

Laois Sawmills Groundwater and Surface Water Monitoring 2023

Annual Report

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

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

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

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1. Introduction

1.1 General Introduction

AECOM Ireland Limited (AECOM) was commissioned by Laois Sawmills Limited (Laois Sawmills) to carry out the site's groundwater and surface water monitoring for 2023 at their facility located in Ballymacken, Portlaoise, Co. Laois (the site).

The work was conducted in accordance with AECOM proposal references: 60654829_ACM_PL_EN_004_0, dated 16 February 2023 and 60654829_ACM_PL_EN_005_0, dated 02 October 2023.

A site location plan is presented in Appendix A, Figure 1, and a site layout plan, showing sampling locations, is presented in Appendix A, Figure 2.

Laois Sawmills is an Environmental Protection Agency (EPA) licensed facility and operates under Industrial Emissions Directive (IED) licence number P0322-01.

Findings of the first three quarterly monitoring events (Q1, Q2 and Q3) in 2023 were reported in brief factual letter reports which were submitted to the EPA¹. This annual groundwater monitoring report presents findings of the fourth quarterly (Q4) monitoring event undertaken at the site in 2023, as well as assessment of the data collected during the routine monitoring completed on site during 2023.

1.2 Background

Hexavalent chromium (Cr(VI)) contaminated soil and groundwater is present at the facility and is understood to have arisen from the historic usage of Tanalith C 3310™ in a timber treatment process conducted within the western portion of the site, referred to as the Old Plant area. This product, also known as CCA (copper chrome arsenic), comprises an aqueous solution of chromium trioxide (30% w/w), copper oxide (11% w/w) and arsenic pentoxide (17% w/w). Tanalith C had been used at the facility from the 1980s to the early 2000s. Whilst all three compounds are of environmental concern, the most significant 'risk driver' is considered to be chromium trioxide as it contains Cr(VI), a known human carcinogen.

Since 2005 the facility has used "Tanalith E" in their timber treatment process, rather than CCA. Tanalith E is a water-based wood preservative containing copper (copper carbonate) and organic biocides (monoethanolamine, ethoxylated amine, organic acid, propiconazole and tebuconazole). Previous formulations also contained boric acid. Tanalith E treatment was used in the Old Plant until 2009, following which it was moved to a purpose built bunded treatment shed, the 'New Plant'. Propiconazole and tebuconazole in groundwater are used as indicator compounds for Tanalith E contamination at the site.

1.3 EPA Compliance Investigation CI000458

EPA Compliance Investigation CI000458 relates to the remediation of historic groundwater contamination outlined above. A Phase I remediation programme using calcium polysulphide (CPS) to remediate Cr(VI) contaminated groundwater in the suspected source area of contamination was carried out in November 2016. Follow-up groundwater monitoring results indicated that Cr(VI) has been transformed to the less toxic trivalent chromium (Cr(III)) within the injection area. A report² detailing results of the Phase I remediation programme was submitted to the EPA in September 2017.

¹ AECOM report references:

60654829_ACM_LT_ENV_008_0 (LSM_GWM_2023_Q1) dated 26 January 2024

60654829_ACM_LT_ENV_009_0 (LSM_GWM_2023_Q2) dated 07 March 2024

60654829_ACM_LT_ENV_010_0 (LSM_GWM_2023_Q3) dated 08 March 2024

² AECOM (2017) Laois Sawmills Phase I Remediation Report dated 18 September 2017

The site undertook an intrusive site investigation and in 2018 prepared a review³ of the conceptual site model (CSM) for the site to better understand the groundwater contamination and requirement for remediation, as required under Compliance Investigation CI000458.

A further update⁴ of the CSM was submitted to the EPA in 2022 following additional site investigation carried out by AECOM to improve the understanding of the contamination and the hydrogeology at the site, and an outline corrective action plan and feasibility study⁵ (outline CAP) was submitted to the EPA in 2023. A detailed CAP is currently being prepared which will further detail the design basis for the proposed remediation programme.

1.4 IEL surface water and groundwater monitoring

The LSM routine groundwater and surface water monitoring programme is carried out quarterly.

The scope of the monitoring programme was previously based on the requirements detailed in the following correspondence with the EPA:

- Letter from the EPA to Laois Sawmills dated 24 August 2005 (EPA ref: M322/gc08bc.doc).
- EPA site inspection report dated 29 August 2006 (EPA ref: P0322-01/snc02bk.doc; EPA Inspection Ref. SI04BK).
- Letter from the EPA to Laois Sawmills dated 31 January 2008 (EPA ref. P0322-01/gen02DD).
- Letter from AECOM (URS) dated 22 March 2012 (Ref. 464021115) proposing a revised groundwater monitoring programme and corresponding letter from the EPA to Laois Sawmills dated 31 May 2012 (EPA ref. P0322-01/ap02mn) accepting the revised programme.
- EPA Request for Information (RI1001049) dated August 2013.

The following changes to groundwater and surface water monitoring were implemented prior to 2023:

- From 2018 monitoring of the site production well, PW, was increased to quarterly to monitor the elevated concentrations of hexavalent chromium detected in the groundwater from that well.
- The monitoring programme had included sampling from three monitoring wells (BH6, BH7 and BH8) and a groundwater supply tap (DW2) located on third-party land belonging to a neighbouring property-owner. In 2016 the landowner withdrew permission for Laois Sawmills to access these locations for sampling purposes; therefore, these sample locations have not been monitored since Q3 2016.
- Tebuconazole and propiconazole are pesticide compounds present in Tanalith E wood preservative and have been analysed for at all collected groundwater and surface water samples since 2017 following the detection of both compounds at several groundwater and surface water locations.

In 2020 EPA Compliance Investigation CI000458 action number A026904 noted that the presence of these Tanalith E indicator compounds was of concern, and a report⁶ on Tanalith E indicator compounds was prepared for Laois Sawmills by AECOM in response. That report recommended that:

- All locations sampled as part of the routine groundwater and surface water programme continue to be monitored for Tanalith E indicator compounds.
- Wells BH23 and BHA in the former treatment area should be monitored annually to measure concentrations of Tanalith E indicator compounds and assess concentration trends in that area.

Since the report was issued, AECOM has carried out monitoring for tebuconazole and propiconazole as per the recommendations of the report.

³ AECOM (2018) Laois Sawmills Conceptual Site Model Review 2018 ref. PR-246955_ACM_RP_EN_001 dated 10 August 2018

⁴ AECOM (2022) *Conceptual Site Model Update 2022*, PR-246955_ACM_RP_ENV_002_0, dated 14 September 2022.

⁵ AECOM (2023) *Laois Sawmills Limited Outline Corrective Action Plan and Feasibility Design* ref. PR-246955_ACM_RP_EN_003 dated 06 June 2023

⁶ AECOM (2020) *Tanalith E Indicator Parameters* ref. PR-477651_ACM_LT_EN_003_0 dated 27 November 2020

- EPA Compliance Investigation CI000458 action number A026915 required that ‘an additional ambient surface water monitoring point downstream of SW1 at a safely accessible location somewhere close to the R425 shall be monitored quarterly as per the current programme for SW1, SW2 and SW3’. Location SW4 was identified and first sampled in Q4 2020. Sampling there was completed quarterly to Q1 2022 where possible, as sampling at this location was often restricted due to safety issues with access and overgrown vegetation.
- The 2022 site investigation included the drilling and installation of paired overburden and bedrock groundwater monitoring wells at eight locations, sixteen additional wells in total (BH27S/D, BH28S/D, BH29S/D, BH30S/D, BH31S/D, BH32S/D, BH33S/D and BH34S/D).

Additionally, as part of the same programme of drilling BH2C was drilled as a replacement well for BH2B, which was decommissioned as its location made it prone to damage from vehicular access to the new sawmill building.

- Proposed changes to the monitoring programme for 2023 were summarised in an AECOM letter⁷ to Laois Sawmills which was submitted to the EPA via EDEN on 14 March 2023 as licensee return LR074489. These included:
 - Quarterly water level measurements at majority of onsite monitoring wells to assess groundwater elevation and model groundwater flow.
 - Removal of BH6, BH7, BH8 and DW2 from monitoring programme, due to withdrawal of well access by the neighbouring landowner.
 - Addition of PW, BH26S, BH26D to quarterly monitoring programme.
 - Inclusion of Tanalith E indicator compounds (tebuconazole and propiconazole) in laboratory analysis for all surface water and groundwater samples.
 - Replacement of groundwater well BH2B (decommissioned in 2022) with new well BH2C.
 - Inclusion of 16 wells installed in 2022 (BH27S/D to BH34S/D) as annual sampling in the Q3 2023 sampling round.
 - Inclusion of all newly installed wells in the site maintenance program.
 - Removal of sampling location SW4 from monitoring program due to sampling quality and access constraints.
 - Trialling of a no-purge sampling technique (using HydraSleeve™ equipment) as an alternative to the traditional three bore purge sampling method.

Note: the HydraSleeve™ sampling will be considered in a separate assessment and the sample results are not presented or discussed in this report.

- The scope of the proposed 2023 monitoring programme was further amended by EPA licensee return LR074489 approval notice dated 05 May 2023 which required:
 - That wells installed in 2022 be monitored quarterly in 2023. This change was instituted from Q3 2023.
 - That samples be obtained from downstream of SW1, with access by agreement with landowners as necessary. A downstream location, SW4A, was sampled in Q4 2023 following negotiation with a neighbouring landowner.
 - That locations BH6, BH7, BH8 and SW2 be retained in the monitoring programme at this stage. These locations were not accessible during 2023.
- EPA site visit report SV27406 dated 28 November 2023 also required that Laois Sawmills submit water quality samples for the interceptor. A grab sample from the interceptor was collected in Q4 2023.

Based on above requirements, the sampling schedule agreed with Laois Sawmills for groundwater, surface water and drinking water monitoring for 2023 is provided in Table 1 overleaf.

⁷ See AECOM letter ‘2023 IEL Groundwater and Surface Water Monitoring’ PR-246955_ACM_LR_ENV_0010, dated 16 February 2023

Table 1. 2023 sampling schedule

Quarter	Month	Groundwater Samples	Surface Water Samples	Drinking Water Samples
Q1	March	BH1A, BH2C, BH3A, BH5A, BH9A, BH26D, BH26S, PW	SW1, SW2, SW3	DW1, DW3
Q2	June	BH1A, BH3A, BH5A, BH9A, BH26D, BH26S, PW	SW3	DW1, DW3
Q3	September / October	BH1A, BH2C, BH3A, BH5A, BH9A, BH23, BH26D, BH26S, PW, BHA, BH27D, BH27S, BH28D, BH28S, BH29D, BH29S, BH30D, BH30S, BH31D, BH31S, BH32D, BH32S, BH33D, BH33S, BH34D, BH34S	SW1, SW2, SW3	DW1, DW3
Q4	01 November	-	SW1*, SW2*, SW3*	-
	07 November	-	-	DW2*,**
	16 November	-	SW1*, SW2*, SW3*	-
	December	BH1A, BH2C, BH3A, BH5A, BH9A, BH23, BH26D, BH26S, PW, BHA, BH27D, BH27S, BH28D, BH28S, BH29D, BH29S, BH30D, BH30S, BH31D, BH31S, BH32D, BH32S, BH33D, BH33S, BH34D, BH34S	SW1, SW2, SW3, SW4A. Interceptor***	DW1

* Tested for tebuconazole and propiconazole only

** Sampled on a one-off basis

*** Grab sample from the site interceptor located to the west of the Pellet Plant

2. Objective

The objective of the works carried out in 2023 was to provide an assessment of groundwater quality beneath the site and surface water quality in the vicinity of the site.

3. Scope of Work

To achieve the above objective the following tasks were completed:

- Quarterly groundwater and surface water sampling as per the sampling schedule outlined in Section 1.4
- Preparation of brief, factual letter reports for Q1, Q2 and Q3 monitoring events
- Preparation of an annual report compiling data collected during 2023 (this document).

3.1 Fieldwork

Four monitoring rounds were completed in 2023:

- Q1 2023 completed on 15 and 16 March 2023.
- Q2 2023 completed on 07 June 2023.
- Q3 2023 completed on 28 September, 4 and 5 October 2023.
- Q4 2023 completed on 14, 15 and 18 December 2023.

As part of the monitoring programme the following field tasks were completed:

- Prior to sampling, gauging depth to groundwater and total depth of each well.

- Purging each well scheduled for sampling of groundwater so that a sample representative of the aquifer could be collected.
- Measurement of in-situ water quality parameters (temperature, pH, electrical conductivity, redox-potential and dissolved oxygen), as well as recording observations of colour, odour, and evidence of contamination, as applicable.
- Collection of groundwater samples from scheduled monitoring wells and the site production well (depending on the scope of each quarterly monitoring round).
- Collection of water samples from two water supply wells; an offsite former drinking water supply, which previously supplied the on-site office (well DW1), and offsite at a privately-owned well (well DW3).

A sample was also collected from offsite privately-owned well DW2 in Q4 2023 on a one-off basis on 07 November 2023. The access was granted at short notice and sampling was limited to collection of a sample for analysis for tebuconazole and propiconazole only, owing to available sampling equipment and containers.

- Collection of up to four (depending on the scope of each quarterly monitoring round) surface water samples from the nearby stream, one upstream (SW2), two downstream (SW1 and SW4A) of the facility, and one from a perforated drainage pipe discharging from the site interceptor to the stream (SW3).

Location SW4A (located downstream of location SW1 but upstream of location SW4) was identified and sampled during Q4 2023 following negotiation with the landowner.

During 2023, the following samples could not be collected in accordance with the proposed sampling schedule:

- Q1 '23:
 - No sample was collected for monitoring well BH9A as the well went dry during purging and recovery was poor.
 - No sample was collected from offsite location DW3, located at a neighbouring property, as the occupants of the property were not there at the time of sampling.
- Q2 '23
 - No groundwater sample was collected from monitoring well BH5A owing to the well drying up during purging.
 - A surface water sample was not collected from location SW3 because there was no discharge from the pipe at the time of sampling.
- Q3 '23
 - BH9A was not accessible at the time of sampling.
 - BH30S quickly purged dry and there was insufficient recharge to obtain a sample.
 - DW3 was not accessible as the occupants of the property were not there at the time of sampling.
 - No sample was collected from location SW3 because there was no discharge from the pipe at the time of sampling.
- Q4 '23:
 - DW3 was not accessible as the occupants were not present at the time of sampling.
 - No sample was collected from location SW3 because there was no discharge from the pipe at the time of sampling.
- In both Q3 and Q4 a sample was collected from the stream directly below the SW3 pipe outlet – for consistency with previous monitoring the results for these samples are not reported, but it is noted that the results and field readings were similar to the SW1 and SW2 results.

All sample locations are illustrated in Appendix A Figure 2.

Water sampling was completed by AECOM field scientists / engineers using dedicated sampling equipment and following standard AECOM sampling procedures to collect samples representative of in situ conditions and minimise changes in water chemistry during sampling and handling.

Samples were collected into laboratory-supplied containers and were stored in chilled cool boxes on site. Where required, samples were filtered in the field and preserved. Samples were stored overnight in the AECOM sample fridge prior to dispatch to the laboratory.

Appropriate Chain of Custody documentation was completed for sample traceability purposes and samples were dispatched to the laboratory by courier. Groundwater samples were couriered to Element Materials Technology (EMT) in the UK for analysis.

3.2 Laboratory Analysis

The complete monitoring schedule for all of 2023, including the Q4 monitoring event, is presented as Appendix B, Table 1.

Throughout 2023, except where otherwise noted, all samples collected were analysed for the following parameters:

- Chromium (total and hexavalent), arsenic, boron and copper.
- Propiconazole & tebuconazole.
- Dissolved organic carbon (DOC).

All samples collected from SW3 were additionally scheduled for analysis for total suspended solids (TSS) and chemical oxygen demand (COD).

Additional analysis required on an annual basis, including an expanded metal suite, major ions and permethrin, was scheduled for selected locations (BH3A, SW1 and SW2) in Q1 2023 only.

3.2.1 Q4 Analysis

In Q4, samples from the following monitoring locations were submitted for laboratory analysis:

- Twenty-five groundwater monitoring wells:
 - BH1A, BH2C, BH3A, BH5A, BH9A, BH23, BH26D, BH26S, BHA, BH27D, BH27S, BH28D, BH28S, BH29D, BH29S, BH30D, BH30S, BH31D, BH31S, BH32D, BH32S, BH33D, BH33S, BH34D, BH34S.
- Two site abstraction wells:
 - PW and DW1.
- One offsite abstraction well:
 - Location DW2.
 - Note: sampled 07 November 2023, scheduled for propiconazole & tebuconazole analysis only.
- Three surface water locations collected during the Q4 monitoring event:
 - SW1, SW2 and SW4A.
- A further six samples were collected from three surface water locations during supplementary sampling completed on 01 and 16 November:
 - SW1, SW2 and SW3.
 - Note: scheduled for propiconazole & tebuconazole analysis only.
- A sample was taken from the Interceptor located in the parking area outside of the Pellet Plant building.

Except where otherwise noted, all samples collected were analysed for the following parameters:

- Chromium (total and hexavalent), arsenic, boron and copper.

- Propiconazole & tebuconazole.
- DOC.

A single duplicate sample was also collected and scheduled for analysis for hexavalent chromium as part of AECOM's quality control protocols.

3.3 Data Assessment – Water Quality Screening Guidelines

Groundwater quality has been assessed by comparing analytical results against generic assessment criteria (GAC). GAC have been selected from the lowest relevant water quality screening guidelines from the following regulations:

- European Communities Environmental Objectives (Groundwater) Regulations, 2010. Statutory Instrument (S.I.) No. 9 of 2010 as amended by European Union Environmental Objectives (Groundwater) (Amendment) Regulations, 2016 (S.I. No. 366 of 2016).
- European Union (Drinking Water) Regulations 2014. Statutory Instrument No. 122 of 2014.

Surface water quality has been assessed by comparing analytical results to:

- European Communities Environmental Objectives (Surface Waters) Regulations, 2009, S.I. No. 272 of 2009.
- European Communities Environmental Objectives (Surface Waters) (Amendment) Regulations, 2012, S.I. No. 327 of 2012.
- European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2015, S.I. No. 386 of 2015.
- European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2019, S.I. No. 77 of 2019.

Where no applicable statutory water quality screening guideline is available, results have been assessed against Interim Guideline Values published by the EPA⁸ or, in the case of copper and boron, against the screening criteria previously set out in S.I. No. 9 of 2010 but which were removed in the 2016 amendment to the Regulations (S.I. No. 366 of 2016).

4. Q4 2023 Results

Depth to groundwater and field water quality measurements recorded during field works are presented in Appendix B Tables 2 and 3 respectively. Analytical results screened against relevant GAC are presented in Appendix B Tables 4 to 7, with a data quality assessment for Cr(VI) in Appendix B Table 8.

The EMT laboratory report is included in Appendix C.

4.1 Field Observations

During Q4 2023 monitoring round, the following observations were noted:

- Groundwater from monitoring wells were ranging from clear to cloudy grey/brown in colour.
- BH2C presented a hydrogen sulphide odour during purging. No other evidence of contamination was identified.
- Groundwater from drinking water well DW1 was clear with no evidence of contamination.
- Surface water samples collected from SW1, SW2 and SW4A were clear brown with the stream being noted full of plant matter with grey algae on the banks. A medium flow was recorded at these locations.
- No flow was reported from SW3.

⁸ Environmental Protection Agency (2003) Towards Setting Guideline Values for the Protection of Groundwater in Ireland – Interim Report.

4.2 Groundwater Flow Direction

The overburden and bedrock groundwater contour plans prepared for AECOM's 2023 Annual Report are presented as Appendix A Figures 3a-b. The groundwater flow direction has been plotted based on the groundwater elevation measurements recorded during the Q4 monitoring events. Groundwater flow in the overburden and bedrock aquifers is inferred to be towards the northwest of the site, in line with the local topography which slopes down from the site to the northwest towards the stream. Both the overburden and bedrock aquifers appear to be influenced by the periodic pumping at well PW, with a stronger relationship seen in the bedrock wells, which are in the unit from which PW abstracts.

4.3 Analytical Results

4.3.1 Groundwater – Q4 2023

Groundwater analytical results for Q4 2023 are presented in Appendix B – Table 4 with a summary of the results presented below. The EMT laboratory reports are included in Appendix C.

Analytical results for the Q4 2023 groundwater samples are summarised as follows:

- Concentrations of both the total chromium and Cr(VI) above selected GAC (37.5 µg/L and 7.5 µg/L respectively) were reported in groundwater from 14 of the 27 wells sampled:
 - 9 overburden wells: BH3A, BH5A, BH23, BH26S, BH27S, BH29S, BH33S, BH34S and BHA
 - 5 bedrock wells: BH26D, BH27D, BH29D, BH33D and PW.

Concentrations for total and hexavalent chromium respectively ranged from 39.4 - 2,248.4 µg/L and 21 – 1,832 µg/L.

A concentration in excess of the GAC for Cr(VI) but not the GAC for total dissolved chromium was reported in groundwater from well BH34D (21 µg/L) only.

Concentrations of total chromium above the laboratory method detection limit (MDL) but below the GAC were reported in wells BH9A, BH30D and BH34D.

- Where detected, dissolved arsenic was reported at concentrations below the selected GAC protective of groundwater (7.5 µg/L) except for well BH23 (64.8 µg/L).
- Apart from BH32D, dissolved boron was detected in all groundwater samples above the laboratory MDL of 12 µg/L but at concentrations which did not exceed the GAC (750 µg/L).

The highest concentration of boron detected in Q4 2023 was 342 µg/L in groundwater from monitoring well BH29D.

- Where detected, dissolved copper was reported at concentrations ranging between 8 µg/L and 78 µg/L, significantly below the selected GAC protective of groundwater (1,500 µg/L).
- Propiconazole was detected above the laboratory MDL and the selected GAC (both 0.1 µg/L) in groundwater from all sampled locations in Q4 2023 apart from DW2.

Concentrations ranged from 0.3 µg/L (BH32S) to 12.7 µg/L (BHA).

- Tebuconazole was detected above the laboratory MDL and GAC protective of groundwater and drinking water (both 0.1 µg/L) in groundwater from 5 of the 27 sampled locations in Q4 2023:
 - Overburden wells: BH23, BH30S, BH34S and BHA.
 - Bedrock well: BH30D.

Concentrations ranged from <0.1 µg/L to 3.8 µg/L (BHA).

- DOC was below the laboratory MDL of 2 mg/L in groundwater from all but three wells sampled in Q4 2023. DOC was detected at the MDL in groundwater from wells BH30D and BHA and at a concentration of 5 mg/L in groundwater from well BH27S. There is no assessment criteria defined for DOC.

4.3.2 Surface Water – Q4 2023

Surface water samples from the stream were collected at three locations in the Q4 2023 quarterly monitoring event completed in December 2023: SW1, SW2 and SW4A. SW3 had no flow in the outfall pipe and was not sampled.

A sample was also collected from the site interceptor.

The following analytes were detected:

- Propiconazole was detected at concentrations above the laboratory MDL (0.1 µg/L) in all four surface water samples collected in Q4 2023 (Interceptor 3.5 µg/L, SW1 1.8 µg/L, SW2 5.8 µg/L and SW4a 3.8 µg/L).

There is no relevant GAC for propiconazole in surface water.

- DOC was detected above the laboratory MDL (2 mg/L) in all surface water samples collected in Q4 2023 (Interceptor 3 µg/L, SW1 22 µg/L, SW2 23 µg/L and SW4a 21 µg/L).

There is no relevant GAC for DOC in surface water.

Additionally, supplementary surface water samples collected from locations SW1, SW2 and SW3 on 01 and 16 November 2023 were analysed for propiconazole and tebuconazole only:

- At SW3 propiconazole concentrations ranged from 2.5 – 3 µg/L while tebuconazole concentrations ranged from 1.9 – 2.0 µg/L.
- Neither compound was detected at either SW1 or SW2.

No other analytes were detected in the surface water samples above their respective MDLs in Q4 2023.

4.3.3 Quality Assurance/Quality Control

Groundwater and surface water samples were subject to sampling, sample custody and laboratory protocols to maintain traceability and reliability of analytical results. These included:

- Recording of field observations and measurements in field notes.
- Transportation of samples under chain of custody documentation.
- Confirming receipt of all samples and analytical scheduling against the chain of custody and monitoring schedule.

As part of AECOM's quality control procedure, a field duplicate (DUP01) of sample BH26D was submitted to the laboratory for Cr(VI) analysis. The RPD between original and duplicate samples was 14%, which is within acceptable RPD ranges:

- Not critical - for results <10 x MDL.
- <50% - for results between 10 x and 20 x MDL.
- <30% - for results greater than 20 x MDL.

A comparison against the primary result including calculated Relative Percentage Differences (RPDs) is presented in Appendix B, Table 8.

5. Groundwater and Surface Water Quality Trends

Historical monitoring data are presented in Appendix B Table 5 (groundwater and drinking water) and Appendix B Table 7 (surface water).

Long term trends for chromium and for Tanalith E indicator compounds (propiconazole and tebuconazole) for selected monitoring locations for which long-term monitoring data are available are presented in Appendix B Graphs 1 to 14.

- Graphs 1-6 illustrate long term changes in the reported concentrations of total chromium and Cr(VI) for the last 11 years⁹ at locations BH1A, BH3A, BH5A, BH26S, BH26D and PW, as these are the locations for which there is a sufficiently large dataset for a robust statistical analysis.

BH3A, BH5A, BH26S and PW are the locations on site at which the most elevated concentrations have consistently been recorded.

BH26D is the bedrock monitoring well for which the most monitoring data are available, while BH1A is a downgradient well in which concentrations which are less elevated, but still above the relevant GAC, have historically been detected.
- Graphs 7-11 present trends in the reported concentrations of propiconazole and tebuconazole for the last seven years at locations BH3A, BH5A, BH9A, BH26S and BH26D.

The shorter timeframe under consideration for the Tanalith E indicator compounds reflects the fact that there were few detections of either propiconazole or tebuconazole prior to Q4 2016. Before then, both compounds were analysed as Tentatively Identified Compounds (TICs) whereas since Q4 2016 the laboratory has used compound specific calibration standards in their analysis.

BH3A, BH5A, BH9A and BH26S are the locations at which the Tanalith E indicator compounds have been most consistently detected, while BH26D is the bedrock monitoring well for which the most monitoring data are available.
- Trends in reported chromium concentrations at surface water monitoring locations SW1, SW2 and SW3 for the last 11 years are presented in Graphs 12-14.

Propiconazole and tebuconazole trends have not been presented for these locations as detections are sporadic.

Within each set of graphs, most locations are presented using common X-axis and Y-axis ranges to facilitate direct comparison.

In each case, a Mann-Kendall test has been used to assess concentration trends in the data: a statistically significant downward trend is denoted by a *TDn* notation after the parameter label in the figure legend, with a statistically significant upward trend identified by a *Tup* notation after the parameter label and summarised below.

Table 2. Summary of Mann Kendall trend analysis results for selected locations

	BH1A	BH3A	BH5A	BH9A	BH26S	BH26D	PW	SW1	SW2	SW3
Total chromium	TDn	TDn	TDn	-	TDn	TDn	TDn	TDn	TDn	TDn
Hexavalent chromium	TDn	TDn	TDn	-	TDn	TDn	TDn	n.t.	n.t.	n.t.
Propiconazole	-	Tup	Tup	Tup	Tup	Tup	-	-	-	-
Tebuconazole	-	TDn	TDn	n.t.	TDn	n.t.	-	-	-	-

Notes:

TDn	Downward trend
Tup	Upward trend
n.t.	No trend
-	Not included in the trend assessment presented in Appendix B

5.1 Chromium

5.1.1 Routinely Monitored Wells

For the locations for which trend analysis was completed, the Mann-Kendall analyses returned a consistently downward concentration trend.

The most elevated concentrations of total chromium and Cr(VI) are detected in groundwater from wells:

- BH3A and BH5A, located near the former treatment area.

⁹ Or since the well was installed in the case of BH26S and BH26D

- BH26S and BH26D, located down-gradient of the former treatment area,
- PW, the site production abstraction well located south-west of the former treatment area.

Figures A-C below illustrate trends in reported total chromium and Cr(VI) concentrations for wells PW, BH3A and BH5A from when monitoring commenced, and Figure D below presents the BH5A trend over the last 11 years. The graphs in Appendix B Graphs 1 – 6 present the trends over the last 7-11 years.

For abstraction well PW the concentration of total chromium in 2023 ranged between 1,843.8 µg/L (Q4) and 2,989.7 µg/L (Q1), which are within the concentration range previously reported and generally consistent with recent years. The reported concentration of Cr(VI) ranged between 1,740 µg/L (Q3) and 2,294 µg/L (Q1), at values consistent with the concentration range previously reported for Cr(VI).

A statistically significant downward trend is apparent for both total chromium and Cr(VI) in groundwater from abstraction well PW since June 2012, see Figure A.

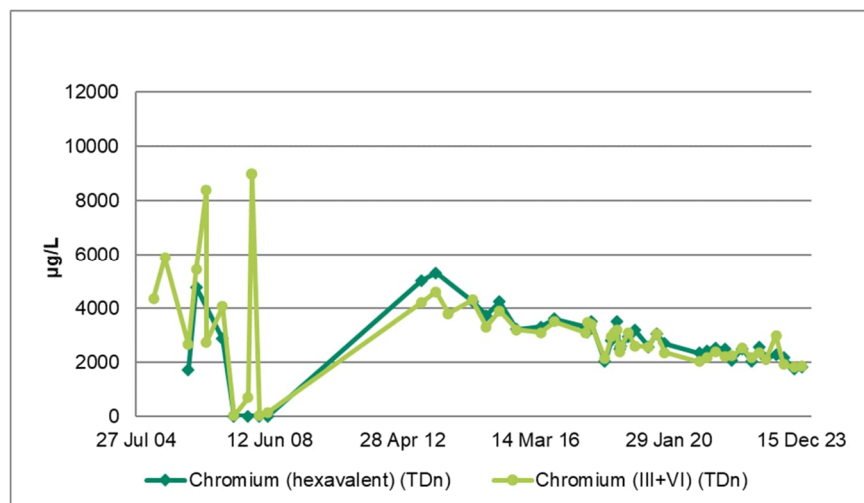


Figure A. Total Chromium and Cr(VI) in Abstraction Well PW

Concentrations of total chromium and Cr(VI) in groundwater from well BH3A ranged from 544.8 µg/L (Q2) to 1,726.3 µg/L (Q3) and 625 µg/L (Q1) to 1,627 µg/L (Q2), respectively in 2023. Concentrations were consistent with previously reported ranges and similar to PW, concentrations over the longer-term are assessed to be following a statistically significant downward trend, see Figure B overleaf.

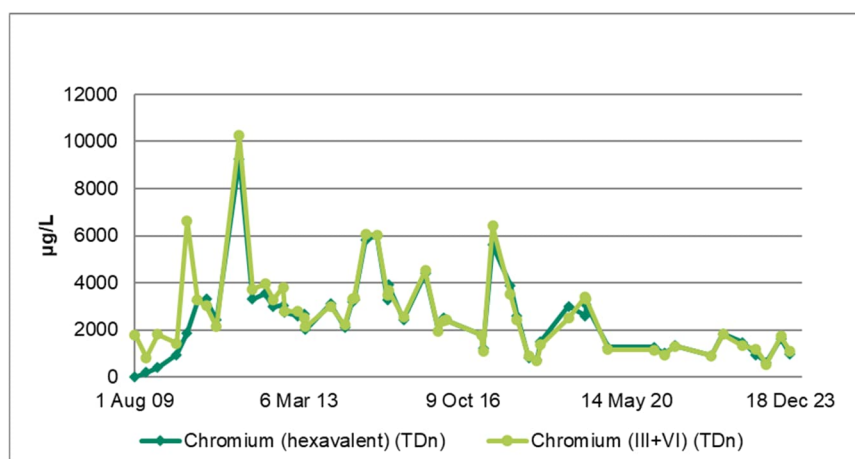


Figure B. Total Chromium and Cr(VI) in Monitoring Well BH3A

Total chromium and Cr(VI) concentrations in groundwater from BH5A in 2023 were on average slightly lower in range compared to 2022, with total chromium ranging from 1,081.1 µg/L (Q3) to 1,370.3 µg/L (Q4) while Cr(VI) ranged between 1,062 µg/L (Q3) and 1,479 µg/L (Q1).

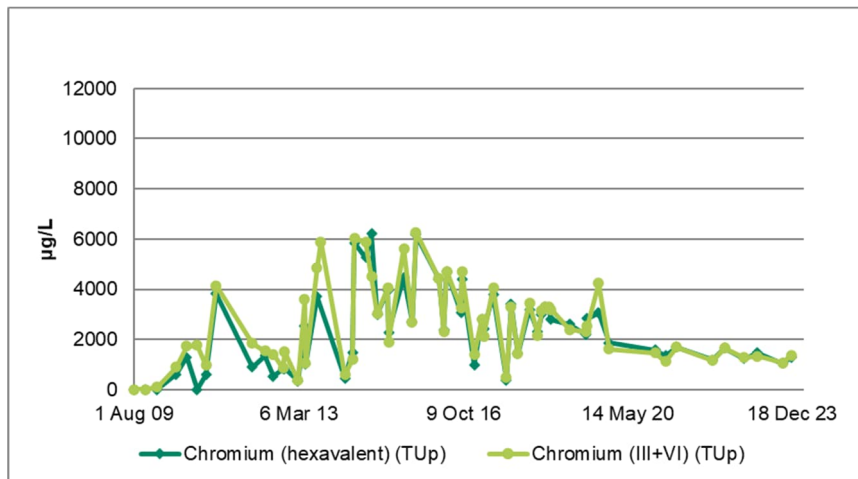


Figure C. Total Chromium and Cr(VI) in Monitoring Well BH5A (all data)

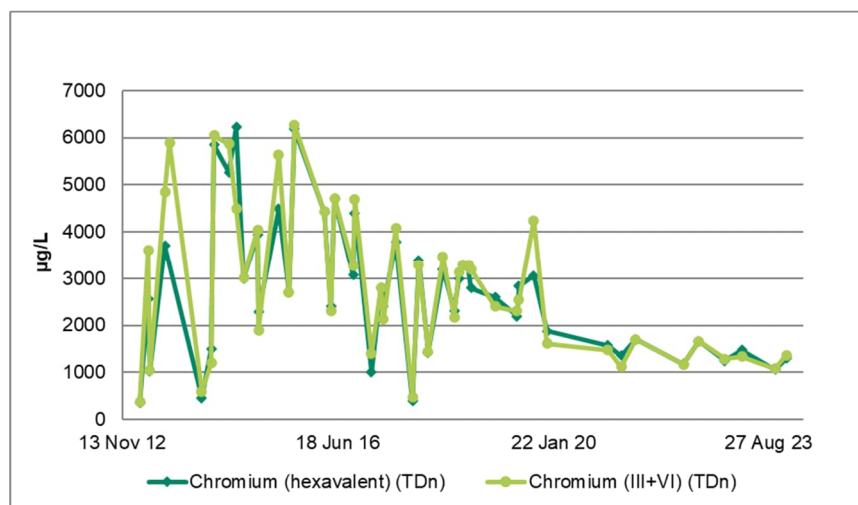


Figure D. Total Chromium and Cr(VI) in Monitoring Well BH5A (data from August 2013)

Reported concentrations of both total chromium and Cr(VI) in groundwater from monitoring well BH5A exhibit statistically significant upward trends when all of the data collected since August 2009 are considered. However, if only the data from August 2013 are considered, the concentrations exhibit a statistically significant downward trend; see Figures C and D above.

The datasets for BH26S and BH26D are smaller, but total chromium and Cr(VI) concentrations at both locations exhibit a declining trend (see Table 2 and Appendix B Graphs 4 and 5).

In 2023, total chromium ranged between 297.6 µg/L (Q3) and 1,149 µg/L (Q2) while Cr(VI) ranged between 247 µg/L (Q3) and 757 µg/L (Q4) in groundwater from BH26D. Total chromium ranged between 472.7 µg/L (Q2) and 1,268 µg/L (Q3) while Cr(VI) ranged between 510 µg/L (Q4) and 1,273 µg/L (Q2) in groundwater from well BH26S.

In 2023, Cr(VI) was reported at a concentration in excess of the GAC (7.5 µg/L) in groundwater from well BH1A in Q1 (12 µg/L) and in Q2 (41 µg/L). Including these detections, Cr(VI) have been detected on three occasions at BH1A since Q2 2019.

Total chromium was detected in groundwater from monitoring well BH1A during each sampling event since 2016, the last time total chromium was detected at a concentration above the GAC (37.5 µg/L) was in Q2 2019 (43.8 µg/L). In 2023, the total chromium concentration ranged from 5.6 µg/L (Q4) to 32.8 µg/L (Q2).

BH1A is located on the site boundary and hydraulically down-gradient of the Old Plant area. The Mann-Kendall assessment indicated that there is a downward trend in both total chromium and Cr(VI) concentrations at location BH1A since 2012 (see Appendix B Graph 1).

The downward trends in chromium concentrations at BH1A, BH3A, BH26S, BH26D, PW and, latterly, BH5A are likely attributable to gradual diminishment of the chromium source in the Old Plant area and the ongoing abstraction of groundwater from PW for use in the timber treatment process.

Cr(VI) has not been detected at well BH9A since it was first sampled in Q3 2018. Total chromium is intermittently detected at a concentration close to the MDL, most recently in Q4 2023 (1.7 µg/L)

Total chromium and Cr(VI) was not detected above the laboratory MDL in samples from BH2C collected in 2023. Neither compound has been detected since the location was first sampled in Q2 2022.

5.1.2 Groundwater Monitoring Wells – New/Infrequently Monitored Locations

In 2023 samples were collected from existing locations BHA (source area injection well) and BH23 (source area observation well) during the Q3 and Q4 monitoring events.

- Total chromium was reported in both locations at concentrations above the GAC (37.5 µg/L):
 - The total chromium concentration at BHA was reported as 339 µg/L (Q3) and 175.3 µg/L (Q4) and at BH23 was reported as 293.9 µg/L (Q3) and 605.3 µg/L (Q4).
- Cr(VI) was also reported with concentrations above the GAC (7.5 µg/L) in all samples from BHA and BH23 during 2023:
 - The Cr(VI) concentrations at BHA ranged between 297 µg/L (Q3) and 140 µg/L (Q4) in 2023, the Cr(VI) concentration at BH23 ranged between 279 µg/L (Q3) and 447 µg/L (Q4) over the same period.
- The total chromium and Cr(VI) concentrations reported in BHA and BH23 in 2023 are 1-2 orders of magnitude higher than those reported in 2022.
 - The concentrations reported for both total chromium and Cr(VI) in BHA are above the GAC for the first time since the Phase I injection, though monitoring has been infrequent (one sample per year in each of 2018, 2021 and 2022).
 - The total chromium concentrations reported in BH23 are within the range of concentrations reported in the seven samples collected between December 2016 (following the Phase I injection) and 2022. The reported Cr(VI) concentrations are above the GAC for the first time since the Phase I injection.

The 16 new monitoring wells installed during 2022 were also sampled during Q3 and Q4 2023. Cr(VI) was reported in the following ranges:

- At or below the MDL: BH28S, BH28D, BH30S, BH30D, BH31S, BH31D, BH32S, BH32D
- Between the MDL and 100 µg/L: BH34D, BH34S
- Greater than 100 µg/L and 1,000 µg/L: BH27D, BH29S, BH33S, BH33D
- Cr(VI) was reported at the following locations above 1,000 µg/L:
 - BH27S – 584 (Q3) and 1,071 µg/L (Q4)
 - BH29D – 659 (Q3) and 1,711 µg/L (Q4)

Total chromium concentrations exhibited a similar pattern, with concentrations below the laboratory MDL in BH28S/D, BH30S, BH31S and BH32D and a maximum concentration of 2,248 µg/L Q4 reported in the sample from BH29D.

5.1.3 Drinking Water Abstraction Wells – DW1, DW2, DW3

Total chromium was detected in water from DW1 in Q1, Q2 and Q3 2023, but at concentrations below the selected GAC (37.5 µg/L). Cr(VI) concentrations were not detected above the laboratory MDL at DW1 in 2023.

Offsite privately-owned well DW2 was sampled in Q4 only in 2023, but access to the location was granted at short notice and only a sample for analysis for tebuconazole and propiconazole could be collected owing to available sampling equipment and containers.

Offsite privately-owned well DW3 was sampled in Q2 only. Cr(VI) and total chromium was not detected.

5.1.4 SW Monitoring Locations – SW1, SW2, SW3 and SW4A

Total chromium was reported at a concentration (1.5 µg/L) below the GAC protective of surface water (4.7 µg/L) in the sample from location SW2 in Q1 2023. The corresponding Cr(VI) result was below the laboratory MDL (<6 µg/L).

Reported concentrations of Cr(VI) and total chromium were at or below laboratory MDLs in all other surface water samples collected throughout 2023.

During 2023, a surface water sample could only be collected from the drainage pipe discharging from the site interceptor to the stream (SW3) in Q1; there was no flow from the pipe during the subsequent 2023 sampling events.

Surface water locations SW1 (downstream of the facility) and SW2 (upstream of the facility) were sampled in Q1, Q3 and Q4 2023.

During the Q4 2023 monitoring event two extra locations were sampled, SW4A (located downstream of SW1 and upstream the previously monitored SW4) and Interceptor (located in the parking area outside of the Pellet Plant building). No chromium (total or hexavalent) was reported in the samples from either location.

The Mann-Kendall analysis reported a downward trend in total chromium concentrations at locations SW1, SW2 and SW3 since 2012 (see Appendix B). No statistically significant trends were evident in the hexavalent chromium concentrations for the surface water locations SW1, SW2 and SW3.

There are insufficient data for the other locations to undertake a statistical trend analysis.

5.2 Tanalith E Indicator Compounds

5.2.1 Groundwater Samples

In Q1 and Q2 2023, where a reduced monitoring scope was completed (see Table 1), propiconazole and tebuconazole were reported at concentrations above the laboratory MDL and the GAC (both 0.1 µg/L) in samples collected from three of the wells which have historically been monitored quarterly – BH3A, BH5A and BH9A.

Propiconazole was detected at concentrations above the laboratory MDL and the GAC (both 0.1 µg/L) in samples from BH26S and BH26D in Q1 and Q2, whereas tebuconazole was not detected. Similarly, in Q3 2023 propiconazole, but not tebuconazole, was detected in samples from BH3A, BH26S and BH26D.

Of the extra wells sampled in Q3 only, concentrations of propiconazole and tebuconazole above the laboratory MDL and the GAC (both 0.1 µg/L) were reported in a further 10 wells – BHA, BH23, BH27S, BH27D, BH28S, BH28D, BH29S, BH29D, BH30D and BH33S. Propiconazole, but not tebuconazole, was also detected in BH32S.

In Q4 2023, propiconazole was detected in all groundwater samples collected (27 locations) with the exception of offsite location DW2. This included:

- Ten locations at which propiconazole was detected in Q4 only - BH1A, BH2C, BH31S, BH31D, BH32D, BH33D, BH34S, BH34D, PW and DW1
- Eight locations at which propiconazole was detected for the first time or for the first time in several years - BH1A, BH2C, BH31S, BH31D, BH32D, BH33D, PW and DW1

Propiconazole is noted to have been detected for the first time in a sample from BH2C, which is located hydraulically upgradient of the anticipated source area for Tanalith E contamination.

Tebuconazole was detected in only five of the locations sampled in Q4 – BHA, BH23, BH30D, BH30S and BH34S.

Table 3 below summarises the locations at which propiconazole and tebuconazole were detected in 2023 and the ranges of concentrations reported. Appendix B Table 5 presents the data alongside historical results for each location.

Table 3. Summary of 2023 propiconazole and tebuconazole detections in groundwater

Location	Propiconazole µg/L (range)	Tebuconazole µg/L (range)	Comment
BH1A	1.6	-	Detected in Q4 only. First detection since 2018.
BH2C	1.0	-	Detected in Q4 only. First detection at BH2/A/B/C since 2010
BH3A	2.0 – 8.6	0.3 – 0.4	8.6 µg/L is the highest propiconazole concentration reported at BH3A
BH5A	0.7 – 1.9	0.4	
BH9A	0.3 – 11.9	0.1	11.9 µg/L is highest propiconazole concentration reported at BH9A
BH23	12.4 – 21.7	3.3 – 4.2	Highest concentrations reported at BH23 (testing began in 2021)
BH26S	1.3 – 1.8	-	1.8 µg/L is highest propiconazole concentration reported at BH26S
BH26D	0.2 – 1.7	-	
BH27S	2.3 – 2.7	1.2	
BH27D	0.6 – 0.7	0.2	
BH28S	1.3 – 2.2	0.6	
BH28D	0.8 – 1.9	0.3	
BH29S	1.0 – 2.7	0.3	
BH29D	1.6 – 9.5	0.5	
BH30S	3.5	1.8	
BH30D	2.6 – 8.2	0.7 – 1.6	
BH31S	0.7	-	Detected in Q4 only. First detection at this location.
BH31D	0.4	-	Detected in Q4 only. First detection at this location.
BH32S	0.3 – 0.4	-	Detected in Q3 and Q4 only. First detections at this location.
BH32D	2.4	-	Detected in Q4 only. First detection at this location.
BH33S	0.2 – 0.8	0.2	
BH33D	5.7	-	Detected in Q4 only. First detection at this location.
BH34S	0.8	-	Detected in Q4 only. Previously detected at this location in 2022.
BH34D	0.8	0.8	Detected in Q4 only. Previously detected at this location in 2022.
BHA	12.7 – 27.5	3.8 – 4.1	Highest reported propiconazole concentrations (testing began 2021)
PW	1.0	-	Detected in Q4 only. First detection at this location since 2018.
DW1	0.6	-	Detected in Q4 only. First detection at this location since 2009.

- : Not Detected

For the locations where tebuconazole and propiconazole were previously detected, the 2023 concentrations are within the range previously reported apart from the following locations:

- At BH3A the propiconazole concentration reported in Q3 (8.6 µg/L) is the highest reported for that location, though it is within the same order of magnitude as results since 2019. Tebuconazole was not detected in Q3 or Q4 2023.
- At BH9A, the propiconazole concentration reported in Q4 (11.9 µg/L) is the highest reported for that location; the previous highest reported concentration was 4.4 µg/L in Q4 2020. Tebuconazole was not detected in Q4 2023.
- At BH26S the propiconazole concentration reported in Q1 (1.8 µg/L) is the highest reported for that location. Results from 2018 to 2022 ranged from 0.3 µg/L to 0.6 µg/L. Tebuconazole has not been detected at BH26S during 2022 or 2023.
- At BHA and BH23 the ranges of propiconazole concentrations reported (respectively, 12.7 µg/L to 27.5 µg/L and 12.7 µg/L to 21 µg/L) are an order of magnitude higher than those previously reported (respectively, 2.0 µg/L to 6.3 µg/L and 1.5 µg/L to 2.6 µg/L). Sampling for these compounds prior to 2023 has been limited to a single sample in each of 2021 and 2022, however.

Graphs 7-11 in Appendix B present trends in the reported concentrations of propiconazole and tebuconazole for the last seven years at locations BH3A, BH5A, BH9A, BH26S and BH26D.

The Mann-Kendall trend analyses indicate that propiconazole concentrations are trending upwards at BH3A, BH5A, BH9A, BH26S and BH26D. Tebuconazole concentrations are trending downwards at BH3A, BH5A, BH26S, with no apparent trend at BH9A and BH26D.

5.2.2 Surface Water Samples

Surface water sampling was completed as proposed at locations SW1 and SW2 during 2023, i.e., during Q1, Q3 and Q4. A sample could only be collected from SW3 during the Q1 quarterly monitoring event as there was no flow from the pipe during the Q2, Q3 or Q4 monitoring events.

To supplement the quarterly monitoring, two additional sets of samples were collected from locations SW1, SW2 and SW3 during Q4, one on 01 November 2023 and the other on 16 November 2023. These samples were scheduled for propiconazole and tebuconazole only.

Table 4 below summarises the ranges of propiconazole and tebuconazole concentrations reported in surface water samples in 2023. Appendix B Table 7 presents the data alongside historical results for each location.

Table 4. Summary of 2023 propiconazole and tebuconazole detections in surface water

Location	Propiconazole µg/L (range)	Tebuconazole µg/L (range)	Comment
SW1	<0.1 – 1.8	<0.1 - 0.4	Highest concentrations reported at SW1
SW2	<0.1 – 5.8	-	Detected in Q4 only. First propiconazole detection at this location.
SW3	2.5 - 6.3	1.9 - 6.9	6.3 µg/L / 6.9 µg/L are highest concentrations reported at SW3
SW4A	3.8	-	Sampled in Q4 only – first sample collected from this location.
Interceptor	3.5	-	Sampled in Q4 only – first sample collected from this location.

- : Not Detected

- At discharge point SW3, propiconazole and tebuconazole were reported at concentrations above the laboratory MDL in each of the four samples collected during the year, one in Q3 and three in Q4.

Propiconazole was also reported in the sample collected directly from the Interceptor onsite, though tebuconazole was not reported at a concentration above the laboratory MDL.

At downstream sampling location SW1 propiconazole was detected in the samples from Q1 and Q4, but not in the samples collected in Q3 or the supplementary samples collected in November). Tebuconazole was detected only in the Q1 sample from SW1.

- A sample was collected from further downstream location SW4A in Q4 2023, propiconazole was detected in this sample but tebuconazole was not reported at a concentration above the laboratory MDL.
- At SW2, located upstream of the SW3 discharge point, propiconazole was detected in the Q4 2023 sample. Tebuconazole was not reported at a concentration above the laboratory MDL.

Mann-Kendall trend analyses for propiconazole and tebuconazole trends have not been presented for the SW locations as detections have been historically sporadic.

5.3 Other Parameters

5.3.1 Arsenic

Where detected, arsenic concentrations were typically below the selected GAC for groundwater and drinking water (7.5 µg/L). Arsenic was detected above the selected GAC in groundwater from well BH23 only. BH23 was sampled in Q3 (11.3 µg/L) and Q4 (64.8 µg/L).

Reported concentrations of arsenic were below laboratory MDLs in surface water samples collected in 2023.

5.3.2 Copper

Copper concentrations were generally low and close to the MDL. Reported concentrations in 2023 typically ranged between below the MDL (7 µg/L) and 78 µg/L at BHA. Copper was reported at a concentration of 200 µg/L at DW3 during Q2 2023, significantly below the corresponding GAC (1,500 µg/L). The concentration at DW3 is consistent with previous years.

In surface waters, the reported copper concentration in the sample from SW1 and SW3 in Q1 2023 (10 µg/L and 25 µg/L respectively) exceeded the adopted GAC (5 µg/L). The Q1 copper concentration at SW3 represents the highest concentration reported at that location to date. Copper concentrations have historically fluctuated from below the MDL to concentrations in excess of the selected GAC at all of surface water sampling locations SW1, SW2 and SW3.

5.3.3 Annual Parameters

Annual parameters were included during the Q1 sampling round for well BH3A and surface water locations SW1 and SW2.

None of the additional annual parameters scheduled for analysis at location BH3A exceeded the adopted GAC.

The adopted GAC for zinc (8 µg/L) was exceeded at locations SW1 and SW2, where reported concentrations were 9 µg/L and 10 µg/L respectively.

No other parameters monitored by AECOM as part of the agreed monitoring programme exceeded the adopted GAC in 2023.

6. Discussion and Conclusions

Groundwater elevation data indicate that the inferred groundwater flow in the overburden and bedrock aquifer are to the northwest of the site, in line with the local topography which slopes down from the site to the northwest towards the stream. This is consistent with the anticipated flow path which is predicted to follow the local topographic gradient toward the unnamed stream that flows from northeast to southwest approximately 200 m north of the site.

Groundwater analytical data from 2023 suggests there are two contaminant plumes onsite:

- A chromium (Cr(VI) and total chromium) plume associated with the historical use of CCA in the Old Plant
- A Tanalith E plume, considered to be associated with the historical use of Tanalith E in the Old Plant and associated pooling of Tanalith E at BH4, as well as potential secondary diffused sources (cracks in hardstanding within treatment shed, tracking of forklifts in and out of the treatment shed and runoff from stored treated timber).

The data confirm that both plumes are present within the overburden and bedrock aquifers. AECOM's 2022 CSM review⁴ and further monitoring events, found no evidence from the monitoring dataset (i.e., GAC exceedances) of impact to down-gradient domestic wells, public water supply and surface water receptors (stream) in the vicinity of the site.

During 2023, elevated concentrations of total dissolved chromium and Cr(VI) above adopted GAC were consistently detected in groundwater samples collected from monitoring wells BH3A, BH5A, BH23, BH26S and BH26D, BH27S, BH27D, BH29S, BH29D, BH33S, BH33D, BHA and PW.

While trend analysis of chromium concentrations in PW, BH3A and BH5A shows that there has been a statistically significant downward trend in reported concentrations in those wells since c. 2013, and in BH26S and BH26D since they were installed in 2018, chromium concentrations in groundwater from these wells remain significantly above the adopted GAC. The declining concentrations are likely attributable to a gradual diminishment of the chromium in the Old Plant area and the ongoing pumping of groundwater from PW for use in the timber treatment process.

Hexavalent chromium concentrations above the GAC were also reported in 8 of the 16 wells installed in 2022, BH27S, BH27D, BH29S, BH29D, BH33S, BH33D, BH34S and BH34D, in source area observation well BH23 and source area injection well BHA. There are not yet enough data points for these locations to produce meaningful trend graphs; trends will be assessed following future monitoring once sufficient data exist for a statistically robust assessment.

One or both of tebuconazole and propiconazole were detected in groundwater from 16 monitoring wells on at least one occasion during monitoring completed from Q1 to Q3 (BH3A, BH5A, BH9A, BH23, BH26D, BH26S, BH27D, BH27S, BH28D, BH28S, BH29D, BH29S, BH30D, BH32S, BH33S, and BHA).

In Q4, one or both of tebuconazole and propiconazole were detected in groundwater from all monitoring locations sampled during the December monitoring event. A sample collected from DW2 in November was the only groundwater sample collected in Q4 which did not contain propiconazole and/or tebuconazole.

The locations at which detections were reported in the December sampling included ten locations at which propiconazole was detected in Q4 only and eight locations at which propiconazole was detected either for the first time or for the first time in several years, including the upgradient location BH2C which is located hydraulically upgradient of the anticipated source area for Tanalith E contamination.

In surface water samples, propiconazole and tebuconazole were detected in samples from the discharge point SW3 and downstream monitoring location SW1 in Q1, but were not detected in the sample from upstream location SW2. Neither compound were detected in SW1 or SW2 in Q2 or Q3, no samples could be collected from SW3 on those occasions. The supplementary sampling completed at SW1, SW2 and SW3 on two dates (01 and 16) in November identified propiconazole and tebuconazole in discharge from SW3 but not in either SW1 or SW2. Similar to the groundwater monitoring, propiconazole was reported in all samples collected during the December (Q4) monitoring

event, including SW1, SW2, SW4A and the site Interceptor. No tebuconazole was detected in any of those samples, and SW3 could not be sampled as there was no flow.

Such widespread detections, including at upgradient monitoring locations, of propiconazole as occurred in the Q4 (December) sampling event have not been previously reported in sampling completed at the site. As the data are unusual, AECOM carried out a quality audit of sampling procedures, but no procedural anomaly was identified. Furthermore, the results were queried with the laboratory which confirmed that the quality checks on the reported results were within the defined criteria.

As they are unprecedented at the site, it is still considered a possibility that the widespread detections may be erroneous (e.g. relating to cross-contamination during sampling). Should they be genuine, detections at upgradient monitoring locations could indicate additional contributions from the broader catchment, i.e. a contamination source unrelated to activities on site. Assessment of results from future monitoring is recommended to assess whether the contamination identified in Q4 is a genuine issue.

Notwithstanding any uncertainty around the Q4 data, the trend assessment for locations BH3A, BH5A, BH9A, BH26S and BH26D indicates that propiconazole concentrations show a statistically significant upwards trend, and the propiconazole concentrations reported in 2023 include the highest reported to date for locations BH3A (8.6 µg/L, Q3), BH9A (11.9 µg/L, Q4), BH26S (1.8 µg/L, Q1), BHA (27.5 µg/L, Q3) and BH23 (21 µg/L, Q3). Further investigation and assessment of Tanalith E contamination on site is recommended.

7. Recommendations and Next Steps

Considering the findings detailed above, AECOM recommends the following:

7.1 Monitoring Programme

AECOM recommends that groundwater and surface water monitoring continues in accordance with current EPA requirements, including an expansion of the quarterly monitoring programme compared to 2023 so that the locations monitored are consistent throughout all quarterly monitoring events.

A review of sampling protocols will be completed to further mitigate potential for cross-contamination, following the unusual propiconazole detections reported in Q4 2023.

7.2 DW1 Supply Well

AECOM understands that water from site supply well DW1 is not currently used to supply drinking water. AECOM continues to recommend that the water from the former site drinking water supply well is not used as potable water.

7.3 Chromium Contamination

Continued monitoring for chromium contamination is recommended for all groundwater, drinking water and surface water monitoring locations.

A detailed CAP is currently being prepared for Laois Sawmills by AECOM which will present the detailed basis of design for the proposed chromium remediation programme.

7.4 Tanalith E

In relation to the Tanalith E contamination AECOM recommends that analysis for the tebuconazole and propiconazole to be continued throughout 2024 at all groundwater, drinking water and surface water monitoring locations on a quarterly basis. A Tanalith E risk assessment is presently underway which comprises additional sampling for Tanalith E indicator compounds (propiconazole and tebuconazole) and further assessment aimed at identifying potential contamination sources and pathways, as well as the associated environmental and health risks.

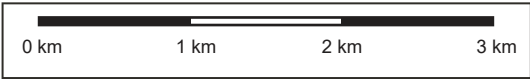
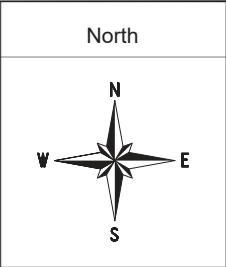
AECOM understands that Laois Sawmills are implementing additional measures on site to reduce Tanalith E contamination, e.g., the use of a dedicated forklift for operations within the Tanalith E treatment shed.

It is also noted that Laois Sawmills are in communications with their supplier in relation to the introduction of a propiconazole-free formulation of Tanalith E which is understood to be currently going through Biocidal Products Regulation¹⁰ (BPR) approvals.

Finally, given the unusual propiconazole results from the Q4 2023 monitoring, and that concentrations at several locations are now consistently higher than 10x the laboratory MDL (and therefore suitable for RPD assessment), consideration should be given to undertaking QA/QC testing for the Tanalith E indicator compounds (tebuconazole and propiconazole) in addition to that already carried out for hexavalent chromium.

¹⁰ REGULATION (EU) No 528/2012 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 22 May 2012 concerning the making available on the market and use of biocidal products (Text with EEA relevance)

Appendix A - Figures



- SI - Inner Protection Zone
- SO - Outer Protection Zone

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LAOIS SAWMILLS LIMITED

PROJECT

LAOIS SAWMILLS
GROUNDWATER MONITORING 2024

DRAWING TITLE

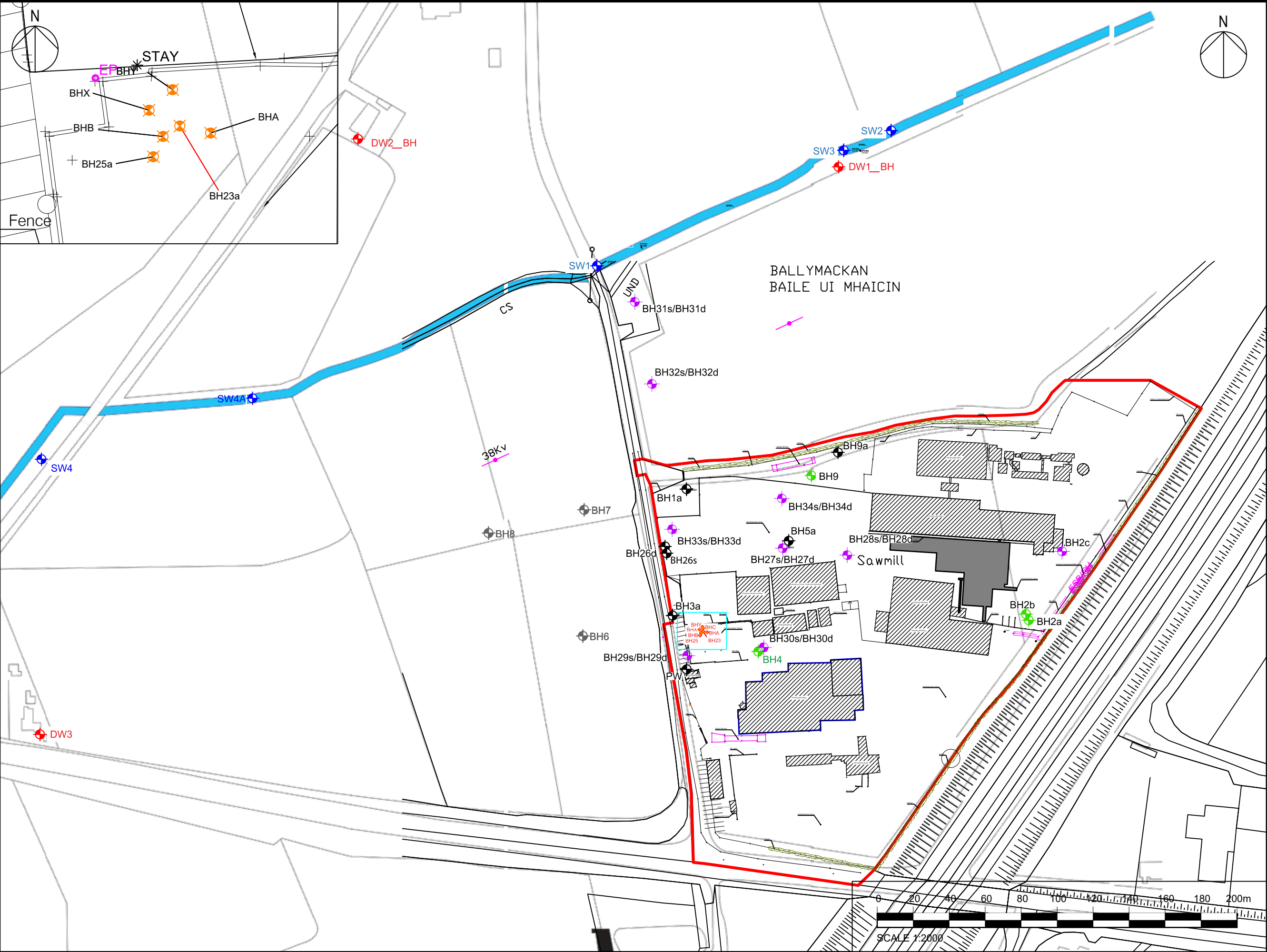
**FIGURE 1 _ SITE LOCATION PLAN SHOWING
SOURCE PROTECTION ZONES**

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- LEGEND
- LAOIS SAWMILLS SITE BOUNDARY
 - WATER SUPPLY WELLS
 - DECOMMISSIONED WELLS
 - SURFACE WATER SAMPLING LOCATIONS
 - 2023 OVERBURDEN/BEDROCK WELLS
 - EXISTING MONITORING WELLS
 - REMEDATION WELLS
 - NOT ACCESSIBLE

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SHEET TITLE
SITE LOCATION AND
ENVIRONMENTAL SAMPLING POINTS

SHEET NUMBER
FIGURE 2

NOTE: ORIGINAL SITE LAYOUT DRAWING SUPPLIED BY
JASON REDMOND & ASSOCIATES CONSULTING ENGINEERS

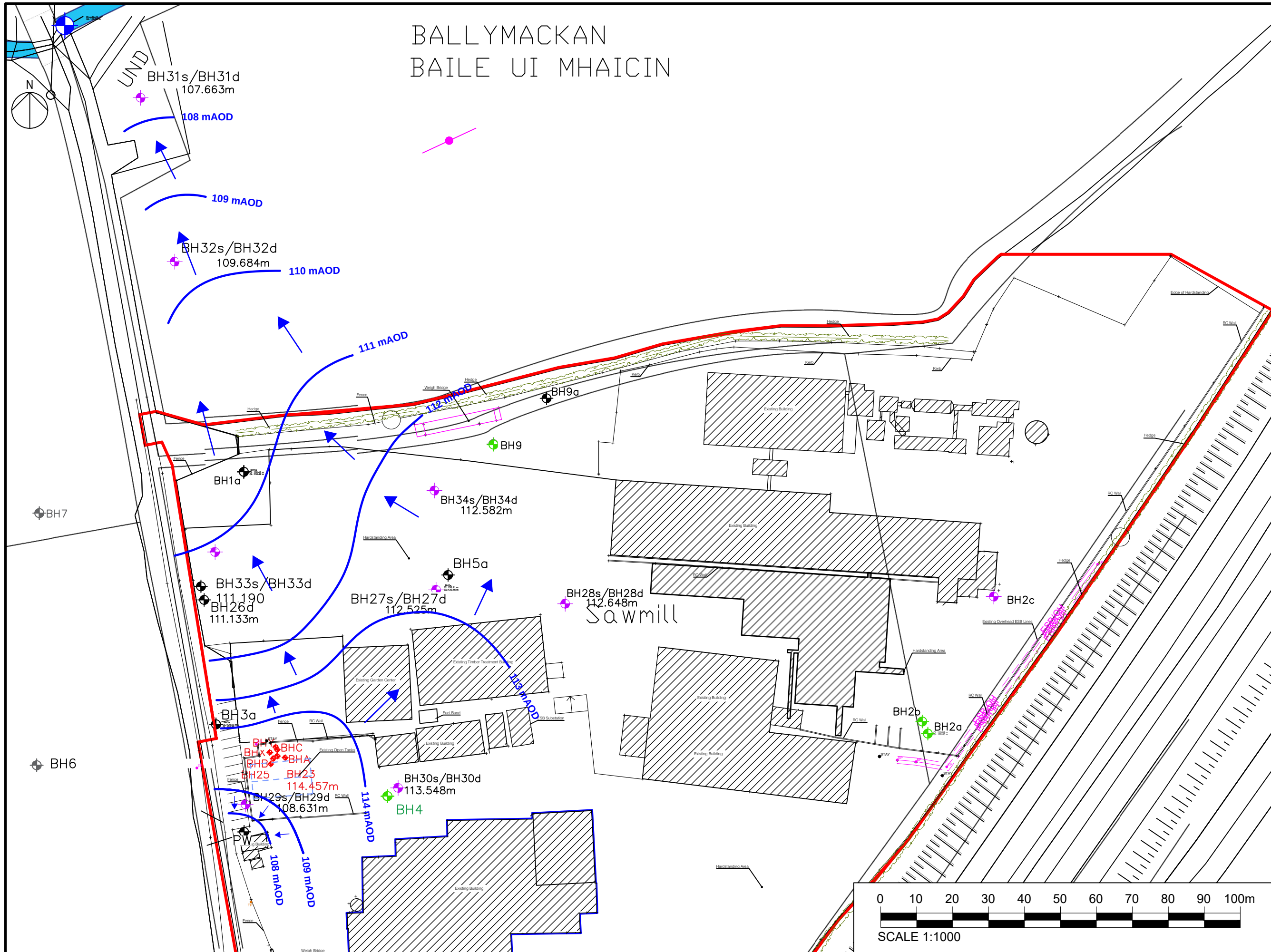
A SITE LOCATION AND ENVIRONMENTAL SAMPLING POINTS

0002

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LEGEND

- LAOIS SAWMILLS BOUNDARY LINE
- DRINKING WATER WELL
- EXISTING MONITORING WELL
- FORMER MONITORING WELL
- SURFACE WATER SAMPLE
- WELL NOT ACCESSIBLE
- DUEL INSTALLATION WELLS 2022
- GROUNDWATER CONTOUR
- GROUNDWATER FLOW

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SITE LOCATION AND
BEDROCK
GROUNDWATER FLOW

SHEET NUMBER

Figure 4a

BEDROCK AQUIFER GROUNDWATER CONTOUR MAP

0004a

Q4 2023

NOTE: ORIGINAL SITE LAYOUT DRAWING SUPPLIED BY
JASON REDMOND & ASSOCIATES CONSULTING ENGINEERS



Appendix B – Tables and Graphs

Monitoring Point			Selected Metals				Propiconazole				Tebuconazole				DOC				TSS and COD				Additional Metals				Major Ions				Permethrin				
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Groundwater	Monitoring Well	BH1A	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
		BH2C	Y	~	Y	Y	Y	~	Y	Y	Y	~	Y	Y	Y	~	Y	Y	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~		
		BH3A	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	~	~	~	~	Y	~	~	~	Y	~	~	~	Y	~	~	~	
		BH5A	Y	Dry	Y	Y	Y	Dry	Y	Y	Y	Dry	Y	Y	Y	Dry	Y	Y	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	
		BH9A	Dry	Y	Dry	Y	Dry	Y	Dry	Y	Dry	Y	Dry	Y	Dry	Y	Dry	Y	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	
		BH26D	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	
		BH26S	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	
		BH27S	~	~	Y	Y	~	~	Y	Y	~	~	Y	Y	~	~	Y	Y	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	
		BH27D	~	~	Y	Y	~	~	Y	Y	~	~	Y	Y	~	~	Y	Y	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	
		BH28S	~	~	Y	Y	~	~	Y	Y	~	~	Y	Y	~	~	Y	Y	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	
		BH28D	~	~	Y	Y	~	~	Y	Y	~	~	Y	Y	~	~	Y	Y	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	
		BH29S	~	~	Y	Y	~	~	Y	Y	~	~	Y	Y	~	~	Y	Y	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	
		BH29D	~	~	Y	Y	~	~	Y	Y	~	~	Y	Y	~	~	Y	Y	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	
		BH30S	~	~	Dry	Y	~	~	Dry	Y	~	~	Dry	Y	~	~	Dry	Y	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
		BH30D	~	~	Y	Y	~	~	Y	Y	~	~	Y	Y	~	~	Y	Y	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
		BH31S	~	~	Y	Y	~	~	Y	Y	~	~	Y	Y	~	~	Y	Y	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
		BH31D	~	~	Y	Y	~	~	Y	Y	~	~	Y	Y	~	~	Y	Y	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
		BH32S	~	~	Y	Y	~	~	Y	Y	~	~	Y	Y	~	~	Y	Y	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
		BH32D	~	~	Y	Y	~	~	Y	Y	~	~	Y	Y	~	~	Y	Y	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
		BH33S	~	~	Y	Y	~	~	Y	Y	~	~	Y	Y	~	~	Y	Y	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
		BH33D	~	~	Y	Y	~	~	Y	Y	~	~	Y	Y	~	~	Y	Y	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
		BH34S	~	~	Y	Y	~	~	Y	Y	~	~	Y	Y	~	~	Y	Y	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
		BH34D	~	~	Y	Y	~	~	Y	Y	~	~	Y	Y	~	~	Y	Y	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
	Remediation Area	Injection Well	BHA	~	~	Y	Y	~	~	Y	Y	~	~	Y	Y	~	~	Y	Y	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	
		Observation Well	BH23	~	~	Y	Y	~	~	Y	Y	~	~	Y	Y	~	~	Y	Y	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	
Abstraction Wells		PW	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	
	DW1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~		
Private Drinking Water Wells	DW2	~	~	~	~	~	~	~	Y	~	~	~	Y	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~		
	DW3	NA	Y	NA	NA	NA	Y	NA	NA	NA	Y	NA	NA	NA	Y	NA	NA	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	
Surface Water	Stream	SW1	Y	~	Y	Y	Y	~	Y	Y ¹	Y	~	Y	Y ¹	Y	~	Y	Y	~	~	~	~	Y	~	~	~	Y	~	~	~	Y	~	~	~	
		SW2	Y	~	Y	Y	Y	~	Y	Y ¹	Y	~	Y	Y ¹	Y	~	Y	Y	~	~	~	~	Y	~	~	~	Y	~	~	~	Y	~	~	~	
		SW4A	~	~	~	Y	~	~	~	Y	~	~	~	Y	~	~	~	Y	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	
	Interceptor	-	~	~	~	Y	~	~	~	Y	~	~	~	Y	~	~	~	Y	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	
	Discharge Pipe	SW3	Y	Dry	Dry	Dry	Y	Dry	Dry	Y ^{1,2}	Y	Dry	Dry	Y ^{1,2}	Y	Dry	Dry	Dry	Y	Dry	Dry	Dry	~	~	~	~	~	~	~	~	~	~	~	~	~

Notes:
Y: Location sampled
Grey font: sample could not be collected as scheduled
NA: not accessible
~: not scheduled for sampling
¹: Sampled in Nov (01 & 16) & Dec
²: Sampled in Nov (01 & 16), dry in Dec

Selected Metals
Arsenic
Chromium (III and VI)
Chromium (VI)
Boron
Copper

DOC
Dissolved organic carbon

TSS and COD
Total suspended solids
Chemical oxygen demand

Additional Metals
Cadmium
Manganese
Lead
Nickel
Zinc
Mercury

Major Ions
Calcium
Sodium
Potassium
Chloride
Ammonium
Sulphate
Sulphide
Nitrite
Alkalinity

Laois Sawmills Limited
Groundwater Monitoring 2023
60654829
Table 2 - Groundwater Level Data - Q4 2023

Borehole	Stratum	Date	Top Of Casing Elevation	Depth To Groundwater	Groundwater Elevation	Total Depth
			mOD	mbtoc	mOD	mbtoc
BH1A	Overburden	14-Dec-2023	116.314	4.146	112.168	8.330
BH3A	Overburden	14-Dec-2023	120.739	6.890	113.849	10.440
BH5A	Overburden	14-Dec-2023	120.143	7.571	112.572	10.270
BH9A	Overburden	14-Dec-2023	117.603	nm	-	8.870
BH26D	Bedrock	14-Dec-2023	118.979	7.843	111.136	19.570
BH26S	Overburden	14-Dec-2023	118.896	6.837	112.059	13.790
BH23	Bedrock	14-Dec-2023	122.220	7.763	114.457	15.540
PW	Bedrock	14-Dec-2023	121.544	nm	-	nm
DW1	Bedrock	14-Dec-2023	-	nm	-	nm
BHA	Overburden	14-Dec-2023	122.271	7.822	114.449	13.830
BH2C	Overburden	14-Dec-2023	118.920	nm	-	12.000
BH27D	Bedrock	14-Dec-2023	120.304	7.779	112.525	18.080
BH27S	Overburden	14-Dec-2023	120.215	7.590	112.625	11.020
BH28D	Bedrock	14-Dec-2023	120.658	8.010	112.648	17.970
BH28S	Overburden	14-Dec-2023	120.680	7.976	112.704	13.520
BH29D	Bedrock	14-Dec-2023	121.731	13.100	108.631	25.600
BH29S	Overburden	14-Dec-2023	121.738	10.800	110.938	20.400
BH30D	Bedrock	14-Dec-2023	122.263	8.715	113.548	20.870
BH30S	Overburden	14-Dec-2023	122.359	8.274	114.085	9.980
BH31D	Bedrock	14-Dec-2023	113.105	5.442	107.663	17.230
BH31S	Overburden	14-Dec-2023	113.053	2.965	110.088	13.730
BH32D	Bedrock	14-Dec-2023	114.456	4.772	109.684	18.420
BH32S	Overburden	14-Dec-2023	114.434	2.275	112.159	11.010
BH33D	Bedrock	14-Dec-2023	118.372	7.182	111.190	17.970
BH33S	Overburden	14-Dec-2023	118.502	6.437	112.065	13.410
BH34D	Bedrock	14-Dec-2023	118.805	6.223	112.582	13.930
BH34S	Overburden	14-Dec-2023	118.869	6.322	112.547	10.510

mOD - metres above Ordnance Datum
mbtoc - metres below top of casing
Dry - well dry
nm - not measured

			pH	Electrical Conductivity	Temperature	Dissolved Oxygen (Filtered)	Redox	
			pH Units	µS/cm	oC	mg/L	mV	
GAC Protective of Groundwater and Drinking Water ^{1,2,3,4}			6.5 < pH < 9.5	1,875	25	nc	nc	
Surface Water Regulations ⁵			4.5 < pH < 9.0*	nc	nc	nc	nc	
Location	Date	Monitoring Zone						Sample Comments
BH1A	15/12/2023	Overburden	7.0	855	11.1	2.61	233	Clear water, NEC.
BH2C	14/12/2023	Overburden	7.1	775	11.7	4.71	115	Cloudy grey, hydrogen sulphide odour.
BH3A	14/12/2023	Overburden	7.1	733	11.3	6.21	267	Clear water, NEC.
BH5A	14/12/2023	Overburden	7.1	899	11.5	5.87	290	Brown, high turbidity, NEC. Readings taken from standing water
BH9A	18/12/2023	Overburden	7.0	837	12.1	1.03	76	Cloudy dark grey, high turbidity, NEC.
BHA	14/12/2023	Bedrock	7.7	460	11.0	3.46	324	Cloudy yellow-brown with many coarse antropogenic solids. Flakes of blue wavin, plastic, etc.
BH23	15/12/2023	Bedrock	7.3	538	10.9	2.07	228	Slightly cloudy, light grey, NEC.
BH26D	14/12/2023	Bedrock	7.1	726	10.7	7.87	271	Clear water, NEC.
BH26S	14/12/2023	Overburden	7.1	791	11.2	6.82	269	Clear water, NEC.
BH27D	14/12/2023	Bedrock	6.9	843	11.0	1.72	269	Clear water, NEC.
BH27S	14/12/2023	Overburden	7.0	642	10.5	6.41	287	Clear water, NEC.
BH28D	18/12/2023	Bedrock	7.1	865	11.3	4.08	247	Light brown, high turbidity, NEC.
BH28S	18/12/2023	Overburden	7.1	828	11.8	1.66	153	Light brown, high turbidity, NEC.
BH29D	14/12/2023	Bedrock	7.2	787	10.5	8.98	271	Purged dry after 100L. Purged water cloudy light brown, NEC. Readings from standing water
BH29S	14/12/2023	Overburden	7.4	898	11.1	10.94	269	Purged dry after 70L. Purged water high turbidity, dark brown, NEC. Readings from standing water
BH30D	15/12/2023	Bedrock	7.2	932	11.0	3.58	278	Purged dry after 43L. Purged water cloudy light brown, NEC. Readings from standing water
BH30S	15/12/2023	Overburden	7.4	628	9.8	5.29	132	Slightly cloudy, light grey, NEC.
BH31D	15/12/2023	Bedrock	7.1	843	10.4	0.69	257	Cloudy light brown, NEC.
BH31S	15/12/2023	Overburden	7.0	1,030	10.7	3.62	258	Clear water, NEC.
BH32D	15/12/2023	Bedrock	7.3	850	10.7	7.46	245	Purged dry after 60L. Purged water cloudy grey, NEC. Readings from standing water
BH32S	15/12/2023	Overburden	7.1	1,492	11.2	6.20	326	Slightly cloudy grey with coarse white & brown flaky solids, NEC.
BH33D	15/12/2023	Bedrock	7.0	860	11.3	4.00	271	Cloudy grey, NEC.
BH33S	14/12/2023	Overburden	7.0	772	11.6	6.90	273	Clear water, NEC.
BH34D	18/12/2023	Bedrock	7.0	854	11.6	0.63	248	Slightly cloudy light brown, medium turbidity, NEC.
BH34S	18/12/2023	Overburden	7.1	737	11.7	1.70	246	Slightly cloudy grey with fine brown solids, NEC.
DW1	18/12/2023	Bedrock	7.1	898	11.9	5.64	195	Clear water, NEC.
DW3	07/11/2023	Unknown	nm	nm	nm	nm	nm	Clear water, NEC.
Interceptor	15/12/2023	Storm Water	nm	nm	nm	nm	nm	Grab sample collected with bailer, no readings recorded.
PW	15/12/2023	Bedrock	nm	nm	nm	nm	nm	Limited access owing to works. Grab sample collected from tap 15/12/2023. No readings recorded.
SW1	01/11/2023	Surface Water	nm	nm	nm	nm	nm	Grab sample for analysis only, no field readings recorded
SW1	16/11/2023	Surface Water	nm	nm	nm	nm	nm	Grab sample for analysis only, no field readings recorded
SW1	14/12/2023	Surface Water	7.6	524	7.5	5.41	223	Flow: Medium. Clear brown water, stream is full of grey algae on banks & plant matter.
SW2	01/11/2023	Surface Water	nm	nm	nm	nm	nm	Grab sample for analysis only, no field readings recorded
SW2	16/11/2023	Surface Water	nm	nm	nm	nm	nm	Grab sample for analysis only, no field readings recorded
SW2	14/12/2023	Surface Water	7.5	519	7.6	4.01	166	Flow: Medium. Clear brown water, stream is full of grey algae on banks & plant matter.
SW3	01/11/2023	Surface Water	nm	nm	nm	nm	nm	Grab sample for analysis only, no field readings recorded
SW3	16/11/2023	Surface Water	nm	nm	nm	nm	nm	Grab sample for analysis only, no field readings recorded
SW3	14/12/2023	Surface Water	nm	nm	nm	nm	nm	No discharge from pipe
SW4A	14/12/2023	Surface Water	nm	nm	nm	nm	nm	Clear brown water. Readings not captured owing to data recording error.

XX	Exceeds GAC Protective of Groundwater and Drinking Water ^{1,2,3,4}
XX	Exceeds Surface Water Regulations ⁵

Notes:

nc	No Criteria
nm	Not Measured
¹	European Communities (Drinking Water) Regulations, 2007 (S.I. No. 106 of 2007)
²	European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010)
³	European Union Environmental Objectives (Groundwater) (Amendment) Regulations, 2016 (S.I. No. 366 of 2016)
⁴	EPA, 2003. Towards Setting Guideline Values for the Protection of Groundwater in Ireland – Interim Report. Environmental Protection Agency, Wexford. 2003
⁵	European Union Environmental Objectives (Surface Waters) Regulations 2015 (as amended, S.I. No. 77 of 2019)
NEC	No Evidence of Contamination
Redox	Redox potential, field readings compensated as recommended by water quality meter manufacturer instructions to give Eh.

			Sample ID	BH1A	BH2C	BH3A	BH5A	BH9A	BH23
			Monitoring Zone	Overburden	Overburden	Overburden	Overburden	Overburden	Overburden
			Sampled_Date_Time	15/12/2023	14/12/2023	14/12/2023	14/12/2023	18/12/2023	15/12/2023
			Lab Report Ref.	EMT-23-21680-1	EMT-23-21680-1	EMT-23-21680-1	EMT-23-21680-1	EMT-23-21661-1	EMT-23-21680-1
			Sample_Type	Normal	Normal	Normal	Normal	Normal	Normal
			Monitoring_Round	2023 Q4	2023 Q4	2023 Q4	2023 Q4	2023 Q4	2023 Q4
			GAC Protective of Groundwater						
Parameter	Unit	EQL							
Arsenic (Filtered)	µg/L	2.5	7.5 ^{#1}	<2.5	<2.5	<2.5	<2.5	5.5	64.8
Boron (Filtered)	µg/L	12	750 ^{#2}	73	20	88	101	44	133
Chromium (III+VI) (Filtered)	µg/L	1.5	37.5 ^{#1}	5.6	<1.5	1,087	1,370	1.7	605.3
Copper (Filtered)	µg/L	7	1500 ^{#2}	<7	<7	<7	<7	<7	18
Chromium (hexavalent)	µg/L	6	7.5 ^{#1}	<6	<6	968	1,301	<6	447
Propiconazole	µg/L	0.1	0.1 ^{#3}	1.6	1	4.1	1.9	11.9	12.4
Tebuconazole	µg/L	0.1	0.1 ^{#3}	<0.1	<0.1	<0.1	<0.1	<2	3.3
Dissolved Organic Carbon	mg/L	2		<2	<2	<2	<2	<2	<2

Env Stds Comments
 #1:Ireland GTVs 2016
 #2:Ireland GTVs 2010
 #3:IGV Ireland 2003

GAC: Generic Assessment Criteria
 (blank): No assessment criteria available
 - : Not analysed

xxx Exceedance of GAC

			Sample ID	BH26D		BH26S	BH27D	BH27S	BH28D	BH28S
			Monitoring Zone	Bedrock		Overburden	Bedrock	Overburden	Bedrock	Overburden
			Sampled_Date_Time	14/12/2023	15/12/2023	14/12/2023	14/12/2023	14/12/2023	18/12/2023	18/12/2023
			Lab Report Ref.	EMT-23-21680-1	EMT-23-21680-1	EMT-23-21680-1	EMT-23-21680-1	EMT-23-21680-1	EMT-23-21661-1	EMT-23-21661-1
			Sample_Type	Normal	Field_D	Normal	Normal	Normal	Normal	Normal
			Monitoring_Round	2023 Q4	2023 Q4	2023 Q4	2023 Q4	2023 Q4	2023 Q4	2023 Q4
						GAC Protective of Groundwater				
Parameter	Unit	EQL								
Arsenic (Filtered)	µg/L	2.5	7.5 ^{#1}	2.6	-	2.7	<2.5	3.7	4.8	3.6
Boron (Filtered)	µg/L	12	750 ^{#2}	89	-	77	61	117	27	29
Chromium (III+VI) (Filtered)	µg/L	1.5	37.5 ^{#1}	899	-	532.7	852.5	1,624	<1.5	<1.5
Copper (Filtered)	µg/L	7	1500 ^{#2}	<7	-	<7	<7	<7	<7	<7
Chromium (hexavalent)	µg/L	6	7.5 ^{#1}	757	661	510	777	1,071	<6	<6
Propiconazole	µg/L	0.1	0.1 ^{#3}	1.7	-	1.3	0.6	2.3	0.8	1.3
Tebuconazole	µg/L	0.1	0.1 ^{#3}	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1
Dissolved Organic Carbon	mg/L	2		<2	-	<2	<2	5	<2	<2

Env Stds Comments
#1:Ireland GTVs 2016
#2:Ireland GTVs 2010
#3:IGV Ireland 2003

GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed

xxx Exceedance of GAC

			Sample ID	BH29D	BH29S	BH30D	BH30S	BH31D	BH31S	BH32D	BH32S
			Monitoring Zone	Bedrock	Overburden	Bedrock	Overburden	Bedrock	Overburden	Bedrock	Overburden
			Sampled_Date_Time	14/12/2023	14/12/2023	15/12/2023	15/12/2023	15/12/2023	15/12/2023	15/12/2023	15/12/2023
			Lab Report Ref.	EMT-23-21680-1	EMT-23-21680-1	EMT-23-21680-1	EMT-23-21680-1	EMT-23-21680-1	EMT-23-21680-1	EMT-23-21680-1	EMT-23-21680-1
			Sample_Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
			Monitoring_Round	2023 Q4	2023 Q4	2023 Q4	2023 Q4	2023 Q4	2023 Q4	2023 Q4	2023 Q4
			GAC Protective of Groundwater								
Parameter	Unit	EQL									
Arsenic (Filtered)	µg/L	2.5	7.5 ^{#1}	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
Boron (Filtered)	µg/L	12	750 ^{#2}	342	102	40	48	23	59	<12	41
Chromium (III+VI) (Filtered)	µg/L	1.5	37.5 ^{#1}	2,248	177.9	1.5	<1.5	3.3	<1.5	<1.5	<1.5
Copper (Filtered)	µg/L	7	1500 ^{#2}	<7	<7	15	8	<7	<7	<7	<7
Chromium (hexavalent)	µg/L	6	7.5 ^{#1}	1,711	126	<6	<6	<6	<6	<6	<6
Propiconazole	µg/L	0.1	0.1 ^{#3}	1.6	1	2.6	3.5	0.4	0.7	2.4	0.3
Tebuconazole	µg/L	0.1	0.1 ^{#3}	<0.1	<0.1	0.7	1.8	<0.1	<0.1	<0.1	<0.1
Dissolved Organic Carbon	mg/L	2		<2	<2	2	<2	<2	<2	<2	<2

Env Stds Comments
#1:Ireland GTVs 2016
#2:Ireland GTVs 2010
#3:IGV Ireland 2003

GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed

xxx Exceedance of GAC

			Sample ID	BH33S	BH33D	BH34D	BH34S	BHA	PW	DW1	DW2
			Monitoring Zone	Overburden	Bedrock	Bedrock	Overburden	Overburden	Bedrock	Bedrock	Unknown
			Sampled_Date_Time	14/12/2023	15/12/2023	18/12/2023	18/12/2023	14/12/2023	15/12/2023	18/12/2023	07/11/2023
			Lab Report Ref.	EMT-23-21680-1	EMT-23-21680-1	EMT-23-21661-1	EMT-23-21661-1	EMT-23-21680-1	EMT-23-21680-1	EMT-23-21661-1	EMT-23-18835-1
			Sample_Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
			Monitoring_Round	2023 Q4	2023 Q4	2023 Q4	2023 Q4	2023 Q4	2023 Q4	2023 Q4	2023 Q4
			GAC Protective of Groundwater								
Parameter	Unit	EQL									
Arsenic (Filtered)	µg/L	2.5	7.5 ^{#1}	<2.5	<2.5	4.6	4.6	5.9	<2.5	3.9	-
Boron (Filtered)	µg/L	12	750 ^{#2}	58	55	32	23	120	135	52	-
Chromium (III+VI) (Filtered)	µg/L	1.5	37.5 ^{#1}	944.8	365.7	28.9	39.4	175.3	1,844	<1.5	-
Copper (Filtered)	µg/L	7	1500 ^{#2}	<7	<7	<7	21	78	<7	<7	-
Chromium (hexavalent)	µg/L	6	7.5 ^{#1}	767	258	21	34	140	1,832	<6	-
Propiconazole	µg/L	0.1	0.1 ^{#3}	0.8	5.7	0.8	0.8	12.7	1	0.6	<0.1
Tebuconazole	µg/L	0.1	0.1 ^{#3}	<0.1	<0.1	<0.1	0.8	3.8	<0.1	<0.1	<0.1
Dissolved Organic Carbon	mg/L	2		<2	<2	<2	<2	2	<2	<2	-

Env Stds Comments
#1:Ireland GTVs 2016
#2:Ireland GTVs 2010
#3:IGV Ireland 2003

GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed

xxx Exceedance of GAC

	Fungicides	Metals				Other
	Propiconazole	Arsenic (Filtered)	Chromium (III+VI) (Filtered)	Copper (Filtered)	Chromium (hexavalent)	Tebuconazole
µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
EQL	0.1	2.5	1.5	7	2	0.1
IE_LSM_GWSC	0.1 ^{#1}	7.5 ^{#2}	37.5 ^{#2}	1500 ^{#3}	7.5 ^{#2}	0.1 ^{#1}

EQL Comments
#1 IGV Ireland 2003
#2 Ireland GTVs 2016
#3 Ireland GTVs 2010
(blank): No assessment criteria available

Data Comments:
#1: Tentatively identified compound
- : Not analysed

GAC: Generic Assessment Criteria
xxx Exceeds GAC

Sample ID	Monitoring Zone	Sampled Date Time	Sample Type						
BH1	Overburden	01/02/2005	Normal	-	<0.5	<2	4	-	-
		01/02/2006	Normal	-	-	169	-	-	-
		01/05/2006	Normal	<0.05	1	13	18	<30	-
		18/12/2007	Normal	-	<5	109	<5	-	-
BH1A	Overburden	01/02/2007	Normal	<0.05	<1	14	14	<30	-
		01/06/2007	Normal	<0.05	<1	270	<5	200	-
		01/11/2007	Normal	-	1	290	9	80	-
		01/03/2008	Normal	<0.02	-	-	-	-	<0.02
		27/03/2008	Normal	-	1	86	9	<150	-
		01/06/2008	Normal	<0.02	1	270	<5	170	<0.02
		01/09/2008	Normal	<0.02	6	44	31	<30	<0.02
		01/12/2008	Normal	<0.02	34	45	39	<30	<0.02
		01/05/2009	Normal	<0.02	6	21	16	<30	<0.02
		01/08/2009	Normal	2.97	<1	25	33	<30	3.46
		01/11/2009	Normal	3.9	<1	<1	2,760	<30	3.69
		01/02/2010	Normal	7.36	<1	8	240	<30	6.64
		01/07/2010	Normal	6.28	13.5	66	1,690	<30	6.8
		23/09/2010	Normal	0.979	11.2	29.7	892	<30	1.53
		15/12/2010	Normal	0.57	1.2	8.7	3	<30	0.613
		28/02/2011	Normal	<0.1	4.1	77	<7	<30	<0.1
		17/05/2011	Normal	<0.1	2.9	90.1	<7	70	<0.1
		15/11/2011	Normal	<0.1	<2.5	9.5	130	<2	<0.1
		28/02/2012	Normal	<0.1	<2.5	10.1	112	7	<0.1
		11/06/2012	Normal	-	<2.5	33.3	<7	<2	-
		02/08/2012	Normal	-	0.9	29	2.5	-	-
		16/08/2012	Normal	-	<2.5	19.4	<7	<30	-
		01/11/2012	Normal	-	<2.5	21.2	10	<30	-
		15/11/2012	Normal	-	<0.5	58	4.3	25.1	-
		01/03/2013	Normal	<0.1	<2.5	14.9	<7	<30	<0.1
		22/04/2013	Normal	-	0.8	51	30	37.7	-
		01/05/2013	Normal	-	3.4	56.6	<7	50	-
		01/08/2013	Normal	<0.1	<2.5	28	<7	<30	<0.1
		11/03/2014	Normal	<0.1 ^{#1}	<2.5	14.6	<7	17	<0.1 ^{#1}
		12/05/2014	Normal	-	<1	18	37	25.8	-
		28/05/2014	Normal	-	<2.5	18.7	<7	15	-
		27/08/2014	Normal	<0.1 ^{#1}	2.5	33.7	<7	25	<0.1 ^{#1}
		09/10/2014	Normal	-	6.6	240	740	9.5	-
		25/11/2014	Normal	-	<2.5	10.4	17	<6	-
		17/02/2015	Normal	<0.1 ^{#1}	<2.5	23.7	<7	<6	<0.1 ^{#1}
		23/02/2015	Normal	-	<1	36	2.4	34.2	-
		24/06/2015	Normal	-	<2.5	64.2	<7	<6	-
		27/08/2015	Normal	-	<1	41	26	40.3	-
		29/09/2015	Normal	<0.1 ^{#1}	<2.5	74.9	10	37	<0.1 ^{#1}
		17/12/2015	Normal	-	<2.5	<1.5	<7	<6	-
		30/03/2016	Normal	<0.1 ^{#1}	<2.5	8.9	10	<6	<0.1 ^{#1}
		09/05/2016	Normal	-	<1	15	4.8	14	-
		01/06/2016	Normal	-	<2.5	46.4	<7	44	-
		22/09/2016	Normal	<0.1 ^{#1}	<2.5	11.8	10	<6	<0.1 ^{#1}
		23/03/2017	Normal	0.9	<2.5	6.9	17	<6	1
		08/06/2017	Normal	0.2	<2.5	42.9	<7	34	0.2
		24/08/2017	Normal	-	2.1	7.9	44	7.8	-
		25/10/2017	Normal	-	<1	7.4	9.3	9.3	-
		19/12/2017	Normal	<0.1	<2.5	1.8	12	<6	0.2
		22/03/2018	Normal	0.1	<2.5	4.3	<7	<6	0.4
		27/06/2018	Normal	<0.1	<2.5	55.2	<7	54	<0.1
		23/07/2018	Normal	-	<1	64	2.3	64	-
		22/08/2018	Normal	<0.1	<2.5	21.4	<7	7	<0.1
		04/02/2019	Normal	-	<1	32	<1	30	-
		17/06/2019	Normal	<0.1	<1	52	<3	140	<0.1
		27/06/2019	Normal	<0.1	<2.5	43.8	<7	<6	<0.1
		16/12/2019	Normal	<0.1	<2.5	8.9	<7	<6	<0.1
		21/12/2020	Normal	<0.1	2.8	6.9	<7	<6	<0.1
		12/03/2021	Normal	<0.1	<2.5	8.4	<7	<6	<0.1
		08/06/2021	Normal	<0.1	<2.5	13.6	<7	<6	<0.1
		25/03/2022	Normal	<0.1	<2.5	16.7	<7	10	<0.1
		28/06/2022	Normal	<0.1	<2.5	24.2	<7	<6	<0.1
		01/12/2022	Normal	<0.1	<2.5	10.8	<7	<6	<0.1
		16/03/2023	Normal	<0.1	4.6	13.5	<7	12	<0.1
		07/06/2023	Normal	<0.1	<2.5	32.8	<7	41	<0.1
		04/10/2023	Normal	<0.1	<2.5	9.8	<7	<6	<0.1
		15/12/2023	Normal	1.6	<2.5	5.6	<7	<6	<0.1

	Fungicides	Metals				Other
	Propiconazole	Arsenic (Filtered)	Chromium (III+VI) (Filtered)	Copper (Filtered)	Chromium (hexavalent)	
EQL	0.1	2.5	1.5	7	2	0.1
IE_LSM_GWSC	0.1 ^{#1}	7.5 ^{#2}	37.5 ^{#2}	1500 ^{#3}	7.5 ^{#2}	0.1 ^{#1}

EQL Comments
#1 IGV Ireland 2003
#2 Ireland GTVs 2016
#3 Ireland GTVs 2010
(blank): No assessment criteria available

Data Comments:
#1: Tentatively identified compound
- : Not analysed

GAC: Generic Assessment Criteria
xxx Exceeds GAC

Sample ID	Monitoring Zone	Sampled Date Time	Sample Type						
BH2	Overburden	01/02/2005	Normal	-	<0.05	<0.05	<0.05	-	-
		01/05/2006	Normal	-	10	16	105	<30	-
		18/12/2007	Normal	-	<5	<5	<5	-	-
BH2A	Overburden	01/02/2007	Normal	<0.05	<1	<5	<5	<30	-
		01/06/2007	Normal	<0.05	<1	<5	<5	<30	-
		01/11/2007	Field_D	<0.15	<2	<5	15	<30	-
		01/03/2008	Normal	<0.04	-	-	-	-	<0.04
		27/03/2008	Normal	-	<1	<5	9	<150	-
		01/06/2008	Normal	<0.02	<1	<5	<5	<30	<0.02
		01/09/2008	Normal	<0.02	2	5	17	<30	<0.02
		01/12/2008	Normal	<0.02	15	2	11	<30	<0.02
		01/05/2009	Normal	<0.02	4	3	7	<30	<0.02
		01/08/2009	Normal	<0.02	<1	2	1	<30	<0.02
		01/11/2009	Normal	0.032	<1	<1	<1	<30	0.038
		01/02/2010	Normal	0.046	2	3	15	<30	0.067
		01/07/2010	Normal	<0.02	<0.8	6	31	<30	0.067
		23/09/2010	Normal	<0.02	1.5	10	16	<30	<0.06
		15/12/2010	Normal	<0.02	0.2	4.1	1	<30	<0.06
		28/02/2011	Normal	<0.1	6.2	44.4	<7	<30	<0.1
		27/05/2011	Normal	<0.1	4.7	<1.5	<7	60	<0.1
		31/08/2011	Normal	<0.1	<2.5	<1.5	<7	<30	<0.1
		15/11/2011	Normal	<0.1	<2.5	<1.5	<7	<2	<0.1
		28/02/2012	Normal	<0.1	<2.5	<1.5	<7	<2	<0.1
		01/11/2012	Normal	-	4.1	<1.5	<7	<30	-
		01/03/2013	Normal	<0.1	<2.5	<1.5	<7	<30	<0.1
		29/08/2013	Normal	-	0.6	6.9	25	-	-
		18/11/2013	Normal	<0.1 ^{#1}	5.6	<1.5	<7	<30	<0.1 ^{#1}
		11/03/2014	Normal	<0.1 ^{#1}	<2.5	<1.5	<7	<30	<0.1 ^{#1}
		27/08/2014	Normal	<0.1 ^{#1}	<2.5	<1.5	<7	<6	<0.1 ^{#1}
		17/02/2015	Normal	<0.1 ^{#1}	<2.5	<1.5	<7	<6	<0.1 ^{#1}
		23/02/2015	Normal	-	<1	6.3	<1	48.4	-
		29/09/2015	Normal	<0.1 ^{#1}	<2.5	<1.5	<7	<6	<0.1 ^{#1}
		30/03/2016	Normal	<0.1 ^{#1}	<2.5	<1.5	<7	<6	<0.1 ^{#1}
		09/05/2016	Normal	-	<1	1.1	2.6	<5	-
		22/09/2016	Normal	<0.1 ^{#1}	<2.5	<1.5	<7	<6	<0.1 ^{#1}
		30/09/2016	Normal	-	<1	<1	4.4	<5	-
		09/12/2016	Normal	-	6.5	<1.5	<7	<6	-
			Field_D	-	6.2	<1.5	<7	<6	-
		23/03/2017	Normal	<0.2	<2.5	<1.5	<7	<6	<0.2
		24/08/2017	Normal	-	<1	<1	<1	<5	-
		19/09/2017	Normal	<0.1	<2.5	<1.5	<7	<6	<0.1
		25/10/2017	Normal	-	<1	1.4	1.4	<5	-
		22/03/2018	Normal	<0.1	<2.5	<1.5	<7	<6	0.3
		22/08/2018	Normal	<0.1	<2.5	1.9	<7	<6	<0.1
		10/09/2018	Normal	-	<1	<1	2.3	<5	-
		04/02/2019	Normal	-	<1	<1	1.2	<5	-
		12/03/2021	Normal	<0.1	<2.5	<1.5	<7	<6	<0.1
		23/09/2021	Normal	<0.1	<2.5	<1.5	<7	<6	<0.1
BH2B	Overburden	24/09/2019	Normal	<0.1	<2.5	<1.5	<7	<6	<0.1
		25/03/2022	Normal	<0.1	<2.5	<1.5	<7	<6	<0.1
BH2C	Overburden	29/06/2022	Normal	<0.1	<2.5	<1.5	<7	<6	<0.1
		20/09/2022	Normal	<0.1	<2.5	<1.5	<7	<6	<0.1
		16/03/2023	Normal	<0.1	<2.5	<1.5	<7	<6	<0.1
		05/10/2023	Normal	<0.1	<2.5	<1.5	<7	<6	<0.1
		14/12/2023	Normal	1	<2.5	<1.5	<7	<6	<0.1

	Fungicides	Metals				Other
	Propiconazole	Arsenic (Filtered)	Chromium (III+VI) (Filtered)	Copper (Filtered)	Chromium (hexavalent)	Tebuconazole
EQL	0.1	2.5	1.5	7	2	0.1
IE_LSM_GWSC	0.1 ^{#1}	7.5 ^{#2}	37.5 ^{#2}	1500 ^{#3}	7.5 ^{#2}	0.1 ^{#1}

EQL Comments
#1 IGV Ireland 2003
#2 Ireland GTVs 2016
#3 Ireland GTVs 2010
(blank): No assessment criteria available

Data Comments:
#1: Tentatively identified compound
- : Not analysed

GAC: Generic Assessment Criteria
xxx Exceeds GAC

Sample ID	Monitoring Zone	Sampled Date Time	Sample Type						
BH3	Overburden	01/02/2005	Normal	-	0.06	6,450	<0.05	-	-
		01/09/2005	Normal	-	<1	5,350	9.75	-	-
		01/02/2006	Normal	<0.002	1	4,997	2	2,990	-
		01/05/2006	Normal	<0.05	2	6,050	54	5,760	-
		01/08/2006	Normal	<0.15	9	5,650	21	-	-
BH3A	Overburden	01/08/2009	Normal	<0.02	<1	1,800	<1	<30	<0.02
		01/11/2009	Normal	<0.02	<1	820	<1	200	<0.02
		01/02/2010	Normal	<0.02	1	1,810	9	400	<0.02
		01/07/2010	Normal	<0.02	<0.8	1,430	33	950	<0.06
		23/09/2010	Normal	<0.02	4.6	6,630	2	1,880	<0.06
		15/12/2010	Normal	<0.02	0.3	3,270	<1	3,230	<0.06
		28/02/2011	Normal	<0.1	<2.5	3,020	<7	3,300	<0.1
		17/05/2011	Normal	<0.1	<2.5	2,133	<7	2,420	<0.1
		15/11/2011	Normal	<0.1	<2.5	10,240	105	9,250	<0.1
		28/02/2012	Normal	<0.1	<2.5	3,741	<7	3,305	<0.1
		11/06/2012	Normal	-	<2.5	3,953	<7	3,542	-
		02/08/2012	Normal	-	1.1	-	1.7	-	-
		16/08/2012	Normal	-	<2.5	3,285	<7	2,990	-
		01/11/2012	Normal	-	<2.5	3,822	<7	3,050	-
		15/11/2012	Normal	-	<0.5	2,800	<0.5	2,747	-
		01/03/2013	Normal	<0.1	<2.5	2,777	<7	2,600	<0.1
		22/04/2013	Normal	-	<0.5	2,500	1.6	2,688	-
		01/05/2013	Normal	-	3.8	2,134	<7	2,020	-
		18/11/2013	Normal	-	<2.5	3,000	<7	2,530	-
			Field_D	-	-	-	-	3,100	-
		11/03/2014	Normal	<0.1 ^{#1}	<2.5	2,224	<7	2,110	<0.1 ^{#1}
			Field_D	<0.1 ^{#1}	<2.5	2,191	<7	1,580	<0.1 ^{#1}
		12/05/2014	Normal	-	1.2	3,300	3.1	3,203	-
		28/05/2014	Normal	-	<2.5	3,353	<7	3,258	-
			Field_D	-	<2.5	3,201	<7	3,201	-
		27/08/2014	Normal	<0.1 ^{#1}	<2.5	6,041	<7	5,833	<0.1 ^{#1}
			Field_D	<0.1 ^{#1}	<2.5	6,002	<7	5,695	<0.1 ^{#1}
		25/11/2014	Normal	-	<2.5	6,027	<7	5,966	-
			Field_D	-	-	-	-	5,982	-
		17/02/2015	Normal	<0.1 ^{#1}	<2.5	3,487	<7	3,281	<0.1 ^{#1}
			Field_D	-	-	3,462	-	3,215	-
		23/02/2015	Normal	-	<1	3,700	<1	3,920	-
		24/06/2015	Normal	-	<2.5	2,513	<7	2,412	-
			Field_D	-	<2.5	2,535	<7	2,434	-
		17/12/2015	Normal	-	<2.5	4,517	<7	4,332	-
			Field_D	-	-	-	-	4,406	-
		30/03/2016	Normal	0.8 ^{#1}	<2.5	1,954	<7	1,953	1.2 ^{#1}
			Field_D	-	-	-	-	1,980	-
		09/05/2016	Normal	-	<1	2,400	<1	2,500	-
		01/06/2016	Normal	<0.1 ^{#1}	<2.5	2,427	<7	2,424	<0.1 ^{#1}
			Field_D	-	-	-	-	2,412	-
		09/03/2017	Normal	-	6.7	1,800	89	1,800	-
		23/03/2017	Normal	0.7	<2.5	1,096	<7	1,238	1.2
		08/06/2017	Normal	0.3	<2.5	6,422	<7	5,603	0.4
		25/10/2017	Normal	-	<1	3,500	<1	3,900	-
		19/12/2017	Normal	0.2	<2.5	2,440	<7	2,324	0.6
			Field_D	-	-	-	-	2,595	-
		22/03/2018	Normal	1.6	<2.5	895	<7	819	3.1
		29/05/2018	Normal	-	-	709.1	-	742	-
		27/06/2018	Normal	0.1	<2.5	1,378	<7	1,498	0.2
			Field_D	0.1	-	-	-	1,507	0.2
		04/02/2019	Normal	-	<1	2,500	<1	3,000	-
		17/06/2019	Normal	4.7	<1	3,400	<3	2,600	8.2
		27/06/2019	Normal	3.9	<2.5	3,304	<7	3,075	6.4
		16/12/2019	Normal	1.5	<2.5	1,173	<7	1,270	1
			Field_D	-	-	-	-	1,252	-
		21/12/2020	Normal	1.8	<2.5	1,154	<7	1,275	0.9
			Field_D	-	-	-	-	1,267	-
		12/03/2021	Normal	2.2	<2.5	954.1	<7	938	1
			Field_D	-	-	-	-	1,005	-
		08/06/2021	Normal	1.2	<2.5	1,314	<7	1,324	0.4
		25/03/2022	Normal	<0.1	<2.5	912.2	<7	911	<0.1
		28/06/2022	Normal	3.5	<2.5	1,817	<7	1,828	<0.1
		01/12/2022	Normal	3.1	<2.5	1,334	<7	1,468	0.1
		15/03/2023	Normal	3.1	<2.5	1,181	<7	945	0.3
		07/06/2023	Normal	2	<2.5	544.8	<7	625	0.4
		05/10/2023	Normal	8.6	<2.5	1,726	<7	1,627	<0.1
		14/12/2023	Normal	4.1	<2.5	1,087	<7	968	<0.1

	Fungicides	Metals				Other
	Propiconazole	Arsenic (Filtered)	Chromium (III+VI) (Filtered)	Copper (Filtered)	Chromium (hexavalent)	Tebuconazole
EQL	0.1	2.5	1.5	7	2	0.1
IE_LSM_GWSC	0.1 ^{#1}	7.5 ^{#2}	37.5 ^{#2}	1500 ^{#3}	7.5 ^{#2}	0.1 ^{#1}

EQL Comments
#1 IGV Ireland 2003
#2 Ireland GTVs 2016
#3 Ireland GTVs 2010
(blank): No assessment criteria available

Data Comments:
#1: Tentatively identified compound
- : Not analysed

GAC: Generic Assessment Criteria
xxx Exceeds GAC

Sample ID	Monitoring Zone	Sampled Date Time	Sample Type						
BH4	Overburden	01/02/2005	Normal	-	<0.05	<0.05	<0.05	-	-
		01/09/2005	Normal	-	40	537	1,400	-	-
		01/02/2006	Normal	<0.002	87	174	56	-	-
		01/05/2006	Normal	46	1,271	730	3,400	<30	-
		01/08/2006	Normal	<0.02	-	610	1,260	-	-
		14/08/2006	Normal	-	45.7	11.9	6.97	-	-
		01/02/2007	Normal	2.81	60	60	190	<30	-
		01/06/2007	Field_D	21.1	98	6	240	<30	-
		01/11/2007	Normal	29.1	169	210	1,780	<30	-
		18/12/2007	Normal	-	21.9	<5	30.1	-	-
		01/03/2008	Field_D	3.95	-	-	-	-	8.5
		27/03/2008	Normal	-	169	96	1,440	<150	-
		01/06/2008	Normal	21.8	68	<5	41	<30	86.6
			Field_D	3.34	-	-	-	-	1.37
		01/09/2008	Normal	<0.02	193	170	4,710	<40	73.6
		01/12/2008	Normal	27.6	162	72	3,210	40	43.2
		01/05/2009	Normal	37	101	2	45	<30	45
BH5	Overburden	02/08/2012	Normal	-	230	490	3,700	-	-
		01/02/2005	Normal	-	<0.05	590	<0.05	-	-
		01/09/2005	Normal	-	-	67	-	-	-
		01/02/2006	Normal	<0.002	<1	482	<5	400	-
		01/05/2006	Normal	0.15	2	390	30	70	-
		01/08/2006	Normal	0.55	6	410	20	<30	-
		01/02/2007	Normal	<0.05	<1	290	<5	120	-
		01/06/2007	Normal	<0.05	<1	530	<5	500	-
		01/11/2007	Normal	0.43	2	530	11	340	-
		18/12/2007	Normal	-	<5	368	<5	-	-
		01/03/2008	Normal	<0.04	-	-	-	-	0.12
		27/03/2008	Normal	-	1	390	10	<150	-
		01/06/2008	Normal	0.054	<1	380	<5	290	0.09
		01/09/2008	Normal	0.08	3	280	10	170	0.153
		01/12/2008	Normal	0.224	7	350	24	230	0.191
		01/05/2009	Normal	0.029	6	190	27	<30	0.053

	Fungicides	Metals				Other
	Propiconazole	Arsenic (Filtered)	Chromium (III+VI) (Filtered)	Copper (Filtered)	Chromium (hexavalent)	Tebuconazole
EQL	0.1	2.5	1.5	7	2	0.1
IE_LSM_GWSC	0.1 ^{#1}	7.5 ^{#2}	37.5 ^{#2}	1500 ^{#3}	7.5 ^{#2}	0.1 ^{#1}

EQL Comments
#1 IGV Ireland 2003
#2 Ireland GTVs 2016
#3 Ireland GTVs 2010
(blank): No assessment criteria available

Data Comments:
#1: Tentatively identified compound
- : Not analysed

GAC: Generic Assessment Criteria
xxx Exceeds GAC

Sample ID	Monitoring Zone	Sampled Date Time	Sample Type						
BH5A	Overburden	01/08/2009	Normal	<0.04	8	3	<1	<30	<0.04
		01/11/2009	Normal	<0.02	<1	<1	55	<30	<0.02
		01/02/2010	Normal	0.055	7	110	53	<30	0.079
		01/07/2010	Normal	0.067	<0.8	895	12	610	0.26
		23/09/2010	Normal	<0.02	2.9	1,740	11	1,290	<0.06
		15/12/2010	Normal	2.42	0.3	1,780	4	<30	2.18
		28/02/2011	Normal	<0.1	<2.5	981.4	<7	600	<0.1
		17/05/2011	Normal	<0.1	<2.5	4,144	<7	3,820	<0.1
		28/02/2012	Normal	<0.1	<2.5	1,842	<7	898	<0.1
		11/06/2012	Normal	-	<2.5	1,552	<7	1,356	-
		02/08/2012	Normal	-	0.9	-	2.9	-	-
		16/08/2012	Normal	-	<2.5	1,414	<7	540	-
		01/11/2012	Normal	-	3.2	855.7	<7	820	-
		15/11/2012	Normal	-	6	1,500	40	841	-
		01/03/2013	Normal	<0.1	<2.5	376.5	<7	350	<0.1
		22/04/2013	Normal	-	2.5	3,600	53	2,558	-
		01/05/2013	Normal	-	5.9	1,050	<7	1,030	-
		01/08/2013	Normal	<0.1	<2.5	4,853	<7	3,700	<0.1
		29/08/2013	Normal	-	<0.5	5,900	6.3	-	-
		11/03/2014	Normal	<0.1 ^{#1}	<2.5	599.8	<7	460	<0.1 ^{#1}
		12/05/2014	Normal	-	1.7	1,200	59	1,493	-
		28/05/2014	Normal	-	<2.5	6,041	<7	5,846	-
		27/08/2014	Normal	<0.1 ^{#1}	<2.5	5,867	<7	5,265	<0.1 ^{#1}
		09/10/2014	Normal	-	<1	4,500	37	6,219	-
		25/11/2014	Normal	-	4.1	3,020	<7	3,001	-
		17/02/2015	Normal	<0.1 ^{#1}	3.5	4,046	<7	3,946	<0.1 ^{#1}
		23/02/2015	Normal	-	<1	1,900	13	2,280	-
		24/06/2015	Normal	-	<2.5	5,633	<7	4,493	-
		27/08/2015	Normal	-	<1	2,700	27	2,704	-
		29/09/2015	Normal	<0.1 ^{#1}	<2.5	6,263	<7	6,183	<0.1 ^{#1}
			Field_D	-	-	-	<7	-	-
		30/03/2016	Normal	<0.1 ^{#1}	<2.5	4,430	<7	4,420	<0.1 ^{#1}
		09/05/2016	Normal	-	<1	2,300	3.5	2,400	-
		01/06/2016	Normal	-	<2.5	4,714	18	4,708	-
		22/09/2016	Normal	<0.1 ^{#1}	<2.5	3,271	13	3,080	<0.1 ^{#1}
			Field_D	-	-	-	-	2,688	-
		30/09/2016	Normal	-	<1	4,700	13	4,400	-
		09/01/2017	Normal	-	6.5	1,400	390	1,000	-
		09/03/2017	Normal	-	3.3	2,800	160	2,800	-
		23/03/2017	Normal	1	<2.5	2,140	<7	2,399	1.6
			Field_D	-	-	-	-	2,413	-
		08/06/2017	Normal	0.2	<2.5	4,074	<7	3,599	0.2
			Field_D	-	-	-	-	3,783	-
		19/09/2017	Normal	0.6	<2.5	484.4	<7	396	1.2
		25/10/2017	Normal	-	<1	3,300	7	3,400	-
		19/12/2017	Normal	<0.1	2.9	1,448	<7	1,423	0.3
		22/03/2018	Normal	0.2	<2.5	3,467	<7	3,196	0.8
			Field_D	0.2	-	-	-	3,113	0.6
		29/05/2018	Normal	-	-	2,176	-	2,311	-
		27/06/2018	Normal	<0.1	<2.5	3,139	<7	2,992	<0.1
		23/07/2018	Normal	-	<1	3,300	2.2	3,300	-
		22/08/2018	Normal	<0.1	<2.5	3,298	<7	3,185	0.1
			Field_D	<0.1	-	-	-	3,242	0.1
		10/09/2018	Normal	-	<1	3,200	9	2,800	-
		04/02/2019	Normal	-	<1	2,400	2	2,600	-
		17/06/2019	Normal	<0.1	<1	2,300	4	2,200	0.2
		27/06/2019	Normal	<0.1	<2.5	2,536	<7	2,840	<0.1
		24/09/2019	Normal	0.2	<2.5	4,239	<7	3,066	0.4
		16/12/2019	Normal	0.2	<2.5	1,613	<7	1,876	0.2
		21/12/2020	Normal	<0.1	4.7	1,475	<7	1,580	0.1
		12/03/2021	Normal	<0.1	2.8	1,127	11	1,360	<0.1
		08/06/2021	Normal	0.1	<2.5	1,707	8	1,706	0.2
		25/03/2022	Normal	0.3	<2.5	1,167	<7	1,186	0.4
		28/06/2022	Normal	1.1	<2.5	1,666	<7	1,661	0.7
		02/12/2022	Normal	0.5	<2.5	1,286	<7	1,250	0.3
		16/03/2023	Normal	0.7	<2.5	1,340	<7	1,479	0.4
		05/10/2023	Normal	<0.1	<2.5	1,080	<7	1,062	<0.1
		14/12/2023	Normal	1.9	<2.5	1,370	<7	1,301	<0.1

	Fungicides	Metals				Other
	Propiconazole	Arsenic (Filtered)	Chromium (III+VI) (Filtered)	Copper (Filtered)	Chromium (hexavalent)	Tebuconazole
EQL	0.1	2.5	1.5	7	2	0.1
IE_LSM_GWSC	0.1 ^{#1}	7.5 ^{#2}	37.5 ^{#2}	1500 ^{#3}	7.5 ^{#2}	0.1 ^{#1}

EQL Comments
#1 IGV Ireland 2003
#2 Ireland GTVs 2016
#3 Ireland GTVs 2010
(blank): No assessment criteria available

Data Comments:
#1: Tentatively identified compound
- : Not analysed

GAC: Generic Assessment Criteria
xxx Exceeds GAC

Sample ID	Monitoring Zone	Sampled Date Time	Sample Type						
BH6	Overburden	01/06/2005	Normal	-	<50	<50	<50	-	-
		01/09/2005	Normal	-	<1	48	21.4	-	-
		01/02/2006	Normal	<0.002	<1	4	<5	<30	-
		01/05/2006	Normal	<0.05	5	<5	<5	<30	-
		01/08/2006	Normal	<0.05	2	<5	11	<30	-
		14/08/2006	Normal	-	<1	<1	<1	-	-
		01/02/2007	Normal	0.12	<1	<5	<5	<30	-
		01/06/2007	Normal	<0.05	3	<5	16	<30	-
		01/11/2007	Normal	<0.15	<1	<5	14	<30	-
		18/12/2007	Normal	-	<5	<5	<5	-	-
		01/03/2008	Normal	<0.04	-	-	-	-	0.045
		27/03/2008	Normal	-	<1	<5	<5	<150	-
		01/05/2008	Normal	0.046	-	-	-	-	0.057
		01/06/2008	Normal	0.046	<1	<5	<5	<30	0.057
		01/09/2008	Normal	<0.02	<1	<1	3	<30	<0.02
		01/12/2008	Normal	<0.04	74	<1	10	<30	<0.04
		01/05/2009	Normal	<0.02	<1	1	11	<30	<0.02
		01/08/2009	Normal	<0.02	<1	<1	<1	<30	<0.02
		01/11/2009	Normal	<0.02	<1	<1	<1	<30	<0.02
		01/02/2010	Normal	<0.02	<1	<1	7	<30	<0.02
		01/07/2010	Normal	<0.02	<0.8	<1	<1	<110	<0.02
		23/09/2010	Normal	<0.02	<0.8	<0.7	<1	<30	<0.06
		25/12/2010	Normal	<0.02	0.2	<0.7	<1	<30	<0.06
		28/02/2011	Normal	<0.1	4.7	135.5	<7	<30	<0.1
		17/05/2011	Normal	<0.1	<2.5	30.3	<7	30	<0.1
		31/08/2011	Normal	<0.1	<2.5	7.2	<7	<30	<0.1
		15/11/2011	Normal	<0.1	<2.5	7.4	135	<2	<0.1
		28/02/2012	Normal	<0.1	<2.5	15	8	<2	<0.1
		11/06/2012	Normal	-	<2.5	<1.5	<7	<2	-
		02/08/2012	Normal	-	0.8	1.6	0.5	-	-
		16/08/2012	Normal	-	<2.5	11.3	8	<30	-
		01/11/2012	Normal	-	<2.5	8.3	<7	<30	-
		15/11/2012	Normal	-	<0.5	9.2	<0.5	<5	-
		01/03/2013	Normal	<0.1	<2.5	<1.5	<7	<30	<0.1
		22/04/2013	Normal	-	<0.5	<0.5	2.4	<5	-
		01/05/2013	Normal	-	<2.5	8.8	<7	<30	-
		01/08/2013	Normal	<0.1	<2.5	2.9	<7	<30	<0.1
		29/08/2013	Normal	-	<0.5	<0.5	1.8	-	-
		18/11/2013	Normal	-	4.1	<1.5	<7	<30	-
		11/03/2014	Normal	<0.1 ^{#1}	<2.5	<1.5	<7	<30	<0.1 ^{#1}
		12/05/2014	Normal	-	<1	<1	1.9	<5	-
		28/05/2014	Normal	-	<2.5	<1.5	<7	<6	-
		27/08/2014	Normal	<0.1 ^{#1}	<2.5	<1.5	10	<6	<0.1 ^{#1}
		09/10/2014	Normal	-	<1	1.8	2.7	<5	-
		25/11/2014	Normal	-	<2.5	<1.5	<7	<6	-
		17/02/2015	Normal	<0.1 ^{#1}	<2.5	<1.5	15	<6	<0.1 ^{#1}
		23/02/2015	Normal	-	1	9	<1	<5	-
		24/06/2015	Normal	-	<2.5	<1.5	24	<6	-
		27/08/2015	Normal	-	<1	<1	<1	<5	-
		29/09/2015	Normal	<0.1 ^{#1}	<2.5	<1.5	<7	<6	<0.1 ^{#1}
		17/12/2015	Normal	-	<2.5	<1.5	8	<6	-
		30/03/2016	Normal	<0.1 ^{#1}	<2.5	<1.5	<7	<6	<0.1 ^{#1}
		09/05/2016	Normal	-	<1	3	<1	<5	-
		01/06/2016	Normal	-	<2.5	<1.5	<7	<6	-
		22/09/2016	Normal	<0.1 ^{#1}	<2.5	<1.5	<7	<6	<0.1 ^{#1}

	Fungicides	Metals				Other
	Propiconazole	Arsenic (Filtered)	Chromium (III+VI) (Filtered)	Copper (Filtered)	Chromium (hexavalent)	Tebuconazole
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	0.1	2.5	1.5	7	2	0.1
IE_LSM_GWSC	0.1 ^{#1}	7.5 ^{#2}	37.5 ^{#2}	1500 ^{#3}	7.5 ^{#2}	0.1 ^{#1}

EQL Comments
#1 IGV Ireland 2003
#2 Ireland GTVs 2016
#3 Ireland GTVs 2010
(blank): No assessment criteria available

Data Comments:
#1: Tentatively identified compound
- : Not analysed

GAC: Generic Assessment Criteria
xxx Exceeds GAC

Sample ID	Monitoring Zone	Sampled Date Time	Sample Type						
BH7	Overburden	01/06/2005	Normal	-	<50	500	70	-	-
		01/09/2005	Normal	-	<1	2.09	4.63	-	-
		01/02/2006	Normal	<0.002	<1	1	<5	<30	-
		01/05/2006	Normal	0.2	2	<5	18	<30	-
		01/08/2006	Normal	<0.05	8	250	53	<30	-
		14/08/2006	Normal	-	<1	<1	<1	-	-
		01/02/2007	Normal	<0.05	<1	31	10	<30	-
		01/06/2007	Normal	<0.05	<1	<5	<5	<30	-
		01/11/2007	Normal	<0.15	<1	6	5	<30	-
		18/12/2007	Normal	-	<5	<5	<5	-	-
		01/03/2008	Normal	<0.04	-	-	-	-	0.082
		27/03/2008	Normal	-	3	280	35	<1,500	-
		01/06/2008	Normal	<0.02	<1	<5	<5	<40	<0.02
		01/09/2008	Normal	<0.02	2	200	18	<30	<0.02
		01/12/2008	Normal	<0.02	7	320	43	<30	<0.02
		01/05/2009	Normal	<0.02	5	480	44	<30	<0.02
		01/08/2009	Normal	<0.02	<1	2	1	<30	<0.02
		01/11/2009	Normal	<0.02	<1	<1	<1	<30	<0.02
		01/02/2010	Normal	<0.02	1	63	8	<30	<0.02
		01/07/2010	Normal	<0.02	<0.8	286	58	<30	<0.06
		23/09/2010	Normal	<0.02	1.3	327.8	19	<30	<0.06
		15/12/2010	Normal	<0.02	0.33	1.6	<1	<30	<0.06
		28/02/2011	Normal	<0.1	5.4	40.2	<7	<30	<0.1
		17/05/2011	Normal	<0.1	<2.5	75.6	<7	<2	<0.1
		31/08/2011	Normal	<0.1	<2.5	<1.5	<7	<30	<0.1
		15/11/2011	Normal	<0.1	<2.5	<1.5	121	<2	<0.1
		28/02/2012	Normal	<0.1	<2.5	2.9	<7	2	<0.1
		11/06/2012	Normal	-	2.9	<1.5	<7	<2	-
		02/08/2012	Normal	-	1.6	5.1	0.7	-	-
		16/08/2012	Normal	-	<2.5	<1.5	<7	<30	-
		01/11/2012	Normal	-	<2.5	<1.5	<7	<30	-
		15/11/2012	Normal	-	<0.5	52	<0.5	<5	-
		01/03/2013	Normal	<0.1	<2.5	<1.5	<7	<30	<0.1
		22/04/2013	Normal	-	0.8	26	1.5	<5	-
		01/05/2013	Normal	-	<2.5	2.4	<7	<30	-
		01/08/2013	Normal	<0.1	<2.5	<1.5	<7	<30	<0.1
		18/11/2013	Normal	-	3.6	<1.5	<7	<30	-
		11/03/2014	Normal	<0.1 ^{#1}	<2.5	<1.5	<7	<30	<0.1 ^{#1}
		12/05/2014	Normal	-	<1	22	3.5	<5	-
		28/05/2014	Normal	-	<2.5	<1.5	<7	<6	-
		27/08/2014	Normal	<0.1 ^{#1}	<2.5	<1.5	<7	<6	<0.1 ^{#1}
		09/10/2014	Normal	-	<1	8.8	1.8	<5	-
		25/11/2014	Normal	-	<2.5	<1.5	8	<6	-
		17/02/2015	Normal	<0.1 ^{#1}	<2.5	<1.5	<7	<6	<0.1 ^{#1}
		23/02/2015	Normal	-	<1	10	<1	<5	-
		24/06/2015	Normal	-	<2.5	<1.5	14	<6	-
		27/08/2015	Normal	-	<1	<1	<1	<5	-
		29/09/2015	Normal	<0.1 ^{#1}	<2.5	<1.5	<7	<6	<0.1 ^{#1}
		17/12/2015	Normal	-	<2.5	<1.5	<7	<6	-
		30/03/2016	Normal	<0.1 ^{#1}	<2.5	<1.5	<7	<6	<0.1 ^{#1}
		09/05/2016	Normal	-	<1	1.8	<1	<5	-
		01/06/2016	Normal	-	<2.5	<1.5	<7	<6	-
		22/09/2016	Normal	<0.1 ^{#1}	<2.5	<1.5	<7	<6	<0.1 ^{#1}
		30/09/2016	Normal	-	<1	1	<1	<5	-

	Fungicides	Metals				Other
	Propiconazole	Arsenic (Filtered)	Chromium (III+VI) (Filtered)	Copper (Filtered)	Chromium (hexavalent)	Tebuconazole
EQL	0.1	2.5	1.5	7	2	0.1
IE_LSM_GWSC	0.1 ^{#1}	7.5 ^{#2}	37.5 ^{#2}	1500 ^{#3}	7.5 ^{#2}	0.1 ^{#1}

EQL Comments
#1 IGV Ireland 2003
#2 Ireland GTVs 2016
#3 Ireland GTVs 2010
(blank): No assessment criteria available

Data Comments:
#1: Tentatively identified compound
- : Not analysed

GAC: Generic Assessment Criteria
xxx Exceeds GAC

Sample ID	Monitoring Zone	Sampled Date Time	Sample Type						
BH8	Overburden	01/06/2005	Normal	-	<50	<50	<50	-	-
		01/09/2005	Normal	-	<1	35	7.92	-	-
		01/02/2006	Normal	<0.002	<1	7	<5	<30	-
		01/05/2006	Normal	<0.05	2	34	87	<30	-
		01/08/2006	Normal	0.95	3	<5	20	<30	-
		14/08/2006	Normal	-	<1	4.12	<1	-	-
		01/02/2007	Normal	<0.05	2	<5	<5	<30	-
		01/06/2007	Normal	<0.05	<1	<5	<5	<30	-
		01/11/2007	Normal	<0.15	<1	<5	19	<30	-
		18/12/2007	Normal	-	<5	<5	<5	-	-
		01/03/2008	Normal	<0.1	-	-	-	-	<0.1
		27/03/2008	Normal	-	<1	13	31	<1,500	-
		01/06/2008	Normal	0.035	<1	<5	<5	<30	0.029
		01/09/2008	Normal	<0.02	4	17	37	<30	<0.02
		01/12/2008	Normal	<0.02	4	4	15	<30	<0.02
		01/05/2009	Normal	<0.02	2	4	23	<30	<0.02
		01/08/2009	Normal	<0.02	<1	140	14	<30	<0.02
		01/11/2009	Normal	<0.02	<1	<1	<1	<30	<0.02
		01/02/2010	Normal	<0.02	1	5	20	<30	<0.02
		01/07/2010	Normal	<0.02	<0.8	14.9	18	<30	<0.06
		23/09/2010	Normal	<0.02	<0.8	12.4	3	<30	<0.06
		15/12/2010	Normal	<0.02	0.1	<0.7	<1	<30	<0.06
		28/02/2011	Normal	<0.1	4.4	16.5	<7	<30	<0.1
		17/05/2011	Normal	<0.1	<2.5	14.5	<7	<2	<0.1
		31/08/2011	Normal	<0.1	<2.5	10.8	<7	<30	<0.1
		15/11/2011	Normal	<0.1	<2.5	<1.5	133	<2	<0.1
		28/02/2012	Normal	<0.1	<2.5	1.8	<7	<2	<0.1
		11/06/2012	Normal	-	<2.5	<1.5	<7	<2	-
		02/08/2012	Normal	-	0.8	1.5	1.3	-	-
		16/08/2012	Normal	-	<2.5	<1.5	<7	<30	-
		01/11/2012	Normal	-	<2.5	3	<7	<30	-
		15/11/2012	Normal	-	1.2	28	4.5	<5	-
		01/03/2013	Normal	<0.1	<2.5	<1.5	<7	<30	<0.1
		22/04/2013	Normal	-	0.5	31	37	<5	-
		01/05/2013	Normal	-	<2.5	<1.5	<7	<30	-
		01/08/2013	Normal	<0.1	<2.5	<1.5	<7	<30	<0.1
		29/08/2013	Normal	-	<0.5	14	27	-	-
		18/11/2013	Normal	-	3.6	9.6	<7	<30	-
		11/03/2014	Normal	<0.1 ^{#1}	<2.5	<1.5	<7	<30	<0.1 ^{#1}
		12/05/2014	Normal	-	<1	7.9	25	<5	-
		28/05/2014	Normal	-	<2.5	<1.5	<7	<6	-
		27/08/2014	Normal	<0.1 ^{#1}	<2.5	<1.5	<7	<6	<0.1 ^{#1}
		25/11/2014	Normal	-	<2.5	<1.5	<7	<6	-
		17/02/2015	Normal	<0.1 ^{#1}	<2.5	<1.5	<7	<6	<0.1 ^{#1}
		23/02/2015	Normal	-	<1	9.5	<1	<5	-
		24/06/2015	Normal	-	2.9	<1.5	<7	<6	-
		27/08/2015	Normal	-	<1	<1	<1	<5	-
		29/09/2015	Normal	<0.1 ^{#1}	<2.5	<1.5	<7	<6	<0.1 ^{#1}
		17/12/2015	Normal	-	<2.5	<1.5	<7	<6	-
		30/03/2016	Normal	<0.1 ^{#1}	<2.5	<1.5	<7	<6	<0.1 ^{#1}
		09/05/2016	Normal	-	<1	1.1	<1	<5	-
		01/06/2016	Normal	-	<2.5	<1.5	<7	<6	-
		22/09/2016	Normal	<0.1 ^{#1}	<2.5	<1.5	<7	<6	<0.1 ^{#1}
		30/09/2016	Normal	-	<1	<1	<1	<5	-

	Fungicides	Metals				Other
	Propiconazole	Arsenic (Filtered)	Chromium (III+VI) (Filtered)	Copper (Filtered)	Chromium (hexavalent)	Tebuconazole
EQL	0.1	2.5	1.5	7	2	0.1
IE_LSM_GWSC	0.1 ^{#1}	7.5 ^{#2}	37.5 ^{#2}	1500 ^{#3}	7.5 ^{#2}	0.1 ^{#1}

EQL Comments
#1 IGV Ireland 2003
#2 Ireland GTVs 2016
#3 Ireland GTVs 2010
(blank): No assessment criteria available

Data Comments:
#1: Tentatively identified compound
- : Not analysed

GAC: Generic Assessment Criteria
xxx Exceeds GAC

Sample ID	Monitoring Zone	Sampled Date Time	Sample Type						
BH9	Overburden	01/05/2006	Normal	<0.05	1	<5	<5	<30	-
		01/08/2006	Normal	<0.05	3	7	13	<30	-
		14/08/2006	Normal	-	<1	5.97	<1	-	-
		01/02/2007	Normal	<0.05	<1	<5	11	<30	-
		01/06/2007	Normal	<0.05	<1	<5	<5	<30	-
		01/11/2007	Normal	<0.15	<1	32	54	<30	-
		18/12/2007	Normal	-	<5	<5	<5	-	-
		01/03/2008	Normal	<0.04	-	-	-	-	<0.04
		27/03/2008	Normal	-	1	<5	15	<150	-
		01/06/2008	Normal	0.033	<1	<5	<5	<40	<0.02
		01/09/2008	Normal	<0.02	2	2	5	<30	<0.02
		01/12/2008	Normal	0.031	1	2	9	<30	<0.02
		01/05/2009	Normal	0.033	2	3	14	<30	0.025
		01/08/2009	Normal	<0.02	3	18	<1	<30	<0.02
		01/11/2009	Normal	0.047	<1	<1	<1	<30	0.038
		01/02/2010	Normal	<0.02	1	<1	10	<30	0.021
		01/07/2010	Normal	<0.02	<0.8	4	3	<30	<0.06
		23/09/2010	Normal	0.049	1.2	4.4	2	<30	0.065
		15/12/2010	Normal	0.029	0.7	0.7	<1	<30	<0.06
		28/02/2011	Normal	<0.1	8	1.9	<7	<30	<0.1
		17/05/2011	Normal	<0.1	<2.5	5.6	<7	<2	<0.1
		31/08/2011	Normal	<0.1	<2.5	<1.5	<7	<30	<0.1
		15/11/2011	Normal	<0.1	<2.5	<1.5	114	<2	<0.1
		28/02/2012	Normal	<0.1	<2.5	<1.5	125	<2	<0.1
		02/08/2012	Normal	-	1	1.3	1.1	-	-
		16/08/2012	Normal	-	<2.5	<1.5	<7	<30	-
		01/03/2013	Normal	<0.1	<2.5	<1.5	<7	<30	<0.1
		22/04/2013	Normal	-	1	4	4.3	<5	-
		01/08/2013	Normal	<0.1	<2.5	<1.5	<7	<30	<0.1
		29/08/2013	Normal	-	0.7	4	3.9	-	-
		11/03/2014	Normal	<0.1 ^{#1}	<2.5	<1.5	<7	<30	<0.1 ^{#1}
		12/05/2014	Normal	-	<1	3.2	7.1	<5	-
		27/08/2014	Normal	<0.1 ^{#1}	3.7	7.6	<7	6	<0.1 ^{#1}
		17/02/2015	Normal	<0.1 ^{#1}	<2.5	<1.5	<7	<6	<0.1 ^{#1}
		23/02/2015	Normal	-	<1	100	1.3	64.1	-
		27/08/2015	Normal	-	<1	<1	1.6	<5	-
		29/09/2015	Normal	<0.1 ^{#1}	<2.5	<1.5	<7	<6	<0.1 ^{#1}
		30/03/2016	Normal	<0.1 ^{#1}	<2.5	<1.5	<7	<6	<0.1 ^{#1}
		22/09/2016	Normal	<0.1 ^{#1}	<2.5	<1.5	<7	<6	<0.1 ^{#1}
		30/09/2016	Normal	-	<1	<1	<1	<5	-
		09/12/2016	Normal	-	6.6	<1.5	<7	<6	-
		23/03/2017	Normal	0.3	2.7	<1.5	<7	<6	0.5
		24/08/2017	Normal	-	<1	<1	2.3	<5	-
		19/09/2017	Normal	<0.1	<2.5	<1.5	<7	<6	0.2
			Field_D	-	-	-	-	<6	-
		25/10/2017	Normal	-	<1	1.4	2.7	<5	-
BH9A	Overburden	22/08/2018	Normal	<0.1	<2.5	1.7	<7	<6	<0.1
		10/09/2018	Normal	-	<1	1.5	1.2	<5	-
		28/11/2018	Normal	0.3	<2.5	<1.5	<7	<6	0.1
		04/02/2019	Normal	-	<1	1.6	<1	<5	-
		17/06/2019	Normal	<0.1	<1	4.8	<3	<5	<0.1
		24/09/2019	Normal	<0.1	<2.5	<1.5	<7	<6	<0.1
		16/12/2019	Normal	<0.1	<2.5	<1.5	<7	<6	<0.1
		21/12/2020	Normal	4.4	<2.5	<1.5	<7	<6	4.7
		12/03/2021	Normal	1.8	<2.5	<1.5	<7	<6	2.1
		08/06/2021	Normal	1	<2.5	<1.5	<7	<6	1.5
		23/09/2021	Normal	1.3	<2.5	<1.5	<7	<6	1.7
		02/12/2021	Normal	0.5	<2.5	<1.5	<7	<6	1.7
		25/03/2022	Normal	1.5	<2.5	1.9	7	<6	1.7
		28/06/2022	Normal	1.5	<2.5	<1.5	<7	<6	1.4
		20/09/2022	Normal	1.3	<2.5	<1.5	<7	<6	0.8
			Field_D	-	-	-	-	<6	-
		01/12/2022	Normal	0.4	<2.5	<1.5	<7	<6	0.2
		07/06/2023	Normal	0.3	3.8	<1.5	<7	<6	0.1
		18/12/2023	Normal	11.9	5.5	1.7	<7	<6	<2

	Fungicides	Metals				Other
	Propiconazole	Arsenic (Filtered)	Chromium (III+VI) (Filtered)	Copper (Filtered)	Chromium (hexavalent)	Tebuconazole
EQL	0.1	2.5	1.5	7	2	0.1
IE_LSM_GWSC	0.1 ^{#1}	7.5 ^{#2}	37.5 ^{#2}	1500 ^{#3}	7.5 ^{#2}	0.1 ^{#1}

EQL Comments
#1 IGV Ireland 2003
#2 Ireland GTVs 2016
#3 Ireland GTVs 2010
(blank): No assessment criteria available

Data Comments:
#1: Tentatively identified compound
- : Not analysed

GAC: Generic Assessment Criteria
xxx Exceeds GAC

Sample ID	Monitoring Zone	Sampled Date	Time	Sample Type					
BH23	Overburden	18/11/2013	Normal	-	40.8	57,740	<7	54,890	-
		14/11/2016	Normal	-	<50	14,000	<20	12,000	-
		17/11/2016	Normal	-	72	3,000	140	<50,000	-
		23/11/2016	Normal	-	<50	1,700	59	<5,000	-
		09/12/2016	Normal	-	4.5	71	1.6	<250	-
		09/01/2017	Normal	-	59	820	22	<50	-
		09/03/2017	Normal	-	7.2	210	9.4	<50	-
		08/06/2017	Normal	-	3.8	10	9.9	<50	-
		29/05/2018	Normal	-	-	118.1	-	15	-
		23/09/2021	Normal	1.5	8.7	<1.5	<7	<6	2.3
		20/09/2022	Normal	2.6	4.1	15.9	<7	29	2.2
		04/10/2023	Normal	21.7	11.3	293.9	26	279	4.2
		15/12/2023	Normal	12.4	64.8	605.3	18	447	3.3
BH25	Overburden	18/11/2013	Normal	-	<2.5	19,000	<7	17,520	-
		14/11/2016	Normal	-	<50	9,800	<20	9,100	-
		17/11/2016	Normal	-	78	2,300	120	<63,000	-
		23/11/2016	Normal	-	<50	1,800	61	<2,500	-
		09/12/2016	Normal	-	1.4	9	<0.5	<50	-
		09/01/2017	Normal	-	5.2	290	3.6	<50	-
		09/03/2017	Normal	-	32	2,300	41	<50	-
		08/06/2017	Normal	-	2.1	3	8.6	<50	-
		29/05/2018	Normal	-	-	2.2	-	<6	-
		22/08/2018	Normal	<0.1	<2.5	650.9	<7	666	0.1
BH26D	Bedrock	10/09/2018	Normal	-	<1	1100	1.1	1,300	-
		28/11/2018	Normal	<0.1	<2.5	615	<7	677	<0.1
		04/02/2019	Normal	-	<1	760	1.2	890	-
		17/06/2019	Normal	<0.1	<1	1300	<3	900	<0.1
		27/06/2019	Normal	<0.1	<2.5	721.6	<7	766	<0.1
			Field_D	-	-	-	-	750	-
		24/09/2019	Normal	<0.1	2.6	498.8	<7	496	<0.1
		16/12/2019	Normal	<0.1	<2.5	705.2	<7	694	<0.1
		21/12/2020	Normal	<0.1	<2.5	426.4	<7	428	<0.1
		12/03/2021	Normal	0.2	3.1	860.5	<7	906	<0.1
		08/06/2021	Normal	<0.1	<2.5	689.7	7	672	<0.1
		23/09/2021	Normal	<0.1	<2.5	478.7	<7	493	<0.1
		02/12/2021	Normal	<0.1	<2.5	383.3	<7	420	<0.1
			Field_D	-	-	-	-	573	-
		25/03/2022	Normal	2	<2.5	471.5	<7	479	0.2
		28/06/2022	Normal	<0.1	<2.5	401.5	<7	68	<0.1
		20/09/2022	Normal	<0.1	<2.5	294.1	<7	293	<0.1
		02/12/2022	Normal	0.4	<2.5	327.9	<7	325	<0.1
		15/03/2023	Normal	0.3	<2.5	603.3	<7	469	<0.1
		07/06/2023	Normal	0.4	<2.5	1,149	<7	530	<0.1
			Field_D	-	-	-	-	713	-
		05/10/2023	Normal	0.2	<2.5	297.6	<7	247	<0.1
		14/12/2023	Normal	1.7	2.6	899	<7	757	<0.1
		15/12/2023	Field D	-	-	-	-	661	-
BH26S	Overburden	22/08/2018	Normal	<0.1	<2.5	4,382	<7	4,369	0.1
		10/09/2018	Normal	-	2.3	2,300	2.5	2,300	-
		28/11/2018	Normal	0.3	<2.5	4,733	<7	4,777	0.1
		04/02/2019	Normal	-	<1	4,000	<1	4,800	-
		21/12/2020	Normal	0.3	6	1,619	<7	1,699	0.3
		12/03/2021	Normal	0.5	3.4	1,630	<7	1,778	0.3
		08/06/2021	Normal	0.4	<2.5	1,612	<7	1,594	0.2
			Field_D	-	-	-	-	1,659	-
		23/09/2021	Normal	0.5	<2.5	1,481	<7	1,599	0.2
			Field_D	-	-	-	-	1,585	-
		02/12/2021	Normal	0.4	<2.5	1,628	<7	1,952	0.6
		25/03/2022	Normal	0.3	<2.5	1,556	<7	1,502	<0.1
			Field_D	-	-	-	-	1,502	-
		28/06/2022	Normal	0.5	<2.5	1,412	<7	1,440	<0.1
			Field_D	-	-	-	-	1,533	-
		20/09/2022	Normal	0.3	<2.5	1,421	<7	1,478	<0.1
		02/12/2022	Normal	0.6	<2.5	1,047	<7	1,050	<0.1
			Field_D	-	-	-	-	963	-
		15/03/2023	Normal	1.8	<2.5	1,050	<7	906	<0.1
		07/06/2023	Normal	1.5	<2.5	472.7	<7	1,273	<0.1
		04/10/2023	Normal	1.5	<2.5	1,268	<7	967	<0.1
		14/12/2023	Normal	1.3	2.7	532.7	<7	510	<0.1

	Fungicides	Metals				Other
	Propiconazole	Arsenic (Filtered)	Chromium (III+VI) (Filtered)	Copper (Filtered)	Chromium (hexavalent)	Tebuconazole
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
	EQL	0.1	2.5	1.5	7	2
IE_LSM_GWSC	0.1 ^{#1}	7.5 ^{#2}	37.5 ^{#2}	1500 ^{#3}	7.5 ^{#2}	0.1 ^{#1}

EQL Comments
#1 IGV Ireland 2003
#2 Ireland GTVs 2016
#3 Ireland GTVs 2010
(blank): No assessment criteria available

Data Comments:
#1: Tentatively identified compound
- : Not analysed

GAC: Generic Assessment Criteria
xxx Exceeds GAC

Sample ID	Monitoring Zone	Sampled Date	Time	Sample Type					
BH27D	Bedrock	08/07/2022		Normal	1.6	<2.5	908.9	<7	1,002
		28/07/2022		Normal	0.2	<2.5	966.6	<7	1,042
				Field_D	-	-	-	-	1,028
		02/12/2022		Normal	<0.1	<2.5	441.3	<7	472
		05/10/2023		Normal	0.7	<2.5	166.6	<7	165
BH27S	Overburden	14/12/2023		Normal	0.6	<2.5	852.5	<7	777
		29/06/2022		Normal	0.3	<2.5	428	<7	24
		28/07/2022		Normal	0.9	3.2	<1.5	<7	<6
		20/09/2022		Normal	4.3	<2.5	109.9	<7	38
		02/12/2022		Normal	10.6	<2.5	18.3	8	9
BH28D	Bedrock	05/10/2023		Normal	2.7	<2.5	612.2	<7	584
		14/12/2023		Normal	2.3	3.7	1,624	<7	1,071
		30/06/2022		Normal	<0.1	<2.5	<1.5	<7	<6
		27/07/2022		Normal	0.2	<2.5	<1.5	<7	<6
		05/10/2023		Normal	1.9	<2.5	<1.5	<7	<6
BH28S	Overburden	18/12/2023		Normal	0.8	4.8	<1.5	<7	<6
		30/06/2022		Normal	<0.1	<2.5	<1.5	<7	<6
		28/07/2022		Normal	0.4	<2.5	<1.5	<7	<6
		05/10/2023		Normal	2.2	<2.5	<1.5	<7	<6
		18/12/2023		Normal	1.3	3.6	<1.5	<7	<6
BH29D	Bedrock	14/12/2023		Normal	1.6	<2.5	2,248	<7	1,711
		05/10/2023		Normal	9.5	<2.5	680.4	<7	659
		01/12/2022		Normal	2.2	<2.5	2,149	<7	2,154
		29/07/2022		Normal	0.5	<2.5	2,491	<7	2,703
		30/06/2022		Normal	0.7	<2.5	1,001	<7	883
BH29S	Overburden	14/12/2023		Normal	1	<2.5	177.9	<7	126
		05/10/2023		Normal	2.7	<2.5	119.5	<7	102
		01/12/2022		Normal	0.5	<2.5	201.1	<7	198
		29/07/2022		Normal	<0.1	<2.5	13.7	<7	<6
		30/06/2022		Normal	<0.1	<2.5	11.3	<7	<6
BH30D	Bedrock	15/12/2023		Normal	2.6	<2.5	1.5	15	<6
		05/10/2023		Normal	8.2	<2.5	<1.5	20	<6
		29/07/2022		Normal	0.5	<2.5	2.1	<7	<6
		30/06/2022		Normal	<0.1	<2.5	<1.5	<7	<6
		15/12/2023		Normal	3.5	<2.5	<1.5	8	<6
BH30S	Overburden	15/12/2023		Normal	2.2	<2.5	1.9	<7	<6
		15/12/2023		Normal	0.7	<2.5	<1.5	<7	<6
		05/10/2023		Normal	<0.1	<2.5	<1.5	<7	<6
		28/07/2022		Normal	<0.1	<2.5	<1.5	<7	<6
		29/06/2022		Normal	<0.1	<2.5	<1.5	<7	<6
BH31D	Bedrock	15/12/2023		Normal	0.4	<2.5	3.3	<7	<6
		05/10/2023		Normal	<0.1	<2.5	<1.5	<7	<6
		29/07/2022		Normal	<0.1	<2.5	<1.5	<7	<6
		29/06/2022		Normal	<0.1	<2.5	<1.5	<7	<6
		15/12/2023		Normal	0.7	<2.5	<1.5	<7	<6
BH31S	Overburden	15/12/2023		Normal	0.3	<2.5	<1.5	<7	<6
		05/10/2023		Normal	0.4	<2.5	4	<7	<6
		28/07/2022		Normal	<0.1	<2.5	<1.5	<7	<6
		29/06/2022		Normal	<0.1	<2.5	<1.5	<7	<6
		29/06/2022		Normal	<0.1	<2.5	<1.5	<7	<6
BH32D	Bedrock	15/12/2023		Normal	2.4	<2.5	<1.5	<7	<6
		05/10/2023		Normal	<0.1	<2.5	<1.5	<7	<6
		01/12/2022		Normal	<0.1	<2.5	<1.5	<7	<6
		29/07/2022		Normal	<0.1	3.1	<1.5	<7	<6
		29/06/2022		Normal	<0.1	<2.5	2	9	<6
BH32S	Overburden	15/12/2023		Normal	0.3	<2.5	<1.5	<7	<6
		05/10/2023		Normal	0.4	<2.5	4	<7	<6
		28/07/2022		Normal	<0.1	<2.5	<1.5	<7	<6
		29/06/2022		Normal	<0.1	<2.5	<1.5	<7	<6
		29/06/2022		Normal	<0.1	<2.5	<1.5	<7	<6
BH33D	Bedrock	15/12/2023		Normal	5.7	<2.5	365.7	<7	258
		04/10/2023		Normal	<0.1	<2.5	242.8	<7	191
		29/07/2022		Normal	<0.1	<2.5	269.6	<7	259
		30/06/2022		Normal	<0.1	<2.5	150	11	131
		15/12/2023		Normal	0.2	<2.5	543.5	<7	617
BH33S	Overburden	14/12/2023		Normal	0.8	<2.5	944.8	<7	767
		04/10/2023		Normal	0.2	<2.5	505.9	<7	492
		02/12/2022		Normal	0.3	<2.5	648.3	<7	646
		29/07/2022		Normal	<0.1	<2.5	630.2	<7	664
		30/06/2022		Normal	0.2	<2.5	543.5	<7	617
BH34D	Bedrock	18/12/2023		Normal	0.8	4.6	28.9	<7	21
		05/10/2023		Normal	<0.1	<2.5	14.2	<7	<6
		30/11/2022		Normal	0.1	<2.5	25.3	<7	13
		29/07/2022		Normal	0.2	3	43.7	<7	8
		30/06/2022		Normal	<0.1	<2.5	37.9	<7	<6
BH34S	Overburden	18/12/2023		Normal	0.8	4.6	39.4	21	34
		05/10/2023		Normal	<0.1	<2.5	2.3	20	<6
		30/11/2022		Normal	0.4	<2.5	27.9	<7	22
		28/07/2022		Normal	0.2	<2.5	58.2	<7	17
		30/06/2022		Normal	<0.1	<2.5	29.9	<7	<6

	Fungicides	Metals				Other
	Propiconazole	Arsenic (Filtered)	Chromium (III+VI) (Filtered)	Copper (Filtered)	Chromium (hexavalent)	Tebuconazole
µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
EQL	0.1	2.5	1.5	7	2	0.1
IE_LSM_GWSC	0.1 ^{#1}	7.5 ^{#2}	37.5 ^{#2}	1500 ^{#3}	7.5 ^{#2}	0.1 ^{#1}

EQL Comments
#1 IGV Ireland 2003
#2 Ireland GTVs 2016
#3 Ireland GTVs 2010
(blank): No assessment criteria available

Data Comments:
#1: Tentatively identified compound
- : Not analysed

GAC: Generic Assessment Criteria
xxx Exceeds GAC

Sample ID	Monitoring Zone	Sampled Date Time	Sample Type						
BHA	Overburden	14/11/2016	Normal	-	59	12,000	440	8,200	-
		29/05/2018	Normal	-	-	<1.5	-	<6	-
		23/09/2021	Normal	2	10.8	2.5	<7	<6	2.5
		20/09/2022	Normal	6.3	2.9	4.3	22	<6	4.4
		04/10/2023	Normal	27.5	6.3	339	70	297	4.1
		14/12/2023	Normal	12.7	5.9	175.3	78	140	3.8
BHB	Overburden	14/11/2016	Normal	-	<50	13,000	63	12,000	-
		29/05/2018	Normal	-	-	5.2	-	<6	-
BHC	Overburden	14/11/2016	Normal	-	120	9,600	530	5,400	-
		29/05/2018	Normal	-	-	34.2	-	<6	-
BHX	Overburden	17/11/2016	Normal	-	180	16,000	890	<63,000	-
		23/11/2016	Normal	-	63	3,500	220	<10,000	-
		09/01/2017	Normal	-	14	5,000	46	3,800	-
		09/03/2017	Normal	-	6	3,000	26	2,400	-
		08/06/2017	Normal	-	9.4	32	2.9	<50	-
		29/05/2018	Normal	-	-	11.7	-	<6	-
BHY	Overburden	14/11/2016	Normal	-	<50	27,000	96	25,000	-
		17/11/2016	Normal	-	83	4,700	180	<50,000	-
		23/11/2016	Normal	-	<50	4,200	140	<5,000	-
		09/12/2016	Normal	-	3.7	210	2.6	<500	-
		09/01/2017	Normal	-	11	3,500	22	2,100	-
		09/03/2017	Normal	-	10	2,200	14	630	-
		08/06/2017	Normal	-	12	270	14	100	-
		29/05/2018	Normal	-	-	4	-	<6	-
PW	Bedrock	01/02/2005	Normal	-	<2	4,350	<2	-	-
		01/06/2005	Normal	-	<50	5,880	<50	-	-
		01/02/2006	Normal	<0.002	<1	2,651	<5	1,700	-
		01/05/2006	Normal	<0.05	1	5,430	<5	4,780	-
		01/08/2006	Normal	<0.3	-	-	-	-	-
		14/08/2006	Normal	-	<1	8,390	<1	-	-
		15/08/2006	Normal	<0.3	2	2,750	<5	-	-
		01/02/2007	Normal	<0.05	<1	4,050	<5	2,870	-
		01/06/2007	Normal	62.7	614	27	240	<30	-
		01/11/2007	Normal	91.4	684	690	2,810	<30	-
		18/12/2007	Normal	-	<5	8,967	<5	-	-
		01/03/2008	Normal	80.4	347	23	580	<1,500	186
		01/06/2008	Normal	69.8	459	150	2,010	<50	86.6
		02/08/2012	Normal	-	0.9	-	1	-	-
		15/11/2012	Normal	-	<0.5	4,200	0.8	4,996	-
		22/04/2013	Normal	-	1.1	4,600	22	5,298	-
		29/08/2013	Normal	-	0.7	3,800	12	-	-
		12/05/2014	Normal	-	<1	4,300	<1	4,255	-
		09/10/2014	Normal	-	<1	3,300	1.7	3,720	-
		23/02/2015	Normal	-	<1	3,900	<1	4,240	-
		27/08/2015	Normal	-	<1	3,200	<1	3,211	-
		09/05/2016	Normal	-	<1	3,100	<1	3,300	-
		30/09/2016	Normal	-	<1	3,500	<1	3,600	-
		24/08/2017	Normal	-	<1	3,100	<1	3,300	-
		19/09/2017	Normal	<0.1	<2.5	3,467	<7	3,121	<0.1
		25/10/2017	Normal	-	<1	3,400	3.4	3,500	-
		22/03/2018	Normal	<0.1	<2.5	2,131	<7	2,016	<0.1
		29/05/2018	Normal	-	-	2,959	-	2,817	-
		27/06/2018	Normal	<0.1	<2.5	3,081	<7	2,985	<0.1
		23/07/2018	Normal	-	<1	3,200	1.8	3,500	-
		22/08/2018	Normal	<0.1	<2.5	2,378	<7	2,485	<0.1
		10/09/2018	Normal	-	<1	2,600	<1	2,600	-
		28/11/2018	Normal	0.3	<2.5	3,085	<7	2,953	0.1
			Field_D	0.3	-	-	-	2,943	0.1
		04/02/2019	Normal	-	<1	2,600	<1	3,200	-
		27/06/2019	Normal	<0.1	<2.5	2,565	<7	2,560	<0.1
		24/09/2019	Normal	<0.1	2.5	3,058	<7	3,039	<0.1
			Field_D	-	-	-	-	3,051	-
		16/12/2019	Normal	<0.1	<2.5	2,355	<7	2,695	<0.1
		21/12/2020	Normal	<0.1	3.6	2,024	<7	2,339	<0.1
		12/03/2021	Normal	<0.1	<2.5	2,186	<7	2,428	<0.1
		08/06/2021	Normal	<0.1	<2.5	2,392	<7	2,523	<0.1
		23/09/2021	Normal	<0.1	<2.5	2,217	<7	2,480	<0.1
		02/12/2021	Normal	<0.1	<2.5	2,228	<7	2,070	<0.1
		25/03/2022	Normal	<0.1	<2.5	2,527	<7	2,495	<0.1
		28/06/2022	Normal	<0.1	<2.5	2,157	<7	2,043	<0.1
		20/09/2022	Normal	<0.1	<2.5	2,343	<7	2,547	<0.1
		30/11/2022	Normal	<0.1	<2.5	2,116	<7	2,133	<0.1
		16/03/2023	Normal	<0.1	<2.5	2,990	<7	2,294	<0.1
		07/06/2023	Normal	<0.1	<2.5	1,925	<7	2,166	<0.1
		28/09/2023	Normal	<0.1	<2.5	1,816	<7	1,740	<0.1
		15/12/2023	Normal	1	<2.5	1,844	<7	1,832	<0.1

	Fungicides	Metals				Other
	Propiconazole	Arsenic (Filtered)	Chromium (III+VI) (Filtered)	Copper (Filtered)	Chromium (hexavalent)	Tebuconazole
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	0.1	2.5	1.5	7	2	0.1
IE_LSM_GWSC	0.1 ^{#1}	7.5 ^{#2}	37.5 ^{#2}	1500 ^{#3}	7.5 ^{#2}	0.1 ^{#1}

EQL Comments
#1 IGV Ireland 2003
#2 Ireland GTVs 2016
#3 Ireland GTVs 2010
(blank): No assessment criteria available

Data Comments:
#1: Tentatively identified compound
- : Not analysed

GAC: Generic Assessment Criteria
xxx Exceeds GAC

Sample ID	Monitoring Zone	Sampled Date Time	Sample Type						
DW1	Bedrock	01/02/2007	Normal	<0.05	<1	14	<5	<30	-
		01/06/2007	Normal	<0.05	<1	11	14	<30	-
		01/11/2007	Normal	<0.15	<1	10	10	<30	-
		01/03/2008	Normal	<0.02	-	-	-	-	<0.02
		27/03/2008	Normal	-	<1	19	10	<30	-
		01/06/2008	Normal	<0.02	<1	9	13	<30	<0.02
		01/09/2008	Normal	<0.02	<1	15	24	<30	<0.02
		01/12/2008	Normal	0.086	<1	7	13	<30	<0.02
		01/05/2009	Normal	0.55	<1	10	19	<30	0.814
		01/08/2009	Normal	<0.02	<1	4	11	<30	<0.02
		01/11/2009	Normal	0.109	<1	<1	4	<30	0.207
		01/02/2010	Normal	<0.02	<1	37	9	30	<0.02
		01/07/2010	Normal	<0.02	<0.8	17	5	<30	<0.06
		23/09/2010	Normal	<0.02	0.9	12.8	9	<30	<0.06
		15/12/2010	Normal	<0.02	0.1	13.9	14	<30	<0.06
		28/02/2011	Normal	<0.1	3.5	9.1	<7	<30	<0.1
		17/05/2011	Normal	<0.1	<2.5	12.2	<7	90	<0.1
		31/08/2011	Normal	<0.1	<2.5	13.5	<7	<30	<0.1
		15/11/2011	Normal	<0.1	<2.5	7.3	125	<2	<0.1
		28/02/2012	Normal	<0.1	<2.5	8.2	13	3	<0.1
		11/06/2012	Normal	-	<2.5	4	8	<2	-
		16/08/2012	Normal	-	<2.5	5.1	17	<30	-
		01/11/2012	Normal	-	<2.5	<1.5	<7	<30	-
		01/03/2013	Normal	<0.1	<2.5	<1.5	<7	<30	<0.1
		01/05/2013	Normal	-	<2.5	7.1	47	<30	-
		01/08/2013	Normal	<0.1	<2.5	5.3	<7	<30	<0.1
		18/11/2013	Normal	-	4.5	10.1	<7	<30	-
		11/03/2014	Normal	<0.1 ^{#1}	<2.5	10.2	<7	13	<0.1 ^{#1}
		28/05/2014	Normal	-	<2.5	23.1	<7	12	-
		27/08/2014	Normal	<0.1 ^{#1}	<2.5	11.4	<7	6	<0.1 ^{#1}
		25/11/2014	Normal	-	<2.5	4.7	<7	<6	-
		17/02/2015	Normal	<0.1 ^{#1}	<2.5	11.5	<7	<6	<0.1 ^{#1}
		24/06/2015	Normal	-	<2.5	6.2	<7	<6	-
		29/09/2015	Normal	<0.1 ^{#1}	<2.5	5.2	<7	<6	<0.1 ^{#1}
		17/12/2015	Normal	-	<2.5	1.7	<7	<6	-
		30/03/2016	Normal	<0.1 ^{#1}	<2.5	25.8	<7	21	<0.1 ^{#1}
		01/06/2016	Normal	-	<2.5	12.1	<7	12	-
		22/09/2016	Normal	<0.1 ^{#1}	<2.5	7.7	<7	<6	<0.1 ^{#1}
		09/12/2016	Normal	-	-	-	-	<6	-
		23/03/2017	Normal	<0.2	<2.5	3.8	<7	<6	<0.2
		08/06/2017	Normal	-	<2.5	4.8	<7	<6	-
		19/09/2017	Normal	<0.1	<2.5	3.3	<7	<6	<0.1
		19/12/2017	Normal	-	4.7	3	<7	<6	-
		22/03/2018	Normal	<0.1	<2.5	4.4	<7	<6	<0.1
		27/06/2018	Normal	<0.1	<2.5	8	9	7	<0.1
		22/08/2018	Normal	<0.1	<2.5	8.7	26	<6	<0.1
		28/11/2018	Normal	<0.1	<2.5	2	<7	<6	<0.1
		27/06/2019	Normal	<0.1	<2.5	4	14	<6	<0.1
		24/09/2019	Normal	<0.1	3.4	2.1	11	<6	<0.1
		16/12/2019	Normal	<0.1	<2.5	2	<7	<6	<0.1
		12/03/2021	Normal	<0.1	<2.5	8.8	9	<6	<0.1
		08/06/2021	Normal	<0.1	<2.5	4.9	12	<6	<0.1
		23/09/2021	Normal	<0.1	<2.5	9.4	8	<6	<0.1
		02/12/2021	Normal	<0.1	<2.5	<1.5	8	<6	<0.1
		25/03/2022	Normal	<0.1	<2.5	1.7	12	<6	<0.1
		28/06/2022	Normal	<0.1	<2.5	<1.5	<7	<6	<0.1
		20/09/2022	Normal	<0.1	<2.5	3.2	9	<6	<0.1
		30/11/2022	Normal	<0.1	<2.5	<1.5	7	<6	<0.1
		16/03/2023	Normal	<0.1	<2.5	2.6	13	<6	<0.1
		07/06/2023	Normal	<0.1	<2.5	1.6	17	<6	<0.1
		28/09/2023	Normal	<0.1	<2.5	1.6	<7	<6	<0.1
		18/12/2023	Normal	0.6	3.9	<1.5	<7	<6	<0.1

	Fungicides	Metals				Other
	Propiconazole	Arsenic (Filtered)	Chromium (III+VI) (Filtered)	Copper (Filtered)	Chromium (hexavalent)	Tebuconazole
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
	EQL	0.1	2.5	1.5	7	2
IE_LSM_GWSC	0.1 ^{#1}	7.5 ^{#2}	37.5 ^{#2}	1500 ^{#3}	7.5 ^{#2}	0.1 ^{#1}

EQL Comments
#1 IGV Ireland 2003
#2 Ireland GTVs 2016
#3 Ireland GTVs 2010
(blank): No assessment criteria available

Data Comments:
#1: Tentatively identified compound
- : Not analysed

GAC: Generic Assessment Criteria
xxx Exceeds GAC

Sample ID	Monitoring Zone	Sampled Date Time	Sample Type						
DW2		01/02/2007	Normal	<0.05	<1	<5	31	<30	-
		01/06/2007	Normal	-	<1	<5	83	<30	-
		01/11/2007	Normal	<0.15	<1	<5	57	<30	-
		01/03/2008	Normal	<0.02	-	-	-	-	<0.02
		27/03/2008	Normal	-	<1	<5	57	<30	-
		01/06/2008	Normal	<0.02	<1	<5	11	<30	<0.02
		01/09/2008	Normal	<0.02	<1	<1	160	<30	<0.02
		01/12/2008	Normal	<0.02	<1	<1	84	<30	<0.02
		01/05/2009	Normal	<0.02	<1	1	12	<30	<0.02
		01/08/2009	Normal	<0.02	<1	<1	97	<30	<0.02
		01/11/2009	Normal	<0.02	<1	<1	16	<30	<0.02
		01/02/2010	Normal	<0.02	<1	<1	51	<30	<0.02
		01/07/2010	Normal	<0.02	<0.8	<1	94	<30	<0.06
		23/09/2010	Normal	<0.02	<0.8	0.9	7	<30	<0.06
		15/12/2010	Normal	<0.02	<0.1	<0.7	6	<30	<0.06
		28/02/2011	Normal	<0.1	5.3	2.1	<7	<30	<0.1
		17/05/2011	Normal	<0.1	<2.5	<1.5	<7	<2	<0.1
		31/08/2011	Normal	<0.1	<2.5	<1.5	<7	<30	<0.1
		15/11/2011	Normal	<0.1	<2.5	<1.5	127	<2	<0.1
		28/02/2012	Normal	<0.1	<2.5	<1.5	<7	<2	<0.1
		11/06/2012	Normal	-	<2.5	<1.5	<7	<2	-
		16/08/2012	Normal	-	<2.5	<1.5	136	<30	-
		01/11/2012	Normal	-	3.5	<1.5	14	<30	-
		01/03/2013	Normal	<0.1	<2.5	<1.5	7	<30	<0.1
		01/05/2013	Normal	-	<2.5	<1.5	<7	<30	-
		01/08/2013	Normal	<0.1	<2.5	<1.5	<7	<30	<0.1
		18/11/2013	Normal	-	6.4	<1.5	<7	<30	-
		11/03/2014	Normal	<0.1 ^{#1}	<2.5	<1.5	<7	<30	<0.1 ^{#1}
		28/05/2014	Normal	-	<2.5	<1.5	79	<6	-
		27/08/2014	Normal	<0.1 ^{#1}	<2.5	2.5	<7	<6	<0.1 ^{#1}
		25/11/2014	Normal	-	<2.5	<1.5	<7	<6	-
		17/02/2015	Normal	<0.1 ^{#1}	<2.5	<1.5	9	<6	<0.1 ^{#1}
		24/06/2015	Normal	-	<2.5	<1.5	<7	<6	-
		29/09/2015	Normal	<0.1 ^{#1}	<2.5	<1.5	<7	<6	<0.1 ^{#1}
		17/12/2015	Normal	-	<2.5	<1.5	7	<6	-
		30/03/2016	Normal	<0.1 ^{#1}	<2.5	<1.5	7	<6	<0.1 ^{#1}
		01/06/2016	Normal	-	<2.5	<1.5	<7	<6	-
		22/09/2016	Normal	<0.1 ^{#1}	<2.5	<1.5	<7	<6	<0.1 ^{#1}
		07/11/2023	Normal	<0.1	-	-	-	-	<0.1

	Fungicides	Metals				Other
	Propiconazole	Arsenic (Filtered)	Chromium (III+VI) (Filtered)	Copper (Filtered)	Chromium (hexavalent)	Tebuconazole
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
	EQL	0.1	2.5	1.5	7	2
IE_LSM_GWSC	0.1 ^{#1}	7.5 ^{#2}	37.5 ^{#2}	1500 ^{#3}	7.5 ^{#2}	0.1 ^{#1}

EQL Comments
#1 IGV Ireland 2003
#2 Ireland GTVs 2016
#3 Ireland GTVs 2010
(blank): No assessment criteria available

Data Comments:
#1: Tentatively identified compound
- : Not analysed

GAC: Generic Assessment Criteria
xxx Exceeds GAC

Sample ID	Monitoring Zone	Sampled Date Time	Sample Type						
DW3	Overburden	01/02/2007	Normal	<0.05	<1	<5	39	<30	-
		01/06/2007	Normal	<0.05	<1	<5	44	<30	-
		01/11/2007	Normal	<0.15	<1	<5	42	<30	-
		01/03/2008	Normal	<0.02	-	-	-	-	<0.02
		27/03/2008	Normal	-	<1	<5	58	<30	-
		01/06/2008	Normal	<0.02	<1	<5	<5	<30	<0.02
		01/09/2008	Normal	<0.02	<1	<1	180	<30	<0.02
		01/12/2008	Normal	<0.02	<1	<1	210	<30	<0.02
		01/05/2009	Normal	0.021	<1	<1	9	<30	0.027
		01/08/2009	Normal	<0.02	<1	<1	290	<30	0.025
		01/11/2009	Normal	<0.02	<1	<1	120	<30	<0.02
		01/02/2010	Normal	<0.02	<1	<1	230	<30	<0.02
		01/07/2010	Normal	<0.02	<0.8	<1	395	<30	<0.06
		23/09/2010	Normal	<0.02	<0.8	<0.7	236	<30	<0.06
		15/12/2010	Normal	<0.02	<0.1	<0.7	152	<30	<0.06
		28/02/2011	Normal	<0.1	3.7	1.9	150	<30	<0.1
		17/05/2011	Normal	<0.1	<2.5	<1.5	171	<2	<0.1
		31/08/2011	Normal	<0.1	<2.5	<1.5	203	<30	<0.1
		15/11/2011	Normal	<0.1	<2.5	<1.5	416	<2	<0.1
		28/02/2012	Normal	<0.1	<2.5	<1.5	153	<2	<0.1
		11/06/2012	Normal	-	<2.5	<1.5	125	<2	-
		16/08/2012	Normal	-	<2.5	<1.5	102	<30	-
		01/11/2012	Normal	-	3.1	<1.5	132	<30	-
		01/03/2013	Normal	<0.1	<2.5	<1.5	195	<30	<0.1
		01/05/2013	Normal	-	<2.5	<1.5	201	<30	-
		01/08/2013	Normal	<0.1	<2.5	<1.5	293	<30	<0.1
		18/11/2013	Normal	-	3.3	<1.5	78	<30	-
		11/03/2014	Normal	<0.1 ^{#1}	<2.5	<1.5	64	<30	<0.1 ^{#1}
		28/05/2014	Normal	-	<2.5	<1.5	<7	<6	-
		27/08/2014	Normal	<0.1 ^{#1}	<2.5	2.2	124	<6	<0.1 ^{#1}
		25/11/2014	Normal	-	<2.5	<1.5	27	<6	-
		17/12/2015	Normal	-	<2.5	<1.5	62	<6	-
		30/03/2016	Normal	<0.1 ^{#1}	<2.5	<1.5	183	<6	<0.1 ^{#1}
		01/06/2016	Normal	-	<2.5	<1.5	183	<6	-
		22/09/2016	Normal	<0.1 ^{#1}	<2.5	<1.5	191	<6	<0.1 ^{#1}
		09/12/2016	Normal	-	<2.5	<1.5	37	<6	-
		23/03/2017	Normal	<0.2	<2.5	<1.5	71	<6	<0.2
		08/06/2017	Normal	-	<2.5	<1.5	129	<6	-
		19/09/2017	Normal	<0.1	<2.5	<1.5	132	<6	<0.1
		19/12/2017	Normal	-	<2.5	<1.5	64	<6	-
		22/03/2018	Normal	<0.1	<2.5	<1.5	309	<6	<0.1
		27/06/2018	Normal	<0.1	<2.5	<1.5	121	<2	<0.1
		22/08/2018	Normal	<0.1	<2.5	1.7	161	<6	<0.1
		28/11/2018	Normal	<0.1	<2.5	<1.5	73	<6	<0.1
		24/09/2019	Normal	<0.1	<2.5	<1.5	324	<6	<0.1
		16/12/2019	Normal	<0.1	<2.5	<1.5	45	<6	<0.1
		21/12/2020	Normal	<0.1	<2.5	1.6	10	<6	<0.1
		25/03/2022	Normal	<0.1	<2.5	<1.5	65	<6	<0.1
		07/06/2023	Normal	<0.1	<2.5	<1.5	200	<6	<0.1

			Sample ID	SW1			SW2			SW3		SW4	Interceptor
			Sampled_Date_Time	01/11/2023	16/11/2023	14/12/2023	01/11/2023	16/11/2023	14/12/2023	01/11/2023	16/11/2023	14/12/2023	15/12/2023
			Sample_Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
			GAC Protective of Surface Waters										
Parameter	Unit	EQL											
Arsenic (Filtered)	µg/L	2.5	25 ^{#1}	-	-	<2.5	-	-	<2.5	-	-	<2.5	<2.5
Boron (Filtered)	µg/L	12		-	-	<12	-	-	<12	-	-	<12	<12
Chromium (III+VI) (Filtered)	µg/L	1.5	4.7 ^{#1}	-	-	<1.5	-	-	<1.5	-	-	<1.5	<1.5
Copper (Filtered)	µg/L	7	5 ^{#1}	-	-	<7	-	-	<7	-	-	<7	<7
Chromium (hexavalent)	µg/L	6	3.4 ^{#1}	-	-	<6	-	-	<6	-	-	<6	<6
Propiconazole	µg/L	0.1		<0.1	<0.1	1.8	<0.1	<0.1	5.8	2.5	3	3.8	3.5
Tebuconazole	µg/L	0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	2	1.9	<0.1	<0.1
Dissolved Organic Carbon	mg/L	2		-	-	22	-	-	23	-	-	21	3

Env Stds Comments
#1:Surface Water Regs SI 272 of 2009

GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed

xxx

Exceedance of GAC

	Fungicides	Metals				Other
	Propiconazole	Arsenic (Filtered)	Chromium (III+VI) (Filtered)	Copper (Filtered)	Chromium (hexavalent)	Tebuconazole
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	0.1	2.5	1.5	7	6	0.1
IE_LSM_SWSC		25 ^{#1}	4.7 ^{#1}	5 ^{#1}	3.4 ^{#1}	

EQL Comments
#1 EC Environmental Objectives (Surface Waters)
Regulations 2009 (S.I. No. 272 of 2009)
(blank): No assessment criteria available

Data Comments:
#1: Tentatively identified compound
- : Not analysed

GAC: Generic Assessment Criteria
xxx Exceeds GAC

Sample ID	Sampled Date Time						
SW1	01/02/2007	<0.05	<1	<5	<5	<30	-
	01/06/2007	0.13	3	<5	<5	-	-
	01/11/2007	<0.3	<1	<5	6	<30	-
	01/03/2008	<0.04	-	-	-	-	<0.04
	27/03/2008	-	1	<5	8	<150	-
	01/06/2008	<0.1	7	34	83	<40	<0.1
	01/09/2008	<0.1	7	20	34	<60	<0.1
	01/12/2008	<0.1	28	9	29	<30	<0.1
	01/05/2009	<0.04	7	16	44	<30	<0.04
	01/08/2009	<0.02	24	17	37	<30	0.023
	01/11/2009	<0.04	<1	<1	<1	<30	<0.04
	01/02/2010	<0.02	<1	4	21	<30	0.029
	01/07/2010	0.027	1.2	4	4	<30	0.064
	23/09/2010	<0.1	1.5	2.6	8	<30	<0.3
	15/12/2010	<0.02	1.9	9.3	30	<30	<0.06
	28/02/2011	<0.1	<2.5	3.6	7	<2	<0.1
	17/05/2011	<0.1	3.1	3.5	7	130	<0.1
	15/11/2011	<0.1	<2.5	<1.5	7	<2	<0.1
	28/02/2012	<0.1	<2.5	<1.5	7	<2	<0.1
	16/08/2012	-	<2.5	<1.5	7	<30	-
	15/11/2012	-	<0.5	13	<0.5	<5	-
	01/03/2013	<0.1	<2.5	<1.5	7	<30	<0.1
	22/04/2013	-	0.7	1.5	3.5	<5	-
	01/08/2013	<0.1	<2.5	1.8	7	<30	<0.1
	11/03/2014	<0.1 ^{#1}	<2.5	5	<7	<30	<0.1 ^{#1}
	12/05/2014	-	<1	1.9	1.5	<5	-
	27/08/2014	<0.1 ^{#1}	<2.5	6.7	<7	<6	<0.1 ^{#1}
	09/10/2014	-	<1	1.1	3.5	<5	-
	17/02/2015	<0.1 ^{#1}	<2.5	<1.5	<7	<6	<0.1 ^{#1}
	23/02/2015	-	<1	7.2	1.6	<5	-
	27/08/2015	-	<1	<1	1.5	<5	-
	29/09/2015	<0.1 ^{#1}	<2.5	<1.5	<7	<6	<0.1 ^{#1}
	30/03/2016	<0.1 ^{#1}	<2.5	<1.5	<7	<6	<0.1 ^{#1}
	09/05/2016	-	<1	5.1	1.1	<5	-
	22/09/2016	<0.1 ^{#1}	<2.5	<1.5	<7	<6	<0.1 ^{#1}
	30/09/2016	-	<1	1.5	19	<5	-
	23/03/2017	<0.2	<2.5	<1.5	<7	<6	<0.2
	24/08/2017	-	<1	<1	1.2	<5	-
	19/12/2017	<0.1	<2.5	<1.5	<7	<6	<0.1
	28/03/2018	<0.1	<2.5	<1.5	<7	<6	<0.1
	23/07/2018	-	<1	<1	2.9	<5	-
	22/08/2018	<0.1	<2.5	1.9	<7	<6	<0.1
	04/02/2019	-	<1	1.4	2.7	<5	-
	17/06/2019	<0.1	<1	<3	<3	<5	<0.1
	24/09/2019	<0.1	<2.5	<1.5	<7	<6	<0.1
	12/03/2021	0.1	<2.5	<1.5	<7	<6	0.2
	25/03/2022	<0.1	<2.5	1.5	<7	<6	<0.1
	15/03/2023	0.6	<2.5	<1.5	10	<6	0.4
	28/09/2023	<0.1	<2.5	<1.5	<7	<6	<0.1
	01/11/2023	<0.1	-	-	-	-	<0.1
	16/11/2023	<0.1	-	-	-	-	<0.1
	14/12/2023	1.8	<2.5	<1.5	<7	<6	<0.1

	Fungicides	Metals				Other
	Propiconazole	Arsenic (Filtered)	Chromium (III+VI) (Filtered)	Copper (Filtered)	Chromium (hexavalent)	Tebuconazole
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	0.1	2.5	1.5	7	6	0.1
IE_LSM_SWSC		25 ^{#1}	4.7 ^{#1}	5 ^{#1}	3.4 ^{#1}	

EQL Comments
#1 EC Environmental Objectives (Surface Waters) Regulations 2009 (S.I. No. 272 of 2009)
(blank): No assessment criteria available

Data Comments:
#1: Tentatively identified compound
- : Not analysed

GAC: Generic Assessment Criteria
xxx Exceeds GAC

Sample ID	Sampled Date Time						
SW2	01/02/2007	<1	13	6	2	-	-
	01/06/2007	<0.05	1	<5	<5	<30	-
	01/11/2007	<0.15	5	12	70	<30	-
	01/03/2008	<0.04	-	-	-	-	<0.04
	27/03/2008	-	1	<5	8	<150	-
	01/06/2008	<0.02	1	<5	6	<50	<0.02
	01/09/2008	<0.04	1	<1	3	<40	<0.04
	01/12/2008	<0.1	38	1	12	<30	<0.1
	01/05/2009	<0.04	22	16	294	<30	<0.04
	01/11/2009	<0.04	<1	<1	<1	<30	<0.04
	01/02/2010	<0.02	<1	<1	5	<30	<0.02
	01/07/2010	<0.02	1.2	<1	4	<30	<0.06
	23/09/2010	<0.04	1	<0.7	2	<30	<0.12
	15/12/2010	<0.02	2.12	1.7	20	<2	<0.06
	17/05/2011	<0.1	3.2	1.7	7	<2	<0.1
	15/11/2011	<0.1	<2.5	<1.5	120	<2	<0.1
	28/02/2012	<0.1	<2.5	<1.5	7	<2	<0.1
	16/08/2012	-	<2.5	<1.5	132	<30	-
	15/11/2012	-	<0.5	14	<0.5	<5	-
	01/03/2013	<0.1	<2.5	<1.5	7	<30	<0.1
	22/04/2013	-	0.6	0.8	1.4	<5	-
	01/08/2013	<0.1	<2.5	<1.5	7	<30	<0.1
	11/03/2014	<0.1 ^{#1}	<2.5	<1.5	<7	<30	<0.1 ^{#1}
	12/05/2014	-	<1	1	3	<5	-
	27/08/2014	<0.1 ^{#1}	3	<1.5	<7	<6	<0.1 ^{#1}
	09/10/2014	-	3.3	1.5		<5	-
	17/02/2015	<0.1 ^{#1}	<2.5	<1.5	<7	<6	<0.1 ^{#1}
	23/02/2015	-	5.8	8.5	5.1	<5	-
	27/08/2015	-	<1	<1	1.7	<5	-
	29/09/2015	<0.1 ^{#1}	<2.5	<1.5	<7	<6	<0.1 ^{#1}
	30/03/2016	<0.1 ^{#1}	<2.5	<1.5	<7	<6	<0.1 ^{#1}
	09/05/2016	-	<1	1.3	1.1	<5	-
	22/09/2016	<0.1 ^{#1}	<2.5	<1.5	<7	<6	<0.1 ^{#1}
	30/09/2016	-	<1	<1	15	<5	-
	23/03/2017	<0.2	<2.5	<1.5	<7	<6	<0.2
	19/12/2017	<0.1	<2.5	<1.5	<7	<6	0.2
	28/03/2018	<0.1	<2.5	<1.5	<7	<6	<0.1
	22/08/2018	<0.1	<2.5	1.9	<7	<6	<0.1
	04/02/2019	-	<1	1.1	2.7	<5	-
	17/06/2019	<0.1	<1	<3	6	<5	<0.1
	24/09/2019	<0.1	<2.5	<1.5	<7	<6	<0.1
	12/03/2021	<0.1	<2.5	<1.5	<7	<6	<0.1
	25/03/2022	<0.1	<2.5	<1.5	<7	<6	<0.1
	15/03/2023	<0.1	<2.5	1.5	<7	<6	<0.1
	28/09/2023	<0.1	<2.5	<1.5	<7	<6	<0.1
	01/11/2023	<0.1	-	-	-	-	<0.1
	16/11/2023	<0.1	-	-	-	-	<0.1
	14/12/2023	5.8	<2.5	<1.5	<7	<6	<0.1

	Fungicides	Metals				Other
	Propiconazole	Arsenic (Filtered)	Chromium (III+VI) (Filtered)	Copper (Filtered)	Chromium (hexavalent)	Tebuconazole
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	0.1	2.5	1.5	7	6	0.1
IE_LSM_SWSC		25 ^{#1}	4.7 ^{#1}	5 ^{#1}	3.4 ^{#1}	

EQL Comments
#1 EC Environmental Objectives (Surface Waters) Regulations 2009 (S.I. No. 272 of 2009)
(blank): No assessment criteria available

Data Comments:
#1: Tentatively identified compound
- : Not analysed

GAC: Generic Assessment Criteria
xxx Exceeds GAC

Sample ID	Sampled Date Time						
SW3	01/02/2007	0.91	-	-	-	-	-
	01/06/2007	-	11	<5	16	-	-
	01/05/2009	0.775	6	<1	6	<30	0.936
	01/11/2009	0.262	1	<1	<1	<30	0.262
	23/09/2010	0.247	6.3	1.3	8	<30	0.331
	28/02/2012	<0.1	5.9	<1.5	7	<2	<0.1
	11/06/2012	-	3.4	<1.5	7	<2	-
	16/08/2012	-	4.8	<1.5	7	<30	-
	01/11/2012	-	<2.5	<1.5	7	<30	-
	01/03/2013	<0.1	<2.5	2.4	7	<30	<0.1
	22/04/2013	-	4.1	1.1	9.6	<5	-
	01/05/2013	-	<2.5	<1.5	7	<30	-
	11/03/2014	<0.1 ^{#1}	4.5	<1.5	<7	<30	<0.1 ^{#1}
	12/05/2014	-	7.4	1.6	16	<5	-
	28/05/2014	-	<2.5	<1.5	<7	<6	-
	25/11/2014	-	7.6	<1.5	<7	<6	-
	17/02/2015	<0.1 ^{#1}	4.3	<1.5	<7	<6	<0.1 ^{#1}
	23/02/2015	-	<1	5.6	3.1	<5	-
	17/12/2015	-	<2.5	<1.5	8	<6	-
	23/03/2017	0.3	<2.5	<1.5	<7	<6	0.4
	08/06/2017	<0.1	<2.5	<1.5	<7	<6	<0.1
	28/03/2018	0.8	<2.5	<1.5	<7	<6	<0.1
	23/07/2018	-	<1	<1	1.9	<5	-
	28/11/2018	<0.1	<2.5	<1.5	<7	<6	<0.1
	04/02/2019	-	2.5	2	7.6	<5	-
	24/09/2019	<0.1	<2.5	<1.5	<7	<6	<0.1
	28/06/2022	3.3	<2.5	<1.5	15	<6	2.7
	15/03/2023	6.3	<2.5	<1.5	25	<6	6.9
	01/11/2023	2.5	-	-	-	-	2
	16/11/2023	3	-	-	-	-	1.9
SW4	21/12/2020	<0.1	<2.5	<1.5	<7	<6	<0.1
	12/03/2021	<0.1	<2.5	<1.5	<7	<6	<0.1
	08/06/2021	<0.1	<2.5	<1.5	<7	<6	<0.1
	25/03/2022	<0.1	<2.5	<1.5	<7	<6	<0.1
SW4A	14/12/2023	3.8	<2.5	<1.5	<7	<6	<0.1
Interceptor	15/12/2023	3.5	<2.5	<1.5	<7	<6	<0.1

Lab Report Number	23-21680-1-050124	23-21680-1-050124	
Field ID	BH26D	DUP01	RPD
Sampled Date/Time	14/12/2023	14/12/2023	

Chem_Group	ChemName	Units	MDL			
Metals	Chromium (hexavalent)	µg/l	6	757	661	14

*RPDs have only been considered where a concentration is greater than 1 times the EQL.
**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 80 (1-10 x EQL); 50 (10-20 x EQL); 30 (> 20 x EQL))

Appendix C – Laboratory Certificates

AECOM
4th Floor Adelphi Plaza
Adelphi Centre
Georges Street Upper
Dun Laoghaire, Co Dublin
Ireland



4225



Attention : Rory Devlin
Date : 5th January, 2024
Your reference : 60654829
Our reference : Test Report 23/21680 Batch 1
Location : LSM
Date samples received : 20th December, 2023
Status : Final Report
Issue : 202401051500

Twenty seven samples were received for analysis on 20th December, 2023 of which twenty six were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 20.634 kg of CO2

Scope 1&2&3 emissions - 48.764 kg of CO2

Authorised By:



Paul Boden BSc
Senior Project Manager

Please include all sections of this report if it is reproduced

Client Name: AECOM
Reference: 60654829
Location: LSM
Contact: Rory Devlin

[illegible]

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

It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 23/21680

SOILS and ASH

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

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

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

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

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

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

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

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

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

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

WATERS

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

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

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

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

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

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

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).

Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x20 Dilution

HWOL ACRONYMS AND OPERATORS USED

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

EMT Job No: 23/21680

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM0	No preparation is required.	Yes			
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.	Yes			

AECOM
4th Floor Adelphi Plaza
Adelphi Centre
Georges Street Upper
Dun Laoghaire, Co Dublin
Ireland



4225



Attention : Rory Devlin
Date : 5th January, 2024
Your reference : 60654829
Our reference : Test Report 23/21661 Batch 1
Location : LSM
Date samples received : 20th December, 2023
Status : Final Report
Issue : 202401051304

Six samples were received for analysis on 20th December, 2023 of which six were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 4.778 kg of CO2

Scope 1&2&3 emissions - 11.293 kg of CO2

Authorised By:



Paul Boden BSc
Senior Project Manager

Please include all sections of this report if it is reproduced

Client Name: AECOM
Reference: 60654829
Location: LSM
Contact: Rory Devlin

[illegible]

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

It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 23/21661

SOILS and ASH

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

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

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

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

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

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

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

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

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

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

WATERS

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

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

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

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

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

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

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).

Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x20 Dilution

HWOL ACRONYMS AND OPERATORS USED

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

EMT Job No: 23/21661

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM0	No preparation is required.	Yes			
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.	Yes			

AECOM
4th Floor Adelphi Plaza
Adelphi Centre
Georges Street Upper
Dun Laoghaire, Co Dublin
Ireland



Attention :	Rory Devlin
Date :	16th November, 2023
Your reference :	60654829
Our reference :	Test Report 23/18835 Batch 1
Location :	LSM
Date samples received :	10th November, 2023
Status :	Final Report
Issue :	1

One sample was received for analysis on 10th November, 2023 and was scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 0.29 kg of CO2

Scope 1&2&3 emissions - 0.684 kg of CO2

Authorised By:



Paul Boden BSc
Senior Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: AECOM
Reference: 60654829
Location: LSM
Contact: Rory Devlin
EMT Job No: 23/18835

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H₂SO₄, Z=ZnAc, N=NaOH, HN=HN0₃

[illegible]

Client Name: AECOM
Reference: 60654829
Location: LSM
Contact: Rory Devlin

[illegible]

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

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NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 23/18835

SOILS and ASH

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

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

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

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

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

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

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

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

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STACK EMISSIONS

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

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

Customer Provided Information

Sample ID and depth is information provided by the customer.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
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M	MCERTS accredited.
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NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

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

EMT Job No: 23/18835

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				

AECOM
4th Floor Adelphi Plaza
Adelphi Centre
Georges Street Upper
Dun Laoghaire, Co Dublin
Ireland



Attention : Rory Devlin
Date : 9th November, 2023
Your reference : 60654829
Our reference : Test Report 23/18386 Batch 1
Location : LSM
Date samples received : 3rd November, 2023
Status : Final Report
Issue : 1

Three samples were received for analysis on 3rd November, 2023 of which three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 0.869 kg of CO2

Scope 1&2&3 emissions - 2.053 kg of CO2

Authorised By:



Paul Boden BSc
Senior Project Manager

Please include all sections of this report if it is reproduced

Client Name: AECOM
Reference: 60654829
Location: LSM
Contact: Rory Devlin

[illegible]

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EMT Job No.: 23/18386

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EMT Job No: 23/18386

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				

AECOM
4th Floor Adelphi Plaza
Adelphi Centre
Georges Street Upper
Dun Laoghaire, Co Dublin
Ireland



Attention : Rory Devlin
Date : 30th November, 2023
Your reference : 60654829
Our reference : Test Report 23/19694 Batch 1
Location : LSM
Date samples received : 23rd November, 2023
Status : Final Report
Issue : 1

Three samples were received for analysis on 23rd November, 2023 of which three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 0.869 kg of CO2

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Authorised By:



Paul Boden BSc
Senior Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: AECOM
Reference: 60654829
Location: LSM
Contact: Rory Devlin
EMT Job No: 23/19694

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
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[illegible]

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EMT Job No: 23/19694

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Plinio Brioschi Neto
Graduate Environmental Scientist
M: (087) 486 0124
E: plinio.brioschineto@aecom.com

AECOM Ireland Limited
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T: +353 1 696 6220