4-Nitrophenol	<100	91-58-7	2-Chloronaphthalene	<100
120-83-2	2,4-Dichlorophenol	<100	91-57-6	2-Methylnaphthalene	<100
105-67-9	2,4-Dimethylphenol	<100	86-74-8	Carbazole	<100
59-50-7	4-Chloro-3-methylphenol	<100	78-59-1	Isophorone	<100
88-06-2	2,4,6-Trichlorophenol	<100	132-64-9	Dibenzofuran	<100
95-95-4	2,4,5-Trichlorophenol	<100	131-11-3	Dimethyl phthalate	<100
87-86-5	Pentachlorophenol	<100	84-66-2	Diethyl phthalate	<100
541-73-1	1,3-Dichlorobenzene	<100	84-74-2	Di-n-butylphthalate	111
106-46-7	1,4-Dichlorobenzene	<100	117-84-0	Di-n-octylphthalate	<100
95-50-1	1,2-Dichlorobenzene	<100	117-81-7	Bis(2-ethylhexyl)phthalate	168
120-82-1	1,2,4-Trichlorobenzene	<100	85-68-7	Butylbenzylphthalate	<100
98-95-3	Nitrobenzene	<100	106-47-8	4-Chloroaniline	<100
103-33-3	Azobenzene	<100	88-74-4	2-Nitroaniline	<100
118-74-1	Hexachlorobenzene	<100	99-09-2	3-Nitroaniline	<100
91-20-3	Naphthalene	<100	100-01-6	4-Nitroaniline	<100
208-96-8	Acenaphthylene	<100	121-14-2	2,4-Dinitrotoluene	<100
83-32-9	Acenaphthene	<100	606-20-2	2,6-Dinitrotoluene	<100
86-73-7	Fluorene	<100	111-44-4	Bis(2-chloroethyl)ether	<100
85-01-8	Phenanthrene	<100	101-55-3	4-Bromophenylphenylether	<100
120-12-7	Anthracene	<100	7005-72-3	4-Chlorophenylphenylether	<100
206-44-0	Fluoranthene	<100	67-72-1	Hexachloroethane	<100
129-00-0	Pyrene	<100	87-68-3	Hexachlorobutadiene	<100
56-55-3	Benzo(a)anthracene	<100	77-47-4	Hexchlorocyclopentadiene	<100
218-01-9	Chrysene	<100	111-91-1	Bis(2-chloroethoxy)methane	<100
205-99-2	Benzo(b)fluoranthene	<100	621-64-7	N-nitrosodi-n-propylamine	<100

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Tentatively Identified Compounds

Sample Identity - 3344-019/WS106 0.5-0.8
Client / Sample matrix - Carl Bro Ltd / Soil
Units - µg/kg

Compound	RetentionTime min	Concentration µg/kg
C16-26 Hydrocarbons	-	8530

ALcontrol Geochem Analytical Services

Semivolatile Organic Compounds

Sample Identity - 200203344-021/WS106/1.3-1.5

Client / Sample matrix - CARL BRO LTD/SOIL

Date Acquired - 7/Apr/2002

Units - µg/kg

CAS Number	Compound	Concn.	CAS Number	Compound	Concn.
108-95-2	Phenol	<100	207-08-9	Benzo(k)fluoranthene	249
95-57-8	2-Chlorophenol	<100	50-32-8	Benzo(a)pyrene	293
95-48-7	2-Methylphenol	<100	193-39-5	Indeno(1,2,3-cd)pyrene	208
106-44-5	4-Methylphenol	<100	53-70-3	Dibenzo(a,h)anthracene	111
88-75-5	2-Nitrophenol	<100	191-24-2	Benzo(ghi)perylene	231
100-02-7	4-Nitrophenol	<100	91-58-7	2-Chloronaphthalene	<100
120-83-2	2,4-Dichlorophenol	<100	91-57-6	2-Methylnaphthalene	<100
105-67-9	2,4-Dimethylphenol	<100	86-74-8	Carbazole	<100
59-50-7	4-Chloro-3-methylphenol	<100	78-59-1	Isophorone	<100
88-06-2	2,4,6-Trichlorophenol	<100	132-64-9	Dibenzofuran	<100
95-95-4	2,4,5-Trichlorophenol	<100	131-11-3	Dimethyl phthalate	<100
87-86-5	Pentachlorophenol	<100	84-66-2	Diethyl phthalate	<100
541-73-1	1,3-Dichlorobenzene	<100	84-74-2	Di-n-butylphthalate	<100
106-46-7	1,4-Dichlorobenzene	<100	117-84-0	Di-n-octylphthalate	<100
95-50-1	1,2-Dichlorobenzene	<100	117-81-7	Bis(2-ethylhexyl)phthalate	225
120-82-1	1,2,4-Trichlorobenzene	<100	85-68-7	Butylbenzylphthalate	<100
98-95-3	Nitrobenzene	<100	106-47-8	4-Chloroaniline	<100
103-33-3	Azobenzene	<100	88-74-4	2-Nitroaniline	<100
118-74-1	Hexachlorobenzene	<100	99-09-2	3-Nitroaniline	<100
91-20-3	Naphthalene	<100	100-01-6	4-Nitroaniline	<100
208-96-8	Acenaphthylene	<100	121-14-2	2,4-Dinitrotoluene	<100
83-32-9	Acenaphthene	<100	606-20-2	2,6-Dinitrotoluene	<100
86-73-7	Fluorene	<100	111-44-4	Bis(2-chloroethyl)ether	<100
85-01-8	Phenanthrene	269	101-55-3	4-Bromophenylphenylether	<100
120-12-7	Anthracene	<100	7005-72-3	4-Chlorophenylphenylether	<100
206-44-0	Fluoranthene	468	67-72-1	Hexachloroethane	<100
129-00-0	Pyrene	352	87-68-3	Hexachlorobutadiene	<100
56-55-3	Benzo(a)anthracene	329	77-47-4	Hexchlorocyclopentadiene	<100
218-01-9	Chrysene	342	111-91-1	Bis(2-chloroethoxy)methane	<100
205-99-2	Benzo(b)fluoranthene	305	621-64-7	N-nitrosodi-n-propylamine	<100

Tentatively Identified Compounds

Sample Identity - 3344-021/WS106 1.3-1.5
Client / Sample matrix - Carl Bro Ltd / Soil
Units - µg/kg

Compound	RetentionTime min	Concentration µg/kg
C10-30 Hydrocarbons	-	14870
Molecular Sulphur	23.13	780

ALcontrol Geochem Analytical Services

Semivolatile Organic Compounds

Sample Identity - 200203344-023/WS107/0.5-0.8

Client / Sample matrix - CARL BRO LTD/SOIL

Date Acquired - 7/Apr/2002

Units - µg/kg

CAS Number	Compound	Concn.	CAS Number	Compound	Concn.
108-95-2	Phenol	<100	207-08-9	Benzo(k)fluoranthene	105
95-57-8	2-Chlorophenol	<100	50-32-8	Benzo(a)pyrene	142
95-48-7	2-Methylphenol	<100	193-39-5	Indeno(1,2,3-cd)pyrene	113
106-44-5	4-Methylphenol	<100	53-70-3	Dibenzo(a,h)anthracene	<100
88-75-5	2-Nitrophenol	<100	191-24-2	Benzo(ghi)perylene	110
100-02-7	4-Nitrophenol	<100	91-58-7	2-Chloronaphthalene	<100
120-83-2	2,4-Dichlorophenol	<100	91-57-6	2-Methylnaphthalene	<100
105-67-9	2,4-Dimethylphenol	<100	86-74-8	Carbazole	<100
59-50-7	4-Chloro-3-methylphenol	<100	78-59-1	Isophorone	<100
88-06-2	2,4,6-Trichlorophenol	<100	132-64-9	Dibenzofuran	<100
95-95-4	2,4,5-Trichlorophenol	<100	131-11-3	Dimethyl phthalate	<100
87-86-5	Pentachlorophenol	<100	84-66-2	Diethyl phthalate	<100
541-73-1	1,3-Dichlorobenzene	<100	84-74-2	Di-n-butylphthalate	<100
106-46-7	1,4-Dichlorobenzene	<100	117-84-0	Di-n-octylphthalate	<100
95-50-1	1,2-Dichlorobenzene	<100	117-81-7	Bis(2-ethylhexyl)phthalate	231
120-82-1	1,2,4-Trichlorobenzene	<100	85-68-7	Butylbenzylphthalate	<100
98-95-3	Nitrobenzene	<100	106-47-8	4-Chloroaniline	<100
103-33-3	Azobenzene	<100	88-74-4	2-Nitroaniline	<100
118-74-1	Hexachlorobenzene	<100	99-09-2	3-Nitroaniline	<100
91-20-3	Naphthalene	<100	100-01-6	4-Nitroaniline	<100
208-96-8	Acenaphthylene	<100	121-14-2	2,4-Dinitrotoluene	<100
83-32-9	Acenaphthene	<100	606-20-2	2,6-Dinitrotoluene	<100
86-73-7	Fluorene	<100	111-44-4	Bis(2-chloroethyl)ether	<100
85-01-8	Phenanthrene	104	101-55-3	4-Bromophenylphenylether	<100
120-12-7	Anthracene	<100	7005-72-3	4-Chlorophenylphenylether	<100
206-44-0	Fluoranthene	192	67-72-1	Hexachloroethane	<100
129-00-0	Pyrene	156	87-68-3	Hexachlorobutadiene	<100
56-55-3	Benzo(a)anthracene	122	77-47-4	Hexachlorocyclopentadiene	<100
218-01-9	Chrysene	151	111-91-1	Bis(2-chloroethoxy)methane	<100
205-99-2	Benzo(b)fluoranthene	150	621-64-7	N-nitrosodi-n-propylamine	<100

ALcontrol Geochem

Tentatively Identified Compounds

Sample Identity - 3344-023/WS107 0.5-0.8
Client / Sample matrix - Carl Bro Ltd / Soil
Units - µg/kg

Compound	RetentionTime min	Concentration µg/kg
C16-30 Hydrocarbons	-	9760

ALcontrol Geochem Analytical Services

Semivolatile Organic Compounds

Sample Identity - 200203344-027/WS108/0.55-0.8
 Client / Sample matrix - CARL BRO LTD/SOIL
 Date Acquired - 7/Apr/2002
 Units - µg/kg

CAS Number	Compound	Concn.	CAS Number	Compound	Concn.
108-95-2	Phenol	<100	207-08-9	Benzo(k)fluoranthene	<100
95-57-8	2-Chlorophenol	<100	50-32-8	Benzo(a)pyrene	<100
95-48-7	2-Methylphenol	<100	193-39-5	Indeno(1,2,3-cd)pyrene	<100
106-44-5	4-Methylphenol	<100	53-70-3	Dibenzo(a,h)anthracene	<100
88-75-5	2-Nitrophenol	<100	191-24-2	Benzo(ghi)perylene	<100
100-02-7	4-Nitrophenol	<100	91-58-7	2-Chloronaphthalene	<100
120-83-2	2,4-Dichlorophenol	<100	91-57-6	2-Methylnaphthalene	<100
105-67-9	2,4-Dimethylphenol	<100	86-74-8	Carbazole	<100
59-50-7	4-Chloro-3-methylphenol	<100	78-59-1	Isophorone	<100
88-06-2	2,4,6-Trichlorophenol	<100	132-64-9	Dibenzofuran	<100
95-95-4	2,4,5-Trichlorophenol	<100	131-11-3	Dimethyl phthalate	<100
87-86-5	Pentachlorophenol	<100	84-66-2	Diethyl phthalate	<100
541-73-1	1,3-Dichlorobenzene	<100	84-74-2	Di-n-butylphthalate	<100
106-46-7	1,4-Dichlorobenzene	<100	117-84-0	Di-n-octylphthalate	<100
95-50-1	1,2-Dichlorobenzene	<100	117-81-7	Bis(2-ethylhexyl)phthalate	103
120-82-1	1,2,4-Trichlorobenzene	<100	85-68-7	Butylbenzylphthalate	<100
98-95-3	Nitrobenzene	<100	106-47-8	4-Chloroaniline	<100
103-33-3	Azobenzene	<100	88-74-4	2-Nitroaniline	<100
118-74-1	Hexachlorobenzene	<100	99-09-2	3-Nitroaniline	<100
91-20-3	Naphthalene	<100	100-01-6	4-Nitroaniline	<100
208-96-8	Acenaphthylene	<100	121-14-2	2,4-Dinitrotoluene	<100
83-32-9	Acenaphthene	<100	606-20-2	2,6-Dinitrotoluene	<100
86-73-7	Fluorene	<100	111-44-4	Bis(2-chloroethyl)ether	<100
85-01-8	Phenanthrene	<100	101-55-3	4-Bromophenylphenylether	<100
120-12-7	Anthracene	<100	7005-72-3	4-Chlorophenylphenylether	<100
206-44-0	Fluoranthene	<100	67-72-1	Hexachloroethane	<100
129-00-0	Pyrene	<100	87-68-3	Hexachlorobutadiene	<100
56-55-3	Benzo(a)anthracene	<100	77-47-4	Hexachlorocyclopentadiene	<100
218-01-9	Chrysene	<100	111-91-1	Bis(2-chloroethoxy)methane	<100
205-99-2	Benzo(b)fluoranthene	<100	621-64-7	N-nitrosodi-n-propylamine	<100

ALcontrol Geochem Analytical Services

Semivolatile Organic Compounds

Sample Identity - 200203344-033/sw1

Client / Sample matrix - carl bro/water

Date Acquired - 11/Apr/2002

Units - µg/l

CAS Number	Compound	Concn.	CAS Number	Compound	Concn.
108-95-2	Phenol	<1	207-08-9	Benzo(k)fluoranthene	<1
95-57-8	2-Chlorophenol	<1	50-32-8	Benzo(a)pyrene	<1
95-48-7	2-Methylphenol	<1	193-39-5	Indeno(1,2,3-cd)pyrene	<1
106-44-5	4-Methylphenol	<1	53-70-3	Dibenzo(a,h)anthracene	<1
88-75-5	2-Nitrophenol	<1	191-24-2	Benzo(ghi)perylene	<1
100-02-7	4-Nitrophenol	<1	91-58-7	2-Chloronaphthalene	<1
120-83-2	2,4-Dichlorophenol	<1	91-57-6	2-Methylnaphthalene	<1
105-67-9	2,4-Dimethylphenol	<1	86-74-8	Carbazole	<1
59-50-7	4-Chloro-3-methylphenol	<1	78-59-1	Isophorone	<1
88-06-2	2,4,6-Trichlorophenol	<1	132-64-9	Dibenzofuran	<1
95-95-4	2,4,5-Trichlorophenol	<1	131-11-3	Dimethyl phthalate	<1
87-86-5	Pentachlorophenol	<1	84-66-2	Diethyl phthalate	<1
541-73-1	1,3-Dichlorobenzene	<1	84-74-2	Di-n-butylphthalate	<1
106-46-7	1,4-Dichlorobenzene	<1	117-84-0	Di-n-octylphthalate	<1
95-50-1	1,2-Dichlorobenzene	<1	117-81-7	Bis(2-ethylhexyl)phthalate	<1
120-82-1	1,2,4-Trichlorobenzene	<1	85-68-7	Butylbenzylphthalate	<1
98-95-3	Nitrobenzene	<1	106-47-8	4-Chloroaniline	<1
103-33-3	Azobenzene	<1	88-74-4	2-Nitroaniline	<1
118-74-1	Hexachlorobenzene	<1	99-09-2	3-Nitroaniline	<1
91-20-3	Naphthalene	<1	100-01-6	4-Nitroaniline	<1
208-96-8	Acenaphthylene	<1	121-14-2	2,4-Dinitrotoluene	<1
83-32-9	Acenaphthene	<1	606-20-2	2,6-Dinitrotoluene	<1
86-73-7	Fluorene	<1	111-44-4	Bis(2-chloroethyl)ether	<1
85-01-8	Phenanthrene	<1	101-55-3	4-Bromophenylphenylether	<1
120-12-7	Anthracene	<1	7005-72-3	4-Chlorophenylphenylether	<1
206-44-0	Fluoranthene	<1	67-72-1	Hexachloroethane	<1
129-00-0	Pyrene	<1	87-68-3	Hexachlorobutadiene	<1
56-55-3	Benzo(a)anthracene	<1	77-47-4	Hexchlorocyclopentadiene	<1
218-01-9	Chrysene	<1	111-91-1	Bis(2-chloroethoxy)methane	<1
205-99-2	Benzo(b)fluoranthene	<1	621-64-7	N-nitrosodi-n-propylamine	<1

ALcontrol Geochem

Tentatively Identified Compounds

Sample Identity - 3344-033/SW1
Client / Sample matrix - Carl Bro Ltd/ water
Units - µg/l

Compound	RetentionTime min	Concentration µg/l
No compounds detected	-	<1

ALcontrol Geochem Analytical Services

Semivolatile Organic Compounds

Sample Identity - 200203344-037/sw2

Client / Sample matrix - carl bro/water

Date Acquired - 11/Apr/2002

Units - µg/l

CAS Number	Compound	Concn.	CAS Number	Compound	Concn.
108-95-2	Phenol	<1	207-08-9	Benzo(k)fluoranthene	<1
95-57-8	2-Chlorophenol	<1	50-32-8	Benzo(a)pyrene	<1
95-48-7	2-Methylphenol	<1	193-39-5	Indeno(1,2,3-cd)pyrene	<1
106-44-5	4-Methylphenol	<1	53-70-3	Dibenzo(a,h)anthracene	<1
88-75-5	2-Nitrophenol	<1	191-24-2	Benzo(ghi)perylene	<1
100-02-7	4-Nitrophenol	<1	91-58-7	2-Chloronaphthalene	<1
120-83-2	2,4-Dichlorophenol	<1	91-57-6	2-Methylnaphthalene	<1
105-67-9	2,4-Dimethylphenol	<1	86-74-8	Carbazole	<1
59-50-7	4-Chloro-3-methylphenol	<1	78-59-1	Isophorone	<1
88-06-2	2,4,6-Trichlorophenol	<1	132-64-9	Dibenzofuran	<1
95-95-4	2,4,5-Trichlorophenol	<1	131-11-3	Dimethyl phthalate	<1
87-86-5	Pentachlorophenol	<1	84-66-2	Diethyl phthalate	<1
541-73-1	1,3-Dichlorobenzene	<1	84-74-2	Di-n-butylphthalate	<1
106-46-7	1,4-Dichlorobenzene	<1	117-84-0	Di-n-octylphthalate	<1
95-50-1	1,2-Dichlorobenzene	<1	117-81-7	Bis(2-ethylhexyl)phthalate	<1
120-82-1	1,2,4-Trichlorobenzene	<1	85-68-7	Butylbenzylphthalate	<1
98-95-3	Nitrobenzene	<1	106-47-8	4-Chloroaniline	<1
103-33-3	Azobenzene	<1	88-74-4	2-Nitroaniline	<1
118-74-1	Hexachlorobenzene	<1	99-09-2	3-Nitroaniline	<1
91-20-3	Naphthalene	<1	100-01-6	4-Nitroaniline	<1
208-96-8	Acenaphthylene	<1	121-14-2	2,4-Dinitrotoluene	<1
83-32-9	Acenaphthene	<1	606-20-2	2,6-Dinitrotoluene	<1
86-73-7	Fluorene	<1	111-44-4	Bis(2-chloroethyl)ether	<1
85-01-8	Phenanthrene	<1	101-55-3	4-Bromophenylphenylether	<1
120-12-7	Anthracene	<1	7005-72-3	4-Chlorophenylphenylether	<1
206-44-0	Fluoranthene	<1	67-72-1	Hexachloroethane	<1
129-00-0	Pyrene	<1	87-68-3	Hexachlorobutadiene	<1
56-55-3	Benzo(a)anthracene	<1	77-47-4	Hexchlorocyclopentadiene	<1
218-01-9	Chrysene	<1	111-91-1	Bis(2-chloroethoxy)methane	<1
205-99-2	Benzo(b)fluoranthene	<1	621-64-7	N-nitrosodi-n-propylamine	<1

Alcontrol Geochem

Tentatively Identified Compounds

Sample Identity - 3344-037/SW2
Client / Sample matrix - Carl Bro Ltd/ water
Units - µg/l

Compound	RetentionTime min	Concentration µg/l
No compounds detected	-	<1

ALcontrol Geochem

Volatile Organic Compounds (EPA 624/8260)

Sample Identity - 3344-004 WS101 1.25-1.5m

Client / Sample matrix - Carl Bro Ltd/Soil

Units - µg/kg

Date Acquired - 6 Apr 2002 14:20

Instrument Name - 90 MSD

CAS No.	Compound	Conc.	CAS No.	Compound	Conc.
75-71-8	Dichlorodifluoromethane	<1	106-93-4	1,2-Dibromoethane	<1
74-87-3	Chloromethane	<1	127-18-4	Tetrachloroethene	<1
75-01-4	Vinyl chloride	<1	630-20-6	1,1,1,2-Tetrachloroethane	<1
74-83-9	Bromomethane	<1	108-90-7	Chlorobenzene	<1
75-00-3	Chloroethane	<1	100-41-4	Ethylbenzene	<1
75-69-4	Trichlorofluoromethane	<1	108-38-3*	p/m-Xylene	<1
156-60-5	trans-1,2-Dichloroethene	<1	75-25-2	Bromoform	<1
75-09-2	Dichloromethane	<1	100-42-5	Styrene	<1
75-15-0	Carbon disulphide	<1	79-34-5	1,1,2,2-Tetrachloroethane	<1
75-35-4	1,1-Dichloroethene	<1	95-47-6	o-Xylene	<1
75-34-3	1,1-Dichloroethane	<1	96-18-4	1,2,3-Trichloropropane	<1
1634-04-4	tert-butyl methyl ether	<1	98-82-8	Isopropylbenzene	<1
156-59-2	cis-1,2-Dichloroethene	<1	108-86-1	Bromobenzene	<1
74-97-5	Bromochloromethane	<1	95-49-8	2-Chlorotoluene	<1
67-66-3	Chloroform	<1	103-65-1	Propylbenzene	<1
594-20-7	2,2-Dichloropropane	<1	106-43-4	4-Chlorotoluene	<1
107-06-2	1,2-Dichloroethane	<1	95-63-6	1,2,4-Trimethylbenzene	<1
71-55-6	1,1,1-Trichloroethane	<1	99-87-6	4-Isopropyltoluene	<1
563-58-6	1,1-Dichloropropene	<1	108-67-8	1,3,5-Trimethylbenzene	<1
71-43-2	Benzene	<1	541-73-1	1,3-Dichlorobenzene	<1
56-23-5	Carbontetrachloride	<1	106-46-7	1,4-Dichlorobenzene	<1
74-95-3	Dibromomethane	<1	135-98-8	sec-Butylbenzene	<1
78-87-5	1,2-Dichloropropane	<1	98-06-6	tert-Butylbenzene	<1
75-27-4	Bromodichloromethane	<1	95-50-1	1,2-Dichlorobenzene	<1
79-01-6	Trichloroethene	<1	104-51-8	n-Butylbenzene	<1
10061-01-5	cis-1,3-Dichloropropene	<1	96-12-8	1,2-Dibromo-3-chloropropane	<1
10061-02-6	trans-1,3-Dichloropropene	<1	120-82-1	1,2,4-Trichlorobenzene	<1
79-00-5	1,1,2-Trichloroethane	<1	91-20-3	Naphthalene	<1
108-88-3	Toluene	<1	87-61-6	1,2,3-Trichlorobenzene	<1
142-28-9	1,3-Dichloropropane	<1	87-68-3	Hexachlorobutadiene	<1
124-48-1	Dibromochloromethane	<1			

N.B. * also CAS No. 106-42-3

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ALcontrol Geochem

Volatile Organic Compounds (EPA 624/8260)

Sample Identity - 3344-008 WS102 0.85-1.0m

Client / Sample matrix - Carl Bro Ltd/Soil

Units - µg/kg

Date Acquired - 6 Apr 2002 10:02

Instrument Name - 00B MSD59

CAS No	Compound	Conc.	CAS No	Compound	Conc.
75-71-8	Dichlorodifluoromethane	<1	106-93-4	1,2-Dibromoethane	<1
74-87-3	Chloromethane	<1	127-18-4	Tetrachloroethene	<1
75-01-4	Vinyl Chloride	<1	630-20-6	1,1,1,2-Tetrachloroethane	<1
74-83-9	Bromomethane	<1	108-90-7	Chlorobenzene	<1
75-00-3	Chloroethane	<1	100-41-4	Ethylbenzene	<1
75-69-4	Trichlorofluoromethane	<1	108-38-3*	p/m-Xylene	<1
156-60-5	trans-1,2-Dichloroethene	<1	75-25-2	Bromoform	<1
75-09-2	Dichloromethane	<1	100-42-5	Styrene	<1
75-15-0	Carbon disulphide	<1	79-34-5	1,1,2,2-Tetrachloroethane	<1
75-35-4	1,1-Dichloroethene	<1	95-47-6	o-Xylene	<1
75-34-3	1,1-Dichloroethane	<1	96-18-4	1,2,3-Trichloropropane	<1
1634-04-4	tert-butyl methyl ether	<1	98-82-8	Isopropylbenzene	<1
156-59-2	cis-1,2-Dichloroethene	<1	108-86-1	Bromobenzene	<1
74-97-5	Bromochloromethane	<1	95-49-8	2-Chlorotoluene	<1
67-66-3	Chloroform	<1	103-65-1	Propylbenzene	<1
594-20-7	2,2-Dichloropropane	<1	106-43-4	4-Chlorotoluene	<1
107-06-2	1,2-Dichloroethane	<1	95-63-6	1,2,4-Trimethylbenzene	<1
71-55-6	1,1,1-Trichloroethane	<1	99-87-6	4-Isopropyltoluene	<1
563-58-6	1,1-Dichloropropene	<1	108-67-8	1,3,5-Trimethylbenzene	<1
71-43-2	Benzene	<1	541-73-1	1,3-Dichlorobenzene	<1
56-23-5	Carbontetrachloride	<1	106-46-7	1,4-Dichlorobenzene	<1
74-95-3	Dibromomethane	<1	135-98-8	sec-Butylbenzene	<1
78-87-5	1,2-Dichloropropane	<1	98-06-6	tert-Buylbenzene	<1
75-27-4	Bromodichloromethane	<1	95-50-1	1,2-Dichlorobenzene	<1
79-01-6	Trichloroethene	<1	104-51-8	n-Butylbenzene	<1
10061-01-5	cis-1,3-Dichloropropene	<1	96-12-8	1,2-Dibromo-3-chloropropane	<1
10061-02-6	trans-1,3-Dichloropropene	<1	120-82-1	1,2,4-Trichlorobenzene	<1
79-00-5	1,1,2-Trichloroethane	<1	91-20-3	Naphthalene	<1
108-88-3	Toluene	<1	87-61-6	1,2,3-Trichlorobenzene	<1
142-28-9	1,3-Dichloropropane	<1	87-68-3	Hexachlorobutadiene	<1
124-48-1	Dibromochloromethane	<1			

N.B. * also CAS No. 106-42-3

** Water blank subtracted

ALcontrol Geochem

Volatile Organic Compounds (EPA 624/8260)

Sample Identity - 3344-018 WS105 0.7-1.0m

Client / Sample matrix - Carl Bro Ltd/Soil

Units - µg/kg

Date Acquired - 6 Apr 2002 10:37

Instrument Name - 00B MSD59

CAS No	Compound	Conc.	CAS No	Compound	Conc.
75-71-8	Dichlorodifluoromethane	<1	106-93-4	1,2-Dibromoethane	<1
74-87-3	Chloromethane	<1	127-18-4	Tetrachloroethene	<1
75-01-4	Vinyl Chloride	<1	630-20-6	1,1,1,2-Tetrachloroethane	<1
74-83-9	Bromomethane	<1	108-90-7	Chlorobenzene	<1
75-00-3	Chloroethane	<1	100-41-4	Ethylbenzene	<1
75-69-4	Trichlorofluoromethane	<1	108-38-3*	p/m-Xylene	<1
156-60-5	trans-1,2-Dichloroethene	<1	75-25-2	Bromoform	<1
75-09-2	Dichloromethane	<1	100-42-5	Styrene	<1
75-15-0	Carbon disulphide	<1	79-34-5	1,1,2,2-Tetrachloroethane	<1
75-35-4	1,1-Dichloroethene	<1	95-47-6	o-Xylene	<1
75-34-3	1,1-Dichloroethane	<1	96-18-4	1,2,3-Trichloropropane	<1
1634-04-4	tert-butyl methyl ether	<1	98-82-8	Isopropylbenzene	<1
156-59-2	cis-1,2-Dichloroethene	<1	108-86-1	Bromobenzene	<1
74-97-5	Bromochloromethane	<1	95-49-8	2-Chlorotoluene	<1
67-66-3	Chloroform	<1	103-65-1	Propylbenzene	<1
594-20-7	2,2-Dichloropropane	<1	106-43-4	4-Chlorotoluene	<1
107-06-2	1,2-Dichloroethane	<1	95-63-6	1,2,4-Trimethylbenzene	<1
71-55-6	1,1,1-Trichloroethane	<1	99-87-6	4-Isopropyltoluene	<1
563-58-6	1,1-Dichloropropene	<1	108-67-8	1,3,5-Trimethylbenzene	<1
71-43-2	Benzene	<1	541-73-1	1,3-Dichlorobenzene	<1
56-23-5	Carbontetrachloride	<1	106-46-7	1,4-Dichlorobenzene	<1
74-95-3	Dibromomethane	<1	135-98-8	sec-Butylbenzene	<1
78-87-5	1,2-Dichloropropane	<1	98-06-6	tert-Buylbenzene	<1
75-27-4	Bromodichloromethane	<1	95-50-1	1,2-Dichlorobenzene	<1
79-01-6	Trichloroethene	<1	104-51-8	n-Butylbenzene	<1
10061-01-5	cis-1,3-Dichloropropene	<1	96-12-8	1,2-Dibromo-3-chloropropane	<1
10061-02-6	trans-1,3-Dichloropropene	<1	120-82-1	1,2,4-Trichlorobenzene	<1
79-00-5	1,1,2-Trichloroethane	<1	91-20-3	Naphthalene	<1
108-88-3	Toluene	<1	87-61-6	1,2,3-Trichlorobenzene	<1
142-28-9	1,3-Dichloropropane	<1	87-68-3	Hexachlorobutadiene	<1
124-48-1	Dibromochloromethane	<1			

N.B. * also CAS No. 106-42-3

** Water blank subtracted

ALcontrol Geochem

Volatile Organic Compounds (EPA 624/8260)

Sample Identity - 3344-020 WS106 0.5-0.8m

Client / Sample matrix - Carl Bro Ltd/Soil

Units - µg/kg

Date Acquired - 6 Apr 2002 11:12

Instrument Name - 00B MSD59

CAS No	Compound	Conc.	CAS No	Compound	Conc.
75-71-8	Dichlorodifluoromethane	<1	106-93-4	1,2-Dibromoethane	<1
74-87-3	Chloromethane	<1	127-18-4	Tetrachloroethene	<1
75-01-4	Vinyl Chloride	<1	630-20-6	1,1,1,2-Tetrachloroethane	<1
74-83-9	Bromomethane	<1	108-90-7	Chlorobenzene	<1
75-00-3	Chloroethane	<1	100-41-4	Ethylbenzene	<1
75-69-4	Trichlorofluoromethane	<1	108-38-3*	p/m-Xylene	<1
156-60-5	trans-1,2-Dichloroethene	<1	75-25-2	Bromoform	<1
75-09-2	Dichloromethane	<1	100-42-5	Styrene	<1
75-15-0	Carbon disulphide	<1	79-34-5	1,1,2,2-Tetrachloroethane	<1
75-35-4	1,1-Dichloroethene	<1	95-47-6	o-Xylene	<1
75-34-3	1,1-Dichloroethane	<1	96-18-4	1,2,3-Trichloropropane	<1
1634-04-4	tert-butyl methyl ether	<1	98-82-8	Isopropylbenzene	<1
156-59-2	cis-1,2-Dichloroethene	<1	108-86-1	Bromobenzene	<1
74-97-5	Bromochloromethane	<1	95-49-8	2-Chlorotoluene	<1
67-66-3	Chloroform	<1	103-65-1	Propylbenzene	<1
594-20-7	2,2-Dichloropropane	<1	106-43-4	4-Chlorotoluene	<1
107-06-2	1,2-Dichloroethane	<1	95-63-6	1,2,4-Trimethylbenzene	<1
71-55-6	1,1,1-Trichloroethane	<1	99-87-6	4-Isopropyltoluene	<1
563-58-6	1,1-Dichloropropene	<1	108-67-8	1,3,5-Trimethylbenzene	<1
71-43-2	Benzene	<1	541-73-1	1,3-Dichlorobenzene	<1
56-23-5	Carbontetrachloride	<1	106-46-7	1,4-Dichlorobenzene	<1
74-95-3	Dibromomethane	<1	135-98-8	sec-Butylbenzene	<1
78-87-5	1,2-Dichloropropane	<1	98-06-6	tert-Butylbenzene	<1
75-27-4	Bromodichloromethane	<1	95-50-1	1,2-Dichlorobenzene	<1
79-01-6	Trichloroethene	<1	104-51-8	n-Butylbenzene	<1
10061-01-5	cis-1,3-Dichloropropene	<1	96-12-8	1,2-Dibromo-3-chloropropane	<1
10061-02-6	trans-1,3-Dichloropropene	<1	120-82-1	1,2,4-Trichlorobenzene	<1
79-00-5	1,1,2-Trichloroethane	<1	91-20-3	Naphthalene	<1
108-88-3	Toluene	<1	87-61-6	1,2,3-Trichlorobenzene	<1
142-28-9	1,3-Dichloropropane	<1	87-68-3	Hexachlorobutadiene	<1
124-48-1	Dibromochloromethane	<1			

N.B. * also CAS No. 106-42-3

** Water blank subtracted

ALcontrol Geochem

Volatile Organic Compounds (EPA 624/8260)

Sample Identity - 3344-022 WS106 1.3-1.5m

Client / Sample matrix - Carl Bro Ltd/Soil

Units - µg/kg

Date Acquired - 6 Apr 2002 11:48

Instrument Name - 00B MSD59

CAS No	Compound	Conc.	CAS No	Compound	Conc.
75-71-8	Dichlorodifluoromethane	<1	106-93-4	1,2-Dibromoethane	<1
74-87-3	Chloromethane	<1	127-18-4	Tetrachloroethene	<1
75-01-4	Vinyl Chloride	<1	630-20-6	1,1,1,2-Tetrachloroethane	<1
74-83-9	Bromomethane	<1	108-90-7	Chlorobenzene	<1
75-00-3	Chloroethane	<1	100-41-4	Ethylbenzene	<1
75-69-4	Trichlorofluoromethane	<1	108-38-3*	p/m-Xylene	<1
156-60-5	trans-1,2-Dichloroethene	<1	75-25-2	Bromoform	<1
75-09-2	Dichloromethane	<1	100-42-5	Styrene	<1
75-15-0	Carbon disulphide	<1	79-34-5	1,1,2,2-Tetrachloroethane	<1
75-35-4	1,1-Dichloroethene	<1	95-47-6	o-Xylene	<1
75-34-3	1,1-Dichloroethane	<1	96-18-4	1,2,3-Trichloropropane	<1
1634-04-4	tert-butyl methyl ether	<1	98-82-8	Isopropylbenzene	<1
156-59-2	cis-1,2-Dichloroethene	<1	108-86-1	Bromobenzene	<1
74-97-5	Bromochloromethane	<1	95-49-8	2-Chlorotoluene	<1
67-66-3	Chloroform	<1	103-65-1	Propylbenzene	<1
594-20-7	2,2-Dichloropropane	<1	106-43-4	4-Chlorotoluene	<1
107-06-2	1,2-Dichloroethane	<1	95-63-6	1,2,4-Trimethylbenzene	<1
71-55-6	1,1,1-Trichloroethane	<1	99-87-6	4-Isopropyltoluene	<1
563-58-6	1,1-Dichloropropene	<1	108-67-8	1,3,5-Trimethylbenzene	<1
71-43-2	Benzene	<1	541-73-1	1,3-Dichlorobenzene	<1
56-23-5	Carbontetrachloride	<1	106-46-7	1,4-Dichlorobenzene	<1
74-95-3	Dibromomethane	<1	135-98-8	sec-Butylbenzene	<1
78-87-5	1,2-Dichloropropane	<1	98-06-6	tert-Buylbenzene	<1
75-27-4	Bromodichloromethane	<1	95-50-1	1,2-Dichlorobenzene	<1
79-01-6	Trichloroethene	<1	104-51-8	n-Butylbenzene	<1
10061-01-5	cis-1,3-Dichloropropene	<1	96-12-8	1,2-Dibromo-3-chloropropane	<1
10061-02-6	trans-1,3-Dichloropropene	<1	120-82-1	1,2,4-Trichlorobenzene	<1
79-00-5	1,1,2-Trichloroethane	<1	91-20-3	Naphthalene	<1
108-88-3	Toluene	2	87-61-6	1,2,3-Trichlorobenzene	<1
142-28-9	1,3-Dichloropropane	<1	87-68-3	Hexachlorobutadiene	<1
124-48-1	Dibromochloromethane	<1			

N.B. * also CAS No. 106-42-3

** Water blank subtracted

ALcontrol Geochem

Volatile Organic Compounds (EPA 624/8260)

Sample Identity - 3344-024 WS107 0.5-0.8m

Client / Sample matrix - Carl Bro Ltd/Soil

Units - µg/kg

Date Acquired - 6 Apr 2002 12:23

Instrument Name - 00B MSD59

CAS No	Compound	Conc.	CAS No	Compound	Conc.
75-71-8	Dichlorodifluoromethane	<1	106-93-4	1,2-Dibromoethane	<1
74-87-3	Chloromethane	<1	127-18-4	Tetrachloroethene	<1
75-01-4	Vinyl Chloride	<1	630-20-6	1,1,1,2-Tetrachloroethane	<1
74-83-9	Bromomethane	<1	108-90-7	Chlorobenzene	<1
75-00-3	Chloroethane	<1	100-41-4	Ethylbenzene	<1
75-69-4	Trichlorofluoromethane	<1	108-38-3*	p/m-Xylene	<1
156-60-5	trans-1,2-Dichloroethene	<1	75-25-2	Bromoform	<1
75-09-2	Dichloromethane	<1	100-42-5	Styrene	<1
75-15-0	Carbon disulphide	<1	79-34-5	1,1,2,2-Tetrachloroethane	<1
75-35-4	1,1-Dichloroethene	<1	95-47-6	o-Xylene	<1
75-34-3	1,1-Dichloroethane	<1	96-18-4	1,2,3-Trichloropropane	<1
1634-04-4	tert-butyl methyl ether	<1	98-82-8	Isopropylbenzene	<1
156-59-2	cis-1,2-Dichloroethene	<1	108-86-1	Bromobenzene	<1
74-97-5	Bromochloromethane	<1	95-49-8	2-Chlorotoluene	<1
67-66-3	Chloroform	<1	103-65-1	Propylbenzene	<1
594-20-7	2,2-Dichloropropane	<1	106-43-4	4-Chlorotoluene	<1
107-06-2	1,2-Dichloroethane	<1	95-63-6	1,2,4-Trimethylbenzene	<1
71-55-6	1,1,1-Trichloroethane	<1	99-87-6	4-Isopropyltoluene	<1
563-58-6	1,1-Dichloropropene	<1	108-67-8	1,3,5-Trimethylbenzene	<1
71-43-2	Benzene	<1	541-73-1	1,3-Dichlorobenzene	<1
56-23-5	Carbontetrachloride	<1	106-46-7	1,4-Dichlorobenzene	<1
74-95-3	Dibromomethane	<1	135-98-8	sec-Butylbenzene	<1
78-87-5	1,2-Dichloropropane	<1	98-06-6	tert-Buylbenzene	<1
75-27-4	Bromodichloromethane	<1	95-50-1	1,2-Dichlorobenzene	<1
79-01-6	Trichloroethene	<1	104-51-8	n-Butylbenzene	<1
10061-01-5	cis-1,3-Dichloropropene	<1	96-12-8	1,2-Dibromo-3-chloropropane	<1
10061-02-6	trans-1,3-Dichloropropene	<1	120-82-1	1,2,4-Trichlorobenzene	<1
79-00-5	1,1,2-Trichloroethane	<1	91-20-3	Naphthalene	<1
108-88-3	Toluene	2	87-61-6	1,2,3-Trichlorobenzene	<1
142-28-9	1,3-Dichloropropane	<1	87-68-3	Hexachlorobutadiene	<1
124-48-1	Dibromochloromethane	<1			

N.B. * also CAS No. 106-42-3

** Water blank subtracted

ALcontrol Geochem

Volatile Organic Compounds (EPA 624/8260)

Sample Identity - 3344-028 WS108 0.55-0.8m

Client / Sample matrix - Carl Bro Ltd/Soil

Units - µg/kg

Date Acquired - 6 Apr 2002 12:58

Instrument Name - 00B MSD59

CAS No	Compound	Conc.	CAS No	Compound	Conc.
75-71-8	Dichlorodifluoromethane	<1	106-93-4	1,2-Dibromoethane	<1
74-87-3	Chloromethane	<1	127-18-4	Tetrachloroethene	<1
75-01-4	Vinyl Chloride	<1	630-20-6	1,1,1,2-Tetrachloroethane	<1
74-83-9	Bromomethane	<1	108-90-7	Chlorobenzene	<1
75-00-3	Chloroethane	<1	100-41-4	Ethylbenzene	<1
75-69-4	Trichlorofluoromethane	<1	108-38-3*	p/m-Xylene	<1
156-60-5	trans-1,2-Dichloroethene	<1	75-25-2	Bromoform	<1
75-09-2	Dichloromethane	<1	100-42-5	Styrene	<1
75-15-0	Carbon disulphide	<1	79-34-5	1,1,2,2-Tetrachloroethane	<1
75-35-4	1,1-Dichloroethene	<1	95-47-6	o-Xylene	<1
75-34-3	1,1-Dichloroethane	<1	96-18-4	1,2,3-Trichloropropane	<1
1634-04-4	tert-butyl methyl ether	<1	98-82-8	Isopropylbenzene	<1
156-59-2	cis-1,2-Dichloroethene	<1	108-86-1	Bromobenzene	<1
74-97-5	Bromochloromethane	<1	95-49-8	2-Chlorotoluene	<1
67-66-3	Chloroform	<1	103-65-1	Propylbenzene	<1
594-20-7	2,2-Dichloropropane	<1	106-43-4	4-Chlorotoluene	<1
107-06-2	1,2-Dichloroethane	<1	95-63-6	1,2,4-Trimethylbenzene	<1
71-55-6	1,1,1-Trichloroethane	<1	99-87-6	4-Isopropyltoluene	<1
563-58-6	1,1-Dichloropropene	<1	108-67-8	1,3,5-Trimethylbenzene	<1
71-43-2	Benzene	<1	541-73-1	1,3-Dichlorobenzene	<1
56-23-5	Carbontetrachloride	<1	106-46-7	1,4-Dichlorobenzene	<1
74-95-3	Dibromomethane	<1	135-98-8	sec-Butylbenzene	<1
78-87-5	1,2-Dichloropropane	<1	98-06-6	tert-Butylbenzene	<1
75-27-4	Bromodichloromethane	<1	95-50-1	1,2-Dichlorobenzene	<1
79-01-6	Trichloroethene	<1	104-51-8	n-Butylbenzene	<1
10061-01-5	cis-1,3-Dichloropropene	<1	96-12-8	1,2-Dibromo-3-chloropropane	<1
10061-02-6	trans-1,3-Dichloropropene	<1	120-82-1	1,2,4-Trichlorobenzene	<1
79-00-5	1,1,2-Trichloroethane	<1	91-20-3	Naphthalene	<1
108-88-3	Toluene	<1	87-61-6	1,2,3-Trichlorobenzene	<1
142-28-9	1,3-Dichloropropane	<1	87-68-3	Hexachlorobutadiene	<1
124-48-1	Dibromochloromethane	<1			

N.B. * also CAS No. 106-42-3

** Water blank subtracted

ALcontrol Geochem

Volatile Organic Compounds (EPA 624/8260)

Sample Identity - 3344-036 SW1

Client / Sample matrix - Carl Bro Ltd/Water

Units - µg/l

Date Acquired - 6 Apr 2002 8:51

Instrument Name - 00B MSD59

CAS No	Compound	Conc.	CAS No	Compound	Conc.
75-71-8	Dichlorodifluoromethane	<1	106-93-4	1,2-Dibromoethane	<1
74-87-3	Chloromethane	<1	127-18-4	Tetrachloroethene	<1
75-01-4	Vinyl Chloride	<1	630-20-6	1,1,1,2-Tetrachloroethane	<1
74-83-9	Bromomethane	<1	108-90-7	Chlorobenzene	<1
75-00-3	Chloroethane	<1	100-41-4	Ethylbenzene	<1
75-69-4	Trichlorofluoromethane	<1	108-38-3*	p/m-Xylene	<1
156-60-5	trans-1,2-Dichloroethene	<1	75-25-2	Bromoform	<1
75-09-2	Dichloromethane	<1	100-42-5	Styrene	<1
75-15-0	Carbon disulphide	<1	79-34-5	1,1,2,2-Tetrachloroethane	<1
75-35-4	1,1-Dichloroethene	<1	95-47-6	o-Xylene	<1
75-34-3	1,1-Dichloroethane	<1	96-18-4	1,2,3-Trichloropropane	<1
1634-04-4	tert-butyl methyl ether	<1	98-82-8	Isopropylbenzene	<1
156-59-2	cis-1,2-Dichloroethene	<1	108-86-1	Bromobenzene	<1
74-97-5	Bromochloromethane	<1	95-49-8	2-Chlorotoluene	<1
67-66-3	Chloroform	<1	103-65-1	Propylbenzene	<1
594-20-7	2,2-Dichloropropane	<1	106-43-4	4-Chlorotoluene	<1
107-06-2	1,2-Dichloroethane	<1	95-63-6	1,2,4-Trimethylbenzene	<1
71-55-6	1,1,1-Trichloroethane	<1	99-87-6	4-Isopropyltoluene	<1
563-58-6	1,1-Dichloropropene	<1	108-67-8	1,3,5-Trimethylbenzene	<1
71-43-2	Benzene	<1	541-73-1	1,3-Dichlorobenzene	<1
56-23-5	Carbontetrachloride	<1	106-46-7	1,4-Dichlorobenzene	<1
74-95-3	Dibromomethane	<1	135-98-8	sec-Butylbenzene	<1
78-87-5	1,2-Dichloropropane	<1	98-06-6	tert-Butylbenzene	<1
75-27-4	Bromodichloromethane	<1	95-50-1	1,2-Dichlorobenzene	<1
79-01-6	Trichloroethene	<1	104-51-8	n-Butylbenzene	<1
10061-01-5	cis-1,3-Dichloropropene	<1	96-12-8	1,2-Dibromo-3-chloropropane	<1
10061-02-6	trans-1,3-Dichloropropene	<1	120-82-1	1,2,4-Trichlorobenzene	<1
79-00-5	1,1,2-Trichloroethane	<1	91-20-3	Naphthalene	<1
108-88-3	Toluene	<1	87-61-6	1,2,3-Trichlorobenzene	<1
142-28-9	1,3-Dichloropropane	<1	87-68-3	Hexachlorobutadiene	<1
124-48-1	Dibromochloromethane	<1			

N.B. * also CAS No. 106-42-3

** Water blank subtracted

ALcontrol Geochem

Volatile Organic Compounds (EPA 624/8260)

Sample Identity - 3344-040 SW2

Client / Sample matrix - Carl Bro Ltd/Water

Units - µg/l

Date Acquired - 6 Apr 2002 9:26

Instrument Name - 00B MSD59

CAS No	Compound	Conc.	CAS No	Compound	Conc.
75-71-8	Dichlorodifluoromethane	<1	106-93-4	1,2-Dibromoethane	<1
74-87-3	Chloromethane	<1	127-18-4	Tetrachloroethene	<1
75-01-4	Vinyl Chloride	<1	630-20-6	1,1,1,2-Tetrachloroethane	<1
74-83-9	Bromomethane	<1	108-90-7	Chlorobenzene	<1
75-00-3	Chloroethane	<1	100-41-4	Ethylbenzene	<1
75-69-4	Trichlorofluoromethane	<1	108-38-3*	p/m-Xylene	<1
156-60-5	trans-1,2-Dichloroethene	<1	75-25-2	Bromoform	<1
75-09-2	Dichloromethane	<1	100-42-5	Styrene	<1
75-15-0	Carbon disulphide	<1	79-34-5	1,1,2,2-Tetrachloroethane	<1
75-35-4	1,1-Dichloroethene	<1	95-47-6	o-Xylene	<1
75-34-3	1,1-Dichloroethane	<1	96-18-4	1,2,3-Trichloropropane	<1
1634-04-4	tert-butyl methyl ether	<1	98-82-8	Isopropylbenzene	<1
156-59-2	cis-1,2-Dichloroethene	<1	108-86-1	Bromobenzene	<1
74-97-5	Bromochloromethane	<1	95-49-8	2-Chlorotoluene	<1
67-66-3	Chloroform	<1	103-65-1	Propylbenzene	<1
594-20-7	2,2-Dichloropropane	<1	106-43-4	4-Chlorotoluene	<1
107-06-2	1,2-Dichloroethane	<1	95-63-6	1,2,4-Trimethylbenzene	<1
71-55-6	1,1,1-Trichloroethane	<1	99-87-6	4-Isopropyltoluene	<1
563-58-6	1,1-Dichloropropene	<1	108-67-8	1,3,5-Trimethylbenzene	<1
71-43-2	Benzene	<1	541-73-1	1,3-Dichlorobenzene	<1
56-23-5	Carbontetrachloride	<1	106-46-7	1,4-Dichlorobenzene	<1
74-95-3	Dibromomethane	<1	135-98-8	sec-Butylbenzene	<1
78-87-5	1,2-Dichloropropane	<1	98-06-6	tert-Butylbenzene	<1
75-27-4	Bromodichloromethane	<1	95-50-1	1,2-Dichlorobenzene	<1
79-01-6	Trichloroethene	<1	104-51-8	n-Butylbenzene	<1
10061-01-5	cis-1,3-Dichloropropene	<1	96-12-8	1,2-Dibromo-3-chloropropane	<1
10061-02-6	trans-1,3-Dichloropropene	<1	120-82-1	1,2,4-Trichlorobenzene	<1
79-00-5	1,1,2-Trichloroethane	<1	91-20-3	Naphthalene	<1
108-88-3	Toluene	<1	87-61-6	1,2,3-Trichlorobenzene	<1
142-28-9	1,3-Dichloropropane	<1	87-68-3	Hexachlorobutadiene	<1
124-48-1	Dibromochloromethane	<1			

N.B. * also CAS No. 106-42-3

** Water blank subtracted

ALcontrol Geochem

Target Phenols Analysis

Sample Identity - 03344-003/WS101/1.25-1.5
Client / Sample matrix - Carl Bro Ltd/Soil
Units - µg/kg

CAS Number	Compound	Concentration
108-95-2	Phenol	3
95-57-8	2-Chlorophenol	<1
88-75-5	2-Nitrophenol	<1
105-67-9	2,4-Dimethylphenol	<1
120-83-2	2,4-Dichlorophenol	<1
59-50-7	4-Chloro-3-methyl-phenol	<1
88-06-2	2,4,6-trichlorophenol	<1
100-02-7	4-Nitrophenol	<1
87-86-5	Pentachlorophenol	<1
Total		3

ALcontrol Geochem

Target Phenols Analysis

Sample Identity - 03344-007/WS102/0.85-1.0
Client / Sample matrix - Carl Bro Ltd/Soil
Units - µg/kg

CAS Number	Compound	Concentration
108-95-2	Phenol	6
95-57-8	2-Chlorophenol	<1
88-75-5	2-Nitrophenol	<1
105-67-9	2,4-Dimethylphenol	<1
120-83-2	2,4-Dichlorophenol	<1
59-50-7	4-Chloro-3-methyl-phenol	<1
88-06-2	2,4,6-trichlorophenol	<1
100-02-7	4-Nitrophenol	<1
87-86-5	Pentachlorophenol	<1
Total		6

ALcontrol Geochem

Target Phenols Analysis

Sample Identity - 03344-017/WS105/0.7-1.0
Client / Sample matrix - Carl Bro Ltd/Soil
Units - µg/kg

CAS Number	Compound	Concentration
108-95-2	Phenol	5
95-57-8	2-Chlorophenol	<1
88-75-5	2-Nitrophenol	<1
105-67-9	2,4-Dimethylphenol	<1
120-83-2	2,4-Dichlorophenol	<1
59-50-7	4-Chloro-3-methyl-phenol	<1
88-06-2	2,4,6-trichlorophenol	<1
100-02-7	4-Nitrophenol	<1
87-86-5	Pentachlorophenol	<1
Total		5

ALcontrol Geochem

Target Phenols Analysis

Sample Identity - 03344-019/WS106/0.5-0.8
Client / Sample matrix - Carl Bro Ltd/Soil
Units - µg/kg

CAS Number	Compound	Concentration
108-95-2	Phenol	1
95-57-8	2-Chlorophenol	<1
88-75-5	2-Nitrophenol	<1
105-67-9	2,4-Dimethylphenol	<1
120-83-2	2,4-Dichlorophenol	<1
59-50-7	4-Chloro-3-methyl-phenol	<1
88-06-2	2,4,6-trichlorophenol	<1
100-02-7	4-Nitrophenol	<1
87-86-5	Pentachlorophenol	<1
Total		1

ALcontrol Geochem

Target Phenols Analysis

Sample Identity - 03344-021/WS106/1.3-1.5
Client / Sample matrix - Carl Bro Ltd/Soil
Units - µg/kg

CAS Number	Compound	Concentration
108-95-2	Phenol	<1
95-57-8	2-Chlorophenol	<1
88-75-5	2-Nitrophenol	<1
105-67-9	2,4-Dimethylphenol	<1
120-83-2	2,4-Dichlorophenol	<1
59-50-7	4-Chloro-3-methyl-phenol	<1
88-06-2	2,4,6-trichlorophenol	<1
100-02-7	4-Nitrophenol	<1
87-86-5	Pentachlorophenol	<1
Total		<1

ALcontrol Geochem

Target Phenols Analysis

Sample Identity - 03344-023/WS107/0.5-0.8
Client / Sample matrix - Carl Bro Ltd/Soil
Units - µg/kg

CAS Number	Compound	Concentration
108-95-2	Phenol	3
95-57-8	2-Chlorophenol	<1
88-75-5	2-Nitrophenol	<1
105-67-9	2,4-Dimethylphenol	<1
120-83-2	2,4-Dichlorophenol	<1
59-50-7	4-Chloro-3-methyl-phenol	<1
88-06-2	2,4,6-trichlorophenol	<1
100-02-7	4-Nitrophenol	<1
87-86-5	Pentachlorophenol	<1
Total		3

ALcontrol Geochem

Target Phenols Analysis

Sample Identity - 03344-027/WS108/0.55-0.8
Client / Sample matrix - Carl Bro Ltd/Soil
Units - µg/kg

CAS Number	Compound	Concentration
108-95-2	Phenol	3
95-57-8	2-Chlorophenol	<1
88-75-5	2-Nitrophenol	<1
105-67-9	2,4-Dimethylphenol	<1
120-83-2	2,4-Dichlorophenol	<1
59-50-7	4-Chloro-3-methyl-phenol	<1
88-06-2	2,4,6-trichlorophenol	<1
100-02-7	4-Nitrophenol	<1
87-86-5	Pentachlorophenol	<1
Total		3

ALcontrol Geochem

Target Phenols Analysis

Sample Identity - 3344-033/SW1
Client / Sample matrix - Carl Bro Ltd/Water
Units - ug/l

CAS Number	Compound	Concentration
108-95-2	Phenol	<1
95-57-8	2-Chlorophenol	<1
88-75-5	2-Nitrophenol	<1
105-67-9	2,4-Dimethylphenol	<1
120-83-2	2,4-Dichlorophenol	<1
59-50-7	4-Chloro-3-methyl-phenol	<1
88-06-2	2,4,6-trichlorophenol	<1
100-02-7	4-Nitrophenol	<1
87-86-5	Pentachlorophenol	<1
Total		<1

ALcontrol Geochem

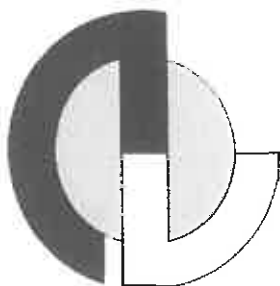
Target Phenols Analysis

Sample Identity - 3344-037/SW2
Client / Sample matrix - Carl Bro Ltd/Water
Units - ug/l

CAS Number	Compound	Concentration
108-95-2	Phenol	<1
95-57-8	2-Chlorophenol	<1
88-75-5	2-Nitrophenol	<1
105-67-9	2,4-Dimethylphenol	<1
120-83-2	2,4-Dichlorophenol	<1
59-50-7	4-Chloro-3-methyl-phenol	<1
88-06-2	2,4,6-trichlorophenol	<1
100-02-7	4-Nitrophenol	<1
87-86-5	Pentachlorophenol	<1
Total		<1

APPENDIX

1. Results are expressed as mg/Kg dry weight unless otherwise stated, excluding analyses in (2) below.
2. Leach tests, cyanide, phenols by MS, hexavalent chrome, flash point, acid soluble sulphides, TPH by IR and volatiles are performed on wet soil as received, and results are expressed as mg/Kg of wet soil or mg/l of leachate of specified leach test. Ammoniacal nitrogen and total phenols by HPLC are performed on wet sample but are then re-calculated and expressed as mg/kg of dry soil.
3. ICP metals results are analysed using a screening program and the data is accurate to within 20%.
4. The majority of analyses are run to an accuracy of 10%, but this may be improved upon if legally defensible data is required.
5. Every fifth sample is run in duplicate, but not reported, as part of our internal QC procedure.
6. A sub sample of all samples received will be retained free of charge for two months for soils and one month for waters (sample size permitting), but may then be discarded 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.
7. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
8. Please note that we take no responsibility for any test performed by sub-contractors (marked with an asterisk).
9. Asbestos screen is done in-house on soils and if no fibres are found will be reported as NFP-no fibres present. If asbestos is detected then identification & quantification is carried out by a sub-contractor. If a sample is suspected of containing asbestos then drying & crushing will be suspended on that sample until the asbestos result is known. If asbestos is present then no analysis requiring dry sample will be undertaken.
10. NDP-No determination possible due to insufficient/unsuitable sample.



ALCONTROL GEOCHEM

REPORT 03/02140/02/01

**ANALYSIS OF SOIL AND WATER SAMPLES
FROM CWMBRAN**

Prepared for

CARL BRO LTD

APRIL 2003

CONTENTS

- 1.0 Log Sheets
- 2.0 Miscellaneous Data
- 3.0 Total Volatiles C₄ to C₁₃
- 4.0 Diesel Range Organics by GC
- 5.0 PAH by GCMS
- 6.0 Target Phenols Analysis
- 7.0 Semivolatile Organic Compounds
- 8.0 Volatile Organic Compounds (EPA/8260)
- 9.0 Appendix
 - (1) Traces
 - (2) QA/QC



Carl Bro Ltd
Grove House
Mansion Gate Drive
Leeds
LS7 4DN

ATTN: Anne Marie Deloughry

CERTIFICATE OF ANALYSIS

Date: 15 April, 2003
Our Reference: 03/02140/02/01
Your Reference:
Location: Cwmbran

A total of 86 samples was received for analysis on Thursday, 20 February 2003. Accredited laboratory tests are defined in the log sheet, but opinions interpretations and on-site data expressed herein are outside the scope of UKAS accreditation. We are pleased to enclose our final report, it was a pleasure to be of service to you, and we look forward to our continuing association.

Signed

Hazel Davidson
Operations Manager
Analytical Services

Compiled By

William Noakes

W. Wood

Numeric values indicate additional scheduling
* Indicates test subcontracted

LOCATION : Cwmbran

TURNAROUND : 10 days

Name : William Noakes

Checked By

ALcontrol Geochem TEST SCHEDULE

JOB NUMBER : 03/2140/02
 CLIENT : Carl Bro Ltd
 CONTACT : Anne Marie Deloughry
 DATE OF RECEIPT : 24/02/03
 LOCATION : Cwmbran

BATCH NUMBER : 2
 CLIENT REF/CODE :
 ORDER NUMBER :
 TURNAROUND : 10 days

Numeric values indicate
 additional scheduling
 * Indicates test subcontracted

Sample Number	Sample Identity	UKAS Accredited ?			Phenol by MS	ICP ICRCL (9)	B (H2O Sol)	Cr VI	Total cyanide	Free CN Soil	Thiocyanate	Tot. SO4 by ICP	Total sulphur	Ac.Sol.Sulphide	PAH by MS	Phen Spec HPLC	Diesel rng orgs	Petrol rng orgs	BTEX by GC	SVOC inc TIC by MS Soil	VOC inc TIC by MS	Amm. N	Formaldehyde	pH (soil)	NRA leach	ICRCL Lch (not Hg) ICPMS	Hg Low DT Lch AA
22	BH3	SOIL	0.50	1 kg	Sample on hold																						
23	BH3	SOIL	0.50	VOC	Sample on hold																						
24	BH3	SOIL	1.00	1 kg	Sample on hold																						
25	BH3	SOIL	1.00	VOC	Sample on hold																						
26	BH3	SOIL	2.00	1 kg	3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
27	BH3	SOIL	2.00	VOC																							
28	BH3	SOIL	3.00	1 kg	Sample on hold																						
29	BH3	SOIL	3.00	VOC	Sample on hold																						
30	WS202	SOIL	0.50	1 kg	3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
31	WS202	SOIL	0.50	VOC																							
32	WS202	SOIL	0.50	VOC	Sample on hold																						
33	WS202	SOIL	1.00	1 kg	Sample on hold																						
34	WS202	SOIL	1.00	VOC	Sample on hold																						
35	WS202	SOIL	1.00	VOC	Sample on hold																						
36	WS202	SOIL	1.50	1 kg	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		
37	WS202	SOIL	1.50	VOC																							
38	WS202	SOIL	1.50	VOC	Sample on hold																						
39	WS202	SOIL	2.00	1 kg	Sample on hold																						
40	WS202	SOIL	2.00	VOC	Sample on hold																						
41	WS202	SOIL	2.00	VOC	Sample on hold																						
42	WS203	SOIL	0.70	1 kg	3	3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		

Checked By W. Noakes Name : William Noakes

ALcontrol Geochem TEST SCHEDULE

JOB NUMBER : 03/2140/02

CLIENT : Carl Bro Ltd

CONTACT : Anne Marie Deloughry

DATE OF RECEIPT : 24/02/03

LOCATION : Cwmbran

BATCH NUMBER : 2

CLIENT REF/CODE :

ORDER NUMBER :

TURNAROUND : 10 days

Numeric values indicate additional scheduling
* Indicates test subcontracted

Sample Number	Sample Identity	UKAS Accredited ?			Phenol by MS	Wet Split	ICP ICRCL (9)	B (H2O Sol)	Cr VI	Total cyanide	Free CN Soil	Thiocyanate	Tot. SO4 by ICP	Total sulphur	Ac.Sol.Sulphide	PAH by MS	Phen Spec HPLC	Diesel rng orgs	Petrol rng orgs	BTEX by GC	SVOC inc TIC by MS Soil	VOC inc TIC by MS	Amm. N	Formaldehyde	pH (soil)	NRA leach	ICRCL Lch (not Hg) ICPMS	Hg Low DT Lch AA	
		Sample Type	Depth (m)	P / V																									
43	WS203	SOIL	0.70	VOC																									
44	WS203	SOIL	0.70	VOC	Sample on hold																								
45	WS203	SOIL	2.00	1 kg	Sample on hold																								
46	WS203	SOIL	2.00	VOC	Sample on hold																								
47	WS203	SOIL	2.00	VOC	Sample on hold																								
48	WS203	SOIL	2.90	1 kg	Sample on hold																								
49	WS203	SOIL	2.90	VOC	Sample on hold																								
50	WS203	SOIL	2.90	VOC	Sample on hold																								
51	WS206	SOIL	0.50	1 kg	Sample on hold																								
52	WS206	SOIL	0.50	VOC	Sample on hold																								
53	WS206	SOIL	0.50	VOC	Sample on hold																								
54	WS205	SOIL	0.90	1 kg	Sample on hold																								
55	WS205	SOIL	0.90	VOC	Sample on hold																								
56	WS205	SOIL	0.90	VOC	Sample on hold																								
57	WS206	SOIL	1.00	1 kg	Sample on hold																								
58	WS206	SOIL	1.00	VOC	Sample on hold																								
59	WS206	SOIL	1.00	VOC	Sample on hold																								
60	WS206	SOIL	2.00	1 kg	Sample on hold																								
61	WS206	SOIL	2.00	VOC	Sample on hold																								
62	WS206	SOIL	2.00	VOC	Sample on hold																								
63	WS206	SOIL	2.80	1 kg	Sample on hold																								

Name : William Noakes

Checked By 

ALcontrol Geochem TEST SCHEDULE

Numeric values indicate
additional scheduling
* Indicates test subcontracted

JOB NUMBER : 03/2140/02

CLIENT : Carl Bro Ltd

CONTACT : Anne Marie Deloughry

DATE OF RECEIPT : 24/02/03

LOCATION : Cwmbran

BATCH NUMBER : 2

CLIENT REF/CODE :

ORDER NUMBER :

TURNAROUND : 10 days

	Hg Low DT Lch AA																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				</
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Checked By W Noakes

Name : William Noakes

*** Indicates test subcontracted**

LOCATION: Cwmbran

TURNAROUND : 10 days

Checked By W. Noe

Page 7 of 73

ALcontrol Geochem
TEST SCHEDULE

JOB NUMBER : 03/2140/02
CLIENT : Carl Bro Ltd
CONTACT : Anne Marie Deloughry
DATE OF RECEIPT : 24/02/03
LOCATION : Cwmbran

BATCH NUMBER : 2
CLIENT REF/CODE :
ORDER NUMBER :
TURNAROUND : 10 days

Numeric values indicate
additional scheduling
* Indicates test subcontracted

Sample Number	Sample Identity	P / V	Depth (m)	Sample Type	UKAS Accredited ?															
						Phen MS Leach														
43	WS203	VOC	0.70	SOIL		Sample on hold														
44	WS203	VOC	0.70	SOIL		Sample on hold														
45	WS203	1 kg	2.00	SOIL		Sample on hold														
46	WS203	VOC	2.00	SOIL		Sample on hold														
47	WS203	VOC	2.00	SOIL		Sample on hold														
48	WS203	1 kg	2.90	SOIL		Sample on hold														
49	WS203	VOC	2.90	SOIL		Sample on hold														
50	WS203	VOC	2.90	SOIL		Sample on hold														
51	WS206	1 kg	0.50	SOIL		2														
52	WS206	VOC	0.50	SOIL																
53	WS206	VOC	0.50	SOIL		Sample on hold														
54	WS205	1 kg	0.90	SOIL																
55	WS205	VOC	0.90	SOIL																
56	WS205	VOC	0.90	SOIL																
57	WS206	1 kg	1.00	SOIL		Sample on hold														
58	WS206	VOC	1.00	SOIL		Sample on hold														
59	WS206	VOC	1.00	SOIL		Sample on hold														
60	WS206	1 kg	2.00	SOIL		Sample on hold														
61	WS206	VOC	2.00	SOIL		Sample on hold														
62	WS206	VOC	2.00	SOIL		Sample on hold														
63	WS206	1 kg	2.80	SOIL																

Checked By W. Noakes Name : William Noakes

ALcontrol Geochem
TEST SCHEDULE

JOB NUMBER : 03/2140/02
CLIENT : Carl Bro Ltd
CONTACT : Anne Marie Deloughry
DATE OF RECEIPT : 24/02/03
LOCATION : Cwmbran

BATCH NUMBER : 2
CLIENT REF/CODE :
ORDER NUMBER :
TURNAROUND : 10 days

Numeric values indicate
additional scheduling
* Indicates test subcontracted

		UKAS Accredited ?																		Total Number of Tests			
Sample Number	Sample Identity	P / V	Depth (m)	Sample Type	Phen MS Leach																		
64	WS206	VOC	2.80	SOIL	Sample on hold																		
65	WS206	VOC	2.80	SOIL																			

Checked By  Name : William Noakes

ALcontrol Geochem TEST SCHEDULE

JOB NUMBER : 03/2140/02

CLIENT : Carl Bro Ltd

CONTACT : Anne Marie Deloughry

DATE OF RECEIPT : 03/03/03

LOCATION : Cwmbran

BATCH NUMBER : 3

CLIENT REF/CODE :

ORDER NUMBER :

TURNAROUND : 10 days

Numeric values indicate
additional scheduling

* Indicates test subcontracted

Sample Number	Sample Identity	P / V	Depth (m)	UKAS Accredited ?	ICRCL (not Hg) ICP-MS	Hg Low Dutch T AA	Cr VI Water	Total CN Water	Free CN Water	Thiocyanate	Sulphate Kone	Sulphide (H2O)	pH (water)	Tot Phen HPLC	PAH by MS	Free Sulphur (W)	Diesel rng orgs	Petrol rng orgs	BTEX by GC	MTBE by GC	SVOC inc TIC MS Water	VOC inc TIC by MS	Amm N Low	Formaldehyde	Phenol by MS	Chloride Kone	Take Vol Water
66	BH1	1glass	UNKNOWN		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
67	BH1	H2SO4	UNKNOWN																								
68	BH1	Vial	UNKNOWN																								
69	BH2	1glass	UNKNOWN			2																					
70	BH2	1glass	UNKNOWN																								
71	BH2	1glass	UNKNOWN																								
72	BH2	1plastic	UNKNOWN		2																						
73	BH2	H2SO4	UNKNOWN																								
74	BH2	NaOH	UNKNOWN					2	2	2																	
75	BH2	ZnAc	UNKNOWN																								
76	BH2	Vial	UNKNOWN																								
77	BH2	Vial	UNKNOWN																								
78	BH3	1glass	UNKNOWN																								
79	BH3	1glass	UNKNOWN																								
80	BH3	1glass	UNKNOWN																								
81	BH3	1plastic	UNKNOWN																								
82	BH3	H2SO4	UNKNOWN																								
83	BH3	NaOH	UNKNOWN																								
84	BH3	ZnAc	UNKNOWN																								
85	BH3	Vial	UNKNOWN																								
86	BH3	Vial	UNKNOWN																								
				Total Number of Tests		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

Checked By

Name : William Noakes

relinquish

☒ Validated

Date of Receipt:
(of first sample)

20/02/03

Client Contact: _____
Client Ref. No.: _____

Anne Marie Deloughry

[illegible]

Note: METHOD DETECTION LIMITS ARE NOT ALWAYS ACHIEVABLE DUE TO VARIOUS CIRCUMSTANCES BEYOND OUR CONTROL.

NDP = NO DETERMINATION POSSIBLE

NFP = NO FIBRES PRESENT

William Noakes

Checked By

☐ preliminary☒ Validated

Sample Type:

Carl Bro Ltd

Location:

20/02/03

Client Contact:

(of first sample)

Soil

Cwmbran

Anne Marie Deloughry

Client Ref. No.:

[illegible]

Note: METHOD DETECTION LIMITS ARE NOT ALWAYS ACHIEVABLE DUE TO VARIOUS CIRCUMSTANCES BEYOND OUR CONTROL.

NDP = NO DETERMINATION POSSIBLE

NFP = NO FIBRES PRESENT

Checked By

William Noakes

Job Number:

Client:

Date of Receipt:
(of first sample)

Client Ref. No.:

Note: METHOD DETECTION LIMITS ARE NOT ALWAYS ACHIEVABLE DUE TO VARIOUS CIRCUMSTANCES BEYOND OUR CONTROL.

NDP = NO DETERMINATION POSSIBLE

NFP = NO FIBRES PRESENT

William Noakes

Checked By

☐ Preliminary☒ Validated

Job Number: 03/02140/02/01

Sample Type: WATER

Client: Carl Bro Ltd

Location: Cwmbran

Date of Receipt: 20/02/03
(of first sample)Client Contact: Anne Marie Deloughry
Client Ref. No.:

Sample Number	Sample Identity	Depth (m)	UKAS Accredited																						
			Units																						
			Detection Method																						
			Method	Detection Limit	✓	mg/l	Spectro	mg/l	Spectro	mg/l	✓	mg/l	SPECTRO	mg/l	Spectro	mg/l	✓	mg/l	HPLC	mg/l	pH Units	ug/l	ICP MS	ug/l	ICP MS
Method	Detection Limit	✓	mg/l	Spectro	mg/l	Spectro	mg/l	✓	mg/l	SPECTRO	mg/l	Spectro	mg/l	✓	mg/l	HPLC	mg/l	pH Units	ug/l	ICP MS	ug/l	ICP MS	ug/l	ICP MS	
																			</						

Note: METHOD DETECTION LIMITS ARE NOT ALWAYS ACHIEVABLE DUE TO VARIOUS CIRCUMSTANCES BEYOND OUR CONTROL.

NDP = NO DETERMINATION POSSIBLE

NFP = NO FIBRES PRESENT

Checked By

William Noakes

☒ Validated

Client Contact: Anne Marie Deloughry
Client Ref. No.:

Note: METHOD DETECTION LIMITS ARE NOT ALWAYS ACHIEVABLE DUE TO VARIOUS CIRCUMSTANCES BEYOND OUR CONTROL.

William Noakes

Page 18 of 73

ALcontrol Geochem

Diesel Range Organics by GC

Job Number : 03/02140/02/01

Client : Carl Bro Ltd

Ref :

Sample Type : SOIL

Units : mg/kg

[illegible]

Diesel Range Organics by GC

Job Number : 03/02140/02/01

Client : Carl Bro Ltd

Ref :

Sample Type : WATER

Units : $\mu\text{g/l}$ [illegible]

ALcontrol Geochem

Job Number : 03/02140/02/01

Client : Carl Bro Ltd

Ref :

Method :		PAH by GCMS					
Sample Type :		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Units :		µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
Depth :		1.0	2.7	2.0	0.5	1.5	0.7
Sample Identity :		BH1	BH2	BH3	WS202	WS202	WS203
Sample Number :		1	16	26	30	36	42
CAS N°	Compound	Conc	Conc	Conc	Conc	Conc	Conc
21-20-3	Naphthalene	81	42	158	90	4760	58
58-96-8	Acenaphthylene	3	2	12	8	206	6
83-32-9	Acenaphthene	3	20	50	21	61	16
86-73-7	Fluorene	3	12	47	19	141	17
85-01-8	Phenanthrene	29	70	427	119	700	91
120-12-7	Anthracene	15	21	77	26	60	17
206-44-0	Fluoranthene	58	70	366	87	93	66
129-00-0	Pyrene	44	49	282	63	107	49
56-55-3	Benz(a)anthracene	60	31	123	53	51	41
218-01-9	Chrysene	41	25	203	56	146	55
205-99-2	Benzo(b)fluoranthene	37	27	234	52	83	51
207-08-9	Benzo(k)fluoranthene	17	11	66	19	23	19
50-32-8	Benzo(a)pyrene	28	18	126	32	28	32
193-39-5	Indeno(123cd)pyrene	14	10	61	19	11	24
53-70-3	Dibenzo(ah)anthracene	6	3	20	8	8	9
191-24-2	Benzo(ghi)perylene	15	11	68	21	45	29
Total 16 PAH		452	421	2321	694	6522	579

ALcontrol Geochem

Job Number : 03/02140/02/01

Client : Carl Bro Ltd

Ref :

Method :		PAH by GCMS					
Sample Type :		SOIL	SOIL	SOIL	WATER	WATER	WATER
Units :		µg/kg	µg/kg	µg/kg	ng/l	ng/l	ng/l
Depth :		0.5	0.9	2.8			
Sample Identity :		WS206	WS205	WS206	BH1	BH2	BH3
Sample Number :		51	54	63	66	69	78
CAS N°	Compound	Conc	Conc	Conc	Conc	Conc	Conc
21-20-3	Naphthalene	3528	86	164	115	<10	<10
21-96-8	Acenaphthylene	250	20	12	<10	<10	<10
83-32-9	Acenaphthene	109	24	23	<10	<10	<10
86-73-7	Fluorene	234	36	23	<10	<10	<10
85-01-8	Phenanthrene	978	426	283	<10	<10	<10
120-12-7	Anthracene	181	106	24	<10	<10	<10
206-44-0	Fluoranthene	1134	454	53	<10	<10	<10
129-00-0	Pyrene	830	326	47	<10	<10	<10
56-55-3	Benz(a)anthracene	600	170	28	<10	<10	<10
218-01-9	Chrysene	759	148	80	<10	<10	<10
205-99-2	Benzo(b)fluoranthene	1209	164	23	<10	<10	<10
207-08-9	Benzo(k)fluoranthene	316	53	12	<10	<10	<10
50-32-8	Benzo(a)pyrene	571	101	13	<10	<10	<10
193-39-5	Indeno(123cd)pyrene	317	39	<1	<10	<10	<10
53-70-3	Dibenzo(ah)anthracene	105	9	<1	<10	<10	<10
191-24-2	Benzo(ghi)perylene	446	37	<1	<10	<10	<10
Total 16 PAH		11569	2195	785	115	<10	<10

Alcontrol Geochem

Target Phenols Analysis

Sample Identity - 02140-001/BH1/1.0
Client / Sample matrix - Carl Bro Ltd/Soil
Units - $\mu\text{g/kg}$

CAS Number	Compound	Concentration
108-95-2	Phenol	2
95-57-8	2-Chlorophenol	<1
105-67-9	2,4-Dimethylphenol	<1
59-50-7	4-Chloro-3-methyl-Phenol	<1
120-83-2	2,4-Dichlorophenol	<1
88-75-5	2-Nitrophenol	<1
88-06-2	2,4,6-trichlorophenol	<1
100-02-7	4-Nitrophenol	<1
87-86-5	Pentachlorophenol	<1
Total		2

Alcontrol Geochem

Target Phenols Analysis

Sample Identity - 02140-010/BH2/1.0
Client / Sample matrix - Carl Bro Ltd/Leachate
Units - ug/l

CAS Number	Compound	Concentration
108-95-2	Phenol	<1
95-57-8	2-Chlorophenol	<1
105-67-9	2,4-Dimethylphenol	<1
59-50-7	4-Chloro-3-methyl-Phenol	<1
120-83-2	2,4-Dichlorophenol	<1
88-75-5	2-Nitrophenol	<1
88-06-2	2,4,6-trichlorophenol	<1
100-02-7	4-Nitrophenol	<1
87-86-5	Pentachlorophenol	<1
Total		<1

Alcontrol Geochem

Target Phenols Analysis

Sample Identity - 02140-016/BH2/2.7
Client / Sample matrix - Carl Bro Ltd/Soil
Units - µg/kg

CAS Number	Compound	Concentration
108-95-2	Phenol	8
95-57-8	2-Chlorophenol	<1
105-67-9	2,4-Dimethylphenol	<1
59-50-7	4-Chloro-3-methyl-Phenol	2
120-83-2	2,4-Dichlorophenol	<1
88-75-5	2-Nitrophenol	<1
88-06-2	2,4,6-trichlorophenol	<1
100-02-7	4-Nitrophenol	<1
87-86-5	Pentachlorophenol	<1
Total		10

Alcontrol Geochem

Target Phenols Analysis

Sample Identity - 200302140-026/BH3 2.0
Client / Sample matrix - Carl Bro Ltd/ soil
Units - µg/kg

CAS Number	Compound	Concentration
108-95-2	Phenol	5
95-57-8	2-Chlorophenol	<1
105-67-9	2,4-Dimethylphenol	<1
59-50-7	4-Chloro-3-methyl-Phenol	<1
120-83-2	2,4-Dichlorophenol	<1
88-75-5	2-Nitrophenol	<1
88-06-2	2,4,6-trichlorophenol	<1
100-02-7	4-Nitrophenol	<1
87-86-5	Pentachlorophenol	<1
Total		5

Alcontrol Geochem

Target Phenols Analysis

Sample Identity - 200302140-030/WS202 0.5
Client / Sample matrix - Carl Bro Ltd/ soil
Units - $\mu\text{g/kg}$

CAS Number	Compound	Concentration
108-95-2	Phenol	3
95-57-8	2-Chlorophenol	<1
105-67-9	2,4-Dimethylphenol	<1
59-50-7	4-Chloro-3-methyl-Phenol	<1
120-83-2	2,4-Dichlorophenol	<1
88-75-5	2-Nitrophenol	<1
88-06-2	2,4,6-trichlorophenol	<1
100-02-7	4-Nitrophenol	<1
87-86-5	Pentachlorophenol	<1
Total		3

ALcontrol Geochem
Target Phenols Analysis

Sample Identity - 02140-036/WS202 1.5
Client / Sample matrix - Carl Bro/Leachate
Units - ug/l

CAS Number	Compound	Concentration
108-95-2	Phenol	<1
95-57-8	2-Chlorophenol	<1
105-67-9	2,4-Dimethylphenol	<1
59-50-7	4-Chloro-3-methyl-Phenol	<1
120-83-2	2,4-Dichlorophenol	<1
88-75-5	2-Nitrophenol	<1
88-06-2	2,4,6-trichlorophenol	<1
100-02-7	4-Nitrophenol	<1
87-86-5	Pentachlorophenol	<1
Total		<1

Alcontrol Geochem

Target Phenols Analysis

Sample Identity - 200302140-036/WS202 1.5
Client / Sample matrix - Carl Bro Ltd/ soil
Units - $\mu\text{g/kg}$

CAS Number	Compound	Concentration
108-95-2	Phenol	3
95-57-8	2-Chlorophenol	<1
105-67-9	2,4-Dimethylphenol	<1
59-50-7	4-Chloro-3-methyl-Phenol	<1
120-83-2	2,4-Dichlorophenol	<1
88-75-5	2-Nitrophenol	<1
88-06-2	2,4,6-trichlorophenol	<1
100-02-7	4-Nitrophenol	<1
87-86-5	Pentachlorophenol	<1
Total		3

Alcontrol Geochem

Target Phenols Analysis

Sample Identity - 200302140-042/WS203 0.7
Client / Sample matrix - Carl Bro Ltd/ soil
Units - µg/kg

CAS Number	Compound	Concentration
108-95-2	Phenol	3
95-57-8	2-Chlorophenol	<1
105-67-9	2,4-Dimethylphenol	<1
59-50-7	4-Chloro-3-methyl-Phenol	<1
120-83-2	2,4-Dichlorophenol	<1
88-75-5	2-Nitrophenol	<1
88-06-2	2,4,6-trichlorophenol	<1
100-02-7	4-Nitrophenol	<1
87-86-5	Pentachlorophenol	<1
Total		3

ALcontrol Geochem
Target Phenols Analysis

Sample Identity - 02140-051/WS206 0.5
Client / Sample matrix - Carl Bro/Leachate
Units - ug/l

CAS Number	Compound	Concentration
108-95-2	Phenol	<1
95-57-8	2-Chlorophenol	<1
105-67-9	2,4-Dimethylphenol	<1
59-50-7	4-Chloro-3-methyl-Phenol	<1
120-83-2	2,4-Dichlorophenol	<1
88-75-5	2-Nitrophenol	<1
88-06-2	2,4,6-trichlorophenol	<1
100-02-7	4-Nitrophenol	<1
87-86-5	Pentachlorophenol	<1
Total		<1

Alcontrol Geochem

Target Phenols Analysis

Sample Identity - 200302140-051/WS206 0.5
Client / Sample matrix - Carl Bro Ltd/ soil
Units - $\mu\text{g/kg}$

CAS Number	Compound	Concentration
108-95-2	Phenol	<1
95-57-8	2-Chlorophenol	<1
105-67-9	2,4-Dimethylphenol	<1
59-50-7	4-Chloro-3-methyl-Phenol	<1
120-83-2	2,4-Dichlorophenol	<1
88-75-5	2-Nitrophenol	<1
88-06-2	2,4,6-trichlorophenol	<1
100-02-7	4-Nitrophenol	<1
87-86-5	Pentachlorophenol	<1
Total		<1

Alcontrol Geochem

Target Phenols Analysis

Sample Identity - 200302140-054/WS205 0.9
Client / Sample matrix - Carl Bro Ltd/ soil
Units - $\mu\text{g/kg}$

CAS Number	Compound	Concentration
108-95-2	Phenol	3
95-57-8	2-Chlorophenol	<1
105-67-9	2,4-Dimethylphenol	<1
59-50-7	4-Chloro-3-methyl-Phenol	<1
120-83-2	2,4-Dichlorophenol	<1
88-75-5	2-Nitrophenol	<1
88-06-2	2,4,6-trichlorophenol	<1
100-02-7	4-Nitrophenol	<1
87-86-5	Pentachlorophenol	<1
Total		3

Alcontrol Geochem

Target Phenols Analysis

Sample Identity - 200302140-063/WS206 2.8
Client / Sample matrix - Carl Bro Ltd/ soil
Units - $\mu\text{g/kg}$

CAS Number	Compound	Concentration
108-95-2	Phenol	3
95-57-8	2-Chlorophenol	<1
105-67-9	2,4-Dimethylphenol	<1
59-50-7	4-Chloro-3-methyl-Phenol	<1
120-83-2	2,4-Dichlorophenol	<1
88-75-5	2-Nitrophenol	<1
88-06-2	2,4,6-trichlorophenol	<1
100-02-7	4-Nitrophenol	<1
87-86-5	Pentachlorophenol	<1
Total		3

ALcontrol Geochem
Target Phenols Analysis

Sample Identity - 2140-066/BH1
Client / Sample matrix - Carl Bro Ltd/Water
Units - ug/l

CAS Number	Compound	Concentration
108-95-2	Phenol	<0.5
95-57-8	2-Chlorophenol	<0.5
105-67-9	2,4-Dimethylphenol	<0.5
59-50-7	4-Chloro-3-methyl-Phenol	<0.5
120-83-2	2,4-Dichlorophenol	<0.5
88-75-5	2-Nitrophenol	<0.5
88-06-2	2,4,6-trichlorophenol	<0.5
100-02-7	4-Nitrophenol	<0.5
87-86-5	Pentachlorophenol	<0.5
Total		<0.5

ALcontrol Geochem
Target Phenols Analysis

Sample Identity - 02140-070/BH2
Client / Sample matrix - Carl Bro/Water
Units - ug/l

CAS Number	Compound	Concentration
108-95-2	Phenol	<0.5
95-57-8	2-Chlorophenol	<0.5
105-67-9	2,4-Dimethylphenol	<0.5
59-50-7	4-Chloro-3-methyl-Phenol	<0.5
120-83-2	2,4-Dichlorophenol	<0.5
88-75-5	2-Nitrophenol	<0.5
88-06-2	2,4,6-trichlorophenol	<0.5
100-02-7	4-Nitrophenol	<0.5
87-86-5	Pentachlorophenol	<0.5
Total		<0.5

ALcontrol Geochem
Target Phenols Analysis

Sample Identity - 02140-079/BH3
Client / Sample matrix - Carl Bro Ltd/Water
Units - ug/l

CAS Number	Compound	Concentration
108-95-2	Phenol	<0.5
95-57-8	2-Chlorophenol	<0.5
105-67-9	2,4-Dimethylphenol	<0.5
59-50-7	4-Chloro-3-methyl-Phenol	<0.5
120-83-2	2,4-Dichlorophenol	<0.5
88-75-5	2-Nitrophenol	<0.5
88-06-2	2,4,6-trichlorophenol	<0.5
100-02-7	4-Nitrophenol	<0.5
87-86-5	Pentachlorophenol	<0.5
Total		<0.5

ALcontrol Geochem Analytical Services

Semivolatile Organic Compounds

Job Number - 03/02140

Client - Carl Bro Ltd

Client Ref -

Sample Identity - 0001 BH1 1.0

Sample Type [Units] - SOLID [$\mu\text{g/kg}$]

Date Acquired - 28 Feb 03 00:00

Date Reported - 28 Feb 03 16:35

CAS No	Compound	Conc.	CAS No	Compound	Conc.
108-95-2	Phenol	<100	207-08-9	Benzo(k)fluoranthene	<100
95-57-8	2-Chlorophenol	<100	50-32-8	Benzo(a)pyrene	<100
95-48-7	2-Methylphenol	<100	193-39-5	Indeno(1,2,3-cd)pyrene	<100
106-44-5	4-Methylphenol	<100	53-70-3	Dibenzo(a,h)anthracene	<100
88-75-5	2-Nitrophenol	<100	191-24-2	Benzo(ghi)perylene	<100
100-02-7	4-Nitrophenol	<100	91-58-7	2-Chloronaphthalene	<100
120-83-2	2,4-Dichlorophenol	<100	91-57-6	2-Methylnaphthalene	<100
105-67-9	2,4-Dimethylphenol	<100	86-74-8	Carbazole	<100
59-50-7	4-Chloro-3-methylphenol	<100	78-59-1	Isophorone	<100
88-06-2	2,4,6-Trichlorophenol	<100	132-64-9	Dibenzofuran	<100
95-95-4	2,4,5-Trichlorophenol	<100	131-11-3	Dimethyl phthalate	<100
87-86-5	Pentachlorophenol	<100	84-66-2	Diethyl phthalate	<100
541-73-1	1,3-Dichlorobenzene	<100	84-74-2	Di-n-butylphthalate	<100
106-46-7	1,4-Dichlorobenzene	<100	117-84-0	Di-n-octylphthalate	<100
95-50-1	1,2-Dichlorobenzene	<100	117-81-7	Bis(2-ethylhexyl)phthalate	279
120-82-1	1,2,4-Trichlorobenzene	<100	85-68-7	Butylbenzylphthalate	<100
98-95-3	Nitrobenzene	<100	106-47-8	4-Chloroaniline	<100
103-33-3	Azobenzene	<100	88-74-4	2-Nitroaniline	<100
118-74-1	Hexachlorobenzene	<100	99-09-2	3-Nitroaniline	<100
91-20-3	Naphthalene	<100	100-01-6	4-Nitroaniline	<100
208-96-8	Acenaphthylene	<100	121-14-2	2,4-Dinitrotoluene	<100
83-32-9	Acenaphthene	<100	606-20-2	2,6-Dinitrotoluene	<100
86-73-7	Fluorene	<100	111-44-4	Bis(2-chloroethyl)ether	<100
85-01-8	Phenanthrene	126	101-55-3	4-Bromophenylphenylether	<100
120-12-7	Anthracene	<100	7005-72-3	4-Chlorophenylphenylether	<100
206-44-0	Fluoranthene	110	67-72-1	Hexachloroethane	<100
129-00-0	Pyrene	<100	87-68-3	Hexachlorobutadiene	<100
56-55-3	Benz(a)anthracene	<100	77-47-4	Hexchlorocyclopentadiene	<100
218-01-9	Chrysene	<100	111-91-1	Bis(2-chloroethoxy)methane	<100
205-99-2	Benzo(b)fluoranthene	<100	621-64-7	N-Nitrosodi-n-propylamine	<100

Tentatively Identified Compounds

Sample Identity	-	2140-001/BH1 1.0
Client / Sample matrix	-	Carl Bro Ltd/Soil
Units	-	µg/kg

Compound	RetentionTime min	Concentration μg/kg
C12-26 Hydrocarbons		15770

ALcontrol Geochem Analytical Services

Semivolatile Organic Compounds

Job Number - 03/02140

Client - Carl Bro Ltd

Client Ref -

Sample Identity - 0016 BH2 2.7

Sample Type [Units] - SOLID [$\mu\text{g/kg}$]

Date Acquired - 28 Feb 03 00:00

Date Reported - 28 Feb 03 16:35

CAS No	Compound	Conc.	CAS No	Compound	Conc.
108-95-2	Phenol	<100	207-08-9	Benzo(k)fluoranthene	<100
95-57-8	2-Chlorophenol	<100	50-32-8	Benzo(a)pyrene	<100
95-48-7	2-Methylphenol	<100	193-39-5	Indeno(1,2,3-cd)pyrene	<100
106-44-5	4-Methylphenol	<100	53-70-3	Dibenzo(a,h)anthracene	<100
88-75-5	2-Nitrophenol	<100	191-24-2	Benzo(ghi)perylene	<100
100-02-7	4-Nitrophenol	<100	91-58-7	2-Chloronaphthalene	<100
120-83-2	2,4-Dichlorophenol	<100	91-57-6	2-Methylnaphthalene	<100
105-67-9	2,4-Dimethylphenol	<100	86-74-8	Carbazole	<100
59-50-7	4-Chloro-3-methylphenol	<100	78-59-1	Isophorone	<100
88-06-2	2,4,6-Trichlorophenol	<100	132-64-9	Dibenzofuran	<100
95-95-4	2,4,5-Trichlorophenol	<100	131-11-3	Dimethyl phthalate	<100
87-86-5	Pentachlorophenol	<100	84-66-2	Diethyl phthalate	<100
541-73-1	1,3-Dichlorobenzene	<100	84-74-2	Di-n-butylphthalate	<100
106-46-7	1,4-Dichlorobenzene	<100	117-84-0	Di-n-octylphthalate	<100
95-50-1	1,2-Dichlorobenzene	<100	117-81-7	Bis(2-ethylhexyl)phthalate	230
120-82-1	1,2,4-Trichlorobenzene	<100	85-68-7	Butylbenzylphthalate	<100
98-95-3	Nitrobenzene	<100	106-47-8	4-Chloroaniline	<100
103-33-3	Azobenzene	<100	88-74-4	2-Nitroaniline	<100
118-74-1	Hexachlorobenzene	<100	99-09-2	3-Nitroaniline	<100
91-20-3	Naphthalene	<100	100-01-6	4-Nitroaniline	<100
208-96-8	Acenaphthylene	<100	121-14-2	2,4-Dinitrotoluene	<100
83-32-9	Acenaphthene	<100	606-20-2	2,6-Dinitrotoluene	<100
86-73-7	Fluorene	<100	111-44-4	Bis(2-chloroethyl)ether	<100
85-01-8	Phenanthrene	<100	101-55-3	4-Bromophenylphenylether	<100
120-12-7	Anthracene	<100	7005-72-3	4-Chlorophenylphenylether	<100
206-44-0	Fluoranthene	<100	67-72-1	Hexachloroethane	<100
129-00-0	Pyrene	<100	87-68-3	Hexachlorobutadiene	<100
56-55-3	Benz(a)anthracene	<100	77-47-4	Hexchlorocyclopentadiene	<100
218-01-9	Chrysene	<100	111-91-1	Bis(2-chloroethoxy)methane	<100
205-99-2	Benzo(b)fluoranthene	<100	621-64-7	N-Nitrosodi-n-propylamine	<100

Tentatively Identified Compounds

Compound	RetentionTime min	Concentration μg/kg
C162-26 Hydrocarbons	-	9880

ALcontrol Geochem Analytical Services

Semivolatile Organic Compounds

Job Number - 03/02140

Client - Carl Bro Ltd

Client Ref -

Sample Identity - 0026 BH3 2.0

Sample Type [Units] - SOLID [$\mu\text{g/kg}$]

Date Acquired - 1 Mar 03 00:00

Date Reported - 4 Mar 03 17:37

CAS No	Compound	Conc.	CAS No	Compound	Conc.
108-95-2	Phenol	<100	207-08-9	Benzo(k)fluoranthene	<100
95-57-8	2-Chlorophenol	<100	50-32-8	Benzo(a)pyrene	<100
95-48-7	2-Methylphenol	<100	193-39-5	Indeno(1,2,3-cd)pyrene	<100
106-44-5	4-Methylphenol	<100	53-70-3	Dibenzo(a,h)anthracene	<100
88-75-5	2-Nitrophenol	<100	191-24-2	Benzo(ghi)perylene	<100
100-02-7	4-Nitrophenol	<100	91-58-7	2-Chloronaphthalene	<100
120-83-2	2,4-Dichlorophenol	<100	91-57-6	2-Methylnaphthalene	<100
105-67-9	2,4-Dimethylphenol	<100	86-74-8	Carbazole	<100
59-50-7	4-Chloro-3-methylphenol	<100	78-59-1	Isophorone	<100
88-06-2	2,4,6-Trichlorophenol	<100	132-64-9	Dibenzofuran	<100
95-95-4	2,4,5-Trichlorophenol	<100	131-11-3	Dimethyl phthalate	<100
87-86-5	Pentachlorophenol	<100	84-66-2	Diethyl phthalate	<100
541-73-1	1,3-Dichlorobenzene	<100	84-74-2	Di-n-butylphthalate	<100
106-46-7	1,4-Dichlorobenzene	<100	117-84-0	Di-n-octylphthalate	<100
95-50-1	1,2-Dichlorobenzene	<100	117-81-7	Bis(2-ethylhexyl)phthalate	639
120-82-1	1,2,4-Trichlorobenzene	<100	85-68-7	Butylbenzylphthalate	<100
98-95-3	Nitrobenzene	<100	106-47-8	4-Chloroaniline	<100
103-33-3	Azobenzene	<100	88-74-4	2-Nitroaniline	<100
118-74-1	Hexachlorobenzene	<100	99-09-2	3-Nitroaniline	<100
91-20-3	Naphthalene	<100	100-01-6	4-Nitroaniline	<100
208-96-8	Acenaphthylene	<100	121-14-2	2,4-Dinitrotoluene	<100
83-32-9	Acenaphthene	<100	606-20-2	2,6-Dinitrotoluene	<100
86-73-7	Fluorene	<100	111-44-4	Bis(2-chloroethyl)ether	<100
85-01-8	Phenanthrene	<100	101-55-3	4-Bromophenylphenylether	<100
120-12-7	Anthracene	<100	7005-72-3	4-Chlorophenylphenylether	<100
206-44-0	Fluoranthene	<100	67-72-1	Hexachloroethane	<100
129-00-0	Pyrene	<100	87-68-3	Hexachlorobutadiene	<100
56-55-3	Benz(a)anthracene	<100	77-47-4	Hexchlorocyclopentadiene	<100
218-01-9	Chrysene	<100	111-91-1	Bis(2-chloroethoxy)methane	<100
205-99-2	Benzo(b)fluoranthene	<100	621-64-7	N-Nitrosodi-n-propylamine	<100

Tentatively Identified Compounds

Sample Identity	-	2140-026/BH3 2.0
Client / Sample matrix	-	Carl bro Ltd/Soil
Units	-	µg/kg

Compound	RetentionTime min	Concentration μg/kg
C16-26 Hydrocarbons	6060	

ALcontrol Geochem Analytical Services

Semivolatile Organic Compounds

Job Number - 03/02140

Client - Carl Bro Ltd

Client Ref -

Sample Identity - 0030 WS202 0.5

Sample Type [Units] - SOLID [$\mu\text{g/kg}$]

Date Acquired - 1 Mar 03 00:00

Date Reported - 4 Mar 03 17:37

CAS No	Compound	Conc.	CAS No	Compound	Conc.
108-95-2	Phenol	<100	207-08-9	Benzo(k)fluoranthene	<100
95-57-8	2-Chlorophenol	<100	50-32-8	Benzo(a)pyrene	<100
95-48-7	2-Methylphenol	<100	193-39-5	Indeno(1,2,3-cd)pyrene	<100
106-44-5	4-Methylphenol	<100	53-70-3	Dibenzo(a,h)anthracene	<100
88-75-5	2-Nitrophenol	<100	191-24-2	Benzo(ghi)perylene	<100
100-02-7	4-Nitrophenol	<100	91-58-7	2-Chloronaphthalene	<100
120-83-2	2,4-Dichlorophenol	<100	91-57-6	2-Methylnaphthalene	<100
105-67-9	2,4-Dimethylphenol	<100	86-74-8	Carbazole	<100
59-50-7	4-Chloro-3-methylphenol	<100	78-59-1	Isophorone	<100
88-06-2	2,4,6-Trichlorophenol	<100	132-64-9	Dibenzofuran	<100
95-95-4	2,4,5-Trichlorophenol	<100	131-11-3	Dimethyl phthalate	<100
87-86-5	Pentachlorophenol	<100	84-66-2	Diethyl phthalate	<100
541-73-1	1,3-Dichlorobenzene	<100	84-74-2	Di-n-butylphthalate	<100
106-46-7	1,4-Dichlorobenzene	<100	117-84-0	Di-n-octylphthalate	<100
95-50-1	1,2-Dichlorobenzene	<100	117-81-7	Bis(2-ethylhexyl)phthalate	1003
120-82-1	1,2,4-Trichlorobenzene	<100	85-68-7	Butylbenzylphthalate	<100
98-95-3	Nitrobenzene	<100	106-47-8	4-Chloroaniline	<100
103-33-3	Azobenzene	<100	88-74-4	2-Nitroaniline	<100
118-74-1	Hexachlorobenzene	<100	99-09-2	3-Nitroaniline	<100
91-20-3	Naphthalene	<100	100-01-6	4-Nitroaniline	<100
208-96-8	Acenaphthylene	<100	121-14-2	2,4-Dinitrotoluene	<100
83-32-9	Acenaphthene	<100	606-20-2	2,6-Dinitrotoluene	<100
86-73-7	Fluorene	<100	111-44-4	Bis(2-chloroethyl)ether	<100
85-01-8	Phenanthrene	<100	101-55-3	4-Bromophenylphenylether	<100
120-12-7	Anthracene	<100	7005-72-3	4-Chlorophenylphenylether	<100
206-44-0	Fluoranthene	<100	67-72-1	Hexachloroethane	<100
129-00-0	Pyrene	<100	87-68-3	Hexachlorobutadiene	<100
56-55-3	Benz(a)anthracene	<100	77-47-4	Hexchlorocyclopentadiene	<100
218-01-9	Chrysene	<100	111-91-1	Bis(2-chloroethoxy)methane	<100
205-99-2	Benzo(b)fluoranthene	<100	621-64-7	N-Nitrosodi-n-propylamine	<100

Tentatively Identified Compounds

Sample Identity	-	2140-030/WS202 0.5
Client / Sample matrix	-	Carl bro Ltd/Soil
Units	-	µg/kg

Compound	RetentionTime min	Concentration μg/kg
C16-26 Hydrocarbons		3800

ALcontrol Geochem Analytical Services

Semivolatile Organic Compounds

Job Number - 03/02140

Client - Carl Bro Ltd

Client Ref -

Sample Identity - 0036 WS202 1.5

Sample Type [Units] - SOLID [$\mu\text{g/kg}$]

Date Acquired - 29 Mar 03 00:00

Date Reported - 31 Mar 03 15:26

CAS No	Compound	Conc.	CAS No	Compound	Conc.
108-95-2	Phenol	<100	207-08-9	Benzo(k)fluoranthene	<100
95-57-8	2-Chlorophenol	<100	50-32-8	Benzo(a)pyrene	<100
95-48-7	2-Methylphenol	<100	193-39-5	Indeno(1,2,3-cd)pyrene	<100
106-44-5	4-Methylphenol	<100	53-70-3	Dibenzo(a,h)anthracene	<100
88-75-5	2-Nitrophenol	<100	191-24-2	Benzo(ghi)perylene	<100
100-02-7	4-Nitrophenol	<100	91-58-7	2-Chloronaphthalene	<100
120-83-2	2,4-Dichlorophenol	<100	91-57-6	2-Methylnaphthalene	<100
105-67-9	2,4-Dimethylphenol	<100	86-74-8	Carbazole	<100
59-50-7	4-Chloro-3-methylphenol	<100	78-59-1	Isophorone	<100
88-06-2	2,4,6-Trichlorophenol	<100	132-64-9	Dibenzofuran	<100
95-95-4	2,4,5-Trichlorophenol	<100	131-11-3	Dimethyl phthalate	<100
87-86-5	Pentachlorophenol	<100	84-66-2	Diethyl phthalate	<100
541-73-1	1,3-Dichlorobenzene	<100	84-74-2	Di-n-butylphthalate	<100
106-46-7	1,4-Dichlorobenzene	<100	117-84-0	Di-n-octylphthalate	<100
95-50-1	1,2-Dichlorobenzene	<100	117-81-7	Bis(2-ethylhexyl)phthalate	1154
120-82-1	1,2,4-Trichlorobenzene	<100	85-68-7	Butylbenzylphthalate	<100
98-95-3	Nitrobenzene	<100	106-47-8	4-Chloroaniline	<100
103-33-3	Azobenzene	<100	88-74-4	2-Nitroaniline	<100
118-74-1	Hexachlorobenzene	<100	99-09-2	3-Nitroaniline	<100
91-20-3	Naphthalene	<100	100-01-6	4-Nitroaniline	<100
208-96-8	Acenaphthylene	<100	121-14-2	2,4-Dinitrotoluene	<100
83-32-9	Acenaphthene	<100	606-20-2	2,6-Dinitrotoluene	<100
86-73-7	Fluorene	<100	111-44-4	Bis(2-chloroethyl)ether	<100
85-01-8	Phenanthrene	120	101-55-3	4-Bromophenylphenylether	<100
120-12-7	Anthracene	<100	7005-72-3	4-Chlorophenylphenylether	<100
206-44-0	Fluoranthene	<100	67-72-1	Hexachloroethane	<100
129-00-0	Pyrene	<100	87-68-3	Hexachlorobutadiene	<100
56-55-3	Benz(a)anthracene	<100	77-47-4	Hexchlorocyclopentadiene	<100
218-01-9	Chrysene	<100	111-91-1	Bis(2-chloroethoxy)methane	<100
205-99-2	Benzo(b)fluoranthene	<100	621-64-7	N-Nitrosodi-n-propylamine	<100

Tentatively Identified Compounds

Compound	RetentionTime min	Concentration μg/kg
C16-26 Hydrocarbons	-	15940

ALcontrol Geochem Analytical Services

Semivolatile Organic Compounds

Job Number - 03/02140

Client - Carl Bro Ltd

Client Ref -

Sample Identity - 0042 WS203 0.7

Sample Type [Units] - SOLID [$\mu\text{g/kg}$]

Date Acquired - 1 Mar 03 00:00

Date Reported - 4 Mar 03 17:37

CAS No	Compound	Conc.	CAS No	Compound	Conc.
108-95-2	Phenol	<100	207-08-9	Benzo(k)fluoranthene	<100
95-57-8	2-Chlorophenol	<100	50-32-8	Benzo(a)pyrene	<100
95-48-7	2-Methylphenol	<100	193-39-5	Indeno(1,2,3-cd)pyrene	<100
106-44-5	4-Methylphenol	<100	53-70-3	Dibenzo(a,h)anthracene	<100
88-75-5	2-Nitrophenol	<100	191-24-2	Benzo(ghi)perylene	<100
100-02-7	4-Nitrophenol	<100	91-58-7	2-Chloronaphthalene	<100
120-83-2	2,4-Dichlorophenol	<100	91-57-6	2-Methylnaphthalene	<100
105-67-9	2,4-Dimethylphenol	<100	86-74-8	Carbazole	<100
59-50-7	4-Chloro-3-methylphenol	<100	78-59-1	Isophorone	<100
88-06-2	2,4,6-Trichlorophenol	<100	132-64-9	Dibenzofuran	<100
95-95-4	2,4,5-Trichlorophenol	<100	131-11-3	Dimethyl phthalate	<100
87-86-5	Pentachlorophenol	<100	84-66-2	Diethyl phthalate	<100
541-73-1	1,3-Dichlorobenzene	<100	84-74-2	Di-n-butylphthalate	<100
106-46-7	1,4-Dichlorobenzene	<100	117-84-0	Di-n-octylphthalate	<100
95-50-1	1,2-Dichlorobenzene	<100	117-81-7	Bis(2-ethylhexyl)phthalate	<100
120-82-1	1,2,4-Trichlorobenzene	<100	85-68-7	Butylbenzylphthalate	<100
98-95-3	Nitrobenzene	<100	106-47-8	4-Chloroaniline	<100
103-33-3	Azobenzene	<100	88-74-4	2-Nitroaniline	<100
118-74-1	Hexachlorobenzene	<100	99-09-2	3-Nitroaniline	<100
91-20-3	Naphthalene	<100	100-01-6	4-Nitroaniline	<100
208-96-8	Acenaphthylene	<100	121-14-2	2,4-Dinitrotoluene	<100
83-32-9	Acenaphthene	<100	606-20-2	2,6-Dinitrotoluene	<100
86-73-7	Fluorene	<100	111-44-4	Bis(2-chloroethyl)ether	<100
85-01-8	Phenanthrene	<100	101-55-3	4-Bromophenylphenylether	<100
120-12-7	Anthracene	<100	7005-72-3	4-Chlorophenylphenylether	<100
206-44-0	Fluoranthene	<100	67-72-1	Hexachloroethane	<100
129-00-0	Pyrene	<100	87-68-3	Hexachlorobutadiene	<100
56-55-3	Benz(a)anthracene	<100	77-47-4	Hexchlorocyclopentadiene	<100
218-01-9	Chrysene	<100	111-91-1	Bis(2-chloroethoxy)methane	<100
205-99-2	Benzo(b)fluoranthene	<100	621-64-7	N-Nitrosodi-n-propylamine	<100

Alcontrol Geochem

Tentatively Identified Compounds

Sample Identity - 2140-042/WS203 0.7
Client / Sample matrix - Carl bro Ltd/Soil
Units - $\mu\text{g/kg}$

Compound	RetentionTime min	Concentration $\mu\text{g/kg}$
No Compounds Detected	-	<100

ALcontrol Geochem Analytical Services

Semivolatile Organic Compounds

Job Number - 03/02140

Client - Carl Bro Ltd

Client Ref -

Sample Identity - 0051 WS206 0.5

Sample Type [Units] - SOLID [$\mu\text{g/kg}$]

Date Acquired - 29 Mar 03 00:00

Date Reported - 31 Mar 03 15:26

CAS No	Compound	Conc.	CAS No	Compound	Conc.
108-95-2	Phenol	<100	207-08-9	Benzo(k)fluoranthene	<100
95-57-8	2-Chlorophenol	<100	50-32-8	Benzo(a)pyrene	<100
95-48-7	2-Methylphenol	<100	193-39-5	Indeno(1,2,3-cd)pyrene	<100
106-44-5	4-Methylphenol	<100	53-70-3	Dibenzo(a,h)anthracene	<100
88-75-5	2-Nitrophenol	<100	191-24-2	Benzo(ghi)perylene	<100
100-02-7	4-Nitrophenol	<100	91-58-7	2-Chloronaphthalene	<100
120-83-2	2,4-Dichlorophenol	<100	91-57-6	2-Methylnaphthalene	<100
105-67-9	2,4-Dimethylphenol	<100	86-74-8	Carbazole	<100
59-50-7	4-Chloro-3-methylphenol	<100	78-59-1	Isophorone	<100
88-06-2	2,4,6-Trichlorophenol	<100	132-64-9	Dibenzofuran	<100
95-95-4	2,4,5-Trichlorophenol	<100	131-11-3	Dimethyl phthalate	<100
87-86-5	Pentachlorophenol	<100	84-66-2	Diethyl phthalate	<100
541-73-1	1,3-Dichlorobenzene	<100	84-74-2	Di-n-butylphthalate	<100
106-46-7	1,4-Dichlorobenzene	<100	117-84-0	Di-n-octylphthalate	<100
95-50-1	1,2-Dichlorobenzene	<100	117-81-7	Bis(2-ethylhexyl)phthalate	1093
120-82-1	1,2,4-Trichlorobenzene	<100	85-68-7	Butylbenzylphthalate	<100
98-95-3	Nitrobenzene	<100	106-47-8	4-Chloroaniline	<100
103-33-3	Azobenzene	<100	88-74-4	2-Nitroaniline	<100
118-74-1	Hexachlorobenzene	<100	99-09-2	3-Nitroaniline	<100
91-20-3	Naphthalene	<100	100-01-6	4-Nitroaniline	<100
208-96-8	Acenaphthylene	<100	121-14-2	2,4-Dinitrotoluene	<100
83-32-9	Acenaphthene	<100	606-20-2	2,6-Dinitrotoluene	<100
86-73-7	Fluorene	<100	111-44-4	Bis(2-chloroethyl)ether	<100
85-01-8	Phenanthrene	<100	101-55-3	4-Bromophenylphenylether	<100
120-12-7	Anthracene	<100	7005-72-3	4-Chlorophenylphenylether	<100
206-44-0	Fluoranthene	161	67-72-1	Hexachloroethane	<100
129-00-0	Pyrene	118	87-68-3	Hexachlorobutadiene	<100
56-55-3	Benz(a)anthracene	<100	77-47-4	Hexchlorocyclopentadiene	<100
218-01-9	Chrysene	136	111-91-1	Bis(2-chloroethoxy)methane	<100
205-99-2	Benzo(b)fluoranthene	<100	621-64-7	N-Nitrosodi-n-propylamine	<100

Tentatively Identified Compounds

Sample Identity	-	2140-051/WS206	0.5
Client / Sample matrix	-	Carl Bro Ltd/Soil	
Units	-	µg/kg	

Compound	RetentionTime min	Concentration μg/kg
C16-26 Hydrocarbons	9790	

ALcontrol Geochem Analytical Services

Semivolatile Organic Compounds

Job Number - 03/02140

Client - Carl Bro Ltd

Client Ref -

Sample Identity - 0054 WS205 0.9

Sample Type [Units] - SOLID [$\mu\text{g/kg}$]

Date Acquired - 1 Mar 03 00:00

Date Reported - 4 Mar 03 17:37

CAS No	Compound	Conc.	CAS No	Compound	Conc.
108-95-2	Phenol	<100	207-08-9	Benzo(k)fluoranthene	<100
95-57-8	2-Chlorophenol	<100	50-32-8	Benzo(a)pyrene	<100
95-48-7	2-Methylphenol	<100	193-39-5	Indeno(1,2,3-cd)pyrene	<100
106-44-5	4-Methylphenol	<100	53-70-3	Dibenzo(a,h)anthracene	<100
88-75-5	2-Nitrophenol	<100	191-24-2	Benzo(ghi)perylene	<100
100-02-7	4-Nitrophenol	<100	91-58-7	2-Chloronaphthalene	<100
120-83-2	2,4-Dichlorophenol	<100	91-57-6	2-Methylnaphthalene	<100
105-67-9	2,4-Dimethylphenol	<100	86-74-8	Carbazole	<100
59-50-7	4-Chloro-3-methylphenol	<100	78-59-1	Isophorone	<100
88-06-2	2,4,6-Trichlorophenol	<100	132-64-9	Dibenzofuran	<100
95-95-4	2,4,5-Trichlorophenol	<100	131-11-3	Dimethyl phthalate	<100
87-86-5	Pentachlorophenol	<100	84-66-2	Diethyl phthalate	<100
541-73-1	1,3-Dichlorobenzene	<100	84-74-2	Di-n-butylphthalate	<100
106-46-7	1,4-Dichlorobenzene	<100	117-84-0	Di-n-octylphthalate	<100
95-50-1	1,2-Dichlorobenzene	<100	117-81-7	Bis(2-ethylhexyl)phthalate	658
120-82-1	1,2,4-Trichlorobenzene	<100	85-68-7	Butylbenzylphthalate	<100
98-95-3	Nitrobenzene	<100	106-47-8	4-Chloroaniline	<100
103-33-3	Azobenzene	<100	88-74-4	2-Nitroaniline	<100
118-74-1	Hexachlorobenzene	<100	99-09-2	3-Nitroaniline	<100
91-20-3	Naphthalene	<100	100-01-6	4-Nitroaniline	<100
208-96-8	Acenaphthylene	<100	121-14-2	2,4-Dinitrotoluene	<100
83-32-9	Acenaphthene	<100	606-20-2	2,6-Dinitrotoluene	<100
86-73-7	Fluorene	<100	111-44-4	Bis(2-chloroethyl)ether	<100
85-01-8	Phenanthrene	<100	101-55-3	4-Bromophenylphenylether	<100
120-12-7	Anthracene	<100	7005-72-3	4-Chlorophenylphenylether	<100
206-44-0	Fluoranthene	<100	67-72-1	Hexachloroethane	<100
129-00-0	Pyrene	<100	87-68-3	Hexachlorobutadiene	<100
56-55-3	Benz(a)anthracene	<100	77-47-4	Hexchlorocyclopentadiene	<100
218-01-9	Chrysene	<100	111-91-1	Bis(2-chloroethoxy)methane	<100
205-99-2	Benzo(b)fluoranthene	<100	621-64-7	N-Nitrosodi-n-propylamine	<100

Tentatively Identified Compounds

Sample Identity	-	2140-054/WS205	0.9
Client / Sample matrix	-	Carl bro Ltd/Soil	
Units	-	µg/kg	

Compound	RetentionTime min	Concentration μg/kg
C16-26 hydrocarbons	-	2240

ALcontrol Geochem Analytical Services

Semivolatile Organic Compounds

Job Number - 03/02140

Client - Carl Bro Ltd

Client Ref -

Sample Identity - 0063 WS206 2.8

Sample Type [Units] - SOLID [$\mu\text{g/kg}$]

Date Acquired - 1 Mar 03 00:00

Date Reported - 4 Mar 03 17:37

CAS No	Compound	Conc.	CAS No	Compound	Conc.
108-95-2	Phenol	<100	207-08-9	Benzo(k)fluoranthene	<100
95-57-8	2-Chlorophenol	<100	50-32-8	Benzo(a)pyrene	<100
95-48-7	2-Methylphenol	<100	193-39-5	Indeno(1,2,3-cd)pyrene	<100
106-44-5	4-Methylphenol	<100	53-70-3	Dibenzo(a,h)anthracene	<100
88-75-5	2-Nitrophenol	<100	191-24-2	Benzo(ghi)perylene	<100
100-02-7	4-Nitrophenol	<100	91-58-7	2-Chloronaphthalene	<100
120-83-2	2,4-Dichlorophenol	<100	91-57-6	2-Methylnaphthalene	<100
105-67-9	2,4-Dimethylphenol	<100	86-74-8	Carbazole	<100
59-50-7	4-Chloro-3-methylphenol	<100	78-59-1	Isophorone	<100
88-06-2	2,4,6-Trichlorophenol	<100	132-64-9	Dibenzofuran	<100
95-95-4	2,4,5-Trichlorophenol	<100	131-11-3	Dimethyl phthalate	<100
87-86-5	Pentachlorophenol	<100	84-66-2	Diethyl phthalate	<100
541-73-1	1,3-Dichlorobenzene	<100	84-74-2	Di-n-butylphthalate	<100
106-46-7	1,4-Dichlorobenzene	<100	117-84-0	Di-n-octylphthalate	<100
95-50-1	1,2-Dichlorobenzene	<100	117-81-7	Bis(2-ethylhexyl)phthalate	883
120-82-1	1,2,4-Trichlorobenzene	<100	85-68-7	Butylbenzylphthalate	<100
98-95-3	Nitrobenzene	<100	106-47-8	4-Chloroaniline	<100
103-33-3	Azobenzene	<100	88-74-4	2-Nitroaniline	<100
118-74-1	Hexachlorobenzene	<100	99-09-2	3-Nitroaniline	<100
91-20-3	Naphthalene	<100	100-01-6	4-Nitroaniline	<100
208-96-8	Acenaphthylene	<100	121-14-2	2,4-Dinitrotoluene	<100
83-32-9	Acenaphthene	<100	606-20-2	2,6-Dinitrotoluene	<100
86-73-7	Fluorene	<100	111-44-4	Bis(2-chloroethyl)ether	<100
85-01-8	Phenanthrene	<100	101-55-3	4-Bromophenylphenylether	<100
120-12-7	Anthracene	<100	7005-72-3	4-Chlorophenylphenylether	<100
206-44-0	Fluoranthene	<100	67-72-1	Hexachloroethane	<100
129-00-0	Pyrene	<100	87-68-3	Hexachlorobutadiene	<100
56-55-3	Benz(a)anthracene	<100	77-47-4	Hexchlorocyclopentadiene	<100
218-01-9	Chrysene	<100	111-91-1	Bis(2-chloroethoxy)methane	<100
205-99-2	Benzo(b)fluoranthene	<100	621-64-7	N-Nitrosodi-n-propylamine	<100

Tentatively Identified Compounds

Sample Identity	-	2140-063/WS206	2.8
Client / Sample matrix	-	Carl bro Ltd/Soil	
Units	-	µg/kg	

Compound	RetentionTime min	Concentration μg/kg
C16-26 hydrocarbons		2590

ALcontrol Geochem Analytical Services

Semivolatile Organic Compounds

Job Number - 03/02140

Client - Carl Bro Ltd

Client Ref -

Sample Identity - 0066 BH1

Sample Type [Units] - LIQUID [$\mu\text{g/l}$]

Date Acquired - 1 Apr 03 00:00

Date Reported - 1 Apr 03 13:16

CAS No	Compound	Conc.	CAS No	Compound	Conc.
108-95-2	Phenol	<1	207-08-9	Benzo(k)fluoranthene	<1
95-57-8	2-Chlorophenol	<1	50-32-8	Benzo(a)pyrene	<1
95-48-7	2-Methylphenol	<1	193-39-5	Indeno(1,2,3-cd)pyrene	<1
106-44-5	4-Methylphenol	<1	53-70-3	Dibenzo(a,h)anthracene	<1
88-75-5	2-Nitrophenol	<1	191-24-2	Benzo(ghi)perylene	<1
100-02-7	4-Nitrophenol	<1	91-58-7	2-Chloronaphthalene	<1
120-83-2	2,4-Dichlorophenol	<1	91-57-6	2-Methylnaphthalene	<1
105-67-9	2,4-Dimethylphenol	<1	86-74-8	Carbazole	<1
59-50-7	4-Chloro-3-methylphenol	<1	78-59-1	Isophorone	<1
88-06-2	2,4,6-Trichlorophenol	<1	132-64-9	Dibenzofuran	<1
95-95-4	2,4,5-Trichlorophenol	<1	131-11-3	Dimethyl phthalate	<1
87-86-5	Pentachlorophenol	<1	84-66-2	Diethyl phthalate	<1
541-73-1	1,3-Dichlorobenzene	<1	84-74-2	Di-n-butylphthalate	<1
106-46-7	1,4-Dichlorobenzene	<1	117-84-0	Di-n-octylphthalate	<1
95-50-1	1,2-Dichlorobenzene	<1	117-81-7	Bis(2-ethylhexyl)phthalate	<1
120-82-1	1,2,4-Trichlorobenzene	<1	85-68-7	Butylbenzylphthalate	<1
98-95-3	Nitrobenzene	<1	106-47-8	4-Chloroaniline	<1
103-33-3	Azobenzene	<1	88-74-4	2-Nitroaniline	<1
118-74-1	Hexachlorobenzene	<1	99-09-2	3-Nitroaniline	<1
91-20-3	Naphthalene	<1	100-01-6	4-Nitroaniline	<1
208-96-8	Acenaphthylene	<1	121-14-2	2,4-Dinitrotoluene	<1
83-32-9	Acenaphthene	<1	606-20-2	2,6-Dinitrotoluene	<1
86-73-7	Fluorene	<1	111-44-4	Bis(2-chloroethyl)ether	<1
85-01-8	Phenanthrene	<1	101-55-3	4-Bromophenylphenylether	<1
120-12-7	Anthracene	<1	7005-72-3	4-Chlorophenylphenylether	<1
206-44-0	Fluoranthene	<1	67-72-1	Hexachloroethane	<1
129-00-0	Pyrene	<1	87-68-3	Hexachlorobutadiene	<1
56-55-3	Benz(a)anthracene	<1	77-47-4	Hexchlorocyclopentadiene	<1
218-01-9	Chrysene	<1	111-91-1	Bis(2-chloroethoxy)methane	<1
205-99-2	Benzo(b)fluoranthene	<1	621-64-7	N-Nitrosodi-n-propylamine	<1

Alcontrol Geochem

Tentatively Identified Compounds

Sample Identity - 2140-066/BH1
Client / Sample matrix - Carl Bro Ltd/Water
Units - $\mu\text{g/l}$

Compound	RetentionTime min	Concentration $\mu\text{g/l}$
No compounds detected		<1

ALcontrol Geochem Analytical Services

Semivolatile Organic Compounds

Job Number - 03/02140

Client - Carl Bro Ltd

Client Ref -

Sample Identity - 0069 BH2

Sample Type [Units] - LIQUID [$\mu\text{g/l}$]

Date Acquired - 29 Mar 03 00:00

Date Reported - 3 Apr 03 11:50

CAS No	Compound	Conc.	CAS No	Compound	Conc.
108-95-2	Phenol	<1	207-08-9	Benzo(k)fluoranthene	<1
95-57-8	2-Chlorophenol	<1	50-32-8	Benzo(a)pyrene	<1
95-48-7	2-Methylphenol	<1	193-39-5	Indeno(1,2,3-cd)pyrene	<1
106-44-5	4-Methylphenol	<1	53-70-3	Dibenzo(a,h)anthracene	<1
88-75-5	2-Nitrophenol	<1	191-24-2	Benzo(ghi)perylene	<1
100-02-7	4-Nitrophenol	<1	91-58-7	2-Chloronaphthalene	<1
120-83-2	2,4-Dichlorophenol	<1	91-57-6	2-Methylnaphthalene	<1
105-67-9	2,4-Dimethylphenol	<1	86-74-8	Carbazole	<1
59-50-7	4-Chloro-3-methylphenol	<1	78-59-1	Isophorone	<1
88-06-2	2,4,6-Trichlorophenol	<1	132-64-9	Dibenzofuran	<1
95-95-4	2,4,5-Trichlorophenol	<1	131-11-3	Dimethyl phthalate	<1
87-86-5	Pentachlorophenol	<1	84-66-2	Diethyl phthalate	<1
541-73-1	1,3-Dichlorobenzene	<1	84-74-2	Di-n-butylphthalate	<1
106-46-7	1,4-Dichlorobenzene	<1	117-84-0	Di-n-octylphthalate	<1
95-50-1	1,2-Dichlorobenzene	<1	117-81-7	Bis(2-ethylhexyl)phthalate	<1
120-82-1	1,2,4-Trichlorobenzene	<1	85-68-7	Butylbenzylphthalate	<1
98-95-3	Nitrobenzene	<1	106-47-8	4-Chloroaniline	<1
103-33-3	Azobenzene	<1	88-74-4	2-Nitroaniline	<1
118-74-1	Hexachlorobenzene	<1	99-09-2	3-Nitroaniline	<1
91-20-3	Naphthalene	<1	100-01-6	4-Nitroaniline	<1
208-96-8	Acenaphthylene	<1	121-14-2	2,4-Dinitrotoluene	<1
83-32-9	Acenaphthene	<1	606-20-2	2,6-Dinitrotoluene	<1
86-73-7	Fluorene	<1	111-44-4	Bis(2-chloroethyl)ether	<1
85-01-8	Phenanthrene	<1	101-55-3	4-Bromophenylphenylether	<1
120-12-7	Anthracene	<1	7005-72-3	4-Chlorophenylphenylether	<1
206-44-0	Fluoranthene	<1	67-72-1	Hexachloroethane	<1
129-00-0	Pyrene	<1	87-68-3	Hexachlorobutadiene	<1
56-55-3	Benz(a)anthracene	<1	77-47-4	Hexchlorocyclopentadiene	<1
218-01-9	Chrysene	<1	111-91-1	Bis(2-chloroethoxy)methane	<1
205-99-2	Benzo(b)fluoranthene	<1	621-64-7	N-Nitrosodi-n-propylamine	<1

Alcontrol Geochem

Tentatively Identified Compounds

Sample Identity - 2140-069/BH2
Client / Sample matrix - Carl Bro Ltd/Water
Units - µg/l

Compound	RetentionTime min	Concentration µg/l
No Compounds Detected	-	<1

ALcontrol Geochem Analytical Services

Semivolatile Organic Compounds

Job Number - 03/02140

Client - Carl Bro Ltd

Client Ref -

Sample Identity - 0078 BH3

Sample Type [Units] - LIQUID [$\mu\text{g/l}$]

Date Acquired - 12 Mar 03 00:00

Date Reported - 12 Mar 03 14:30

CAS No	Compound	Conc.	CAS No	Compound	Conc.
108-95-2	Phenol	<1	207-08-9	Benzo(k)fluoranthene	<1
95-57-8	2-Chlorophenol	<1	50-32-8	Benzo(a)pyrene	<1
95-48-7	2-Methylphenol	<1	193-39-5	Indeno(1,2,3-cd)pyrene	<1
106-44-5	4-Methylphenol	<1	53-70-3	Dibenzo(a,h)anthracene	<1
88-75-5	2-Nitrophenol	<1	191-24-2	Benzo(ghi)perylene	<1
100-02-7	4-Nitrophenol	<1	91-58-7	2-Chloronaphthalene	<1
120-83-2	2,4-Dichlorophenol	<1	91-57-6	2-Methylnaphthalene	<1
105-67-9	2,4-Dimethylphenol	<1	86-74-8	Carbazole	<1
59-50-7	4-Chloro-3-methylphenol	<1	78-59-1	Isophorone	<1
88-06-2	2,4,6-Trichlorophenol	<1	132-64-9	Dibenzofuran	<1
95-95-4	2,4,5-Trichlorophenol	<1	131-11-3	Dimethyl phthalate	<1
87-86-5	Pentachlorophenol	<1	84-66-2	Diethyl phthalate	<1
541-73-1	1,3-Dichlorobenzene	<1	84-74-2	Di-n-butylphthalate	<1
106-46-7	1,4-Dichlorobenzene	<1	117-84-0	Di-n-octylphthalate	<1
95-50-1	1,2-Dichlorobenzene	<1	117-81-7	Bis(2-ethylhexyl)phthalate	<1
120-82-1	1,2,4-Trichlorobenzene	<1	85-68-7	Butylbenzylphthalate	<1
98-95-3	Nitrobenzene	<1	106-47-8	4-Chloroaniline	<1
103-33-3	Azobenzene	<1	88-74-4	2-Nitroaniline	<1
118-74-1	Hexachlorobenzene	<1	99-09-2	3-Nitroaniline	<1
91-20-3	Naphthalene	<1	100-01-6	4-Nitroaniline	<1
208-96-8	Acenaphthylene	<1	121-14-2	2,4-Dinitrotoluene	<1
83-32-9	Acenaphthene	<1	606-20-2	2,6-Dinitrotoluene	<1
86-73-7	Fluorene	<1	111-44-4	Bis(2-chloroethyl)ether	<1
85-01-8	Phenanthrene	<1	101-55-3	4-Bromophenylphenylether	<1
120-12-7	Anthracene	<1	7005-72-3	4-Chlorophenylphenylether	<1
206-44-0	Fluoranthene	<1	67-72-1	Hexachloroethane	<1
129-00-0	Pyrene	<1	87-68-3	Hexachlorobutadiene	<1
56-55-3	Benz(a)anthracene	<1	77-47-4	Hexchlorocyclopentadiene	<1
218-01-9	Chrysene	<1	111-91-1	Bis(2-chloroethoxy)methane	<1
205-99-2	Benzo(b)fluoranthene	<1	621-64-7	N-Nitrosodi-n-propylamine	<1

Alcontrol Geochem

Tentatively Identified Compounds

Sample Identity - 2140-078/BH3
Client / Sample matrix - Carl Bro Ltd/ water
Units - $\mu\text{g/l}$

Compound	RetentionTime min	Concentration $\mu\text{g/l}$
No compounds detected		<1

ALcontrol Geochem

Volatile Organic Compounds (EPA 624/8260)

Job Number - 03/02140

Client - Carl Bro Ltd

Client Ref -

Sample Identity - 0003 BH1 1.0

Sample Type [Units] - SOIL [µg/kg]

Date Acquired - 28 Feb 03 10:00

Date Reported - 28 Feb 03 14:06

CAS No	Compound	Conc.	CAS No	Compound	Conc.
75-71-8	Dichlorodifluoromethane	<1	106-93-4	1,2-Dibromoethane	<1
74-87-3	Chloromethane	<1	127-18-4	Tetrachloroethene	<1
75-01-4	Vinyl Chloride	<1	630-20-6	1,1,1,2-Tetrachloroethane	<1
74-83-9	Bromomethane	<1	108-90-7	Chlorobenzene	<1
75-00-3	Chloroethane	<1	100-41-4	Ethylbenzene	3
75-69-4	Trichlorofluoromethane	<1	108-38-3*	p/m-Xylene	7
156-60-5	trans-1,2-Dichloroethene	<1	75-25-2	Bromoform	<1
75-09-2	Dichloromethane	<1	100-42-5	Styrene	<1
75-15-0	Carbon disulphide	<1	79-34-5	1,1,2,2-Tetrachloroethane	<1
75-35-4	1,1-Dichloroethene	<1	95-47-6	o-Xylene	2
75-34-3	1,1-Dichloroethane	<1	96-18-4	1,2,3-Trichloropropane	<1
1634-04-4	tert-butyl methyl ether	<1	98-82-8	Isopropylbenzene	<1
156-59-2	cis-1,2-Dichloroethene	<1	108-86-1	Bromobenzene	<1
74-97-5	Bromochloromethane	<1	95-49-8	2-Chlorotoluene	<1
67-66-3	Chloroform	<1	103-65-1	Propylbenzene	<1
594-20-7	2,2-Dichloropropane	<1	106-43-4	4-Chlorotoluene	<1
107-06-2	1,2-Dichloroethane	<1	95-63-6	1,2,4-Trimethylbenzene	<1
71-55-6	1,1,1-Trichloroethane	<1	99-87-6	4-Isopropyltoluene	<1
563-58-6	1,1-Dichloropropene	<1	108-67-8	1,3,5-Trimethylbenzene	2
71-43-2	Benzene	<1	95-50-1	1,2-Dichlorobenzene	<1
56-23-5	Carbontetrachloride	<1	106-46-7	1,4-Dichlorobenzene	<1
74-95-3	Dibromomethane	<1	135-98-8	sec-Butylbenzene	<1
78-87-5	1,2-Dichloropropane	<1	98-06-6	tert-Butylbenzene	<1
75-27-4	Bromodichloromethane	<1	541-73-1	1,3-Dichlorobenzene	<1
79-01-6	Trichloroethene	<1	104-51-8	n-Butylbenzene	<1
10061-01-5	cis-1,3-Dichloropropene	<1	96-12-8	1,2-Dibromo-3-chloropropane	<1
10061-02-6	trans-1,3-Dichloropropene	<1	120-82-1	1,2,4-Trichlorobenzene	<1
79-00-5	1,1,2-Trichloroethane	<1	91-20-3	Naphthalene	<1
108-88-3	Toluene	6	87-61-6	1,2,3-Trichlorobenzene	<1
142-28-9	1,3-Dichloropropane	<1	87-68-3	Hexachlorobutadiene	<1
124-48-1	Dibromochloromethane	<1			

N.B. * also CAS No. 106-42-3

** Water blank subtracted

ALcontrol Geochem

Volatile Organic Compounds (EPA 624/8260)

Job Number - 03/02140

Client - Carl Bro Ltd

Client Ref -

Sample Identity - 0018 BH2 2.7

Sample Type [Units] - SOIL [$\mu\text{g/kg}$]

Date Acquired - 28 Feb 03 10:35

Date Reported - 28 Feb 03 14:06

CAS No	Compound	Conc.	CAS No	Compound	Conc.
75-71-8	Dichlorodifluoromethane	<1	106-93-4	1,2-Dibromoethane	<1
74-87-3	Chloromethane	<1	127-18-4	Tetrachloroethene	<1
75-01-4	Vinyl Chloride	<1	630-20-6	1,1,1,2-Tetrachloroethane	<1
74-83-9	Bromomethane	<1	108-90-7	Chlorobenzene	<1
75-00-3	Chloroethane	<1	100-41-4	Ethylbenzene	4
75-69-4	Trichlorofluoromethane	<1	108-38-3*	p/m-Xylene	8
156-60-5	trans-1,2-Dichloroethene	<1	75-25-2	Bromoform	<1
75-09-2	Dichloromethane	<1	100-42-5	Styrene	<1
75-15-0	Carbon disulphide	<1	79-34-5	1,1,2,2-Tetrachloroethane	<1
75-35-4	1,1-Dichloroethene	<1	95-47-6	o-Xylene	3
75-34-3	1,1-Dichloroethane	<1	96-18-4	1,2,3-Trichloropropane	<1
1634-04-4	tert-butyl methyl ether	<1	98-82-8	Isopropylbenzene	<1
156-59-2	cis-1,2-Dichloroethene	<1	108-86-1	Bromobenzene	<1
74-97-5	Bromochloromethane	<1	95-49-8	2-Chlorotoluene	<1
67-66-3	Chloroform	<1	103-65-1	Propylbenzene	<1
594-20-7	2,2-Dichloropropane	<1	106-43-4	4-Chlorotoluene	<1
107-06-2	1,2-Dichloroethane	<1	95-63-6	1,2,4-Trimethylbenzene	<1
71-55-6	1,1,1-Trichloroethane	<1	99-87-6	4-Isopropyltoluene	<1
563-58-6	1,1-Dichloropropene	<1	108-67-8	1,3,5-Trimethylbenzene	3
71-43-2	Benzene	<1	95-50-1	1,2-Dichlorobenzene	<1
56-23-5	Carbontetrachloride	<1	106-46-7	1,4-Dichlorobenzene	<1
74-95-3	Dibromomethane	<1	135-98-8	sec-Butylbenzene	<1
78-87-5	1,2-Dichloropropane	<1	98-06-6	tert-Butylbenzene	<1
75-27-4	Bromodichloromethane	<1	541-73-1	1,3-Dichlorobenzene	<1
79-01-6	Trichloroethene	<1	104-51-8	n-Butylbenzene	<1
10061-01-5	cis-1,3-Dichloropropene	<1	96-12-8	1,2-Dibromo-3-chloropropane	<1
10061-02-6	trans-1,3-Dichloropropene	<1	120-82-1	1,2,4-Trichlorobenzene	<1
79-00-5	1,1,2-Trichloroethane	<1	91-20-3	Naphthalene	<1
108-88-3	Toluene	9	87-61-6	1,2,3-Trichlorobenzene	<1
142-28-9	1,3-Dichloropropane	<1	87-68-3	Hexachlorobutadiene	<1
124-48-1	Dibromochloromethane	<1			

N.B. * also CAS No. 106-42-3

** Water blank subtracted

ALcontrol Geochem

Volatile Organic Compounds (EPA 624/8260)

Job Number - 03/02140

Client - Carl Bro Ltd

Client Ref -

Sample Identity - 0027 BH3 2.0

Sample Type [Units] - SOIL [$\mu\text{g/kg}$]

Date Acquired - 28 Feb 03 17:48

Date Reported - 3 Mar 03 14:42

CAS No	Compound	Conc.	CAS No	Compound	Conc.
75-71-8	Dichlorodifluoromethane	<1	106-93-4	1,2-Dibromoethane	<1
74-87-3	Chloromethane	<1	127-18-4	Tetrachloroethene	<1
75-01-4	Vinyl Chloride	<1	630-20-6	1,1,1,2-Tetrachloroethane	<1
74-83-9	Bromomethane	<1	108-90-7	Chlorobenzene	<1
75-00-3	Chloroethane	<1	100-41-4	Ethylbenzene	2
75-69-4	Trichlorofluoromethane	<1	108-38-3*	p/m-Xylene	7
156-60-5	trans-1,2-Dichloroethene	<1	75-25-2	Bromoform	<1
75-09-2	Dichloromethane	<1	100-42-5	Styrene	<1
75-15-0	Carbon disulphide	<1	79-34-5	1,1,2,2-Tetrachloroethane	<1
75-35-4	1,1-Dichloroethene	<1	95-47-6	o-Xylene	3
75-34-3	1,1-Dichloroethane	<1	96-18-4	1,2,3-Trichloropropane	<1
1634-04-4	tert-butyl methyl ether	<1	98-82-8	Isopropylbenzene	<1
156-59-2	cis-1,2-Dichloroethene	<1	108-86-1	Bromobenzene	<1
74-97-5	Bromochloromethane	<1	95-49-8	2-Chlorotoluene	<1
67-66-3	Chloroform	<1	103-65-1	Propylbenzene	<1
594-20-7	2,2-Dichloropropane	<1	106-43-4	4-Chlorotoluene	<1
107-06-2	1,2-Dichloroethane	<1	95-63-6	1,2,4-Trimethylbenzene	<1
71-55-6	1,1,1-Trichloroethane	<1	99-87-6	4-Isopropyltoluene	<1
563-58-6	1,1-Dichloropropene	<1	108-67-8	1,3,5-Trimethylbenzene	1
71-43-2	Benzene	<1	95-50-1	1,2-Dichlorobenzene	<1
56-23-5	Carbontetrachloride	<1	106-46-7	1,4-Dichlorobenzene	<1
74-95-3	Dibromomethane	<1	135-98-8	sec-Butylbenzene	<1
78-87-5	1,2-Dichloropropane	<1	98-06-6	tert-Butylbenzene	<1
75-27-4	Bromodichloromethane	<1	541-73-1	1,3-Dichlorobenzene	<1
79-01-6	Trichloroethene	<1	104-51-8	n-Butylbenzene	<1
10061-01-5	cis-1,3-Dichloropropene	<1	96-12-8	1,2-Dibromo-3-chloropropane	<1
10061-02-6	trans-1,3-Dichloropropene	<1	120-82-1	1,2,4-Trichlorobenzene	<1
79-00-5	1,1,2-Trichloroethane	<1	91-20-3	Naphthalene	<1
108-88-3	Toluene	<1	87-61-6	1,2,3-Trichlorobenzene	<1
142-28-9	1,3-Dichloropropane	<1	87-68-3	Hexachlorobutadiene	<1
124-48-1	Dibromochloromethane	<1			

N.B. * also CAS No. 106-42-3

** Water blank subtracted

ALcontrol Geochem

Volatile Organic Compounds (EPA 624/8260)

Job Number - 03/02140

Client - Carl Bro Ltd

Client Ref -

Sample Identity - 0031 WS202 0.5

Sample Type [Units] - SOIL [µg/kg]

Date Acquired - 28 Feb 03 18:23

Date Reported - 3 Mar 03 14:42

CAS No	Compound	Conc.	CAS No	Compound	Conc.
75-71-8	Dichlorodifluoromethane	<1	106-93-4	1,2-Dibromoethane	<1
74-87-3	Chloromethane	<1	127-18-4	Tetrachloroethene	<1
75-01-4	Vinyl Chloride	<1	630-20-6	1,1,1,2-Tetrachloroethane	<1
74-83-9	Bromomethane	<1	108-90-7	Chlorobenzene	<1
75-00-3	Chloroethane	<1	100-41-4	Ethylbenzene	<1
75-69-4	Trichlorofluoromethane	<1	108-38-3*	p/m-Xylene	<1
156-60-5	trans-1,2-Dichloroethene	<1	75-25-2	Bromoform	<1
75-09-2	Dichloromethane	<1	100-42-5	Styrene	<1
75-15-0	Carbon disulphide	<1	79-34-5	1,1,2,2-Tetrachloroethane	<1
75-35-4	1,1-Dichloroethene	<1	95-47-6	o-Xylene	<1
75-34-3	1,1-Dichloroethane	<1	96-18-4	1,2,3-Trichloropropane	<1
1634-04-4	tert-butyl methyl ether	<1	98-82-8	Isopropylbenzene	<1
156-59-2	cis-1,2-Dichloroethene	<1	108-86-1	Bromobenzene	<1
74-97-5	Bromochloromethane	<1	95-49-8	2-Chlorotoluene	<1
67-66-3	Chloroform	<1	103-65-1	Propylbenzene	<1
594-20-7	2,2-Dichloropropane	<1	106-43-4	4-Chlorotoluene	<1
107-06-2	1,2-Dichloroethane	<1	95-63-6	1,2,4-Trimethylbenzene	<1
71-55-6	1,1,1-Trichloroethane	<1	99-87-6	4-Isopropyltoluene	<1
563-58-6	1,1-Dichloropropene	<1	108-67-8	1,3,5-Trimethylbenzene	<1
71-43-2	Benzene	<1	95-50-1	1,2-Dichlorobenzene	<1
56-23-5	Carbontetrachloride	<1	106-46-7	1,4-Dichlorobenzene	<1
74-95-3	Dibromomethane	<1	135-98-8	sec-Butylbenzene	<1
78-87-5	1,2-Dichloropropane	<1	98-06-6	tert-Butylbenzene	<1
75-27-4	Bromodichloromethane	<1	541-73-1	1,3-Dichlorobenzene	<1
79-01-6	Trichloroethene	<1	104-51-8	n-Butylbenzene	<1
10061-01-5	cis-1,3-Dichloropropene	<1	96-12-8	1,2-Dibromo-3-chloropropane	<1
10061-02-6	trans-1,3-Dichloropropene	<1	120-82-1	1,2,4-Trichlorobenzene	<1
79-00-5	1,1,2-Trichloroethane	<1	91-20-3	Naphthalene	<1
108-88-3	Toluene	<1	87-61-6	1,2,3-Trichlorobenzene	<1
142-28-9	1,3-Dichloropropane	<1	87-68-3	Hexachlorobutadiene	<1
124-48-1	Dibromochloromethane	<1			

N.B. * also CAS No. 106-42-3

** Water blank subtracted

ALcontrol Geochem

Volatile Organic Compounds (EPA 624/8260)

Job Number - 03/02140

Client - Carl Bro Ltd

Client Ref -

Sample Identity - 0037 WS202 1.5

Sample Type [Units] - SOIL [$\mu\text{g/kg}$]

Date Acquired - 28 Mar 03 07:39

Date Reported - 28 Mar 03 12:20

CAS No	Compound	Conc.	CAS No	Compound	Conc.
75-71-8	Dichlorodifluoromethane	<1	106-93-4	1,2-Dibromoethane	<1
74-87-3	Chloromethane	<1	127-18-4	Tetrachloroethene	<1
75-01-4	Vinyl Chloride	<1	630-20-6	1,1,1,2-Tetrachloroethane	<1
74-83-9	Bromomethane	<1	108-90-7	Chlorobenzene	<1
75-00-3	Chloroethane	<1	100-41-4	Ethylbenzene	<1
75-69-4	Trichlorofluoromethane	<1	108-38-3*	p/m-Xylene	<1
156-60-5	trans-1,2-Dichloroethene	<1	75-25-2	Bromoform	<1
75-09-2	Dichloromethane	<1	100-42-5	Styrene	<1
75-15-0	Carbon disulphide	<1	79-34-5	1,1,2,2-Tetrachloroethane	<1
75-35-4	1,1-Dichloroethene	<1	95-47-6	o-Xylene	<1
75-34-3	1,1-Dichloroethane	<1	96-18-4	1,2,3-Trichloropropane	<1
1634-04-4	tert-butyl methyl ether	<1	98-82-8	Isopropylbenzene	<1
156-59-2	cis-1,2-Dichloroethene	<1	108-86-1	Bromobenzene	<1
74-97-5	Bromochloromethane	<1	95-49-8	2-Chlorotoluene	<1
67-66-3	Chloroform	<1	103-65-1	Propylbenzene	<1
594-20-7	2,2-Dichloropropane	<1	106-43-4	4-Chlorotoluene	<1
107-06-2	1,2-Dichloroethane	<1	95-63-6	1,2,4-Trimethylbenzene	<1
71-55-6	1,1,1-Trichloroethane	<1	99-87-6	4-Isopropyltoluene	<1
563-58-6	1,1-Dichloropropene	<1	108-67-8	1,3,5-Trimethylbenzene	<1
71-43-2	Benzene	<1	95-50-1	1,2-Dichlorobenzene	<1
56-23-5	Carbontetrachloride	<1	106-46-7	1,4-Dichlorobenzene	<1
74-95-3	Dibromomethane	<1	135-98-8	sec-Butylbenzene	<1
78-87-5	1,2-Dichloropropane	<1	98-06-6	tert-Butylbenzene	<1
75-27-4	Bromodichloromethane	<1	541-73-1	1,3-Dichlorobenzene	<1
79-01-6	Trichloroethene	<1	104-51-8	n-Butylbenzene	<1
10061-01-5	cis-1,3-Dichloropropene	<1	96-12-8	1,2-Dibromo-3-chloropropane	<1
10061-02-6	trans-1,3-Dichloropropene	<1	120-82-1	1,2,4-Trichlorobenzene	<1
79-00-5	1,1,2-Trichloroethane	<1	91-20-3	Naphthalene	<1
108-88-3	Toluene	<1	87-61-6	1,2,3-Trichlorobenzene	<1
142-28-9	1,3-Dichloropropane	<1	87-68-3	Hexachlorobutadiene	<1
124-48-1	Dibromochloromethane	<1			

N.B. * also CAS No. 106-42-3

** Water blank subtracted

ALcontrol Geochem

Volatile Organic Compounds (EPA 624/8260)

Job Number - 03/02140

Client - Carl Bro Ltd

Client Ref -

Sample Identity - 0043 WS203 0.7

Sample Type [Units] - SOIL [µg/kg]

Date Acquired - 28 Feb 03 18:58

Date Reported - 3 Mar 03 14:42

CAS No	Compound	Conc.	CAS No	Compound	Conc.
75-71-8	Dichlorodifluoromethane	<1	106-93-4	1,2-Dibromoethane	<1
74-87-3	Chloromethane	<1	127-18-4	Tetrachloroethene	<1
75-01-4	Vinyl Chloride	<1	630-20-6	1,1,1,2-Tetrachloroethane	<1
74-83-9	Bromomethane	<1	108-90-7	Chlorobenzene	<1
75-00-3	Chloroethane	<1	100-41-4	Ethylbenzene	<1
75-69-4	Trichlorofluoromethane	<1	108-38-3*	p/m-Xylene	<1
156-60-5	trans-1,2-Dichloroethene	<1	75-25-2	Bromoform	<1
75-09-2	Dichloromethane	<1	100-42-5	Styrene	<1
75-15-0	Carbon disulphide	<1	79-34-5	1,1,2,2-Tetrachloroethane	<1
75-35-4	1,1-Dichloroethene	<1	95-47-6	o-Xylene	<1
75-34-3	1,1-Dichloroethane	<1	96-18-4	1,2,3-Trichloropropane	<1
1634-04-4	tert-butyl methyl ether	<1	98-82-8	Isopropylbenzene	<1
156-59-2	cis-1,2-Dichloroethene	<1	108-86-1	Bromobenzene	<1
74-97-5	Bromochloromethane	<1	95-49-8	2-Chlorotoluene	<1
67-66-3	Chloroform	<1	103-65-1	Propylbenzene	<1
594-20-7	2,2-Dichloropropane	<1	106-43-4	4-Chlorotoluene	<1
107-06-2	1,2-Dichloroethane	<1	95-63-6	1,2,4-Trimethylbenzene	<1
71-55-6	1,1,1-Trichloroethane	<1	99-87-6	4-Isopropyltoluene	<1
563-58-6	1,1-Dichloropropene	<1	108-67-8	1,3,5-Trimethylbenzene	<1
71-43-2	Benzene	<1	95-50-1	1,2-Dichlorobenzene	<1
56-23-5	Carbontetrachloride	<1	106-46-7	1,4-Dichlorobenzene	<1
74-95-3	Dibromomethane	<1	135-98-8	sec-Butylbenzene	<1
78-87-5	1,2-Dichloropropane	<1	98-06-6	tert-Butylbenzene	<1
75-27-4	Bromodichloromethane	<1	541-73-1	1,3-Dichlorobenzene	<1
79-01-6	Trichloroethene	<1	104-51-8	n-Butylbenzene	<1
10061-01-5	cis-1,3-Dichloropropene	<1	96-12-8	1,2-Dibromo-3-chloropropane	<1
10061-02-6	trans-1,3-Dichloropropene	<1	120-82-1	1,2,4-Trichlorobenzene	<1
79-00-5	1,1,2-Trichloroethane	<1	91-20-3	Naphthalene	<1
108-88-3	Toluene	<1	87-61-6	1,2,3-Trichlorobenzene	<1
142-28-9	1,3-Dichloropropane	<1	87-68-3	Hexachlorobutadiene	<1
124-48-1	Dibromochloromethane	<1			

N.B. * also CAS No. 106-42-3

** Water blank subtracted

ALcontrol Geochem

Volatile Organic Compounds (EPA 624/8260)

Job Number - 03/02140

Client - Carl Bro Ltd

Client Ref -

Sample Identity - 0052 WS206 0.5

Sample Type [Units] - SOIL [µg/kg]

Date Acquired - 28 Mar 03 08:14

Date Reported - 28 Mar 03 12:20

CAS No	Compound	Conc.	CAS No	Compound	Conc.
75-71-8	Dichlorodifluoromethane	<1	106-93-4	1,2-Dibromoethane	<1
74-87-3	Chloromethane	<1	127-18-4	Tetrachloroethene	<1
75-01-4	Vinyl Chloride	<1	630-20-6	1,1,1,2-Tetrachloroethane	<1
74-83-9	Bromomethane	<1	108-90-7	Chlorobenzene	<1
75-00-3	Chloroethane	<1	100-41-4	Ethylbenzene	<1
75-69-4	Trichlorofluoromethane	<1	108-38-3*	p/m-Xylene	<1
156-60-5	trans-1,2-Dichloroethene	<1	75-25-2	Bromoform	<1
75-09-2	Dichloromethane	<1	100-42-5	Styrene	<1
75-15-0	Carbon disulphide	<1	79-34-5	1,1,2,2-Tetrachloroethane	<1
75-35-4	1,1-Dichloroethene	<1	95-47-6	o-Xylene	<1
75-34-3	1,1-Dichloroethane	<1	96-18-4	1,2,3-Trichloropropane	<1
1634-04-4	tert-butyl methyl ether	<1	98-82-8	Isopropylbenzene	<1
156-59-2	cis-1,2-Dichloroethene	<1	108-86-1	Bromobenzene	<1
74-97-5	Bromochloromethane	<1	95-49-8	2-Chlorotoluene	<1
67-66-3	Chloroform	<1	103-65-1	Propylbenzene	<1
594-20-7	2,2-Dichloropropane	<1	106-43-4	4-Chlorotoluene	<1
107-06-2	1,2-Dichloroethane	<1	95-63-6	1,2,4-Trimethylbenzene	<1
71-55-6	1,1,1-Trichloroethane	<1	99-87-6	4-Isopropyltoluene	<1
563-58-6	1,1-Dichloropropene	<1	108-67-8	1,3,5-Trimethylbenzene	<1
71-43-2	Benzene	<1	95-50-1	1,2-Dichlorobenzene	<1
56-23-5	Carbontetrachloride	<1	106-46-7	1,4-Dichlorobenzene	<1
74-95-3	Dibromomethane	<1	135-98-8	sec-Butylbenzene	<1
78-87-5	1,2-Dichloropropane	<1	98-06-6	tert-Butylbenzene	<1
75-27-4	Bromodichloromethane	<1	541-73-1	1,3-Dichlorobenzene	<1
79-01-6	Trichloroethene	<1	104-51-8	n-Butylbenzene	<1
10061-01-5	cis-1,3-Dichloropropene	<1	96-12-8	1,2-Dibromo-3-chloropropane	<1
10061-02-6	trans-1,3-Dichloropropene	<1	120-82-1	1,2,4-Trichlorobenzene	<1
79-00-5	1,1,2-Trichloroethane	<1	91-20-3	Naphthalene	<1
108-88-3	Toluene	<1	87-61-6	1,2,3-Trichlorobenzene	<1
142-28-9	1,3-Dichloropropane	<1	87-68-3	Hexachlorobutadiene	<1
124-48-1	Dibromochloromethane	<1			

N.B. * also CAS No. 106-42-3

** Water blank subtracted

ALcontrol Geochem

Volatile Organic Compounds (EPA 624/8260)

Job Number - 03/02140

Client - Carl Bro Ltd

Client Ref -

Sample Identity - 0056 WS205 0.9

Sample Type [Units] - SOIL [$\mu\text{g/kg}$]

Date Acquired - 28 Feb 03 19:33

Date Reported - 3 Mar 03 14:42

CAS No	Compound	Conc.	CAS No	Compound	Conc.
75-71-8	Dichlorodifluoromethane	<1	106-93-4	1,2-Dibromoethane	<1
74-87-3	Chloromethane	<1	127-18-4	Tetrachloroethene	<1
75-01-4	Vinyl Chloride	<1	630-20-6	1,1,1,2-Tetrachloroethane	<1
74-83-9	Bromomethane	<1	108-90-7	Chlorobenzene	<1
75-00-3	Chloroethane	<1	100-41-4	Ethylbenzene	<1
75-69-4	Trichlorofluoromethane	<1	108-38-3*	p/m-Xylene	<1
156-60-5	trans-1,2-Dichloroethene	<1	75-25-2	Bromoform	<1
75-09-2	Dichloromethane	<1	100-42-5	Styrene	<1
75-15-0	Carbon disulphide	<1	79-34-5	1,1,2,2-Tetrachloroethane	<1
75-35-4	1,1-Dichloroethene	<1	95-47-6	o-Xylene	<1
75-34-3	1,1-Dichloroethane	<1	96-18-4	1,2,3-Trichloropropane	<1
1634-04-4	tert-butyl methyl ether	<1	98-82-8	Isopropylbenzene	<1
156-59-2	cis-1,2-Dichloroethene	<1	108-86-1	Bromobenzene	<1
74-97-5	Bromochloromethane	<1	95-49-8	2-Chlorotoluene	<1
67-66-3	Chloroform	<1	103-65-1	Propylbenzene	<1
594-20-7	2,2-Dichloropropane	<1	106-43-4	4-Chlorotoluene	<1
107-06-2	1,2-Dichloroethane	<1	95-63-6	1,2,4-Trimethylbenzene	<1
71-55-6	1,1,1-Trichloroethane	<1	99-87-6	4-Isopropyltoluene	<1
563-58-6	1,1-Dichloropropene	<1	108-67-8	1,3,5-Trimethylbenzene	<1
71-43-2	Benzene	<1	95-50-1	1,2-Dichlorobenzene	<1
56-23-5	Carbontetrachloride	<1	106-46-7	1,4-Dichlorobenzene	<1
74-95-3	Dibromomethane	<1	135-98-8	sec-Butylbenzene	<1
78-87-5	1,2-Dichloropropane	<1	98-06-6	tert-Butylbenzene	<1
75-27-4	Bromodichloromethane	<1	541-73-1	1,3-Dichlorobenzene	<1
79-01-6	Trichloroethene	<1	104-51-8	n-Butylbenzene	<1
10061-01-5	cis-1,3-Dichloropropene	<1	96-12-8	1,2-Dibromo-3-chloropropane	<1
10061-02-6	trans-1,3-Dichloropropene	<1	120-82-1	1,2,4-Trichlorobenzene	<1
79-00-5	1,1,2-Trichloroethane	<1	91-20-3	Naphthalene	<1
108-88-3	Toluene	<1	87-61-6	1,2,3-Trichlorobenzene	<1
142-28-9	1,3-Dichloropropane	<1	87-68-3	Hexachlorobutadiene	<1
124-48-1	Dibromochloromethane	<1			

N.B. * also CAS No. 106-42-3

** Water blank subtracted

ALcontrol Geochem

Volatile Organic Compounds (EPA 624/8260)

Job Number - 03/02140

Client - Carl Bro Ltd

Client Ref -

Sample Identity - 0064 WS206 2.8

Sample Type [Units] - SOIL [µg/kg]

Date Acquired - 28 Feb 03 20:09

Date Reported - 3 Mar 03 14:42

CAS No	Compound	Conc.	CAS No	Compound	Conc.
75-71-8	Dichlorodifluoromethane	<1	106-93-4	1,2-Dibromoethane	<1
74-87-3	Chloromethane	<1	127-18-4	Tetrachloroethene	<1
75-01-4	Vinyl Chloride	<1	630-20-6	1,1,1,2-Tetrachloroethane	<1
74-83-9	Bromomethane	<1	108-90-7	Chlorobenzene	<1
75-00-3	Chloroethane	<1	100-41-4	Ethylbenzene	<1
75-69-4	Trichlorofluoromethane	<1	108-38-3*	p/m-Xylene	<1
156-60-5	trans-1,2-Dichloroethene	<1	75-25-2	Bromoform	<1
75-09-2	Dichloromethane	<1	100-42-5	Styrene	<1
75-15-0	Carbon disulphide	<1	79-34-5	1,1,2,2-Tetrachloroethane	<1
75-35-4	1,1-Dichloroethene	<1	95-47-6	o-Xylene	<1
75-34-3	1,1-Dichloroethane	<1	96-18-4	1,2,3-Trichloropropane	<1
1634-04-4	tert-butyl methyl ether	<1	98-82-8	Isopropylbenzene	<1
156-59-2	cis-1,2-Dichloroethene	<1	108-86-1	Bromobenzene	<1
74-97-5	Bromochloromethane	<1	95-49-8	2-Chlorotoluene	<1
67-66-3	Chloroform	<1	103-65-1	Propylbenzene	<1
594-20-7	2,2-Dichloropropane	<1	106-43-4	4-Chlorotoluene	<1
107-06-2	1,2-Dichloroethane	<1	95-63-6	1,2,4-Trimethylbenzene	<1
71-55-6	1,1,1-Trichloroethane	<1	99-87-6	4-Isopropyltoluene	<1
563-58-6	1,1-Dichloropropene	<1	108-67-8	1,3,5-Trimethylbenzene	<1
71-43-2	Benzene	<1	95-50-1	1,2-Dichlorobenzene	<1
56-23-5	Carbontetrachloride	<1	106-46-7	1,4-Dichlorobenzene	<1
74-95-3	Dibromomethane	<1	135-98-8	sec-Butylbenzene	<1
78-87-5	1,2-Dichloropropane	<1	98-06-6	tert-Butylbenzene	<1
75-27-4	Bromodichloromethane	<1	541-73-1	1,3-Dichlorobenzene	<1
79-01-6	Trichloroethene	<1	104-51-8	n-Butylbenzene	<1
10061-01-5	cis-1,3-Dichloropropene	<1	96-12-8	1,2-Dibromo-3-chloropropane	<1
10061-02-6	trans-1,3-Dichloropropene	<1	120-82-1	1,2,4-Trichlorobenzene	<1
79-00-5	1,1,2-Trichloroethane	<1	91-20-3	Naphthalene	<1
108-88-3	Toluene	<1	87-61-6	1,2,3-Trichlorobenzene	<1
142-28-9	1,3-Dichloropropane	<1	87-68-3	Hexachlorobutadiene	<1
124-48-1	Dibromochloromethane	<1			

N.B. * also CAS No. 106-42-3

** Water blank subtracted

ALcontrol Geochem

Volatile Organic Compounds (EPA 624/8260)

Job Number - 03/02140

Client - Carl Bro Ltd

Client Ref -

Sample Identity - 0066 BH1

Sample Type [Units] - WATER [µg/l]

Date Acquired - 1 Apr 03 05:07

Date Reported - 1 Apr 03 14:49

CAS No	Compound	Conc.	CAS No	Compound	Conc.
75-71-8	Dichlorodifluoromethane	<1	106-93-4	1,2-Dibromoethane	<1
74-87-3	Chloromethane	<1	127-18-4	Tetrachloroethene	<1
75-01-4	Vinyl Chloride	<1	630-20-6	1,1,1,2-Tetrachloroethane	<1
74-83-9	Bromomethane	<1	108-90-7	Chlorobenzene	<1
75-00-3	Chloroethane	<1	100-41-4	Ethylbenzene	<1
75-69-4	Trichlorofluoromethane	<1	108-38-3*	p/m-Xylene	<1
156-60-5	trans-1,2-Dichloroethene	<1	75-25-2	Bromoform	<1
75-09-2	Dichloromethane	<1	100-42-5	Styrene	<1
75-15-0	Carbon disulphide	<1	79-34-5	1,1,2,2-Tetrachloroethane	<1
75-35-4	1,1-Dichloroethene	<1	95-47-6	o-Xylene	<1
75-34-3	1,1-Dichloroethane	<1	96-18-4	1,2,3-Trichloropropane	<1
1634-04-4	tert-butyl methyl ether	<1	98-82-8	Isopropylbenzene	<1
156-59-2	cis-1,2-Dichloroethene	<1	108-86-1	Bromobenzene	<1
74-97-5	Bromochloromethane	<1	95-49-8	2-Chlorotoluene	<1
67-66-3	Chloroform	<1	103-65-1	Propylbenzene	<1
594-20-7	2,2-Dichloropropane	<1	106-43-4	4-Chlorotoluene	<1
107-06-2	1,2-Dichloroethane	<1	95-63-6	1,2,4-Trimethylbenzene	<1
71-55-6	1,1,1-Trichloroethane	<1	99-87-6	4-Isopropyltoluene	<1
563-58-6	1,1-Dichloropropene	<1	108-67-8	1,3,5-Trimethylbenzene	<1
71-43-2	Benzene	<1	95-50-1	1,2-Dichlorobenzene	<1
56-23-5	Carbontetrachloride	<1	106-46-7	1,4-Dichlorobenzene	<1
74-95-3	Dibromomethane	<1	135-98-8	sec-Butylbenzene	<1
78-87-5	1,2-Dichloropropane	<1	98-06-6	tert-Butylbenzene	<1
75-27-4	Bromodichloromethane	<1	541-73-1	1,3-Dichlorobenzene	<1
79-01-6	Trichloroethene	<1	104-51-8	n-Butylbenzene	<1
10061-01-5	cis-1,3-Dichloropropene	<1	96-12-8	1,2-Dibromo-3-chloropropane	<1
10061-02-6	trans-1,3-Dichloropropene	<1	120-82-1	1,2,4-Trichlorobenzene	<1
79-00-5	1,1,2-Trichloroethane	<1	91-20-3	Naphthalene	<1
108-88-3	Toluene	<1	87-61-6	1,2,3-Trichlorobenzene	<1
142-28-9	1,3-Dichloropropane	<1	87-68-3	Hexachlorobutadiene	<1
124-48-1	Dibromochloromethane	<1			

N.B. * also CAS No. 106-42-3

** Water blank subtracted

ALcontrol Geochem

Volatile Organic Compounds (EPA 624/8260)

Job Number - 03/02140

Client - Carl Bro Ltd

Client Ref -

Sample Identity - 0077 BH2

Sample Type [Units] - WATER [µg/l]

Date Acquired - 28 Mar 03 14:06

Date Reported - 28 Mar 03 14:51

CAS No	Compound	Conc.	CAS No	Compound	Conc.
75-71-8	Dichlorodifluoromethane	<1	106-93-4	1,2-Dibromoethane	<1
74-87-3	Chloromethane	<1	127-18-4	Tetrachloroethene	<1
75-01-4	Vinyl Chloride	<1	630-20-6	1,1,1,2-Tetrachloroethane	<1
74-83-9	Bromomethane	<1	108-90-7	Chlorobenzene	<1
75-00-3	Chloroethane	<1	100-41-4	Ethylbenzene	<1
75-69-4	Trichlorofluoromethane	<1	108-38-3*	p/m-Xylene	<1
156-60-5	trans-1,2-Dichloroethene	<1	75-25-2	Bromoform	<1
75-09-2	Dichloromethane	<1	100-42-5	Styrene	<1
75-15-0	Carbon disulphide	<1	79-34-5	1,1,2,2-Tetrachloroethane	<1
75-35-4	1,1-Dichloroethene	<1	95-47-6	o-Xylene	<1
75-34-3	1,1-Dichloroethane	<1	96-18-4	1,2,3-Trichloropropane	<1
1634-04-4	tert-butyl methyl ether	<1	98-82-8	Isopropylbenzene	<1
156-59-2	cis-1,2-Dichloroethene	<1	108-86-1	Bromobenzene	<1
74-97-5	Bromochloromethane	<1	95-49-8	2-Chlorotoluene	<1
67-66-3	Chloroform	<1	103-65-1	Propylbenzene	<1
594-20-7	2,2-Dichloropropane	<1	106-43-4	4-Chlorotoluene	<1
107-06-2	1,2-Dichloroethane	<1	95-63-6	1,2,4-Trimethylbenzene	<1
71-55-6	1,1,1-Trichloroethane	<1	99-87-6	4-Isopropyltoluene	<1
563-58-6	1,1-Dichloropropene	<1	108-67-8	1,3,5-Trimethylbenzene	<1
71-43-2	Benzene	<1	95-50-1	1,2-Dichlorobenzene	<1
56-23-5	Carbontetrachloride	<1	106-46-7	1,4-Dichlorobenzene	<1
74-95-3	Dibromomethane	<1	135-98-8	sec-Butylbenzene	<1
78-87-5	1,2-Dichloropropane	<1	98-06-6	tert-Butylbenzene	<1
75-27-4	Bromodichloromethane	<1	541-73-1	1,3-Dichlorobenzene	<1
79-01-6	Trichloroethene	<1	104-51-8	n-Butylbenzene	<1
10061-01-5	cis-1,3-Dichloropropene	<1	96-12-8	1,2-Dibromo-3-chloropropane	<1
10061-02-6	trans-1,3-Dichloropropene	<1	120-82-1	1,2,4-Trichlorobenzene	<1
79-00-5	1,1,2-Trichloroethane	<1	91-20-3	Naphthalene	<1
108-88-3	Toluene	<1	87-61-6	1,2,3-Trichlorobenzene	<1
142-28-9	1,3-Dichloropropane	<1	87-68-3	Hexachlorobutadiene	<1
124-48-1	Dibromochloromethane	<1			

N.B. * also CAS No. 106-42-3

** Water blank subtracted

ALcontrol Geochem

Volatile Organic Compounds (EPA 624/8260)

Job Number - 03/02140

Client - Carl Bro Ltd

Client Ref -

Sample Identity - 0086 BH3

Sample Type [Units] - WATER [µg/l]

Date Acquired - 7 Mar 03 11:36

Date Reported - 7 Mar 03 14:10

CAS No	Compound	Conc.	CAS No	Compound	Conc.
75-71-8	Dichlorodifluoromethane	<1	106-93-4	1,2-Dibromoethane	<1
74-87-3	Chloromethane	<1	127-18-4	Tetrachloroethene	<1
75-01-4	Vinyl Chloride	<1	630-20-6	1,1,1,2-Tetrachloroethane	<1
74-83-9	Bromomethane	<1	108-90-7	Chlorobenzene	<1
75-00-3	Chloroethane	<1	100-41-4	Ethylbenzene	1
75-69-4	Trichlorofluoromethane	<1	108-38-3*	p/m-Xylene	<1
156-60-5	trans-1,2-Dichloroethene	<1	75-25-2	Bromoform	<1
75-09-2	Dichloromethane	<1	100-42-5	Styrene	<1
75-15-0	Carbon disulphide	<1	79-34-5	1,1,2,2-Tetrachloroethane	<1
75-35-4	1,1-Dichloroethene	<1	95-47-6	o-Xylene	2
75-34-3	1,1-Dichloroethane	<1	96-18-4	1,2,3-Trichloropropane	<1
1634-04-4	tert-butyl methyl ether	<1	98-82-8	Isopropylbenzene	<1
156-59-2	cis-1,2-Dichloroethene	<1	108-86-1	Bromobenzene	<1
74-97-5	Bromochloromethane	<1	95-49-8	2-Chlorotoluene	11
67-66-3	Chloroform	<1	103-65-1	Propylbenzene	<1
594-20-7	2,2-Dichloropropane	<1	106-43-4	4-Chlorotoluene	2
107-06-2	1,2-Dichloroethane	<1	95-63-6	1,2,4-Trimethylbenzene	<1
71-55-6	1,1,1-Trichloroethane	<1	99-87-6	4-Isopropyltoluene	<1
563-58-6	1,1-Dichloropropene	<1	108-67-8	1,3,5-Trimethylbenzene	<1
71-43-2	Benzene	<1	95-50-1	1,2-Dichlorobenzene	<1
56-23-5	Carbontetrachloride	<1	106-46-7	1,4-Dichlorobenzene	<1
74-95-3	Dibromomethane	<1	135-98-8	sec-Butylbenzene	<1
78-87-5	1,2-Dichloropropane	<1	98-06-6	tert-Butylbenzene	<1
75-27-4	Bromodichloromethane	<1	541-73-1	1,3-Dichlorobenzene	<1
79-01-6	Trichloroethene	<1	104-51-8	n-Butylbenzene	<1
10061-01-5	cis-1,3-Dichloropropene	<1	96-12-8	1,2-Dibromo-3-chloropropane	<1
10061-02-6	trans-1,3-Dichloropropene	<1	120-82-1	1,2,4-Trichlorobenzene	<1
79-00-5	1,1,2-Trichloroethane	<1	91-20-3	Naphthalene	<1
108-88-3	Toluene	9	87-61-6	1,2,3-Trichlorobenzene	<1
142-28-9	1,3-Dichloropropane	<1	87-68-3	Hexachlorobutadiene	<1
124-48-1	Dibromochloromethane	<1			

N.B. * also CAS No. 106-42-3

** Water blank subtracted

APPENDIX

APPENDIX

1. Results are expressed as mg/kg dry weight (dried at 35°C) on all soil analyses except for the following:
Leach tests, hexavalent chrome, flash point, acid soluble sulphides, TPH by IR and volatiles are expressed as mg/kg wet soil as received, although these are currently under review.
Phenol, ammoniacal nitrogen and cyanide are performed on wet samples as received, but the results are expressed as mg/kg dry weight.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. A sub sample of all samples received will be retained free of charge for two months for soils and one month for waters (sample size permitting), but may then be discarded 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.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS Accredited Laboratories, in this instance a Laboratory with a known track record will be utilised.
6. Asbestos screen is done in-house on soils and if no fibres are found will be reported as NFP - no fibres present. If asbestos is detected, then identification and quantification is carried out by ALcontrol Technichem. If a sample is suspected of containing asbestos, then drying and crushing will be suspended on that sample until the asbestos result is known. If asbestos is present, then no analysis requiring dry sample will be undertaken.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace is present in the volatile sample.
8. NDP - No determination possible due to insufficient/unsuitable sample.
9. Metals in waters are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
10. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.

UKAS ACCREDITED TEST METHODS

METHOD No	METHOD TITLE	UNITS
TM002	Determination of pH in soil using the HANNAH H1931402 Micro Processor pH meter	pH
TM004	Solvent extraction of soil	mg/kg
TM009	Class separation of hydrocarbons by thin layer chromatography (using Iatroscan)	mg/l mg/kg
TM015	Kone Analyser - Operator's Guide	N/A
TM021	The determination of total dissolved solids in waters.	mg/l
TM022	The determination of total suspended solids in waters	mg/l
TM023	The determination of pH in water samples using the 3040 ion analyser	pH
TM024	Determination of Exchangeable Ammonium in soil samples	mgNH ₄ /kg
TM027	Determination of phenol as C ₆ H ₅ OH using the Dr Lange photometer	mg/l mg/kg
TM028	Determination of chemical oxygen demand (COD) using the Hach COD reactor system	mgO /l
TM036	Determination of electrical conductivity using the Ciba Corning meter	mScm ⁻¹
TM043	Determination of alkalinity in aqueous samples	mg/l mg/kg
TM045	Determination of BOD ₅ (ATU) using the Ciba Corning Oxygen Meter	mg/l
TM049	Leco CS444 – Operator's Guide	N/A
TM050	Determination using the Leco CS444 Total Organic Carbon	%
TM053	Determination of Bulk Gas Composition (Suite 1)	% v/v
TM055	GC-MS Engine determination of polynuclear aromatic hydrocarbons in oil based mud by mass selective detection	µg/l mg/kg
TM057	Determination of saturates by gas chromatography	µg/l µg/kg mg/l mg/kg

UKAS ACCREDITED TEST METHODS

METHOD No	METHOD TITLE	UNITS
TM059	Determination of whole oil by gas chromatography	N/A
TM060	Analysis of drilling cuttings	µg/l % wt
TM061	Determination of total petroleum hydrocarbons by gas chromatography	µg/l µg/kg mg/l mg/kg
TM062	Determination of phenols by HPLC	mg/l mg/kg
TM063	Analysis of BTEX hydrocarbons by GC-MSD/Tekmar	µg/l
TM064	Analysis of volatile hydrocarbons by GC-MS/Tekmar	µg/l
TM065	Preparation of Standard Solutions for Calibration Quality Control of Emission Spectrometers	N/A
TM066	Analysis of acid digested samples by Inductively Coupled Plasma - general operation	N/A
TM067	Total (Acid-Soluble) sulphate determination in soils using Leco CS444	%
TM068	Total sulphur determination using Leco CS444	%
TM070	Determination of total polychlorinated biphenyls (PCB's)	µg/l µg/kg mg/l mg/kg
TM071	Determination of acid /base neutrals by GCMS	µg/l mg/kg
TM072	Determination of phenols by GCMS	µg/l mg/kg
TM073	Determination of organochlorine and organophosphorous pesticides by GCMS	µg/l mg/kg
TM074	Determination of polynuclear aromatic hydrocarbons (PAH) by GC-MS	µg/l µg/kg mg/l mg/kg
TM078	Solid phase extraction of waters	mg/l
TM083	Determination of Sodium and Potassium by Flame Photometer	mg/l mg/kg
TM084	Analysis of aqueous samples for phenol – using the Alliance distillation instrument	mg/l

UKAS ACCREDITED TEST METHODS

METHOD No	METHOD TITLE	UNITS
TM087	Measurement of semi- and non-volatile petroleum hydrocarbons in soil or water samples by infra-red spectroscopy	mg/l mg/kg
TM089	Determination of Gasoline Range Organic Hydrocarbons (GRO) and BTEX(MTBE) compounds by Headspace GC-FID	µg/l µg/kg mg/l mg/kg
TM090	Determination of total organic carbon/total organic carbon in water and waste water	mgC/l
TM097	Determination of Chloride using the Kone Analyser	mg Cl /l mg Cl /kg
TM098	Determination of Sulphate using the Kone Analysers	mg SO ₄ ²⁻ /l
TM099	Determination of Ammonium in water samples and cation exchange capacity in soil samples using the Kone Analyser	mg NH ₄ -N/l
TM100	Determination of Phosphate using the Kone Analyser	mg PO ₄ /l
TM101	Determination of Sulphide in water samples using the Kone Analyser	mg S ²⁻ /l
TM102	Determination of Nitrate using the Kone Analyser	mg NO ₃ /l
TM103	Determination of Nitrite using the Kone Analyser	mg NO ₂ /l
TM104	Determination of Fluoride using the Kone Analyser	mg F /l
TM107	The determination of Chemical Oxygen Demand using the COD Dr Lange Kit	mg O /l
TM108	Determination of Thiocyanate by Colourmetric Spectroscopic Analysis	mg SCN /l mg SCN /kg
TM109	Total Carbon Determination using LECO CS444	%
TM112	Determination of S1 & S2 compounds by Pyrolysis -Gas Chromatography.	Area %
TM113	Determination of Total Cyanide by Steam Distillation	mg CN ⁻ /l mg CN ⁻ /kg
TM114	Determination of Aromatics by Gas Chromatography	N/A

UKAS ACCREDITED TEST METHODS

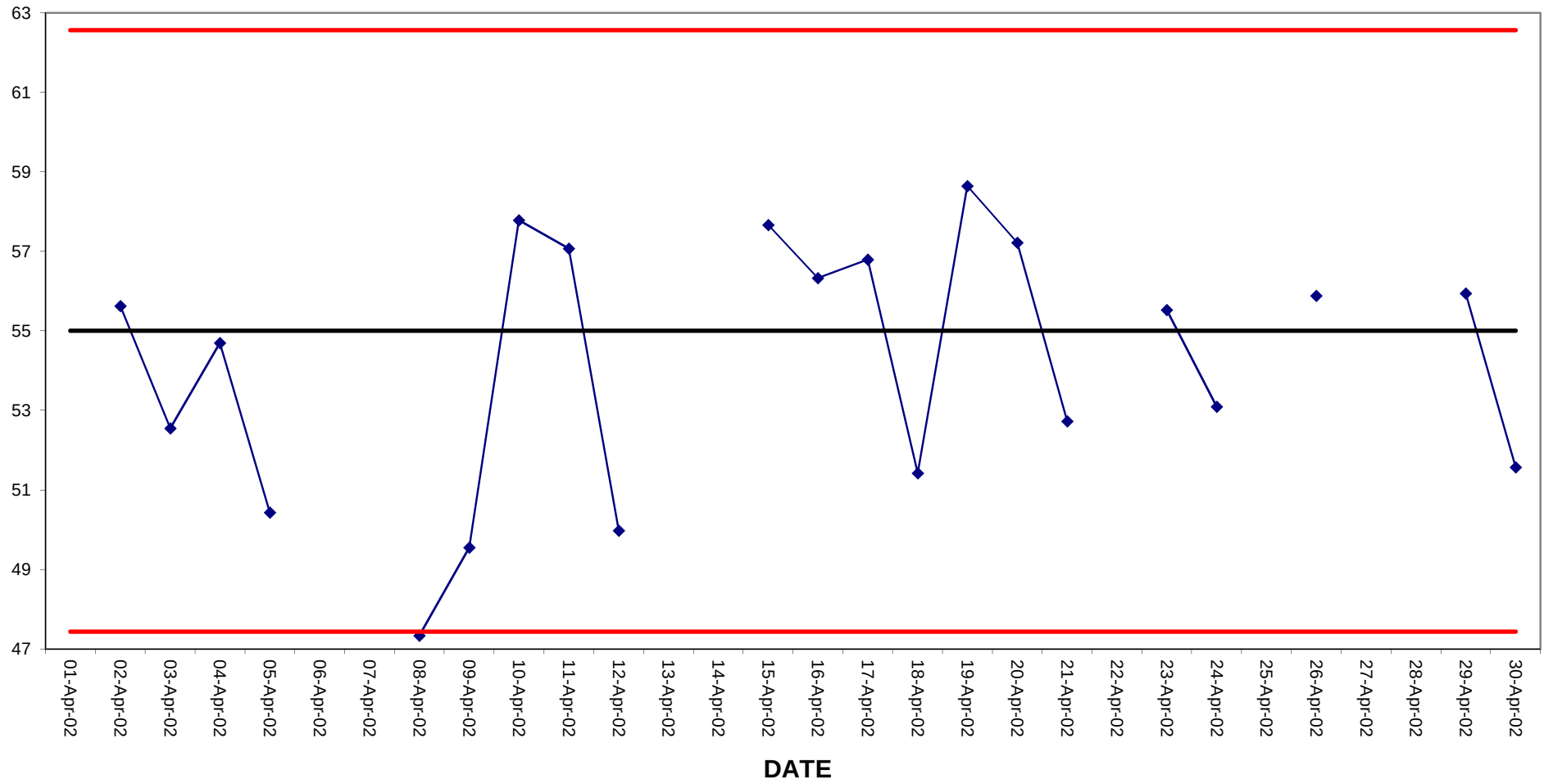
METHOD No	METHOD TITLE	UNITS
TM120	Determination of Electrical Conductivity using the Jenway Conductivity Meter 4320	mScm ⁻¹
TM 123	The Determination of Total dissolved Solids in Water using the Jenway 4320 meter	mg/l
TM116	Preparation & Analysis of Volatile Hydrocarbons by Headspace GC-MSD/HP7694 Headspace Autosampler	µg/l µg/kg
TM 127	The determination of Trace Level Mercury in Aqueous Media and soil extracts by Atomic Absorption Spectroscopy	µg/l
TM 128	The determination of Ultra-Trace Level Arsenic and Selenium in aqueous Media and soil extracts by Hydride Generation Atomic Absorption Spectrophotometry	µg/l
TM 129	Determination of Metal Cations by IRIS Emmission Spectrometer	mg/l, mg/kg
TM131	USN Low-Level Metals	µg/l
TM 133	pH in Soil using the GLpH001 Meter	pH units
TM 134	Total Cyanide in Water by Steam Distillation	mg/l

APPENDIX D

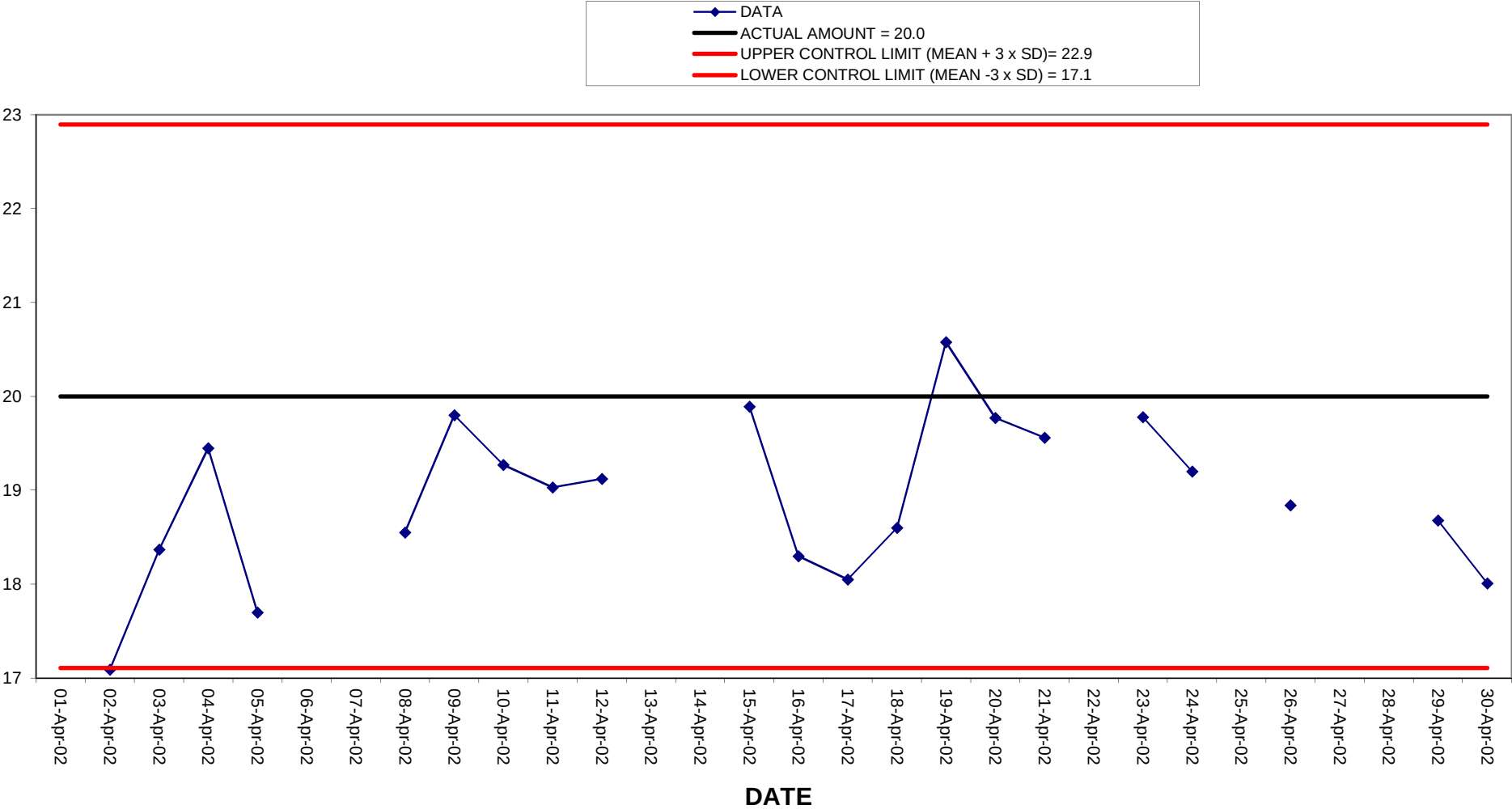
CD CONTAINING QA/QC DATA FOR LABORATORY ANALYSIS

AQC ZINC BY ICP-OES 55.0 mg/l

◆ DATA — ACTUAL AMOUNT = 55 — UPPER CONTROL LIMIT (MEAN + 3 x SD)= 62.6 — LOWER CONTROL LIMIT (MEAN - 3 x SD) = 47.4

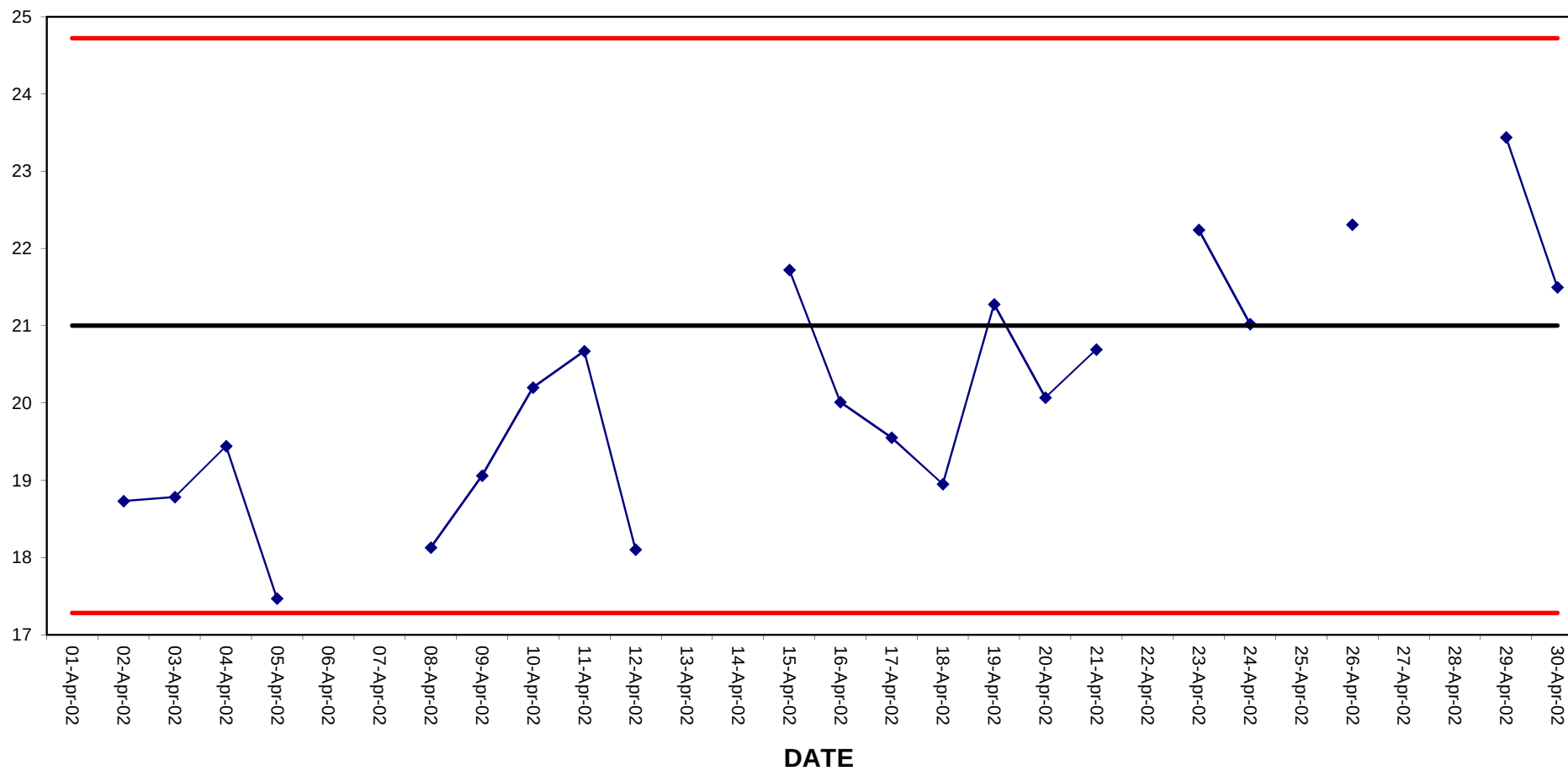


AQC ARSENIC BY ICP-OES 20.0 mg/l

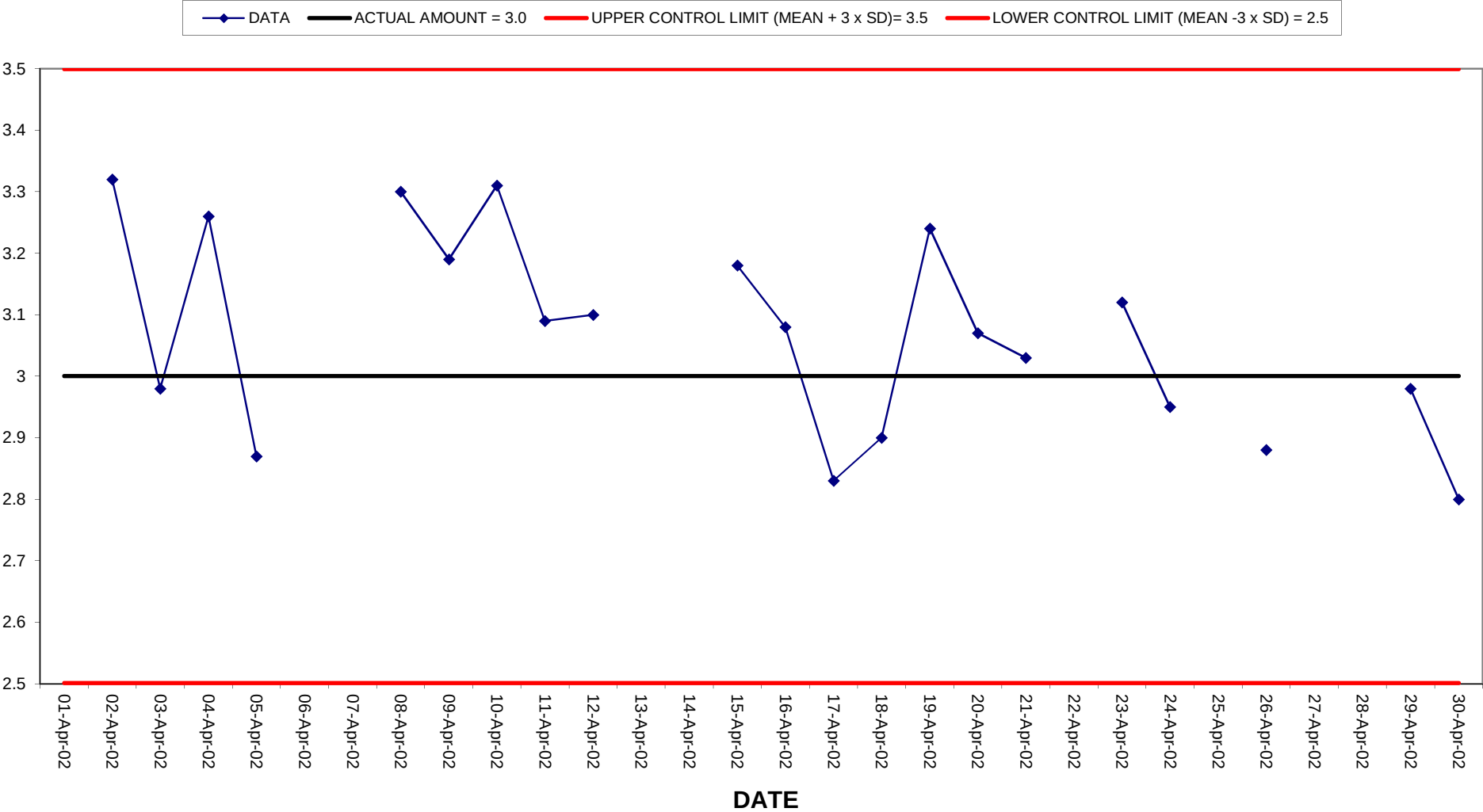


AQC VANADIUM BY ICP-OES 21.0 mg/l

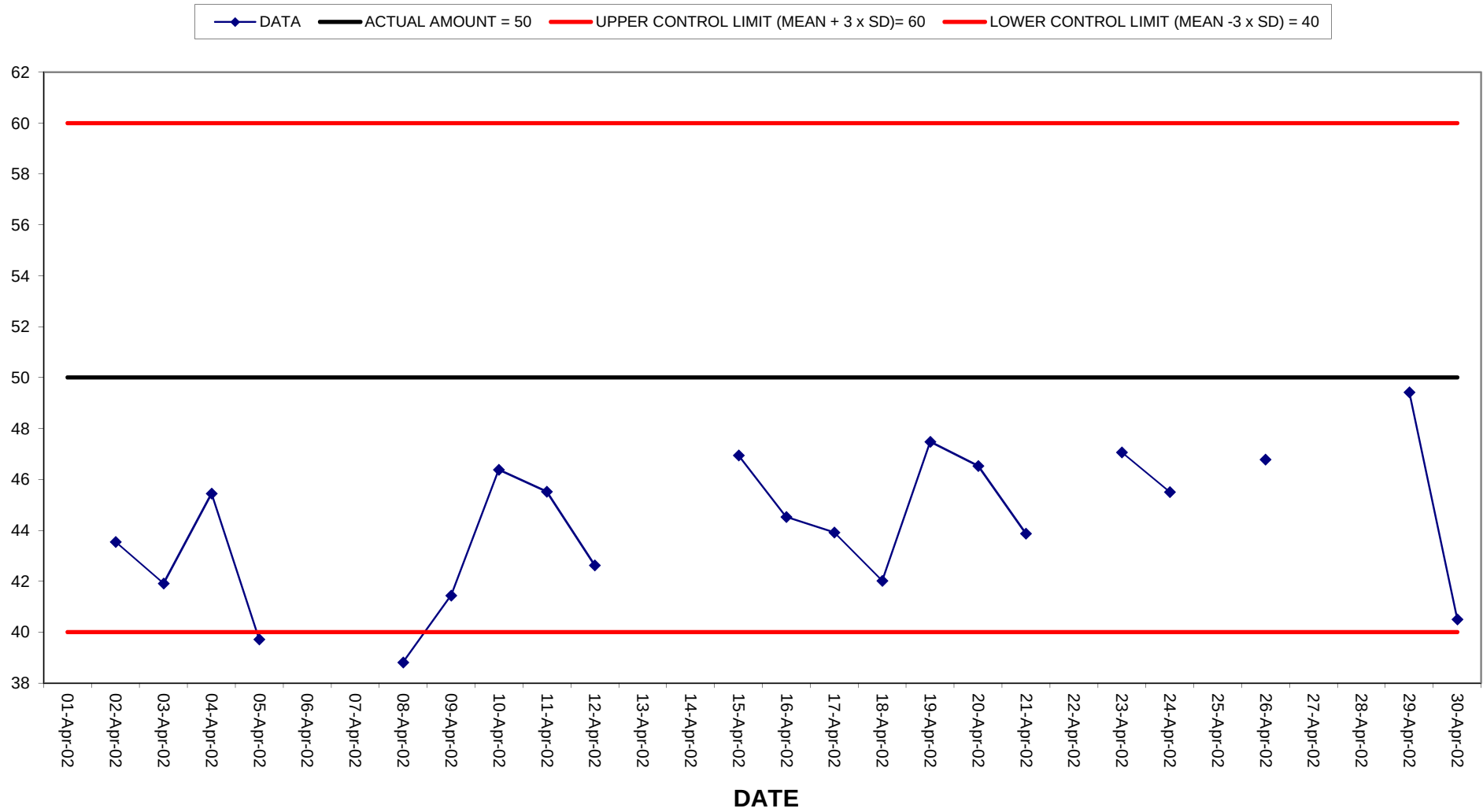
—◆— DATA — ACTUAL AMOUNT = 21 — UPPER CONTROL LIMIT (MEAN + 3 x SD)=24.7 — LOWER CONTROL LIMIT (MEAN - 3 x SD) = 17.3



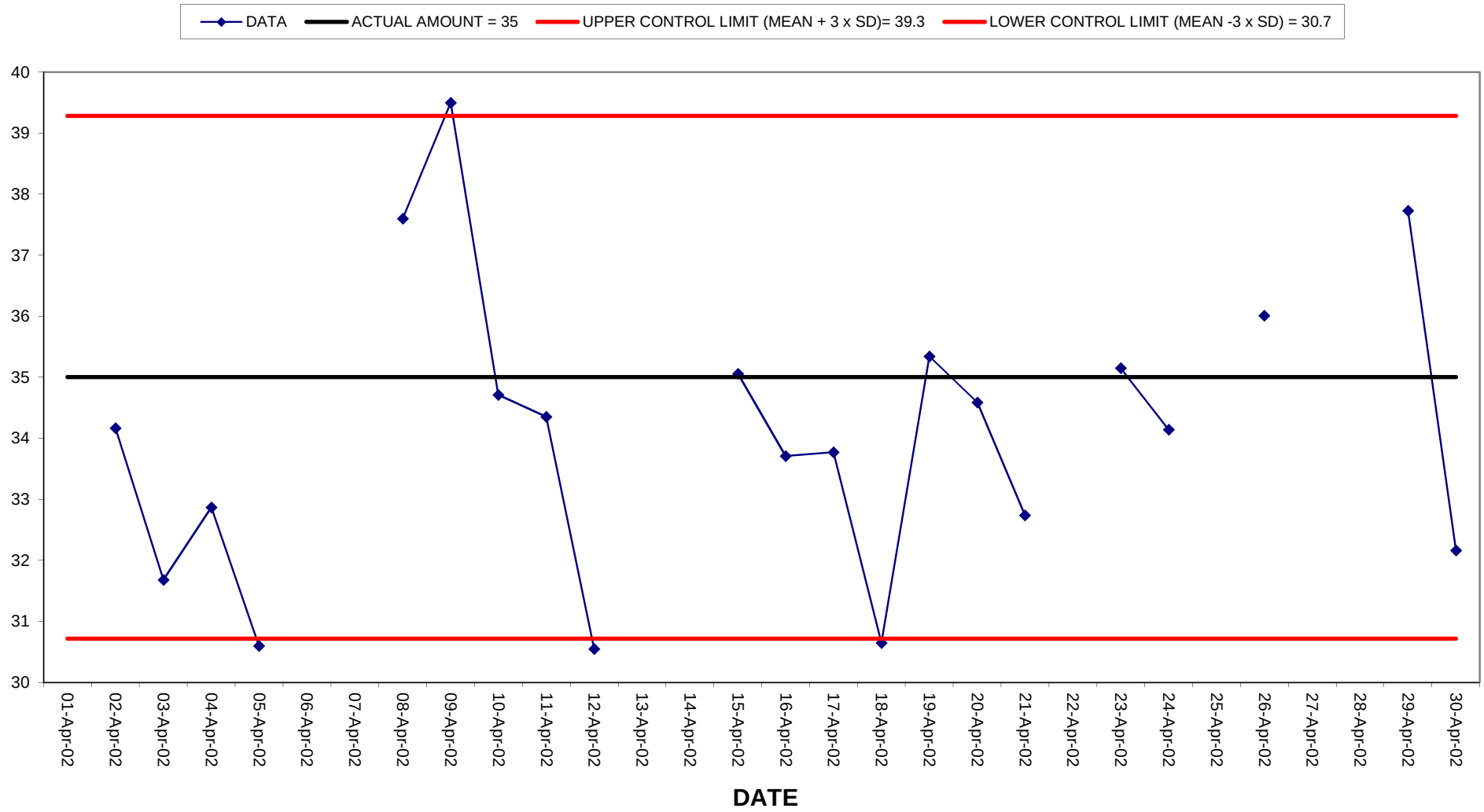
AQC SELENIUM BY ICP-OES 3.0 mg/l



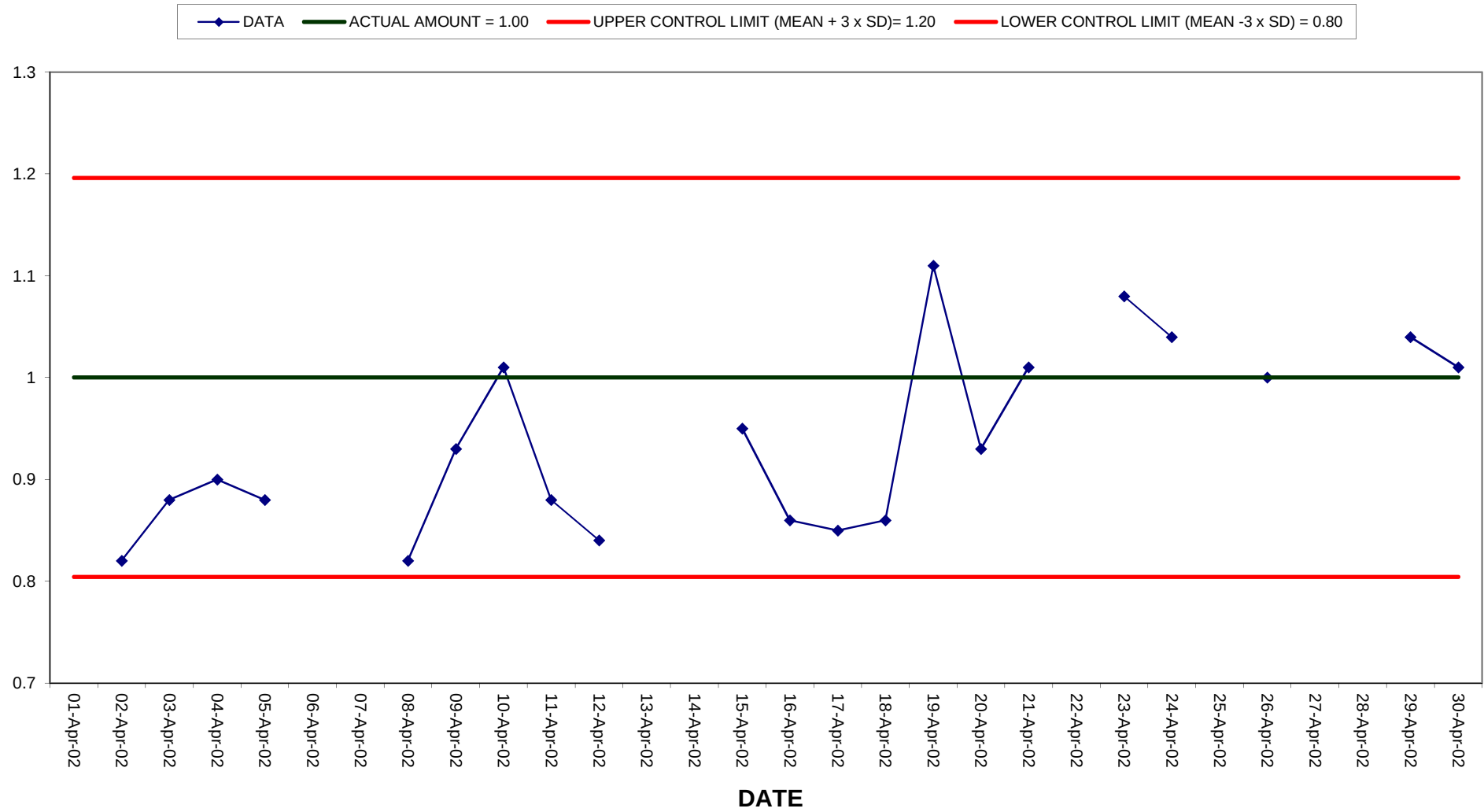
AQC LEAD BY ICP-OES 50mg/l



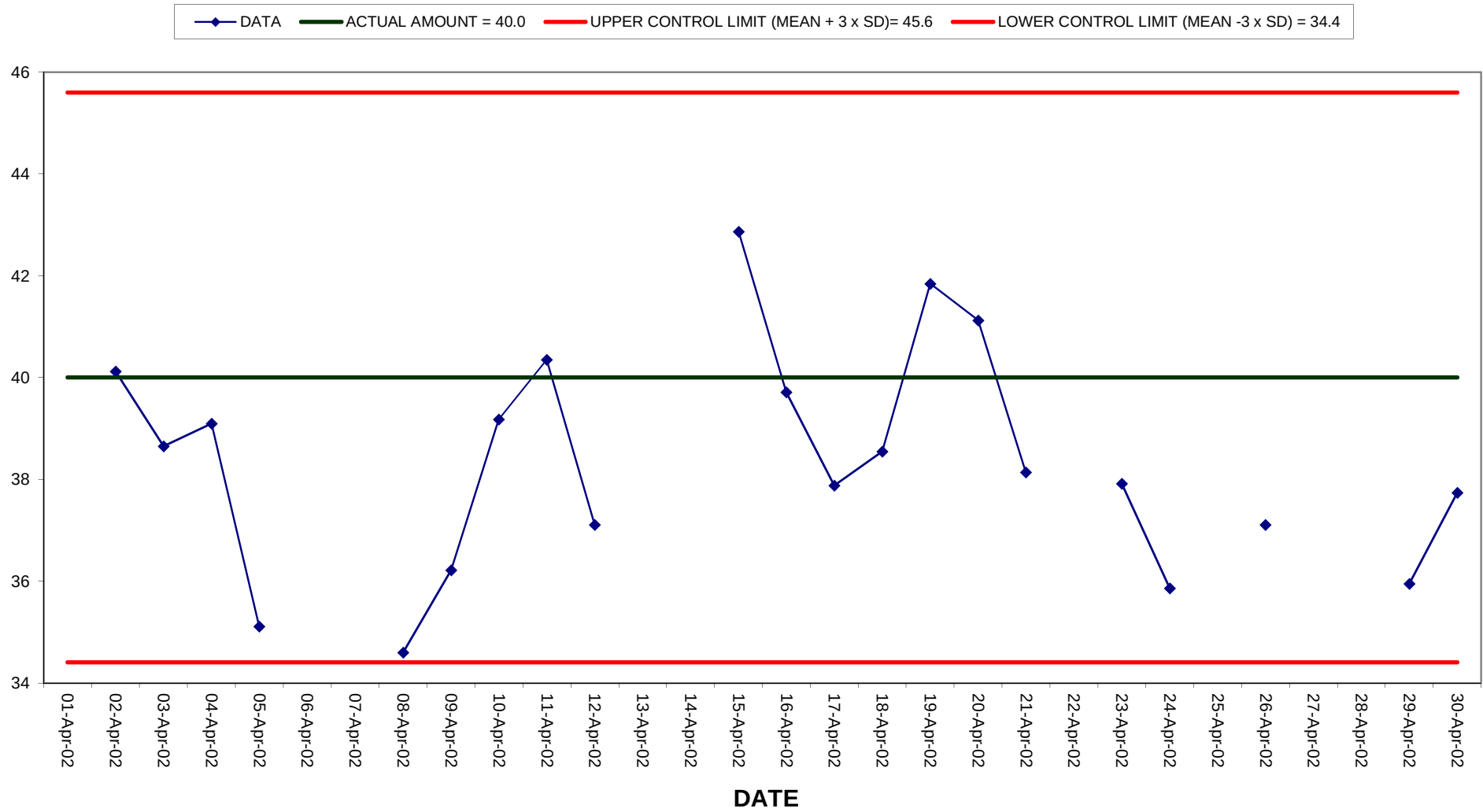
AQC NICKEL ICP-OES 35.0 mg/l



AQC MERCURY BY ICP-OES 1.00 mg/l

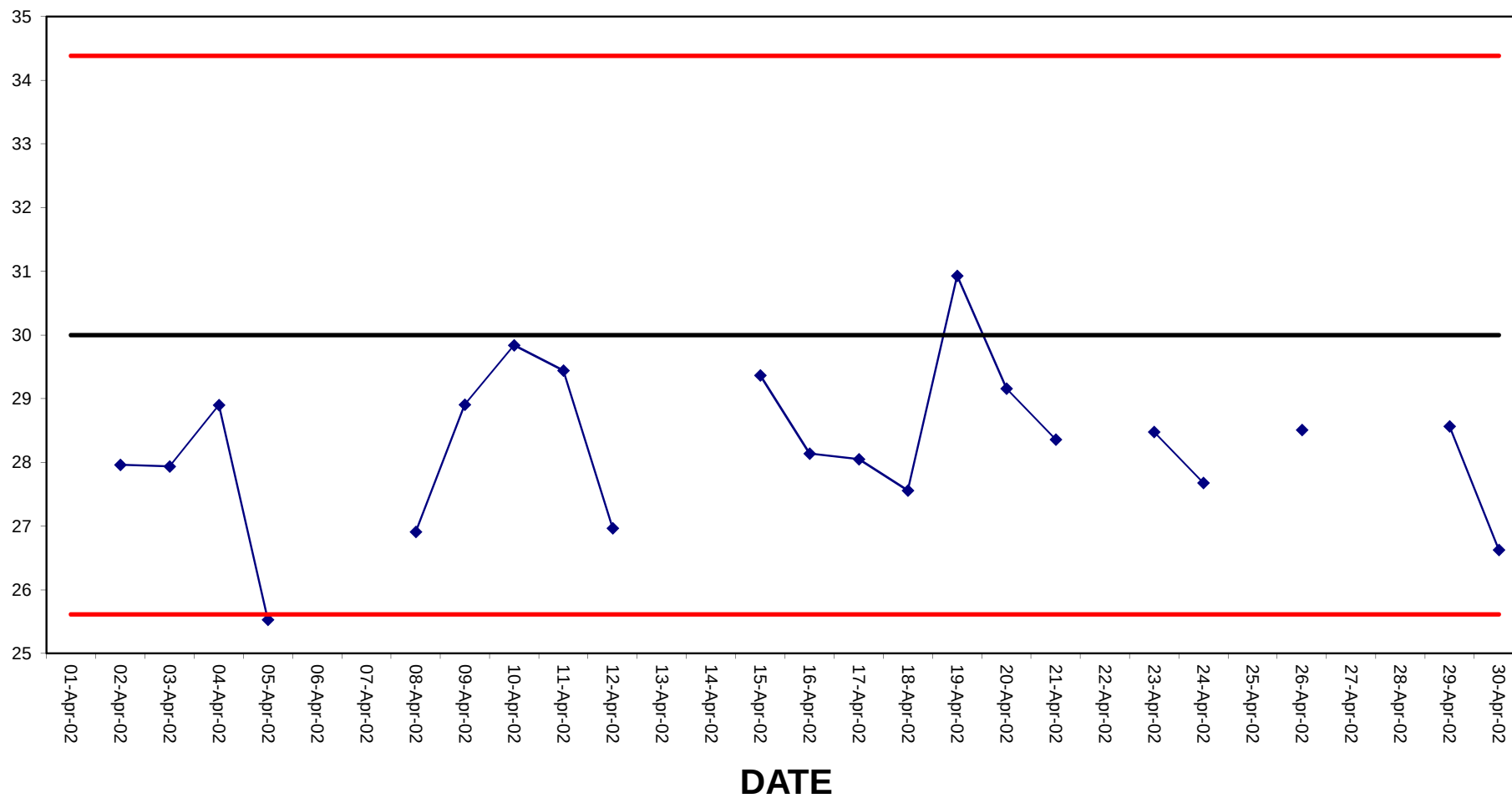


AQC COPPER ICP-OES 40.0mg/l



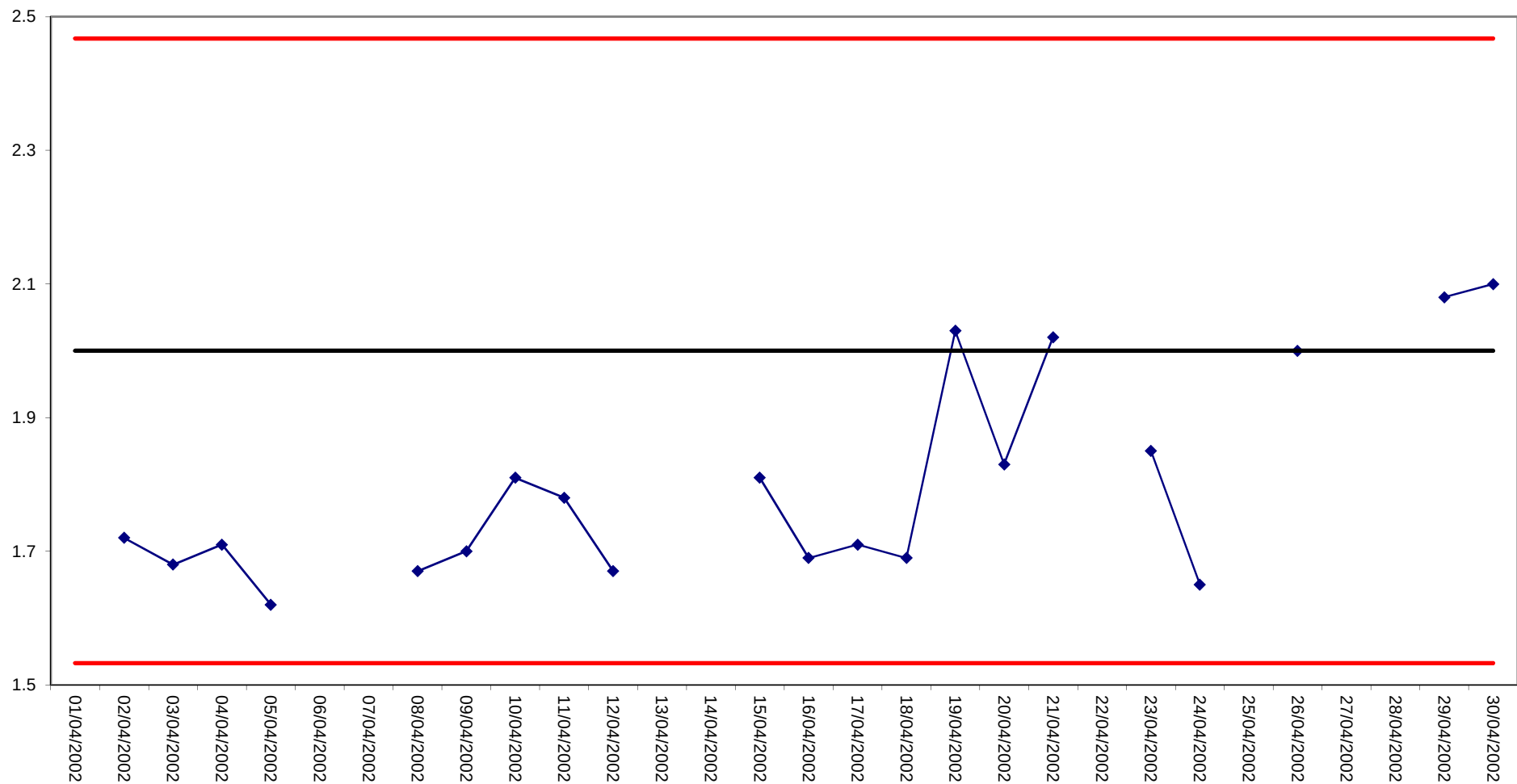
AQC CHROMIUM ICP-OES 30.0mg/l

—◆— DATA — ACTUAL AMOUNT = 30.0 — UPPER CONTROL LIMIT (MEAN + 3 x SD)= 34.4 — LOWER CONTROL LIMIT (MEAN -3 x SD) = 25.6

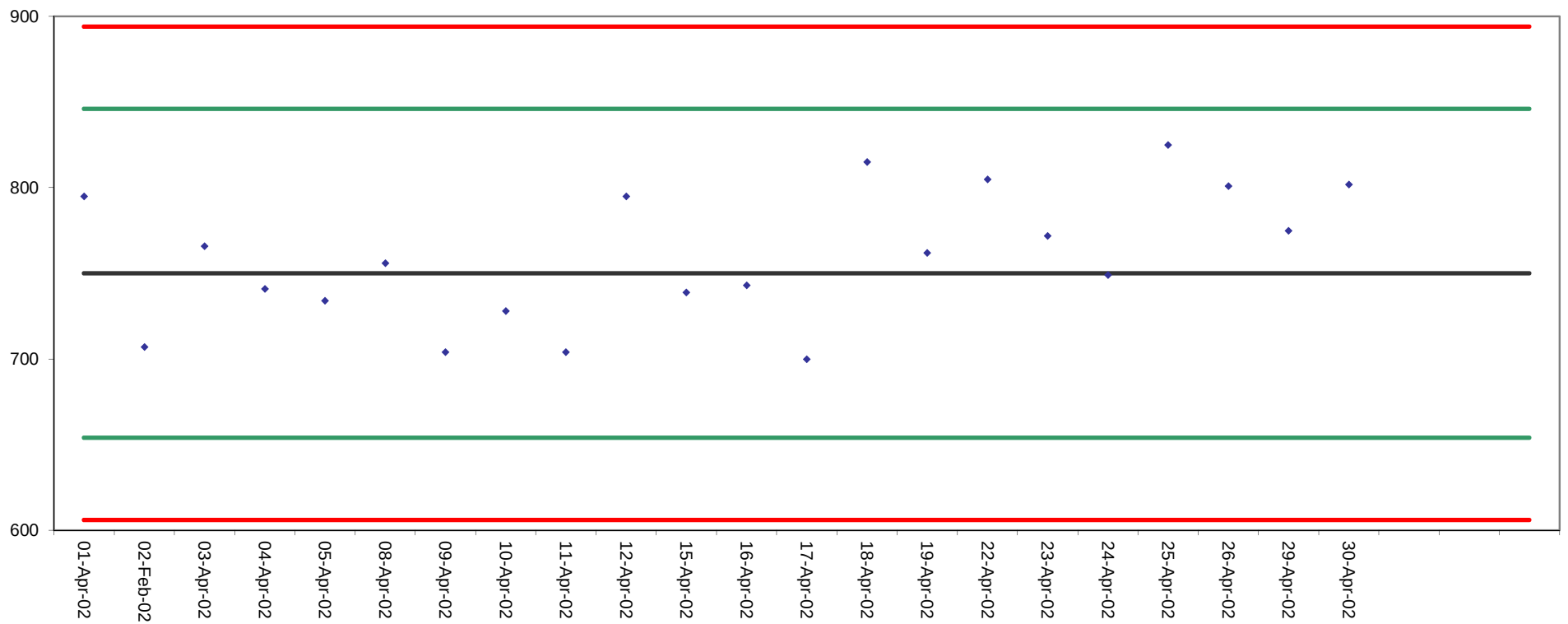
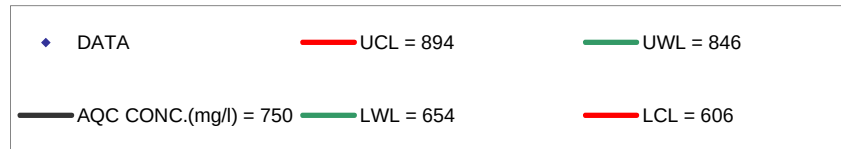


AQC CADMIUM BY ICP-OES 2.5mg/l

DATA ACTUAL AMOUNT = 2.00 UPPER CONTROL LIMIT (MEAN + 3 x SD)= 2.47 LOWER CONTROL LIMIT (MEAN - 3 x SD) = 1.53



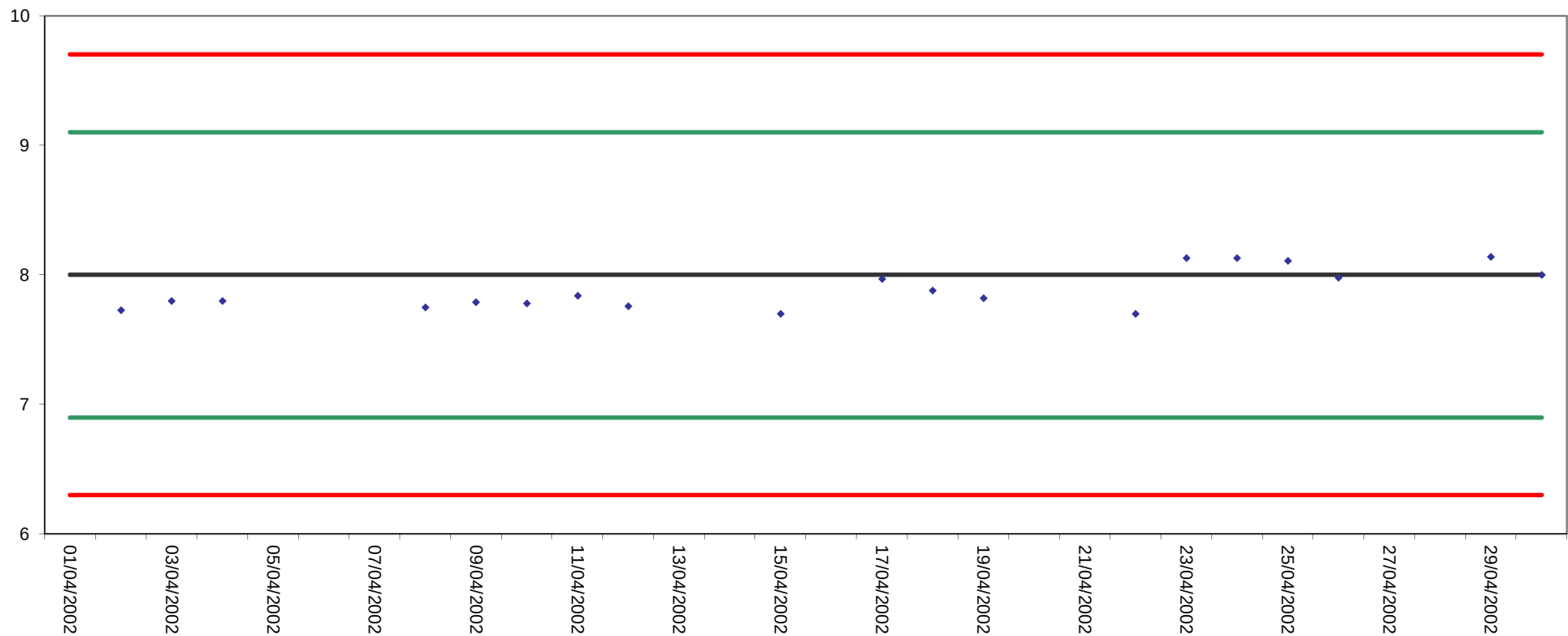
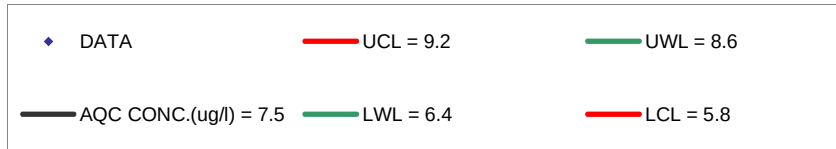
AQC TPH 750 mg/l



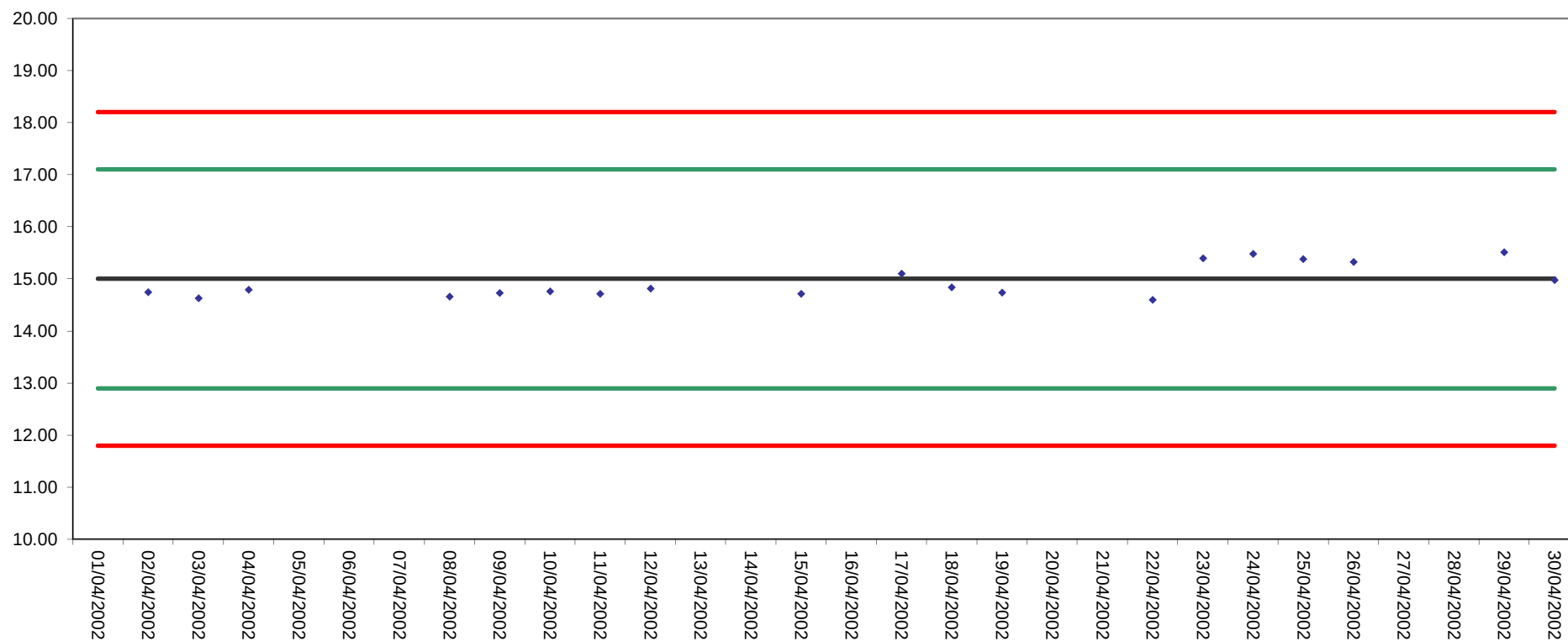
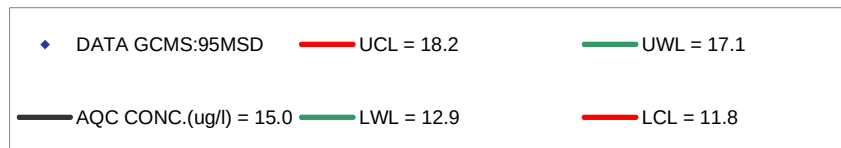
AQC Phenol 2.5 mg/l



AQC Cresols Group 7.5mg/l



Xylenol 15 mg/l



AQC Total Phenol 37.5 mg/l

