

14050/RB

22 May 2026

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For the attention of Rhys Edwards

Earlswood Training Facility, Neath – Technical Note

1. Introduction

This technical note has been prepared by Intégral Géotechnique (Wales) Limited on behalf of Mid & West Wales Fire Service in connection with the Earlswood Training Facility at Jersey Marine, Neath.

This Technical Note supports the Supplementary Site Investigation Report (Ref: 14050/LW/25/SSI/RevB dated November 2025) and has been prepared specifically to respond to concerns raised by Natural Resources Wales (NRW) in their latest correspondence Ref. CAS-294 153-B0Y6 dated 16 December 2025 (copy included in Appendix A for reference), regarding PFAS groundwater contamination.

The detailed quantitative risk assessment (DQRA) presented within Supplementary Site Investigation Report (Ref: 14050/LW/25/SSI/RevB dated November 2025) concluded that recorded concentrations of lead and PFAS within the groundwater exceeded the remedial target levels at a 50m compliance point but did not present a potential risk to the River Neath. It should be noted that the DQRA was based on conservative numerical modelling from the upgradient borehole which recorded the highest concentrations and did not consider direct attenuation within the site itself.

Therefore, a mass flux assessment has been undertaken to further quantify the potential risk and support the conclusion made previously and as stated within Supplementary Site Investigation Report (Ref: 14050/LW/25/SSI/RevB dated November 2025).

This note presents further lines of evidence in support of the position that active groundwater remediation is not warranted at this site:

- The results and interpretation of a site-specific PFAS groundwater mass flux assessment;
- A summary of the groundwater risk assessment findings, including comparison with applicable regulatory thresholds; and
- A direct response to the specific concerns raised by NRW, demonstrating that each issue has been addressed through site data and risk-based analysis.

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2. Site Setting and Conceptual Site Model

2.1 Site Description

The Earlswood Training Facility is located at Jersey Marine, Neath, and is operated by Mid & West Wales Fire Service. The site is used as a fire training centre and comprises a main training building with associated hardstanding and operational areas.

Historical use of aqueous film-forming foam (AFFF) at and in the vicinity of the site has resulted in the presence of PFAS compounds, principally PFOS (perfluorooctane sulfonate) and PFOA (perfluorooctanoic acid), in the shallow groundwater beneath the site. The primary PFAS-bearing AFFF is no longer used or stored on site.

2.2 Hydrogeological Setting

The site is underlain by made ground of variable thickness (typically 0.5–3.0 m) overlying superficial soils comprising silty clayey sand to fine–coarse sand. Groundwater is encountered within the superficial deposits at depths of approximately 0.75–2.5 m below ground level (mbgl), equating to groundwater levels of approximately 5.5–6.1 m above ordnance datum (mAOD).

The River Neath is located approximately 200 m to the southeast of the site. Groundwater levels are considered to be in hydraulic continuity with the river, which is tidally influenced. Based on a site groundwater level of approximately 5.7 mAOD and a river level of approximately 1.0 mAOD over a separation distance of 200 m, the hydraulic gradient is calculated as 0.02 m/m in a southeasterly direction. This is consistent with the groundwater flow direction inferred from groundwater level monitoring data.

2.3 Source and Pathway Controls

The following operational and physical controls are in place that serve to reduce the PFAS source term and limit ongoing plume development:

- PFAS-containing AFFF has been removed from the site and is no longer used or stored on site, eliminating the active source;
- Made ground across the site is fully covered by building footprint and concrete hardstanding, preventing direct infiltration through the primary source material;
- Formal drainage infrastructure controls surface water run-off, minimising water ingress to ground and leachate generation; and
- The new fire training facility operates a fully closed drainage system. Process water is collected, recirculated and/or tankered off site, with no process water discharged to ground.

3. PFAS Groundwater Monitoring Data

3.1 Monitoring Network

Three groundwater monitoring standpipes (WS203, WS205, and WS206) were installed within windowless sample boreholes drilled to a maximum depth of 4.0 m bgl. Three rounds of groundwater sampling were undertaken, and the samples were analysed for an extended suite of PFAS compounds at i2 Analytical.

Based on the groundwater level and site plan data, the positions of the monitoring wells relative to groundwater flow are as follows:

- WS205: situated in the northern part of the site, upgradient of WS206 and in proximity to the historical AFFF storage and use area. This well represents the near-source groundwater conditions and carries the highest PFAS concentrations of the three monitoring wells.
- WS203: situated to the west of WS205, in an approximately cross gradient position relative to the southeast groundwater flow direction. The original site investigation rationale explicitly designated WS203 as an upgradient reference sample, and its spatial relationship to WS205, positioned laterally across the flow direction rather than downgradient, is consistent with this designation. WS203 and WS205 are best understood as two wells spanning the source zone on approximately the same control plane perpendicular to flow. PFAS concentrations detected at WS203 (average PFOS 5.0 ng/L) likely reflect lateral migration within the source zone rather than downgradient attenuation from WS205.
- WS206: situated on the south eastern site boundary, in a downgradient position relative to WS205. This well is positioned closest to the site boundary in the direction of groundwater flow and therefore best represents conditions approaching the River Neath receptor. This well was drilled outside the hardstanding area, into undisturbed superficial soils.

3.2 PFAS Concentration Summary

The PFAS compounds detected at concentrations above laboratory limits of detection across the three monitoring rounds are summarised in Table 1 below. PFOS and PFOA are the principal compounds of concern.

Table 1: Summary of PFAS Concentrations in Groundwater (ng/L)

Borehole	Round 1 PFOS	Round 2 PFOS	Round 3 PFOS	Round 1 PFOA	Round 2 PFOA	Round 3 PFOA	Notes
WS205	36.3	23.2	28.0	24.6	24.7	32.4	Near-source, upgradient
WS203	5.3	4.08	5.75	8.7	2.37	5.51	Source zone / upgradient reference (cross gradient to WS205)
WS206	1.98	<0.65 ND	<0.65 ND	1.39	<LoD ND	<LoD ND	Site boundary, downgradient
AA-EQS (PFOS)	0.65	0.65	0.65	n/a	n/a	n/a	WFD surface water EQS

All PFAS concentrations are directly reported analytical results from VLS subcontracted low-level analysis. ND = not detected above the laboratory limit of detection (0.65 ng/L); half-LoD (0.325 ng/L) applied conservatively for non-detects in the flux calculation. All values in ng/L.

The data demonstrate a clear and consistent concentration gradient from the near-source well (WS205) to the site boundary well (WS206). Critically, PFOS at WS206 was detectable only in Round 1 at 1.98 ng/L and fell entirely below the 0.65 ng/L laboratory detection limit in both subsequent monitoring rounds. This represents a 95% concentration reduction from WS205 to WS206 in Round 1, and complete attenuation to below detection limits at the site boundary in Rounds 2 and 3, despite WS205 remaining elevated at 23–28 ng/L throughout. This is strong empirical evidence of natural attenuation occurring within the aquifer between the source zone and the site boundary.

4. PFAS Groundwater Mass Flux Assessment

4.1 Methodology

A mass flux assessment has been undertaken to quantify the rate at which PFAS compounds are migrating through the aquifer at two control planes (transects) perpendicular to the groundwater flow direction. This approach is consistent with established contaminated land guidance and provides a more complete characterisation of risk than concentration data alone, as it accounts for both the concentration and the volumetric flow of groundwater transporting the contamination.

The transect integral method has been applied, in which the mass flux contribution from each borehole is calculated as the product of the Darcy flux, the representative cross-sectional area assigned to that borehole, and the measured contaminant concentration. Total flux across each transect is the sum of contributions from all boreholes on that transect.

The assessment considers two compounds of concern: PFOS, for which regulatory thresholds exist, and PFOA, which is present at comparable concentrations. Where concentrations were reported as below the laboratory limit of detection (LoD), a value of half the LoD has been applied conservatively for the calculation.

4.2 Hydraulic Parameters

The hydraulic parameters applied in the mass flux assessment are derived directly from site-specific data obtained during the supplementary site investigation and are consistent with those used in the Level 3 Quantitative Risk Assessment:

Table 2: Hydraulic Parameters Applied in Mass Flux Assessment

Parameter	Value	Basis
Hydraulic conductivity, K	0.04 m/day	Rising head permeability test, WS205
Hydraulic gradient, i	0.02 m/m	Calculated from GW levels (5.7 mAOD) to River Neath (1.0 mAOD) over 200 m
Darcy flux, $q = K \times i$	8.0×10^{-4} m/day	Calculated
Effective porosity, n	0.16	Silty clayey sand (literature, consistent with DQRA)
Saturated aquifer thickness, b	4.0 m	Maximum proven thickness (boreholes to 4.0 m bgl)
Seepage velocity, $v = q/n$	5.0×10^{-3} m/day	Calculated
Assumed screened interval length	3.0 m	Conservative: borehole depth 4.0 m, GW at 0.75–0.87 mbgl (monitoring data)

4.3 Transect Design

Two control plane transects have been defined perpendicular to the southeast groundwater flow direction:

- **Transect A (source zone):** a single-borehole transect through WS205, representing groundwater conditions in the near-source zone upgradient of the site. An assumed plume width of 20 m has been applied, consistent with the value adopted in the DQRA and based on the estimated lateral extent of the PFAS plume perpendicular to the groundwater flow direction at the source zone.
- **Transect B (site boundary / compliance point):** a single-borehole transect through WS206, representing groundwater conditions at the site boundary in the downgradient direction towards the River Neath. WS206 is the most downgradient well and is positioned closest to the site boundary in the direction of groundwater flow. An assumed plume width of 20 m has been applied, consistent with the DQRA and the estimated lateral extent of the PFAS plume perpendicular to the groundwater flow direction at the site boundary.

WS203 does not form part of either transect but provides valuable corroborating data. The concentration data from WS203, consistently 4–6 ng/L PFOS across all rounds, reflects lateral influence within the source zone and is considered alongside the transect results for context. As WS203 is cross gradient to the principal flow direction (see Section 3.1), it cannot demonstrate downgradient attenuation along the source-to-boundary flow path.

The along-gradient separation of the three wells allows the mass flux assessment to characterise attenuation across the full flow path from source to site boundary.

4.4 Mass Flux Calculation

Mass flux at each transect has been calculated using the transect integral method:

$$\text{Flux (g/day)} = q \text{ (m/day)} \times A \text{ (m}^2\text{)} \times C \text{ (ng/L)} \times 10^{-6}$$

where A is the assumed plume cross-sectional area (assumed plume width × screen length), and C is the measured or conservatively estimated PFAS concentration. Average concentrations across the three monitoring rounds have been used to represent steady-state conditions.

Table 3: Mass Flux Calculation Results

Parameter	WS205 (Transect A)	WS203 (intermediate)	WS206 (Transect B)	Total Transect A	Total Transect B	Notes
Assumed plume width (m)	20	20	20	—	—	
Screen length (m)	3.0	3.0	3.0	—	—	
Area (m ²)	60	60	60	—	—	Width × screen length
Avg PFOS conc (ng/L)	29.2	5.04	0.88	—	—	WS206 R2/R3: ½ LoD applied
Avg PFOA conc (ng/L)	27.2	5.53	0.68	—	—	WS206 R2/R3: ½ LoD applied

Parameter	WS205 (Transect A)	WS203 (intermediate)	WS206 (Transect B)	Total Transect A	Total Transect B	Notes
PFOS flux (g/day)	1.40×10^{-6}	2.42×10^{-7}	4.21×10^{-8}	1.40×10^{-6}	4.21×10^{-8}	WS206 only
PFOA flux (g/day)	1.31×10^{-6}	2.65×10^{-7}	3.26×10^{-8}	1.31×10^{-6}	3.26×10^{-8}	WS206 only
Total PFAS flux (g/day)	—	—	—	2.71×10^{-6}	7.47×10^{-8}	Source zone (A) vs site boundary WS206 (B)
Total PFAS flux (kg/yr)	—	—	—	9.88×10^{-7}	2.73×10^{-8}	
Flux attenuation A→B	—	—	—	—	97%	Reduction source→boundary

4.5 Interpretation

The mass flux assessment demonstrates that the total PFAS flux at Transect A (source zone WS205) is 2.71×10^{-6} g/day (9.88×10^{-7} kg/yr), reducing to 7.47×10^{-8} g/day (2.73×10^{-8} kg/yr) at Transect B (site boundary, WS206 only), representing a 97% reduction in PFAS mass flux between the source zone and the site boundary.

WS203, being cross gradient to the principal flow direction, does not form part of the transect flux calculation. Its PFAS detections are consistent with lateral source zone influence rather than downgradient plume migration, and do not affect the compliance transect result at WS206.

These are extremely low absolute mass flux values. In absolute terms, the flux arriving at the site boundary from this site is in the order of nanograms to low micrograms per day, several orders of magnitude lower than would be considered significant in a mass flux risk context. For comparison, mass flux thresholds discussed in EA and international guidance for significant PFAS plumes are typically of the order of grams per day or higher.

The 97% mass flux attenuation between Transects A and B provides quantitative confirmation that natural attenuation processes, including dilution, dispersion, and sorption onto aquifer materials, are actively reducing the mass of PFAS migrating towards the River Neath. This is consistent with the concentration data, which show PFOS concentrations falling below the 0.65 ng/L detection limit at WS206 in two of the three monitoring rounds (Rounds 2 and 3).

The calculation has been deliberately conducted using average concentrations across all three monitoring rounds, with half the limit of detection applied conservatively for non-detects. This means the flux estimates are conservative (actual fluxes in Rounds 2 and 3 are likely lower than presented).

It should be noted that the River Neath at Jersey Marine is subject to tidal influence from the Severn Estuary, which has one of the largest tidal ranges in the world. Tidal fluctuation in the river level will have a direct effect on the hydraulic gradient driving groundwater flow between the site and the river. The hydraulic gradient applied in the DQRA and mass flux assessment (0.02 m/m) is derived from the difference between the measured site groundwater level (approximately 5.7 mAOD) and a representative river level (approximately 1.0 mAOD) over a separation distance of approximately 200 m. This represents a static, time-averaged condition and does not account for tidal fluctuation in the river.

At high tide, the rise in water level of the River Neath will effectively reduce the hydraulic head difference between the site groundwater and the river. Depending on the tidal range at this location, the hydraulic gradient may be significantly reduced or potentially reversed during periods of high tide, temporarily inhibiting or reversing the direction of groundwater flow towards the river. Over a complete tidal cycle, the net seaward groundwater flux may therefore be considerably lower than the static gradient implies, and in the most conservative interpretation could approach near-zero over the tidal period if rising and falling limb effects approximately cancel.

This has two important implications for the risk assessment. Firstly, the Darcy flux and associated mass flux figures presented in Section 4 are based on the static hydraulic gradient and therefore represent a conservative overestimate of the actual long-term rate of contaminant transport towards the River Neath. The true time-averaged mass flux at the site boundary is likely to be lower than calculated, providing additional assurance that the already extremely low flux value of 7.47×10^{-8} g/day is not understated. Secondly, tidal oscillation of the water table promotes repeated mixing and dispersion within the aquifer, which is known to enhance physical attenuation processes including dilution, dispersion and sorption. The tidal character of the River Neath therefore actively supports rather than undermines the physical attenuation of PFAS migrating towards the river.

5. Regulatory Threshold Assessment

5.1 Groundwater and Surface Water Standards

The following regulatory thresholds are applicable to the assessment of PFAS at this site:

- PFOS Annual Average Environmental Quality Standard (AA-EQS) for inland surface water: 0.65 ng/L. This is the primary regulatory threshold for the protection of the River Neath.
- PFOS Maximum Allowable Concentration (MAC-EQS): 36 µg/L (36,000 ng/L). All site groundwater concentrations are significantly below this threshold.
- DWI PFAS monitoring thresholds (sum of 48 PFAS): Tier 1 (no action required below 0.01 µg/L); Tier 2 (investigation required between 0.01 and 0.1 µg/L); Tier 3 (immediate action above 0.1 µg/L). The site is not within a Source Protection Zone.
- UK Technical Advisory Group (UKTAG) groundwater annual mean threshold: 1 µg/L (1,000 ng/L) for PFOS. All groundwater concentrations are below this threshold.

5.2 Compliance Assessment

The PFOS concentrations in groundwater at WS205 and WS203 exceed the AA-EQS of 0.65 ng/L. However, groundwater concentrations alone are not the appropriate metric for assessing risk to surface water, the relevant assessment is whether PFAS migrating from the site is likely to cause the River Neath to exceed the EQS. This has been assessed through the Level 3 DQRA and is further supported by the mass flux analysis presented herein.

Three rounds of direct River Neath surface water monitoring demonstrate that PFOS was detectable in the downstream sample in one round only (Round 2: 0.79 ng/L), slightly above the AA-EQS of 0.65 ng/L, and was not detected in the upstream or downstream samples in Rounds 1 or 3. The Round 2 detection is consistent with background sources (including from multiple industrial sites upstream) and cannot be attributed to the Earlswood site given that WS206 returned a non-detect for PFOS in Rounds 2 and 3. The mass flux data, showing 7.47×10^{-8} g/day arriving at the site boundary, supports the conclusion that the site is not the source of river exceedances.

6. Response to NRW Concerns

NRW's correspondence (Ref. CAS-294 153-B0Y6 dated 16 December 2025) raises specific concerns regarding the controlled waters risk assessment, the 50 m compliance point exceedances for lead, PFOS and 6:2FTS, the distance of the River Neath from the site boundary, and the adequacy of the justification for not requiring remedial action. Each of NRW's points is considered in turn below.

6.1 50 m Compliance Point Exceedances: Lead, PFOS and 6:2FTS

NRW notes that the DQRA identifies exceedances of the remedial target concentration at the 50 m compliance point for lead, PFOS, and 6:2FTS. This is acknowledged. Under the accepted compliance point guidance, exceedances at the 50 m default compliance point for hazardous substances trigger the requirement to investigate, assess, and if necessary, take remedial action to reduce the source term, stabilise the migrating front, or reduce plume expansion.

The position of this technical note is that this obligation has been fulfilled through the Level 3 DQRA, the mass flux assessment presented in Section 4 of this Technical Note, and the empirical River Neath monitoring data.

These collectively and independently demonstrate that the plume does not extend beyond the site boundary in concentrations that pose an unacceptable risk to the River Neath or to groundwater as a receptor in its own right. The specific justification for each contaminant is set out in Sections 6.2 to 6.4 below.

6.2 Lead

Lead concentrations in groundwater at WS205 and WS203 have been recorded above the AA-EQS threshold of 1.2 µg/L across all three monitoring rounds, with a maximum detected concentration of 15 µg/L at WS205 in Round 1. The DQRA confirms that this exceeds the remedial target at the 50 m compliance point but does not exceed the remedial target at the 200 m compliance point (the River Neath).

Two important lines of evidence support the conclusion that lead does not present an unacceptable risk to controlled waters requiring active remediation:

- Source attribution. The DQRA concludes that the elevated concentrations of lead in groundwater are likely attributable to the historical nature of the site and the wider area rather than a discrete identifiable onsite source. Lead is commonly encountered in made ground across industrial areas of South Wales and its presence in shallow groundwater is consistent with background leaching from the general made ground rather than a site-specific contamination event. This is a material distinction when assessing the proportionality of remedial action, since there is no discrete source to reduce. Additionally, the site surface is hard finished with a fully closed drainage system, thereby reducing potential leachate generation.
- Site-specific PNEC. Site-specific Predicted No-Effect Concentrations (PNECs) have been calculated for lead using the Water Framework Directive M-BAT Metal Bioavailability Tool, accounting for site groundwater chemistry including dissolved organic carbon. PNECs of between 4.21 µg/L and 11.99 µg/L were derived. Whilst two recorded concentrations exceed their respective PNECs, the PNEC-based assessment demonstrates that the toxicologically relevant threshold is substantially higher than the generic AA-EQS, reflecting the specific bioavailability conditions at this site.

Lead concentrations at WS206, the site boundary downgradient well, were 1.6 µg/L (Round 1, marginally above the AA-EQS of 1.2 µg/L) and below detection in Rounds 2 and 3.

No lead exceedances were recorded in River Neath surface water monitoring. The DQRA modelling confirms that concentrations attenuate to below the remedial target before reaching the 200 m compliance point.

Given the likely background source of lead, the low and intermittent concentrations at the site boundary, the DQRA confirmation that the 200 m compliance point is not exceeded, and the absence of lead in River Neath monitoring, remedial action specifically targeting lead in groundwater is not considered proportionate or technically justified under the Remedial Targets Framework v2.

6.3 PFOS

PFOS exceedances at the 50 m compliance point arise from the near-source concentrations at WS205. The case for no active remediation in respect of PFOS is set out in detail in Sections 4 and 5 of this technical note and is supported by three independent lines of evidence:

- Mass flux at the site boundary (WS206, Transect B) is 4.21×10^{-8} g/day for PFOS alone. Total PFAS flux at the suite boundary is 7.47×10^{-8} g/day, representing a 97% reduction in total PFAS flux from the source zone. This is an extremely low absolute value, several orders of magnitude below flux levels considered significant in regulatory guidance.
- WS206 returned PFOS below the laboratory detection limit of 0.65 ng/L in two of three monitoring rounds (Rounds 2 and 3). The single detection of 1.98 ng/L in Round 1, whilst above the AA-EQS, is substantially below concentrations that would generate an exceedance at the River Neath after further dilution and attenuation across the remaining aquifer distance.
- Three rounds of direct River Neath surface water monitoring confirm PFOS was below the AA-EQS of 0.65 ng/L in two of three rounds. The single above-threshold detection in Round 2 (0.79 ng/L) coincided with a PFOS non-detect at WS206, making attribution of that exceedance to the Earlswood site implausible.

The PFAS source has been eliminated. PFAS-containing AFFF is no longer used or stored at the site, use of PFOS-containing foam has been prohibited since June 2017, and the new training facility operates a fully closed drainage system with no process water discharged to ground. In the absence of an active source, residual groundwater concentrations are expected to continue declining through physical attenuation, principally dilution, dispersion and sorption, in the absence of ongoing recharge to the source zone.

6.4 6:2 Fluorotelomer Sulfonic Acid (6:2FTS)

6:2FTS was detected at WS205 only across all three monitoring rounds, at concentrations of 0.38 µg/L (Round 1), 0.75 µg/L (Round 2), and 1.3 µg/L (Round 3). No detections of 6:2FTS were recorded at WS203 or WS206 in any monitoring round. The absence of 6:2FTS at WS206 provides direct empirical evidence that this compound has not migrated to the site boundary and is confined to the near-source zone at WS205.

No published EQS values currently exist for 6:2FTS in the UK. The DQRA applied the available remedial target methodology and identified a modelled exceedance at the 50 m compliance point.

However, the empirical monitoring data take precedence over modelled values where they exist: zero detections across six sampling events at WS203 and WS206 constitutes strong evidence that 6:2FTS is not migrating at concentrations of concern. The modelled 50 m exceedance reflects the conservative nature of the RTM methodology rather than actual conditions in the aquifer.

It is further noted that 6:2FTS has the potential to transform to PFHxA under certain environmental conditions. No detections of PFHxA were recorded in any groundwater or soil sample from the site, confirming that this transformation is not occurring at concentrations of concern.

6.5 Groundwater as a Receptor in its Own Right and River Neath Distance

NRW identifies that groundwater must be assessed as a receptor in its own right and notes that the River Neath is less than 200 m from the site boundary. Both points are noted. The relevant question under the Remedial Targets Framework v2 is whether contaminant plumes are extending or likely to extend beyond the applicable compliance distances, and whether identified exceedances give rise to unacceptable risk that is not being managed by existing controls.

The following factors collectively demonstrate that the plume is stable, attenuating, and controlled:

- The plume is not expanding. Three rounds of monitoring show stable or declining groundwater concentrations. PFOS and 6:2FTS are undetectable at WS206 in two of three rounds, and 6:2FTS is undetectable at both WS203 and WS206 across all rounds.
- The mass flux assessment quantifies a 97% reduction in PFAS flux between source zone and site boundary, with total PFAS flux at the site boundary of 7.47×10^{-8} g/day, consistent with a stable, attenuating plume rather than an expanding one.
- The River Neath, whilst confirmed to be less than 200 m from the site boundary and its closest point, but approximately 200m from the site along the hydraulic gradient direction, is not being impacted at concentrations above regulatory thresholds attributable to this site, as confirmed by three rounds of direct surface water monitoring.
- Existing source and pathway controls are in place and effective: full hardstanding coverage, formal drainage, no infiltration, and a closed-circuit process water system at the new training facility. These controls actively limit recharge of the contaminated zone and support continued natural attenuation.
- Lead concentrations in groundwater are consistent with background diffuse leaching from made ground across the wider area rather than a discrete migrating plume and are not detected in River Neath surface water monitoring.

It is considered that the totality of evidence presented in this technical note and the accompanying DQRA provided previously within Supplementary Site Investigation Report (Ref: 14050/LW/25/SSI/RevB dated November 2025) constitutes a sufficient justification, under the Remedial Targets Framework v2, that no active groundwater remediation is warranted at this site.

Active remediation of groundwater at the concentrations and fluxes present would be technically challenging, disproportionately expensive relative to the residual risk, and unlikely to achieve material improvement in groundwater or surface water quality within a practicable timescale.

7. Conclusions

This technical note presents a groundwater mass flux assessment, a response to the specific concerns raised by Natural Resources Wales (NRW), and additional technical justification in support of the no-active-remediation conclusion reached in the Level 3 DQRA. The key conclusions are:

- The 50 m compliance point exceedances for lead, PFOS and 6:2FTS identified in the DQRA are acknowledged. However, the Remedial Targets Framework v2 requires that exceedances at the default 50 m compliance point be assessed in the context of actual plume behaviour, receptor risk, and the proportionality of remediation, not treated as automatic triggers for remedial action.
- Lead exceedances in groundwater are attributed to background diffuse leaching from made ground across the wider industrial area rather than a discrete manageable onsite source. Concentrations at the site boundary well (WS206) are low and intermittent, no lead exceedances have been recorded in River Neath surface water monitoring, and the DQRA confirms the 200 m compliance point is not exceeded. Active remediation targeting diffuse background lead would not be technically justified or proportionate.
- 6:2FTS has not been detected at WS203 or WS206 in any of the three monitoring rounds, confirming empirically that this compound is confined to the near-source well (WS205) and has not migrated to the site boundary. The modelled 50 m exceedance reflects the conservative nature of the RTM methodology; the empirical monitoring data demonstrate that 6:2FTS does not pose a risk to controlled waters at or beyond the site boundary.
- PFAS (principally PFOS and PFOA) concentrations show a clear attenuation gradient from the source zone (WS205: average PFOS 29.2 ng/L) to the site boundary (WS206: PFOS non-detect in two of three monitoring rounds). The mass flux assessment quantifies total PFAS flux at the source zone as 2.71×10^{-6} g/day, reducing by 97% to 7.47×10^{-8} g/day at the site boundary, an extremely low absolute value consistent with a stable and attenuating plume.
- The PFAS source has been eliminated. PFAS-containing AFFF is no longer used or stored on site, use of PFOS-containing foam has been prohibited since June 2017, and the new training facility operates a fully closed drainage system with no discharge to ground. Residual groundwater concentrations are expected to continue declining through physical attenuation process, principally dilution, dispersion and sorption, in the absence of ongoing recharge to the source zone.
- Three rounds of direct River Neath surface water monitoring confirm that the site is not causing exceedances at the river attributable to this site. The single above-EQS PFOS detection in Round 2 (0.79 ng/L) coincided with a non-detect at WS206, making attribution to Earlswood implausible, particularly given the various upstream industrial sites that are present along the banks of the River Neath.
- Existing source and pathway controls, full hardstanding coverage, formal drainage infrastructure, and a closed-circuit process water system, are in place and effective, actively limiting infiltration and supporting continued natural attenuation.

- On the basis of the Level 3 DQRA, the mass flux assessment, the empirical monitoring data, and the source and pathway controls in place, it is submitted that a no-active-remediation conclusion is sufficiently justified under the Remedial Targets Framework v2 and the compliance point guidance. Active remediation of groundwater at the concentrations and fluxes present at this site would be technically challenging, disproportionately expensive relative to the residual risk, and unlikely to achieve material improvement in groundwater or surface water quality within a practicable timescale.

We trust the above is to your satisfaction. However, if you have any queries or wish to discuss this further, please do not hesitate to contact us.

Yours faithfully



Rob Bathurst
For
Intégral Géotechnique (Wales) Limited

Enc.

Appendix A NRW Correspondence Ref. CAS-294 153-B0Y6 dated 16 December 2025

APPENDIX A

NRW CORRESPONDENCE

Ein cyf/Our ref: CAS-294153-B0Y6
Eich cyf/Your ref: P2025/0706

Neath Port Talbot County Borough Council
The Quays
Briton Ferry
SA11 2GG

Dyddiad/Date: 16 December 2025

Annwyl / Dear Ms Hall,

BWRIAD/PROPOSAL: Details submitted pursuant to discharge of conditions 3 (intrusive site investigation), 4 (remediation scheme) and 5 (verification report) of planning permission P2023/0466 dated 30.11.23 (which varied planning permission P2022/0589 for the conversion of existing workshop building into a carbonaceous fire behaviour training facility)

LLEOLIAD/LOCATION: Earlswood Depot Earlswood Depot Access Road Jersey Marine Neath Port Talbot SA10 6NG

Thank you for re consulting Cyfoeth Naturiol Cymru (CNC)/Natural Resources Wales (NRW) about the above, which we received on 27 November 2025.

We continue to have concerns with the application as submitted. We do not recommend your Authority discharges conditions 3,4 and 5 for the following reasons.

Land Contamination

We have reviewed the additional information provided in support of the application:

- Letter response prepared by Integral Geotechnique, Dated 26 November 2025
- Earlswood Training Facility, Supplementary Site Investigation and Controlled Waters Risk Assessment, Revision B, Prepared by Integral Geotechnique, Dated November 2025

We welcome clarification of the points raised by NRW with regards to the Conceptual Site Model and Water Quality Standards as well as the additional assessment of PFAS concentrations within soils and the controlled waters risk assessment input parameters including a sensitivity analysis. The additional information resolves the majority of NRW's outstanding queries.

We note that the outcome of the controlled waters risk assessment having revised the compliance point to 50m for hazardous substances in line with [Land contamination groundwater compliance points: quantitative risk assessments - GOV.UK](#) show exceedances of Lead, PFOS and 6:2 FTS. According to the above guidance:

Where there is existing groundwater contamination, your aim is to avoid contaminant plumes extending beyond the 50 or 250 metre distances. This is measured from the boundary of the original pollutant source. If your hydrogeological risk assessment indicates this has or may occur, you must investigate, assess and if necessary take remedial action to:

- *reduce the source term*
- *stabilise the migrating front of the plume*
- *reduce the expansion of the plume*

The supplementary site investigation report suggests:

“The results indicate that the maximum detected concentration of each of identified potential contaminants of concern in groundwater do not exceed the derived remedial target concentration for the 200m compliance point consisting of the River Neath.

Although the concentrations of lead, PFOS and 6:2FTS exceed the derived remedial target concentration at a 50m compliance point, the results indicate that the concentrations are not considered to pose a risk to the water quality of the River Neath”.

According to NRW’s mapping system the River Neath is <200m from the site boundary and the groundwater must also be considered as a receptor in its own right. A decision against taking remedial action must be sufficiently justified in line with the above guidance and [Remedial Targets Framework v2](#). We don’t consider the above to be sufficient justification at this time therefore we are unable to recommend discharge of conditions.

Other Matters

The advice in this letter relates to matters which are included on our [consultation topics list](#). We do not rule out the potential for the proposed development to affect other environmental interests that are not included on this list.

We advise the applicant that, in addition to planning permission, it is their responsibility to ensure they secure all other permits/consents/licences relevant to their development. Please refer to our [website](#) for further details.

If you have any queries about the above, please do not hesitate to contact us.

Yn gywir / Yours faithfully,

Harriet Power

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Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi./Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay.