CBRE

West Midlands Interchange Proposed Non-Material Change Environmental Implications Report

West Midlands Rail Freight Interchange Order 2020 (as amended).

Four Ashes Limited
June 2023

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1. Introduction

1.1. Context

Four Ashes Limited ('FAL') has the benefit of The West Midlands Rail Freight Interchange Order 2020 (as amended by The West Midlands Rail Freight Interchange (Correction) Order 2020) ("the Order").

The Order (as amended) granted consent for a 'strategic rail freight interchange' ('SRFI') on land at Four Ashes within South Staffordshire District, close to Junction 12 of the M6 motorway. FAL has adopted the name 'West Midlands Interchange ('WMI') for the project. The main components of development granted by the Order can be summarised as follows:

- An intermodal freight terminal with direct connections to the West Coast Main Line, capable of accommodating at least four trains per day and trains of up to 775m long, including container storage, Heavy Goods Vehicle ('HGV') parking, rail control building and staff facilities;
- Up to 743,200 m^2 (gross internal area) of rail served warehousing and ancillary service buildings;
- New road infrastructure and works to the existing road infrastructure;
- Demolition and alterations to existing structures and earthworks to create development plots and landscape zones;
- Reconfiguring and burying of electricity pylons and cables; and
- Strategic landscaping and open space, including alterations to public rights of way and the creation of new ecological enhancement areas and publicly accessible open areas, including two new country parks.

The application for theOrder was submitted in 2018 (the '2018 application') and was accompanied by an Environmental Statement (the '2018 ES') prepared by Ramboll Limited and supporting technical specialists on behalf of FAL (the Applicant)[1].

The Applicant are now submitting an application for an amendment to the Order (the '2023 Non-Material Change (NMC) Application') in accordance with section 152 and Schedule 6 of the Planning Act 2008 and the Infrastructure Planning (Changes to, and Revocation of, Development Consent Orders) Regulation 2011 (as amended). A series of non-material changes are now being proposed as part of this application to address technical considerations (the '2023 proposed amendments'). Consent is sought for the following amendments to the Order:

- **The Bridge Span and Width Changes:** Amendments to the consented bridge spans for Bridges Nos. 1-4 and the consented bridge widths for Bridge Nos. 1, 2 and 3, including amendments to the general arrangement of carriageway and footway/cycleway, identified on the Bridge Plans and Highway General Arrangement Plans (Section 3.2.1);
- **The Road Level Changes:** Amendments to certain consented finished road levels identified on the certified Development Zone, Floor Levels and Building Heights and Green Infrastructure Parameters Plans (Section 3.2.2);
- **The Rail Infrastructure Area (Zone C) Changes:** Amendments to enable the inclusion of 0.0308ha of additional land currently outside of Order Limits within the south of Zone C to accommodate extended cripple siding and buffer stop within the new railway area connecting the new Rail Freight Terminal to the West Coast Main Line Loop Railway ("WCML Loop"); and expansion of Zone C into currently consented Green Infrastructure and Rail-Served Warehousing Land to facilitate rail switches underneath the widened Bridge No.1 span width proposed as part of the Bridge Span and Width Changes (Section 3.2.3); and
- **The Straight Mile / Woodlands Lane / Kings Road Footway Changes**: Amendments to the proposed locations of dropped kerb crossings and new footway on Straight Mile / Woodlands Lane / Kings Road (Section 3.2.4).

[1] A number of updated technical assessments were submitted following the submission of the application. For the purpose of this report, the '2018 ES' refers to the original 2018 ES, as amended by the updated technical assessments.

This document should also be read alongside the Application Statement, draft Amendment Order and other plans and documents submitted as part of this NMC Application.

1.2. Document Purpose and Structure

This document provides a review of the proposed design changes, and the amended development as a whole, in the context of the assessment findings reported in the 2018 ES [certified Document 6.2 as identified in Schedule 15 of the Order]. In doing so, the review has been informed by Planning Act 2008 Guidance[2] and consideration has been given to whether the proposed amendments to the 2022 Order give rise to any new or, materially different, likely significant effects on the environment to those set out in the 2018 ES and whether the conclusions of the 2018 ES remain valid.

The conclusions of the 2018 Habitat Regulations Assessment which accompanied the 2018 application have also been reviewed in light of the amendments proposed.

This document is set out as follows:

- Chapter 2 of this document provides a summary of the key elements of the proposed development as set out in the Order and as assessed within the 2018 ES, together with confirmation of which elements are being amended through this 2023 NMC application;
- Chapter 3 of this document provides details of the design changes proposed, along with any salient updates to things such as the list of committed development considered within the cumulative assessment of the 2018 ES;
- Chapter 4 of this document provides details on the review process undertaken by the EIA technical consultants and an overview of the conclusions found from the reviews;
- Appendix A comprises the figures, including the consented scheme plans and proposed amendments;
- Appendix B provides the ES authors' technical competencies; and
- Appendices C to F report the findings of the reviews undertaken by technical topic specialists, as required.

For further details regarding the Order, description of and rationale for the 2023 NMC Application, refer to the accompanying Application Statement produced by CBRE.

[2] Planning Act 2008: Guidance on Changes to Development Consent Orders, DCLG (December 2015).

2. The Order Design Summary

2.1. Main Components

The 2018 ES clearly outlined that the assessment of effects reported within that document was based on the proposed development description included within the Chapter 4: 'Description of the Proposed Development', Volume I of the ES and the supporting plans submitted as part of the 2018 application and authorised under Works in Part 1 Schedule 1 of the Order (as listed in Sections 2-5 of the Application Statement). 2018 ES Vol I Chapter 2 paras 2.49 – 2.56 summarise how the assessment accorded with the PINS 'Advice Note Nine: *Rochdale Envelope*[3]', whereby parameter plans have been used to establish an appropriate development envelope for testing which enabled the identification and assessment of the likely significant effects of the proposed development. Three parameter plans (Development Zone; Floor Levels and Building Heights; and Green Infrastructure) formed the basis of the technical assessments, as presented within the ES technical chapters.

The summary of the proposed development is provided in Chapter 4: 'Description of the Proposed Development' of the 2018 ES is as follows:

- An intermodal freight terminal with direct connections to the West Coast Main Line, capable of accommodating up to 10 trains per day and trains of up to 775 m long, including container storage, HGV parking, rail control and staff facilities;
- Up to 743,200 square meters (gross internal area) of rail served warehousing and ancillary service buildings;
- New road infrastructure and works to the existing road infrastructure;
- Demolition and alterations to existing structure and earthworks to create development plots and landscape zones;
- Reconfiguring and burying of electricity pylons and cables respectively; and
- Strategic landscaping and open space, including alternations to public rights of way and the creation of new ecological enhancement areas and publicly accessible open areas.

The key scheme components, as reported within Chapter 4 of the 2018 ES are summarised in **Table 2.1.1**.

[3] The Planning Inspectorate (2012) Advice Note 9: Rochdale Envelope, Version 3 [online] Available: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-nine-rochdale-envelope/ [Accessed 19 January 2023]

Table 2.1.1
Key assessed scheme components

Key Design Components	Order Design Components Description	Amended as Part of 2023 NMC Application
Site Area (ha)	Approximately 297 ha	Yes – relating to the Rail Infrastructure Area (Zone C) Changes, see Section 3
Highways & Bridges	Highways To facilitate highway access to the Site, the Proposed Development would comprise the construction of three new roundabout junctions: - A5 Access (north of Site) – Construction of a new three arm roundabout from the A5. New 3m footway/cycleways would be provided to the west of the new junction and the existing 2m footways are to be reconfigured to the east of the junction to tie in with the new arrangement; - A449 Access (west of Site) – Construction of a new four arm roundabout from the A449 into Gravelly Way at Crateford Lane, replacing the traffic signal junction. New 3m footway/cycleways would be provided to the west of the new junction and the existing 2m footways are to be reconfigured to the east of the junction to tie in with the new arrangement. Uncontrolled pedestrian crossings are proposed at the southern, eastern and western arms of the new roundabout; and - Vicarage Road Access (south of Site) – Construction of a new four arm roundabout from Vicarage Road. New 3m footway/cycles would be provided to the north, southern and western arms of the new roundabout and uncontrolled crossings are proposed to all arms. Adopted Route through the Site: The Proposed Development would provide a link road connecting the A5 and A449 ('A5/A449 Link Road'). The Link Road would comprise a 30mph public highway which, together with the A5 and A449 roundabouts, would be adopted and maintained by SCC. The route would be a 7.3m carriageway together with a 3m shared use cycle footway. New bridges would be provided to cross the WCML Loop railway, Staffordshire and Worcestershire Canal and access to the SI land. The provision of the new rail bridge would enable the closure and removal of the existing Gravelly Way railway bridge, which would be retained for pedestrian use only. Access to existing employment uses which use Gravelly Way (SI Group and Bericote Development) would be provided via new access arrangements. Access for the SI Group would be via the pass beneath the new Link Road bridge and access for the Bericote Development would be via the existing four-arm Hoppe roundabout. Non-Adopted Route through the Site: A further north-south traffic route would be provided to the south-east towards Vicarage Road, which would connect to the A5/A449 Link Road to Vicarage Road. The route would connect to Vicarage Road via the new Vicarage Road Access roundabout. At the north, the route would connect to the A5/A449 Link Road via a new three-arm roundabout, located approximately mid-way between the canal crossing and new A5 Access. A four-arm roundabout would be provided approximately 250m from the Vicarage Road Access to provide access/egress from the Development Zones.	Yes – relating to all proposed amendments, see Section 3

Key Design Components	Order Design Components Description	Amended as Part of 2023 NMC Application
	Station Drive: The Proposed Development would introduce a right turn ban into Station Drive for northbound traffic on the A449, preventing access to the A5 via Station Drive and Vicarage Road. A turning area for HGVs would be provided on the west side of the railway bridge to enable HGVs to turn without striking the bridge or causing traffic disruption. A449 New Laybys: New laybys would be provided on the northbound and southbound carriageways of the A449 to replace those lost as a result of the new A5 Access roundabout. The existing 2m footway adjacent to the northbound carriageway is to be diverted around the layby and tied in with the existing footway. To the southbound carriageway, the proposed 3m shared footway/cycleway is to be installed to the rear edge of the layby. The existing bus stops to the north of Crateford Land and South Gravelly Way on the A449 would be replaced with improved layby arrangements. Bridges The Proposed Development would include four bridges: to carry the new road across the new rail sidings; over the WCML Loop railway; over the SI Group link road; and over The Staffordshire and Worcestershire Canal. The road would be carried on an embankment with the road level set approximately 6m above existing ground levels at its highest point. The rail and link road crossings are summarised as follows: - Bridge over new rail sidings in the SRFI – approximately 6m clearance from the proposed rail level to the bridge soffit, with an approximate 8.5m span, concrete abutments; - Bridge over existing WCML Loop railway – approximately 29m span to avoid existing embankments, with soffit set at approximately 10m above rail level (approximately 5m above existing ground level), vertical concrete walls; - Bridge over SI Group Link Road – approximately 9m clearance from proposed road level to bridge soffit, vertical concrete walls; and - Bridge over Canal – an approximate 20m span, concrete beam bridge, with concrete abutments clad in red brick for all faces of the bridge abutments/walls to provide an appearance in keeping with the canal setting from all viewpoints. The finish, along with other details of the bridge, would be confirmed at the detailed design stage in consultation with the Canal & River Trust and the local Highway Authority. Road drainage from the bridges will be directed into the wider surface water drainage network for the Proposed Development. The certified Parameter Plans define spot height above ordnance datum ('AOD') for new on-site road infrastructure approved in Works Nos. 4 and 5 authorised in Schedule 1 Part 1 of the Order, with a 0.5 metre limit of deviation upwards or downwards. An earthworks model, generated using the target levels (spot heights), was used to inform the EIA.	
Site Wide Surface Water Drainage Strategy	Site Wide Surface Water Drainage Strategy The approved site wide surface water drainage strategy (2018 ES Vol II Technical Appendix 16.3) is designed to restrict surface water runoff rates to greenfield rates across the proposed outfalls. It is proposed to drain all areas of hardstanding within the Site via a pipe network to a series of swales and surface detention ponds prior to discharge to various surface water outfalls.	No – whilst it is noted that the change in highway levels has been partly driven by the development of the

Key Design Components	Order Design Components Description	Amended as Part of 2023 NMC Application
	The swales and detention ponds would provide the required attenuation storage for up to the 1-in-100 year storm, including allowances for the predicted effects of climate change. The foul water drainage strategy for the Site involves splitting the drainage network between two discharge points: the point to the south-west is a Severn Trent Water manhole which currently receives a rising main which runs alongside the A449; the south-east discharge point is a Severn Trent water pumping station which feeds a rising main to the existing sewage treatment plant located on Deepmore Lane.	highway drainage design (i.e., to achieve the necessary falls), the key principles of the surface water drainage strategy on which the 2018 EIA was based, remain valid.
Rail Infrastructure	The Proposed Development would include the provision of rail infrastructure, comprising up to 8 km of new rail track between 6 through sidings, 3 dead end sidings and connection spurs to/from the WCML Loop railway. Container handling operations would be undertaken either by reach stackers and/or overhead rail-mounted gantry cranes.	Yes – relating to the Rail Infrastructure Area (Zone C) Changes, see Section 3
Building Zones, Heights & Design	The Development Zone Parameters Plan defines Building Zones for the following development components: - Zones A1-A7 for development of up to 743,200sqm GIA of rail-served warehouse floorspace; - Zone B for development of a rail freight terminal connected by new rail infrastructure to the WCML Loop railway; - Zone C for development of new rail infrastructure to connect the proposed rail freight terminal to the WCML Loop railway. The Development Zone Parameters Plan also identifies areas wherein strategic landscaping, an estate management office / amenity and welfare facilities and new on-site road infrastructure and access is permitted. Maximum building heights per Building Zone are summarized as follows: - Zones A1, A2, A6, A7(a,b and c) and the north-western portion of Zones A4a and A4b – Maximum building heights of 20 m; - Zones A5a and A5b, and the far eastern portion of Zone A4a adjacent to Calf Heath reservoir – Maximum building height of 24 m; - Central and south-western portion of Zones A4a and A4b – Maximum building height of 30 m; and - Sitewide - Maximum building and stacked container height of 12 m, with the exception of the gantry cranes within Zone B which would be up to 30 m tall. The proposed warehouse units, rail terminal and associated landscaping are required to be designed in accordance with the design principles set out in Chapter 7 of the certified Design and Access Statement (Document 7.5), which sets out that the warehouse units would typically be constructed from either prefabricated composite insulated metal panels or sheets of profiled steel or aluminum. Cladding at higher levels would require less protection and can be constructed of lighter coloured metal cladding materials. Other design principles relate to green infrastructure, noise mitigation, lighting strategy, drainage, sustainable design measures and car and HGV parking standards.	Yes - however, the amendments are in relation to the Rail Infrastructure Area (Zone C) and do not comprise changes to the building zone parameters
Green Infrastructure	As shown in the Green Infrastructure Parameters Plan, the green infrastructure areas would extend to approximately 107 ha (approximately 36% of the Site area) and would include the creation and conservation of landscape corridors throughout the	Yes – in relation to Rail Infrastructure Area (Zone

Key Design Components	Order Design Components Description	Amended as Part of 2023 NMC Application
	Proposed Development; the provision of new mixed habitats to satisfy biodiversity objectives; the formation of earthwork proposals and the establishment of high quality landscapes to the building development plots and surrounds; and the creation of two new community parks. The Green Infrastructure Parameters Plan identifies features to be retained including hedgerows and trees and the addition of a landscape buffer throughout the perimeter of the site to provide connectivity and screening to mitigate visual and noise impacts of the Proposed Development. The banks would utilize a reinforced earth slope or retaining wall to create a near vertical face (70˚) on the development side of the bank, to maximise utilized space and noise mitigation; and a gently sloping face (1:3 slope) on the outward side to merge with the surrounding landscape. The heights of the landscaped mounding are set so they are relative to the adjacent development zone finished floor levels (FFL) to ensure that the mounding will provide the screening required to the active elevation. This is with the exception of the mounding to the eastern side of the canal, which has been set relative to the new road infrastructure. Sufficient space has been allowed in the Parameter Plans to accommodate the associated width required to maintain the aforementioned bank profile.	C) Changes and Road Level Changes, see Section 3
Staffordshire and Worcestershire Canal Corridor	A Canal Enhancement Scheme is to be agreed and secured through a Order Requirement which sets out improvement and mitigation measures relating to the section of canal which is located within the Order Limits. The scheme will include improvement and mitigation measures such as pedestrian connections to the towpath, wayfinding and information signage and specific ecological information, included in the Framework Ecological Mitigation and Management Plan ('FEMMP', 2018 ES Vol II Technical Appendix 10.4).	No
Electricity Pylons and Cables	The Proposed Development would include the repositioning and under-grounding of the existing electricity overhead lines within the Site. This would comprise the replacement and under-grounding the existing overhead line which consists of 7 pylons that currently cross the Site, plus the removal and replacement of two pole mounted substations and under-grounding of the existing circuits fed by 34 wood poles within the Site.	No
Demolition and Construction	For the purposes of the EIA, the demolition and construction works were anticipated to be phased over an indicative 15-year period, commencing in 2020, with completion targeted for 2035. The phased works were anticipated to be phased over 5 separate phases, made up of an number of elements to include infrastructure (roads, bridges, drainage etc.), two phases of rail freight terminal, individual warehouse buildings, with relevant earthworks, landscaping and utilities works to be undertaken in each phase. To accommodate the Proposed Development, a number of structures would be demolished, which are predominantly residential in nature. Current proposals achieve a 1:1 cut/fill balance meaning no earth needs to be imported or exported from the Site, 2-8 minimizing traffic numbers accordingly.	No – whilst it is noted that the phasing strategy approved further to Requirement 3 of the Order (Ref: 21/01261/COND3) is different to the phasing used to inform the EIA, the phasing strategy

Key Design Components	Order Design Components Description	Amended as Part of 2023 NMC Application
	For the purpose of calculating construction traffic flows for the EIA it was assumed that the following construction works would be carried out simultaneously: - Up to 120,500 sqm of warehouse construction in Development Zone A4; - Rail Freight Interchange in Development Zone C; and - Internal Link road between the A5 and A449.	presented in the 2018 ES was purely indicative and as such, was used insofar as to inform the worst-case assessment assumptions. Accordingly, upon review of the approved phasing strategy and given that the overall construction period remains the same, the assumptions used to inform the EIA remain valid. Refer to **Table 4.2.1** for further information, notably in respect of construction traffic numbers relating to Air Quality and Transport.
Decommissioning	The Proposed Development is expected to be operational indefinitely, as long as it is viable and fit for purpose. In the long term, it may be re-developed or adapted on a piecemeal basis as operator requirements change and new occupiers move to the Site. Any such piecemeal redevelopments would be expected to be undertaken in accordance with current and future legislation and guidance and would be subject to separate planning applications and planning requirements and conditions.	No

Information on how the key scheme information, as set out above, is proposed to change as part of the amended proposed development, can be found in the following chapter.

3. 2023 Design Changes Summary

3.1. Context

The design changes to the Order have been driven by a number of technical considerations and are provided in detail within the Application Statement that accompanies this 2023 NMC application.

The review presented in this report has focused on the relevant proposed amendments, as summarised in Section 3.2.

3.2. Design Changes

3.2.1. The Bridge Span and Width Changes

The proposed amendments seek to make the following changes to the proposed internal bridge spans identified on bridge plans, as shown by comparing **Figure 3.1** and **Figure 3.2, Appendix A**:

- Bridge No.1 – the bridge which would span the new northern track access from the WCML Loop Railway to the proposed Rail Terminal would increase from approximately 8.5 metres to approximately 20.4 metres, allowing 2 metres lateral deviation on either side of the illustrative abutment positions;
- Bridge No.2 – the bridge would span the existing WCML Loop Railway would increase from approximately 29 metres to approximately 32.5 metres, allowing 1.5 metres lateral deviation on either side of the illustrative abutment positions;
- Bridge No.3 – the bridge which would span the access to the SI land would increase from approximately 8 metres to approximately 8.4 metres, allowing 0.5 metres on either side of the illustrative abutment positions; and
- Bridge No.4 – the bridge which would span the Staffordshire and Worcestershire Canal would reduce from approximately 20 metres to approximately 17.9 metres, allowing 2 metres lateral deviation on either side of the illustrative abutment positions.

The bridge design continues to fall within the parameters of authorised development defined Article 4(b) of the Order, in terms of the bridges being permitted to deviate vertically from the levels shown highlighted yellow on the bridge plans to a maximum of 0.5 metres upwards or 1.0 metres downwards.

In order to improve the buildability of the bridges, reductions to the overall width of Bridge Nos. 1, 2 and 3 are proposed. The width of Bridge No. 1 is proposed to be reduced by 0.5 metres and Bridge No. 2 & 3 is proposed to be reduced by 1.9 metres.

This reduction in width would be achieved through the following amendments to the certified general arrangement, as shown in the Proposed road bridges plan and long section, 2.18A, 1516-04250WDK-SI-C-301-010 Rev P9. Submitted with this application:

- Removal of 1 metre verge between the footway/cycleway running along the north of the A5/A449 Link Road and the vehicular carriageway;
- Increasing the width of the footway/cycleway by 0.5 metres to a width of 3.5 metres to compensate for the removal of verge; and,
- Reduction of verge width to the south of the A5/A449 Link Road from 2 metres to 0.6 metres.

3.2.2. The Road Level Changes

The proposed amendments to new on-site road infrastructure levels would comprise variations to the heights as compared with the approved spot levels by between circa. 0.9 metres below and circa. 1.2 metres above these spot heights. In order to provide flexibility, the 0.5 metre upward and downward limit of deviation, as currently provided for on the certified Parameter Plans and through Article 4(b) of the Order, would be retained. The approved and proposed spot height levels are shown in **Figures 3.3 and 3.4, Appendix A** and can be summarised as follows:

A5/A449 Link Road

- Increasing the finished site level of the A5/A449 Link Road on approach to the proposed A5 Access Roundabout by up to 1.2 metres (+-0.5 metres) from

+104.5m AOD to +105.7m AOD in order to accommodate a culvert underneath the proposed A5/A449 Link Road connecting the Calf Heath Reservoir with the Staffordshire and Worcestershire Canal (**Figure 3.5, Appendix A**);
- Decreasing the finished site level of the A5/A449 Link Road mid-way between the proposed A5 Access Roundabout and junction with the proposed unadopted Spine Road by up to 0.9m AOD (+-0.5 metres) from +106.5m AOD to 105.6m AOD in order to provide a compliant road alignment associated with the increase in the finished site level of the A5/A449 Link Road on approach to the proposed A5 Access Roundabout;
- Increasing the finished site level of the A5/A449 Link Road at junction with the proposed unadopted Spine Road by up to 0.6 metres (+-0.5 metres) from +104.5m AOD to 105.1m AOD, in order to create sufficient fall in levels south-to-north to enable gravity-driven drainage towards the Staffordshire and Worcestershire Canal. The groundwater levels in this location are too high to allow for the necessary fall in levels for the drainage strategy;
- Reducing the finished bridge deck level on Bridge No. 3 over the proposed road access into the proposed rail terminal and rail-served warehousing (defined as Zones B and A1 on the Development Zone Parameters Plan) by 0.9 metres (+-0.5 metres) from 112m AOD to 111.1m AOD in order to provide a compliant road alignment in this location. It is noted that whilst this proposed spot height would not comply with the +/- 0.5 metre height limit of deviation annotated on the certified Parameter Plans, it would comply with the + 0.5 metre upward / - 1.0 metre downward limits of deviation permitted in Part 2 Article 4(b) of the Order; and

Spine Road

- Increasing the finished site level at the mid-point of the Spine Road by up to 0.7 metres (+-0.5 metres) from +106m AOD to 106.7m AOD to enable the delivery of the drainage strategy.

The proposed amendments to new on-site road infrastructure levels would also comprise amendments to the levels for Bridges No.1 to No.4, discussed in Section 3.2.1, which are necessary to ensure a compliant vertical road alignment. The approved bridge carriageway heights (in mAOD) would reduce by between approximately 0.4m and 1.4m.

The proposed amendments to new on-site road infrastructure levels would also drive changes in the finished height mounding levels along the A5/A449 Link Road and Spine Road, which are set relative to the finished site level of the roads**.** Based on the amendments to the road level spot heights listed above, this would result in a change in finished mound height levels of up to 1.2 m upwards or 0.9m downwards compared with the mounding assessed in the 2018 EIA.

For the avoidance of doubt, this does not necessitate a change to the spot heights relative to the A5/A449 Link Road identified for mounding and the height relationship would remain the same. However, the height relationship relative to the Staffordshire and Worcestershire Canal to the west, as well as the development plots, would change by up to 1.2 m upwards or 0.9 m downwards given that the Staffordshire and Worcestershire Canal levels would remain the same.

These changes in road and mounding levels are reflected in the updated Floor Levels and Building Heights and Green Infrastructure Parameter Plans, as well as the updated topographic model, which has been used to inform the Noise and Vibration review (refer to **Appendix E** for further information).

3.2.3. The Rail Infrastructure Area (Zone C) Changes

Extension to Zone C to south of Rail Terminal for Buffer Stop

As shown in **Figure 3.6, Appendix A**, the proposed amendment seeks to incorporate additional land into Zone C (railway works), comprising 0.2797 ha, to accommodate the extension of the proposed tracks running up to the two buffer stops (The Cripple Siding Buffer Stop and the Neck Shunt Trap Buffer Stop). This would result in a net reduction in area identified as Landscaping land on the certified Development Zone and Green Infrastructure Parameters Plan by 0.2489 ha, together with expanding the Zone C extent and associated Order Limits boundary southwards to include 0.0308 ha of land at Craigmore, which is owned by FAL.

The Illustrative Expanded Rail Terminal Layout drawing would be amended to reflect the following amendments:

- The Cripple Siding Buffer Stop – proposed to be relocated circa. 70.2 metres further southward compared with the current proposed location.
- The Neck Shunt Trap Buffer Stop –proposed to be relocated circa. 34.7m further southward compared with the current proposed location and would

encroach on land currently identified as Landscaping on the certified Development Zone and Green Infrastructure Parameters Plan.

The indicative location of acoustic fencing identified on the certified Green Infrastructure Parameters Plan would be relocated westward, as shown in the revised Parameter Plan (**Figure 3.4, Appendix A**).

Extension of Zone C to north of Rail Terminal for Double Track Under Bridge No.1

The proposed amendment seeks to incorporate an additional 0.129 ha of land into Zone C (railway works) , as shown in **Figure 3.7, Appendix A**, to facilitate the proposed change to double-tracking under Bridge No.1 (see Section 3.2.3). This would result in a net reduction in area for Landscaping by 0.0347 ha, for Rail Freight Infrastructure by 0.0418 ha, for highways infrastructure by 0.0172 ha, and for Rail Served Warehousing by 0.0192 ha. This reduction in Rail Served Warehousing area does not affect the ability to deliver the maximum quantum of floorspace identified on the certified Development Zone Parameters Plan.

3.2.4. The Straight Mile / Woodlands Lane / Kings Road Footway Changes

The new dropped kerb crossing on Straight Mile is proposed to be shifted 15m westward, as shown in **Figure 3.8, Appendix A**.

Owing to the constraint posed by a drainage ditch running along western edge of Woodlands Lane, the new dropped kerb crossing would be formed on eastern side of Woodlands Lane, allowing crossing from proposed Calf Heath Community Park, leading to a new footway along the eastern side of Woodlands Lane down to Straight Mile, where a dropped kerb crossing would allow pedestrians to cross to the new footway on Kings Road. This would remove the need for 35m of footway on the southern side of Straight Mile.

Vegetation clearance would be required for the construction of the proposed new footway along the eastern side of Woodlands Lane, comprising the removal of long grass and scrub. No trees or hedges would be removed.

4. Environmental Review of Changes

4.1. The Review Process

The design changes detailed in Section 3 of this document, and illustrated in the revised planning drawings shown in **Appendix A** and issued with the 2023 NMC application, have been reviewed by CBRE and the EIA technical consultants. The team of EIA technical consultants is summarised in **Table 4.1.1**. In accordance with Part 5 Paragraph 18(5) of the 2017 EIA Regulations, the consultant's statements of technical competence have been provided within **Appendix B**.

The EIA technical consultants have reviewed and assessed (as required) the changes presented in this document, and as described in detail in the Application Statement, and the updated drawing pack, to determine whether the amended proposed development would lead to any new, or materially different, likely significant effects on the environment to those identified in the 2018 ES[4], i.e. a new significant effect would be where an effect that was previously Negligible or Minor Adverse but as a result of the proposed amendments is now Moderate or Major Adverse. Consideration has also been given to whether the change in effect corresponds with what would be considered a material change to the Order brought about by the proposed amendments. There is no specific explanation in DCLG guidance[5] or topic-specific technical guidance on what constitutes a material change and as such this has been based on professional judgement. In this regard, where effects have previously been on the threshold of an effect boundary (e.g. Minor Adverse and not significant) and a very small change then resulted in the effect becoming Moderate Adverse and significant, this would not necessarily constitute a materially different effect even if the significance of effect has changed. In this instance, the materiality of the change in effect would be determined on a case by case basis and application of professional judgement.

In undertaking the review, the EIA technical consultants have given consideration to:

- Any changes to legislation, policy and assessment methodologies since the 2018 EIA;
- Any changes in baseline conditions since the 2018 EIA;
- Any new or amended cumulative schemes that have come about since the 2018 EIA;
- The conclusions of the 2018 EIA; and
- Any changes to the updated 2018 EIA as a result of the 2023 amended proposed development.

Due to the nature of the proposed non-material amendments, the scope of the EIA is considered to remain valid as the proposed changes are not predicted to give rise to new significant effects in respect of those topics previously scoped out of the EIA. Accordingly, the following topics, which were scoped out from the 2018 ES as discrete technical assessments, have not formed part of this review:

- Waste;
- Telecommunication Interference;
- Light Spillage;
- Daylight, Sunlight and Overshadowing;
- Wind Microclimate; and
- Aviation.

Where impacts relating to these topics have previously been considered within the technical assessments scoped in to EIA, such as Light Spillage and Wind Microclimate in respect of Ecology and Socio-Economics respectively, this has been considered as part of this review, as presented in **Table 4.2.1**.

[4] A number of updated technical assessments were submitted following the submission of the application. For the purpose of this report, the '2018 ES' refers to the original 2018 ES, as amended by the updated technical assessments.

[5] DCLG, 2015. Planning Act 2008: Guidance on Changes to Development Consent Orders (December 2015)

The focus of this review has therefore been on those topics previously scoped into the 2018 ES as discrete technical chapters.

As shown in **Table 2.1.1**, the proposed amendments would not result in any material changes to the assumed decommissioning of the proposed development. Accordingly, the conclusions of the decommissioning stage assessments for all technical topics is considered to remain valid and the review presented in this report has focused on the demolition and construction stage and completed development stage only.

As the 2023 proposed amendments are non-material and, as confirmed in this review (Section 4), on balance do not result in any new or materially different, likely significant effects on the environment, the 2023 amended proposed development would not result in any new or amended cumulative effects.

Any new or amended cumulative schemes that have come about since the 2018 EIA was undertaken are required to include the existing approval within their cumulative assessment and consider and mitigate against the potential for inter-development cumulative effects. Therefore, given the non-material changes proposed for the proposed development, no further consideration has been given to the potential for in-combination effects with cumulative schemes.

The findings of the reviews undertaken by the EIA technical consultants is presented in Section 4.2, and supported by topic specific technical notes appended to this document, where required. As the proposed changes do not impact all technical topics equally, the topic specific technical notes have only been produced for those topics where additional supporting information was required in order to draw the conclusions that are presented in Section 4.2.

This document should be read alongside the 2018 ES. Due to the size of the 2018 ES, it has not been appended to this report but can be provided in electronic format.

Table 4.1.1
ES Chapter and Technical Assessment Authors

Topic	Author of 2018 ES	Author of 2023 NMC EIR	ES Chapter	Appendix to this Document
EIA Coordinator & Author of front-end and back-end ES Chapters	Ramboll	CBRE	ES Volume 1, Chapters 1-5 & 17-18; Non-Technical Summary	N/A
Agriculture and Soils	Askew Land & Soil	Tim O'Hare Associated LLP	ES Volume I, Chapter 6	N/A
Air Quality	Ramboll	Ramboll	ES Volume I, Chapter 7	Appendix C
Archaeology (Buried Heritage Assets)	Montagu Evans	Wessex Archaeology	ES Volume I, Chapter 8	N/A
Cultural Heritage (Built Heritage)	Montagu Evans	Wessex Archaeology	ES Volume I, Chapter 9	N/A
Ecology and Nature Conservation	Ramboll	Delta Simmons	ES Volume I, Chapter 10	Appendix D
Ground Conditions	Ramboll	Delta Simons	ES Volume I, Chapter 11	Appendix E
Landscape and Visual Impact	Montagu Evans	FPCR	ES Volume I, Chapter 12	N/A

Topic	Author of 2018 ES	Author of 2023 NMC EIR	ES Chapter	Appendix to this Document
Noise and Vibration	Resound Acoustics	Resound Acoustics	ES Volume I, Chapter 13	Appendix F
Socio-Economics and Human Health	Quod	CBRE	ES Volume I, Chapter 14	N/A
Transport and Access	WSP	WSP	ES Volume I, Chapter 15	N/A
Water Environment and Flood Risk	Ramboll	Burrows Graham	ES Volume I, Chapter 16	N/A

4.2. Review of 2018 ES Results

Table 4.2.1 presents the conclusions of the EIA technical consultant's review as to whether the 2023 amended proposed development would lead to any new or materially different, likely significant effects on the environment to those identified in the 2018 ES.

Table 4.2.1
Environmental Implications of 2023 Proposed Amendments

Technical Topic	Assessment Methodology & Baseline Conditions	Conclusions of 2018 ES	Review of 2022 Amended Proposed Development
Agriculture and Soils	**Assessment Methodology** Since the 2018 EIA, there has been no new guidance published. The 2023 proposed amendments, including the proposed expansion of Zone C boundaries into green infrastructure land, do not materially change the scope or methodology of the assessment. **Baseline Conditions** It is assumed that the land has remained under agricultural use (arable/pasture) since the baseline conditions set out in the 2018 ES. As such no significant change in soil properties are anticipated. Other factors used to calculate ALC Grade (including published climate data and landform) are unlikely to have changed. Agricultural holdings, buildings and hardstanding are also assumed to have remained unchanged. The proposed rail terminal expansion area would result in an additional 0.0308 ha of land take for the proposed development, which currently falls outside of the Order limits but is owned by FAL. Aerial images of the proposed additional 0.0308 ha of land indicates that the majority of this parcel comprises of agricultural buildings and hardstanding, no productive agricultural land (arable / pasture) appears to be present. A very small section of rough grassland appears to be present in the north-eastern corner of the parcel (approximately 13m x 26m). Based on aerial images, only very limited soil resources may be recoverable from within the very small area of rough grassland. This does not appear to be agriculturally productive land. As such, the proposed additional 0.0308 ha of land would most likely fall under the 'other land' classification by Agricultural Land Classification (ALC) survey, which, as defined in the 2018 ES, is appropriate for land uses comprising '*railway, mineral extraction land, buildings, hard-standing, roads, farm tracks, woodland, canal and water bodies*'. The proposed additional 0.0308 ha of land is therefore considered to be of low sensitivity, consistent with the adjacent land within the Order limits (Holding Reference C).	**Summary of Residual Effects** <u>Demolition and Construction</u> **Soils** • Permanent sealing of agricultural land falling within Grade 2 and Grade 3a – **Major Adverse** and significant at a national level. • Permanent sealing of subgrade 3b agricultural land – **Minor Adverse** and not significant. • Permanent sealing of non-agricultural land – **Minor Adverse** and not significant. • Effect of construction activities on quality and quantity of soil resources available on-site for reuse – **Minor Adverse** and not significant with the implementation of a Soil Resource Plan, as per Section 6.0 of the ODCEMP. **Agriculture and Holdings** • Permanent reduction in area of agricultural land within holding – **Moderate Adverse** and significant at a local level. • Extinguishment of agricultural holding in Phase 4 and Phase 5 – **Minor Adverse** and not significant. • Extinguishment of agricultural holding/land parcels – **Minor Adverse** and not significant. • Mitigation would include prolonging agricultural production for as long as possible on agricultural land being developed later on in the construction programme, such as by agreeing access routes for construction personnel, machinery and equipment movements, if required. <u>Completed Development</u> • Once the development has been constructed, no effects are anticipated.	**Updated Residual Effects** <u>Demolition and Construction</u> The proposed rail terminal expansion area would result in an additional 0.0308 ha of land take for the proposed development, which currently falls outside of the Order limits, and therefore the area assessed for the purpose of the 2018 EIA. Based on the low agricultural value of this additional parcel of land (as identified in the Baseline Conditions section), combined with the negligible increase in the context of the overall Site area , as well as the fact that the proposed amendments would not wholly alter the existing land use (i.e. a mix of landscaping, buildings and hardstanding), no new or materially different significant effects would arise and the conclusions presented in the 2018 ES are considered to remain valid. <u>Completed Development</u> Given the effects to agriculture and soils from the proposed development would arise during the demolition and construction stage only, the proposed amendments would not result in any new residual effects during the completed development stage. Accordingly, the conclusions of the 2018 ES remain valid.
Air Quality	**Assessment Methodology** Since the 2018 EIA, the following changes have been made in regard to legislation and guidance: • The NPPF was updated February 2019 and revised July 2021. • National Planning Practice Guidance was updated in November 2019. • The Environment Act 2021 set targets for annual mean PM2.5 concentrations and a Population Exposure Reduction target for PM2.5 concentrations to be met by 2040. • The Design Manual for Roads and Bridges (DMRB) was updated in November 2019. • Defra Local Air Quality Management Technical Guidance was updated in August 2022. The above changes do not constitute a material change in the methodology of the 2018 EIA, which is still considered to be appropriate. **Baseline** The baselines for the assessment were established by reviewing local authority air quality monitoring data and predicted background pollutant concentration data provided by Defra and undertaking dispersion modeling. Dispersion modelling was used the predict the (then) future baseline pollutant concentrations in 2021, 2028 and 2036. The dispersion modelling was verified (i.e. the model calibrated) against 2016 monitoring data. Since the modelling was undertaken, Defra have updated the tools and data used in the assessment; the Emissions Factor Toolkit (EFT) has been updated to version 10.1, the NO_x to NO_2 calculator to v8.1 and	**Summary of Residual Effects** <u>Demolition and Construction</u> • Construction traffic would have a **Negligible**, direct, temporary, reversible long term effect on residential receptors (not significant). • Construction dust would have a **Negligible to Slight**, direct, temporary, reversible long term effect on residential receptors (not significant). • Construction dust would have a **Negligible to Slight**, direct, temporary, reversible long term effect on canal moorings and canal towpath receptors (not significant). <u>Completed Development</u> • Operational traffic would have a **Negligible to Slight**, direct, permanent, reversible long term effect on human receptors adjacent to the road network (not significant). • Operational traffic would have a **Not Insignificant**, direct, permanent, reversible long term effect on ecological receptors. The impacts were assessed further within the Ecological Chapter of the 2018 EIA and were concluded to be not significant.	**Updated Residual Effects** <u>Demolition and Construction</u> The proposed design changes would not be expected to give rise to a change in construction vehicle trips, nor would the amended phasing strategy alter the assumptions used to inform the construction vehicle trips (i.e. the overall duration of the demolition and construction programme remains valid, as well as the worst-case assumptions around the potential simultaneous works). Overall it would be anticipated that the predicted emissions as a result of construction traffic would be lower than in the 2018 EIA, and the conclusions presented in the 2018 ES are considered to remain valid. The proposed amendments would not alter the scale and nature of the construction works. In terms of the risk of construction dust impacts, the earthworks, construction and trackout dust emission magnitude would therefore remain Large (the highest category) and unchanged from the 2018 EIA. The extension of the sidings at the southern extent of Zone C has the potential to bring construction works closer to external receptors along Station Drive; however, due to the location of receptors close to the site boundary, the area sensitivity to dust soiling was already considered to be High (the highest category) within the 2018 EIA and would remain so in relation to the proposed amendments. The area sensitivity to human health impacts would also remain Low. Overall, there would therefore be no change to the risk of construction dust impacts. Accordingly, the mitigation measures and the residual effect would remain the same, and the conclusions presented in the 2018 ES are considered to remain valid. <u>Completed Development</u>

Technical Topic	Assessment Methodology & Baseline Conditions	Conclusions of 2018 ES	Review of 2022 Amended Proposed Development
	the background pollutant concentration data to a 2018 reference year. These updated tools reflect updated predictions regarding pollutant emissions in the UK, but the trend in emissions are consistent with the data used in the 2018 ES (as illustrated in **Appendix C).** Dispersion modelling was used to predict the impact of construction traffic in 2021 and operational traffic in 2021 (25% development traffic), 2028 (50% development traffic) and 2036 (100% development traffic). The updated baseline monitoring data (**Appendix C**) show lower pollutant concentrations than were presented in the 2018 ES and the data used for model verification. These reflect anticipated improvements in air quality as a result of reductions in emissions from road vehicles and the impact of the Covid-19 pandemic on reducing the quantity of traffic on the road in 2020 and 2021. Overall, the updated monitoring data and background data are consistent with the data used in the air quality assessment for the 2018 EIA and the baseline conditions remain valid. As noted in the Transport and Access section of this table, since the 2018 EIA, the M54/M6 Link Road Development Consent Order (DCO) has been granted consent. At the time of the 2018 EIA, it had been agreed with Highways England (now National Highways) and Staffordshire County Council that in order to assess a worst case, the assessment of transport effects and impacts should make no allowance for the M54/M6 Link Road scheme. The traffic data in relation to those highway links in proximity to the Site are shown to be less than those forecast by the 2018 EIA. Whilst utilizing the more recent traffic evidence base provided by National Highways as the baseline may show greater proportional changes in traffic flows, the 2018 EIA has considered, in absolute terms, the worst case.		The A5/A449 link road was included in the dispersion model (traffic links 058 and 059) to predict the operational effects of transport emissions on human health receptor locations adjacent to the A5 and A449. The nearest off-site receptor locations on the A5 and A449 are in excess of 100 metres from the A5/A449 link road; changes in elevation of approximately 0.9 metres lower or 1.2 metres higher would have an insignificant impact on the contribution of the link road traffic to offsite pollutant concentrations. The conclusions presented in the 2018 ES are considered to remain valid with regard to changes to the A5/A449 link road. Extension of the Order Limits boundary southwards to include land at Craigmore has the potential to bring idling locomotives closer to off-site receptors along Station Drive. The Neck Shunt Trap Buffer Stop would be located such that idling engine exhaust emissions would occur at least 15 metres from the site boundary. Defra Local Air Quality Management Technical Guidance TG22 only requires an assessment of idling locomotive emissions if there is public exposure within 15 metres of the source. The extension of the Order Limits boundary will not therefore introduce a new significant effect. The conclusions presented in the 2018 ES are considered to remain valid.
Archaeology (Buried Heritage Assets)	**Assessment Methodology** Since the 2018 EIA, the following changes have been made in regard to legislation, policy and guidance: • The NPPF was updated February 2019 and revised July 2021. • Both the Chartered Institute for Archaeologist's guidance on geophysical survey and desk-based assessment were updated in October 2020. While the above changes have been noted here, they do not constitute a material change in the methodology of the 2018 EIA which is still considered to be appropriate. **Baseline** The 2018 baseline was informed by the known and potential archaeological resource at the time of writing and was informed by a search of the Historic Environment Record (HER). Since the 2018 EIA, a programme of archaeological trial trench evaluation has commenced in line with the Outline Written Scheme of Investigation (WSI) conditioned as part of the Order (Requirement 9). The evaluation is designed to target features identified during the September 2017 gradiometer survey (Wessex Archaeology) and is intended to provide information about the archaeological potential of the Site to inform on the scope and nature of further works (if required). A total of 436 trenches were excavated in addition to 117 hand dug test pits. There was no obvious clustering of features indicative of an area of concentrated activity, however, archaeological remains were present in 120 of the trenches. These remains seemed to be evenly spread across the fields east of the Staffordshire and Worcester Canal and north of Station Road. The main findings of the evaluation undertaken to date can be summarised as follows:	**Summary of Residual Effects** <u>Demolition and Construction</u> • Direct, permanent, irreplaceable, long term residual effect to a possible Neolithic ring ditch and linear feature (WA 88). The significance of effect was deemed to be **Moderate Adverse** should the asset be present within the site. • Direct, permanent, irreplaceable, long term residual effect to a possible Bronze Age ring ditch (WA 89). The significance of effect was deemed to be **Moderate Adverse,** significant should the asset be present within the site. • Direct, permanent, irreplaceable, long term residual effect to the remains associated with Romano-British occupation and other forms of activity. The significance of effect was deemed to be **Minor Adverse** or **Moderate Adverse** depending on the confirmed nature of the asset (if present). • Direct, permanent, irreplaceable, long term residual effect to remains associated with the Anglo-Saxon and medieval occupation of Gailey (WA 26). The significance of effect was deemed to be **Minor Adverse** or **Moderate Adverse** depending on the confirmed nature of the asset (if present). • Direct, permanent, irreplaceable, long term residual effect to remains derived from medieval cultivation. The significance of effect was deemed to be **Minor Adverse**. • Direct, permanent, irreplaceable, long term residual effect to remains associated with post-medieval agricultural practices. The significance of effect was deemed to be not significant.	**Updated Residual Effects** <u>Demolition and Construction</u> The archaeological trial trench evaluation undertaken since the 2018 EIA indicates that the site has an overall low potential for encountering archaeological remains. The assessment of effects presented in the 2018 ES was based on the known archaeological resource and potential at the time of writing and is therefore considered to be representative of the likely worst-case. In respect of the Bronze Age mound and medieval to post-medieval agricultural remains identified during the evaluation, their sensitivity/value is considered to be no greater than that of the Bronze Age ring ditch (WA 89), medieval cultivation evidence or post-medieval agricultural evidence identified as receptors in the 2018 ES, especially as they could be related. As such the scale of effect for the archaeological remains dating to the Bronze Age and medieval to post-medieval periods would remain the same, as would the conclusions of the 2018 ES. The addition 0.0308 ha of land to be included within the Order Limits lies immediately adjacent to the railway line and therefore any archaeological remains would have been truncated/removed when the railway line was constructed. This combined with the low archaeological potential of the land means that no new or different effects are likely to arise. As such the conclusions of the 2018 ES remain valid. Accordingly, no new or materially different significant residual effects would arise and the conclusions presented in the 2018 ES are considered to remain valid when considering the updated baseline information and scheme amendments . <u>Completed Development</u> As per the 2018 ES, following the cessation of construction activities, it is expected that no additional direct impacts to archaeological receptors would occur during the operation of

Technical Topic	Assessment Methodology & Baseline Conditions	Conclusions of 2018 ES	Review of 2022 Amended Proposed Development
	• No new receptors have been identified on-site that would warrant any new potential effects arising from the proposed development. The archaeology recovered could be related to previously identified assets; • The archaeological remains found relate to evidence of Bronze Age activity in the form of the mound and remnants of what are likely medieval to post-medieval agricultural practices/land divisions (see below); • Based on the above finds, the overall archaeological potential of the site is considered to be low; and • The baseline conditions assessed for the 2018 EIA are therefore considered representative of a worst-case scenario. In respect of the archaeological remains found, the potential Bronze Age burnt mound (dated from environmental composition as opposed to finds) was recorded in the north of the site adjacent to Watling Street. This asset could be related to a Bronze Age ring ditch (WA 89) that was identified as a receptor in the 2018 ES. Based on this, it is assumed that its value (and therefore the significance of effect) would be at least similar to that of the possible ring ditch. Aside from the above, ditches were the most commonly recorded feature, and the evaluation report suggests that these formed part of medieval to post-medieval field systems which could be related to medieval cultivation evidence and post-medieval activity. Based on this, it is assumed that the ditches would likely be of the same value as the medieval to post-medieval remains already identified. While earlier Roman and Anglo-Saxon activity is recorded within the area surrounding the site, no features that could be directly related to such activity were found. At the time of writing, a small area is left to be evaluated as access was not possible at the time of the fieldwork between January-April 2022. It is intended that the evaluation will be completed in spring 2023 pending access arrangements. Following completion of the evaluation, the WSI will be submitted to the LPA for approval to support with the discharge of Requirement 9 of the Order to provide information on the archaeological potential of the site and any further works required to reduce or remove any effects from the construction of the proposed development. Given that the additional 0.0308 ha parcel of land to be included in the Order Limits is immediately adjacent to the Site, the locations of the trial trenches remain representative of site conditions and the archaeological potential of this additional parcel of land is also considered to be low.	• Direct, permanent, irreplaceable, long term residual effect to remains associated with the construction and use of the Staffordshire and Worcestershire Canal (WA 44) and the Grand Junction Railway (WA 83). The significance of effect was deemed to be **Minor Adverse**. • Direct, permanent, irreplaceable, long term residual effect to remains associated with the large curving ditch feature identified during LiDAR data assessment. The significance of effect was deemed to be **Minor Adverse**. • Direct, permanent, irreplaceable, long term residual effect to remains associated with the linear ditch feature representing possible continuation of post-medieval, or earlier track/routeway. The significance of effect was deemed to be **Minor Adverse**. • Direct, permanent, irreplaceable, long term residual effect to remains associated with the seven anomalies of possible archaeological original identified during the detailed gradiometer survey. The significance of effect was deemed to be **Minor Adverse**. • Direct, permanent, irreplaceable, long term residual effect to other as yet unidentified buried archaeological remains. The significance of effect was yet to be determined due to the unknown nature of the archaeological resource. <u>Completed Development</u> • Following the cessation of construction activities, it is expected that no additional direct impacts to archaeological receptors would occur during the operation of the proposed development. Accordingly, no effects predicted and effects during the completed development stage has been scoped out of the assessment.	the amended proposed development. Accordingly, no effects are predicted to arise, consistent with the findings of the 2018 ES.
Cultural Heritage	**Assessment Methodology** Since the 2018 EIA, the following changes have been made in regard to legislation, policy and guidance: • The NPPF was updated February 2019 and revised July 2021. The changes are not considered to constitute a material change in the methodology of the 2018 EIA, which is still considered to be appropriate. **Baseline** Since the Cultural Heritage assessment was undertaken for the 2018 EIA (as presented in Chapter 9 of the 2018 ES), Wessex Archaeology have completed a building recording of Woodside Farm on Vicarage Road (Wessex Archaeology 2022[6]). The building recording was required as part of the Order which granted development consent (Requirement 10) in 2020. The building recording and associated research concluded that the history and development of Woodside Farm was well understood, and that a structural watching brief during demolition works (as first outlined in the requirement) would not be required and that the report is suitable to discharge the Requirement. This was also agreed in consultations with Mr Shane Kelleher, County Archaeologist, on 5 October 2022 (via email) advising the local planning authority on heritage matters and the	**Summary of Residual Effects** <u>Demolition and Construction</u> • Short-term, temporary **Minor Adverse** effects and not significant in respect of potential effects relating to the use of hoarding, materials and machinery leading to an increase in activity along the road networks and the potential impacts of noise, dust and vibration. • Long-term, permanent **Minor Adverse** effect associated with the demolition of Heath Farm (Locally Listed Grade B heritage receptor). <u>Completed Development</u> • All residual effects arising from the Proposed Development on heritage receptors were found to be nil/negligible, or **Minor Adverse** and not significant. • Of note, **Minor Adverse** effects would arise in relation to the Staffordshire and Worcestershire Canal Conservation Area due to a change in its setting which could harm its significance/special interest. However, this change will not	**Updated Residual Effects** <u>Demolition and Construction</u> Whilst the proposed amendments relate to areas of the Site adjacent to heritage receptors, such as the Canal Conservation Area, the nature of the construction works would not change as a result of the proposed design changes and indirect effects on Heritage Assets relating to the use of hoarding, materials demolition and machinery would remain the same. Furthermore, the environmental controls set out in the ODCEMP remain valid. Accordingly, the conclusions of the 2018 EIA remain valid. <u>Completed Development</u> While the proposed design updates to the bridge crossing the Staffordshire and Worcestershire Canal Conservation Area would lead to an increase in the physical scale of the bridge, the predicted impacts on the Conservation Area would remain unchanged. This is due to the fact that the key features of the consented new bridge structure will be retained. A change in the predicted magnitude of impact would only be anticipated in the event that the proposed bridge was removed as part of the scheme amendments, or if additional bridges were to be included. Accordingly, it is considered that there would be no additional harm to the heritage receptor beyond that already assessed in the 2018 EIA. No other changes proposed would alter the potential impacts to heritage receptors. As such, it is considered that there is no change to the conclusions of the 2018 EIA.

[6] Wessex Archaeology, 2022. Woodside Farm, Vicarage Road Four Ashes, Staffordshire. Historic Building Recording.

Technical Topic	Assessment Methodology & Baseline Conditions	Conclusions of 2018 ES	Review of 2022 Amended Proposed Development
	Requirement. This information is currently in the process of being formally discharged pursuant to LPA application ref: 21/01261/COND5. Accordingly, the baseline conditions as reported in the 2018 ES remain valid.	have an effect on the appreciation of the heritage value of the receptor and is not considered to be significant.	
Ecology and Nature Conservation	**Assessment Methodology** Since the 2018 EIA, the following changes have been made in regard to legislation, policy and guidance: • Ecological Impact Assessments (CIEEM, updated 2019). However, this is not considered to materially change the assessment methodology. **Baseline Conditions** Due to the time that has elapsed since the original baseline surveys to inform the 2018 ES, updated surveys have been conducted across 2021 and 2022 to identify the current conditions across the wider Site and status of any protected or otherwise notable species. The updated survey also captured the additional 0.0308 ha parcel of land to be included within the Order Limits, associated with the proposed Zone C rail extension. The updated survey results are presented in **Appendix D**. As presented in **Appendix D**, no significant changes to the baseline conditions have been identified. The habitat compositions and conditions remained largely unchanged, and the overall presence, and status of protected and notable species, though fluid in relation to the location of bat roosts and badger sett activity, remains comparable to that which formed the baseline of the 2018 ES such that the geographic scale of importance remains the same.	**Summary of Residual Effects** <u>Demolition and Construction</u> • Habitats – Significant adverse effect from loss of veteran trees and time required to replace (Local scale). • Farmland Birds – Significant adverse effect due to the removal of breeding habitat (although during the construction phase there may be some local gains, and there would be gains for other species in the operational phase). (Local scale). • Invertebrates - Significant adverse effect on the assemblage of invertebrates while vegetation and enhancements establish with mitigation measures applied. (Site scale). • Bats - Significant adverse effect due to the time taken for vegetation in green corridors and providing screening to mature and sufficiently establish to provide a fully functional habitat resource for bats. (Local Scale). • Badger - Adverse. Traffic hazards and associated mortality. (Local Scale). <u>Completed Development</u> • Habitats – Beneficial. Securing long term provision of native black poplar on-site. (County Scale). • Birds woodland and scrub – Adverse. Change of habitat available compared with baseline, noise effects on the assemblage of bird species important at the local level offset by habitat improvement/creation. Habitat intended for additional species of conservation concern would be provided but there would be a significant effect due to uncertainties relating to effectiveness of habitat improvements and management. (Site scale). • Water birds – Beneficial. Provision of significant areas of open water in the operational phase, managed for the benefit of birds. (Local Scale). • Invertebrates - Significant beneficial effect providing enhanced habitats for invertebrates relative to those in the local area managed for biodiversity in the long term. (Local Scale). • Bats - Significant adverse effect owing to the impact on foraging and commuting bats as a result of noise and lighting which, whilst largely mitigated for may result in a change in the use of the Site by and composition of the bat assemblage. (Local Scale). <u>Habitat Regulations Assessment</u> An assessment for 'Likely Significant Effects' (LSE) on the qualifying features of the identified European Sites was included within the 2018 ES. European Sites within 10km of the Site were identified, with an assessment of 'Likely Significant Effects': Cannock Chase Special Areas of Conservation (SAC), Mottey Meadows SAC and Cannock Extension Canal SAC. The assessment considered the potential LSE's from the following potential impacts: • Direct physical effects, habitat loss / fragmentation / displacement; • Disturbance from noise (all sources);	**Updated Residual Effects** <u>Demolition and Construction</u> In consideration of the updated baseline conditions, the proposed changes are unlikely to affect the demolition and construction phase assumptions or the assessment of effects undertaken for the construction phase, as reported in Chapter 10 of the ES. Whilst the proposed amendments would result in a further land take of 0.0308 ha associated with the rail sidings extension, the additional parcel of land is considered to have limited ecological value, consistent with the adjacent yard space assessed as part of the 2018 EIA and is not of notable value to any protected species. The remaining proposed design changes fall within the consented Order Limits for which the 2018 EIA was based on a worst-case assessment whereby the entire area required for infrastructure development was considered as comprising the construction of buildings and/or hardstanding (i.e. resulting in the loss of habitats on-site from site clearance and groundworks). This included areas within the developable area which would comprise landscaping, such as the area of verge now proposed for the footway. As such, the proposed design changes would not alter the worst-case parameters and assumptions used to inform the original EIA and the residual effects would remain as previously reported in the 2018 ES. Furthermore, Application of the FEMMP, and the associated Ecological Mitigation and Management Plans (EMMPs) for each phase of works, will ensure appropriate mitigation is applied as assessed within the 2018 ES. <u>Completed Development</u> In consideration of the updated baseline conditions, the proposed changes are unlikely to affect the operational phase assumptions or the assessment of effects undertaken for the operational phase, as reported in Chapter 10 of the 2018 ES. The proposed changes are not anticipated to affect the agreed ecological mitigation and compensation measures detailed. In respect of the proposed amendments, whilst the landscaping plan is subject to change, the net reduction in landscaping area would be 0.2489 ha, representing a negligible change in the context of the overall land proposed for landscaping (and ecological provisions). Accordingly, no new or materially different significant residual effects would arise and the conclusions presented in the 2018 ES are considered to remain valid . <u>Habitat Regulations Assessment</u> The proposed amendments are not considered to change the assessment due to the Site distance, lack of connectivity and designation qualifying features. No likely significant effects are anticipated from direct physical effects, noise, water quality or from changes in ambient air quality.

Technical Topic	Assessment Methodology & Baseline Conditions	Conclusions of 2018 ES	Review of 2022 Amended Proposed Development
		• Changes in ambient air quality – direct (NO2, NOx, SO2 and dust) and indirect (Nitrogen and acid deposition), for instance from traffic and site operations; • Changes to water quality, for instance from road run off; and • In combination effects. Potential effects as a result of the Proposed Development on the internationally designated sites were excluded based on the Site's distance and lack of connectivity, and information from the 2018 Transport Assessment and ES Chapter 15: Transport.	
Ground Conditions	**Assessment Methodology** Since the 2018 ES assessments, the following changes have been made to legislation, policy and guidance: • LCRM – Land Contamination Risk Management. • The NPPF was updated February 2019 and revised July 2021. This guidance does not constitute a material change in the methodology of the 2018 EIA, which is still considered to be appropriate. The 2023 proposed amendments do not materially change the scope or methodology of the assessment. The 2023 proposed amendments and 2023 amended proposed development as a whole do not introduce any new issues for consideration in the updated assessment. **Baseline** Since the ground conditions assessment was undertaken for the 2018 EIA (as presented in Chapter 11 of the 2018 ES), Delta Simmons have undertaken further surveys on-site, both to support with the discharge of planning requirements, as well as to capture the additional parcel of land which is now proposed to be included within the Order Limits. The results of the updated surveys are presented in **Appendix E** of this EIL. In summary, there would be no material change to the baseline conditions reported in the 2018 ES.	**Summary of Residual Effects** <u>Demolition and Construction</u> • Human Health - Residual risks from direct contact and inhalation of ground contamination and gases – **Negligible / Minor Adverse** and not significant. • Controlled waters – Leaching and migration of contaminants associated with the Proposed Development via groundwater – **Minor Adverse** and not significant. • Ongoing remediation works - Potential reduction in remediation efficiency / operation – **Minor / Moderate Adverse** and not significant. • Off-Site Geological SSSI - Risks of degradation of the SSSI through dust / vapour release - **Minor Adverse** and not significant. <u>Completed Development</u> • Direct contact and inhalation of ground contamination and hazardous ground gases - **Negligible Adverse** and not significant. • Leaching and migration of the contamination associated with the Proposed Development via groundwater - **Minor Adverse** and not significant. • Ongoing remediation works – Potential reduction in remediation efficiency /operation - **Minor / Moderate Adverse** and not significant.	**Updated Residual Effects** <u>Demolition and Construction</u> In respect of the proposed amendments of relevance to the ground conditions assessment (i.e the rail infrastructure changes and associated additional parcel of land to be included within the Order Limits), the baseline conditions are considered to remain consistent with those used to inform the 2018 EIA and as such no further risks from contamination are likely. As such, the mitigation measures required, as set out in the 2018 ES, continue to be appropriate and would capture the additional parcel of land. In respect of the potential impact to the ongoing remediation works, it is noted that ongoing negotiation between SI Group and the proposed development construction contractor's will be undertaken throughout the design process in order to continually assess effect on the ongoing remedial objectives. Continual negotiation will minimize the likelihood of undermining remedial objectives. As such, no new or materially different significant residual effects would arise and the conclusions presented in the 2018 ES are considered to remain valid - Negligible/Minor Adverse to Minor/ Moderate Adverse for all risks following appropriate mitigation. The detailed review of the proposed amendments for each of the potential impacts is presented in **Appendix E**. <u>Completed Development</u> As above, considering the baseline conditions remain consistent with those used to inform the 2018 EIA, no further risks are likely and the mitigation proposed in the 2018 ES is considered to remain valid. Accordingly, the residual risks summarised within ES Chapter 11 remain valid - Negligible Adverse to Minor/ Moderate Adverse for all risks following appropriate mitigation, as further discussed within **Appendix E**.
Landscape and Visual Impact	**Assessment Methodology** Since the 2018 EIA, the following changes have been made in regard to legislation, policy and guidance: • The NPPF was updated February 2019 and revised July 2021. The above changes do not constitute a material change in the methodology of the 2018 EIA which is still considered to be appropriate. **Baseline** There has been no material change to the baseline conditions set out in the 2018 ES.	**Summary of Residual Effects** <u>Demolition and Construction - Landscape</u> • **Site Landscape Character:** Moderate/ Major Adverse direct effect upon the character of the Site landscape. • **Site Landscape Features – Woodland/ Trees/ Hedgerows**: Moderate/ Major Adverse direct effect and loss of existing woodland, trees and hedgerows, including approximately two thirds of Calf Heath Wood. • **Site Landscape Context/ Cannock Chase AONB/ Staffordshire and Worcestershire Canal:** Minor to Moderate Adverse direct and/or indirect effect upon landscape character and/ or features. <u>Demolition and Construction - Visual</u> • **Settlement and Properties (Near Views):** Minor/ Moderate to Major Adverse. • **Settlement and Properties (Distant Views):** Minor to Minor/ Moderate Adverse. • **Highways/ Road Users:** Minor to Moderate / Major Adverse	**Updated Residual Effects** <u>Demolition and Construction</u> The proposed amendments would not alter the nature of the demolition and construction works and the spatial extent of the works would remain virtually the same, with the exception of the small additional parcel of the land for the railway extension which is considered to be imperceptible in the context of the scale of the proposed development. Considering the proposed amendments, together with the fact that the duration of the demolition and construction programme would remain materially unchanged, the potential impacts of the demolition and construction works for the amended proposed development would not change. No change to the overall levels of landscape and visual effects for the receptor groups and no change to the overall conclusions of the 2018 ES Chapter 12. <u>Completed Development</u> The proposed amendments would not change the overall levels of landscape and visual effects for the receptor groups and therefore would not change the overall conclusions of the 2018 ES Chapter 12 for the reasons summarised below: • Whilst the road levels changes proposed along the Link Road would potentially alter the level of visual screening afforded to residential receptors to the west of the canal

Technical Topic	Assessment Methodology & Baseline Conditions	Conclusions of 2018 ES	Review of 2022 Amended Proposed Development
		• **PROW/ Footpaths Canal Towpath (incl. boat users):** Moderate/ Major Adverse. • **PROW/ Footpaths Shoal Hill footpaths/ open space**: Moderate Adverse. • **PROW/ Footpaths Generally and Calf Heath Reservoir:** Minor to Moderate/ Major Adverse. <u>Completed Development (15 yrs after full completion) - Landscape</u> • **Site Landscape Character:** Moderate Adverse direct effect upon the character of the Site landscape. • **Site Landscape Features – Woodland/ Trees/ Hedgerows**: Minor Adverse/ Negligible direct effect and loss of existing woodland, trees and hedgerows, including approximately two thirds of Calf Heath Wood. • **Site Landscape Context/ Cannock Chase AONB/ Staffordshire and Worcestershire Canal:** Minor to Minor/ Moderate Adverse direct and/or indirect effect upon landscape character and/ or features. <u>Completed Development (15 yrs after full completion) - Visual</u> • **Settlement and Properties (Near Views):** Minor to Moderate/ Major Adverse. • **Settlement and Properties (Distant Views):** Minor to Minor/ Moderate Adverse. • **Highways/ Road Users:** Minor to Moderate Adverse. • **PROW/ Footpaths Canal Towpath (incl. boat users):** Moderate Adverse. • **PROW/ Footpaths Shoal Hill footpaths/ open space**: Moderate Adverse. • **PROW/ Footpaths Generally and Calf Heath Reservoir: Minor to** Moderate Adverse.	and users of the canal and towpath, overall, the extent of change is likely to be negligible and would not alter the nature of the views to the proposed buildings beyond; • Whilst the green infrastructure would be amended as a result of the rail sidings extension, the net reduction in landscaping area would be 0.2489 ha, which would be negligible in the context of the overall land proposed for landscaping, and the changes proposed are not considered to prejudice the overall landscape design and mitigation measures of the green infrastructure proposals. Tree group (G6 in Appendix 12.7 of the 2018 ES) consists of a group of 7No. Lombardy Poplar trees. These were shown as being retained on the consented Green Infrastructure Parameters Plan yet will now be removed to facilitate the extended rail area. The loss of these trees will not be significant in landscape, visual or arboricultural terms and will be compensated for by extensive new tree and other planting as part of the green infrastructure proposals, including within the green infrastructure areas close to the existing trees. This will result in no material change to the landscape and visual impacts resulting from the amended proposed development, in comparison to the consented development. • The most notable change to the proposed internal bridge spans is to Bridge No. 1. This change is likely to result in a marginal reduction in the roadside green space and planting. This proposed bridge is not however readily visible from beyond the Site or from the canal corridor. The proposed increased span would have no discernible implications or effects in landscape and visual terms and would not result in any changes to the landscape and visual impact assessment, as reported in the 2018 ES. • The proposed increased spans to Bridges No. 2 and No. 3 are limited and neither bridge is readily visible from beyond the Site and any potential views from the canal corridor would be limited. The proposed increased spans to these bridges would have no discernible implications or effects in landscape and visual terms and would not result in any changes to the landscape and visual impact assessment, as reported in the 2018 ES. • It is proposed to slightly reduce the span of Bridge No.4, which would span the Staffordshire and Worcestershire Canal. This bridge would be closely and clearly visible for users of the canal and associated towpath. The scale of the span reduction is however minimal and it would not alter the overall character and appearance of the proposed bridge for users of the canal. Consequently, the proposed change would have no discernible implications or effects in landscape and visual terms and would not result in any changes to the landscape and visual impact assessment, as reported in the 2018 ES. • The proposed footway changes at the Straight Mile, Woodlands Lane and Kings Road Junction would result in the footway moving to the eastern side of Woodlands Lane, which would require the removal of brambles and scrub. No trees or hedges would be removed. These amendments would result in no discernible changes to the landscape and visual effects as previously assessed and stated within the 2018 ES. Overall, the conclusions of the 2018 ES remain valid.
Noise and Vibration	**Assessment Methodology** Since the 2018 EIA, the following changes have been made in regard to legislation, policy and guidance: • Although not the primary policy consideration on noise matters, the NPPF was updated in February 2019 and revised in July 2021. • The operational noise assessment method, contained in British Standard 4142, was amended in 2019 and the current version is BS4142: 2014+A1: 2019. The above changes do not constitute a material change in the methodology of the 2018 EIA, which is still considered to be appropriate. **Baseline**	**Summary of Residual Effects** <u>Demolition and Construction</u> • Short-term **Moderate to Major Adverse** noise effects at the receptors closest to the Site, where the construction works are close to the Site boundaries. • **Moderate Adverse** vibration effects at receptors close to the site, when heavy ground works are carried out close to them. • Short-term **Moderate Adverse** construction noise effects at the canal moorings and canal towpath receptors. <u>Completed Development</u> • Noise from on-site operational activities is likely to give rise to **Moderate Adverse** effects at a number of receptors around the Site. The provision of a BNIS should result in	**Updated Residual Effects** <u>Demolition and Construction</u> The proposed changes would not alter the demolition and construction phase information or assumptions on which the assessment of effects was undertaken for the construction phase, as presented in Chapter 13 of the 2018 ES (see the Transport and Access review below for further information). Accordingly, there is no change to the conclusions of the 2018 EIA. The updated baseline does not alter this conclusion, since the baseline sound levels inform the assessment criteria, and the most stringent thresholds had already been adopted. <u>Completed Development</u> The proposed changes would not materially affect the assessment of effects relating to off-site road traffic noise as a result of the operation of the Proposed Development, as presented in Chapter 13 of the 2018 ES (see the Transport and Access review below for

Technical Topic	Assessment Methodology & Baseline Conditions	Conclusions of 2018 ES	Review of 2022 Amended Proposed Development

	The baseline has been updated as part of the bespoke noise insulation scheme (BNIS); the update is a requirement of Clause 2 in Schedule 6 of the Development Consent Obligation.
	
	The results of the baseline survey update, undertaken for the BNIS, are presented in **Appendix F**. In summary, the baseline sound levels have increased to the north-west of the Site by approximately 4 dB and decreased to the south-east of the Site by approximately 5 dB. Due to the precautionary nature of the BNIS, it is proposed to reduce the baseline sound levels for the properties to the south-east of the Site, but not increase the baseline sound levels for the properties to the north-west of the Site. This means that the insultation measures offered under the BNIS will be offered to properties to the south-east of the Site at a lower noise level that would have been the case without the baseline update.
	Where the updated baseline results are factored into the assessment of operational noise from the Site, the impacts at properties to the south-east of the Site have the potential to be materially worse than were set out in the 2018 EIA, before any changes to the scheme are considered, i.e. a material worsening may result from the change in the baseline alone.
		internal noise levels that meet the available guidelines for residential properties.
		• Increases in noise from road traffic on roads around the site, particularly on Vicarage Road between the Site access and the A5, the A5 between the Site access and the M6, the A449 Between Gravelly Way and Brewood Road are predicted to lead to **Moderate to Major Adverse** effects.
		• The provision of a BNIS for operational and construction noise, which builds on the statutory requirement set out in the NPS to apply the Noise Insulation Regulations, results in a scheme that meets the policy requirements of the NPS, in particular:
		  • Significant adverse effects on health and quality of life from noise are avoided;
		  • A range of measures are proposed, particularly through careful layout of the Proposed Development to mitigate and minimize other adverse effects on health and quality of life; and
		  • Mitigation measures are proposed in the form of a noise insulation scheme to ensure that satisfactory residential environments continue to be provided for the properties in closest proximity to the development.
			further information). The updated baseline would also not alter the assessment of effects since the measured baseline sound levels are not factored into the assessment of off-site road traffic noise. Accordingly, there is no change to the conclusions of the 2018 EIA in respect of effects resulting from off-site road traffic noise.
			
			The potential effects of the alterations brought about by the proposed highways and bridges amendments on noise generated by operations of the Site have been considered. Given that there would be no change to the operation of the amended development, the same operational parameters as were assessed in the 2018 EIA were used, i.e. the same types and numbers for all activities have been assumed.
			The locations of the activities have also remained as previously assumed for the 2018 EIA, with the following exceptions:
			• the absolute height of any vehicles assumed to be travelling on the internal site roads have been adjusted to follow the new heights of the roads (as discussed in Section 3.2.2), so that they remain 0.5 metres above those roads;
			• the absolute finished height of mounding has been amended to in connection with the new heights of the roads; and
			• an idling locomotive has been modelled at the southern extent of the new neck shunt, further south than was assumed in the 2018 EIA. As advised by the future operator, it is understood that the neck shunt will be used when reversing a locomotive, which will occur four to five times per day, and will take up to approximately 5 minutes for a locomotive to complete this manoeuvre. Therefore, the updated calculations for the proposed highways and bridges amendments have been based on one locomotive idling for a full 5 minutes in any given hour.
			The method for determining appropriate acoustic feature corrections remains as described in the 2018 ES.
			The results of the updated assessment, which are presented in **Appendix F**, show that operations at the Site are expected to change by up to ±2dB at the assessed receptors, except at one receptor, where a change of +3dB is expected.
			
			When assessed using the same methods and approach as adopted for the 2018 EIA, including the same baseline data as used in the 2018 EIA, it has been found that the proposed highways and bridges amendments do not, in and of themselves, lead to any new or materially different likely significant effects.
			
			The correction of an error in the noise calculations in the 2018 EIA leads to two previously-declared likely significant effects becoming not significant, at the receptors Avenue Cottages and The Villa.
			
			When accounting for the change in the background sound levels, the lower baseline sound levels to the south-east of the Site have been found to give rise to new likely significant effects at five receptors locations: Cobweb Cottage, High Clere, Meadow View, Straight Mile Farm and Woodland Farm. However, as shown in Table 6.5 of the Noise Assessment and discussed in the following section, Section 7 (**Appendix F**), these additional five likely significant effects are predicted to occur irrespective of whether the consented scheme is altered by the proposed highways and bridges amendments.
			
			When considered on a like-for-like basis, where the baseline acoustic climate is the same and the calculation error made in the 2018 application is corrected, the number of likely significant effects is the same for the consented scheme and the proposed highways and bridges amendments.
			
			It is noted that of the five new receptors where new likely significant effects are predicted, four are expected to be eligible under the BNIS when assessing operational noise, including two receptors (High Clere and Meadow View) that would not have been eligible under the operational BNIS assessment without the change in baseline conditions.

Technical Topic	Assessment Methodology & Baseline Conditions	Conclusions of 2018 ES	Review of 2022 Amended Proposed Development
			On the basis of the updated assessment set out in **Appendix F**, it is concluded that the noise impacts of the consented scheme would not be materially changed by the proposed highways and bridges amendments, and that although new significant effects have been identified, these would occur with or without the proposed highways and bridges amendments, as they are caused solely by the changes in the baseline acoustic climate.
Socio-Economics and Human Health	**Assessment Methodology** The assessment methodology has remained unchanged. It is noted the Use Classes Order was updated in September 2020 and August 2021; however, assessment guidance relating to the use classes has not changed. As the type and quantum of land uses proposed are not subject to change, the proposed amendments do not introduce any new elements for consideration in the updated assessment. **Baseline** In respect of baseline data, there would be certain revisions where some data sources have released updates. A summary of some key baseline updates for the South Staffordshire District has been provided below: • The total population is 110,500 based on the Census 2021 data released from the Office for National Statistics (ONS) which is an increase of approximately 2% from the 2011 population. This is the projected level of growth anticipated in the 2018 ES. • The total number of economically active people based on the NOMIS data (Official Census and Labour Market Statistics) between October 2021 – September 2022 is 51,500. This is approximately a 0.3% decrease from the level stated in the 2018 ES. • The claimant count rate based on the NOMIS data in December 2022 is 2.6%. This is an increase of 1.6% from that stated in the 2018 ES although is still well below the national average of 3.7%. • At the time of the 2021 Census, the majority of residents worked in managerial and professional occupations (48%) with a lower proportion in process and elementary occupations (14%). This is very similar to the 2018 ES with the proportions being 42% and 14% respectively. • At the time of the 2021 Census, wholesale and retail trades and health and social work are still amongst the most significant employers as stated in the 2018 ES. In addition, since the 2018 ES, there are still similar proportions of those employed in manufacturing (10%) which has slightly reduced by 2%, construction (12%) which has increased by 2% and transport and storage (3%) which has decreased by 1%. • In the Annual Survey of Hours and Earnings (ASHE) Provisional 2022 Results released by ONS, the median income for the local authority is £34,121. This is higher than the wage stated in the 2018 ES which will be related to inflation, and is still relatively similar to the England and Wales median income of £33,101. • The Indices of Multiple Deprivation (IMD) released in 2019 have not been updated since and therefore the site is still located in an area that is not within the 10% or 20% most deprived in the country. • The South Staffordshire Health Profile 2019 released by Public Health England (PHE) shows that overall the health indicators are better or similar to the England average. This is very similar to what has been reported in the 2018 ES. This shows that the baseline has not substantially changed from the 2018 ES, and therefore it is not considered these would result in significant changes to the assessment.	**Summary of Residual Effects** <u>Demolition and Construction</u> • Construction and demolition employment – **Minor Beneficial** (District, West Midlands, SSLEP). • Wider economic effect – **Minor Beneficial** (District, SSLEP). • Effects on local businesses, organisations and clubs during demolition and construction – **Neutral to Minor Adverse** (Local). • Recreation and amenity effects during demolition and construction – **Minor Adverse** (Local). • Human health effects during demolition and construction – **None** at all spatial scales. <u>Completed Development</u> • Operational employment – **Major Beneficial** (Local, District, SSLEP). • Operational employment – **Minor Beneficial** (TTWA). • Wider economic effects of operation – **Major Beneficial** (Local, District, SSLEP). • Wider economic effects of operation – **Minor Beneficial** (National). • Effects on local businesses, organisations and clubs during operation – **Neutral**. • Recreation and amenity effects during operation – **Minor Adverse** (Local). • Human health effects during operation – **None** at all spatial scales.	**Updated Residual Effects** <u>Demolition and Construction</u> The duration of the demolition and construction programme would remain materially unchanged as a result of the proposed amendments and there is not anticipated to be any material change in construction employment generated. As the spatial extent of the demolition and construction works would remain virtually the same, with the exception of the small additional parcel of land for the railway extension, the effects relating to recreation and amenity and human health would also remain the same. Accordingly, no new or materially different significant residual effects would arise and the conclusions presented in the 2018 ES are considered to remain valid. <u>Completed Development</u> Given the proposed amendments would not alter the quantum of land uses being delivered, the economic effects of the proposed development would remain the same. Accordingly, no new or materially different significant residual effects would arise and the conclusions presented in the 2018 ES are considered to remain valid.
Transport and Access	**Assessment Methodology** Since the 2018 EIA, the following changes have been made in regard to legislation, policy and guidance: • The NPPF was updated February 2019 and revised July 2021. The above changes do not constitute a material change in the methodology of the 2018 EIA which is still considered to be appropriate. The 2023 proposed amendments do not materially change the scope or methodology of the assessment, noting the following:	**Summary of Residual Effects** <u>Demolition and Construction</u> • **short term minor adverse effect** on local roads as a result of traffic re-assignment away from the A449 whilst the Site access roundabout is constructed. <u>Interim Completed Development</u> • temporary direct, long-term effect on severance of **negligible to minor adverse significance.**	**Updated Residual Effects** <u>Demolition and Construction</u> The proposed design changes would not be expected to give rise to a change in construction vehicle trips, nor would the amended phasing strategy alter the assumptions used to inform the construction vehicle trips (i.e. the overall duration of the demolition and construction programme remains valid, as well as the worst-case assumptions around the potential simultaneous works, as set out in **Table 2.1.1**). Whilst the amended phasing strategy may result in traffic increases on certain roads, these changes would not be permanent and would be limited in duration. The construction traffic routing would be

Technical Topic	Assessment Methodology & Baseline Conditions	Conclusions of 2018 ES	Review of 2022 Amended Proposed Development
	• The type and quantum of land uses proposed are not subject to change; • There are no changes proposed to the transport infrastructure and mitigation that is necessary to reduce the effects of the Proposed Development; and • No changes are proposed to the delivery trigger points for transport infrastructure and mitigation. Therefore the 2023 proposed amendments do not introduce any new issues for consideration in an updated assessment. **Baseline Conditions** Since the 2018 EIA, the M54/M6 Link Road DCO has been granted consent. At the time of the 2018 EIA, it had been agreed with Highways England (now National Highways) and Staffordshire County Council that in order to assess a worst case, the assessment of transport effects and impacts should make no allowance for the M54/M6 Link Road scheme. The traffic data submitted by National Highways in support of the M54/M6 Link Road has been reviewed and specifically in relation to those highway links in proximity to West Midlands Interchange, flows are shown to be less than those forecast by the 2018 EIA. Whilst utilizing the more recent traffic evidence base provided by National Highways as the baseline may show greater proportional changes in traffic flows, the 2018 EIA has considered, in absolute terms, the worst case. The above position has been agreed with National Highways and Staffordshire County Council as relevant Highway Authorities and is considered reflective of the nature of the proposed non material amendments to the Order.	• temporary, direct, long-term effect of **minor adverse significance** on driver stress and delay. • temporary, direct, long-term effect of **negligible to minor adverse significance** on pedestrian delay. • temporary, direct, long-term effect of **minor adverse significance** on levels of cyclist delay. • temporary, direct, long-term effect of **minor adverse significance** on fear and intimidation levels. • temporary, direct, long-term effect of minor **adverse significance** on the typical number of accidents. <u>Completed Development</u> • Permanent, direct, long-term effect on severance of **negligible to minor adverse significance**. • **Minor to moderate adverse significance** on driver stress and delay. • Permanent, direct, long-term effect on pedestrian delay and amenity of **negligible to minor adverse significance**. • Permanent, direct, long-term effect on cyclist delay and amenity of **negligible to minor adverse significance.** • Permanent, direct, long-term effect on fear and intimidation of **minor adverse significance**. • **Minor to moderate adverse significance** on accidents and safety.	managed and mitigated in accordance with the Demolition and Construction Traffic Management Plan. Accordingly, no new or materially different significant residual effects would arise and the conclusions presented in the 2018 ES are considered to remain valid . <u>Interim and Completed Development</u> The proposed amendments would not alter the quantum or type of land uses being delivered and the trigger points for the delivery of infrastructure and mitigation would remain as that secured by the consented Order. The 2018 EIA reported a worst case in terms of the assessment of effects therefore the transport effects of the proposed development would be no worse than those shown previously. Accordingly, no new or materially different significant residual effects would arise and the conclusions presented in the 2018 ES are considered to remain valid.
Water Environment and Flood Risk	**Assessment Methodology** Since the 2018 ES, the following new legislation, policy and guidance has been published: • 2021 National Planning Policy Framework; • Climate Change Allowances 2016 (27 May 2022 update); • Southern Staffordshire Councils Level 1 Strategic Flood Risk Assessment (October 2019); and • South Staffordshire Council Climate Change Strategy 2020. None of the above documents introduce new issues for consideration which would affect the assessment scopes and methodologies of the 2018 EIA. The 2023 proposed amendments and 2023 amended proposed development as a whole do not introduce any new issues for consideration in the updated assessment. **Baseline Conditions** There has been no material change to the baseline conditions set out in the 2018 ES.	**Summary of Residual Effects** <u>Demolition and Construction</u> • All residual effects related to Demolition and Construction were assessed to be Negligible (not significant) for all Water Environment and Flood Risk receptors. <u>Completed Development</u> • All residual effects related to the Completed Development were assessed to be Negligible (and not significant) for all Water Environment and Flood Risk receptors.	**Updated Residual Effects** <u>Demolition and Construction</u> The 2023 proposed amendments would not alter the demolition and construction methods and the mitigation to be implemented through the ODCEMP. Accordingly, no new or materially different significant residual effects would arise in relation to Demolition and Construction for all Water Environment and Flood Risk receptors and the conclusions presented in the 2018 ES are considered to remain valid. <u>Completed Development</u> As described in Section 3.2 - Design Changes, the proposed amendments to new on-site road infrastructure levels has been driven by the fall levels required to achieve the drainage strategy. However, the overall site-wide drainage strategy itself, which informed the 2018 Water Resources and Flood Risk Assessment (as presented in the 2018 ES Vol II Technical Appendix 16.3), would not change. It is also noted that the proposed extension to Zone C to the south of the Rail Terminal would result in new rail lines displacing land previously identified for landscaping, which would now be shifted south requiring an additional 0.0308 ha to be included in the consented Order Limits. Given the proposed amendments would not alter the land use (& would not materially change from soft/permeable landscaping to hard/impermeable landscaping), the site wide drainage strategy would continue to provide sufficient attenuation to reduce runoff to greenfield rates. Accordingly, the drainage strategy would remain the same. Based on the above considerations and the validity of the drainage strategy, the proposed amendments would therefore not alter the assessment of effects presented in the 2018 ES and the conclusions would remain the same. It is noted that the drainage strategy has been subsequently updated to omit the proposed inverted siphon under the WCML through introducing a fifth drainage catchment – Outlet E; however, the main principles remain valid and these amendments would not alter the assessment of effects of the proposed development on the water environment,

4.3. Conclusions

An application for a non-material change to the West Midlands Rail Freight Interchange Order 2020 (as amended by The West Midlands Rail Freight Interchange (Correction) Order 2020) has been submitted by FAL to the Planning Inspectorate (PINS), on behalf of the Secretary of State (SoS), in order introduce a series of scheme amendments, comprising of design changes, as well as the inclusion of 0.0308 ha additional land currently outside of Order Limits (but within FAL's ownership). This report presents the results of a review undertaken by FAL's appointed technical specialist team to determine whether the proposed design changes would give rise any new or, materially different, likely significant effects on the environment to those set out in the 2018 ES.

In the course of the review, in addition to the proposed amendments, the appointed technical specialist team have given consideration to the ongoing validity of the scope of the 2018 EIA, the validity of the baseline conditions reported in the 2018 ES, any changes to legislation and guidance of relevance to the assessments undertaken in the 2018 EIA, any changes to the assumptions used to inform the EIA including the phasing of the demolition and construction works, and any new or amended cumulative schemes that have come forward in the interim.

Due to the nature of the proposed design changes, the scope of the 2018 EIA is considered to remain valid and therefore the following topics have not formed part of this review: Waste; Telecommunication Interference; Light Spillage; Daylight, Sunlight and Overshadowing; Wind Microclimate; and Aviation, as it remains the case that no significant effects would be anticipated in relation to these topics as a result of the amended proposed development.

In respect of topics previously scoped in to the 2018 EIA, no new or materially different significant residual effects would arise with respect to Agricultural and Soils; Air Quality; Archaeology; Cultural Heritage; Ground Conditions; Ecology and Nature Conservation; Landscape and Visual Impact; Socio-Economics and Human Health; Transport and Access; and Water Environment and Flood Risk, and the conclusions presented in the 2018 ES are considered to remain valid for both the demolition and construction stage and completed development stage.

In respect Noise and Vibration, there would be new likely significant effects during the completed development stage at five receptor locations: Cobweb Cottage, High Clere, Meadow View, Straight Mile Farm and Woodland Farm. However, these new likely significant effects occur as a result of the change in the baseline conditions and would therefore occur with or without the proposed amendments to the scheme. It is also noted that the correction of an error in the noise calculations in the 2018 EIA leads to two previously-declared likely significant effects becoming not significant at the receptor locations, Avenue Cottages and The Villa. When undertaking a like-for-like assessment with the consented scheme using the same baseline data, there would be no new or materially different significant effects as a result of the proposed amendments themselves. On balance, it is considered that the noise effects from the amended proposed development are materially the same as those presented in the 2018 ES.

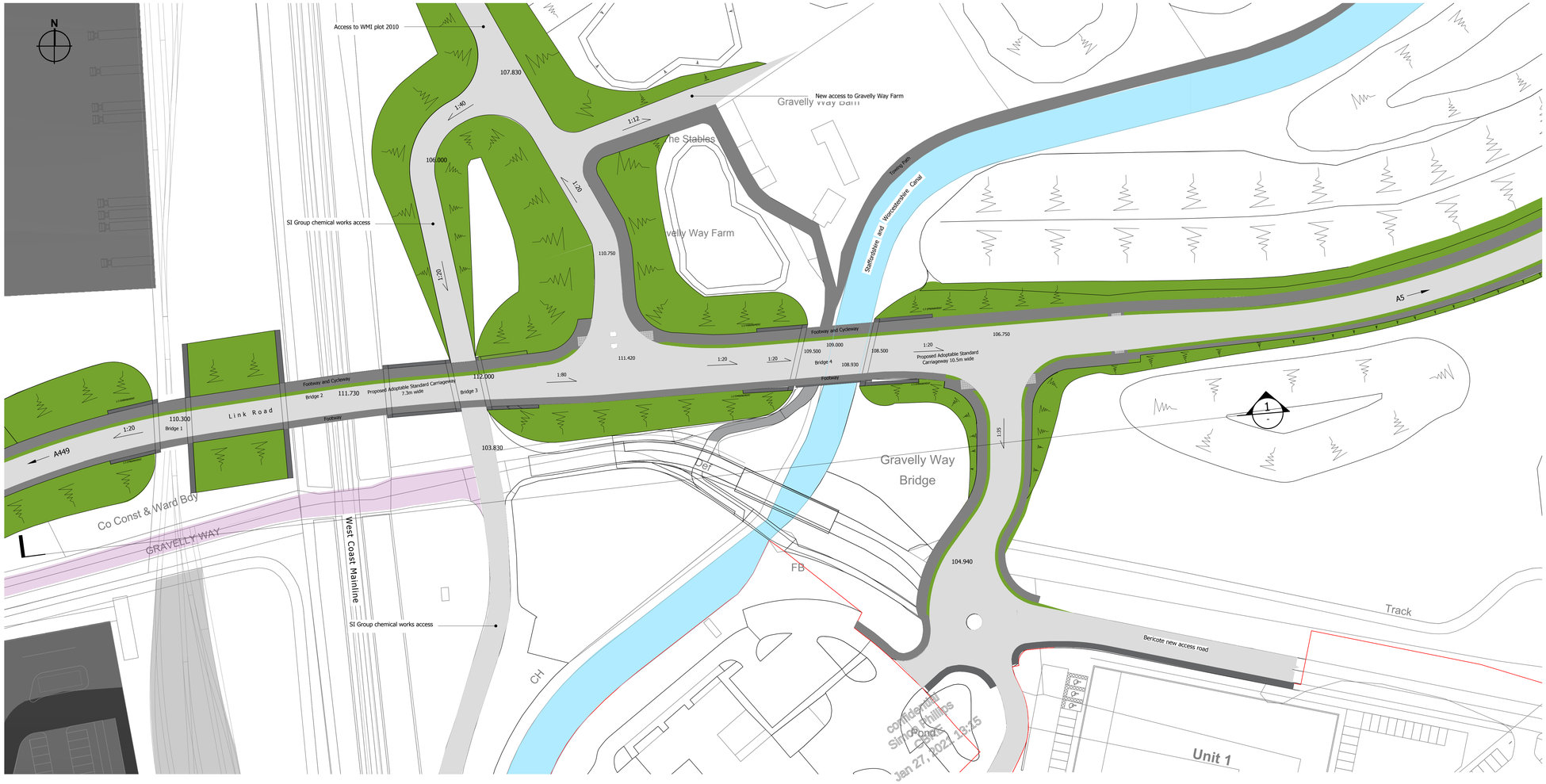
Overall, the reviews undertaken by the consultant team show that the proposed design changes are expected to have no material impact on the results reported in the ES submitted alongside the 2018 application and no additional mitigation is required as a result of the proposed changes.

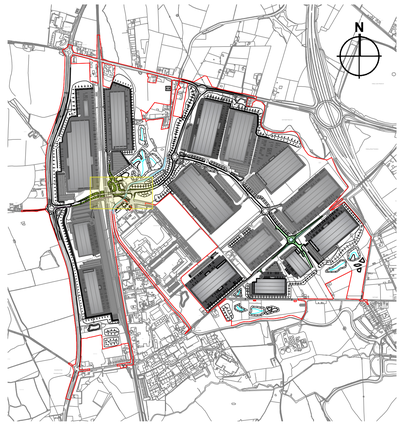
As such, the original ES results and conclusions remain valid in the context of the amended proposed development.

In addition to the certified ES, the original 2018 application was accompanied by a Habitats Regulations Statement – No Significant Effects Report (dated July 2018). European Sites within 10km of the Site were identified, with an assessment of 'Likely Significant Effects': Cannock Chase SAC, Mottey Meadows SAC and Cannock Extension Canal SAC. This report concluded that the proposed development was not likely to have a significant effect on any European Sites, either alone or in combination with other projects and plans. As a result, it was concluded that an Appropriate Assessment was not required. Due to the site distance, lack of connectivity and designation qualifying features, the proposed amendments are not considered to result in a new significant effects on any European site, alone or in-combination. Accordingly, the conclusions of the Habitat Regulations Statement remain valid and an Appropriate Assessment is not required.

Appendix A: Figures

Figure 3.1: Consented Road Bridges



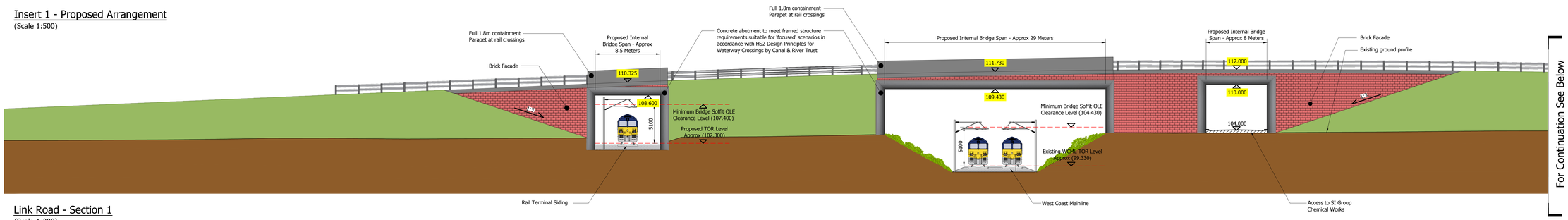


Key Plan
(NTS)

Key

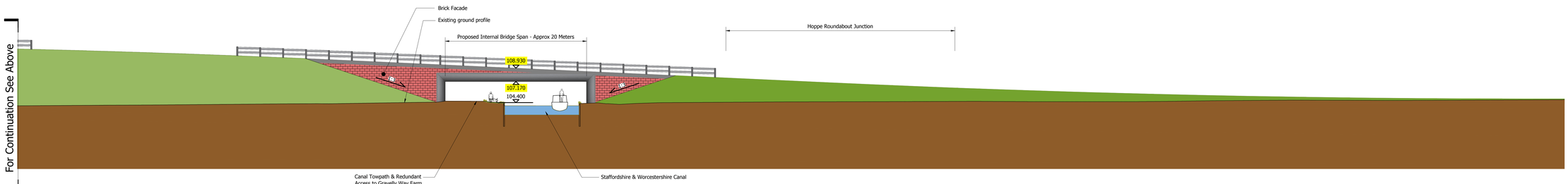
108.930 Denotes bridge carriageway and soffit levels subject to Article 4 of the DCO

Insert 1 - Proposed Arrangement
(Scale 1:500)



Link Road - Section 1
(Scale 1:200)

For Continuation See Below



For Continuation See Above

Link Road - Section 1 (Continued)
(Scale 1:200)

SCALE BAR 1:500
0 10 20 50 100

SCALE BAR 1:200
0 5 10 20 40

P8	Bridge carriageway and soffit levels highlighted. Key added.	May 2019 VRL
P7	Waldeck's logo added	July 2018 NG
P6	Drawing status updated, scale bar added	July 2018 NG
P5	Drawing title & Document number amended, WMI order limits updated	12.06.18 NG
P4	Document & regulation number and drawing title amended	09.05.18 NG
P3	Notes added & amended, Four OS Map updated	04.04.18 NG
P2	Title amended	06.03.18 JRB
P1	Issued for Comment	06.03.18 JRB

Revisions

West Midlands Interchange

Project
THE WEST MIDLANDS RAIL FREIGHT INTERCHANGE ORDER 201X

Drawing Status
Final

Drawing Title
Proposed Road Bridges

Drawing Size A0

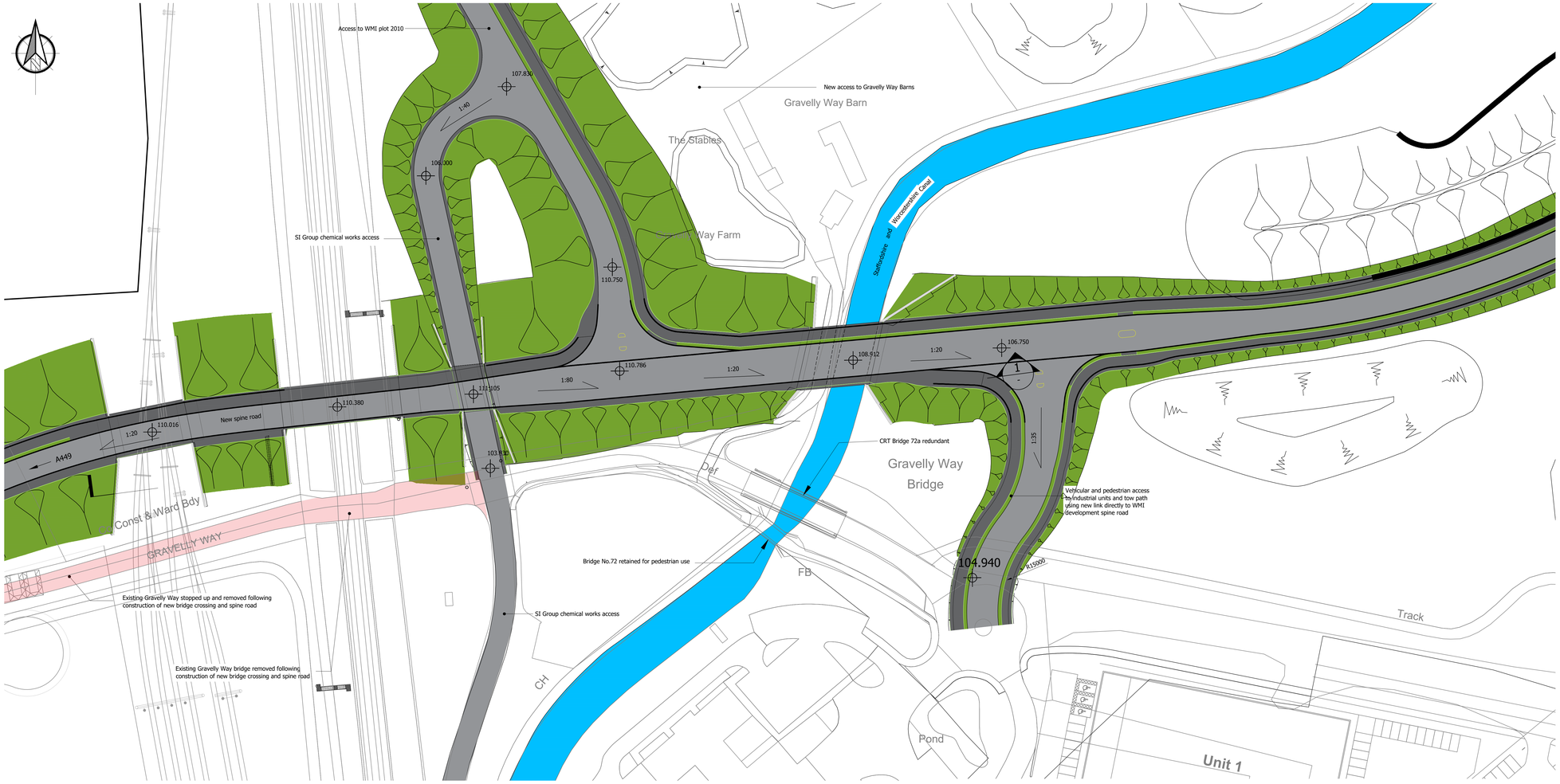
Regulation	Document
5 (2) (o)	2.18A

Drawn JRB	Date July 2018	Scale As Shown	Reviewed TL

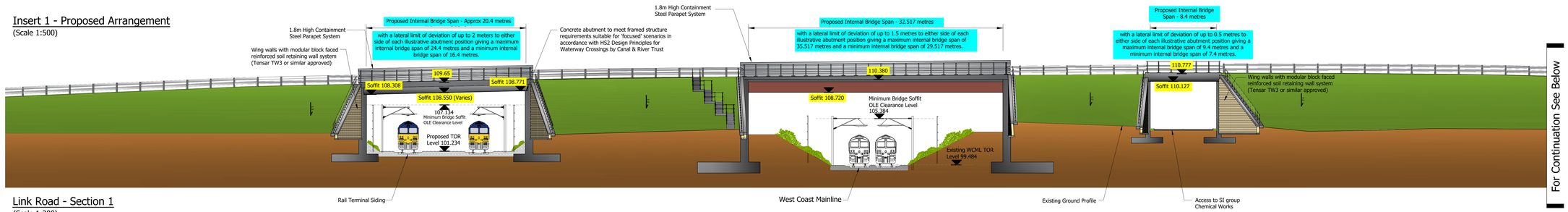
Drawing No.
1516-0425-WDK-SI-C-301-010

Rev.
P8

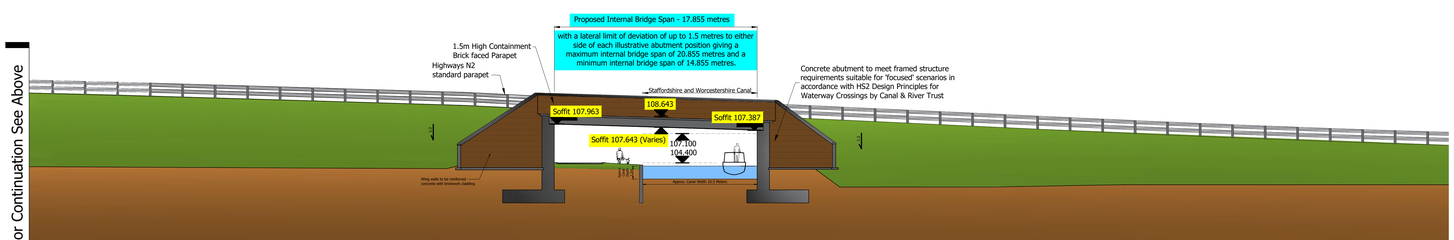
Figure 3.2: Proposed Road Bridges



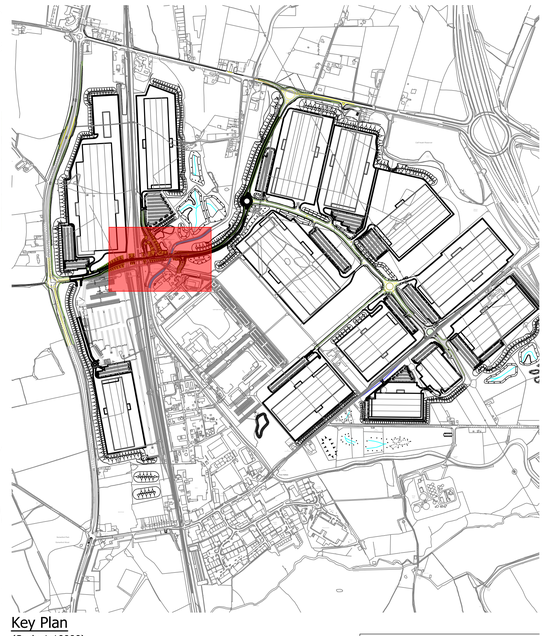
Insert 1 - Proposed Arrangement
(Scale 1:500)



Link Road - Section 1
(Scale 1:200)



Link Road - Section 1 (Continued)
(Scale 1:200)



Key Plan
(Scale 1:10000)

External References:

Notes

1. Do not scale this drawing.
2. All dimensions are in millimetres unless stated otherwise.
3. This drawing to be read in conjunction with all other relevant drawings and specifications.
4. All proprietary items to be installed in strict compliance with manufacturers instructions and recommendations.

Key

Bridge soffit Level (107.127)	Denotes bridge carriageway and soffit levels subject to Article 4 of the DCO
Internal Bridge Span 8.4 Metors	Denotes bridge abutment positions subject to Article 4 of the DCO

P11	Bridge 1 & 3 south verge width reduced	May 2022 LW
P10	Text colour changed to blue	April 2023 LW
P9	Bridge clear span updated. Road levels updated. Wingwalls updated.	Nov 2022 LW
P8	Bridge carriageway and soffit levels highlighted. Key added.	May 2018 VRL
P7	Waldeck's logo added	July 2018 NG
P6	Drawing status updated, scale bar added	July 2018 NG
P5	Drawing title & Document number amended, WMI order limits updated	12.06.18 NG
P4	Document & regulation number and drawing title amended	09.05.18 NG
P3	Notes added & amended, our OS Map updated	04.04.18 NG
P2	Tittle amended	06.03.18 JRB
P1	Issued for Comment	06.03.18 JRB

Revisions

West Midlands Interchange

Project
THE WEST MIDLANDS RAIL FREIGHT INTERCHANGE 2020

Drawing Status
Final

Waldeck Digital Strategy Consultancy Solutions

Drawing Title
Proposed Road Bridge

Drawing Size A0

Regulation	Document
5 (2) (o)	2.18A

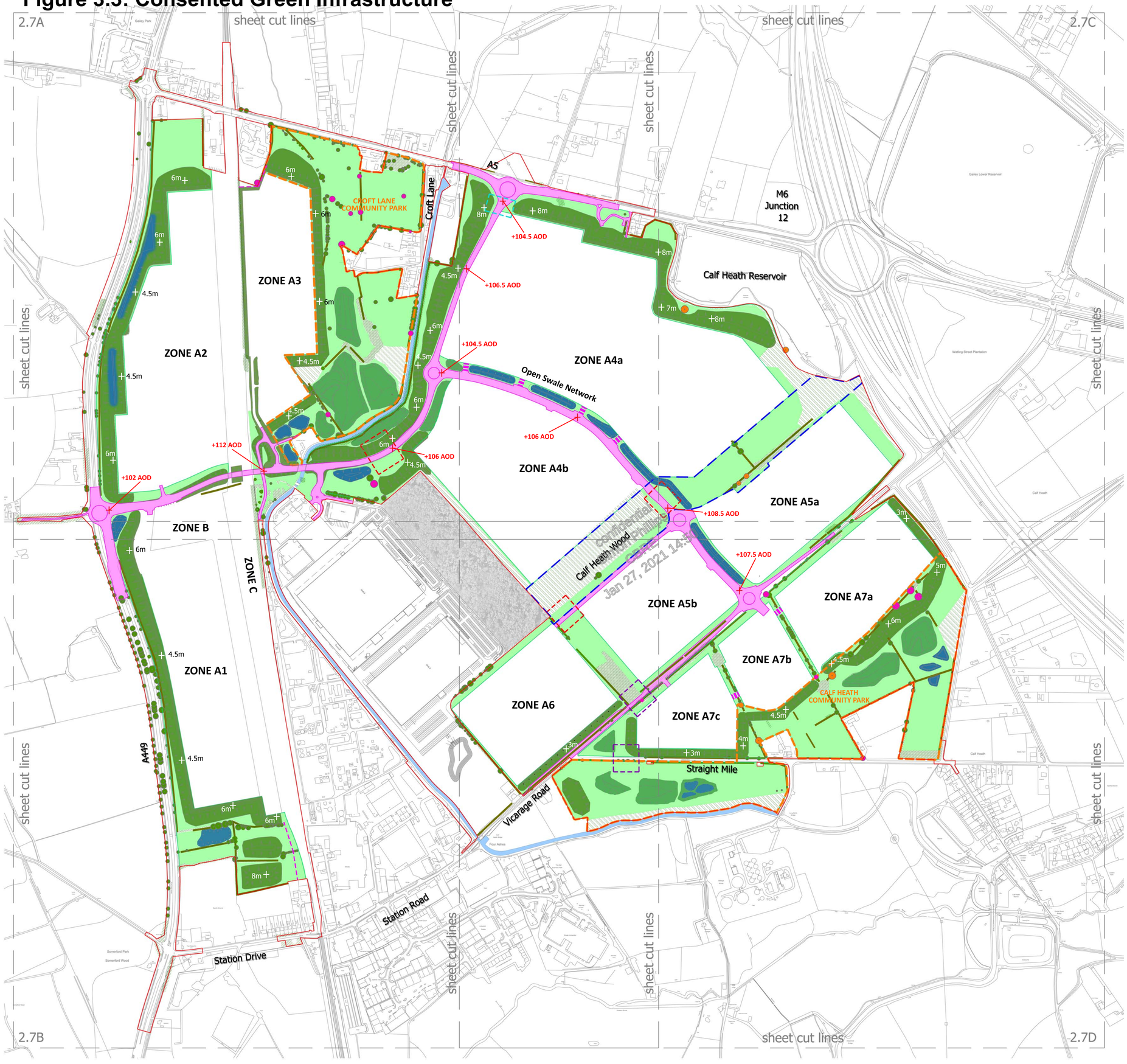
Drawn TP	Date July 2018	Scale 1:500	Reviewed TL

Drawing No.
1516-0425-WDK-SI-C-301-010

Rev.
P11

10m SCALE 1:500
1m SCALE 1:200

Figure 3.3: Consented Green Infrastructure



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N

0m 50m 100m 200m 500m

- Order Limits
- Canal
- New road infrastructure and improvements to existing infrastructure.
- Landscaping
- Mounding
- Dry Attenuation (precise location and extent to be approved at time of submission of details for approval post DCO approval)
- Wet Attenuation Ponds (precise location and extent to be approved at time of submission of details for approval post DCO approval)
- Community Park Boundary
- Acoustic Fencing
- Ecological Corridor Linking Calf Heath Wood and Calf Heath Reservoir
- Existing Conserved Woodland / Trees to be retained
- Existing Conserved Hedgerows to be retained
- Existing Veteran Trees to be retained
- Existing 'Future' Veteran Trees to be retained
- Plot Access Points through Green Infrastructure. (precise location and extent to be approved at time of submission of details for approval post DCO approval)
- +3m to +8m — Height of mounding (relative to the adjoining development zone's finished floor level (FFL) as shown on document 2.6)

Note:
Height of mounding to the eastern side of the canal is relative to the new road infrastructure

Note:
All AOD levels shown for the new on-site road infrastructure are subject to a vertical deviation of 0.5 metres upwards or downwards

- Bat Hopover - Precise location and extent to be approved at time of submission of details for approval post DCO approval.
- Bat Hopover and Wildlife Crossing - Precise location and extent to be approved at time of submission of details for approval post DCO approval.
- Wildlife Crossing - Precise location and extent to be approved at time of submission of details for approval post DCO approval.

Revisions

West Midlands Interchange

Project
THE WEST MIDLANDS RAIL FREIGHT INTERCHANGE ORDER 201X

Drawing Status
SUBMISSION

Drawing Title
KEY PLAN - PARAMETERS PLAN
GREEN INFRASTRUCTURE PLAN

Drawing Size A1

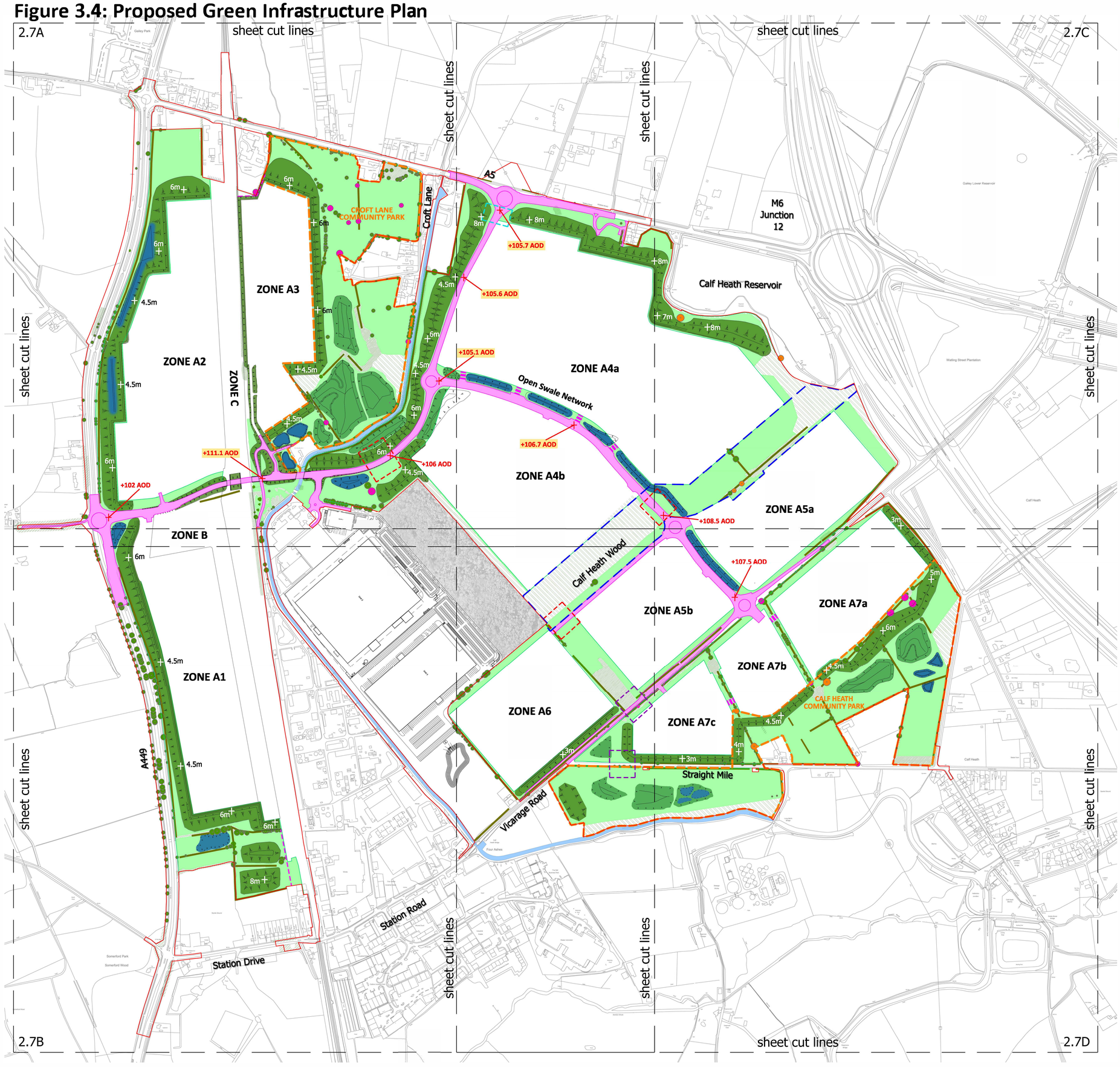
Regulation	Document
5 (2) (o)	2.7

Drawn	Date	Scale	Reviewed
SM	MARCH 2018	1/5000	PMJS

Drawing No. 4049 - 1033

Rev. 10

Figure 3.4: Proposed Green Infrastructure Plan



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N

0m 50m 100m 200m 500m

+000.0 AOD **Updated AOD**

- Order Limits
- Canal
- New road infrastructure and improvements to existing infrastructure.
- Landscaping
- Mounding
- Dry Attenuation (precise location and extent to be approved at time of submission of details for approval post DCO approval)
- Wet Attenuation Ponds (precise location and extent to be approved at time of submission of details for approval post DCO approval)
- Community Park Boundary
- Illustrative Alignment of Acoustic Fencing (precise location and extent to be approved at time of submission of details for approval)
- Ecological Corridor Linking Calf Heath Wood and Calf Heath Reservoir
- Existing Conserved Woodland / Trees to be retained
- Existing Conserved Hedgerows to be retained
- Existing Veteran Trees to be retained
- Existing 'Future' Veteran Trees to be retained
- Plot Access Points through Green Infrastructure. (precise location and extent to be approved at time of submission of details for approval post DCO approval)
- +3m to +8m — Height of mounding (relative to the adjoining development zone's finished floor level (FFL) as shown on document 2.6)

Note:
Height of mounding to the eastern side of the canal is relative to the new road infrastructure

Note:
All AOD levels shown for the new on-site road infrastructure are subject to a vertical deviation of 0.5 metres upwards or downwards

- Bat Hopover - Precise location and extent to be approved at time of submission of details for approval post DCO approval.
- Bat Hopover and Wildlife Crossing - Precise location and extent to be approved at time of submission of details for approval post DCO approval.
- Wildlife Crossing - Precise location and extent to be approved at time of submission of details for approval post DCO approval.

Revisions

West Midlands Interchange

Project
THE WEST MIDLANDS RAIL FREIGHT INTERCHANGE ORDER 2020

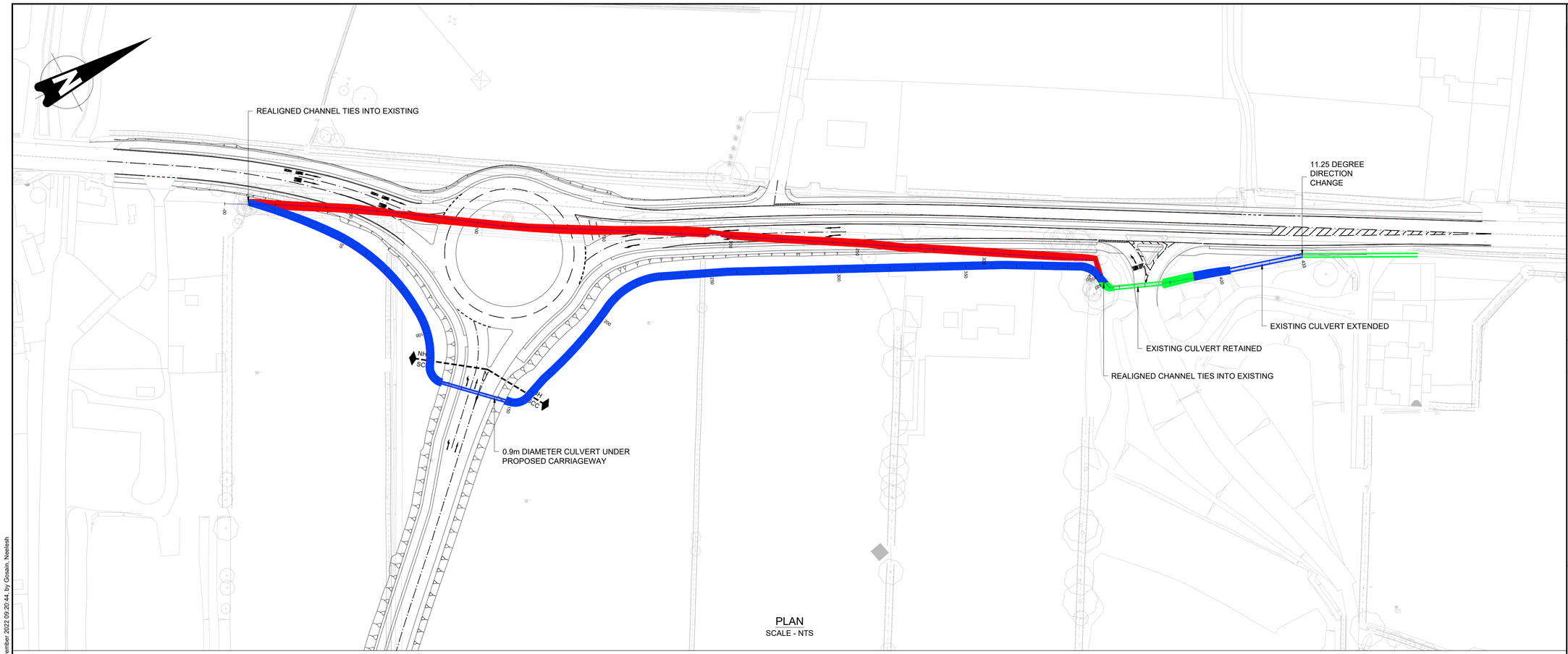
Drawing Status
SUBMISSION

Drawing Title
KEY PLAN - PARAMETERS PLAN
GREEN INFRASTRUCTURE PLAN

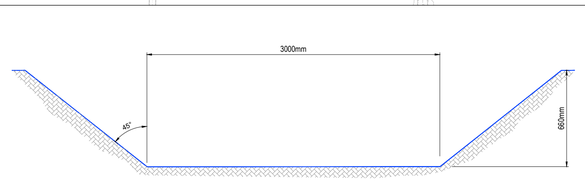
Drawing Size A1

Regulation	Document		
5 (2) (o)	2.7		
Drawn SM	Date MARCH 2018	Scale 1/5000	Reviewed PMJS
Drawing No. 4990 - 02020			Rev. 11

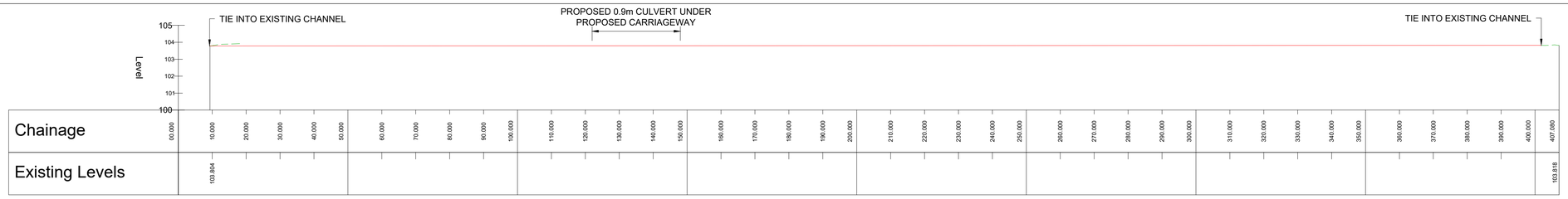
Figure 3.5: Proposed Canal Feeder Channel Diversion



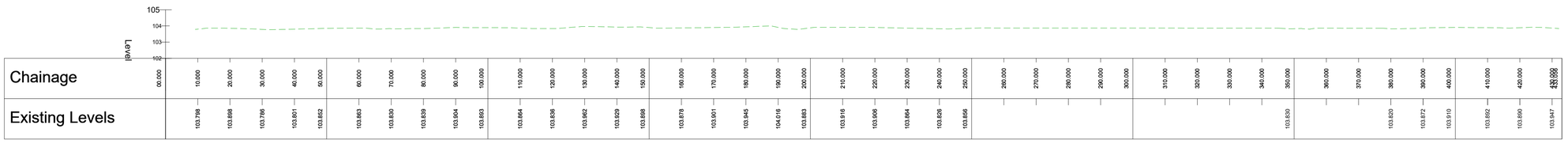
PLAN
SCALE - NTS



TYPICAL EXISTING DITCH -
SIDE SLOPES 1:1



PROPOSED REALIGNED CHANNEL LONG SECTION



EXISTING CHANNEL LONG SECTION

KEY :

- DCO BOUNDARY
- 100.000 CHAINAGE LINE
- PROPOSED CHANNEL ALIGNMENT
- EXISTING CHANNEL TO BE ABANDONED
- EXISTING CHANNEL RETAINED

NOTE:

1. DO NOT SCALE FROM THIS DRAWING.
2. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
3. ALL LEVELS ARE IN METRES ABOVE ORDNANCE SURVEY (OS) DATUM UNLESS OTHERWISE NOTED.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERS DRAWINGS AND SPECIFICATIONS.

HEALTH AND SAFETY INFORMATION

1. PLEASE REFER TO THE DESIGN RISK REGISTER FOR DETAILS OF THE RISKS ASSOCIATED WITH THIS WORK.
2. IN PREPARATION OF CONSTRUCTION METHOD STATEMENTS CONSIDERATION SHOULD BE GIVEN TO THE CLOSE PROXIMITY OF ANY STRUCTURES THAT MAY BE AFFECTED BY CONSTRUCTION.
3. THE CONTRACTOR SHALL REFER TO STATUTORY UNDERTAKERS LAYOUT DRAWINGS AND IDENTIFY LOCATION OF EXISTING UNDERGROUND SERVICES PRIOR TO CARRYING OUT EXCAVATION WORKS.

KEY:

- INDICATES A RESIDUAL RISK AS A WARNING .
- INDICATES A RESIDUAL RISK REQUIRING COMPULSORY ACTION.
- INDICATES A RESIDUAL RISK REQUIRING PROHIBITIVE ACTION.
- INDICATES A RESIDUAL RISK FOR INFORMATION.

REV	DATE	BY	DESCRIPTION	CHK	APP
P01	01/11/2022	NG	FIRST ISSUE	WT	AP

DRAWING STATUS:
S0 - WORK IN PROGRESS

The Mailbox, Level 2 100 Wharfside Street Birmingham, B1 1RT, UK
T+ 44 (0) 121 352 4700
wsp.com

CLIENT:
WEST MIDLANDS INTERCHANGE M6/JCT.12

SITE/PROJECT:
THE WEST MIDLANDS RAIL FREIGHT INTERCHANGE

TITLE:
PHASE 3
CANAL FEEDER CHANNEL DIVERSION

SCALE @ A1:	CHECKED:	APPROVED:	
NTS	WT	AP	
PROJECT NO:	DESIGNED:	DRAWN:	DATE:
70089554	ASA	NG	November 22

DRAWING No: WMI-WSP-HGN-PH3-SK-CH-000010
REV: P01

Figure 3.6: Proposed Development Zone Parameter Plan - Zone C Southern Extent

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ZONE B

ZONE A1

ZONE A6

ZO

Calf Heath Wood

A449

Vicarage Road

Station Road

Station Drive

Unit 2

Unit 3

Four Ashes

Somerford Park

Somerford Wood

Sports Ground

Brunel Court

Waste Incinerator

Sandon Brook

N

+000.0 AOD — Updated AOD

Order Limits

Zone A1-A7 - Development Areas

Zone B - Rail terminal, container storage, Parking area and associated welfare facilities.

Zone C - Rail corridor including new rail lines and landscaping.

New on-site road infrastructure and access.

Landscaping

Estate Management Offices / Amenity and Welfare Facilities

Residential Property and Curtilage

Plot Access Points through Green Infrastructure. (precise location and extent to be approved at time of submission of details for approval post DCO approval)

Canal crossings to be demolished

Existing Overhead Electricity Cables

Existing Overhead Electricity Cables to be re-routed underground

Limits of Deviation shown on works plan and set out in Article 4 of the DCO

Note:
All AOD levels shown for the new on-site road infrastructure are subject to a vertical deviation of 0.5 metres upwards or downwards

2.5B

Revisions

West Midlands Interchange

Project	THE WEST MIDLANDS RAIL FREIGHT INTERCHANGE ORDER 2020
Drawing Status	SUBMISSION
Drawing Title	PARAMETER PLAN DEVELOPMENT ZONE PLAN - SHEET 2
Drawing Size	A1
Regulation	5 (2) (o)
Document	2.5B
Drawn	SM
Date	MARCH 2018
Scale	1/2500
Reviewed	PMJS
Drawing No.	4990 - 02002
Rev.	08

Figure 3.7: Proposed Development Zone Parameter Extent - Zone C Northern Extent

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2.5A

N

ZONE A1

ZONE A2

ZONE A3

ZONE A4a

ZONE A4b

ZONE B

ZONE C

A5

Croft Lane

Open Swale Network

+105.7 AOD

+105.6 AOD

+105.1 AOD

+106.7 AOD

+106 AOD

+111.1 AOD

+102 AOD

+000.0 AOD Updated AOD

Order Limits

Zone A1-A7 - Development Areas

Zone B - Rail terminal, container storage, Parking area and associated welfare facilities.

Zone C - Rail corridor including new rail lines and landscaping.

New on-site road infrastructure and access.

Landscaping

Estate Management Offices / Amenity and Welfare Facilities

Residential Property and Curtilage

Plot Access Points through Green Infrastructure. (precise location and extent to be approved at time of submission of details for approval post DCO approval)

Canal crossings to be demolished

Existing Overhead Electricity Cables

Existing Overhead Electricity Cables to be re-routed underground

Limits of Deviation shown on works plan and set out in Article 4 of the DCO

Note:
All AOD levels shown for the new on-site road infrastructure are subject to a vertical deviation of 0.5 metres upwards or downwards

Revisions

West Midlands Interchange

Project	THE WEST MIDLANDS RAIL FREIGHT INTERCHANGE ORDER 2020
Drawing Status	SUBMISSION
Drawing Title	PARAMETER PLAN DEVELOPMENT ZONE PLAN - SHEET 1
Drawing Size	A1
Regulation	5 (2) (o)
Document	2.5A
Drawn	SM
Date	MARCH 2018
Scale	1/2500
Reviewed	PMJS
Drawing No.	4990 - 02001
Rev.	08

N

FOR CONTINUATION, SEE DOCUMENT 2.9K

STRAIGHT MILE

NEW DROPPED KERB CROSSING

WOODLANDS LANE

NEW DROPPED KERB CROSSING

2.0m

NEW FOOTWAY

NEW DROPPED KERB CROSSING

KINGS ROAD

NEW FOOTWAY

KEY

ORDER LIMITS

CYCLEWAY / FOOTWAY

FOOTWAY

TACTILE PAVING

NOTE:

LIMITS OF DEVIATION SHOWN ON THE WORKS PLANS (DOCUMENT SERIES 2.2) AND SET OUT IN ARTICLE 4 OF THE DEVELOPMENT CONSENT ORDER.

CHANGES TO DOCUMENT 2.9K SINCE DCO SUBMISSION:

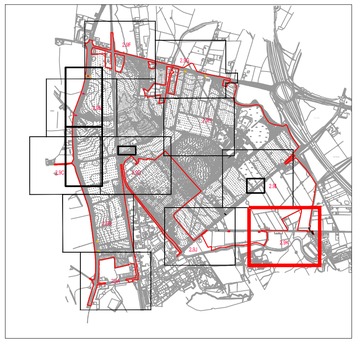
MAY 2019 –

- VIEWPORT ADJUSTED (ALTERATION OF SHEET LAYOUT) TO REMAIN IN LINE WITH DOCUMENTS 2.9I AND 2.9J.

CHANGES MADE TO DOCUMENT 2.9K SINCE DCO APPROVAL:

NOVEMBER 2022 –

- ALTERATION TO POSITIONS OF DROPPED KERB CROSSING POINTS ON STRAIGHT MILE TO AVOID CLASH WITH LAYBY AND ASSOCIATED BOLLARDS.
- AMENDMENTS TO FOOTWAYS ON STRAIGHT MILE/KINGS ROAD/WOODLANDS LANE.



West Midlands Interchange

Project
THE WEST MIDLANDS RAIL FREIGHT INTERCHANGE ORDER 201X

Drawing Status
SUBMISSION

Drawing Title
GENERAL ARRANGEMENT PLAN
111

Drawing Size A1

Regulation	Document
5 (2) (o)	2.9K

Drawn	Date	Scale	Reviewed
NW	JUNE 2018	1: 1000	IF

Drawing No.
WSP-70001979-GA-111

Rev.
H

Appendix B: ES Authors Competence Summary

TECHNICAL DISCIPLINE	COMPANY	LEAD PERSON	PROFESSIONAL MEMBERSHIPS/ QUALIFICATIONS AND EXPERIENCE
EIA Project Director, Coordinator and Lead author of the non-technical sections of the document	CBRE	Ben Weldin-Berry	Practitioner member of IEMA. 10 years' experience within the EIA sector across a variety of sectors, including but not limited to, infrastructure and logistics. CBRE is a member of the IEMA Quality Mark.
Agriculture and Soils	Askew Land & Soil / CBRE	Ben Weldin-Berry	Practitioner member of IEMA. 10 years' experience within the EIA sector across a variety of sectors, including but not limited to, infrastructure and logistics. CBRE is a member of the IEMA Quality Mark.
Air Quality	Ramboll	Graham Harker	BSc(Eng) in Mechanical Engineering, Chartered Engineer Member of the Institute of Mechanical Engineers, Institution of Environmental Sciences and Institute of Air Quality Management. 20 years' experience of air quality assessments
Archaeology (Buried Heritage Assets) Cultural Heritage	Wessex Archaeology	Mark Turner	BA Archaeology and Prehistory, Member of Chartered Institute for Archaeologists (MCIfA) 30 years of experience in archaeology and built heritage across a variety of sectors, including fieldwork, project management and EIA, including, but not limited to, infrastructure and large scale projects.
		Sarah Generalski-Sparling	BA Archaeology & History, MA Landscape Archaeology, Associate of Chartered Institute for Archaeologists (ACIfA) 7 years worth of experience in heritage consultancy, including production of technical reports and assessments, including EIA, for a variety of schemes.
Ecology and Nature Conservation	Delta Simmons	Jennifer Britt	Associated member of CIEEM 12 years' experience of ecological consultancy Delta-Simons is a member of the IEMA Quality Mark
Ground Conditions	Delta Simmons	Simon Steele	MEng (Hons) FGS 17 years experienced in environmental consultancy
Landscape and Visual Impact	FPCR Environment and Design Ltd	Tim Jackson	Chartered Member of the Landscape Institute (CMLI); BA (Hons), Dip LA.

TECHNICAL DISCIPLINE	COMPANY	LEAD PERSON	PROFESSIONAL MEMBERSHIPS/ QUALIFICATIONS AND EXPERIENCE
			30 years experience of EIA and Landscape and Visual Impact Assessments. FPCR Environment and Design Ltd is a member of the Landscape Institute, IEMA, IEEM and RIBA
Noise and Vibration	Resound Acoustics	Mike Brownstone	BEng(Hons) in Engineering Acoustics and Vibration Member of the Institute of Acoustics (MOA) 30 years' experience of noise and vibration assessments. Resound Acoustics is a member of the Association of Noise Consultants
Socio-Economics and Human Health	CBRE	Ceara Shields	Affiliate Member of IEMA. 9 years' experience within the EIA sector including socio-economics and health impact assessments.
Transport and Access	WSP	Ian Fielding	BSC (Hons), CMILT MCIHT Over 25 years' experience in assessing development related transport impacts and effects.
Water Environment and Flood Risk	Burrows Graham	Jack Williams	Chartered Engineer and Member of the Institution of Civil Engineers (ICE). 8 years' experience of flood risk assessments and drainage design for developers including EIA and ES assessments.

Appendix C: Air Quality Technical Note

Appendix C: Air Quality Technical Note

Introduction

Ramboll have undertaken a review of the design changes to the proposed strategic rail freight interchange development (the proposed development) on land at Four Ashes within South Staffordshire District, close to Junction 12 of the M6 motorway. The planning application was accompanied by an Environmental Statement (the '2018 ES'), and this technical note confirms any changes which have occurred since then which are relevant to the air quality assessment reported in Chapter 7, ES Volume II.

This document should be read in conjunction with Chapter 7: Air Quality of the 2018 ES.

Information in this Appendix is supplementary and supporting to the assessment presented in the Environmental Implications Report and does not duplicate it.

Baseline Considerations

Since the 2018 EIA there have been updated monitoring data measured by the local authorities in the vicinity of the Site. In some instances monitoring has ceased to be undertaken at the previously referenced locations. Relevant data were reviewed and assessed for the following local authorities to update the baseline air quality:

a. SSDC (Air Quality Annual Status Report (ASR) 2022[1]);
b. Cannock Chase Council (CCC) (ASR 2021[2]);
c. Wolverhampton City Council (WCC) (ASR 2019[3]);
d. Stafford Borough Council (SBC) (ASR 2021[4]);
e. Shropshire Council (SC) (ASR 2022[5];
f. Telford and Wrekin Council (TWC) (ASR 2022[6]); and
g. Walsall District Council (WDC).

There are no changes to the Air Quality Management Areas (AQMAs) described in the 2018 ES.
Appendix 7.3 of the 2018 ES has been updated to include the latest available monitoring data, as presented in Table 1-1.

[1] South Staffordshire Council, 2022. 2022 Annual Status Report (ASR).
[2] Cannock Chase Council, 2021. 2021 Air Quality Status Report (ASR).
[3] City of Wolverhampton Council, 2020. 2019 Air Quality Status Report (ASR).
[4] Stafford Borough Council, 2021. 2021 Air Quality Status Report (ASR).
[5] Shropshire Council, 2022. 2022 Air Quality Annual Status Report (ASR).
[6] Telford & Wrekin Council, 2022. 2022 Air Quality Annual Status Report (ASR)

Table 1 Updated Appendix D Local Authority Monitoring Data

Council	Site Name	Monitoring Type	Distance to kerb of nearest road (m)	Site Type	X – adjusted based on actual location	Y – adjusted based on actual location	Height (m) from Councils report	2018 - NO_2 Annual Mean Concentration ($\mu g/m^3$)	2019 - NO_2 Annual Mean Concentration ($\mu g/m^3$)	2020 - NO_2 Annual Mean Concentration ($\mu g/m^3$)	2021 - NO_2 Annual Mean Concentration ($\mu g/m^3$)
Cannock Chase Council	67 Watling Street, Bridgtown	Diffusion tube	7.8	Roadside	398051	308512	1.1	25	33.8	17.9	N/A
Cannock Chase Council	54 Watling Street, Bridgtown	Diffusion tube	5.2	Roadside	398250	308428	1.2	34.3	31.2	24.7	N/A
Cannock Chase Council	Bridgtown Automatic Monitoring Station (triplicate)	Automatic	6.8	Roadside	398010	308560	3	-	-	-	-
Cannock Chase Council	268 Watling Street	Diffusion tube	3.8	Roadside	400727	307423	2.3	39	37.0	27.6	-
Cannock Chase Council	BTL-B	Diffusion tube	5	Roadside	397952	308567	1.8	34	24.6	25.6	-
South Staffordshire Council	ES4	Diffusion tube	6	Roadside	396958	303269	3	-	-	-	-
South Staffordshire Council	ES5	Diffusion tube	8	Roadside	396969	303269	3	-	-	-	-
South Staffordshire Council	ES6	Diffusion tube	11	Roadside	396999	303440	3	-	-	-	-
South Staffordshire Council	HA2	Diffusion tube	1	Roadside	394776	309756	3	33.2	34.2	20.9	25.0
South Staffordshire Council	HA5	Diffusion tube	1	Roadside	394831	309737	3	-	-	-	-
South Staffordshire Council	HA6	Diffusion tube	1	Roadside	394905	309708	3	-	-	-	-

Council	Site Name	Monitoring Type	Distance to kerb of nearest road (m)	Site Type	X – adjusted based on actual location	Y – adjusted based on actual location	Height (m) from Councils report	2018 - NO_2 Annual Mean Concentration ($\mu g/m^3$)	2019 - NO_2 Annual Mean Concentration ($\mu g/m^3$)	2020 - NO_2 Annual Mean Concentration ($\mu g/m^3$)	2021 - NO_2 Annual Mean Concentration ($\mu g/m^3$)
South Staffordshire Council	PE1	Diffusion tube	1	Roadside	392259	314020	3	-	-	14.8	17.8
South Staffordshire Council	PE2A	Diffusion tube	11	Roadside	393177	313866	3	-	-	-	-
South Staffordshire Council	PE2B	Diffusion tube	11	Roadside	393177	313866	3	-	-	-	-
South Staffordshire Council	PE2C	Diffusion tube	11	Roadside	393177	313866	3	-	-	-	-
South Staffordshire Council	PE11	Diffusion tube	10	Other	393519	315327	3	-	-	-	-
South Staffordshire Council	SA2	Diffusion tube	2	Roadside	396716	308742	3	29.4	30.3	20.7	22.3
South Staffordshire Council	SA5	Diffusion tube	2	Roadside	396705	308673	3	-	-	-	-
South Staffordshire Council	SA6	Diffusion tube	2	Roadside	396701	308613	3	-	-	-	-
South Staffordshire Council	Wolgarston Road, Penkridge PE	Automatic	3.5	Other	393171	313859	2	-	-	-	-
Stafford Borough Council	1	Diffusion tube	0	Other	390130	321700	2	27.0	30.0	27.8	32.0
Stafford Borough Council	2	Diffusion tube	0	Other	390130	321700	2	24.0	32.0	23.4	34.0
Stafford Borough Council	3	Diffusion tube	0	Other	390130	321700	2	31.0	30.0	33.9	-

Council	Site Name	Monitoring Type	Distance to kerb of nearest road (m)	Site Type	X – adjusted based on actual location	Y – adjusted based on actual location	Height (m) from Councils report	2018 - NO_2 Annual Mean Concentration ($\mu g/m^3$)	2019 - NO_2 Annual Mean Concentration ($\mu g/m^3$)	2020 - NO_2 Annual Mean Concentration ($\mu g/m^3$)	2021 - NO_2 Annual Mean Concentration ($\mu g/m^3$)
Stafford Borough Council	33	Diffusion tube	5	Kerbside	392154	319970	2	**41.0**	34.0	25.2	-
Wolverhampton City Council	BIL1	Diffusion Tube	4	Roadside	395057	296541	3	41	39	-	-
Wolverhampton City Council	BIL2	Diffusion Tube	4.5	Roadside	395085	296475	3	31	29	-	-
Wolverhampton City Council	BIL3	Diffusion Tube	3	Roadside	395095	296492	3	39	39	-	-
Wolverhampton City Council	BIL4	Diffusion Tube	2.5	Roadside	395118	296454	3	**43**	**42**	-	-
Wolverhampton City Council	STA1	Diffusion Tube	2	Roadside	391389	299803	3	30	29	-	-
Wolverhampton City Council	STA5_6_7	Diffusion Tube	8.5	Roadside	391261	302199	3	30	29	-	-
Wolverhampton City Council	STA9	Diffusion Tube	3.5	Roadside ISA	391541	303373	3	-	-	-	-
Wolverhampton City Council	STA9A	Diffusion Tube	7	Roadside	391535	303346	3	30	29	-	-
Wolverhampton City Council	STA12	Diffusion Tube	5	Roadside	391616	303643	3	33	-	-	-
Wolverhampton City Council	WIL1	Diffusion Tube	8	Roadside ISA	394187	298452	3	22	22	-	-
Wolverhampton City Council	BRI	Diffusion Tube	11	Roadside	388195	298787	3	20	19	-	-
Wolverhampton City Council	DUD	Diffusion Tube	3.5	Roadside	391530	297313	3	27	25	-	-
Wolverhampton City Council	HOR	Diffusion Tube	2.7	Roadside	392116	298607	3	**40**	34	-	-
Wolverhampton City Council	WRE	Diffusion Tube	50	Background	392090	296095	3	16	15	-	-
Wolverhampton City Council	Stafford Road	Automatic	8.5	Roadside	391261	302199	2.5	29	28	-	-

The 2018 ES highlighted that the majority of SSDC sites recorded an overall decline in concentrations between 2013 and 2017 whereas the CCC and WCC data showed no significant trend in concentrations between 2013 and 2017. Table 1-1 shows that annual mean NO_2 concentrations declined in 2020 and 2021 (where monitoring data was available), which was likely due to travel restrictions during the Covid-19 pandemic. The reduction in measured concentrations in 2020 and 2021 compared to previous levels is likely to have masked any declining trend in concentrations as a result of reductions in vehicle emissions.

In addition to monitored data, the 2018 ES presented the range of background pollutant concentrations predicted by Defra (Table 7.8 of the ES). These concentrations are modelled data and are averages over 1km grid squares covering the district. The updated predicted background pollutant concentrations are presented in Table 1-2 as a range for each local authority, to cover the different backgrounds for the receptors used in the assessment. As per the 2018 ES, data for 2030 is used for 2036 as the background maps do not extend beyond 2030.

Table 1-2 Updated Table A7.8 Annual Mean Concentrations from DEFRA Maps (µg/m[3])

Local Authority	Year	NO_2	PM_{10}	$PM_{2.5}$
CCC	2021	6.5-16.6	10.1-17.3	6.7-11.3
	2028	5.4-13.0	9.6-16.8	6.3-10.9
	2036	5.3-12.5	9.6-16.8	6.3-10.8
SBC	2021	4.6-13.9	9.3-14.1	6.0-8.4
	2028	3.9-10.1	8.8-13.7	5.6-8.0
	2036	3.8-9.8	8.8-13.6	5.6-8.0
SC	2021	2.8-10.5	5.6-16.5	5.6-8.5
	2028	2.3-9.4	8.1-16.0	5.2-8.0
	2036	2.3-9.2	8.1-16.0	5.2-7.9
SSDC	2021	4.9-20.9	10.4-16.3	6.7-10.0
	2028	4.2-15.9	9.8-15.6	6.3-9.6
	2036	4.1-15.3	9.8-15.5	6.2-9.6
TWC	2021	4.3-13.9	10.4-14.1	6.5-9.0
	2028	3.7-11.4	9.9-13.6	6.1-8.6
	2036	3.6-11.0	9.9-13.6	6.0-8.6

Local Authority	Year	NO_2	PM_{10}	$PM_{2.5}$
WDC	2021	11.1-24.2	12.5-17.7	8.2-10.9
	2028	9.1-18.7	11.9-17.0	7.8-10.4
	2036	8.8-18.1	11.9-17.0	7.8-10.4
WCC	2021	8.7-23.9	11.5-15.7	7.6-10.5
	2028	7.2-19.5	11.0-15.0	7.2-10.0
	2036	7.0-18.9	11.0-15.0	7.2-9.9
National Air Quality Strategy Objective		**40**	**40**	**20**

There are changes to the predicted background concentrations since the 2018 ES. However, the pattern of concentrations is the same in that background pollutant concentrations are seen to reduce over time and the maximum concentrations are well below the relevant National Air Quality Strategy Objectives. All of the lowest predicted concentrations are lower than the previous estimates.

Table 7.9 of the 2018 ES also provided data on background pollutant concentrations and deposition rates in the ecological receptors. Background NO_x data at the sensitive ecological sites presented in Table 1-3 have also been taken from the Defra 2018-based background maps. Nitrogen deposition and acid (N) deposition rates at the sensitive ecological sites have been taken from the Air Pollution Information System (APIS) website[7].

Table 1-3 Updated Table A7.9 Annual Mean NOx Concentrations, Nitrogen and Acid Deposition Rates

Site	NO_x (µg/m^3)	N-Deposition (kgN/ha/yr)	Acid (N) Deposition (keq/ha/yr)
Doxey and Tillington Marshes	10.6-14.1	27.5-27.9	1.9-2
Belvide Reservoir	9.0	22.5	1.6

[7] Air Pollution Information System. Available at: http://www.apis.ac.uk/

APIS reports data as a three-year average; the data presented in Table 1-3 is based on the 2018-2020 average, whereas the values reported in the 2018 ES were based on the 2009-2011 average. Furthermore, the APIS 2018-2022 data is reported at a 1 km^2 grid resolution compared to the 2009-2011 data which was reported at a 5 km^2 grid resolution.

Compared to the previous report, background NO_x concentrations have decreased at both designated sites which currently meet the annual mean objective as set out in the 2018 ES. At both designated sites, the relevant Critical Loads (CL) for N-deposition and Acid deposition are already exceeded as set out in the 2018 ES. As the CLs are exceeded, the assessment of significance is based on the development contribution, as per the 2018 EIA.

Overall, the updated monitoring data and background data are consistent with the data used in the air quality assessment for the 2018 EIA and the baseline conditions remain valid.

Vehicle Emissions

Dispersion modelling vehicle emissions was used to predict the impact of construction and operational traffic in the 2018 EIA. Vehicle emissions were estimated using version 8.0 of the Emissions Factor Toolkit (EFT). Since the assessment was undertaken Defra have updated the EFT to version 11.0 which takes account of updated information on emissions from vehicle fleet, and in particular, NOx emissions.

The assessment results presented in 2018 ES showed that predicted concentrations in 2028 and 2036 were lower than in 2021 with development traffic in place. The largest predicted reductions were in terms of NO_2 concentrations which reflected the reduction in NO_x emissions from the vehicle fleet. The graph presented in Figure 1-1 overleaf has been produced from the latest version of EFT for an illustrative traffic volume (31,000 vehicles Annual Average Daily Traffic (AADT)), speed (36 kph) and Heavy Duty Vehicle (HDV) composition (5%).

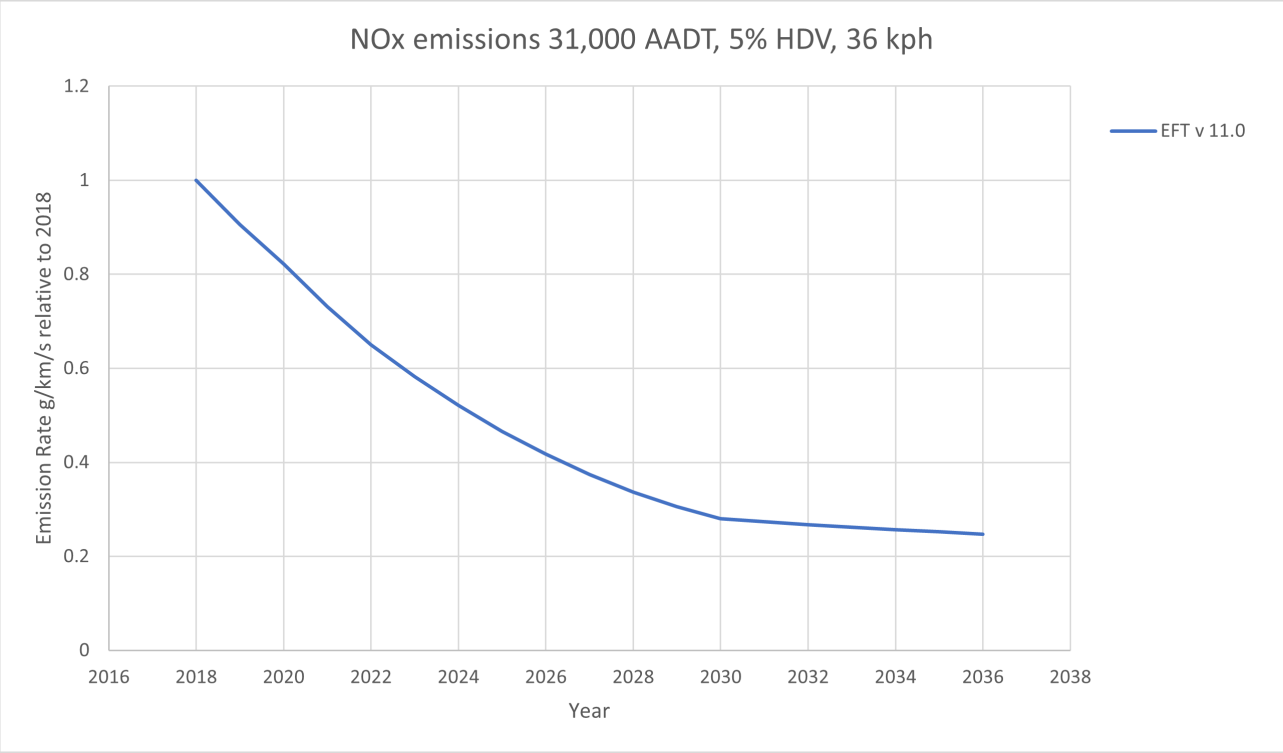
The graph shows the predicted decline in vehicle NO_x emissions over time compared to 2018. By 2021 emissions are predicted to be approximately 70% of the 2018 values and by 2028 the emission rate is approximately 35% of the 2018 value. Beyond 2028, the predicted emission rate continues to reduce to between 25 and 30% of the 2018 value. The updated vehicle emissions are consistent with the data used in the 2018 EIA in that very significant reductions in vehicle NO_x emissions are still being predicted.

Consideration of Changes

The information presented in this technical appendix is in terms of updated baseline data and assumptions regarding vehicle factors. The changes in the data are not considered to invalidate the assessment undertaken in the 2018 EIA.

In addition, as discussed in the Environmental Information Report, the approval of the M54/M6 link road will lead to a reduction in traffic levels on highways links in proximity to West Midlands Interchange. This will further reduce concentrations compared to those predicted in the 2018 ES.

Figure 11: Updated Vehicular NO_x Emissions



Appendix D: Ecology and Nature Conservation Technical Note

Appendix D: Ecology and Nature Conservation Technical Note

Introduction

Delta-Simons have undertaken a review of the design changes to the proposed strategic rail freight interchange development (the proposed development) on land at Four Ashes within South Staffordshire District, close to Junction 12 of the M6 motorway. The Development Consent Order (DCO) application was accompanied by an Environmental Statement (the '2018 ES'), and this technical note confirms any changes which have occurred since then which are relevant to the ecological assessment reported in Chapter 10, ES Volume II of the 2018 ES.

This document should be read in conjunction with Chapter 10 of the 2018 ES.

Policy Updates

Since the 2018 ES, several revisions have been made to the National Planning Policy Framework, most recently in 2021. The revised NPPF states:

"*Planning policies and decisions should contribute to and enhance the natural and local environment by:*

a) *protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);*

b) *recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;*

c) *maintaining the character of the undeveloped coast, while improving public access to it where appropriate;*

d) *minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;*

e) *preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and*

f) *remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.*"

These changes are not considered to constitute a material change in the methodology of the 2018 EIA, which is still considered to be appropriate.

Baseline Considerations

Due to the time that has elapsed since the original baseline surveys were undertaken to inform the 2018 ES, updated surveys have been conducted to identify the current conditions across the wider Site and status of any protected or otherwise notable species. In addition to a general Site walkover to identify any significant changes to habitat composition and condition, species-specific update surveys were undertaken, as summarised in Table 1. The updated surveys also captured the additional land required for the proposed Zone C rail extension.

Table 1: Scope of Surveys Undertaken (2021/22)

Target Species	Area Surveyed	Scope of Survey
2021		
Great Crested Newts (GCN)	All accessible ponds on-site and within 500 m of the Site not subject to dispersal barrier	Habitat suitability assessment and eDNA survey of any qualifying ponds
Bats	Woodside Farmhouse, Woodside Barn, Gailey Magazine	Bat Roost Potential (BRP) survey and dusk emergence/dawn re-entry surveys
	Semi-mature and mature trees to be impacted by initial phases of development	Ground level BRP survey and dusk emergence/dawn re-entry surveys
Badgers	Due to welfare considerations of this species, details of the badger surveys are provided in a separate confidential report and are not discussed further in this report.	
Invasive Plants	Area to be impacted by initial phases of development	Walkover survey to identify the presence and extent of invasive plant species.
2022		
Great Crested Newts (GCN)	Pond 4 and 18	Habitat suitability assessment
Bats	Mile End Cottage, Gravelly Way Properties, Clovelly, Meadow View/Warehouse, Croft House, Fir Tree Cottage, Ash House, Stonebrook.	BRP survey and dusk emergence/dawn re-entry surveys
	Semi-mature and mature trees across the wider Site	Ground level BRP survey, aerial inspections and dusk emergence/dawn re-entry surveys
Badgers	Due to welfare considerations of this species, details of the badger surveys are provided in a separate confidential report and are not discussed further in this report.	
Invasive Plants	Site-wide	Walkover survey to identify the presence and extent of invasive plant species.

Further details of the surveys and results are included in the Update Ecological Baseline 2021/22 Report (**Appendix A.1**), and Confidential Badger Baseline 2021/22 Report (**Appendix A.2**).

The surveys confirmed the baseline conditions have not materially changed from the baseline conditions used to inform the 2018 EIA. The habitat compositions and conditions have remained largely unchanged, and the overall presence, and status of protected and notable species, though fluid in relation to the location of bat roosts, and badger sett activity, remains comparable to that which formed the baseline of the 2018 ES such that the geographic level of value remains the same.

Updated targeted surveys for birds and reptiles were not considered necessary since the conditions on-site have not significantly changed and the mitigation proposed within the approved Framework Ecology Mitigation and Management Plan (FEMMP) remains appropriate.

The proposed amendments include an extension to the Order Limits to include an additional 0.0308 ha of land at the south-west of the Site associated with the extension of rail sidings. This parcel of land was surveyed in summer 2022 as part of on-going site-wide survey visits and was found to comprise an extension of the on-site semi-improved grassland and an area of hardstanding/bare ground supporting equipment and materials associated with the yard. Consistent with the baseline conditions for adjacent land, this additional parcel of land was considered to have limited ecological value, with no additional potential or evidence of protected or notable species recorded.

Design Changes

The following proposed design changes are not considered relevant to this assessment as they do not have the potential to alter the previously reported effects or mitigation measures as presented in the 2018 ES:

- Amendments to the consented finished road levels identified on the certified Parameters Plans;
- Amendments to the consented bridge span widths and lengths in relation to Bridges Nos. 1-4, including amendments to the general arrangement of carriageway and footway/cycleway; and
- Amendments to the new railway line to the north of the Rail Terminal, between the new railway line and new connection to the West Coast Mainline Loop railway, which would be facilitated by the widening of consented Bridge No.1 span width.

The design changes that have been considered relevant to this assessment are presented below:

- Amendments to the proposed locations of dropped kerb crossings and new footway on Straight Mile / Woodlands Lane / Vicarage Road;
- Amendments to enable the inclusion of 0.0308ha of additional land to accommodate larger buffer stop area within the new railway area connecting the Rail Terminal to the West Coast Main Line loop railway and associated amended to Order Limits to incorporate this additional land within the Order.

Consideration of Changes

Delta Simons have reviewed the relevant design changes in the context of the updated baseline data to determine whether the amended proposed development would lead to any new or amended significant effects to those identified in the 2018 ES.

Table 2 presents the conclusions of the updated EIA of the 2022 amended proposed development.

Table 2: Review of 2022 Amended Proposed Development

Residual Effects Identified in the 2018 ES	2023 Amended Proposed Development Residual Effects	Summary
Demolition and Construction		
Habitats – Significant adverse effect from loss of veteran trees and time required to replace (Local scale)	No change from 2018 ES	Whilst the proposed amendments would result in a further land take of 0.0308 ha associated with the rail sidings extension, the additional parcel of land is considered to have limited ecological value, consistent with the adjacent yard space assessed as part of the 2018 EIA, and is not of notable value to any protected species. For avoidance of doubt, it is also confirmed that there are no veteran trees within this additional parcel of land. Whilst the green infrastructure would be amended as a result of the rail sidings extension, including the loss of tree group G6 (as shown in Appendix 12.7 of the 2018 ES), this tree group consists of 7No. Lombardy Poplar trees. The loss of these trees will not be significant in ecological terms. The remaining proposed design changes fall within the consented Order Limits for which the 2018 EIA was based on a worst-case assessment whereby the entire area required for infrastructure development was considered as comprising the construction of buildings and/or hardstanding (i.e. resulting in the loss of habitats on-site from site clearance and groundworks). This included areas within the developable area which would comprise landscaping, such as the area of verge now proposed for the footway. As such, the proposed design changes would not alter the worst-case parameters and assumptions used to inform the original EIA and the residual effects would remain as previously reported in the 2018 ES.
Farmland Birds – Significant adverse effect due to the removal of breeding habitat (although during the construction phase there may be some local gains, and there would be gains for other species in the operational phase). (Local scale)	No change from 2018 ES	The additional habitat loss is not considered of value to farmland birds. The proposed design changes will therefore not result in any changes to the impacts on farmland birds, such that the 2018 residual effect remains the same.
Invertebrates - Significant adverse effect on the assemblage of invertebrates while vegetation and enhancements establish with mitigation measures applied. (Site scale)	No change from 2018 ES	The additional habitat loss is not considered of notable value to invertebrates. The proposed design changes will therefore not result in any changes to the impacts on invertebrates, such that the 2018 residual effect remains the same.

Residual Effects Identified in the 2018 ES	2023 Amended Proposed Development Residual Effects	Summary
Bats - Significant adverse effect due to the time taken for vegetation in green corridors and providing screening to mature and sufficiently establish to provide a fully functional habitat resource for bats. (Local Scale)	No change from 2018 ES	The additional habitat loss is not considered of notable value to bats in the context of the wider area. The proposed design changes will therefore not result in any changes to the impacts on bats, such that the 2018 residual effect remains the same. A full assessment of the potential for the existing bridges proposed for demolition to support roosting bats was not considered as part of the 2018 assessment. This is being addressed within updated baseline surveys and will be covered by the relevant EMMP. This is required as part of the existing scheme, and is not specifically relevant to the proposed design changes.
Badger - Adverse. Traffic hazards and associated mortality. (Local Scale)	No change from 2018 ES	The additional habitat loss is not considered of value to badgers and no signs of badgers were recorded in these areas during the update surveys. The proposed design changes will therefore not result in any changes to the impacts on badgers, such that the 2018 residual effect remains the same.
Completed Development		
Habitats – Beneficial. Securing long term provision of native black poplar on-site. (County Scale)	No change from 2018 ES	Whilst the green infrastructure would be amended as a result of the rail sidings extension, the net reduction in landscaping area would be 0.2489 ha, which would be negligible in the context of the overall land proposed for landscaping, and the changes proposed are not considered to prejudice the overall landscape design and mitigation measures of the green infrastructure proposals. Tree group (G6 in Appendix 12.7 of the 2018 ES) consists of a group of 7No. Lombardy Poplar trees. These were shown as being retained on the consented Green Infrastructure Parameters Plan yet, as confirmed above, will now be removed to facilitate the extended rail area. The loss of these trees will not be significant in ecological terms and will be compensated for by extensive new tree and other planting as part of the green infrastructure proposals, including within the green infrastructure areas close to the existing trees. This will result in no material change to the ecological impacts resulting from the amended proposed development, in comparison to the consented development.
Birds woodland and scrub – Adverse. Change of habitat available compared with baseline, noise effects on the assemblage of bird species important at the local level offset by habitat improvement/creation. Habitat intended for additional species of conservation concern	No change from 2018 ES	Whilst the green infrastructure would be amended as a result of the rail sidings extension, the net reduction in landscaping area would be 0.2489 ha, which would be negligible in the context of the overall land proposed for landscaping, and the changes proposed are not considered to prejudice the overall landscape design and mitigation measures for birds. Tree group (G6 in Appendix 12.7 of the 2018 ES) consists of a group of 7No. Lombardy Poplar trees. These were shown as being retained on the consented Green Infrastructure

Residual Effects Identified in the 2018 ES	2023 Amended Proposed Development Residual Effects	Summary
would be provided but there would be a significant effect due to uncertainties relating to effectiveness of habitat improvements and management. (Site scale)		Parameters Plan yet, as confirmed above, will now be removed to facilitate the extended rail area. The loss of these trees will not be significant in terms of bird nesting provision and will be compensated for by extensive new tree and other planting as part of the green infrastructure proposals, including within the green infrastructure areas close to the existing trees. This will result in no material change to the ecological impacts resulting from the amended proposed development, in comparison to the consented development.
Water birds – Beneficial. Provision of significant areas of open water in the operational phase, managed for the benefit of birds. (Local Scale)	No change from 2018 ES	The proposed changes do not affect the assessment of impacts on water birds such that the 2018 residual effect remains unchanged.
Invertebrates - Significant beneficial effect providing enhanced habitats for invertebrates relative to those in the local area managed for biodiversity in the long term. (Local Scale)	No change from 2018 ES	The net reduction in landscaping area as a result of the proposed amendments would be negligible in the context of the overall land proposed for landscaping, and the changes proposed are not considered to prejudice the overall landscape design and mitigation measures for invertebrates. This is not considered to materially change the assessment of effects.

Conclusion

Updated baseline surveys have been undertaken as appropriate and have confirmed that the baseline conditions remain materially consistent with those reported in the 2018 ES.

Having considered the proposed changes in the context of the demolition and construction phase assessment previously undertaken and reported in the 2018 ES, it is considered unlikely that they would affect the demolition and construction phase assumptions or the assessment of effects undertaken, as reported in Chapter 10 of the 2018 ES. Application of the FEMMP, and the associated Ecological Mitigation and Management Plans (EMMPs) for each phase of works, will ensure appropriate mitigation is applied, as set out within the 2018 ES.

Having considered the proposed changes in the context of the operational phase assessment previously undertaken and reported in the 2018 ES, it is considered unlikely that they would affect the operational phase assumptions or the assessment of effects, as reported in Chapter 10 of the 2018 ES. Therefore, the proposed changes are not anticipated to affect the agreed ecological mitigation and compensation measures, as set out in the 2018 ES..

Accordingly, the demolition and construction stage and operational stage impacts and effects as reported in the 2018 ES are considered to remain valid for the amended proposed development.

Appendix A.1: Update Ecological Baseline 2021/22

West Midlands Interchange

Presented to **Four Ashes Limited**

Issued: February 2023

Delta-Simons Project No. 21-0028.04

deltasimons

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Report Details

Client	Four Ashes Limited
Report Title	Update Ecological Baseline 2021/22
Site Address	West Midlands Interchange
Project No.	21-0028.04
Delta-Simons Contact	Jennifer Britt [redacted]

Quality Assurance

Issue No.	Status	Issue Date	Comments	Author	Technical Review	Authorised
4	**Final**	**2nd February 2023**	**Updated with full 2022 survey results**	[redacted]	[redacted]	[redacted]
				Jennifer Britt Associate Ecologist	**Jon Spencer Associate Ecologist**	**Jon Spencer Associate Ecologist**

About us

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1.0 Introduction

Delta-Simons Limited was instructed by Four Ashes Limited ('the Client') to undertake update ecological baseline surveys of land for the proposed West Midlands Interchange (WMI) development (hereafter referred to as 'the Site'). The Site location is shown in Figure 1.

On 4 May 2020 the Secretary of State decided under section 114 of the 2008 Act to make with modifications an order granting development consent for the proposals associated with the WMI. This development covers a large area for a range of land uses and includes for up to 743,200 m^2 of rail served warehousing and ancillary service buildings. This application was informed by a suite of baseline ecology surveys of the Site undertaken in 2016/17 (Ramboll, 2018). The potential impacts on ecology and biodiversity which may arise from the construction and operation of the development were assessed as part of the Environmental Impact Assessment (EIA) process and are reported in Chapter 10 of the Environmental Statement (ES).

Due to the age of the previous survey data, and in accordance with the Framework Ecological Mitigation and Management Plan (FEMMP), which comprises Appendix 10.2 of the approved ES certified pursuant to the West Midlands Rail Freight Interchange Order (as amended by The West Midlands Rail Freight Interchange (Correction) Order 2020), update surveys are required to inform the specific mitigation requirements for each phase of development and their associated EMMP.

This report provides a summary of the surveys undertaken during the 2021/22 season, including the methodologies applied and results of the surveys. Specific impacts from the development are/will be addressed within the relevant EMMP for each phase.

In addition to a general Site walkover to identify any significant changes to habitat composition and condition, the following species-specific surveys have been identified for update, and are detailed in this report:

Table 1: Scope of Surveys Undertaken (2021/22)

Target Species	Area Surveyed	Scope of Survey
2021		
Great Crested Newts (GCN)	All accessible ponds on-Site and within 500 m of the Site not subject to dispersal barrier (see Figure 2)	Habitat suitability assessment and eDNA survey of any qualifying ponds
Bats	Woodside Farmhouse, Woodside Barn, Gailey Magazine	Bat Roost Potential (BRP) survey and dusk emergence/dawn re-entry surveys
	Semi-mature and mature trees to be impacted by initial phases of development	Ground level BRP survey and dusk emergence/dawn re-entry surveys
Badgers	Due to welfare considerations of this species, details of the badger surveys are provided in a separate confidential report and are not discussed further in this report.	
Invasive Plants	Area to be impacted by initial phases of development	Walkover survey to identify the presence and extent of invasive plant species.
2022		
Great Crested Newts (GCN)	Pond 4 and 18 (see Figure 2)	Habitat suitability assessment
Bats	Mile End Cottage, Gravelly Way	Bat Roost Potential (BRP) survey and dusk

	Properties, Clovelly, Meadow View/Warehouse, Croft House, Fir Tree Cottage, Ash House, Stonebrook.	emergence/dawn re-entry surveys
	Semi-mature and mature trees across the wider Site	Ground level BRP survey, aerial inspections and dusk emergence/dawn re-entry surveys of those trees to be impacted by the proposed works
Badgers	Due to welfare considerations of this species, details of the badger surveys are provided in a separate confidential report and are not discussed further in this report.	
Invasive Plants	Wide site	Walkover survey to identify the presence and extent of invasive plant species.

Update targeted surveys for birds and reptiles was not considered necessary since the conditions on-Site have not significantly changed and the mitigation proposed within the FEMMP remains appropriate.

2.0 Methodology

The previous baseline information for the Site was reviewed to inform the scope of the update surveys and to assess any changes at the Site.

2.1 Site Walkover

During the targeted species surveys, and as part of a general Site walkover by a Delta-Simons ecologist, a record was made of any significant changes to the habitat composition or condition since the 2016/17 baseline surveys.

2.2 GCN

Where access allowed, any ponds on-Site or those within 500 m of the Site which were not subject to significant barriers to dispersal were assessed for their suitability to support GCNs, with reference to Oldham *et al.* (2000).

A total of 35 ponds were identified, as well as a number of waterbodies formed within the active quarry in the central eastern area of the Site. The locations of the ponds are shown in Figure 2. In accordance with the 2016/17 surveys, eight of these ponds (Pond (P) 1, 2, 3, 10, 11, 12, 13 and 28) were considered to be separated from the Site by significant dispersal barriers. In addition, P33 and 34 were scoped out of further assessment due to their heavy stocking densities of fish and impacts from wildfowl.

Due to the disparity of previous survey results, any accessible pond containing standing water was subject to environmental (e)DNA sampling to establish the presence/likely absence of GCNs. Water samples were collected from each pond and sent to SureScreen Scientifics for analysis. The sampling followed the Natural England accepted protocol and the water test detects pond occupancy by GCNs by detecting traces of DNA shed into the pond (eDNA). The method followed is detailed in Biggs *et al.* (2014). The ponds were sampled on 29th/30th July 2021 (see limitations), led by Jennifer Britt ACIEEM (Natural England survey licence number 2015-16800-CLS-CLS).

2.3 Bats

The bat surveys were undertaken to the following current guidance: Collins ed. (2016) Bat Surveys for Professional Ecologists Good Practice Guidelines, English Nature (2004) Bat Mitigation Guidelines, and BS 42020: 2013 Biodiversity. Code of Practice for Planning and Development.

2.3.1 Preliminary Roost Assessment

An assessment of BRP of the buildings across the Site and those semi-mature or mature trees to be impacted by works within, or immediately adjacent to, the Site was completed. The survey methodology enabled the categorisation of each building and tree in relation to its value for bats (see Appendix B).

Buildings

Any significant changes to the condition of the buildings since the 2016/17 surveys was noted.

The exterior of the buildings were visually assessed for potential bat access points and evidence of bat activity, using binoculars, a high powered torch and endoscope, where necessary. Features, such as small gaps/crevices beneath eaves, along the ridges or within the brick work; lifted or missing roofing materials; or gaps around doorways and broken windows which had potential as bat access points into the building were sought. Evidence that these potential access points were actively used by bats typically would include staining within gaps and/or bat droppings or urine staining under gaps and/or on walls. These signs were recorded wherever they were present. The presence of cobwebs and general detritus within the features was also recorded as these indicate that potential access points are likely to be inactive.

The interiors of all accessible buildings were assessed for evidence of bat activity, or potential roost features. Evidence, including droppings and urine staining, was sought beneath features that bats may use for roosting and/or as an access point. Features included gaps within mortise joints, above beams and lintels and gaps

within walls. The presence of a bat roost is typically indicated by the presence of live/dead bats, a concentration of, or scattered bat droppings, food remains, for example moth wings, scratch marks, fur, or urine stains. A torch, bat detector, binoculars and endoscope were used as required during the internal surveys.

Trees

All semi-mature and mature trees within the survey area with the potential to be impacted by the proposed development were assessed for their potential to support a bat roost. Binoculars were used to check the trees for suitable features to support bats such as cracks, crevices and hollows in the trunks or branches as a result of decay, weathering or pruning. These are all features more commonly associated with mature or semi-mature trees. Furthermore, these features can be concealed by ivy *Hedera helix*, or dense woody ivy can itself provide the necessary features to support an occasional bat roost.

Any trees that had features suitable to support a bat roost were also checked for signs of bats, such as droppings, scratch marks and staining around possible entrance holes. All tree inspections were undertaken by visual observation, aided by binoculars, from ground level, and where possible, using ladders and endoscope to allow a closer inspection of potential roost features. In addition, four trees within the existing quarry (where nocturnal access was challenging) were subject to an aerial inspection by qualified tree climbers.

2.3.2 Roost Presence/Absence and Characterisation Surveys

Dusk emergence and dawn return nocturnal surveys were carried out to determine bat activity associated with the buildings and trees. This was largely undertaken in accordance with their assessed level of BRP and with reference to best practice guidelines (Collins, 2016). However, due to the seasonal limitations of the surveys, the transitional nature of tree roosts and the likely delay to works commencing on-Site, those trees assessed as having high BRP were only subject to two separate survey visits, rather than the recommended three surveys. This is still considered to provide an update on the likely use of the trees within the survey area by roosting bats, and appropriate mitigation, including further survey works prior to any impacts on the identified trees will be included within the relevant EMMP.

The dusk surveys commenced approximately fifteen minutes prior to sunset and ceased approximately one and a half hours following sunset. The dawn surveys commenced approximately one and a half hours prior to sunrise and finished at sunrise, or fifteen minutes after depending on light, weather conditions and bat activity. The surveyors were equipped with Echometer Touch 2 Pro bat detectors recording equipment. Recordings were made of any bats seen and/or heard and the species, the timing, activity, location and direction of flight. Where appropriate some trees were surveyed using an infrared camera and SM4 remote bat detector to record any bat activity.

With reference to the Bat Mitigation Guidelines (2004), Collins (2016) and professional judgement, the weather conditions during the dusk/dawn surveys were considered suitable for bat activity. Table 2 provides details of the surveys.

Surveys were undertaken throughout July-September 2021, and May-September 2022.

2.3.3 Details of Surveyors

The bat surveys were led by Jennifer Britt ACIEEM (Natural England survey licence 2015-13633-CLS-CLS), Bekie Perry (Natural England survey licence 2021-54535-CLS-CLS),with assistance from suitably experienced ecologists competent in identifying and recording bat activity.

2.4 Invasive Species

The occurrence of any invasive plant species within the survey area (see Figure 4) was identified in terms of species and stand size.

2.5 Limitations to the Survey

GCN

Whilst the ponds were surveyed in the month of July, which is outside the optimal survey window, it is considered that there remains a good likelihood of detecting GCN presence, and any negative results provide a strong indication of likely absence when considered in combination with the previous survey data for the Site.

At the time of the surveys, P26 was not subject to update surveys due to access limitations, however, due to the lack of suitable waterbodies in the surrounding area and overall absence of GCNs from the Site, it is considered unlikely GCN occur..

Bats

In contrast to best practice guidelines, a number of trees, whilst subject to two survey visits, were not subject to both a dusk emergence and dawn return survey due to health and safety considerations regarding access. In addition, trees assessed as having high BRP were only subject to two survey visits, rather than the recommended three surveys. The survey data recorded is, however, considered suitable to inform the associated EMMP and subsequent mitigation requirements.

General

The baseline conditions described in this report were accurate at the time at which the surveys were undertaken.

3.0 Results

3.1 Site Walkover

No significant changes in habitat composition or condition were noted within the survey area, with the exception of a number of ponds found to have dried out. This is discussed in relation to GCNs below.

3.2 GCNs

Of the 35 ponds identified, eight are considered to be isolated from the Site by significant dispersal barriers (P1-3,10-13, and 28), and two have been scoped out of the assessment due to the high fish density and impacts from wildfowl (P33 and 34). Of the remaining 25, five were not subject to assessment in 2021 due to access limitations (P4, 14, 18, 19 and 26), however, in 2022 P4 and 18 were found to be dry. Whilst access was also not available to Ponds 15 and 16, these are considered to be a complex of ponds with P17 which has been resurveyed.

Three of the ponds found to be dry in 2016/17 remained so in 2021 (P7, 9 and 25). In 2021, a further nine ponds were found to be dry, despite recent rainfall (P5, 6, 20, 22, 27, 29, 30, 31 and 32), such that they were considered sub-optimal to support breeding amphibians.

Of the six ponds, assessed in 2021 which contained water, five were subject to eDNA sampling (P8, 17, 23, 24 and 45). Only P17 returned a positive result indicating the presence of GCN, consistent with the 2016/17 surveys. P21, whilst holding standing water at the time of the survey, could not be accessed to take water samples due to the dense surrounding scrub vegetation. However, given the below average suitability assessment, and the results obtained from nearby ponds, it is considered unlikely this pond supports GCNs in isolation.

Several areas of standing water were present within the active quarry in the central eastern area of the Site. The majority of these are subject to regular disturbance as part of the quarry workings and supported heavily turbid water. As such they were not considered suitable to support GCNs. However, one small area of standing water appeared to have accumulated on saturated ground (rather than as part of the quarry activities directly) and supported colonising reed *Typha* sp. and moderate water quality. An eDNA sample was taken as a precaution, however, this returned a negative result indicating the absence of GCNs. The table below provides a summary of the pond surveys to date.

Table 2: Summary of Pond Survey Results

Pond reference	HSI 2016/17	GCN Suitability	2016 eDNA Results	2017 e-DNA Results	2016/17 traditional survey method	2021(22) Results
1	Barrier to movement – A449					
2	Barrier to movement – A5					
3	Barrier to movement – A5					
4	0.57	Below average	Negative	Negative	n/a	Dry (22)
5	0.56	Below average	Negative	n/a	Assumed absent	Dry
6	0.61	Average	Positive	n/a		Dry
7	Dry					Dry
8	0.75	Good	Positive	n/a	Assumed absent	Negative
9	Dry					Dry
10	Barrier to movement – A449					
11	Barrier to movement – A449					
12	Barrier to movement – A449					
13	Barrier to movement – A449					
14	0.74	Good	Positive	n/a	Assumed absent	No access
15	0.75	Good	Negative	Negative	Low population	No access

16	0.78	Good	Positive	n/a		No access
17	0.61	Average	Negative	Positive		Positive
18	0.67	Average	Positive	n/a	Assumed absent	Dry (22)
19	0.70	Good	Negative	n/a	n/a	No access
20	0.48	Poor	Negative	Negative	n/a	Dry
21	0.59	Below average	Positive	n/a	Assumed absent	Inaccessible due to dense scrub
22	0.51	Below average	Positive	n/a	Assumed absent	Dry
23	0.75	Good	Positive	n/a	Assumed absent	Negative
24	0.75	Good	Positive	n/a	Assumed absent	Negative
25	Dry					Dry
26	No access – Private property					
27	0.49	Poor	Negative	Negative	n/a	Dry
28	Barrier to movement – Staffordshire and Worcestershire Canal					
29	0.71	Good	Positive	n/a	Assumed absent	Dry
30	0.50	Below average	n/a	n/a	Assumed absent	Dry
31	0.62	Average	n/a	n/a	Assumed absent	Dry
32	0.55	Below average	n/a	n/a	Assumed absent	Dry
33	0.31	Poor – heavily stocked with fish and impacted by wildfowl	n/a	n/a	n/a	n/a
34	0.31	Poor – heavily stocked with fish and impacted by wildfowl	n/a	n/a	n/a	n/a
45	0.64	Average	n/a	n/a	Assumed absent	Negative
Quarry Pond	n/a					Negative

3.3 Bats

3.3.1 Preliminary Roost Assessment

Buildings

The preliminary roost assessment of the buildings was largely consistent with the 2016/17 findings and informed the dusk emergence/dawn re-entry surveys ..

Trees

Results of the preliminary roost assessment were found to be largely consistent with the 2016/17 surveys, although the potential of a number of trees was downgraded based on the current condition/presence of the potential roost features. Results of the 2021/22 preliminary roost assessment for trees assessed as having moderate or high potential are shown in Figure 3. In addition, several trees were found to offer low potential for roosting bats, or the potential for opportunities to develop in the future. These have not been recorded in detail, but appropriate mitigation will be considered in the relevant EMMP.

3.3.2 Roost Presence/Absence and Characterisation Surveys

Buildings

A summary of the dusk emergence/dawn return surveys is provided in the table below. Bat roosts have been identified in Woodside Barn, Mile End Cottage and Gailey Magazine 3, roughly consistent with the previous surveys, although less activity was identified to be associated with Woodside Barn. In addition, three roosts were recorded within Woodside Farmhouse.

Table 3: Summary of Roost Presence/Absence Surveys - Buildings

Building	Details of Roost
Heath Farm Outbuilding Coverted (Cartbarn/TheShippen)	Confirmed roost 1 x common pipistrelle emerging from south-west corner of the roof
	Confirmed Roost. Re-entry likely common pipistrelle behind gutter above door on east side of building.
Plot 8 Mile end cottage	Confirmed Roost. Single pipistrelle. Entry behind small gaps of face tile lower left of windowsill. Western elevation.
	Confirmed roost, 1 x common pipistrelle emergence from under tile next to upper southern window.
Plot 11 Fir tree cottage	Brown Long-Eared (BLE) re-entry into outbuilding north of house
Plot 2 Clovelly	Possible BLE emergence from under guttering on north side of building.
Plot 5 Gravelly Way Farmhouse	Confirmed roost 1x common pipistrelle re-entry into roof at ride on west of building.
Plot 5 GW Barn	Confirmed Roost - 15 pipistrelle. Entry near fire alarm. Western elevation.
	Roost confirmed - 2x common pipistrelle re-entry under guttering
Woodside Farmhouse and Outbuilding	Roost Confirmed - Three bat roosts (two common pipistrelle and a likely whiskered bat) were recorded to be associated with the farmhouse during the surveys, each supporting individual bats.
Woodside barn	Roost Confirmed - A small common pipistrelle roost was identified within the roof structure on the north-western elevation, and a potential Myotis emergence was recorded from the barn door on the same aspect.
Gailey Magazine 3	Roost Confirmed - A total of five soprano pipistrelle were recorded to return to roost on the south-west corner

Trees

A small noctule day roost was recorded within T102. No other tree roosts have been identified at the Site to date.

Bat activity varied across the survey area, indicative of the immediate surrounding landscape. Overall species abundance and composition appeared comparable to the previous survey with no notable results recorded.

3.4 Invasive Species

Calf Heath Wood continues to support extensive rhododendron throughout.

Two stands of Japanese knotweed *Fallopia japonica* have been identified in the proposed Calf Heath Community Park, south of Straight Mile. One stand is located within the woodland strip, adjacent to the Canal, in the approximate location of the proposal drainage outfall. The exact extent of this stand could not be determined due to the surrounding dense vegetation. The second stand, covering an area of approximately 25 m^2 is situated to the south of Straight Mile Road, within the grassland field. Further Japanese knotweed was reported along the railway line to the north of the Site in 2016/17, however, its current status is unknown.

Himalayan balsam *Impatiens glandulifera* was recorded within woodland in the eastern section of the proposed Calf Heath Wood Community Park, north of Straight Mile.

4.0 Disclaimer

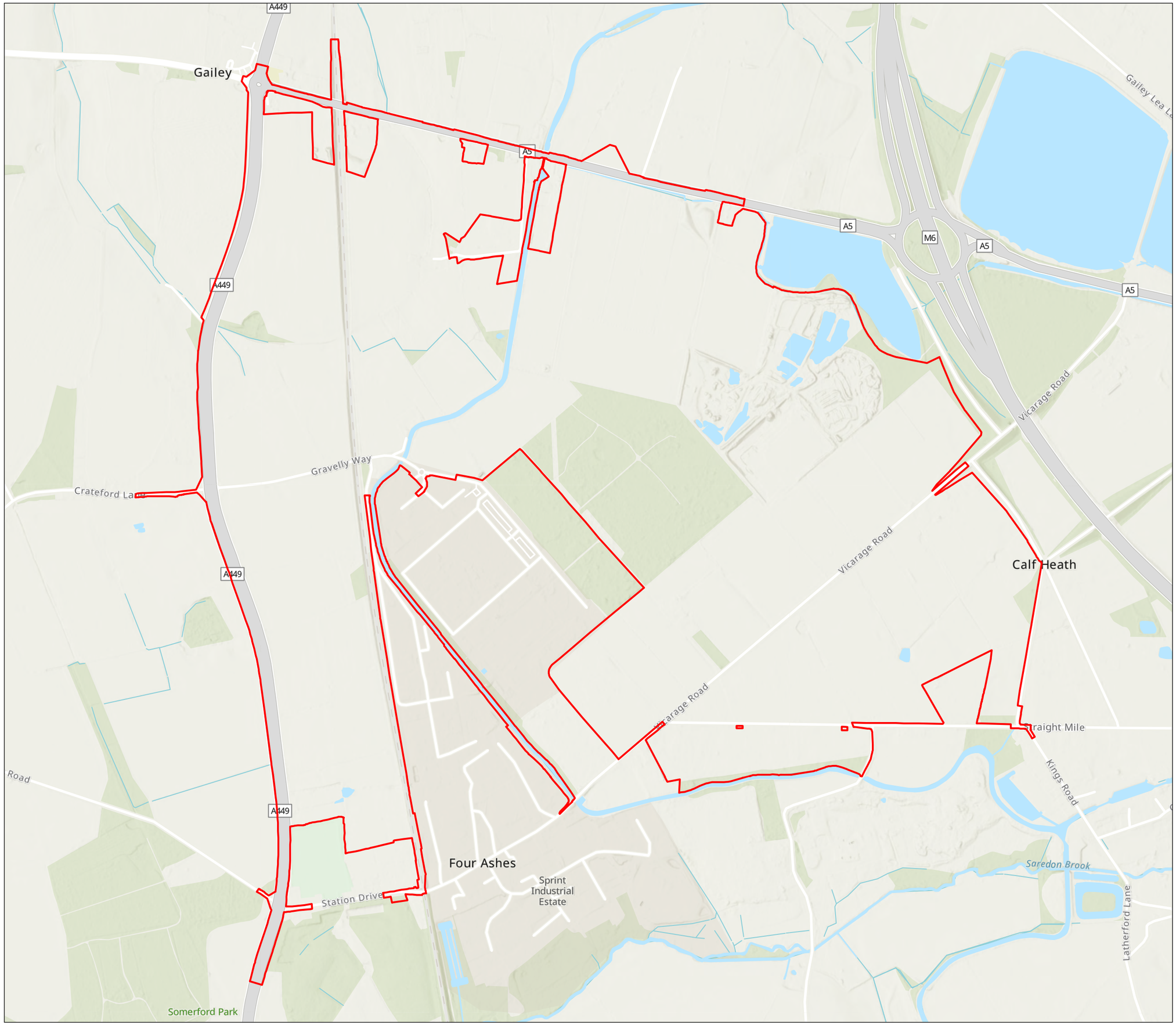
The recommendations contained in this Report represent Delta-Simons' professional opinions, based upon the information referred to in Section 1.0 of this Report, exercising the duty of care required of an experienced Ecology Consultant. Delta-Simons does not warrant or guarantee that the Site is free of Bats or other protected species.

The behaviour of animals can be unpredictable and may not conform to characteristics recorded in current scientific literature. This Report, therefore, cannot predict with absolute certainty that animal species will or will not occur in apparently suitable locations or habitats or that they will not occur in locations or habitats that appear unsuitable.

No part of the survey included an assessment of the materials and conditions of any buildings. No part of the survey included an asbestos assessment, nor did it represent an appraisal of other deleterious materials or hazardous substances.

This Report was prepared by Delta-Simons for the sole and exclusive use of the Client and for the specific purpose for which Delta-Simons was instructed as defined in Section 1.0 of this Report. Nothing contained in this Report shall be construed to give any rights or benefits to anyone other than the Client and Delta-Simons, and all duties and responsibilities undertaken are for the sole and exclusive benefit of the Client and not for the benefit of any other party. In particular, Delta-Simons does not intend, without its written consent, for this Report to be disseminated to anyone other than the Client or to be used or relied upon by anyone other than the Client. Use of the Report by any other person is unauthorised and such use is at the sole risk of the user. Anyone using or relying upon this Report, other than the Client, agrees by virtue of its use to indemnify and hold harmless Delta-Simons from and against all claims, losses and damages (of whatsoever nature and howsoever or whensoever arising), arising out of or resulting from the performance of the work by the Consultant.

Figure 1 – Site Location Map



Legend

Site boundary

0 100 200 300 400 Meters

N

Figure	Site Location Map		
Job	West Midlands Interchange		
Client	Four Ashes Limited		
Figure No. 1	Revision A	Date 31/01/2022	
Drawn BB	Checked JB	Scale 1:10,000 @ A3	
Job No. 21-0028.04		Central GR 392137E 309410N	

DO NOT SCALE.
NOT FOR CONSTRUCTION.

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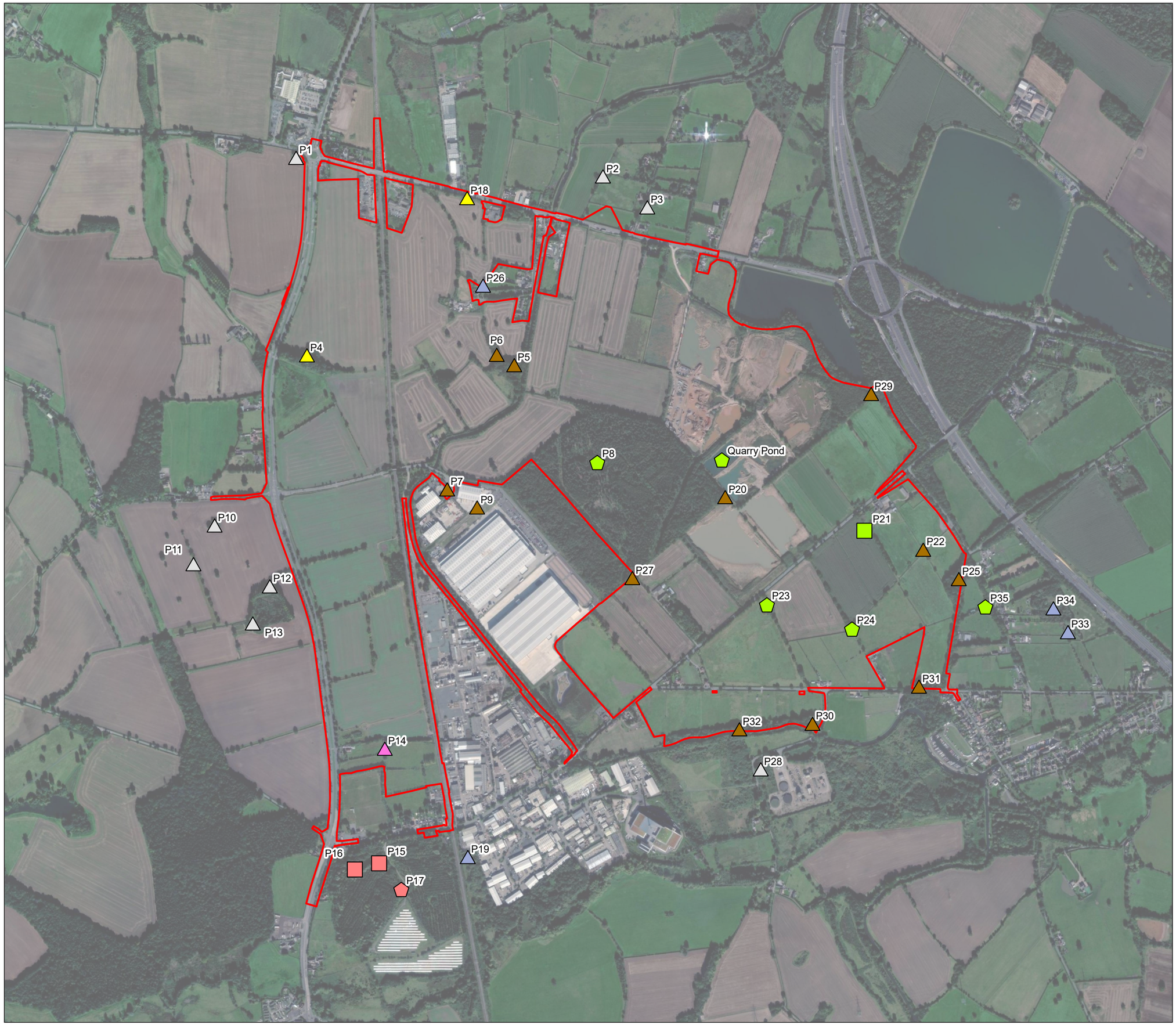
Figure 2 – GCN Survey Results 2021/22



Legend

- Site boundary
- eDNA positive
- eDNA negative
- Access restricted/assumed present
- Access restricted/assumed absent
- Far side of barrier to movement
- Dry
- Dry - 2022
- Not surveyed in 2021
- No access/unsuitable

0 100 200 300 400 Meters

N

Figure	GCN Survey Results 2021/22		
Job	West Midlands Interchange		
Client	Four Ashes Limited		
Figure No. 2	Revision A	Date 26/01/2023	
Drawn BB	Checked JB	Scale 1:12,000 @ A3	
Job No. 21-0028.04		Central GR 392137E 309410N	

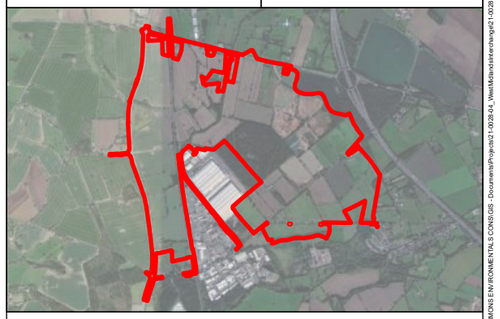


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Figure 3 – Bat Survey Results 2021/22 - Trees

Legend

- Site boundary
- Confirmed roost
- High suitability
- Moderate suitability

0 100 200 300 400 Meters

N

Figure	Bat Survey Results 2021/22		
Job	West Midlands Interchange		
Client	Four Ashes Limited		
Figure No. 3	Revision A	Date	26/01/2023
Drawn BB	Checked JB	Scale	1:10,000 @ A3
Job No. 21-0028.04		Central GR	392137E 309412N

DO NOT SCALE.
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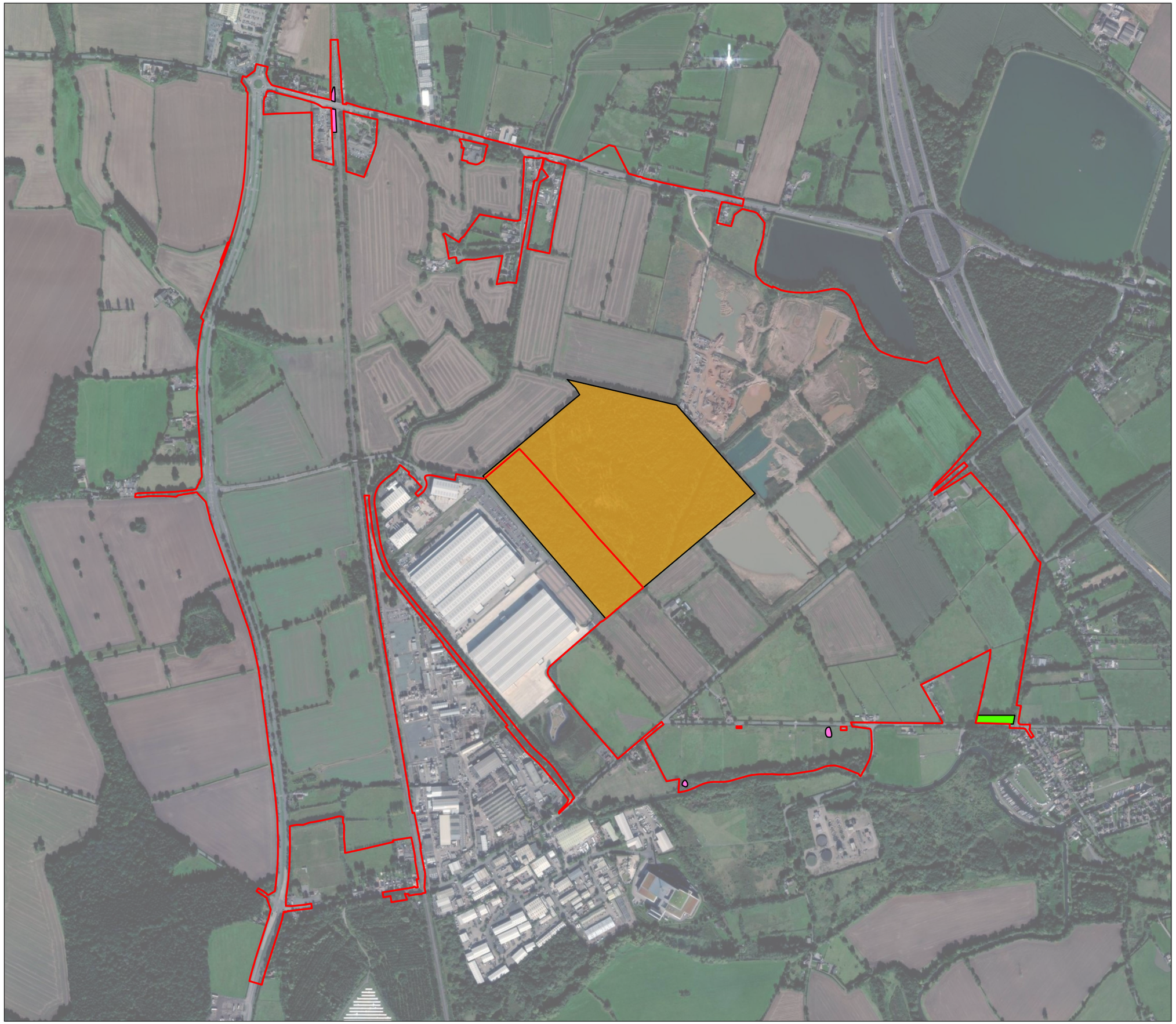
Figure 4 – Invasive Plant Survey Results 2021/22



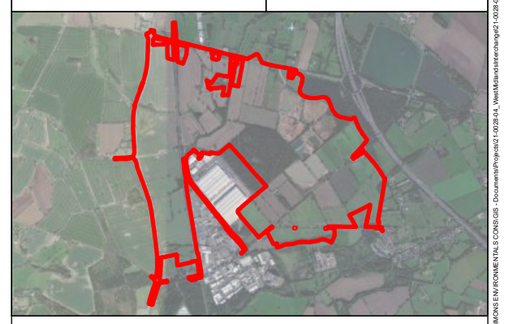
Legend

- Site boundary
- Rhododendron
- Japanese kntoweed
- Himalyan balsam

0 100 200 300 400 Meters

N

Figure	Invasive Plant Survey Results 2021/22		
Job	West Midlands Interchange		
Client	Four Ashes Limited		
Figure No. 4	Revision A	Date 26/01/2023	
Drawn BB	Checked JB	Scale 1:10,000 @ A3	
Job No. 21-0028.04		Central GR 392137E 309412N	



DO NOT SCALE.
NOT FOR CONSTRUCTION.

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Appendix A – References

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BS 42020:2013 Biodiversity. Code of Practice for Planning and Development

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Appendix B – Assessment of Structures, Trees and Habitats for Bats

Assessment of Structures, Trees and Habitats for Bats

Guidance on Assessing the Potential Suitability of Development Sites to Support Bats (adapted from Collins, J. (ed)).

Suitability	Description	
	Roosting	**Commuting and Foraging**
Negligible	An inspected structure or tree which is considered to have no features of importance for roosting bats. No further constraints apply to the method or timing of proposed works.	Negligible habitat features on-Site to support commuting or foraging bats.
Low	A structure with at least one or more features suitable to support opportunistic individual bats. However, inadequate space, shelter, protection and conditions, and the low suitability of surrounding habitats means that it is unlikely to be used as a maternity or hibernation roost site. A tree of adequate age and stature to support potential roosting features, however, either no features, or only features of limited potential recorded from the ground.	Habitat with potential to support low numbers of commuting bats due to its quality and connectivity. For example, a gappy hedgerow or unvegetated stream that is isolated from the surrounding landscape. Alternatively, suitable but isolated habitats suitable to support low numbers of foraging bats such as a lone tree or a patch of scrub.
Moderate	A structure or tree with one or more potential roost sites that are of adequate size, shelter and protection, with suitable conditions and surrounding habitat to support a bat roost not of high conservation status (with respect to roost type not individual species conservation status).	Linear habitat continuity connecting to the wider landscape offering potential to support commuting bats, such as rows of trees and scrub or linked back gardens. Habitat such as trees, scrub, grassland or a waterbody with connectivity to the wider landscape offering foraging opportunities for bats.
High	A structure or tree with one or more potential roost sites that are suitable for use by large numbers of bats on a regular basis and for long periods of time due to their size, shelter, protection, conditions and the surrounding habitat.	Continuous high-quality habitat with strong connectivity to the wider landscape that is likely to be used by commuting bats on a regular basis, such as flowing waterbodies, hedgerows, rows of trees and woodland edges. High quality habitat with strong connectivity to the wider landscape that is likely to be regularly used by foraging bats, such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to, and connected to, known roost sites.

Appendix E: Ground Conditions Technical Note

Appendix E: Ground Conditions Technical Note

Introduction

Delta Simons have undertaken a review of the design changes to the proposed strategic rail freight interchange development (the proposed development) on land at Four Ashes within South Staffordshire District, close to Junction 12 of the M6 motorway. The planning application was accompanied by an Environmental Statement (the '2018 ES')[1], and this technical note confirms any changes which have occurred since then which are relevant to the ground conditions assessment reported in Chapter 11, ES Volume I.

This document should be read in conjunction with Chapter *11 Ground Conditions* of the 2018 ES.

Policy Updates

Previously within the 2018 ES Chapter the 'Model Procedures for the Management of Land Contamination' (CLR11) provides the technical framework for applying a risk management process when dealing with contaminated land. The process involves identifying, making decisions on, and taking appropriate action to deal with land contamination in a way that is consistent with government policies and legislation within the UK. CLR11 procedures are intended to assist all those involved in dealing with land contamination, including landowners, developers, professional advisors, regulatory bodies and financial providers.

Since the 2018 EIA, the following changes have been made to legislation and guidance:

- Land Contamination Risk Management (LCRM) was published October 2020 and updated April 2021;
- The NPPF was updated February 2019 and revised July 2021; and
- Land Affected by Contamination Planning Practice Guidance (PPG) was last updated July 2019.

These changes have been considered as part of this review; however, they do not materially change the scope and methodology of the 2018 EIA.

Baseline Considerations

The baseline conditions used to inform the 2018 ES was based on a combination of desk-based data, as well as on-site investigations undertaken by Ramboll in 2015, 2017 and 2019. These baseline conditions are provided within Technical Appendices 11.3 and 11.4 of the 2018 ES.

In addition to the baseline conditions considered, further surveys have subsequently been undertaken in 2022 and 2023 across the Site area to assess the Site on a closer grid format and in regard to the proposed development design, in order to support the discharge of planning requirements 13 and 14 of the 2020 Order. The surveys also included a zone-based approach to ground gas monitoring with respect to the proposed development and the identified generation potential.

[1] An updated Ground Conditions technical assessment was submitted following the application with a number of other technical assessments. For the purpose of this review, the '2018 ES' refers to the original 2018 ES, as amended by the updated technical assessments.

Additional works were also completed within the identified landfill in the south east of the Site in order to provide further environmental and geotechnical information to inform detailed design.

This information is included within the Site Wide Geo-Environmental Assessment completed by Delta-Simon (Ref 21-0028.05 / 87175.554197 dated February 2023) which will be submitted to support the discharge of planning requirements 13 and 14 of the 2020 Order[2].

The general findings for the additional works undertaken are summarised in the sections below. Overall, no significant widespread contamination of shallow soils or groundwater was identified. The mitigation measures outlined in the Technical Appendix 11.5 of the 2018 ES have been refined (as summarised in the sections below), based on the greater understanding of the baseline conditions provided by the ground conditions revealed and the laboratory test results of the additional assessment. Whilst some refinements to remedial measures are anticipated, these are materially consistent with the embedded mitigation measures listed in the 2018 ES.

Delta-Simons Intrusive Site Investigation (2022)

With respect to the proposed commercial development, widespread or significant contamination of the soils has not been identified at the Site, though localised asbestos and low level PAHs were recorded within soils. Exposure pathways to future occupants will be broken by widespread concrete hardstanding and the installation of a clean cover system in proposed soft landscaped areas of the Site. Elevated concentrations may present a risk to human health to construction workers where short term risk would be mitigated by use of PPE and provision of suitable welfare facilities. These findings reported by Delta Simons are widely co[3]nsistent with those reported in the 2018 ES.

Exceedances of guidance acceptance criteria (GAC) were identified for the applied GAC for the protection of potable water for Nickel and Hydrocarbons as well as elevated VOC and PAH concentrations. However, it is considered that the above marginal exceedances recorded do not pose a significant risk to controlled waters given the historical industrial context of the south of the Site and the ongoing remediation in the south west of the Site. As such, no significant potential risk to controlled waters has been identified given the proposed impermeable surfaces and drainage of water into a series of interlinked ponds (lined with an impermeable barrier) in the south east of the Site. The findings reported are consistent with those detailed in the 2018 ES.

The Site has been given a zoned classification between Characteristic Situation 1 and 3 (CS1/3) in terms of ground gas, and as such, ground gas protection measures will be required in line with BS 8485 A1:2019. No significant source of vapour risk was identified during the investigation. Localised contaminant exceedances that may pose a vapour risk were identified at one location reported within the 2018 ES which Delta Simons did not encounter during their investigation, as such no longer considered a risk with respect to the proposed development.

Aggressive ground has not been identified within natural ground. However, Phenol has a deteriorative effect on concrete at concentrations above 1000mg/l. As such, care should be taken to closely assess the impact of phenol concentrations, particularly in the south west of the Site, close to the rail line within Plume A, due to the shallower depth profile of the plume and its poorer characterisation.

Within areas of recorded landfill (Units 5030, 3010) barrier pipe is likely required within areas of landfill/non-natural soils.

[2] The Site Wide Geo Environmental Assessment completed by Delta Simons dated February2023 will be available upon request.
[3]

A number of measures will be required during the construction phase to protect the ongoing groundwater remediation works in the south-western part of the Site. These are outlined in more detail in Technical Appendix 11.5 of the 2018 ES, as updated, referencing the remediation safeguarding report. The remediation safeguarding report enables and facilitates the variation of the permit held by SI Group with the EA following negotiations held between the Applicant and SI Group. When considering the updated baseline conditions and design changes, these do not change the requirement for groundwater remediation protection measures as outlined in the 2018 ES.

Delta-Simons Walkover (2023)

It additional to the above investigation and assessment, a walkover was undertaken on Thursday 12 January 2023 across the additional parcel of land at Craigmore, which forms part of the proposed amendments being sought for this application and that has not previously been surveyed. This additional parcel of land was observed to comprise a rectangular shaped area, roughly vegetated, with areas of rough gravel surfacing. At the time of the walkover, the parcel of land was in varied use, including vehicle maintenance, storage of farming equipment, with three wooden structures for the storage of animals/equipment with notable asbestos tiling. In addition two (likely oil) tanks, one intermediate bulk container (IBC), various drums of hydraulic oils for vehicle maintenance and several vehicles were also noted in the area. These land uses and observations are not considered to differ from parts of the Site already considered in the 2018 ES.

When considering the above additional site investigations completed and additional walkover, it is deemed that the baseline conditions and mitigation measure presented in the 2018 ES have not materially changed and are considered to remain valid.

Design Changes

The design changes that have been considered relevant to this assessment relate to the proposed amendment to the rail infrastructure (Zone C) to expand the Works No. 1 (railway works) extent and associated Order Limits boundary southwards to include land at Craigmore, totalling 0.0308 hectares. This would involve removing 0.249 hectares of land currently identified as Landscaping land on the certified Parameters Plan, and expanding the area of Zone C [Rail corridor including new rail lines and landscaping] by 0.279 hectares to accommodate the extension of the proposed tracks running up to the two buffer stops (Figure 3.7).

The proposed amendments do not alter the assumptions made in respect of the construction methods and no new risk receptor pathways would be introduced. Therefore, the mitigation measures proposed remain valid and none of the other proposed amendments, as summarised in Section 3.2 of the EIL, are considered relevant to the contamination assessment. The remainder of this report therefore focuses on the additional parcel of land at Craigmore and whether this would introduce any new risk of contamination not previously identified in the 2018 ES.

Consideration of Changes

Given the site-wide baseline conditions are considered to remain consistent with those used to inform the 2018 EIA, the residual effects previously reported in the 2018 ES would not be amended by the updated baseline data. Accordingly, this review has focused on any potential new or amended residual effects resulting from proposed design amendments being sought as part of this NMC application (i.e. the rail infrastructure changes, as discussed above).

In this regard, the additional parcel of land required for the rail infrastructure changes was not considered within the Chapter 11 of the 2018 ES, or the more recent investigation and assessment works completed by Delta-Simons in 2022.

This additional parcel of land is likely underlain by a sequence of topsoil and/or Made Ground (in areas of former buildings or areas of surfacing) underlain by Glaciofluvial Deposits, and subsequently bedrock of the Wildmoor Sandstone Formation.

As identified during the walkover undertaken by Delta-Simons in 2023, limited potential sources of contamination have been identified within this additional parcel, comprising localised Made Ground deposits, the potential for buried asbestos/asbestos in soils, any contamination associated with the current use of the Site as vehicle storage/maintenance yard, the storage of two (likely oil) tanks, IBCs (anticipated to store water), and drums of hydraulic oil and any spills associated with these. In addition to these sources, the lack of significant hardstanding and noted poor housekeeping presents a contaminant linkage pathway. However, widespread or significant contamination is considered unlikely.

The inclusion of the additional parcel of land within the Order Limits is not considered to have introduced any material changes to the baseline condition previously reported in the 2018 ES, nor would the changes proposed alter the demolition and construction phase assumptions (noting that the nature of the demolition and construction works would remain the same) or the assessment of effects undertaken for the 2018 EIA. As such, the mitigation measures presented in the 2018 ES would also apply to this new parcel of land and therefore remain valid.

Overall, the proposed amendments would not alter the conclusions of the 2018 ES and the residual effects remain valid – Negligible Adverse to Minor / Moderate Adverse for all residual effects following the implementation of appropriate mitigation.

Appendix F: Noise and Vibration Technical Note

A Noise Assessment for the Proposed Highways and Bridges Amendments at West Midlands Interchange

On behalf of Four Ashes Limited

May 2023

resound acoustics

A Noise Assessment for the Proposed Highways and Bridges Amendments at West Midlands Interchange

On behalf of
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Report Reference: RA00738– Rep 3

Resound Acoustics Limited is a
Member of the Association of Noise Consultants

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1 INTRODUCTION

1.1 Four Ashes Limited ('FAL') has the benefit of The West Midlands Rail Freight Interchange Order 2020 (as amended by The West Midlands Rail Freight Interchange (Correction) Order 2020) ('the Order').

1.2 The Order granted consent for a 'strategic rail freight interchange' ('SRFI') on land at Four Ashes within South Staffordshire District, close to Junction 12 of the M6 motorway. FAL has adopted the name 'West Midlands Interchange' ('WMI') for the project.

1.3 The main components of development granted by the Order can be summarised as follows:

- an intermodal freight terminal with direct connections to the West Coast Mainline Loop, capable of accommodating at least 4 no. trains per day and trains of up to 775 metres long, including container storage, heavy goods vehicle ('HGV') parking, rail control building and staff facilities;
- up to 743,200 m^2 (gross internal area) of rail-served warehousing and ancillary service buildings;
- new road infrastructure and works to the existing road infrastructure;
- demolition and alterations to existing structures and earthworks to create development plots and landscape zones;
- reconfiguring and burying of electricity pylons and cables; and
- strategic landscaping and open space, including alterations to public rights of way and the creation of new ecological enhancement areas and publicly accessible open space areas, including two new country parks.

1.4 The application for the Development Consent Order (DCO) was submitted in 2018 (the '2018 DCO application') and was accompanied by an Environmental Statement ('ES') and Environmental Statement Addendum ('ESA') prepared by Ramboll Limited and supporting technical specialists on behalf of FAL (the Applicant).

1.5 Resound Acoustics produced both the noise and vibration chapter in the 'July 2018 ES' and the noise and vibration chapter in the April 2019 ESA, both of which were before the Secretary of State as part of the 2018 DCO application. The 2018 DCO application was determined in May 2020.

1.6 An application for a non-material change to the DCO (referred to as the 'proposed highways and bridges amendments') is now being submitted to the Secretary of State which proposes a series of minor changes to the development approved by the DCO that are required to address a number of technical considerations in respect of delivery and operation of the WMI project ("the non-material change application").

1.7 This assessment sets out the potential implications of the proposed changes in terms of how they affect the noise climate at sensitive receptors around the site of the SRFI and how those outcomes vary from the conclusions of the assessments submitted with the 2018 DCO application.

1.8 This assessment focusses only on the operational stage of the development since the proposed highways and bridges amendments do not fundamentally alter the location or required construction methods relative to the consented scheme in the Order; no material

changes are anticipated in relation to the previously-reported demolition and construction stage assessment in respect of noise and vibration.

1.9 Furthermore, within the completed development stage assessment, no further assessment work has been undertaken in relation to off-site road traffic noise or vibration levels because the level of development-generated traffic will not change from the levels assessed within the 2018 DCO application.

1.10 Whilst reasonable efforts have been made to produce a report that is easy to understand and follow, is the assessment is technical in nature and, therefore, to assist the reader, an introduction to noise and an explanation of the terminology used in this report is contained in Appendix A.

2 SITE DESCRIPTION

Existing Site Description

2.1 The site is located approximately 10 kilometres ('km') north of Wolverhampton and lies immediately west of Junction 12 of the M6 motorway, with the West Coast Mainline Loop ('WCML Loop') intersecting the site of the WMI. It lies within the administrative boundary of South Staffordshire District Council ('SSDC') and comprises approximately 297 hectares ('ha') of land.

2.2 The site also borders the A5 and the A449 trunk roads to the north and west respectively, which in turn link to the M6 motorway, M6 toll road and the M54 motorway. Penkridge railway station is located approximately 3km north of the site.

2.3 Also adjacent to the site boundary is the Four Ashes Energy Recovery Facility ('the ERF'), the Severn Trent Sludge Disposal Centre and the Bericote Site / Gestamp Factory to the south, with the Rodbaston Wind Farm approximately 1km to the north.

2.4 The completed development will broadly be bounded by the A5 trunk road to the north (from Junction 12 to the Gailey Roundabout); Calf Heath Reservoir, the M6 motorway, Stable Lane and Woodlands Lane to the east; Station Drive, Straight Mile and Woodlands Lane to the south; and the A449 trunk road (Stafford Road), from the Gailey Roundabout to Station Drive to the west. The south-eastern part of the site is bisected by Vicarage Road.

2.5 The north-eastern section of the site contains an area of historic sand and gravel mineral extraction at Calf Heath Quarry ('the Quarry'). The mineral extraction area covers approximately 40ha, with almost the entirety of this area open-cast with silt lagoons and areas of standing water extending across. The extraction activities have now finished, although there are daytime vehicle movements and de-watering activities.

2.6 The majority of the remainder of the site is made up of a patchwork of agricultural fields with hedgerows and trees around the outer boundaries of Site. Calf Heath Wood is an area of mixed woodland part of which lies within the Order Limits, towards the middle of the site.

2.7 There are a number of residential properties within the Order Limits, with some further residential properties in close proximity to the site boundary, including a grouping of properties located on Croft Lane, and properties off Station Drive, Vicarage Road, the A449 and the A5.

2.8 A site location plan is included as Figure B.1 in Appendix B.

Proposed Development

2.9 The Proposed Development authorised by the Order comprises:

- an intermodal freight terminal with direct connections to the West Coast Main Line, capable of accommodating at least 4 trains per day and trains of up to 775 metres long, including container storage, heavy goods vehicle ('HGV') parking, rail control building and staff facilities;

- up to 743,200 square metres (gross internal area) of rail-served warehousing and ancillary service buildings;
- new road infrastructure and works to the existing road infrastructure;
- demolition of existing structures and earthworks to create development plots and landscape zones;
- reconfiguring and burying of existing overhead power lines and pylons; and
- strategic landscaping and open space, including alterations to public rights of way and the creation of new ecological enhancement areas and publicly accessible open space areas including two new country parks.

Proposed Amendments

2.10 A series of changes are now being proposed to address a number of technical considerations in respect of delivery and operation of the WMI project (the 'proposed highways and bridges amendments'), and these changes are described in full in the Planning Statement that accompanies the non-material change application.

2.11 The aspects of the proposed highways and bridges amendments that are relevant to operational noise emissions from the site are:

- **The Road Level Changes:** Amendments to certain consented finished road levels identified on the certified Development Zone, Floor Levels and Building Heights and Green Infrastructure Parameters Plans. Although the proposed highways and bridges amendments do not alter the heights of the mounding shown on the certified Parameters Plans relative to the A4/A449 Link Road, the proposed amendments to the on-site road infrastructure levels will result in changes to the finished height of mounding along the A5/A449 Link Road in absolute terms. The full details are contained in the Planning Statement;
- **Rail Infrastructure Changes:** Amendments to enable the inclusion of additional land to accommodate an extended cripple siding and buffer stop within the new railway area connecting the new Rail Freight Terminal to the West Coast Main Line Loop Railway ('WCML Loop'). The new buffer stop on the neck shunt is further south than under the consented scheme.

2.12 The other changes proposed as part of the highways and bridges amendments, such as bridge span changes and footway changes, have no material effect on the noise assessment.

2.13 As previously stated, the level of development-generated traffic will not change from the levels assessed within the 2018 DCO application. In relation to noise, the materiality of the amendments therefore rests only with the effect that the proposed highways and bridges amendments bring about to the noise emissions from the operational SRFI.

3 POLICY AND GUIDANCE

3.1 The majority of relevant planning policy, legislation and guidance remains the same as at the time of the 2018 DCO application. There have been minor updates to the principal British Standard used to assess operational noise and to the National Planning Policy Framework (NPPF), however, those changes do not materially affect any element of the assessment submitted with the 2018 DCO application.

3.2 The planning policy, legislation and guidance is only repeated here insofar as it is necessary to understand the process for assessing operational noise and how those assessment outcomes translate into EIA-compatible conclusions for both the 2018 DCO application and for this updated assessment, and to capture any changes since the 2018 DCO application.

National Policy Statement for National Networks

3.3 The *National Policy Statement (NPS) for National Networks*[1] provides the policy basis for the consented scheme and it, and the Government's Planning Practice Guidance for noise[2], both recognise that adverse effects are possible and may be acceptable, and that a balance must be struck on the basis of the following:

- avoid significant adverse effects on health and quality of life, i.e. where the effects of the proposed development exceed the significant observed adverse effect level:
- the significant adverse effects can be avoided through the implementation of mitigation, including design, layout, embedded mitigation, and/or the provision of noise insulation and ventilation;
- only once the effect of the proposed development reaches an unacceptable level should the scheme be prevented; and
- the level at which an unacceptable effect is reached must lie above the trigger values set out in the NIR 1975 and NIR 1996, otherwise the NPS would not endorse their use for national infrastructure schemes.
- adverse effects of the proposed development should be mitigated and minimised:
    - the provision of mitigation is an appropriate response to adverse effects, and the mitigation can take a number of forms, including engineering methods, modifications to the layout, bunding and noise barriers, DCO Requirements, or insulation.

3.4 The balance that is to be struck must be done in the overarching context of the Government's policy on sustainable development.

3.5 A new draft of the NPS for National Networks[3] was published in March 2023. The changes are relatively minor, with the key policy tests remaining the same. The following changes have been identified:

- the contents of a noise assessment now stated where *"noise impacts are likely to arise from the proposed development"* and not solely when an EIA is required;
- as well as assessing effects on noise-sensitive receptors, the assessment should identify whether *"any particular groups are more likely to be affected"*;

[1] *National Policy Statements for National Networks*, Department of Transport (2014)
[2] *Planning Practice Guidance (2019) Noise,* DCLG
[3] *Draft National Policy Statements for National Networks,* Department of Transport (2023)

- the current stipulation that the nature and extent of a noise assessment should be proportionate to the likely noise impact is proposed to be removed;
- reference is now made to the EU's *"Common Noise Assessment Methods (CNOSSOS)"*, in addition to the UK-specific methods.

3.6 None of these proposed changes affect this assessment in respect of the non-material change application.

National Planning Policy Framework

3.7 The Department for Communities and Local Government published the *National Planning Policy Framework* (NPPF) on 27th March 2012 and it was most recently revised in July 2021.

3.8 The changes made in July 2021, which post-date the 2018 DCO application and hearings, largely relate to a simplification of the text and the numbering of paragraphs rather than to a material change to the policy itself.

3.9 The NPPF remains of less importance to the DCO than the NPS for National Networks, which is the primary policy consideration on noise matters for the SRFI. However, the July 2021 changes to the NPPF are summarised here for the sake of completeness.

3.10 The general guiding principle in the NPPF is contained in Section 15 under the heading *Conserving and enhancing the natural environment*. Paragraph 174 states:

> *"Planning policies and decisions should contribute to and enhance the natural and local environment by:*
>
> *(e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans;"*

3.11 The noise planning policy is contained in paragraph 185, which also appears in Section 15 of the NPPF:

> *"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:*
>
> *a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;*
>
> *b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason;"*

3.12 A footnote to the point paragraph 185(a) refers to the *Explanatory Note of the Noise Policy Statement for England*, which defines *"significant adverse impacts on health and quality of life."* and "*adverse impacts on health and quality of life*."

Amendments to a DCO

3.13 Guidance for determining the materiality of the changes to a DCO is set out in DCLG guidance[4], with paragraph 12 providing:

> *"A change should be treated as material if it would require an updated Environmental Statement (from that at the time the original Development Consent Order was made) to take account of new, or materially different, likely significant effects on the environment."*

3.14 The guidance in the DCLG document is that where likely significant effects are new or are materially different, such that an updated ES would be required, the proposed change should be considered as material.

3.15 Strictly speaking, likely significant effects that are materially improved may still result in the proposed changes being considered material, as is noted in the paragraph 13 of the DCLG guidance:

> *"There may be cases where the change proposed to a Development Consent Order will result in likely significant effects on the environment that are entirely positive. In these cases, an updated Environmental Statement will still be required and the application will need to be treated as a material change in order to ensure that the regulatory requirements on Environmental Impact Assessment are met. However, depending on the circumstances, such material changes may be ones where no examination needs to be held"*

3.16 For the purposes of making changes to a DCO, in general terms, it is presumed simpler to justify material improvements than to justify a material worsening.

British Standard 4142

3.17 British Standard 4142 was amended in late 2019, after the July 2018 ES and April 2019 ESA were completed. The changes included in the 2019 amendment of the standard were minor and would not have affected the assessment submitted with the 2018 DCO application, which relied on the unamended 2014 version of the standard.

3.18 Since the amendments in the 2019 version of the standard do not affect how the standard has been used at WMI, this report refers only to BS4142, with no reference to the specific year of publication, unless the version of the standard is relevant.

3.19 BS4142: 2014 + A1: 2019: *Methods for rating and assessing industrial and commercial sound* describes a method for rating and assessing sound of an industrial or commercial nature, which includes:

- sound from industrial and manufacturing processes;

[4] *Planning Act 2008: Guidance on Changes to Development Consent Orders*, DCLG (December 2015)

- sound from fixed installations which comprise mechanical and electrical plant and equipment;
- sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and
- sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train or ship movements on or around an industrial and/or commercial site.

3.20 It should be noted that BS4142 contains both mandatory requirements and commentary, explanation or general information material. Where relevant, the distinction between these two presentation conventions is stated in this report.

3.21 In a BS4142 assessment, the industrial or commercial sound is assessed outside a dwelling or premises used for residential purposes. The procedure is to quantify the *"specific sound level"*, which is the measured or predicted level of sound from the source in question over a one hour period for the daytime and a 15 minute period for the night-time.

3.22 Although BS4142 does not define daytime and night-time, daytime is noted in the standard to be typically 07:00 to 23:00 hours, and night-time typically 23:00 to 07:00 hours.

3.23 The preferred method for determining the specific sound level is measurement. However, where it is not possible to determine the specific sound by measurement alone, for example because the specific source does not yet exist, as is the case here, the standard allows for a calculated approach in clause 7.3.6:

> *"Determine the specific sound level by calculation alone if measurement is not practicable, for example if the source is not yet in operation. In such cases, report the method of calculation in detail and give the reason for using it."*

3.24 Once established, the specific sound level is converted to a rating level by adding penalties on a sliding scale to account for either potentially tonal, impulsive, or intermittent elements, using subjective judgement. The standard also sets out objective methods for determining the presence of tones or impulsive elements using measurements; however, the standard notes that these should be used where the subjective method is not sufficient and in any event, it is not possible to use them where the sources do not yet exist in the acoustic climate in which they are assessed.

3.25 The penalty for tonal elements is between 0dB and 6dB, and the standard non-mandatory provides guidance on how this might be implemented:

> *"Subjectively, this can be converted to a penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible, and 6 dB where it is highly perceptible."*

3.26 The penalty for impulsive elements is between 0dB and 9dB, and again, the standard provides non-mandatory guidance on how this might be implemented:

> *"Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible, and 9 dB where it is highly perceptible."*

3.27 The standard also states that if a source has identifiable on/off conditions, a penalty may be applied for intermittency. The suggested, non-mandatory, penalty for sources that have intermittent elements is:

> *"If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied."*

3.28 Where the specific sound features acoustic characteristics that are distinctive against the residual acoustic climate, but are not tonal, impulsive or intermittent in nature, a penalty of +3dB may be applied.

3.29 The background sound level is the L_{A90} of the residual sound, which is itself the sound remaining at the assessment location when the specific sound source being assessed is suppressed to such a degree that it does not contribute to the ambient sound.

3.30 The standard presents guidance that the background sound level can include industrial and/or commercial sound in some circumstances:

> *"Since the intention is to determine a background sound level in the absence of the specific sound that is under consideration, it is necessary to understand that the background sound level can in some circumstances legitimately include industrial and/or commercial sounds that are present as separate to the specific sound."*

3.31 The standard presents guidance that the background sound level should be measured over a period of sufficient length to obtain a representative value. This should not normally be less than 15 minute intervals. The standard states that:

> *"A representative level ought to account for the range of background sound levels and ought not automatically to be assumed to be either the minimum or modal value."*

3.32 The initial assessment outcome results from a comparison of the rating level with the background sound level. The standard states:

> *"a) Typically, the greater this difference, the greater the magnitude of the impact.*
>
> *b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.*
>
> *c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.*
>
> *d) The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.*
>
> *NOTE 2 Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact."*

3.33 BS4142 states that relevant contextual matters should be taken into account before reaching a final position on the assessment outcome. It is noted as important because:

"An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context."

3.34 BS4142 lists some of the contextual matters that might influence the assessment outcome:

"1) The absolute level of sound. For a given difference between the rating level and the background sound level, the magnitude of the overall impact might be greater for an acoustic environment where the residual sound level is high than for an acoustic environment where the residual sound level is low.

Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.

Where residual sound levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts, and the margin by which the rating level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impacts worse.

2) The character and level of the residual sound compared to the character and level of the specific sound. Consider whether it would be beneficial to compare the frequency spectrum and temporal variation of the specific sound with that of the ambient or residual sound to assess the degree to which the specific sound source is likely to be distinguishable and will represent an incongruous sound by comparison to the acoustic environment that would occur in the absence of the specific sound. Any sound parameters, sampling periods and averaging time periods used to undertake character comparisons should reflect the way in which sound of an industrial and/ or commercial nature is likely to be perceived and how people react to it.

NOTE 3 Consideration should be given to evidence on human response to sound and, in particular, industrial and/or commercial sound where it is available. A number of studies are listed in the "Effects on humans of industrial and commercial sound" portion of the "Further reading" list in the Bibliography.

3) The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions, such as:

- *i) facade insulation treatment;*
- *ii) ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation; and*
- *iii) acoustic screening."*

3.35 In terms of the first of these contextual considerations, BS4142 does not indicate how the initial estimate of impact should be adjusted when background and rating levels are low. However, it is considered that in this situation, the absolute levels may suggest a more or less acceptable outcome than would otherwise be suggested by the difference between the values.

3.36 BS4142: 2014 + A1: 2019 does not define 'low' in the context of background sound levels nor rating levels. The note to the *Scope* of the 1997 version of BS4142 defined very low

background sound levels as being less than about 30dB L_{A90}, and low rating levels as being less than about 35dB L_{Ar}. It is considered that these definitions provide a reasonable reference point for the definition of 'low' in the context of the current version of the standard.

3.37 It is also noted that the consideration of internal noise levels is not necessarily limited to those situations where background and rating levels are low; the contextual matters set out in BS4142 are examples, and not an exhaustive, prescriptive list.

3.38 Other contextual matters that might be relevant, include:

- character of a particular neighbourhood;
- former uses at or close to a site;
- legitimacy of the industrial use, e.g. planning permissions or environmental permits;
- implementation of best practicable means for a given process or activity; or
- local convention or perceptions.

3.39 BS4142 requires uncertainties in data and associated calculations to be considered, and where the uncertainty is likely to affect the outcome of the assessment, steps should be taken to reduce the uncertainty.

Process for Determining Effects in the DCO

3.40 Setting aside the methods of calculating the levels of noise likely to be generated by an operational SRFI, which for the SRFI as modified by the proposed highways and bridges amendments are summarised in Section 4 of this report, this section describes how the calculated sound levels were assessed and translated into an outcome consistent with the EIA Regulations in the 2018 DCO application; the same method of assessment has been applied to the proposed highways and bridges amendments.

3.41 There are a number of steps to the process, which can be summarised as follows:

- calculating the sound levels likely to be generated by operations at the site at receptors close to the site;
- correcting the calculated sound levels to obtain rating levels at each receptor considered;
- determining the level of impact of the sound, using the method set out in BS4142;
- translating the level of impact into a magnitude of effect, by considering the size of the impact, the sensitivity of the receptor, and the duration of the exposure;
- determining whether or not the magnitude of effect is considered to be likely significant effect in the context of the EIA Regulations.

3.42 It is important to spell out these steps, as each of them can be considered to represent the potential noise impact from the SRFI, as considered at the DCO application stage, i.e. the level of sound from the site, the level of impact, the level of effect, and the significance of the effect, can each be considered as potentially representing the overall impact the scheme was expected to have at the DCO application stage, and therefore the materiality of any changes could, in theory, relate to any of these four elements.

3.43 There is no specific explanation as to how different a previously-identified likely significant effect on a receptor would need to be to be considered sufficient to trigger the need for an updated Environmental Statement.

3.44 For the purposes of this report, where there is no change in the category of effect as a result of the proposed highways and bridges amendments, a change of ±5dB is considered to be the minimum required difference for a previously-identified likely significant effect that remains a likely significant effect to be deemed materially different.

3.45 There is no specific guidance to support a change of ±5dB as the minimum to give rise to a materially different likely significant effect, however, the assessment outcomes in BS4142 are gradated in 5dB steps, as was set out in paragraph 3.32 of this report, suggesting a degree of correlation between the 'severity' of the outcomes with a 5dB change in assessed impacts, i.e. a low impact is deemed to occur when the rating level is no higher than the background sound level, an adverse impact is deemed to occur when the rating is around 5dB above the background sound level, and a significant adverse impact is deemed to occur when the rating level if around 10dB or more above the background sound level.

3.46 These 5dB steps represent the change from one assessment outcome to the next, so ±5dB is considered a reasonable threshold to apply when determining if previously-identified likely significant effects are materially different, where there is no change in the category of effect as a result of the proposed highways and bridges amendments.

3.47 Where a likely significant effect on a receptor does change effect category, i.e. it changes from moderate adverse to major adverse, it is considered reasonable to give weight to this change of effect category in determining whether a material change has occurred.

3.48 However, a change of effect category on its own is not considered to equate to a materially different likely significant effect, if the accompanying change in level that causes the change in category is small. For example, a 1dB increase in impact that causes a moderate adverse effect to become a major adverse effect is considered to be materially the same outcome.

3.49 This is because the effect categories have been tied to the initial numerical impact outcomes in BS4142, but the standard is clear that there is no precision in its outcomes; impacts occur *'around'* the defined thresholds not *'at'* the thresholds.

3.50 A change of 3dB is generally considered to be the smallest change in sound level that can be readily perceived in *'typical'* circumstances. This is described in the IEMA *Guidelines for Environmental Noise Impact Assessment*[(5)], which state (emphasis added):

> *"Measuring in decibels means that a 3dB increase is equivalent to a doubling of the sound energy, and a 10dB increase is a tenfold increase in energy. For broad band sounds which are very similar in all but magnitude,* ***a change or difference in noise level of 1dB is just perceptible under laboratory conditions, 3dB is perceptible under most normal conditions****, and a 10dB increase generally appears to be twice as loud."*

3.51 General guidance can also be found in the Welsh[(6)] and Scottish[(7)] planning guidance. Although Welsh and Scottish guidance are not directly relevant to a site in England, the

(5) *Guidelines for Environmental Noise Impact Assessment* (2014) IEMA
(6) Planning Guidance (Wales), Technical Advice Note (Wales) 11, *Noise* (October 1997) Welsh Government
(7) Planning Advice Note (PAN) *Planning and Noise* (March 2011) Scottish Government

physics and human perception of sound are not location-specific, and therefore the guidance provided in these documents is considered valid when deriving a scale correlating change in sound level to human perception.

3.52 Technical Advice Note (Wales) 11, commonly referred to as TAN11, states:

> *"Measurements in dB(A) broadly agree with people's assessment of loudness. A change of 3dB(A) is the minimum perceptible under normal conditions, and a change of 10dB(A) corresponds roughly to halving or doubling the loudness of a sound."*

3.53 The Scottish planning guidance, Planning Advice Note (PAN) 1/2011 Planning and Noise, provides similar guidance:

> *"Measurements in dB(A) broadly agree with people's assessment of loudness. For noise of a similar character, a change of 3dB(A) is the minimum perceptible under normal conditions, and a change of 10dB(A) corresponds roughly to halving or doubling the loudness of a sound."*

3.54 The perception of these changes in noise level originated in the 1963 Wilson Report[8], which still underpins much modern UK guidance on noise. It states:

> *"It will be helpful to remember that a change of three decibels in the meter reading given by a noise is about the smallest which most people would think significant, and that an increase of 10 decibels in noise of the same kind corresponds approximately to a doubling of loudness."*

3.55 These documents all provide similar advice; a change in noise level of 3dB is generally the smallest change that is perceptible, unless controlled circumstances apply.

3.56 Although comparing noise predictions for a source that does not yet exist with updated predictions for an amended form of that source, which also does not yet exist, will not provide a basis for perceiving a change of 3dB, there being no change for anyone to hear, that there would be no perceptible difference between two sources that are less than 3dB apart is considered a reasonable basis for determining the materiality of a noise change that causes a change in effect category.

3.57 In summary:

- Where there is no change in effect category, a previously identified likely significant effect will only be considered materially different if the level of impact changes by ±5dB or more; and
- where there is a change in effect category, a previously identified likely significant effect will only be considered materially different if the level of impact changes by ±3dB.

[8] *Committee on the Problem of Noise: Noise – Final Report* (July 1963), HMSO

Rating Level Corrections

3.58 Having calculated the operational sound levels for the whole SRFI at each receptor around the site, the sound levels must be converted to rating levels, whereby any potential acoustic characteristics that may draw attention to the source are taken into account.

3.59 The corrections account for certain acoustic characteristics that can increase the level of impact over that expected just from the comparison between the sound level from the site ('specific sound level'), and the background sound level. In simple terms, do the acoustic characteristics make the sound from the site more noticeable? The specific sound level plus the feature corrections is termed the 'rating level'.

3.60 BS4142 allows for two methods of determining the size of appropriate corrections, a subjective method, based on the assessor's judgement, and an objective method based on measurements. In this instance, the proposed development does not yet exist, so only the subjective methods are possible.

3.61 The use of the word *'subjective'* is not wholly helpful nor appropriate for what is required by the standard, and the subjective method could perhaps be more accurately termed *'a qualitative approach'*, as distinct from the purely quantitative objective methods. The adopted subjective methods should be employed *'objectively'* in the broader sense of the word.

3.62 There is no prescribed method in BS4142 as to how the subjective methods should be deployed, the standard just requires the prominence of the features to be established and corrections applied. The standard contains non-mandatory commentary that is designed to assist the assessor in arriving at appropriate corrections, and this commentary is used widely, and was used specifically in the 2018 DCO application.

3.63 The approach to determining the acoustic character corrections used in the 2018 DCO application was set out in paragraphs 13.255 to 13.257 of the July 2018 ES, and the process is summarised here with some additional text to clarify certain points:

- The overall L_{Aeq} and L_{AFmax} sound levels from the operation of the site are calculated for all elements likely to exhibit a tonal character, including reversing alarms and crane alarms, and the resultant values are compared with the representative L_{Aeq} level measured during the baseline noise survey.
- For the purposes of understanding the process, the L_{Aeq} level can be considered an 'average' measure of sound and the L_{AFmax} can be considered as the highest noise level likely to occur during a particular period of time.
- This process tests the potential audibility of both the average tonal and impulsive sound levels and the peaks of tonal or impulsive sound against the existing acoustic climate at each receptor.
- For all receptors, the total L_{Aeq} value for tonal sources was considerably below the existing measured L_{Aeq} values, suggesting that the average measure of the tonal elements would not be audible in the context of the existing acoustic climate.
- This process was repeated for all of the impulsive operations, including, cranes and reach stackers picking up/putting down containers, and tugs and HGVs picking up trailers. Again the total L_{Aeq} value for impulsive sources was considerably below the existing measured L_{Aeq} values, suggesting that the average measure of the impulsive elements would not be audible in the context of the existing acoustic climate.

- The maximum noise levels likely to result from tonal and impulsive activities were calculated for each receptor, and compared with the existing baseline L_{Aeq} levels. The aim of this test was to determine whether peaks of sound would be distinctive or distinguishable from existing general sounds at each receptor.
- Since the L_{AFmax} maximum sound levels were not all below the existing L_{Aeq} sound levels at the various receptors, scales were adopted to provide a consistent, quantified approach to determining the likelihood of each characteristic being audible.
- This approach was an attempt to 'standardise' the implementation of the subjective method of deriving acoustic feature corrections, as described in the commentary in BS4142.
- Depending on the receptor/source type and location, the maximum noise levels ranged from considerably below the existing baseline L_{Aeq} values, and therefore likely to be inaudible, to being 10dB or more above them, and therefore likely to be audible.
- The corrections were applied on the following basis for tonal elements:
  - L_{Amax} values below L_{Aeq} values by more than 5dB: 0dB
  - L_{Amax} values between 5dB below and equal to the L_{Aeq} values: +2dB
  - L_{Amax} values between equal to and 10dB above L_{Aeq} values: +4dB
  - L_{Amax} values 10dB or more above L_{Aeq} values: +6dB
- A similar process was applied to the impulsive elements:
  - L_{Amax} values below L_{Aeq} values by more than 5dB: 0dB
  - L_{Amax} values between 5dB below and equal to the L_{Aeq} values: +3dB
  - L_{Amax} values equal to and 10dB above L_{Aeq} values: +3dB
  - L_{Amax} values 10dB or more above L_{Aeq} values: +9dB
- The corrections are cumulative, i.e. for the most tonal, impulsive sources, a total correction of +15dB is possible.

3.64 As part of the 2018 DCO application, it was considered that the proposed development was unlikely to be noticeably intermittent at off-site receptors; although operations will, on an individual basis, be intermittent, there will be a large number of overlapping operations so that when judged in the context of the existing noise climate and the significant amount of road traffic noise in the area, sound from the site is likely to appear to be consistent. No corrections for intermittency were therefore considered necessary in the 2018 DCO application. The same position is considered to apply to the SRFI as modified by the proposed highways and bridges amendments.

3.65 The method of calculating the L_{Amax} levels at the surrounding receptors was not stated in the 2018 DCO application, but it is worth noting that it used a very simple calculation of attenuation due to distance only, with a simple correction if the propagation path was either obstructed or partially obstructed. No account was taken for any reductions due to soft ground, where sound attenuates more quickly over soft ground such as grass or fields than over hard surfaces such as concrete, or air absorption, whereby sound is dissipated as it travels through the air, primarily as a result of molecular friction.

3.66 The simple calculation method was adopted at the time of the original calculations for the 2018 DCO application as the receptors being assessed were relatively close to the site boundary, generally within a distance of 300 metres. Over such distances, the simplicity of the calculation was considered to give an acceptably robust answer, whereby the calculated value was likely to be higher than was likely in practice, therefore providing for greater corrections than might otherwise have been the case. This was considered to be a suitably

precautionary approach, whereby potential impacts and effects would not be under-estimated.

3.67 Later in the DCO process the range of assessed receptors was expanded, at the request of the local planning authority, so that receptors further from the site were considered. For these receptors, the simple calculation method can result in applying corrections for acoustic characteristics that will not be audible because the receptor is too far from the site, but the simple calculation suggests that the characteristics may be audible as it underestimates the reductions in sound level over longer distances. This may have resulted in larger corrections, and potentially greater impacts, than would have been the case with a more complex calculation method.

3.68 To maintain a precautionary approach and to be consistent with the original DCO submission, the original simple calculation method has been retained for this updated assessment; any inherent over-prediction of the prominence of acoustic characteristics will lead to a worst-case outcome.

Magnitude of Impact

3.69 Once the rating level was determined at each receptor, the initial impact magnitude was determined, using the approach set out in BS4142.

3.70 As noted earlier in this section, the approach set out in BS4142 is intentionally imprecise, with impact magnitudes noted to occur at outcomes *'around 5dB above the background sound level'* and *'around 10dB or more above the background sound level'*. This lack of precision is deliberate and was designed to allow the standard to be applied flexibly in a range of situations.

3.71 To seek to apply a level of consistency to the assessment, the differences between the rating levels and background sound levels at each receptor were deemed to result in the outcomes set out in Table 3.1.

Table 3.1: Determination of initial BS4142 impact (originally Table 13.4 in the July 2018 ES)

Level of magnitude	Definition of initial impact magnitude	
	BS4142 assessment level	**Description provided in BS4142 for likely impact**
High	> +10dB	*"A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context."*
Moderate	+5dB to +10dB	*"A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context."* No BS 4142: 2014 description for above +5dB, but the greater the difference, the greater the magnitude of the impact.
Low	+1dB to +4dB	No BS 4142: 2014 description but the lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact.

Level of magnitude	Definition of initial impact magnitude	
	BS4142 assessment level	**Description provided in BS4142 for likely impact**
Negligible	≤ 0dB	BS4142: 2014 states that where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

3.72 It is important to note that the standard clearly states that contextual considerations should be factored into the overall judgment of impact; a direct correlation between the numerical assessment outcomes and the significance of potential impacts should not be assumed, hence the description of the assessment outcomes in Table 3.1 as *'initial'* assessment outcomes. The standard itself uses the same language, describing the numerical outcome as *'the initial estimate'*.

3.73 It is also important to note that BS4142 does not describe the thresholds set out in Table 3.1 in definitive terms. The standard refers to outcomes *'around'* the values stated, for example:

> *"A difference of around +5dB is likely to be an indication of an adverse impact, depending on context". (emphasis added)*.

3.74 The word *'around'* is important as it illustrates that there is not a rigid threshold of adverse impact that is reached when the rating level exceeds the background sound level by 5dB, but would disappear when the rating drops by 0.55dB, where the rating level, rounded to a whole number, would exceed the background sound level by 4dB.

3.75 For the purposes of the 2018 DCO application, the numerical BS4142 assessments were taken to be indicative of the initial impact significance, as defined in Table 3.1, with contextual factors set out that may modify the stated outcomes.

3.76 The net effect of the contextual matters, in general terms, is that where an initial numerical assessment suggests, for example, a moderate adverse impact, internal sound levels that meet relevant criteria might reduce the impact magnitude to low. Equally, where, for example, a low adverse impact is initially identified, very high sound levels in the area may suggest that the outcome should be a moderate adverse impact as a worsening of an already poor sound climate may be more impactful than the initial estimate suggests.

3.77 Where appropriate, these contextual matters were factored into the 2018 DCO application.

3.78 The assessment of the proposed highways and bridges amendments are based on the same contextual considerations, since the context remains the same as was considered in the 2018 DCO application; the materiality of any changes is determined by the numerical outcomes alone.

Receptor Sensitivity

3.79 The sensitivity of the various receptors assessed in the 2018 DCO application was determined in accordance with the scale set out in Table 3.2.

Table 3.2: Determination of receptor sensitivity (Table 13.5 in July 2018 ES)

Receptor Sensitivity	Type of receptor
High	Hospitals (e.g. operating theatres or high dependency units), residential accommodation, private gardens, hospital wards, care homes, research facilities
Medium	Schools, universities, national parks during the day, temporary holiday accommodation at all times including hotels, areas of designated value, e.g. Conservation Areas
Low	Offices, shops, general outdoor amenity areas, long distance footpaths, doctors surgeries, sports facilities and places of worship
Negligible	Warehouses, light industry, car parks, agricultural land

3.80 These receptor sensitivity categories were applied to receptors for both the construction and operational phases of the proposed development.

3.81 The same approach has been used for the assessment of the proposed highways and bridges amendments.

Duration of Effect

3.82 The duration of any identified impacts was considered as short term, medium term or long term in the 2018 DCO application, according to Table 3.3.

Table 3.3: Duration of effects (Table 13.6 in July 2018 ES)

Timescale	Definition
Short term	0 to 1 year
Medium term	1 to 5 years
Long term	5 + years

3.83 The same approach has been used for the assessment of the proposed highways and bridges amendments.

Assessing Significance of Effect

3.84 The impact magnitude in the 2018 DCO application was related to the receptor sensitivity to determine the overall significance of the effect, in accordance with Table 3.4. An effect of moderate or major significance was considered to be significant in an EIA context.

Table 3.4: Significance of effect (Table 13.7 in July 2018 ES)

Magnitude of impact	Sensitivity of receptor			
	High	Medium	Low	Negligible
High	Major	Moderate	Minor	None
Moderate	Moderate	Minor	Minor	None
Low	Minor	Minor	None	None
Negligible	None	None	None	None

3.85 The same approach has been used for the assessment of the proposed highways and bridges amendments.

SOAEL versus EIA Significance

3.86 An important distinction was drawn in the 2018 DCO application between the threshold for identifying significant adverse effects in an Environmental Statement and the specific identification of SOAEL, or the significant observed adverse effect level, which has a particular meaning in planning policy.

3.87 This distinction had been made clear in other infrastructure-based planning inquiries, for example the Thames Tideway Tunnel[9], where the Secretary of State found that despite the identification of significant adverse effects in the noise assessment:

> *"…the proposed development meets the first NPS aim of avoiding significant adverse impacts on health and quality of life"*[10]

3.88 The Secretary of State made a clear distinction between the identification of significant adverse effects in EIA terms, and complying with the policy aims of avoiding significant adverse impacts of health and quality of life.

3.89 The later decision by the Secretary of State to allow the appeal by Heathrow Airport Limited against the decision by the London Borough of Hillingdon to refuse permission for enabling works that would allow implementation of full runway alternation during easterly operations at Heathrow Airport reached a similar conclusion.

3.90 Paragraph 1064 of the decision letter for the Heathrow application[11] summarised the findings of the Thames Tideway Tunnel Order letter:

> *"I do not equate the 'significant adverse effects' identified in the ES with those that the NPSE seeks to avoid."*[12]

3.91 It was considered clear from those two decisions that the SOAEL, the point at which a significant adverse effect on health and quality of life occurs, can lie above the point at which a significant adverse effect occurs in EIA terms.

3.92 For WMI, SOAEL was taken to be the background sound level plus 10dB or façade levels of 66dB $L_{Aeq,16hrs}$ (daytime) and 62dB $L_{Aeq,8hrs}$ (night-time), whichever is reached first.

3.93 Applying the advice in the noise planning practice guidance[13], mitigation in the form of appropriate design and site layout, together with the use of noise insulation at the point where the SOAEL may be reached, was considered appropriate; the provision of noise insulation in those circumstances mitigates the noise impact and avoids significant adverse effects on health and the quality of life, consistent with the requirements of national policy.

3.94 The means of achieving this outcome in the 2018 DCO application was the *Bespoke Noise Insulation Scheme*.

Bespoke Noise Insulation Scheme

[9] Planning Act 2008: Application for the Proposed Thames Water Utilities Limited (Thames Tideway Tunnel) Order
[10] Para 74, DCLG / DEFRA Thames Tideway Tunnel Order Decision Letter dated 12th September 2014
[11] DCLG/DEFRA Letter dated 2nd February 2017
[12] Para 1064, DCLG/DEFRA Letter dated 2nd February 2017
[13] Planning Practice Guidance (2014) *Noise*, DCLG

3.95 To avoid significant adverse effects on health and quality of life, FAL committed to a bespoke noise insulation scheme that addressed potential noise impacts at lower thresholds than would be the case for the Noise Insulation Regulations for roads[14] or railways[15], and that included noise sources not covered by those two pieces of legislation.

3.96 The *Bespoke Noise Insulation Scheme* ('BNIS') was initially limited to properties within 300 metres of the order limits, and designed to trigger a grant for insulation when sound from the site exceeded levels equivalent to the NIR 1975 and NIR 1996, with two additional thresholds for operational noise, one linked to the adopted SOAEL and one linked to internal sound levels.

3.97 The content of the BNIS was amended during the DCO examination following discussions with the local planning authority, and the final version of the scheme is contained in Schedule 6 of the Development Consent Obligation (DCOb) for the scheme.

3.98 For operational noise, the following thresholds were adopted:

- in terms of absolute external criteria (all three criteria are required to be met):
  - noise levels from the scheme exceed façade noise levels of 66dB $L_{Aeq,16hrs}$ during the daytime, or 62dB $L_{Aeq,8hrs}$ during the night-time;
  - noise levels increase by at least 1dB as a result of the scheme; and
  - the contribution from the scheme to the overall noise level is at least 1dB.
- or, in terms of relative criteria:
  - where the rating level at an eligible façade, including any appropriate character corrections, exceeds the background sound level in the absence of any sound from the scheme, by 8dB or more, during either the daytime and/or the night-time, calculated in accordance with BS4142: 2014.
- or, in terms of absolute internal criteria in habitable rooms:
  - where the internal rating level within a habitable room exceeds 40dB $L_{Aeq,16hrs}$ during the daytime, or 35dB $L_{Aeq,8hr}$s during the night-time.
- Daytime is taken to be 07:00 hours to 23:00 hours, and night-time 23:00 hours to 07:00 hours.

3.99 The key changes made to the BNIS following discussions with the local planning authority were the removal of the 300 metre distance limit, and reducing the threshold for the relative criteria to 8dB above the background sound level from the original 10dB above the background sound level, which was equal to the adopted SOAEL.

3.100 The timing of the assessments under the BNIS for operational noise were defined and linked to specific areas of floorspace.

3.101 Importantly for the discussion presented later in this report, the BNIS required the applicant to remeasure the baseline acoustic environment if requested to do so by the local planning authority, prior to occupation of the first warehouse. The aim of the re-measurement is to inform the assessments for operational noise under the BNIS with up-to-date baseline information.

[14] SI 1975 No. 1763 Building and Buildings, The Noise Insulation Regulations 1975
SI 1988 No. 2000 Building and Buildings, The Noise Insulation (Amendment) Regulations 1988
[15] SI 1996 No. 428 Building and Buildings, The Noise Insulation (Railways and Other Guided Transport Systems) Regulations 1996

4 THE DCO POSITION

4.1 The July 2018 ES and April 2019 ESA that were submitted with the 2018 DCO application set out the assessment of operational noise from the WMI scheme. The July 2018 ES provided a description of the assessment methods and assessed parameters, while the April 2019 ESA provided an update to the assessment outcomes that resulted from additional baseline sound level measurements.

4.2 This section includes a summary of the key elements of the operational noise assessment in the 2018 DCO application, so that the materiality of any noise changes likely to result from the proposed highways and bridges amendments can be considered.

Baseline Noise Climate

4.3 The representative baseline sound levels that were adopted in the April 2019 ESA are summarised in Table 4.1, which is an amalgam of Tables 13.A.13 and 13.A.14 from the April 2019 ESA. The baseline information set out in the April 2019 ESA was an update of the information in the July 2018 ES, which had been adversely affected by external factors such music festivals and roadworks.

4.4 A plan showing the locations of the monitoring locations is included as Figure B.2 in Appendix B (replicated from Figure 13A.1 in the April 2019 ESA).

Table 4.1: Baseline sound levels from April 2019 ESA, free-field dB

Position	Period	Background Sound Levels, L_{A90}		Ambient Sound Levels, $L_{Aeq,T}$	
		Range	Representative Values	Range	Representative Values
N1	Day	36 to 59	44	54 to 66	58
	Night	29 to 53	36	46 to 66	49
N2	Day	37 to 62	42	57 to 77	64
	Night	37 to 53	39	39 to 72	54
N4	Day	41 to 58	47	48 to 61	52
	Night	40 to 57	44	44 to 64	48
N5	Day	35 to 50	41	40 to 60	45
	Night	35 to 51	39	38 to 53	43
N6	Day	38 to 51	41	43 to 61	48
	Night	35 to 49	37	37 to 60	41
N7	Day	37 to 51	41	42 to 60	46
	Night	28 to 51	33	37 to 56	41
N8	Day	41 to 58	46	44 to 69	48
	Night	42 to 57	44	44 to 59	47
N9	Day	38 to 57	46	47 to 62	51
	Night	42 to 57	45	46 to 58	48
N10	Day	30 to 48	34	35 to 58	41
	Night	27 to 48	33	32 to 53	36
N11	Day	38 to 51	42	42 to 57	45
	Night	39 to 52	42	42 to 53	45
N12	Day	34 to 48	39	39 to 61	43
	Night	33 to 50	38	36 to 63	41

4.5 It is noted that Position N3 was used in the July 2018 ES, but changes to the boundary of the proposed development meant that Position N3 was no longer required in the April 2019 ESA.

4.6 The background sound level data in Table 4.1 formed the basis of the BS4142 impact assessment in the 2018 DCO application, and the ambient sound levels were used in the determination of appropriate acoustic character corrections.

Predicted Operational Sound Levels

4.7 The calculations were based on what was considered to be a reasonable worst-case interpretation of the Parameters Plans, as described in the July 2018 ES. In broad terms, the calculations included:

- vehicle movements on internal site roads within the Order limits, including heavy goods vehicles, cars, and tugs;
- vehicle movements and loading/unloading activities in the service yards of all units, including heavy goods vehicles and forklifts;
- vehicle movements in car parking areas of all units, including cars;
- train movements, with two trains per hour assumed, and locomotives assumed to be either moving trains or standing stationary and idling;
- loading/unloading activities in rail terminal areas, including the use of gantry cranes in the main rail terminal and reach stackers in the rail-connected Unit 1030;
- undefined activities within each unit assumed to give rise to internal sound levels of 75dB(A), which is considered typical for a B8 use. The sound reduction performance of the external building fabric was assumed to be 39dB R_w for walls, 28dB R_w for roofs, which allows for the lower sound reduction performance of rooflights, and 0dB for level access doors, which are all assumed to be open;
- the potential acoustic screening effects of landscaped bunding and fencing, as set out on the Green Infrastructure plan, and from the proposed buildings themselves.

4.8 The calculations in the 2018 DCO application used the methods set out in ISO9613[16] and the *Calculation of Railway Noise*[17], as implemented by the modelling software CADNA/A. The topography on and around the site was modelled using OS mapping information and on-site observations. The acoustic absorbency of the ground around the site was assumed to be acoustically soft, including all landscaping and landscaped bunds, while the ground absorbency at the site itself was assumed to be acoustically hard. All buildings were modelled as approximately 70% acoustically reflective.

4.9 The potential operational sound levels were assessed at a number of receptor locations, that were considered representative of the noise-sensitive properties close to the site. The receptor locations, which were agreed with the local planning authority, are shown in Figure B.3 in Appendix B.

4.10 The outcomes of the 2018 DCO application are set out in Table 4.2, which replicates Table 13A.19 in the April 2019 ESA. The receptors where likely significant effects were predicted are shaded in blue.

[16] ISO9613 (1996) *Acoustics – Attenuation of sound during propagation outdoors – Part 2 General method of calculation*, ISO
[17] Department of Transport (1995) *Calculation of Railway Noise*, HMSO, London

Table 4.2: BS4142 assessment outcomes (Table 13A.19 in the April 2019 ESA), free-field dB

Receptor	Period	Background Sound Level, L_{A90}	Rating Level, $L_{Ar,T}$	Difference
1 Kings Road	Day	46	39	-7
	Night	45	41	-4
181 Station Drive	Day	41	46	+5
	Night	37	49	+12
182 Station Drive	Day	41	48	+7
	Night	37	50	+13
4 Croft Lane	Day	41	52	+11
	Night	39	51	+12
Allspan	Day	46	41	-5
	Night	44	40	-4
Avenue Cottages	Day	47	54	+7
	Night	44	55	+11
Avery Bungalow	Day	46	40	-6
	Night	44	39	-5
Chase View	Day	41	53	+12
	Night	33	52	+19
Cobweb Cottage	Day	46	42	-4
	Night	44	41	-3
Craigmore	Day	41	48	+7
	Night	37	51	+14
Denson House	Day	41	50	+9
	Night	33	51	+18
Elmhurst	Day	46	41	-5
	Night	44	40	-4
Evergreen	Day	44	50	+6
	Night	36	49	+13
Gailey House	Day	41	53	+12
	Night	39	54	+15
Hamerton House	Day	41	50	+9
	Night	39	49	+10
High Clere	Day	46	44	-2
	Night	45	43	-2
Hollybyre	Day	44	50	+6
	Night	36	49	+13
Homestead	Day	44	50	+6
	Night	36	52	+16
Longacre	Day	47	46	-1
	Night	44	44	0
Longfield	Day	41	51	+10

Receptor	Period	Background Sound Level, L_{A90}	Rating Level, $L_{Ar,T}$	Difference
	Night	39	50	+11
Marsh Farm	Day	44	44	0
	Night	36	46	+10
Meadow View	Day	46	45	-1
	Night	45	44	-1
Oak View	Day	41	52	+11
	Night	39	51	+12
Roundabout Cottages	Day	41	49	+8
	Night	33	51	+18
School House	Day	41	52	+11
	Night	33	51	+18
Silverthorne	Day	41	49	+8
	Night	37	51	+14
St Clare	Day	41	49	+8
	Night	37	52	+15
Straight Mile Farm	Day	46	45	-1
	Night	45	48	+3
Sylvestris	Day	46	39	-7
	Night	45	40	-5
The Cottage	Day	41	49	+8
	Night	39	48	+9
The Villa	Day	47	47	0
	Night	44	49	+5
Wharf Cottage	Day	41	49	+8
	Night	39	48	+9
Wharf House	Day	41	51	+10
	Night	39	50	+11
Wood View	Day	42	50	+8
	Night	39	51	+12
Woodland Farm	Day	46	46	0
	Night	44	46	+2
Calf Heath Reservoir West	Day	47	49	+2
	Night	44	50	+6
Calf Heath Reservoir East	Day	47	54	+7
	Night	44	55	+11
Canal Moorings North	Day	41	50	+9
	Night	39	51	+12
Canal Moorings South	Day	41	53	+12
	Night	39	53	+14
	Day	39	56	+17

Receptor	Period	Background Sound Level, L_{A90}	Rating Level, $L_{Ar,T}$	Difference
Canal Towpath Gravelly Way	Night	38	58	+20
221i Crateford Lane	Day	34	52	+18
	Night	33	53	+20
219 Crateford Lane	Day	34	50	+16
	Night	33	51	+18
Comox	Day	42	45	+3
	Night	42	44	+2
The Poultry Farm House	Day	42	48	+6
	Night	42	47	+5
The Poplars	Day	42	44	+2
	Night	42	43	+1

4.11 In total, likely significant effects were predicted at 32 no. receptor locations.

4.12 The April 2019 ESA concluded that 29 no. of the assessed receptors were likely to qualify for insulation under the BNIS, all except two qualifying on the basis of the relative criteria and two (Straight Mile Farm and Woodland Farm) qualifying on the basis of the absolute internal criteria.

4.13 Since the assessed receptors were a representative sample of either groups of properties or individual properties close to the site, the April 2019 ESA identified that a further 75 no. properties were also likely to be eligible for insulation as they were close to receptors identified as qualifying.

4.14 Three receptors in the April 2019 ESA were not expected to qualify for insulation under the BNIS for operational noise effects, despite having been identified as having likely significant effects. Of these, The Villa was expected to qualify under both the construction element of the BNIS and under the NIR 1975 for road traffic noise, receiving mitigation under the BNIS, while Calf Heath Reservoir East is not a residential property.

4.15 The remaining receptor of these three, Poultry Farm House, was not expected to qualify for insulation under the BNIS, as the predicted sound levels fell between a likely significant effect, which was deemed to occur when site noise was 5dB above the background sound level, and qualification under the BNIS, which was deemed to occur when site noise exceeded the background sound level by 8dB. The outcome at this receptor did not result in the DCO application being refused.

4.16 It was also noted that the two canal mooring assessment locations were predicted to have rating levels more than 8dB above the background sound levels at night and would therefore qualify under the BNIS. However, as was stated in paragraphs 13.294 to 13.298 of the July 2018 ES, canal mooring locations were considered as quasi-residential receptors, but the affected occupants will not be exposed to noise for prolonged periods as the moorings are time-limited and it was not considered practicable to install bespoke noise insulation for transitory visiting boats.

Summary of DCO Position

4.17 Operational noise from the proposed development was predicted to result in high adverse impacts at the worst-affected receptors in the 2018 DCO application, but these receptors would benefit from the BNIS, thereby reducing the significance of the impacts.

4.18 Overall and once the effect of the BNIS is taken into account, the impacts at these properties were considered to be moderate adverse, which when combined with high sensitivity receptors, resulted in moderate adverse effects, which were likely significant effects.

4.19 The effects at the canal mooring locations and on the canal towpaths were considered to be moderate adverse effects, which were also likely significant effects.

4.20 All of the identified impacts and effects from operational noise were expected to be long-term, permanent effects.

4.21 In total, likely significant effects were predicted at 32 no. of the 45 no. assessed receptors in the April 2019 ESA.

5 BASELINE SOUND LEVEL MEASUREMENTS

5.1 Clause 2 of the BNIS, which is contained in Schedule 6 of the DCOb for the development, requires the baseline acoustic climate to be re-measured prior to the occupation of the first warehouse, unless the local planning authority agrees that such a re-survey is not necessary.

5.2 Due to (and for the purposes of) the DCOb, the local planning authority confirmed in 2022 that a re-survey would be required to confirm that the original survey data remained valid.

5.3 To avoid construction works associated with the WMI compromising the re-measurement, the survey was carried out in November 2022 before significant construction works commenced. It was considered important to avoid undertaking baseline measurements during periods of construction, as noise from those works was likely to affect the acoustic climate thereby rendering it atypical, unrepresentative and potentially unsuitable for use in the BNIS.

5.4 It is noted that in the normal course of an application to amend a DCO, a re-measurement of the baseline conditions would not be required, if there were no reason to suspect that conditions had changed. In this instance, the re-measurement was required by the DCOb and since the measurements were undertaken prior to the submission of this application, the results are available for use in this assessment of the noise effects arising from the proposed highways and bridges amendments.

5.5 The measurements took place over a period of approximately two weeks, from Wednesday 2nd November 2022 to Thursday 17th November 2022. A reduced number of monitoring locations was agreed with the local planning authority, with the aim being to test a small proportion of the original survey locations, to determine whether the baseline had changed since the April 2019 ESA was issued. However, during discussions with the local planning authority, additional positions were added so that more than half of the original survey locations were eventually re-surveyed.

5.6 The re-surveyed positions are shown in Figure B.4 in Appendix B.

5.7 The survey methodology and results are set out in the draft Resound Acoustics report *A Baseline Sound Level Survey Report for West Midlands Interchange* (report reference RA00738 – Rep 2, Dft 0, dated 21st December 2022)('the draft December 2022 baseline noise survey report'), a copy of which is included in Appendix C of this report.

5.8 The draft December 2022 baseline survey noise report has not yet been finalised and issued to the local planning authority as it has been undertaken as part of the BNIS process, and it not yet required. It will be finalised and submitted due course.

5.9 The representative background sound levels identified in the draft December 2022 baseline noise survey report have been compared with those set out in the April 2019 ESA to determine whether the baseline acoustic climate has materially changed.

5.10 The two sets of representative background sound levels are compared in Table 5.1.

Table 5.1: Comparison of April 2019 ESA and November 2022 representative background sound levels, free-field L_{A90} dB

Location	Period	April 2019 ESA Values	November 2022 Survey Values	Difference
Position N1	Day	44	49	+5
	Night	36	37	+1
Position N2	Day	42	42	0
	Night	39	36	-3
Position N4	Day	47	49	+2
	Night	44	43	-1
Position N5	Day	41	43	+2
	Night	39	38	-1
Position N7	Day	41	48	+7
	Night	33	37	+4
Position N9	Day	46	43	-3
	Night	45	38	-7

5.11 It can be seen from Table 5.1 that the representative background sound levels identified from the November 2022 survey are reasonably close to the values set out in the April 2019 ESA.

5.12 The November 2022 values at Positions N2, N4 and N5 are the closest to those set out in the April 2019 ESA, being within 3dB. A change of between 1 and 3dB is considered to be within the bounds of measurement tolerance to be expected when measuring sound levels from multiple, geographically diverse sources. This is considered to fall within the bounds of what might be termed 'normal' survey variability; differences of less than 3dB in the background sound level over a period of three or four years are not considered significant.

5.13 The values at Positions N1, N7 and N9 are less consistent, with Positions N1 and N7 being higher in November 2022 than in the April 2019 ESA and Position N9 being lower.

5.14 Higher background sound levels in November 2022 might suggest that future assessments of operational noise under the BNIS could be overly stringent if they retained the original background sound level data, i.e. a background sound level that is now higher would provide more headroom for site noise, before eligibility for insulation is triggered under the BNIS. Similarly, background sound levels that are now lower would trigger eligibility for insulation at a lower level than would be the case for the original baseline data.

5.15 To assist in determining whether the differences at these three positions reflect an actual change in the baseline acoustic climate, the changes in the ambient sound levels have also been analysed. For the sake of clarity, background sound levels represent a statistical measure of sound, equivalent to the lowest 10% of the sound levels that occur during a particular period of time, which is normally influenced by sound sources that are relatively steady in level over 90% of a period of time. The assessment method set out in BS4142, which is used to assess noise of a commercial or industrial nature, is based on the level of background sound.

5.16 The ambient sound level is a measure of average acoustic energy that might result from all sources at a particular location over a particular period of time. While the background sound

level tends to be influenced primarily by steady sources of sound, the ambient sound level is much more affected by shorter duration events, like passing cars.

5.17 Since some of the background sound levels were found to have altered in November 2022, relative to the background sound levels in the April 2019 ESA, it is considered reasonable to also look at how the ambient sound levels changed between the two surveys, to assist in understanding these changes.

5.18 Table 5.2 sets out a comparison between the representative ambient sound levels from the April 2019 ESA and those identified from the November 2022 survey data.

Table 5.2: Comparison of April 2019 ESA and November 2022 representative ambient sound levels, free-field $L_{Aeq,T}$ dB

Location	Period	April 2019 ESA Values	November 2022 Survey Values	Difference
Position N1	Day	58	61	+3
	Night	49	54	+5
Position N2	Day	64	64	0
	Night	54	49	-5
Position N4	Day	52	53	+1
	Night	48	48	0
Position N5	Day	45	45	0
	Night	43	40	-3
Position N7	Day	46	52	+6
	Night	41	45	+4
Position N9	Day	51	50	-1
	Night	48	40	-8

5.19 The differences between the representative ambient sound levels set out in the April 2019 ESA and those identified from the November 2022 survey, as shown in the final column of Table 5.2, suggest that the ambient sound levels have also remained broadly consistent at Positions N2, N4 and N5, have increased at Positions N1 and N7 and decreased at Position N9.

5.20 A change in the ambient sound level of up to 5dB over a three to four year period is not considered significant; the ambient sound level is much more susceptible to peaks of sound than the background sound level, which tends to 'smooth' out transient sources of sound.

5.21 Changes of more than 5dB could be an indication that the acoustic climate has shifted since the April 2019 ESA was issued, albeit short duration surveys do not offer definitive evidence of a long-term trend.

5.22 On the basis of the changes in the representative background and ambient sound levels set out in Tables 5.1 and 5.2, it is considered that the majority of the values adopted in the April 2019 ESA remain broadly appropriate.

5.23 The representative background sound levels derived from the November 2022 data for the receptors to the north, west and south of the proposed development have either remained as set out in the April 2019 ESA, or have increased to a small degree.

5.24 It is considered prudent to not increase the representative background sound levels to be used in future BNIS assessments at these locations even though the November 2022 survey has suggested that the baseline acoustic climate may have increased in level since the April 2019 ESA was issued. This will avoid reducing the protection offered in the BNIS to properties affected by site noise relative to those considered in the DCO application.

5.25 At Position N9 it is considered prudent to adopt a lower background sound level to account for the apparent reduction in the acoustic climate for receptors to the south-east of the proposed development.

5.26 It was recommended in the draft December 2022 baseline noise survey report that a reduction of 5dB be adopted for Position N9, for both the daytime and night-time periods, this being a broad average of the identified daytime and night-time changes. Since Position N8 is close to Position N9, it was recommended that a similar reduction be applied to the representative background sound levels at Position N8 as well.

5.27 No measurements were undertaken at Position N8, so the adjustment at that position is based on professional judgement, extrapolating from the outcomes at the nearby Position N9.

5.28 This is considered to be an appropriately precautionary approach as it means that properties represented by Positions N8 and N9 will qualify under the BNIS at a lower level than would have been the case with the background sound level data from the April 2019 ESA, i.e. noise insulation will be offered under the BNIS at a lower level of noise from the site.

5.29 The updated representative background sound levels to be adopted in future bespoke noise insulation assessments for the operational phase of the site should be as set out in Table 5.3.

Table 5.3: Representative background sound levels for use in operational phase bespoke noise insulation assessments, free-field dB

Position	Period	Representative Background Sound Levels, L_{A90}
N1	Day	44
	Night	36
N2	Day	42
	Night	39
N4	Day	47
	Night	44
N5	Day	41
	Night	39
N6	Day	41
	Night	37
N7	Day	41
	Night	33
N8	Day	41
	Night	39
N9	Day	41
	Night	40
N10	Day	34
	Night	33
N11	Day	42

Position	Period	Representative Background Sound Levels, L_{A90}
	Night	42
N12	Day	39
	Night	38

5.30 These adjusted representative background sound levels should be taken forward into the bespoke noise insulation assessments for the operational phase of the site, as required by Schedule 6 of the DCOb.

5.31 Without the commitment in the DCOb to remeasure the baseline acoustic climate as part of the BNIS, this re-measurement is unlikely to have otherwise been undertaken as part of the proposed highways and bridges amendments.

5.32 However, since the re-measurement was undertaken prior to writing this report to avoid undue influence from any construction work, it is considered appropriate to include consideration of that baseline update in this report.

6 UPDATED MODELLING

6.1 The potential effects of the alterations brought about by the proposed highways and bridges amendments have been determined, based on the same operational parameters as were assessed in the April 2019 ESA, i.e. the same types and numbers for all activities have been assumed.

6.2 The locations of the activities have remained as previously assumed for the April 2019 ESA, with the following exceptions:

- the absolute height of any vehicles assumed to be travelling on the internal site roads have been adjusted to follow the new heights of the roads, so that they remain 0.5 metres above those roads;
- the absolute finished height of mounding has been amended to match the updated proposals; and
- an idling locomotive has been modelled at the southern extent of the new neck shunt, further south than was assumed in the 2018 EIA. As advised by the future operator, it is understood that the neck shunt will be used when reversing a locomotive, which will occur four to five times per day, and will take up to approximately 5 minutes for a locomotive to complete this manoeuvre. Therefore, the updated calculations for the proposed highways and bridges amendments have been based on one locomotive idling for a full 5 minutes in any given hour.

6.3 The method for determining appropriate acoustic feature corrections remains as described in the July 2018 ES, as summarised in Section 3 of this report.

6.4 The calculated specific sound levels for the operational site, as altered by the proposed highways and bridges amendments, are shown in Table 6.1, together with the specific sound levels calculated for the April 2019 ESA.

Table 6.1: Comparison of specific sound levels, free-field $L_{Aeq,T}$ dB

Receptor	Period	April 2019 ESA	H&B Amendments	Difference
1 Kings Road	Day	36	36	0
	Night	35	35	0
181 Station Drive	Day	40	39	-1
	Night	40	39	-1
182 Station Drive	Day	42	40	-2
	Night	41	42	+1
4 Croft Lane	Day	43	44	+1
	Night	42	43	+1
Allspan	Day	35	35	0
	Night	34	34	0
Avenue Cottages	Day	45	38	-7
	Night	44	37	-7
Avery Bungalow	Day	34	35	+1
	Night	33	34	+1
Chase View	Day	44	45	+1
	Night	43	44	+1

Receptor	Period	April 2019 ESA	H&B Amendments	Difference
Cobweb Cottage	Day	36	37	+1
	Night	35	36	+1
Craigmore	Day	42	41	-1
	Night	42	45	+3
Denson House	Day	41	42	+1
	Night	40	41	+1
Elmhurst	Day	35	36	+1
	Night	34	35	+1
Evergreen	Day	44	44	0
	Night	43	43	0
Gailey House	Day	42	43	+1
	Night	41	42	+1
Hamerton House	Day	41	41	0
	Night	40	40	0
High Clere	Day	38	39	+1
	Night	37	38	+1
Hollybyre	Day	44	44	0
	Night	43	43	0
Homestead	Day	44	45	+1
	Night	43	44	+1
Longacre	Day	40	39	-1
	Night	38	38	0
Longfield	Day	42	42	0
	Night	41	41	0
Marsh Farm	Day	41	41	0
	Night	40	40	0
Meadow View	Day	39	40	+1
	Night	38	39	+1
Oak View	Day	43	43	0
	Night	42	42	0
Roundabout Cottages	Day	43	43	0
	Night	42	42	0
School House	Day	43	43	0
	Night	42	43	+1
Silverthorne	Day	43	41	-2
	Night	42	44	+2
St Clare	Day	43	42	-1
	Night	43	45	+2
Straight Mile Farm	Day	39	40	+1
	Night	39	39	0
Sylvestris	Day	36	36	0

Receptor	Period	April 2019 ESA	H&B Amendments	Difference
	Night	34	35	+1
The Cottage	Day	40	40	0
	Night	39	39	0
The Villa	Day	41	40	-1
	Night	40	39	-1
Wharf Cottage	Day	40	41	+1
	Night	39	40	+1
Wharf House	Day	42	42	0
	Night	41	41	0
Wood View	Day	44	44	0
	Night	42	43	+1
Woodland Farm	Day	37	39	+2
	Night	37	38	+1
Calf Heath Reservoir West	Day	40	40	0
	Night	39	38	-1
Calf Heath Reservoir East	Day	43	43	0
	Night	42	42	0
Canal Moorings North	Day	41	41	0
	Night	40	40	0
Canal Moorings South	Day	44	45	+1
	Night	44	45	+1
Canal Towpath Gravelly Way	Day	47	48	+1
	Night	47	47	0
221i Crateford Lane	Day	41	42	+1
	Night	40	41	+1
219 Crateford Lane	Day	41	41	0
	Night	40	40	0
Comox	Day	39	40	+1
	Night	38	38	0
The Poultry Farm House	Day	39	39	0
	Night	38	38	0
The Poplars	Day	38	38	0
	Night	37	37	0

6.5 It can be seen from Table 6.1 that the changes in operational sound levels generated by the amended site are less than +2dB in the majority of cases. There are two categories of exception to this:

- Avenue Cottages, where a reduction of 7dB is predicted, which has been found to be the result of an error in the noise modelling for the April 2019 ESA, that has been corrected in the updated modelling for the proposed highways and bridges amendments;
- The receptor Craigmore, where an increase of 3dB is predicted at night. An increase of 3dB at a single receptor is not, in itself, considered a significant change

in noise level; the significance of that predicted change needs to be considered as part of the full BS4142 assessment before a conclusion can be drawn.

6.6 If specific sound levels set out in Table 6.1 for the proposed highways and bridges amendments were converted to rating levels and assessed against the original background sound level data, as set out in the April 2019 ESA, there would be fewer likely significant effects relative to those identified as part of the 2018 DCO application, since the previously-identified likely significant effect at Avenue Cottages will be removed when the error in the noise modelling for the April 2019 ESA is corrected. This correction to the noise modelling will also lead to a small reduction in expected noise from the site at The Villa, which is sufficient to bring that receptor into a not significant category of effect as well.

6.7 This is shown in Table 6.2, which sets out a BS4142 assessment for the rating levels due to the proposed highways and bridges amendments when assessed against the original background sound levels as were set out in the April 2019 ESA. The likely significant effects are shaded in blue, and it can be seen that 30 no. likely significant effects are now identified compared with the 32 no. identified in the DCO application (as was shown in Table 4.2 of this report).

Table 6.2: BS4142 assessment for proposed highways and bridges amendments, using April 2019 ESA baseline, free-field dB

Receptor	Period	Background Sound Level, L_{A90}	Rating Level, $L_{Ar,T}$	Difference
1 Kings Road	Day	46	39	-7
	Night	45	41	-4
181 Station Drive	Day	41	45	+4
	Night	37	48	+11
182 Station Drive	Day	41	46	+5
	Night	37	51	+14
4 Croft Lane	Day	41	53	+12
	Night	39	52	+13
Allspan	Day	46	41	-5
	Night	44	40	-4
Avenue Cottages	Day	47	47	0
	Night	44	48	+4
Avery Bungalow	Day	46	41	-5
	Night	44	40	-4
Chase View	Day	41	54	+13
	Night	33	53	+20
Cobweb Cottage	Day	46	43	-3
	Night	44	42	-2
Craigmore	Day	41	47	+6
	Night	37	54	+17
Denson House	Day	41	51	+10
	Night	33	52	+19
Elmhurst	Day	46	42	-4

Receptor	Period	Background Sound Level, L_{A90}	Rating Level, $L_{Ar,T}$	Difference
	Night	44	41	-3
Evergreen	Day	44	50	+6
	Night	36	49	+13
Gailey House	Day	41	54	+13
	Night	39	55	+16
Hamerton House	Day	41	50	+9
	Night	39	49	+10
High Clere	Day	46	45	-1
	Night	45	44	-1
Hollybyre	Day	44	50	+6
	Night	36	49	+13
Homestead	Day	44	51	+7
	Night	36	53	+17
Longacre	Day	47	45	-2
	Night	44	44	0
Longfield	Day	41	51	+10
	Night	39	50	+11
Marsh Farm	Day	44	44	0
	Night	36	46	+10
Meadow View	Day	46	46	0
	Night	45	45	0
Oak View	Day	41	52	+11
	Night	39	51	+12
Roundabout Cottages	Day	41	49	+8
	Night	33	51	+18
School House	Day	41	52	+11
	Night	33	52	+19
Silverthorne	Day	41	47	+6
	Night	37	53	+16
St Clare	Day	41	48	+7
	Night	37	54	+17
Straight Mile Farm	Day	46	46	0
	Night	45	48	+3
Sylvestris	Day	46	39	-7
	Night	45	41	-4
The Cottage	Day	41	49	+8
	Night	39	48	+9
The Villa	Day	47	46	-1
	Night	44	48	4
Wharf Cottage	Day	41	50	+9

Receptor	Period	Background Sound Level, L_{A90}	Rating Level, $L_{Ar,T}$	Difference
	Night	39	49	+10
Wharf House	Day	41	51	+10
	Night	39	50	+11
Wood View	Day	42	50	+8
	Night	39	52	+13
Woodland Farm	Day	46	48	+2
	Night	44	47	+3
Calf Heath Reservoir West	Day	47	49	+2
	Night	44	49	+5
Calf Heath Reservoir East	Day	47	54	+7
	Night	44	55	+11
Canal Moorings North	Day	41	50	+9
	Night	39	51	+12
Canal Moorings South	Day	41	54	+13
	Night	39	54	+15
Canal Towpath Gravelly Way	Day	39	57	+18
	Night	38	58	+20
221i Crateford Lane	Day	34	53	+19
	Night	33	54	+21
219 Crateford Lane	Day	34	50	+16
	Night	33	51	+18
Comox	Day	42	46	+4
	Night	42	44	+2
The Poultry Farm House	Day	42	48	+6
	Night	42	47	+5
The Poplars	Day	42	44	+2
	Night	42	43	+1

6.8 It can be concluded from Table 6.2 that the physical changes proposed as part of the highways and bridges amendments will not lead to any new likely significant effects. The relatively small magnitudes of change in the predicted noise levels shown in Table 6.1 suggest that any previously-identified likely significant effects will not be materially different as none of them will be 5dB worse, which is the threshold adopted in this report as signifying a materially different likely significant effect where there is no change in effect category.

6.9 If there is a change in effect category, a materially different likely significant effect is considered to occur where the predicted level changes by ±3dB, instead of the ±5dB where there is no change in effect category. Only one receptor is predicted to have a change in level of +3dB, the receptor Craigmore at night, and a change in effect category is not predicted; it was assessed as a major adverse effect in the April 2019 ESA and remains so with the proposed highways and bridges amendments. The predicted change of +3dB at this receptor is therefore not regarded as a materially different likely significant effect.

6.10 When the updated November 2022 baseline position is used to assess the effects of the proposed highways and bridges amendments (as opposed to the 2019 baseline data used in the 2019 ESA), new likely significant effects are introduced at five receptor locations giving an overall increase of three likely significant effects once the likely significant effects at Avenue Cottages and The Villa are removed when the noise modelling is corrected. This is shown in Table 6.3.

Table 6.3: BS4142 assessment for proposed highways and bridges amendments, using November 2022 baseline

Receptor	Period	Background Sound Level, L_{A90}	Rating Level, $L_{Ar,T}$	Difference
1 Kings Road	Day	41	42	+1
	Night	40	41	+1
181 Station Drive	Day	41	45	+4
	Night	37	48	+11
182 Station Drive	Day	41	46	+5
	Night	37	51	+14
4 Croft Lane	Day	41	53	+12
	Night	39	52	+13
Allspan	Day	41	41	0
	Night	39	40	+1
Avenue Cottages	Day	47	47	0
	Night	44	48	+4
Avery Bungalow	Day	41	41	0
	Night	39	40	+1
Chase View	Day	41	54	+13
	Night	33	53	+20
Cobweb Cottage	Day	41	46	+5
	Night	39	45	+6
Craigmore	Day	41	47	+6
	Night	37	54	+17
Denson House	Day	41	51	+10
	Night	33	52	+19
Elmhurst	Day	41	42	+1
	Night	39	41	+2
Evergreen	Day	44	50	+6
	Night	36	49	+13
Gailey House	Day	41	54	+13
	Night	39	55	+16
Hamerton House	Day	41	50	+9
	Night	39	49	+10
High Clere	Day	41	45	+4
	Night	40	47	+7
Hollybyre	Day	44	50	+6

Receptor	Period	Background Sound Level, L_{A90}	Rating Level, $L_{Ar,T}$	Difference
	Night	36	49	+13
Homestead	Day	44	51	+7
	Night	36	53	+17
Longacre	Day	47	45	-2
	Night	44	44	0
Longfield	Day	41	51	+10
	Night	39	50	+11
Marsh Farm	Day	44	44	0
	Night	36	46	+10
Meadow View	Day	41	46	+5
	Night	40	48	+8
Oak View	Day	41	52	+11
	Night	39	51	+12
Roundabout Cottages	Day	41	49	+8
	Night	33	51	+18
School House	Day	41	52	+11
	Night	33	52	+19
Silverthorne	Day	41	47	+6
	Night	37	53	+16
St Clare	Day	41	48	+7
	Night	37	54	+17
Straight Mile Farm	Day	41	49	+8
	Night	40	50	+10
Sylvestris	Day	41	42	+1
	Night	40	41	+1
The Cottage	Day	41	49	+8
	Night	39	48	+9
The Villa	Day	47	46	-1
	Night	44	48	+4
Wharf Cottage	Day	41	50	+9
	Night	39	49	+10
Wharf House	Day	41	51	+10
	Night	39	50	+11
Wood View	Day	42	50	+8
	Night	39	52	+13
Woodland Farm	Day	41	50	+9
	Night	39	49	+10
Calf Heath Reservoir West	Day	47	49	+2
	Night	44	49	+5
Calf Heath Reservoir East	Day	47	54	+7
	Night	44	55	+11

Receptor	Period	Background Sound Level, L_{A90}	Rating Level, $L_{Ar,T}$	Difference
Canal Moorings North	Day	41	50	+9
	Night	39	51	+12
Canal Moorings South	Day	41	54	+13
	Night	39	54	+15
Canal Towpath Gravelly Way	Day	39	57	+18
	Night	38	58	+20
221i Crateford Lane	Day	34	53	+19
	Night	33	54	+21
219 Crateford Lane	Day	34	50	+16
	Night	33	51	+18
Comox	Day	42	46	+4
	Night	42	44	+2
The Poultry Farm House	Day	42	48	+6
	Night	42	47	+5
The Poplars	Day	42	44	+2
	Night	42	43	+1

6.11 It can be seen from Table 6.3 that when the rating levels predicted for the proposed highways and bridges amendments are assessed against the November 2022 background sound levels, likely significant effects are predicted at 35 no. receptors, as shown by the shaded blue cells.

6.12 As noted previously, the 2018 DCO application identified likely significant effects at 32 no. receptors (see Table 4.2 of this report), so the net increase of likely significant effects at three receptors results from the reduction in baseline levels from those in the 2019 ES to those measured in 2022 giving rise to likely significant effects at five receptors that previously had not been identified, and the removal of likely significant effects at two receptors when an error in the 2018 DCO application modelling is corrected.

6.13 The fact that the creation of new likely significant effects results from the change in baseline conditions and not the proposed highways and bridges amendments can be seen if the sound levels predicted in the original 2018 DCO application are assessed against the November 2022 background sound levels, as is shown in Table 6.4.

6.14 It should be noted that the rating corrections applied to the 2018 predicted specific sound levels to account for distinctive acoustic characteristics have been re-calculated to allow for the lower background and ambient sound levels measured in November 2022. This results in rating levels in Table 6.4 that are marginally higher at some receptors than the values in Table 4.2 that were assessed in the 2018 DCO application.

Table 6.4: BS4142 assessment for original DCO application scheme, using November 2022 baseline

Receptor	Period	Background Sound Level, L_{A90}	Rating Level, $L_{Ar,T}$	Difference
1 Kings Road	Day	41	42	+1
	Night	40	41	+1
181 Station Drive	Day	41	46	+5
	Night	37	49	+12
182 Station Drive	Day	41	48	+7
	Night	37	50	+13
4 Croft Lane	Day	41	52	+11
	Night	39	51	+12
Allspan	Day	41	41	0
	Night	39	40	+1
Avenue Cottages	Day	47	54	+7
	Night	44	55	+11
Avery Bungalow	Day	41	40	-1
	Night	39	39	0
Chase View	Day	41	53	+12
	Night	33	52	+19
Cobweb Cottage	Day	41	45	+4
	Night	39	44	+5
Craigmore	Day	41	48	+7
	Night	37	51	+14
Denson House	Day	41	50	+9
	Night	33	51	+18
Elmhurst	Day	41	41	0
	Night	39	40	+1
Evergreen	Day	44	50	+6
	Night	36	49	+13
Gailey House	Day	41	53	+12
	Night	39	54	+15
Hamerton House	Day	41	50	+9
	Night	39	49	+10
High Clere	Day	41	44	+3
	Night	40	46	+6
Hollybyre	Day	44	50	+6
	Night	36	49	+13
Homestead	Day	44	50	+6
	Night	36	52	+16
Longacre	Day	47	46	-1
	Night	44	44	0
Longfield	Day	41	51	+10

Receptor	Period	Background Sound Level, L_{A90}	Rating Level, $L_{Ar,T}$	Difference
	Night	39	50	+11
Marsh Farm	Day	44	44	0
	Night	36	46	+10
Meadow View	Day	41	45	+4
	Night	40	47	+7
Oak View	Day	41	52	+11
	Night	39	51	+12
Roundabout Cottages	Day	41	49	+8
	Night	33	51	+18
School House	Day	41	52	+11
	Night	33	51	+18
Silverthorne	Day	41	49	+8
	Night	37	51	+14
St Clare	Day	41	49	+8
	Night	37	52	+15
Straight Mile Farm	Day	41	48	+7
	Night	40	50	+10
Sylvestris	Day	41	42	+1
	Night	40	40	0
The Cottage	Day	41	49	+8
	Night	39	48	+9
The Villa	Day	47	47	0
	Night	44	49	+5
Wharf Cottage	Day	41	49	+8
	Night	39	48	+9
Wharf House	Day	41	51	+10
	Night	39	50	+11
Wood View	Day	42	50	+8
	Night	39	51	+12
Woodland Farm	Day	41	48	+7
	Night	39	48	+9
Calf Heath Reservoir West	Day	47	49	+2
	Night	44	50	+6
Calf Heath Reservoir East	Day	47	54	+7
	Night	44	55	+11
Canal Moorings North	Day	41	50	+9
	Night	39	51	+12
Canal Moorings South	Day	41	53	+12
	Night	39	53	+14
Canal Towpath Gravelly Way	Day	39	56	+17
	Night	38	58	+20

Receptor	Period	Background Sound Level, L_{A90}	Rating Level, $L_{Ar,T}$	Difference
221i Crateford Lane	Day	34	52	+18
	Night	33	53	+20
219 Crateford Lane	Day	34	50	+16
	Night	33	51	+18
Comox	Day	42	45	+3
	Night	42	44	+2
The Poultry Farm House	Day	42	48	+6
	Night	42	47	+5
The Poplars	Day	42	44	+2
	Night	42	43	+1

6.15 Table 6.4 shows that the scheme as assessed in the 2018 DCO application would have given rise to likely significant effects at 37 no. receptors had the background sound levels at the time been the same as were measured in November 2022. This represents likely significant effects at an additional five receptors, relative to the likely significant effects identified at 32 no. receptors in the 2018 DCO application. These are the same five receptors identified by using the November 2022 baseline date for the assessment of the noise effects of the proposed highways and bridges amendments and that is clearly a result of the change in the baseline conditions.

6.16 The five additional likely significant effects would occur regardless of whether the proposed highways and bridges amendments are permitted or not as they are related purely to a change in baseline conditions.

Summary

6.17 The net effect of the proposed highways and bridges amendments themselves is that there are no new likely significant effects, and no existing likely significant effects are predicted to be materially different. When an error in the noise modelling that informed the April 2019 ESA is corrected, the number of likely significant effects reduces by two, to 30 no. from 32 no.

6.18 When the updated November 2022 baseline information is taken into account, the number of receptors with likely significant effects is predicted to increase from 32 no. to 35 no., with likely significant effects predicted to occur at five receptors not previously expected to have likely significant effects, and likely significant effects at two receptors that become not significant when an error in the noise modelling that informed the April 2019 ESA is corrected.

6.19 It is noted that had the scheme set out in the 2018 DCO application been assessed against baseline sound levels the same as those measured in November 2022, the outcomes would have been equivalent to those now predicted for the proposed highways and bridges amendments with the updated baseline data.

6.20 In reality, given that the baseline acoustic climate has changed, the outcomes set out in Table 6.4 represent the likely outcomes for the consented scheme, i.e. the additional five

likely significant will now occur, even if the proposed highways and bridges amendments are not incorporated.

6.21 The number of receptors subject to likely significant effects is summarised in Table 6.5 for the four scenarios considered in this report, which are:

- original scheme as set out in the 2018 DCO application using the April 2019 ESA baseline data, this was the scenario assessed in the April 2019 ESA (as shown in Table 4.2 of this report);
- proposed highways and bridges amendments, assessed against the original baseline data as was set out in the April 2019 ESA. This shows the effect of the proposed highways and bridges amendments on their own, without the change in baseline conditions measured in November 2022 (as shown in Table 6.2 of this report);
- proposed highways and bridges amendments, assessed against the November 2022 baseline data. This shows the net effect of both the proposed highways and bridges amendments and the updated baseline information (as shown in Table 6.3 of this report);
- original scheme as set out in the 2018 DCO application assessed against the November 2022 baseline data. This shows the outcome that will occur with the original 2018 DCO application scheme, now that the baseline conditions have altered (as shown in Table 6.4 of this report).

6.22 The number of receptors subject to likely significant effects presented in Table 6.5 excludes the two receptors that were previously identified as a result of a calculation error.

Table 6.5: Summary of likely significant effects

Number of receptors predicted to have likely significant effects			
Original DCO scheme with April 2019 ESA baseline	**Proposed H&B amendments with April 2019 ESA baseline**	**Proposed H&B amendments with November 2022 baseline**	**Original DCO scheme with November 2022 baseline**
30	30	35	35

6.23 It can be seen from Table 6.5 that, in the absence of the calculation errors present in the 2018 DCO application, there is no difference in the number of likely significant effects between the consented scheme and the scheme as amended by the proposed highways and bridges amendments.

6.24 Section 7 of this report sets out the implications of the different outcomes in the context of whether the proposed highways and bridges amendments gives rise to new or materially different likely significant effects.

7 DISCUSSION

7.1 This report presents the outcomes of further noise assessments, updated to take account of both the changes proposed as part of the highways and bridges amendments, and a change in the baseline acoustic environment, which has been re-measured further to, and in accordance with, Clause 2 of the BNIS; the re-measurement was undertaken at the request of SSDC, a request they were entitled to make under the BNIS.

7.2 The effects of the proposed highways and bridges amendments are not predicted to be materially different from those considered in the 2018 DCO application when assessed on a like-for-like basis with the same baseline position; no new likely significant effects have been identified, and the previously-identified likely significant effects, are not materially different. The changes in noise level likely to be brought about by the proposed highways and bridges amendments are less than ±2dB at all receptor locations relative the noise levels predicted and assessed as part of the 2018 DCO application, except at one receptor where a change of +3dB has been identified.

7.3 None of these changes lead to new likely significant effects, nor to materially different likely significant effects, and on this basis, it is considered that the proposed highways and bridges amendments are a non-material change.

7.4 As noted in paragraph 7.1 of this report, SSDC requested that the background sound levels in the area be re-measured, a request they were entitled to make under Clause 2 of the BNIS. This baseline noise re-survey was not required as part of the proposed highways and bridges amendments submission, however, to avoid the re-survey being adversely affected by construction activities that are due to start in June 2023, the re-survey was undertaken in November 2022 and the findings are therefore available to inform this assessment.

7.5 The re-survey found that background sound levels have decreased by an average of 5dB at locations to the south-east of the WMI site.

7.6 When assessed against the lower baseline levels measured in November 2022, a net increase of three likely significant effects is found for the proposed highways and bridges amendments, relative to the consented scheme; likely significant effects are predicted at five locations not previously expected to have likely significant effects, and two previously-identified likely significant effects fall away when an error in the noise modelling used in the 2018 DCO application is corrected.

7.7 Irrespective of whether the proposed highways and bridges amendments are ultimately included in the consented scheme, the change in baseline levels will result in additional likely significant effects at five receptors.

7.8 Since it is the change in baseline levels that give rise to the additional five likely significant effects, rather than any changes to the scheme itself, and the change in baseline levels has occurred independently of the scheme, the additional five likely significant effects will occur for the consented scheme too.

7.9 Outside of the current application for the proposed highways and bridges amendments and the implementation of the BNIS, there would be no need to quantify these updated outcomes. Even when assessing noise from the site for the BNIS, eligibility for insulation does not align with the thresholds signifying a likely significant effect, so arguably the

identification of these additional five likely significant effects would not happen without the proposed highways and bridges amendments.

7.10 It is clear from Table 6.5 that the difference in the number of receptors expected to have likely significant effects is entirely dependent on the change in the baseline position from that set out in the April 2019 ESA to that measured in November 2022 and is not affected by the proposed highways and bridges amendments themselves, confirming that the proposed highways and bridges amendments are a non-material change.

7.11 That the consented scheme would give rise to likely significant noise effects was clear from the submitted noise assessments that accompanied the 2018 DCO application. This point was acknowledged by the Examining Authority, who noted at paragraph 6.4.36 of their report[18]:

> *"Table 13.428 sets out the Applicant's summary of residual effects taking account of the proposed mitigation including the BNIS. The likely significant effects are:*
>
> - *Moderate adverse effects from operational noise at a number of receptors around the site but the BNIS should provide internal noise levels that meet the guidelines for residential properties;"*

7.12 The benefit of the BNIS was reiterated by the Examining Authority at paragraph 6.4.55:

> *"Moderate adverse effects of vibration from construction works may be experienced by some residential receptors but these would be temporary and short-term. The BNIS, which would be operated in both the construction and operational phases of the development, would result in a scheme which meets the policy requirements set out in paragraphs 5.194-196 of the NPSNN. In particular:*
>
> - *Significant adverse effects on health and quality of life would be avoided;*
> - *A range of measures are proposed to mitigate the adverse effects of noise;*
> - *The BNIS would ensure a satisfactory internal environment for all residential properties in closest proximity to the site."*

7.13 The Examining Authority confirmed that the proposed development complied with the NPS for National Networks at paragraph 6.4.56:

> *"The Proposed Development would not achieve an improvement in health and quality of life through the effective management of noise. However, paragraph 5.195 of the NPSNN states that this should be achieved where possible and does not set this as a specific test of acceptability. Accordingly, I consider that the requirements of the NPSNN are met insofar as noise and vibration effects are concerned."*

7.14 In drawing overall conclusions, the Examining Authority placed the likely significant noise effects in context at paragraph 9.2.22:

> *"In addition, I have found that the proposal would result in;*

[18] *West Midlands Interchange Examining Authority's Report of Findings and Conclusions and Recommendation to the Secretary of State for Transport*, Planning Inspectorate, 27th November 2019

- *Limited harm in terms noise and vibration effects;"*

7.15 It can therefore be seen that the quantum of likely significant effects identified in the 2018 DCO application was considered to represent a limited harm in the view of the Examining Authority.

7.16 The proposed highways and bridges amendments does not change the number of likely significant effects on their own; the change in the baseline conditions gives rise to the additional likely significant effects, but these will occur anyway with the consented scheme because the change in the baseline acoustic climate since it was described in the April 2019 ESA has occurred independently of the development.

7.17 It is noted that of the five new receptors where new likely significant effects are predicted, four would be eligible under the BNIS when assessing operational noise. Of these four, two receptors (High Clere and Meadow View) would not have been eligible under the operational BNIS assessment without the updated baseline conditions, and the other two (Straight Mile Farm and Woodland Farm) were previously eligible under the operational BNIS assessment. All four have already qualified for insulation under the already-completed construction BNIS assessment.

7.18 The remaining receptor, Cobweb Cottage, would not be eligible for insulation under the BNIS, as it is predicted to fall between a likely significant effect, which is deemed to occur when the rating level is 5dB above the background sound level, and the threshold for eligibility for insulation under the BNIS that occurs when the rating level is 8dB above the background sound level. Cobweb Cottage is not predicted to meet the absolute BNIS tests and it did not qualify under the construction BNIS assessment.

7.19 The outcome at Cobweb Cottage is the same as for The Poultry Farm House in the April 2019 ESA, which did not qualify under the BNIS methodology but was identified as having a likely significant effect; this outcome did not lead to refusal of the DCO. Both receptor locations, Poultry Farm House and Cobweb Cottage, will fall into this category once the proposed highways and bridges amendments and the reduced baseline sound levels are taken into account.

7.20 In summary, the key outcomes are:

- the proposed amendments themselves do not give rise to any new or materially different likely significant effects when judged against the scheme assessed in the 2018 DCO application;
- the change in the baseline climate on its own gives rise to new likely significant effects at five receptors, with two erroneously identified likely significant effects falling away, to produce a net increase of three likely significant effects relative to the consented scheme.
- The additional five likely significant effects will occur with or without the proposed highways and bridges amendments, since it is the change in baseline levels that lead to the different effects, not the proposed highways and bridges amendments.
- These additional five likely significant effects will occur even if the consented scheme is not amended.

7.21 It is concluded that the consented scheme is not materially changed by the proposed highways and bridges amendments, in terms of operational noise effects.

8 CONCLUSION

8.1 Four Ashes Limited ('FAL') has the benefit of The West Midlands Rail Freight interchange Order 2020 (as amended by The West Midlands Rail Freight Interchange (Correction) Order 2020) ('the Order').

8.2 The Order (as amended) granted consent for a 'strategic rail freight interchange' ('SRFI') on land at Four Ashes within South Staffordshire District, close to Junction 12 of the M6 motorway. FAL has adopted the name 'West Midlands Interchange' ('WMI') for the project.

8.3 FAL wishes to make a number of amendments to the consented scheme, termed 'the proposed highways and bridges amendments'. and this report considers the potential noise implications of those proposed amendments.

8.4 Neither the construction of the SRFI nor the volume of road traffic from the operation of the proposed development are affected by the proposed highways and bridges amendments, so there will be no new or materially different likely significant effects as a result of these aspects of the scheme. The assessment set out in this report focusses on noise from the operation of the SRFI, as that has the potential to change as a result of the proposed highways and bridges amendments.

8.5 Calculations that update the operational noise assessments submitted for the 2018 DCO application have shown that operations at the site are expected to change by up to ±2dB at the assessed receptors, except at one, where a change of +3dB is expected. When assessed using the same methods and approach as adopted for the 2018 DCO application, it has been found that the proposed highways and bridges amendments will not, in and of themselves, lead to any new or materially different likely significant effects.

8.6 Unrelated to the assessment of the proposed scheme amendments, the baseline acoustic climate has been re-measured, as requested by South Staffordshire District Council, as is their right under Clause 2 of the Bespoke Noise Insulation Scheme for the SRFI, which was set out in Schedule 6 of the Development Consent Obligation.

8.7 The re-survey has found that baseline sound levels have reduced in certain locations relative to the baseline position at the time of the 2018 DCO application. The reduction in the baseline acoustic climate is sufficient to give to rise to likely significant effects at five receptors that were not previously predicted have such effects. These additional five likely significant effects are predicted to occur irrespective of whether the consented scheme is altered by the proposed highways and bridges amendments.

8.8 When considered on a like-for-like basis, i.e. where the baseline acoustic climate is the same and a calculation error made in the 2018 DCO application is corrected, the number of likely significant effects is the same for the consented scheme and the proposed highways and bridges amendments.

8.9 On the basis of the updated assessments set out in this report, it is concluded that the consented scheme is not materially changed by the proposed highways and bridges amendments, and there will be no new or materially different likely significant effects.

8.10 The additional likely significant effects will occur with or without the proposed highways and bridges amendments, as they are caused solely by the changes in the baseline acoustic climate.

Appendices

Appendix A – Introduction to Noise and Glossary of Terminology

Noise is defined as unwanted sound. The human ear is able to respond to sound in the frequency range 18Hz (deep bass) to 18,000Hz (high treble) and over the audible range of 0dB (the threshold of perception) to 140dB (the onset of pain). The ear does not respond equally to different frequencies of the same magnitude, but is more responsive to mid-frequencies than to lower or higher frequencies. To quantify noise in a manner that approximates the response of the human ear, a weighting (filtering) mechanism is used. This reduces the importance of lower and higher frequencies, approximating the response of the human ear.

Furthermore, the perception of noise may be determined by a number of other factors, which may not necessarily be acoustic. Noise can be perceived to be louder or more noticeable if the source of the noise is observed; e.g. roads, trains, factories, building sites etc. In general, the impact of noise depends upon its level, the margin by which it exceeds the background level, its character and its variation over a given period of time. In some cases, the time of day and other acoustic features such as tonality may be important, as may the disposition of the affected individual. Any assessment of noise should give due consideration to all of these factors when assessing the significance of a noise source. Various noise indices have been derived to describe the fluctuation of noise levels that vary over time. Usually, these noise indices relate to specific types of noise, and as such different noise indices are used to describe road traffic noise, background noise, construction noise, etc.

The weighting mechanism that best corresponds to the response of the human ear is the 'A'-weighting scale. This is widely used for environmental noise measurement and the levels are denoted as dB(A) or L_{Aeq}, L_{A10}, etc, according to the parameter being measured.

Noise is measured on the decibel scale, which is logarithmic rather than linear. As a result of this, a 3dB increase in sound level represents a doubling of the sound energy present. Judgement of sound is subjective, but as a general guide a 10dB(A) increase can be taken to represent a doubling of loudness, whilst an increase in the order of 3dB(A) is generally regarded as the minimum difference needed to perceive a change. Table A.1 sets out examples of noise levels typically experienced during everyday activities. Table A.2 sets out an explanation of the terminology used in this report.

Table A.1: Typical sound levels found in the environment

Sound Level	**Location**
0 to 10dB(A)	Threshold of hearing
10 to 20dB(A)	Broadcasting studio
20 to 30dB(A)	Quiet bedroom at night
30 to 40dB(A)	Living room during the day
40 to 50dB(A)	Typical office
50 to 60dB(A)	Inside a car
60 to 70dB(A)	Typical high street
70 to 90dB(A)	Inside a factory or noisy pub
100 to 110dB(A)	Burglar Alarm at 1m
110 to 130dB(A)	Pneumatic drill at 1m away
140dB(A)	Threshold of Pain

Table A.2: Terminology relating to noise and vibration

Sound Pressure	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.
Sound Pressure Level (Sound Level)	The sound level is the sound pressure relative to a standard reference pressure of 20μPa ($20x10^{-6}$ Pascals) on a decibel scale.
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s_1 and s_2 is given by $20 \log_{10} (s_1/s_2)$. The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20μPa.
A-weighting, dB(A)	The unit of sound level, weighted according to the A-scale, which takes into account the increased sensitivity of the human ear at some frequencies.
Noise Level Indices	Noise levels usually fluctuate over time, so it is often necessary to consider an average or statistical noise level. This can be done in several ways, so a number of different noise indices have been defined, according to how the averaging or statistics are carried out.
L_w	The L_w, or sound power level, is a measure of the total noise energy of a source.
$L_{Aeq,T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max,T}$	A noise level index defined as the maximum noise level during the period T. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
$L_{90,T}$ or Background Noise Level	A noise level index. The noise level exceeded for 90% of the time over the period T. L_{90} can be considered to be the "average minimum" noise level and is often used to describe the background noise.
$L_{10,T}$	A noise level index. The noise level exceeded for 10% of the time over the period T. L_{10} can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise.
Free-field	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5 metres
Façade	At a distance of 1 metre in front of a large sound reflecting object such as a building façade.
Fast Time Weighting	An averaging time used in sound level meters. Defined in BS EN 61672.

Appendix B – Site Plans

Figure B.1: Site location plan

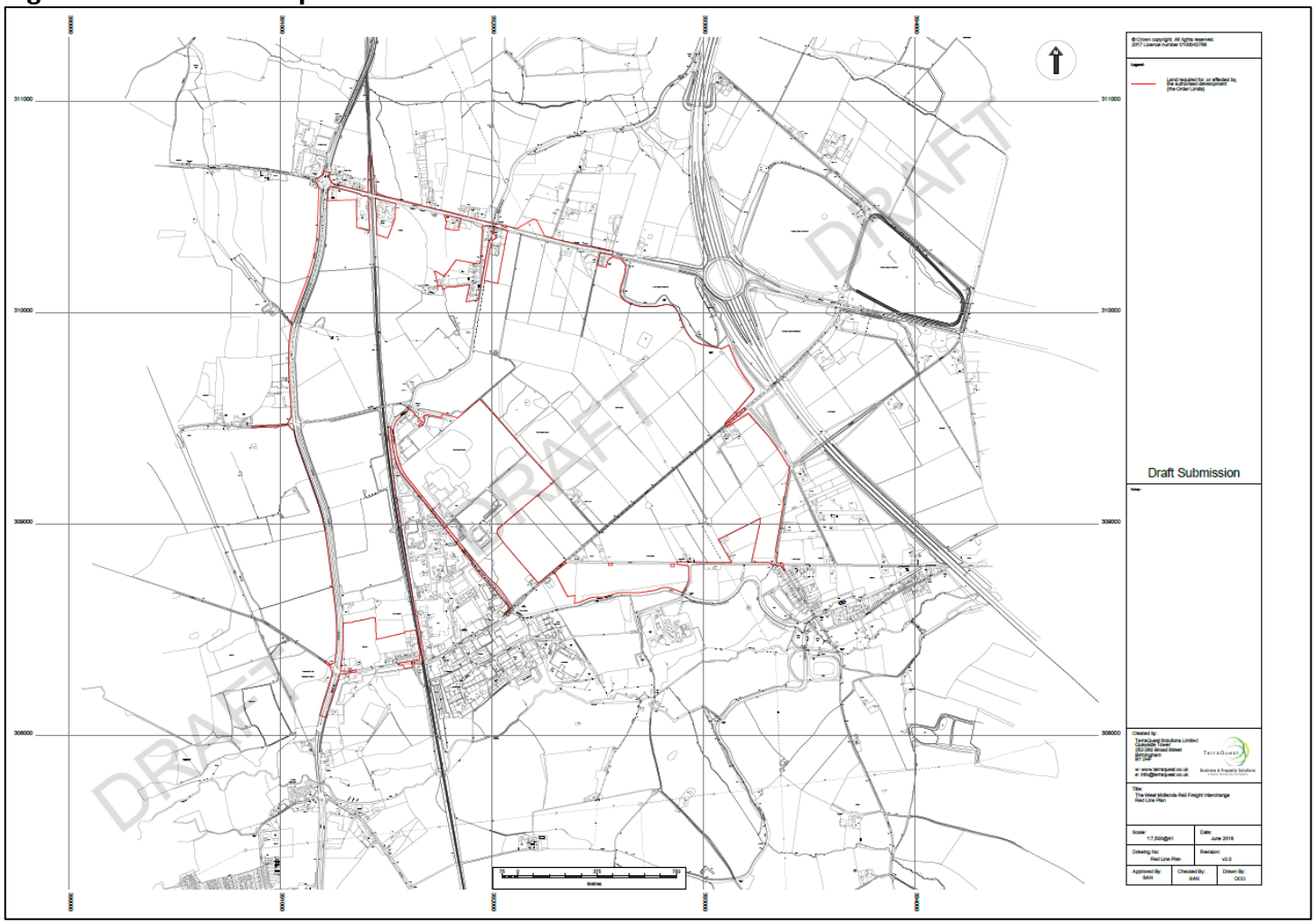


Figure B.2: Monitoring locations from April 2019 ESA

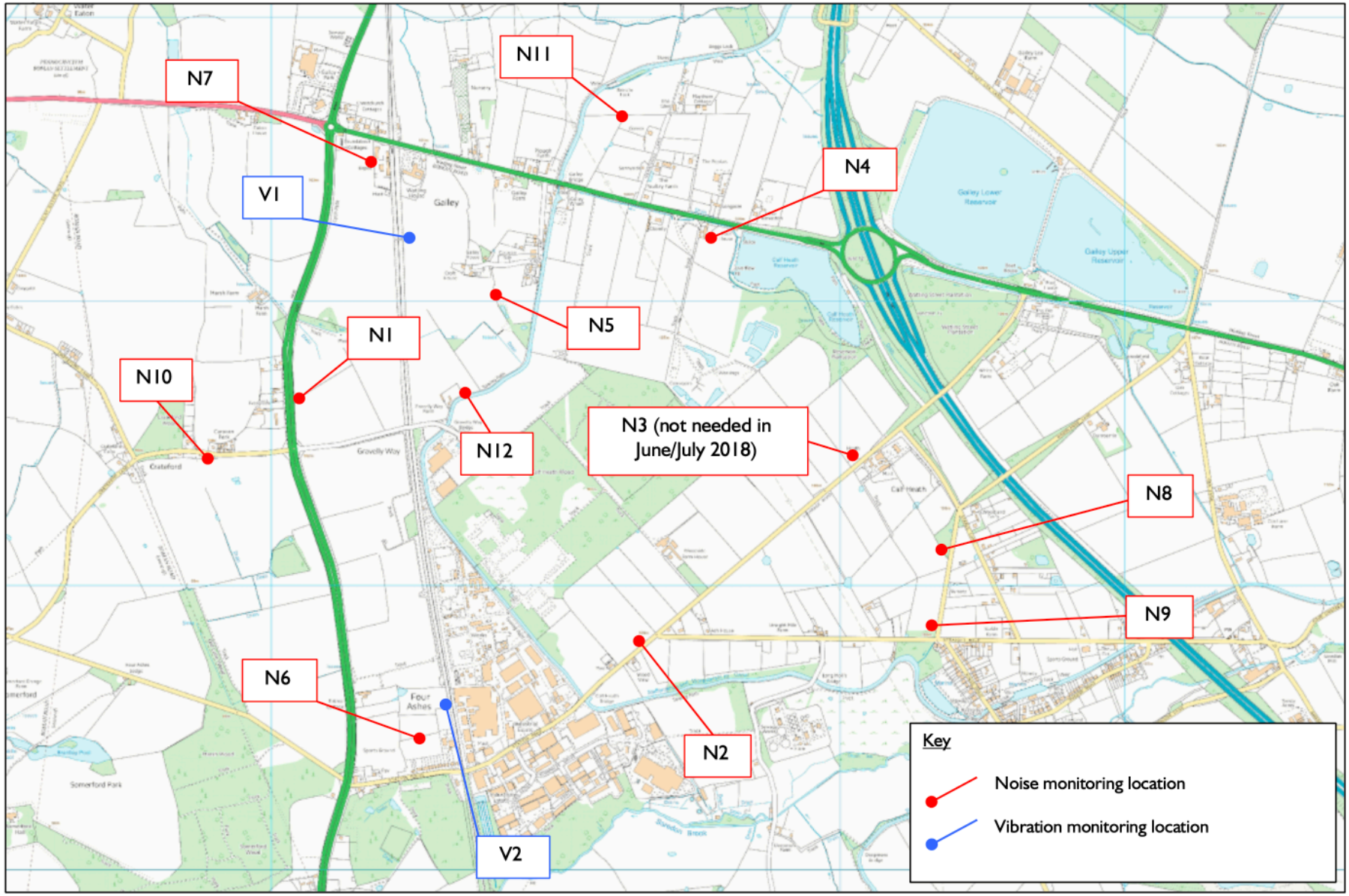


Figure B.3: Assessed receptor locations

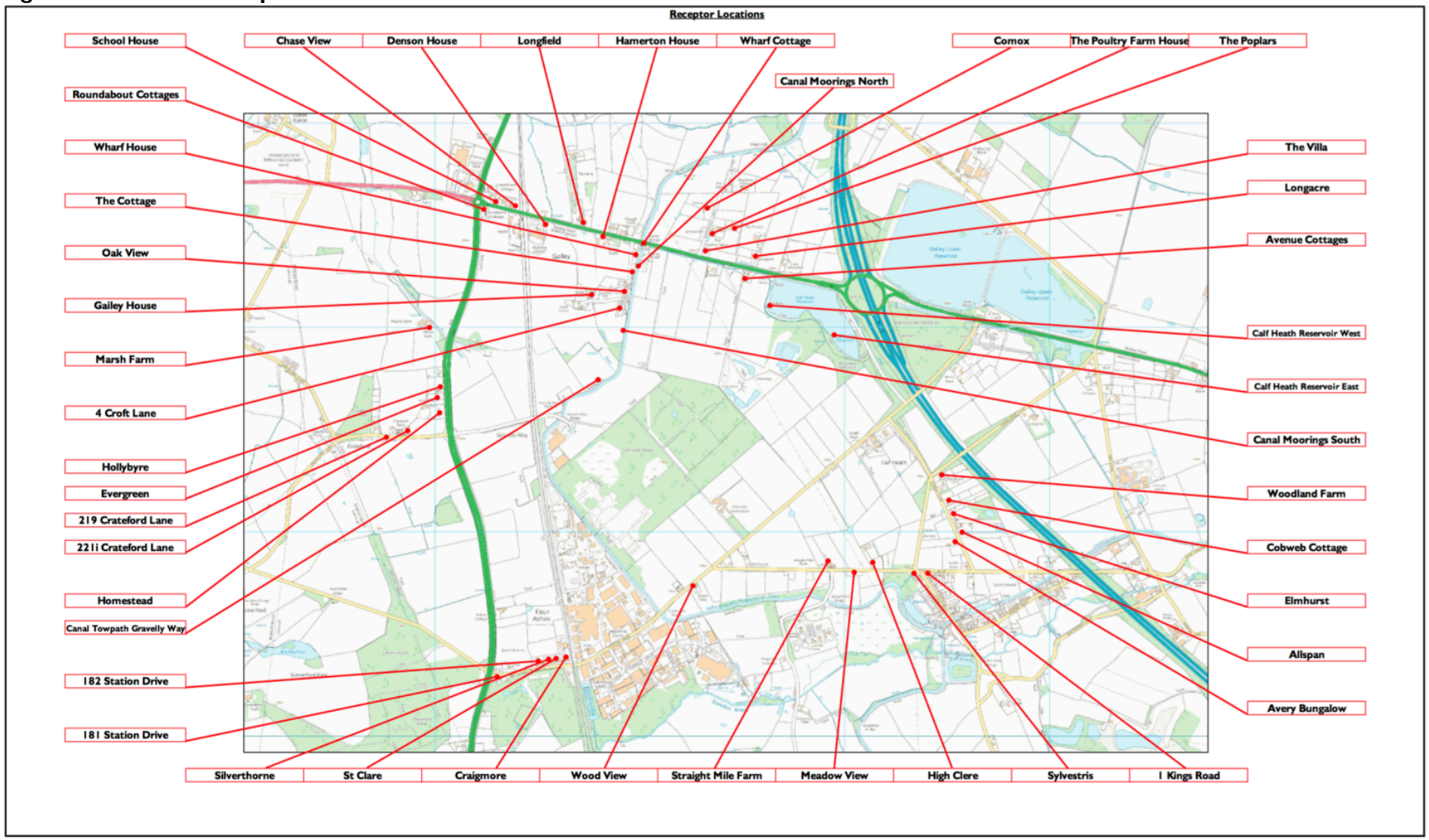
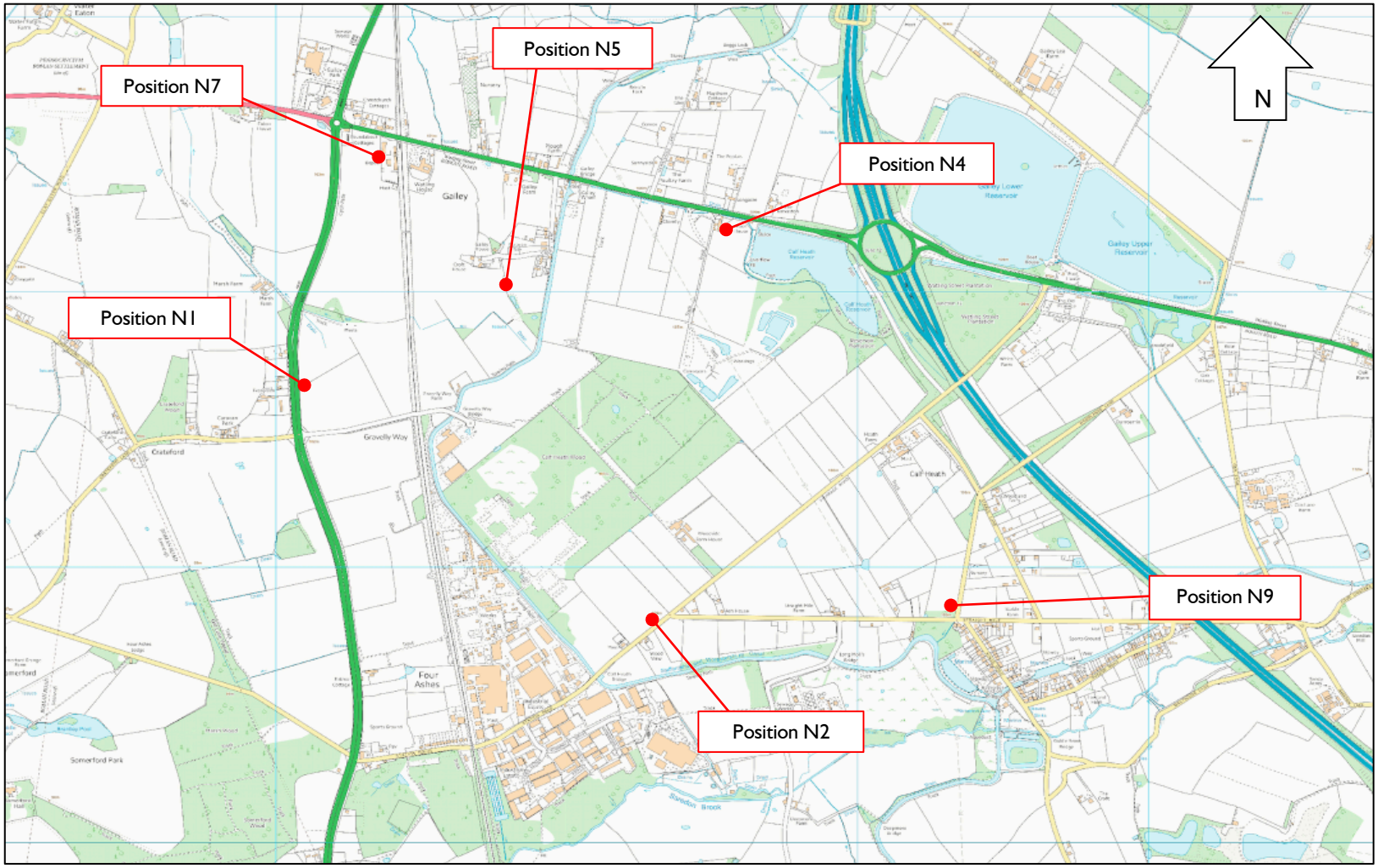


Figure B.4: Overview of agreed monitoring locations for November 2022 survey



Appendix C – Draft December 2022 Baseline Noise Survey Report

A Baseline Sound Level Survey Report for West Midlands Interchange

On behalf of Four Ashes Limited

December 2022

resound acoustics

A Baseline Sound Level Survey Report for West Midlands Interchange

On behalf of Four Ashes Limited

Report Reference: RA00738– Rep 2

Resound Acoustics Limited is a
Member of the Association of Noise Consultants

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Appendix F Full Survey Results

1 INTRODUCTION

1.1 Four Ashes Limited has appointed Resound Acoustics Limited to undertake a baseline noise survey, to discharge their obligations under the Development Consent Obligation dated 20 August 2019 and made between (1) South Staffordshire District Council (2) Staffordshire County Council (3) Piers Alastair Carlos Monckton (4) Alan Stobart Monckton (5) Joanna Mary Monckton and (6) Four Ashes Limited (the *"Development Consent Obligation"*) that was agreed as in support of the grant of the Development Consent Order for the West Midlands Interchange development (*The West Midlands Rail Freight Interchange Order* SI 2020 No. 511).

1.2 Schedule 6 of the Development Consent Obligation contained a *Bespoke Noise Insulation Scheme* ('BNIS'), which set out a process for identifying properties adversely affected by construction or operational noise such that they qualified for a grant in respect of sound insulation to be fitted to the property.

1.3 Clause 2 of Schedule 6 of the Development Consent Obligation requires Four Ashes Limited to undertake updated baseline sound level surveys, unless agreed otherwise by the District Council.

1.4 This report sets out the results of an updated baseline sound level survey.

1.5 Whilst reasonable efforts have been made to produce a report that is easy to understand, it is technical in nature. To assist the reader, an introduction to noise and an explanation of the terminology used in this report is contained in Appendix A.

2 SITE DESCRIPTION

Existing Site Description

2.1 The Site is located approximately 10 kilometres ('km') north of Wolverhampton and lies immediately west of Junction 12 of the M6 motorway, with the West Coast Main Line ('WCML') intersecting. It lies within the administrative boundary of South Staffordshire District Council ('SSDC') and comprises approximately 297 hectares ('ha') of land.

2.2 The Site also borders the A5 and the A449 trunk roads, which in turn link to M6 motorway, M6 Toll Road and the M54 motorway. Penkridge railway station is located approximately 3km north of the Site.

2.3 Also adjacent to the Site boundary is the Four Ashes Energy Recovery Facility ('the ERF'), the Severn Trent Sludge Disposal Centre and the Bericote Site / Gestamp Factory to the south, with the Rodbaston Wind Farm approximately 1km to the north.

2.4 The completed development will broadly be bounded by the A5 trunk road to the north (from Junction 12 to the Gailey Roundabout); Calf Heath reservoir, the M6 motorway, Stable Lane and Woodlands Lane to the east; Station Drive, Straight Mile and Woodlands Lane to the south; and the A449 trunk road (Stafford Road), from the Gailey Roundabout to Station Drive to the west. The south-eastern area of the Site is bisected by Vicarage Road.

2.5 The north-eastern section of the Site contains an area of historic sand and gravel mineral extraction at Calf Heath Quarry ('the Quarry'). The mineral extraction area covers approximately 40ha, with almost the entirety of this area open-cast with silt lagoons and areas of standing water extending across. It is understood that the extraction activities have now largely finished, although there are daytime vehicle movements and de-watering activities.

2.6 The majority of the remainder of the Site is made up of a patchwork of agricultural fields with hedgerows and trees around the outer boundaries of Site. Calf Heath Wood is an area of mixed woodland part of which lies within the Order Limits, towards the middle of the Site.

2.7 There are a number of residential properties within the Order Limits, with some further residential properties in close proximity to the Site boundary, including a grouping of properties located on Croft Lane, and properties off Station Drive, Vicarage Road, the A449 and the A5.

2.8 A site location plan is included as Figure B.1 in Appendix B.

Proposed Development

2.9 The Proposed Development comprises:

- an intermodal freight terminal with direct connections to the West Coast Main Line, capable of accommodating up to ten trains per day and trains of up to 775 metres long, including container storage, heavy goods vehicle ('HGV') parking, rail control building and staff facilities;

- up to 743,200 square metres (gross internal area) of rail-served warehousing and ancillary service buildings;
- new road infrastructure and works to the existing road infrastructure;
- demolition of existing structures and earthworks to create development plots and landscape zones;
- reconfiguring and burying of existing overhead power lines and pylons; and
- strategic landscaping and open space, including alterations to public rights of way and the creation of new ecological enhancement areas and publicly accessible open areas.

Environmental Statement and Addendum

2.10 Resound Acoustics produced the noise and vibration chapter in the July 2018 Environmental Statement (ES), setting out an assessment of the potential noise and vibration effects associated with the Proposed Development. The ES is referred to in this report as '*the July 2018 ES*'.

2.11 The July 2018 ES was supplemented by an ES Addendum, the noise and vibration chapter again produced by Resound Acoustics, which provided updated baseline sound level survey results and updated those elements of the noise assessment that were affected by the baseline sound level survey results. The ES Addendum is referred to in this report as *'the April 2019 ES Addendum'*.

2.12 The representative baseline sound levels that were adopted in the April 2019 ES Addendum are summarised in Table 2.1, which is an amalgam of Tables 13.A.13 and 13.A.14 from the April 2019 ES Addendum. A plan showing the locations of the monitoring locations is included as Figure B.2 in Appendix B (replicated from Figure 13A.1 in the April 2019 ES Addendum).

Table 2.1: Baseline sound levels from April 2019 ES Addendum, free-field dB

Position[1]	Period	Background Sound Levels, L_{A90}		Ambient Sound Levels, $L_{Aeq,T}$	
		Range	Representative Values	Range	Representative Values
N1	Day	36 to 59	44	54 to 66	58
	Night	29 to 53	36	46 to 66	49
N2	Day	37 to 62	42	57 to 77	64
	Night	37 to 53	39	39 to 72	54
N4	Day	41 to 58	47	48 to 61	52
	Night	40 to 57	44	44 to 64	48
N5	Day	35 to 50	41	40 to 60	45
	Night	35 to 51	39	38 to 53	43
N6	Day	38 to 51	41	43 to 61	48
	Night	35 to 49	37	37 to 60	41
N7	Day	37 to 51	41	42 to 60	46
	Night	28 to 51	33	37 to 56	41
N8	Day	41 to 58	46	44 to 69	48
	Night	42 to 57	44	44 to 59	47
N9	Day	38 to 57	46	47 to 62	51
	Night	42 to 57	45	46 to 58	48

Position[1]	Period	Background Sound Levels, L_{A90}		Ambient Sound Levels, $L_{Aeq,T}$	
		Range	Representative Values	Range	Representative Values
N10	Day	30 to 48	34	35 to 58	41
	Night	27 to 48	33	32 to 53	36
N11	Day	38 to 51	42	42 to 57	45
	Night	39 to 52	42	42 to 53	45
N12	Day	34 to 48	39	39 to 61	43
	Night	33 to 50	38	36 to 63	41

Note: Position N3 was used in the July 2018 ES, but changes to the boundary of the Proposed Development meant that Position N3 was no longer require in the April 2019 ES Addendum.

3 GUIDANCE

The Obligation

3.1 As part of the Development Consent Order for the West Midlands Interchange development, Four Ashes Limited committed to provide a scheme for insulating properties that were likely to be significantly affected by noise from the construction of the scheme.

3.2 The commitment appeared as Schedule 6 of the Development Consent Obligation, wherein Four Ashes Limited committed to identify properties that were likely to be exposed to construction or operational noise levels in excess of certain, stated thresholds.

3.3 Clause 2 of Schedule 6 of the Development Consent Obligation requires Four Ashes Limited to update the baseline sound level survey data, prior to the occupation of the first warehouse, stating:

> *"2. Prior to the Occupation of the first Warehouse to be Occupied the Applicant will undertake a re-measurement of Baseline Conditions in accordance with a scheme first agreed with the District Council and provide details of the same to the District Council unless the District Council confirms to the Applicant that no such re-measurement is required and a pre-existing survey of baseline conditions can instead be relied upon for the purposes of applying the provisions of this Schedule."*

3.4 It was considered reasonably likely that the bespoke noise insulation assessments for the operational phase of the Proposed Development would coincide with construction works at the Site, which could adversely affect the measured sound levels. It was therefore considered prudent to undertake the re-measurement prior to the start of any construction or enabling works, so that such activities did not affect the measured sound levels.

Local Planning Authority Consultation

3.5 As required by Clause 2 of Schedule 6 of the Development Consent Obligation, the Environmental Health Department of South Staffordshire District Council (SSDC) was consulted, to agree the proposed approach to the re-measurement of the baseline sound climate.

3.6 It was agreed that measurements would be undertaken at six of the original 11 no. survey locations to determine whether the original baseline data remained representative or not. The six locations were agreed with SSDC and are shown in Figure B.3 in Appendix B.

3.7 A copy of the email correspondence between Resound Acoustics and SSDC setting out the agreed survey locations is contained in Appendix C.

British Standard 7445

3.8 British Standard (BS) 7445 *Description and measurement of environmental noise* has three parts:

- Part 1: *Guide to quantities and procedures* (2003);
- Part 2: *Guide to acquisition of data pertinent to land use* (1991); and

- Part 3: *Guide to application of noise limits* (1991).

3.9 The standard sets out correct practice for the measurement of environmental noise. It states that the sound level meter used should preferably be of Type 1 and should be field-calibrated before and after each series of measurements.

3.10 Measurements should either be made in free-field conditions, at least 3.5 metres from reflecting surfaces other than the ground, or in façade conditions, which is 1 metre from a reflecting surface other than the ground. The preferred height of the microphone is between 1.2 and 1.5 metres above ground level.

British Standard 4142

3.11 BS4142: 2014+A1: 2019 *Methods for rating and assessing industrial and commercial sound* describes a method for rating and assessing sound of an industrial or commercial nature. Of particular importance for this document, BS4142: 2014+A1: 2019 sets out guidance on how to undertake sound level measurements.

3.12 BS4142: 2014+A1: 2019 states that a field calibration check should be made at the beginning and at the end of every measurement session. Where the difference between the initial calibration value, any subsequent calibration check, and the final calibration value exceeds 0.5dB, measurement results should be treated with caution.

3.13 Measurement locations should be chosen that are representative of the sound level at the assessment location. Measurements should be taken at a height of 1.2 to 1.5 metres above the ground, unless there is a specific reason to use an alternative height. Reflections should be minimised by making measurements at least 3.5 metres away from any reflecting surface other than the ground.

3.14 Precautions should be taken to minimise interference from sources such as wind passing over the diaphragm of the microphone (i.e. by using an effective windshield), rain falling on the microphone windshield, electrical and electromagnetic interference, and temperature.

3.15 Weather conditions during the measurements should be recorded, including wind speed and direction, cloud cover, any precipitation and temperature. The standard notes that where appropriate, a logging meteorological station should be used at the measurement location when undertaking long-term unattended measurements.

3.16 The background sound level is the L_{A90} of the residual sound, which is itself the sound remaining at the assessment location when the specific sound source being assessed is suppressed to such a degree that it does not contribute to the ambient sound.

3.17 The standard notes that the background sound level can include industrial and/or commercial sound in some circumstances:

> *"Since the intention is to determine a background sound level in the absence of the specific sound that is under consideration, it is necessary to understand that the background sound level can in some circumstances legitimately include industrial and/or commercial sounds that are present as separate to the specific sound."*

3.18 The standard states that the background sound level should be measured over a period of sufficient length to obtain a representative value. This should not normally be less than 15 minute intervals. The standard states that:

> *"A representative level ought to account for the range of background sound levels and ought not automatically to be assumed to be either the minimum or modal value."*

4 BASELINE SOUND LEVEL MEASUREMENTS

4.1 Sound level measurements were undertaken in November 2022 to determine whether the baseline acoustic climate had materially changed since the April 2019 ES Addendum was issued. The measurements took place over a period of approximately two weeks, from 10:30 hours on Wednesday 2nd November 2022 to 13:00 hours on Thursday 17th November 2022.

4.2 The survey methodology and results are set out in this section of the report.

Survey Methodology

4.3 The sound level measurements were undertaken using remote, unattended sound level meters. The measurements took the form of consecutive 15 minute measurements over a fifteen day period at each of six locations, which were agreed with SSDC.

4.4 The equipment used during the survey is summarised in Appendix D. The sound level meters were calibrated immediately before and after all of the measurements using the listed acoustic calibrators and no significant calibration drifts were found to have occurred.

4.5 The sound level meters had been laboratory-calibrated to a traceable standard within the two years preceding the survey. The acoustic calibrators had been laboratory-calibrated to a traceable standard within the year preceding the survey.

4.6 Sound level measurements were carried out at the following six positions, as shown in Figure B.3 in Appendix B, using the same numbering as was adopted in the April 2019 ES Addendum:

- Position N1: close to the western boundary of the Site, opposite the properties along the A449;
- Position N2: adjacent to Vicarage Road, close to the junction with Straight Mile;
- Position N4: close to the rear of Avenue Cottages to the north of the Site;
- Position N5: at the southern end of Croft Lane;
- Position N7: at the north-western corner of the Site, towards the junction between the A5 and A449; and
- Position N9: close to the junction between Woodlands Lane and Straight Mile.

4.7 The sound level measurements at all positions were undertaken with the microphones at a height of 1.5 metres above ground level, under free-field conditions, i.e. at least 3.5 metres away from any reflecting surfaces other than the ground.

4.8 A weather station was installed with the sound level meter at Position N1, to measure wind (speed and direction), rainfall and humidity.

4.9 The survey was undertaken prior to the start of any construction works associated with the West Midlands Interchange, other than de-watering activities at the quarry, which were limited to daytime hours only.

Survey Results

4.10 Details of the weather over the course of the survey and the measured sound levels at each position are set out in the following sections of this report.

Weather

4.11 The weather during the survey was generally suitable for sound level measurements, it being mainly dry with windspeeds of less than of 5m/s. Winds were from a south-easterly direction for a majority of the survey and temperatures ranged from approximately 0°C during the night, rising to approximately 16°C during the day.

4.12 There were some periods of rain and/or high wind speeds during the survey, as follows:

- 15:30 hours to 19:30 hours on Wednesday 2nd November 2022;
- 06:30 hours to 07:15 hours on Saturday 5th November 2022, with some further intermittent short periods up until approximately 07:45 hours on Sunday 6th November 2022;
- 12:15 hours to 13:45 hours Sunday 6th November 2022;
- 21:30 hours on Monday 7th November 2022 to 02:30 hours on Tuesday 8th November 2022, with some further intermittent short periods up until approximately 18:30 hours on Tuesday 8th November 2022; and
- 03:45 hours on Tuesday 15th November 2022 until towards the end of the survey.

4.13 The most prolonged periods of rain were from the early morning of Tuesday 15th November until near the end of the survey. The data gathered from 03:45 hours on Tuesday 15th November 2022 onwards are considered unsuitable for use in this report, and have therefore been excluded.

4.14 Data gathered between 18:00 and 23:00 on Saturday 5th November 2022 have also been excluded from the analysis as sound from fireworks affected the measured levels at some of the survey locations. Although the fireworks were noted to only have affected some locations, the data have not been included in the analysis of any of the locations, but the data are reported.

Position N1

4.15 The measurements at Position N1 were undertaken between 13:30 hours on Wednesday 2nd November 2022 and 12:00 hours on Thursday 17th November 2022, although the period from 03:45 hours on Tuesday 15th November 2022 has not been included as the weather was not suitable for sound measurements.

4.16 The monitoring location is shown in Figure E.1 in Appendix E; the monitoring location matched the location set out in the April 2019 ES Addendum.

4.17 The dominant sources during the measurements were:

- road traffic on the A449, as well as more distant road traffic audible during lulls in traffic on A449;
- passing trains audible during lulls in traffic on A449; and
- natural sounds including birdsong and rustling trees.

4.18 The daily sound levels measured at Position N1 are summarised in Table 4.1 and the full survey results are contained in graphical form in Figure F.1 in Appendix F.

Table 4.1: Summary of measured sound levels at Position N1, free-field dB

Date	Period	Duration, T	$L_{Aeq,T}$	$L_{A90,T}$ [1]	$L_{A10,T}$ [1]	L_{AFmax}
Wednesday 2nd November 2022	Day	9.5 hours	65.5	56.4	67.6	70.7 to 83.0
	Night	8 hours	59.5	42.5	63.2	69.0 to 82.0
Thursday 3rd November 2022	Day	16 hours	64.1	55.1	66.9	70.0 to 81.5
	Night	8 hours	60.3	49.2	63.7	68.0 to 75.5
Friday 4th November 2022	Day	16 hours	64.8	55.2	67.7	69.3 to 84.1
	Night	8 hours	57.3	41.7	61.7	67.1 to 81.9
Saturday 5th November 2022	Day	16 hours	63.5	53.1	66.7	70.0 to 82.0
	Night	8 hours	55.1	37.2	57.6	65.1 to 73.0
Sunday 6th November 2022	Day	16 hours	62.6	50.9	65.8	68.9 to 83.3
	Night	8 hours	58.0	41.5	58.0	60.9 to 74.0
Monday 7th November 2022	Day	16 hours	64.3	55.7	67.3	70.9 to 87.6
	Night	8 hours	62.3	49.7	64.3	68.3 to 83.2
Tuesday 8th November 2022	Day	16 hours	64.7	55.7	67.5	69.2 to 80.8
	Night	8 hours	59.9	43.5	63.4	67.5 to 75.3
Wednesday 9th November 2022	Day	16 hours	64.3	55.0	67.1	69.0 to 86.0
	Night	8 hours	59.2	43.8	62.8	68.3 to 79.8
Thursday 10th November 2022	Day	16 hours	64.0	54.9	66.8	70.1 to 86.1
	Night	8 hours	59.4	46.1	63.1	66.8 to 89.1
Friday 11th November 2022	Day	16 hours	63.6	53.9	66.4	67.6 to 92.7
	Night	8 hours	57.2	41.5	61.3	67.2 to 80.2
Saturday 12th November 2022	Day	16 hours	62.2	52.0	65.3	68.7 to 84.5
	Night	8 hours	54.4	38.9	57.5	66.2 to 79.1
Sunday 13th November 2022	Day	16 hours	60.1	49.6	63.4	67.1 to 82.1
	Night	8 hours	55.9	39.7	56.1	62.5 to 76.7
Monday 14th November 2022	Day	16 hours	62.6	52.4	65.6	68.9 to 87.8
	Night	4.75 hours	55.4	41.6	58.0	66.3 to 89.8

Note: [1] – The $L_{A90,T}$ and $L_{A10,T}$ values are the arithmetic means of the $L_{A90,T}$ and $L_{A10,T}$ measurements for each period.

4.19 The average daytime and night-time sound levels measured at Position N1 are shown in Table 4.2.

Table 4.2: Average measured sound levels at Position N1, free-field dB

Average Type	Period	$L_{Aeq,T}$	$L_{A90,T}$	$L_{A10,T}$	L_{AFmax}
Overall average	Day	63.6	53.6	66.4	67.1 to 92.7
	Night	58.8	42.9	61.1	60.9 to 89.1

Position N2

4.20 The measurements at Position N2 were undertaken between 10:30 hours on Wednesday 2nd November 2022 and 11:00 hours on Thursday 17th November 2022, although the period from 03:45 hours on Tuesday 15th November 2022 has not been included as the weather was not suitable for sound measurements.

4.21 The monitoring location is shown in Figure E.2 in Appendix E; the monitoring location matched the location set out in the April 2019 ES Addendum.

4.22 The dominant sources during the measurements were:

- road traffic on Vicarage Road as well as more distant road traffic during lulls in traffic on Vicarage Road;
- distant industrial/commercial premises from the Four Ashes Industrial Estate during lulls in traffic on Vicarage Road; and
- natural sounds including birdsong and rustling trees.

4.23 The daily sound levels measured at Position N2 are summarised in Table 4.3 and the full survey results are contained in graphical form in Figure F.2 in Appendix F.

Table 4.3: Summary of measured sound levels at Position N2, free-field dB

Date	Period	Duration, T	$L_{Aeq,T}$	$L_{A90,T}$ [1]	$L_{A10,T}$ [1]	L_{AFmax}
Wednesday 2nd November 2022	Day	12.5 hours	68.8	51.5	71.2	79.9 to 96.9
	Night	8 hours	63.4	39.9	56.0	51.8 to 88.4
Thursday 3rd November 2022	Day	16 hours	69.2	51.8	72.4	79.4 to 97.4
	Night	8 hours	63.9	48.2	58.6	74.1 to 90.9
Friday 4th November 2022	Day	16 hours	69.4	51.3	72.4	78.5 to 97.3
	Night	8 hours	60.4	37.1	55.7	47.6 to 88.4
Saturday 5th November 2022	Day	16 hours	67.4	46.3	70.9	77.3 to 87.9
	Night	8 hours	56.7	33.9	48.5	46.1 to 83.5
Sunday 6th November 2022	Day	16 hours	66.4	44.3	69.6	77.1 to 89.0
	Night	8 hours	62.9	39.1	53.2	43.6 to 87.1
Monday 7th November 2022	Day	16 hours	69.1	52.3	71.9	79.4 to 91.2
	Night	8 hours	63.7	44.2	57.9	51.6 to 94.8
Tuesday 8th November 2022	Day	16 hours	69.2	51.6	72.3	79.5 to 90.4
	Night	8 hours	63.6	40.3	56.6	72.9 to 89.4
Wednesday 9th November 2022	Day	16 hours	69.4	51.3	72.8	78.1 to 91.2
	Night	8 hours	63.1	40.4	56.7	68.7 to 95.0
Thursday 10th November 2022	Day	16 hours	68.9	52.0	72.1	79.1 to 93.2
	Night	8 hours	62.9	42.2	56.9	75.0 to 90.6
Friday 11th November 2022	Day	16 hours	68.7	50.4	71.7	78.2 to 97.0
	Night	8 hours	60.2	37.8	55.3	77.1 to 84.6
Saturday 12th November 2022	Day	16 hours	66.8	46.5	70.4	76.5 to 94.3
	Night	8 hours	57.2	36.5	49.5	45.7 to 85.7
Sunday 13th November 2022	Day	16 hours	66.0	47.6	68.9	78.7 to 94.5
	Night	8 hours	62.7	40.5	54.3	44.1 to 85.7
Monday 14th November 2022	Day	16 hours	68.9	50.3	71.7	79.2 to 96.0
	Night	4.75 hours	58.6	40.5	49.6	51.4 to 98.3

Note: [1] – The $L_{A90,T}$ and $L_{A10,T}$ values are the arithmetic means of the $L_{A90,T}$ and $L_{A10,T}$ measurements for each period.

4.24 The average daytime and night-time sound levels measured at Position N2 are shown in Table 4.4.

Table 4.4: Average measured sound levels at Position N2, free-field dB

Average Type	Period	$L_{Aeq,T}$	$L_{A90,T}$	$L_{A10,T}$	L_{AFmax}
Overall average	Day	68.4	49.6	71.4	76.5 to 97.4
	Night	62.4	40.3	54.9	43.6 to 95.0

Position N4

4.25 The measurements at Position N4 were undertaken between 11:45 hours on Wednesday 2nd November 2022 and 12:45 hours on Thursday 17th November 2022, although the period from 03:45 hours on Tuesday 15th November 2022 has not been included as the weather was not suitable for sound measurements.

4.26 The monitoring location is shown in Figure E.3 in Appendix E; the monitoring location matched the location set out in the April 2019 ES Addendum.

4.27 The dominant sources during the measurements were:

- road traffic on the A5, with distant road traffic on the M6 audible on occasion;
- works at the quarry, south of the measurement position, during the daytime only; and
- natural sounds including birdsong and rustling trees.

4.28 The daily sound levels measured at Position N4 are summarised in Table 4.5 and the full survey results are contained in graphical form in Figure F.3 in Appendix F.

Table 4.5: Summary of measured sound levels at Position N4, free-field dB

Date	Period	Duration, T	$L_{Aeq,T}$	$L_{A90,T}$[1]	$L_{A10,T}$[1]	L_{AFmax}
Wednesday 2nd November 2022	Day	11.25 hours	57.1	53.0	57.4	58.6 to 79.4
	Night	8 hours	51.4	45.7	54.0	57.4 to 66.8
Thursday 3rd November 2022	Day	16 hours	55.3	51.5	56.4	59.1 to 81.4
	Night	8 hours	55.6	51.5	58.0	61.0 to 71.4
Friday 4th November 2022	Day	16 hours	55.8	51.0	56.9	58.3 to 87.3
	Night	8 hours	48.1	43.7	50.8	55.7 to 66.3
Saturday 5th November 2022	Day	16 hours	67.3	50.2	56.1	58.1 to 106.5
	Night	8 hours	48.4	41.8	49.6	52.3 to 75.7
Sunday 6th November 2022	Day	16 hours	53.9	50.7	55.4	57.0 to 79.8
	Night	8 hours	54.5	45.9	55.9	63.2 to 80.0
Monday 7th November 2022	Day	16 hours	67.1	55.1	66.4	72.4 to 98.9
	Night	8 hours	74.3	53.5	68.9	76.9 to 105.6
Tuesday 8th November 2022	Day	16 hours	65.2	54.0	64.8	68.3 to 95.3
	Night	8 hours	52.5	46.2	55.0	60.2 to 82.9
Wednesday 9th November 2022	Day	16 hours	56.0	50.4	58.0	61.5 to 81.4
	Night	8 hours	54.3	46.9	56.5	60.4 to 79.5
Thursday 10th November 2022	Day	16 hours	62.5	53.3	64.3	66.6 to 94.7
	Night	8 hours	59.2	48.0	60.1	67.9 to 87.5
Friday 11th November 2022	Day	16 hours	57.3	51.4	58.3	59.8 to 84.3
	Night	8 hours	50.7	46.4	53.3	57.9 to 70.4
Saturday 12th November 2022	Day	16 hours	56.0	53.5	57.2	60.3 to 76.3
	Night	8 hours	50.4	46.1	52.4	56.5 to 66.8

Date	Period	Duration, T	$L_{Aeq,T}$	$L_{A90,T}$[1]	$L_{A10,T}$[1]	L_{AFmax}
Sunday 13th November 2022	Day	16 hours	58.4	55.8	59.2	57.9 to 78.4
	Night	8 hours	53.0	48.5	53.5	55.9 to 65.2
Monday 14th November 2022	Day	16 hours	55.9	51.9	56.5	57.1 to 85.2
	Night	4.75 hours	52.4	48.8	54.4	59.0 to 76.0

Note: [1] – The $L_{A90,T}$ and $L_{A10,T}$ values are the arithmetic means of the $L_{A90,T}$ and $L_{A10,T}$ measurements for each period.

4.29 The average daytime and night-time sound levels measured at Position N4 are shown in Table 4.6.

Table 4.6: Average measured sound levels at Position N4, free-field dB

Average Type	Period	$L_{Aeq,T}$	$L_{A90,T}$	$L_{A10,T}$	L_{AFmax}
Overall average	Day	62.0	52.4	59.1	57.0 to 106.5
	Night	63.9	47.0	55.7	52.3 to 105.6

Position N5

4.30 The measurements at Position N5 were undertaken between 12:15 hours on Wednesday 2nd November 2022 and 13:00 hours on Thursday 17th November 2022, although the period from 03:45 hours on Tuesday 15th November 2022 has not been included as the weather was not suitable for sound measurements.

4.31 The monitoring location is shown in Figure E.4 in Appendix E; the monitoring location matched the location set out in the April 2019 ES Addendum.

4.32 Localised fireworks were noted to have affected the measurements at Position N5 between 18:00 and 19:00 hours on Friday 4th November 2022; data from this period have been excluded from the analysis, although they are reported.

4.33 The dominant sources during the measurements were:

- distant road traffic;
- occasional passing trains;
- occasional tonal alarm at 1 Croft Lane (MMS Gas Power), linked to their entrance gate; and
- natural sounds including birdsong and rustling trees.

4.34 The daily sound levels measured at Position N5 are summarised in Table 4.7 and the full survey results are contained in graphical form in Figure F.4 in Appendix F.

Table 4.7: Summary of measured sound levels at Position N5, free-field dB

Date	Period	Duration, T	$L_{Aeq,T}$	$L_{A90,T}$[1]	$L_{A10,T}$[1]	L_{AFmax}
Wednesday 2nd November 2022	Day	10.75 hours	54.6	48.4	54.5	52.0 to 76.1
	Night	8 hours	43.8	39.5	45.1	49.2 to 74.8
Thursday 3rd November 2022	Day	16 hours	48.9	44.6	48.9	52.2 to 77.2
	Night	8 hours	50.9	48.6	52.2	53.0 to 63.5
Friday 4th November 2022	Day	16 hours	59.2	46.7	50.5	49.7 to 102.7
	Night	8 hours	42.0	37.9	43.2	46.0. to 69.9
Saturday 5th November 2022	Day	16 hours	46.6	43.8	47.6	49.4 to 72.9
	Night	8 hours	39.0	34.9	39.6	41.6 to 64.0

Date	Period	Duration, T	$L_{Aeq,T}$	$L_{A90,T}$ [1]	$L_{A10,T}$ [1]	L_{AFmax}
Sunday 6th November 2022	Day	16 hours	46.0	43.1	46.8	49.9 to 83.9
	Night	8 hours	42.8	39.0	43.0	43.9 to 71.2
Monday 7th November 2022	Day	16 hours	49.6	46.6	50.7	52.3 to 77.2
	Night	8 hours	52.3	45.7	50.7	47.4 to 73.4
Tuesday 8th November 2022	Day	16 hours	51.9	46.6	51.5	52.8 to 90.8
	Night	8 hours	43.2	39.6	44.8	48.1 to 60.9
Wednesday 9th November 2022	Day	16 hours	48.2	44.7	48.7	51.7 to 88.6
	Night	8 hours	43.4	40.2	44.7	47.7 to 70.3
Thursday 10th November 2022	Day	16 hours	49.6	46.0	50.9	54.0 to 83.7
	Night	8 hours	47.0	42.3	48.5	50.8 to 64.7
Friday 11th November 2022	Day	16 hours	47.3	44.1	48.0	50.5 to 72.2
	Night	8 hours	42.8	40.1	43.8	46.4 to 67.4
Saturday 12th November 2022	Day	16 hours	47.8	45.4	47.9	49.9 to 87.9
	Night	8 hours	41.7	39.3	42.8	44.9 to 65.3
Sunday 13th November 2022	Day	16 hours	50.2	48.2	50.5	50.5 to 76.7
	Night	8 hours	44.9	41.9	45.2	46.0 to 60.3
Monday 14th November 2022	Day	16 hours	47.6	44.3	47.6	51.8 to 70.4
	Night	4.75 hours	45.1	42.5	46.3	49.3 to 64.8

Note: [1] – The $L_{A90,T}$ and $L_{A10,T}$ values are the arithmetic means of the $L_{A90,T}$ and $L_{A10,T}$ measurements for each period.

4.35 The average daytime and night-time sound levels measured at Position N5 are shown in Table 4.8.

Table 4.8: Average measured sound levels at Position N5, free-field dB

Average Type	Period	$L_{Aeq,T}$	$L_{A90,T}$	$L_{A10,T}$	L_{AFmax}
Overall average	Day	51.4	45.3	49.1	49.4 to 102.7
	Night	46.3	40.8	45.3	41.6 to 74.8

Position N7

4.36 The measurements at Position N7 were undertaken between 12:45 hours on Wednesday 2nd November 2022 and 12:30 hours on Thursday 17th November 2022, although the period from 03:45 hours on Tuesday 15th November 2022 has not been included as the weather was not suitable for sound measurements.

4.37 The monitoring location is shown in Figure E.5 in Appendix E; the monitoring location matched the location set out in the April 2019 ES Addendum.

4.38 The dominant sources during the measurements were:

- road traffic on the A5 and A449;
- activities at the Staffordshire County Council Depot, immediately east of the measurement position;
- occasional passing trains; and
- natural sounds including birdsong and rustling trees.

4.39 The daily sound levels measured at Position N7 are summarised in Table 4.9 and the full survey results are contained in graphical form in Figure F.5 in Appendix F.

Table 4.9: Summary of measured sound levels at Position N7, free-field dB

Date	Period	Duration, T	$L_{Aeq,T}$	$L_{A90,T}$[1]	$L_{A10,T}$[1]	L_{AFmax}
Wednesday 2nd November 2022	Day	10.25 hours	58.2	53.1	59.8	61.4 to 78.8
	Night	8 hours	52.5	43.9	54.9	60.3 to 71.0
Thursday 3rd November 2022	Day	16 hours	56.3	51.8	57.6	58.5 to 80.9
	Night	8 hours	53.6	46.8	55.7	58.8 to 76.2
Friday 4th November 2022	Day	16 hours	57.8	53.8	59.4	61.2 to 86.6
	Night	8 hours	49.9	41.4	52.9	58.0 to 67.6
Saturday 5th November 2022	Day	16 hours	56.0	51.5	58.1	61.6 to 76.3
	Night	8 hours	47.6	35.2	50.1	54.6 to 71.1
Sunday 6th November 2022	Day	16 hours	54.7	49.4	56.8	60.8 to 77.9
	Night	8 hours	50.7	39.0	51.6	55.8 to 71.5
Monday 7th November 2022	Day	16 hours	56.5	52.1	58.4	61.8 to 75.7
	Night	8 hours	55.9	46.3	56.8	60.0 to 79.4
Tuesday 8th November 2022	Day	16 hours	58.0	53.3	59.6	61.9 to 84.9
	Night	8 hours	53.2	43.9	55.4	58.7 to 70.7
Wednesday 9th November 2022	Day	16 hours	58.2	53.8	59.8	61.0 to 74.0
	Night	8 hours	52.4	43.9	54.5	58.6 to 87.9
Thursday 10th November 2022	Day	16 hours	57.1	52.8	58.9	62.0 to 78.1
	Night	8 hours	52.5	44.9	54.9	59.0 to 73.8
Friday 11th November 2022	Day	16 hours	56.4	51.6	58.1	58.3 to 80.2
	Night	8 hours	49.4	41.1	51.9	56.5 to 68.3
Saturday 12th November 2022	Day	16 hours	52.8	48.6	54.6	55.8 to 74.0
	Night	8 hours	46.0	38.0	47.8	53.1 to 79.4
Sunday 13th November 2022	Day	16 hours	50.9	47.4	52.2	54.0 to 69.3
	Night	8 hours	47.0	38.2	47.8	51.5 to 70.7
Monday 14th November 2022	Day	16 hours	52.9	48.7	54.7	57.9 to 83.9
	Night	4.75 hours	46.0	39.3	48.9	55.3 to 65.4

Note: [1] – The $L_{A90,T}$ and $L_{A10,T}$ values are the arithmetic means of the $L_{A90,T}$ and $L_{A10,T}$ measurements for each period.

4.40 The average daytime and night-time sound levels measured at Position N7 are shown in Table 4.10.

Table 4.10: Average measured sound levels at Position N7, free-field dB

Average Type	Period	$L_{Aeq,T}$	$L_{A90,T}$	$L_{A10,T}$	L_{AFmax}
Overall average	Day	56.1	51.2	57.4	54 to 86.6
	Night	51.8	41.9	52.9	51.5 to 87.9

Position N9

4.41 The measurements at Position N9 were undertaken between 11:00 hours on Wednesday 2nd November 2022 and 11:15 hours on Thursday 17th November 2022, although the period from 03:45 hours on Tuesday 15th November 2022 has not been included as the weather was not suitable for sound measurements.

4.42 The monitoring location is shown in Figure E.6 in Appendix E; the monitoring location matched the location set out in the April 2019 ES Addendum.

4.43 The dominant sources during the measurements were:

- distant road traffic on the M6 motorway;
- occasional road traffic on Straight Mile and Woodlands Lane; and
- natural sounds including birdsong and rustling trees.

4.44 The daily sound levels measured at Position N9 are summarised in Table 4.11 and the full survey results are contained in graphical form in Figure F.6 in Appendix F.

Table 4.11: Summary of measured sound levels at Position N9, free-field dB

Date	Period	Duration, T	$L_{Aeq,T}$	$L_{A90,T}$ (1)	$L_{A10,T}$ (1)	L_{AFmax}
Wednesday 2nd November 2022	Day	12 hours	55.9	48.8	55.6	47.7 to 78.2
	Night	8 hours	45.5	39.9	44.6	42.3 to 70.5
Thursday 3rd November 2022	Day	16 hours	54.3	45.5	56.3	64.3 to 81.5
	Night	8 hours	54.5	51.7	55.1	54.0 to 74.1
Friday 4th November 2022	Day	16 hours	55.5	50.2	56.0	59.6 to 81.1
	Night	8 hours	42.5	37.0	41.3	42.7 to 67.7
Saturday 5th November 2022	Day	16 hours	52.0	45.0	53.3	62.4 to 81.2
	Night	8 hours	44.1	38.0	43.1	48.8 to 67.9
Sunday 6th November 2022	Day	16 hours	50.2	44.1	51.5	55.8 to 82.4
	Night	8 hours	46.7	39.7	43.5	42.1 to 82.5
Monday 7th November 2022	Day	16 hours	53.7	47.7	56.0	60.5 to 84.4
	Night	8 hours	53.7	47.2	53.2	50.2 to 70.6
Tuesday 8th November 2022	Day	16 hours	54.0	47.1	55.5	62.0 to 77.4
	Night	8 hours	45.2	38.8	43.3	43.8 to 71.1
Wednesday 9th November 2022	Day	16 hours	52.5	43.5	54.4	59.3 to 77.7
	Night	8 hours	45.1	39.4	43.3	45.9 to 74.9
Thursday 10th November 2022	Day	16 hours	52.3	45.4	54.7	62.3 to 79.5
	Night	8 hours	46.2	41.1	46.4	47.8 to 69.8
Friday 11th November 2022	Day	16 hours	52.0	44.2	54.0	60.8 to 83.4
	Night	8 hours	45.8	41.7	46.3	47.7 to 78.5
Saturday 12th November 2022	Day	16 hours	54.0	49.7	55.4	57.4 to 83.6
	Night	8 hours	47.9	43.8	49.4	51.8 to 70.8
Sunday 13th November 2022	Day	16 hours	56.1	53.3	56.7	58.8 to 85.4
	Night	8 hours	50.8	46.1	50.7	48.6 to 75.0
Monday 14th November 2022	Day	16 hours	54.8	47.0	54.5	53.8 to 79.6
	Night	4.75 hours	49.2	46.4	50.7	54.1 to 71.8

Note: (1) – The $L_{A90,T}$ and $L_{A10,T}$ values are the arithmetic means of the $L_{A90,T}$ and $L_{A10,T}$ measurements for each period.

4.45 The average daytime and night-time sound levels measured at Position N9 are shown in Table 4.12.

Table 4.12: Average measured sound levels at Position N9, free-field dB

Average Type	Period	$L_{Aeq,T}$	$L_{A90,T}$	$L_{A10,T}$	L_{AFmax}
Overall average	Day	53.7	46.9	54.9	47.7 to 85.4
	Night	49.1	42.0	46.7	42.1 to 82.5

Representative Sound Levels

4.46 In accordance with BS4142: 2014+A1: 2019, the assessment of sound from operational activities presented in the April 2019 ES Addendum relied on representative background sound levels, determined from the results of baseline survey measurements. The April 2019 ES Addendum also relied on representative ambient sound levels, quantified in terms of the L_{Aeq} index.

4.47 Since the purpose of the survey described in this report is to identify whether the acoustic climate has materially changed since the April 2019 ES Addendum was issued, representative values for both the background sound climate (L_{A90}) and ambient sound climate (L_{Aeq}) have been determined from the sound levels measured in November 2022.

4.48 Using the same methods as were adopted in the April 2019 ES Addendum, the distributions of the background and ambient sound levels have been analysed to determine representative values. To aid this determination, the cumulative percentage of each dataset set has also been analysed, and the 25% point has been identified, i.e. the value above which 75% of the data lies. This is considered a reasonable starting point in identifying a representative level, although the representative level is not necessarily considered to be equal to this value.

4.49 Data gathered during periods where weather conditions or localised events were considered to have unduly affected the measured sound levels have not been included in the analysis. The periods of these exclusions are shown in the time history graphs in Figures F.1 to F.6 in Appendix F.

4.50 The representative background and ambient sound levels identified from the November 2022 survey data are shown in Table 4.13. The representative values have been rounded to the nearest whole number as was the case for the April 2019 ES Addendum. The distributions of both the background and ambient sound levels are contained in Appendix F, starting at Figure F.7 for the background sound levels and at Figure F.19 for the ambient sound levels.

Table 4.13: Representative background and ambient sound levels, November 2022, free-field dB

Position	Period	Background Sound Levels, L_{A90}		Ambient Sound Levels, $L_{Aeq,T}$	
		Range	Representative Values	Range	Representative Values
N1	Day	39 to 62	49	54 to 68	61
	Night	32 to 60	37	46 to 66	54
N2	Day	37 to 63	42	58 to 73	64
	Night	31 to 59	36	34 to 71	49
N4	Day	42 to 62	49	48 to 79	53
	Night	36 to 57	43	41 to 69	48
N5	Day	38 to 54	43	42 to 60	45
	Night	30 to 52	38	33 to 54	40
N7	Day	39 to 59	48	44 to 62	52
	Night	27 to 57	37	38 to 60	45
N9	Day	37 to 58	43	41 to 66	50
	Night	32 to 57	38	35 to 59	40

5 ANALYSIS OF BASELINE SOUND LEVELS

5.1 The representative sound levels identified from the November 2022 survey data have been compared with those set out in the April 2019 ES Addendum to determine whether the baseline acoustic climate has materially changed.

5.2 The two sets of representative background sound levels are compared in Table 5.1.

Table 5.1: Comparison of April 2019 ES Addendum and November 2022 representative background sound levels, free-field L_{A90} dB

Location	Period	April 2019 ES Addendum Values	November 2022 Survey Values	Difference
Position N1	Day	44	49	+5
	Night	36	37	+1
Position N2	Day	42	42	0
	Night	39	36	-3
Position N4	Day	47	49	+2
	Night	44	43	-1
Position N5	Day	41	43	+2
	Night	39	38	-1
Position N7	Day	41	48	+7
	Night	33	37	+4
Position N9	Day	46	43	-3
	Night	45	38	-7

5.3 It can be seen from Table 5.1 that the representative background sound levels identified from the November 2022 survey are reasonably close to the values set out in the April 2019 ES Addendum.

5.4 The values at Positions N2, N4 and N5 are the closest, being within 3dB of the April 2019 ES Addendum values. A change of between 1 and 3dB is within the bounds of measurement tolerance to be expected when measuring sound levels from multiple, geographically diverse sources. This is considered to fall within the bounds of what might be termed 'normal' survey variability; differences of less than 3dB over a period of three or four years are not considered significant.

5.5 The values at Positions N1, N7 and N9 are less consistent, with Positions N1 and N7 being higher in November 2022 than in the April 2019 ES Addendum and Position N9 being lower.

5.6 Higher background sound levels in November 2022 might suggest that future assessments of operational noise under the BNIS could be overly stringent, while lower background sound levels might suggest a less stringent assessment.

5.7 To assist in determining whether the differences at these three positions reflect an actual change in the acoustic climate, the changes in the ambient sound levels have also been analysed.

5.8 Table 5.2 sets out a comparison between the representative ambient sound levels from the April 2019 ES Addendum and those identified from the November 2022 survey data.

Table 5.2: Comparison of April 2019 ES Addendum and November 2022 representative ambient sound levels, free-field $L_{Aeq,T}$ dB

Location	Period	April 2019 ES Addendum Values	November 2022 Survey Values	Difference
Position N1	Day	58	61	+3
	Night	49	54	+5
Position N2	Day	64	64	0
	Night	54	49	-5
Position N4	Day	52	53	+1
	Night	48	48	0
Position N5	Day	45	45	0
	Night	43	40	-3
Position N7	Day	46	52	+6
	Night	41	45	+4
Position N9	Day	51	50	-1
	Night	48	40	-8

5.9 The differences between the representative ambient sound levels set out in the April 2019 ES Addendum and those identified from the November 2022 survey, as shown in the final column of Table 5.2, suggest that the ambient sound levels have remained broadly consistent at Positions N2, N4 and N5, have increased at Positions N1 and N7 and decreased at Position N9.

5.10 A change in the ambient sound level of 5dB over a three to four year period is not considered significant; the ambient sound level is much more susceptible to peaks of sound than the background sound level, which tends to 'smooth' out such transient sources of sound.

5.11 Changes of more than 5dB could be an indication that the acoustic climate has shifted since the April 2019 ES Addendum was issued, albeit short duration surveys do not offer definitive evidence of a long-term trend.

5.12 On the basis of the changes in the representative background and ambient sound levels set out in Tables 5.1 and 5.2, it is considered that the majority of the values adopted in the April 2019 ES Addendum remain broadly appropriate. The representative background sound levels that were adopted for receptors to the north, west and south of the Proposed Development have remained as set out in the April 2019 ES Addendum, or have increased to a small degree.

5.13 It is considered prudent to not increase the representative background sound levels at these locations even though the November 2022 survey has suggested that the baseline acoustic climate may have increased in level since the April 2019 ES Addendum was issued.

5.14 The exception was at Position N9, where it is considered prudent to adopt a lower background sound level to account for the apparent reduction in the acoustic climate for receptors to the south-east of the Proposed Development.

5.15 It is recommended that a reduction of 5dB be adopted for Position N9, for both the daytime and night-time periods, this being a broad average of the identified daytime and night-time

changes. Since Position N8 is close to Position N9, it is recommended that a similar reduction be applied to the representative background sound levels at Position N8 as well.

5.16 For ease of reference, the representative background sound levels to be adopted in the bespoke noise insulation assessments for the operational phase of the site should be as set out in Table 5.3.

Table 5.3: Representative background sound levels for use in operational phase bespoke noise insulation assessments, free-field dB

Position	Period	Representative Background Sound Levels, L_{A90}
N1	Day	44
	Night	36
N2	Day	42
	Night	39
N4	Day	47
	Night	44
N5	Day	41
	Night	39
N6	Day	41
	Night	37
N7	Day	41
	Night	33
N8	Day	41
	Night	39
N9	Day	41
	Night	40
N10	Day	34
	Night	33
N11	Day	42
	Night	42
N12	Day	39
	Night	38

5.17 These adjusted representative background sound levels should be taken forward into the bespoke noise insulation assessments for the operational phase of the site, as required by Schedule 6 of the Development Consent Obligation.

6 CONCLUSION

6.1 Four Ashes Limited has appointed Resound Acoustics Limited to undertake a baseline sound level survey, to discharge their obligations under the Development Consent Obligation that was agreed as in support of the grant of the Development Consent Order for the West Midlands Interchange development (*The West Midlands Rail Freight Interchange Order* SI 2020 No. 511).

6.2 Schedule 6 of the Development Consent Obligation (document dated 20th August 2019) contained a *Bespoke Noise Insulation Scheme* ('BNIS'), which set out a process for identifying properties adversely affected by construction or operational noise such that they qualified for a grant in respect of sound insulation to be fitted to the property.

6.3 Clause 2 of Schedule 6 of the Development Consent Obligation requires Four Ashes Limited to undertake updated baseline sound level surveys, unless agreed otherwise by the District Council.

6.4 A baseline sound level re-measurement has been carried out at six of the original 11 no. monitoring locations, and the majority of the measured sound levels suggest that the representative background sound levels set out in the April 2019 ES Addendum remain appropriate. The exception to this occurred at Position N9, where the re-measurement suggested that the baseline sound levels have decreased in the three to four years since the April 2019 ES Addendum was issued.

6.5 As a result, it is recommended that the representative background sound levels used in any future bespoke noise insulation assessment for the operational phase of the development be reduced at Positions N8 and N9. The amended representative background sound levels are set out in Table 5.3 of this report.

Appendices

Appendix A – Introduction to Noise and Glossary of Terminology

Noise is defined as unwanted sound. The human ear is able to respond to sound in the frequency range 18Hz (deep bass) to 18,000Hz (high treble) and over the audible range of 0dB (the threshold of perception) to 140dB (the onset of pain). The ear does not respond equally to different frequencies of the same magnitude, but is more responsive to mid-frequencies than to lower or higher frequencies. To quantify noise in a manner that approximates the response of the human ear, a weighting (filtering) mechanism is used. This reduces the importance of lower and higher frequencies, approximating the response of the human ear.

Furthermore, the perception of noise may be determined by a number of other factors, which may not necessarily be acoustic. Noise can be perceived to be louder or more noticeable if the source of the noise is observed; e.g. roads, trains, factories, building sites etc. In general, the impact of noise depends upon its level, the margin by which it exceeds the background level, its character and its variation over a given period of time. In some cases, the time of day and other acoustic features such as tonality may be important, as may the disposition of the affected individual. Any assessment of noise should give due consideration to all of these factors when assessing the significance of a noise source. Various noise indices have been derived to describe the fluctuation of noise levels that vary over time. Usually, these noise indices relate to specific types of noise, and as such different noise indices are used to describe road traffic noise, background noise, construction noise, etc.

The weighting mechanism that best corresponds to the response of the human ear is the 'A'-weighting scale. This is widely used for environmental noise measurement and the levels are denoted as dB(A) or L_{Aeq}, L_{A10}, etc, according to the parameter being measured.

Noise is measured on the decibel scale, which is logarithmic rather than linear. As a result of this, a 3dB increase in sound level represents a doubling of the sound energy present. Judgement of sound is subjective, but as a general guide a 10dB(A) increase can be taken to represent a doubling of loudness, whilst an increase in the order of 3dB(A) is generally regarded as the minimum difference needed to perceive a change. Table A.1 sets out examples of noise levels typically experienced during everyday activities. Table A.2 sets out an explanation of the terminology used in this report.

Table A.1: Typical sound levels found in the environment

Sound Level	**Location**
0 to 10dB(A)	Threshold of hearing
10 to 20dB(A)	Broadcasting studio
20 to 30dB(A)	Quiet bedroom at night
30 to 40dB(A)	Living room during the day
40 to 50dB(A)	Typical office
50 to 60dB(A)	Inside a car
60 to 70dB(A)	Typical high street
70 to 90dB(A)	Inside a factory or noisy pub
100 to 110dB(A)	Burglar Alarm at 1m
110 to 130dB(A)	Pneumatic drill at 1m away
140dB(A)	Threshold of Pain

Table A.2: Terminology relating to noise and vibration

Sound Pressure	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.
Sound Pressure Level (Sound Level)	The sound level is the sound pressure relative to a standard reference pressure of 20μPa ($20x10^{-6}$ Pascals) on a decibel scale.
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s_1 and s_2 is given by $20 \log_{10} (s_1/s_2)$. The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20μPa.
A-weighting, dB(A)	The unit of sound level, weighted according to the A-scale, which takes into account the increased sensitivity of the human ear at some frequencies.
Noise Level Indices	Noise levels usually fluctuate over time, so it is often necessary to consider an average or statistical noise level. This can be done in several ways, so a number of different noise indices have been defined, according to how the averaging or statistics are carried out.
L_w	The L_w, or sound power level, is a measure of the total noise energy of a source.
$L_{Aeq,T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max,T}$	A noise level index defined as the maximum noise level during the period T. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
$L_{90,T}$ or Background Noise Level	A noise level index. The noise level exceeded for 90% of the time over the period T. L_{90} can be considered to be the "average minimum" noise level and is often used to describe the background noise.
$L_{10,T}$	A noise level index. The noise level exceeded for 10% of the time over the period T. L_{10} can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise.
Free-field	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5 metres
Façade	At a distance of 1 metre in front of a large sound reflecting object such as a building façade.
Fast Time Weighting	An averaging time used in sound level meters. Defined in BS EN 61672.

Appendix B – Site Plans

Figure B.1: Site location plan

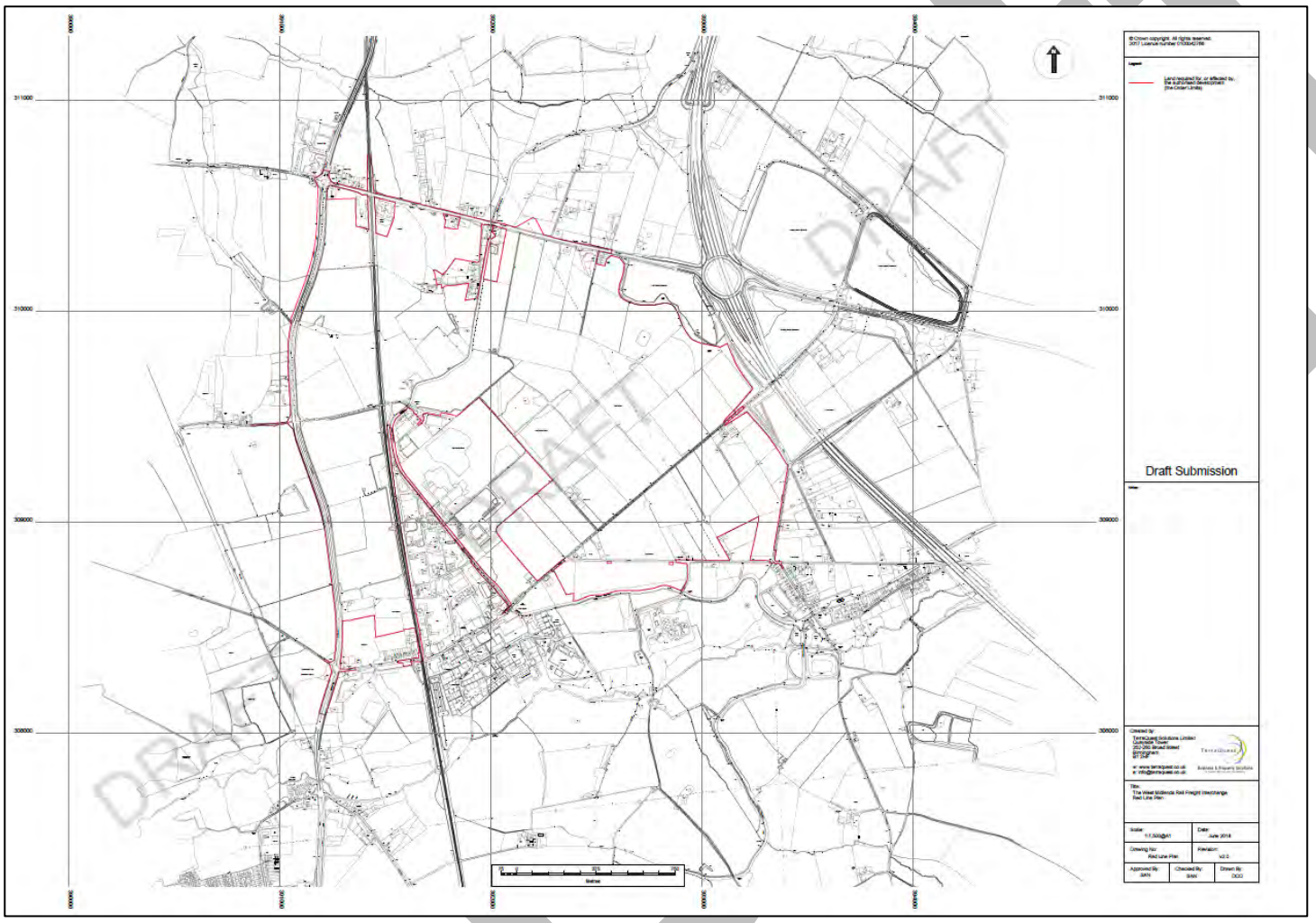


Figure B.2: Monitoring locations from April 2019 ES Addendum

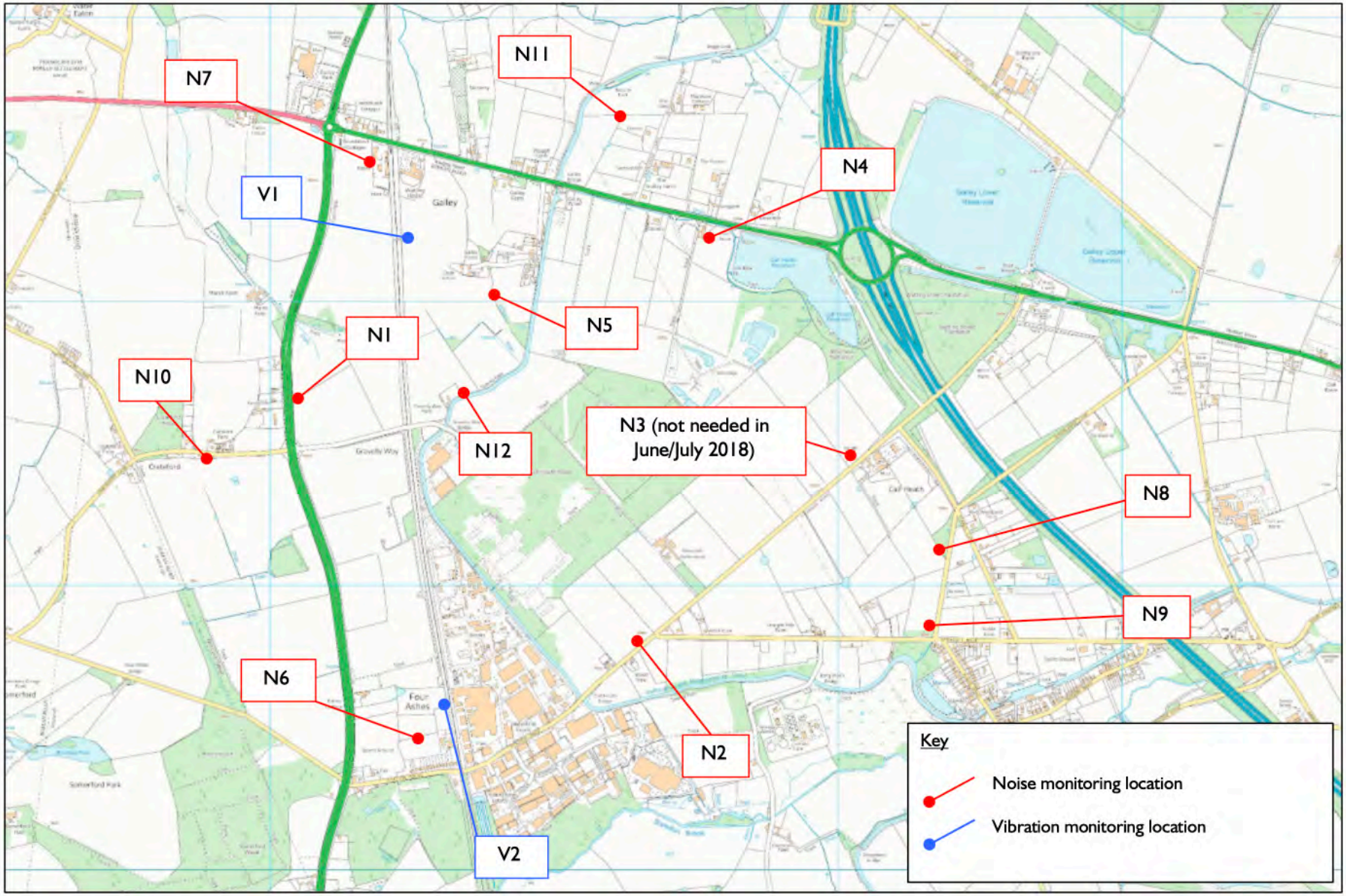
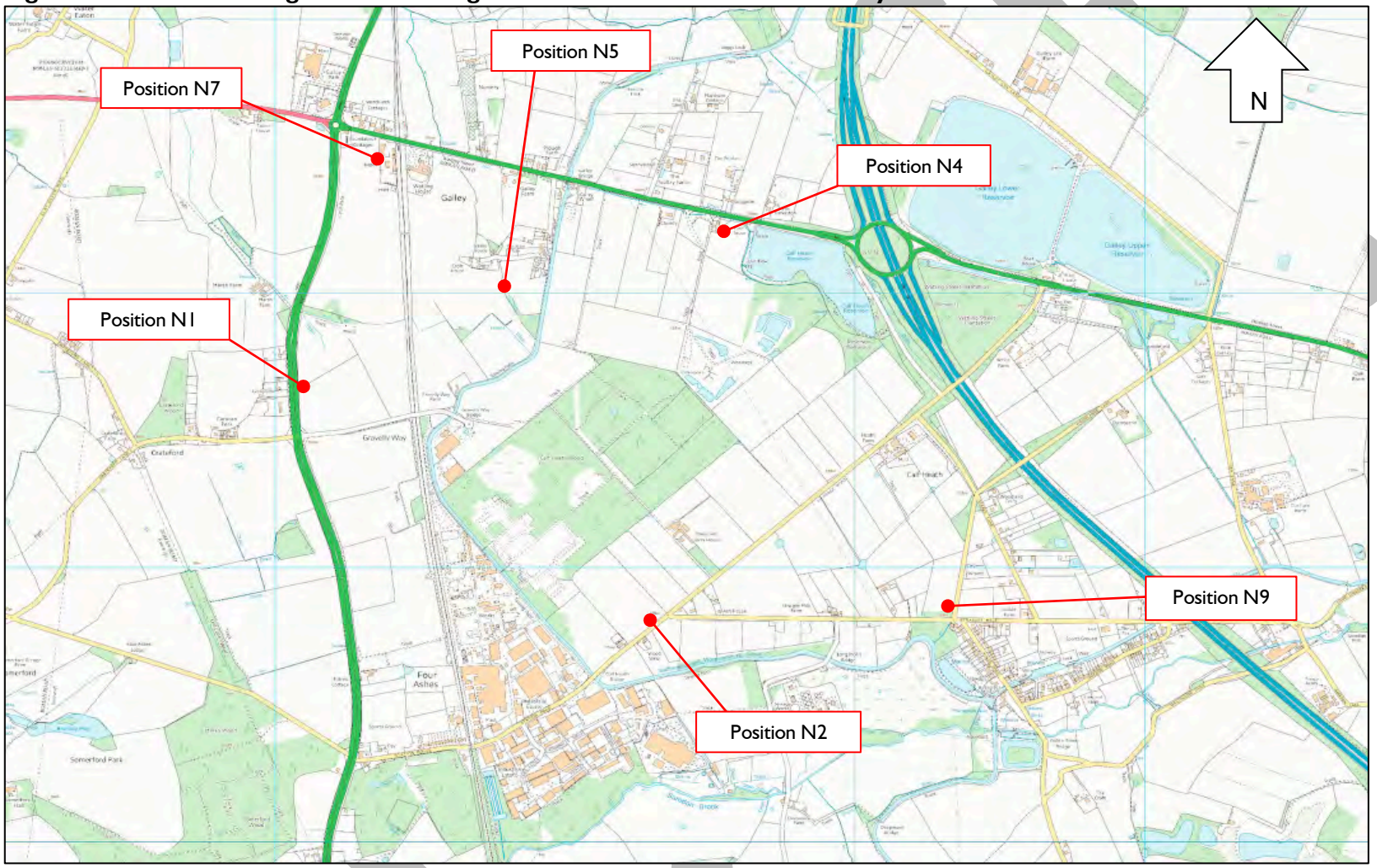


Figure B.3: Overview of agreed monitoring locations for November 2022 survey



Appendix C – Correspondence with South Staffordshire District Council

Subject: RE: West Midlands Interchange - Validation Noise Survey
Date: Thursday, 29 September 2022 at 17:07:17 British Summer Time
From: Lee Jamieson
To: Mike Brownstone
CC: Tom Nutt, Michael Brown, McFadden, Mark @ Birmingham, Brown, Richard @ Birmingham, Michael Taylor, Alan Hamilton, Rob Smart

Good afternoon Mike,

Thanks for the email and revised RAMS – yes I confirm I am happy with the proposed addition of point N7.

Kind regards

Lee Jamieson

Assistant Team Manager
Environmental Health & Licensing
South Staffordshire Council

Tel: [redacted]
www.sstaffs.gov.uk

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From: Mike Brownstone <[redacted]>
Sent: 29 September 2022 17:03
To: Lee Jamieson [redacted]
Cc: Tom Nutt [redacted]; Michael Brown [redacted]; McFadden, Mark @ Birmingham [redacted]; Brown, Richard @ Birmingham [redacted]; Michael Taylor [redacted]; Alan Hamilton

[redacted]; Rob Smart [redacted]
Subject: Re: West Midlands Interchange - Validation Noise Survey

Thanks Lee

Having discussed internally, we think adding Position N7 is the better option, as there is benefit in each of the other five positions, so that none warrant being dropped. See attached v2 of the RAMS.

If you're happy with that, we'll get started!

Kind regards

Mike

Mike Brownstone
Director
Mob: [redacted]
Tel: [redacted]

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[redacted]

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From: Lee Jamieson [redacted]
Date: Tuesday, 27 September 2022 at 11:06
To: Mike Brownstone [redacted]
Cc: Tom Nutt [redacted], Michael Brown [redacted], McFadden, Mark @ Birmingham [redacted], Brown, Richard @ Birmingham [redacted], Michael Taylor [redacted], Alan Hamilton [redacted]
Subject: RE: West Midlands Interchange - Validation Noise Survey

Good morning Mike,

Apologies for not coming back to you sooner on this.

Having considered the proposed validation monitoring location, in general these appear satisfactory and representative. However, I wonder if it is possible to add in a location closer to Gailey Island or perhaps substitute one of the proposed locations.

Regards

Lee Jamieson

Assistant Team Manager
Environmental Health & Licensing
South Staffordshire Council

Tel: [redacted]
www.sstaffs.gov.uk

From: Mike Brownstone [redacted]
Sent: 27 September 2022 10:57
To: Lee Jamieson [redacted]
Cc: Tom Nutt [redacted]; Michael Brown [redacted]; McFadden, Mark @ Birmingham [redacted]; Brown, Richard @ Birmingham [redacted]; Michael Taylor [redacted]; Alan Hamilton [redacted]
Subject: Re: West Midlands Interchange - Validation Noise Survey

Hi Lee

Just following up my email below – can you let me know your view?

Many thanks

Mike

Mike Brownstone

Director
Mob: [redacted]
Tel: [redacted]

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From: Mike Brownstone [redacted]
Date: Thursday, 15 September 2022 at 15:44
To: Lee Jamieson [redacted]
Cc: Tom Nutt [redacted], Michael Brown [redacted], McFadden, Mark @ Birmingham [redacted], Brown, Richard @ Birmingham [redacted], Michael Taylor [redacted], Alan Hamilton [redacted]
Subject: West Midlands Interchange - Validation Noise Survey

Hi Lee

Trust you're well.

We spoke earlier in the year about the need for updated baseline measurements at WMI, to feed into the operational bespoke noise insulation assessment that will be undertaken at a future point (in line with the triggers in the s106 agreement). You suggested that a number of 'validation' measurements would be acceptable to determine if any changes had occurred since the last surveys, and if they had occurred, to determine what those changes were.

I've attached a method statement (and risk assessment, although is perhaps less relevant to my question here), which includes the locations we propose to monitor at. We've selected the locations that we consider to be a suitably representative sample of the locations measured previously, covering the northern, southern, eastern and western boundaries of the site, plus a central location.

I'd be grateful if you could confirm whether you consider the proposed validation measurements to be sufficient to provide comfort that either the baseline information remains representative, or to identify what changes may have occurred, if they have occurred.

Kind regards

Mike

Mike Brownstone
Director

Mob: [redacted]
Tel: [redacted]

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[redacted]

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Appendix D – Monitoring Equipment

Table D.1: Noise monitoring equipment

Position	Equipment	Serial Number	Calibration Date
Position N1	01dB Fusion type 1 sound level meter	14026	15/06/2021
	01dB PRE22N pre-amplifier	2105013	
	GRAS 40CD microphone	428433	
	Cirrus CR515 calibrator	96172	28/06/2021
Position N2	01dB Black Solo type 1 sound level meter	65682	11/08/2022
	01dB PRE 21S pre-amplifier	16310	
	01dB MCE212 microphone	153491	
	01dB Cal21 acoustic calibrator	34134139	04/04/2022
Position N4	01dB Fusion type 1 sound level meter	12081	12/02/2021
	01dB PRE22N pre-amplifier	10755	
	GRAS 40CD microphone	331890	
	Cirrus CR515 calibrator	96168	22/04/2022
Position N5	01dB Fusion type 1 sound level meter	12079	11/02/2021
	01dB PRE22N pre-amplifier	1805158	
	GRAS 40CD microphone	367009	
	Cirrus CR515 calibrator	96168	28/06/2021
Position N7	01dB Fusion type 1 sound level meter	12080	22/06/2022
	01dB PRE22N pre-amplifier	1805334	
	GRAS 40CD microphone	331919	
	Cirrus CR515 calibrator	96168	28/06/2021
Position N9	01dB Blue Solo type 1 sound level meter	60582	16/12/2020
	01dB PRE 21S pre-amplifier	13510	
	01dB MCE212 microphone	90416	
	01dB Cal01 acoustic calibrator	980058	20/12/2021

Appendix E – Detail of Monitoring Locations

Figure E.1: Position N1

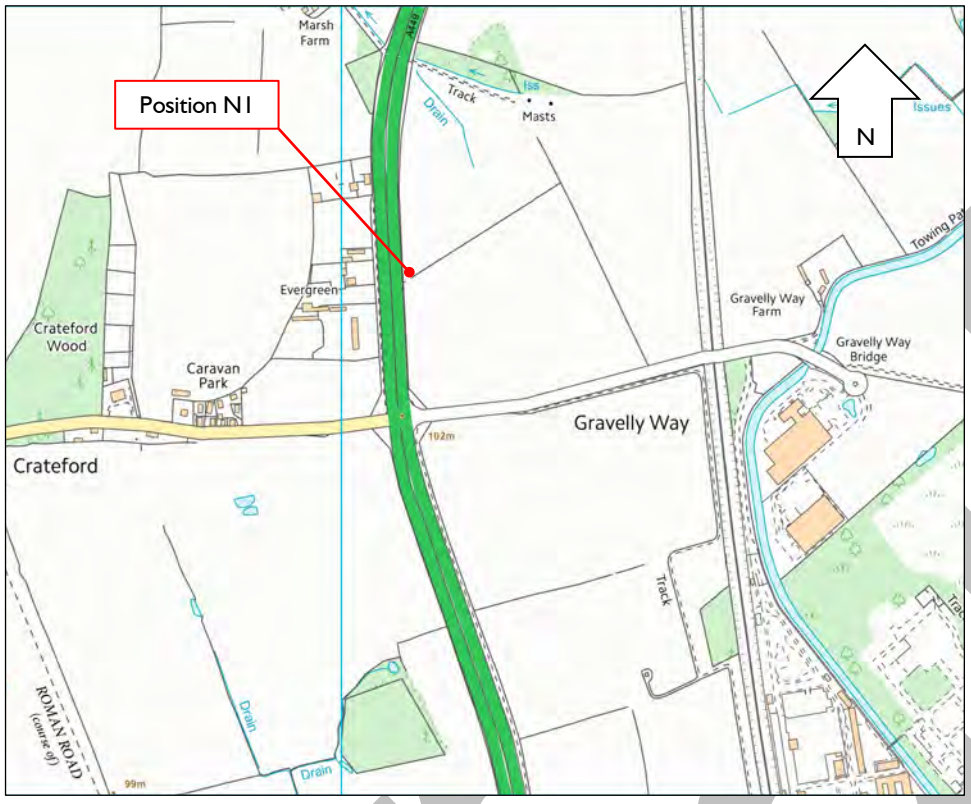


Figure E.2: Position N2

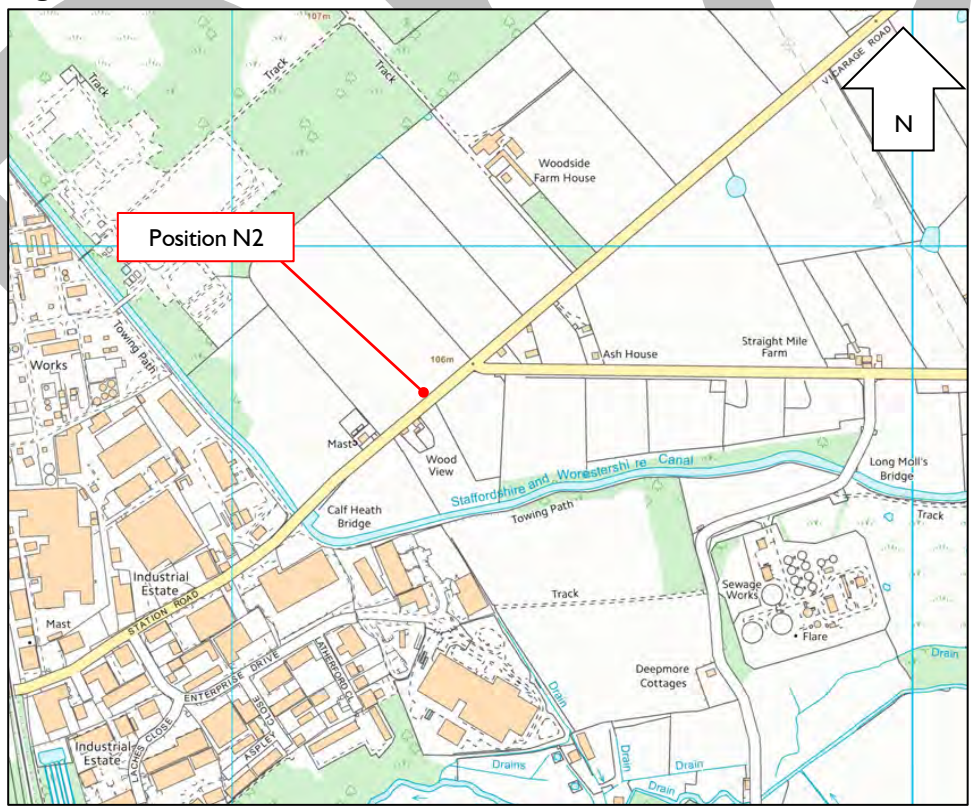


Figure E.3: Position N4

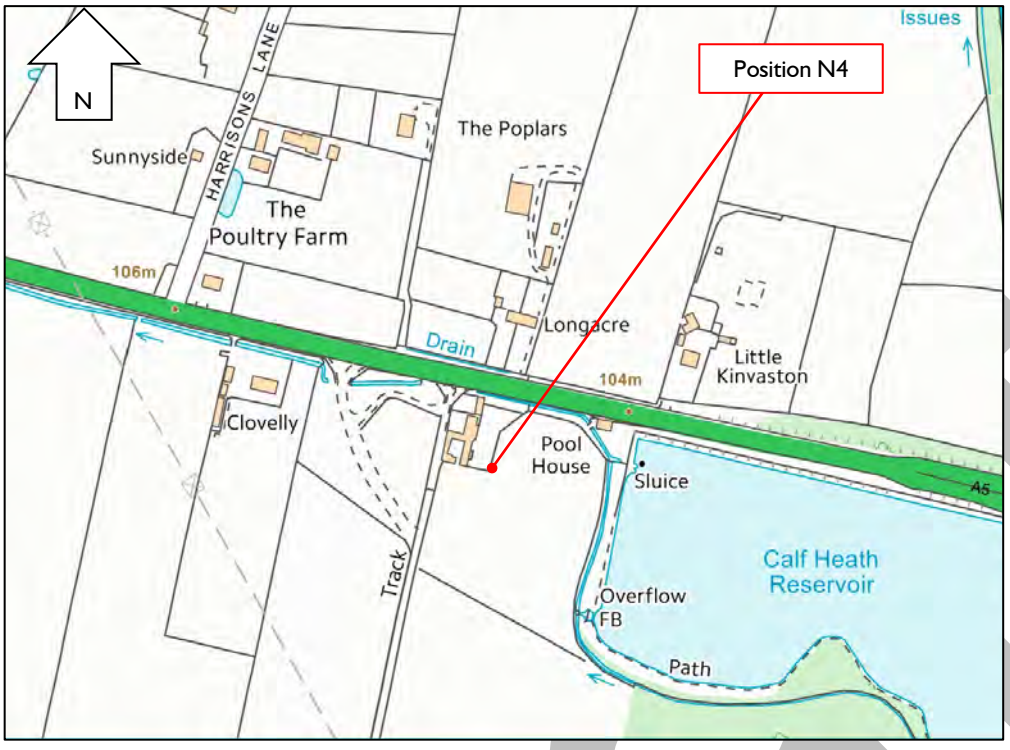


Figure E.4: Position N5

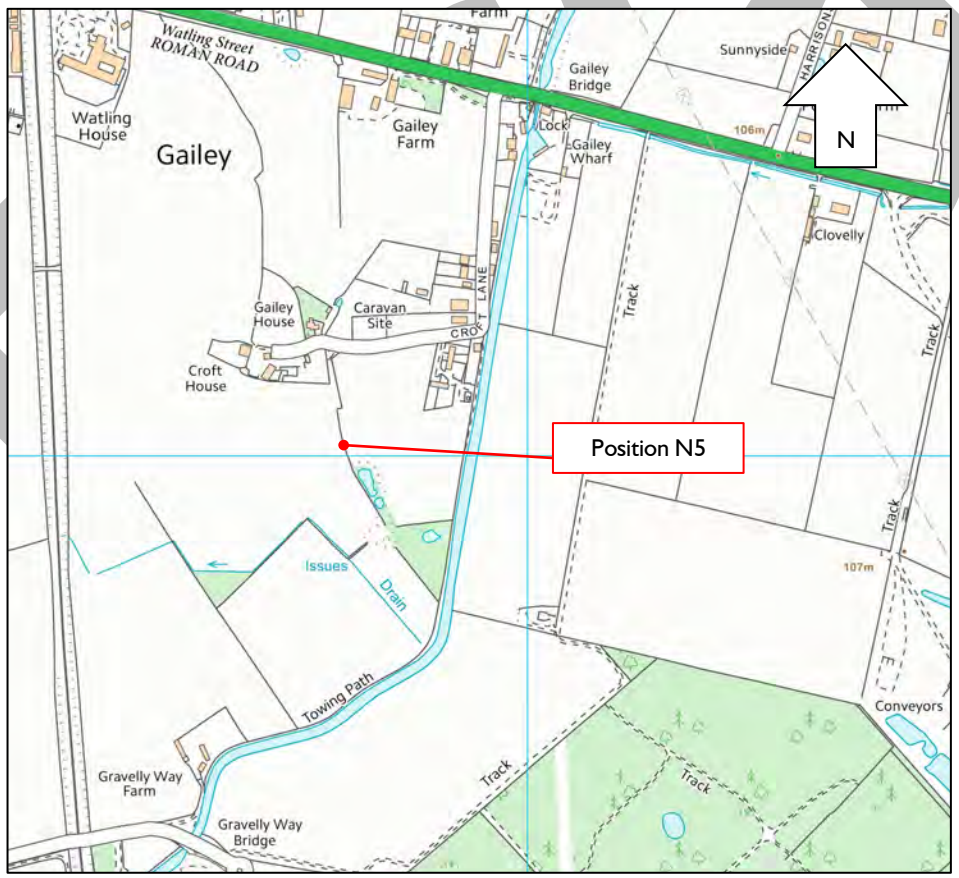


Figure E.5: Position N7

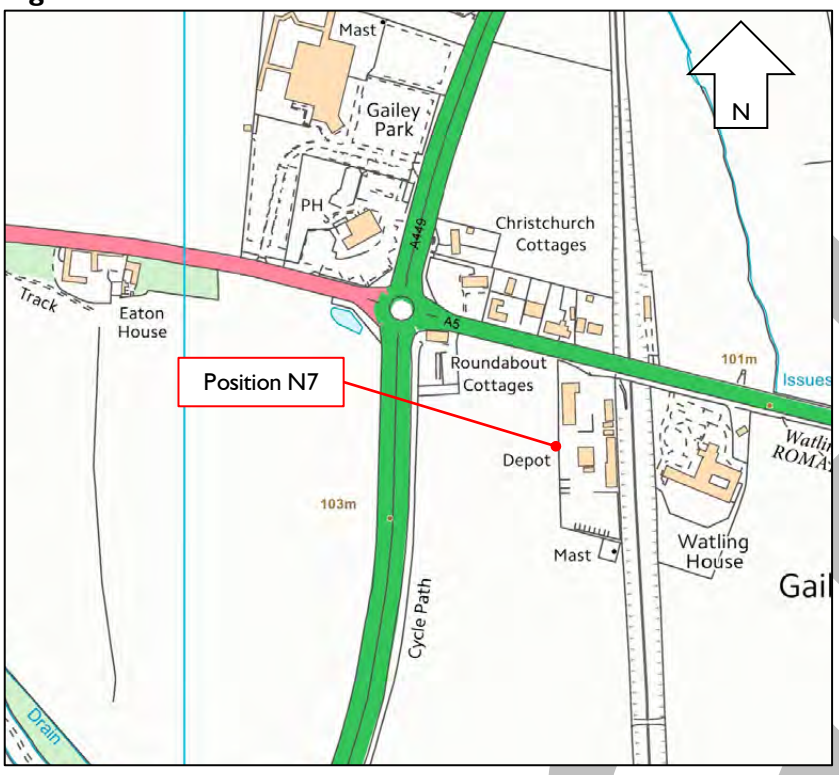
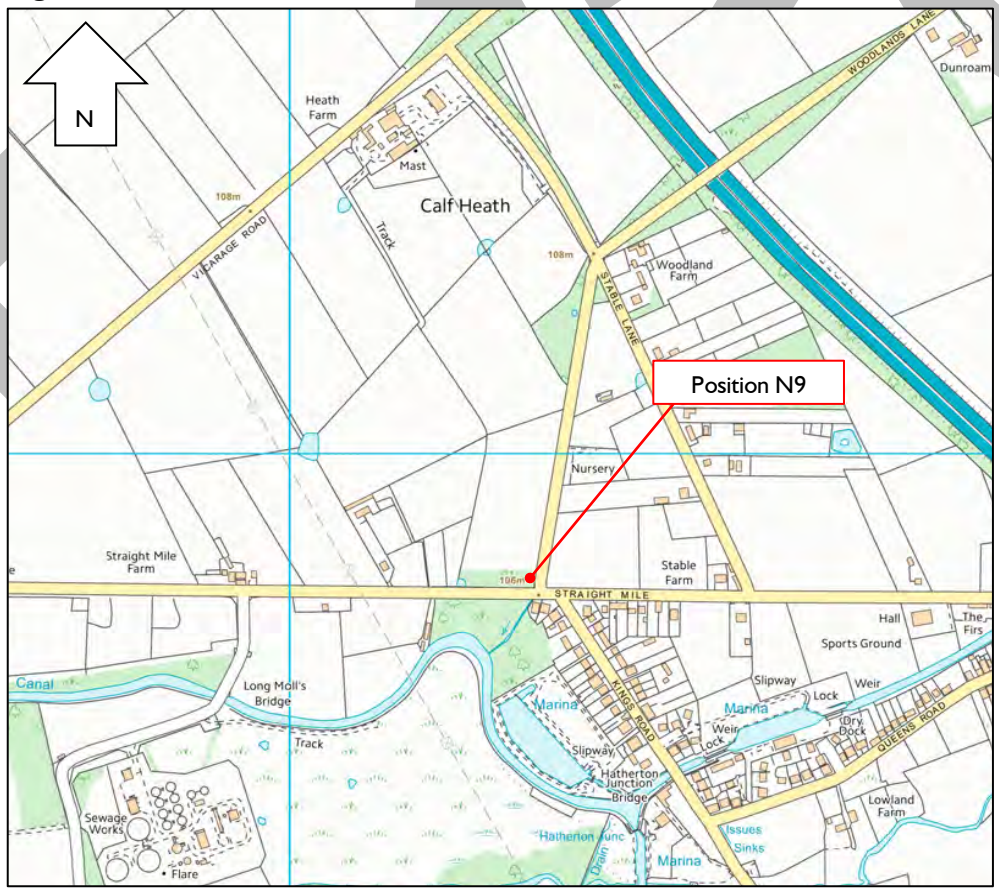


Figure E.6: Position N9



Appendix F – Full Survey Results

Figure F.1: Noise levels measured at Position N1, free-field dB

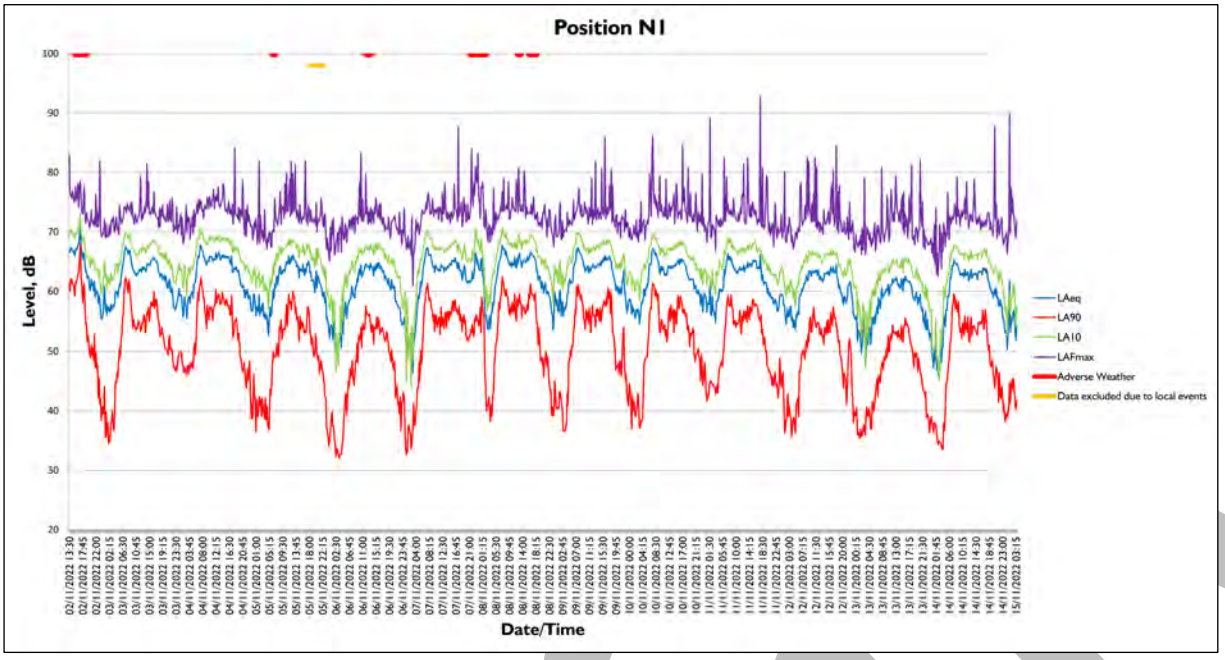


Figure F.2: Noise levels measured at Position N2, free-field dB

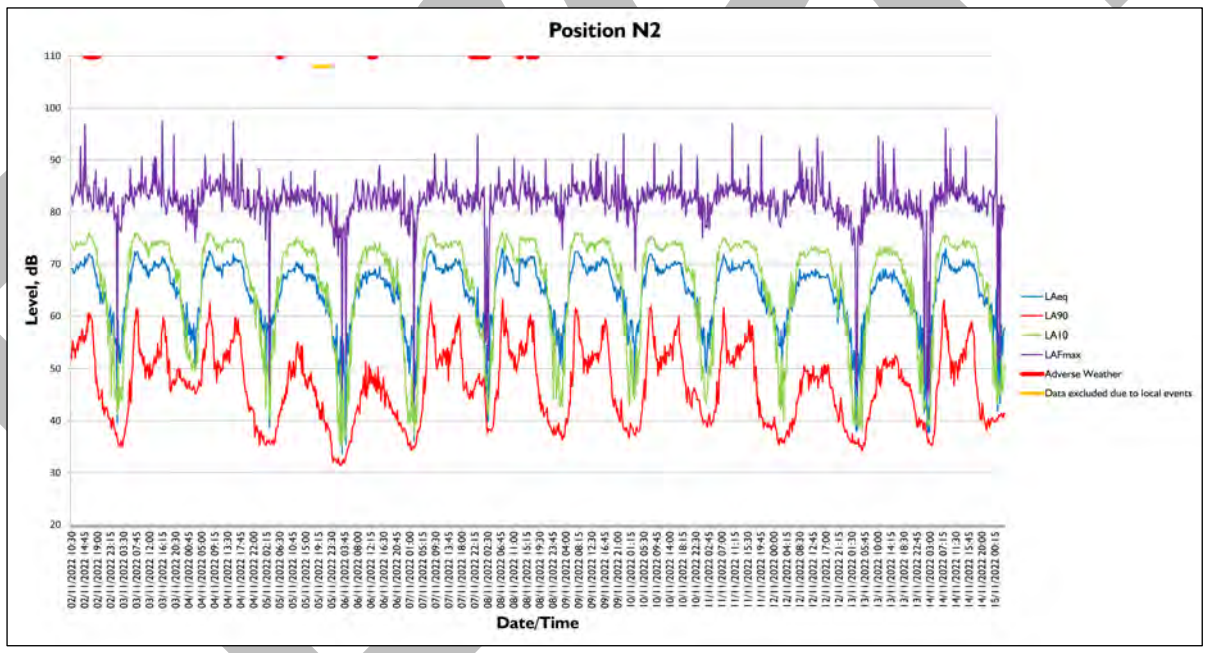


Figure F.3: Noise levels measured at Position N4, free-field dB

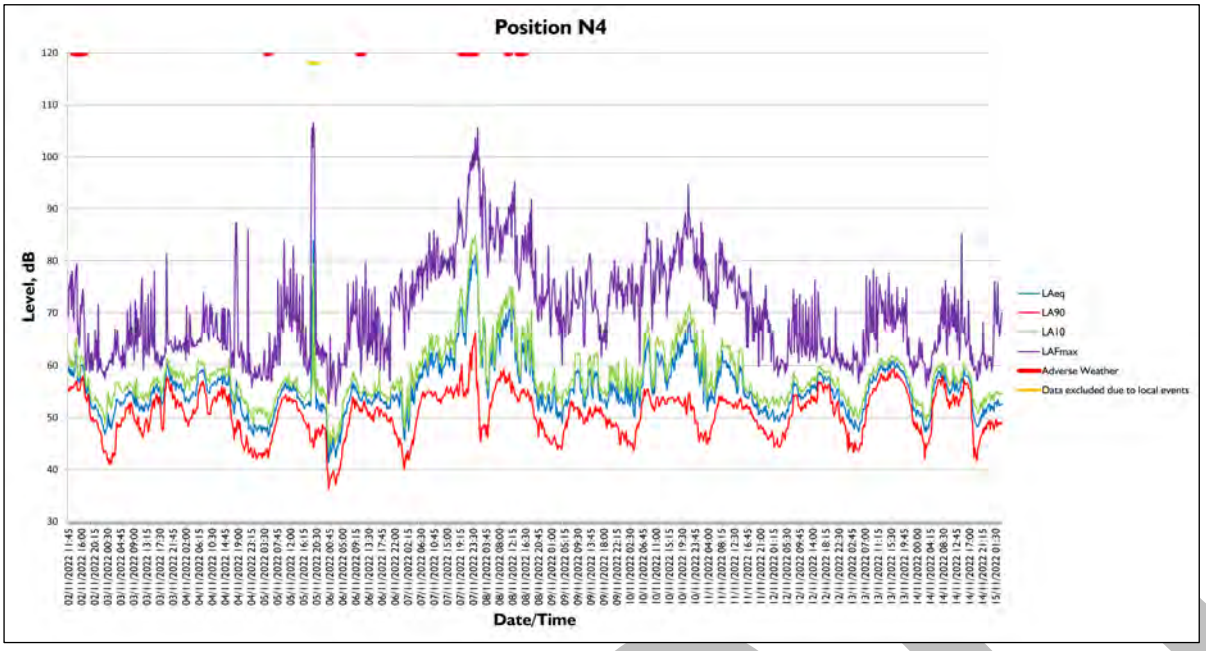


Figure F.4: Noise levels measured at Position N5, free-field dB

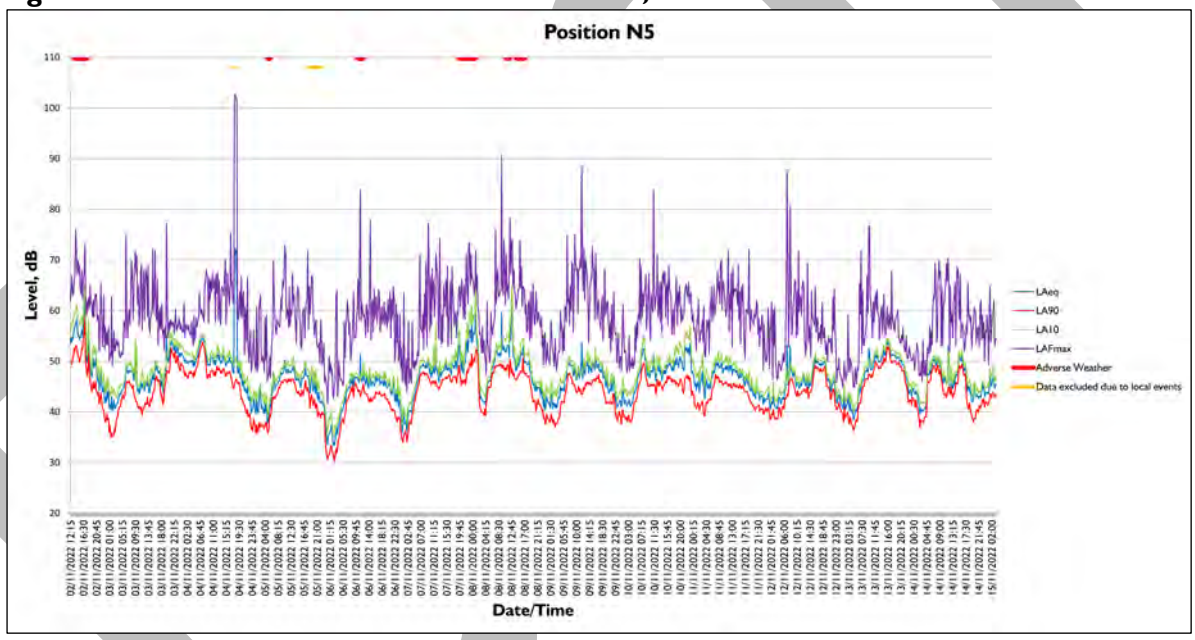


Figure F.5: Noise levels measured at Position N7, free-field dB

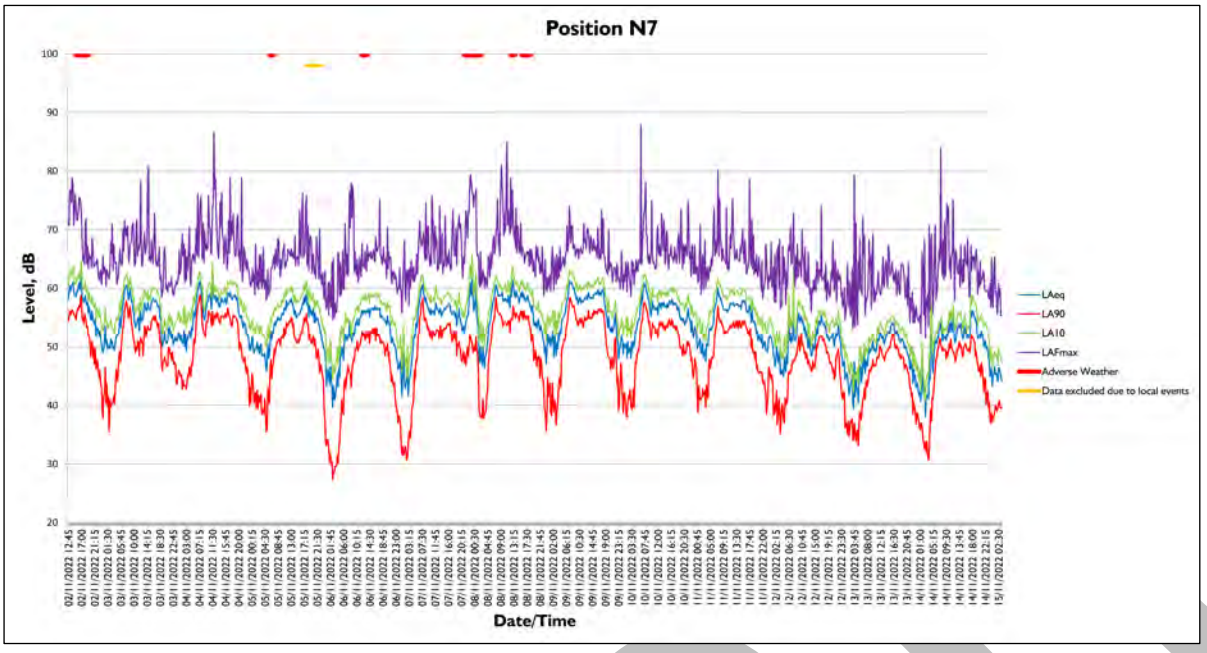


Figure F.6: Noise levels measured at Position N9, free-field dB

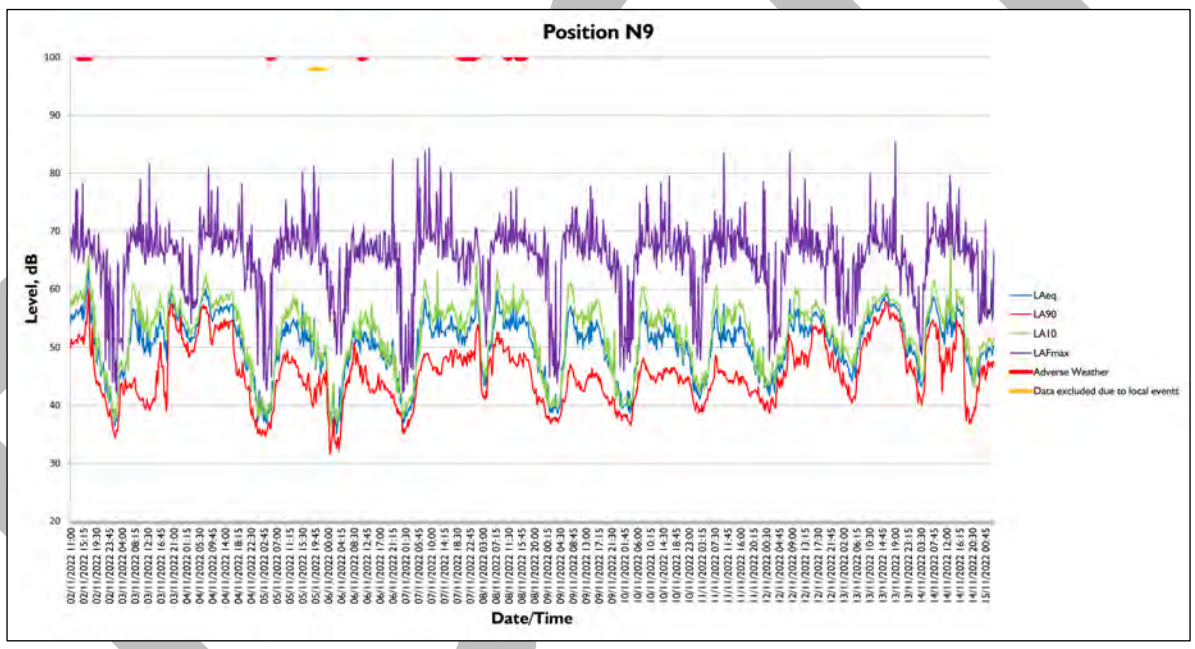


Figure F.7: L_{A90} Distribution - Position N1, daytime (07:00 to 23:00)

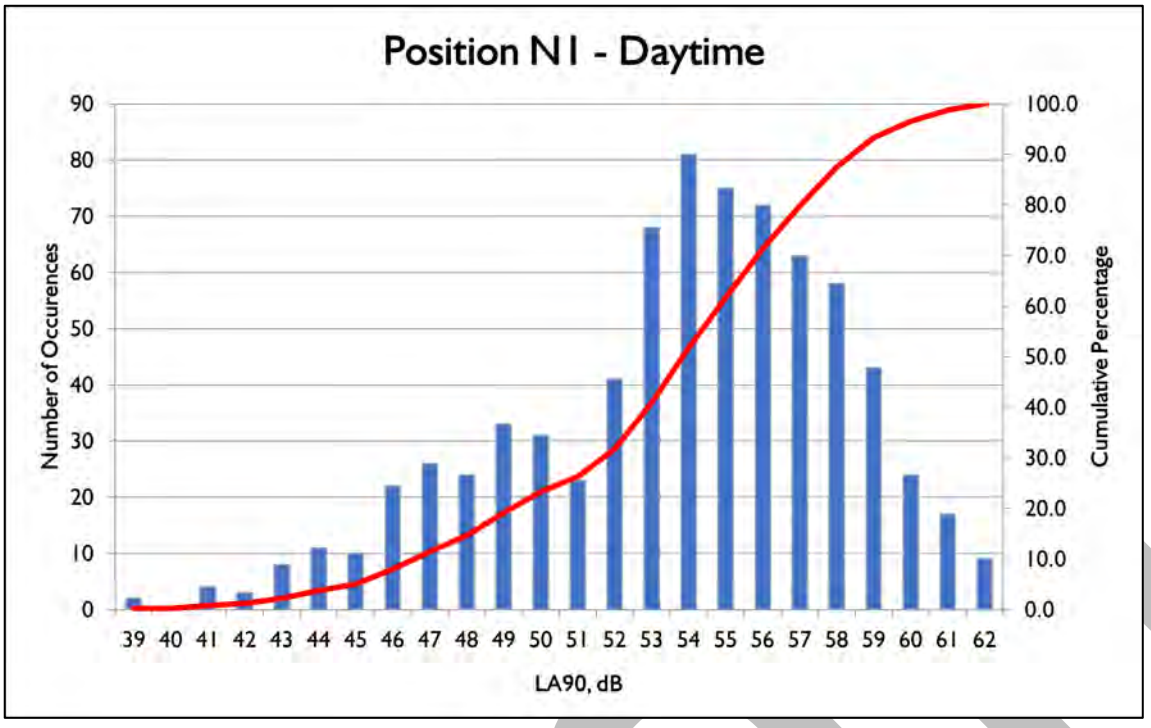


Figure F.8: L_{A90} Distribution - Position N1, night-time (23:00 to 07:00)

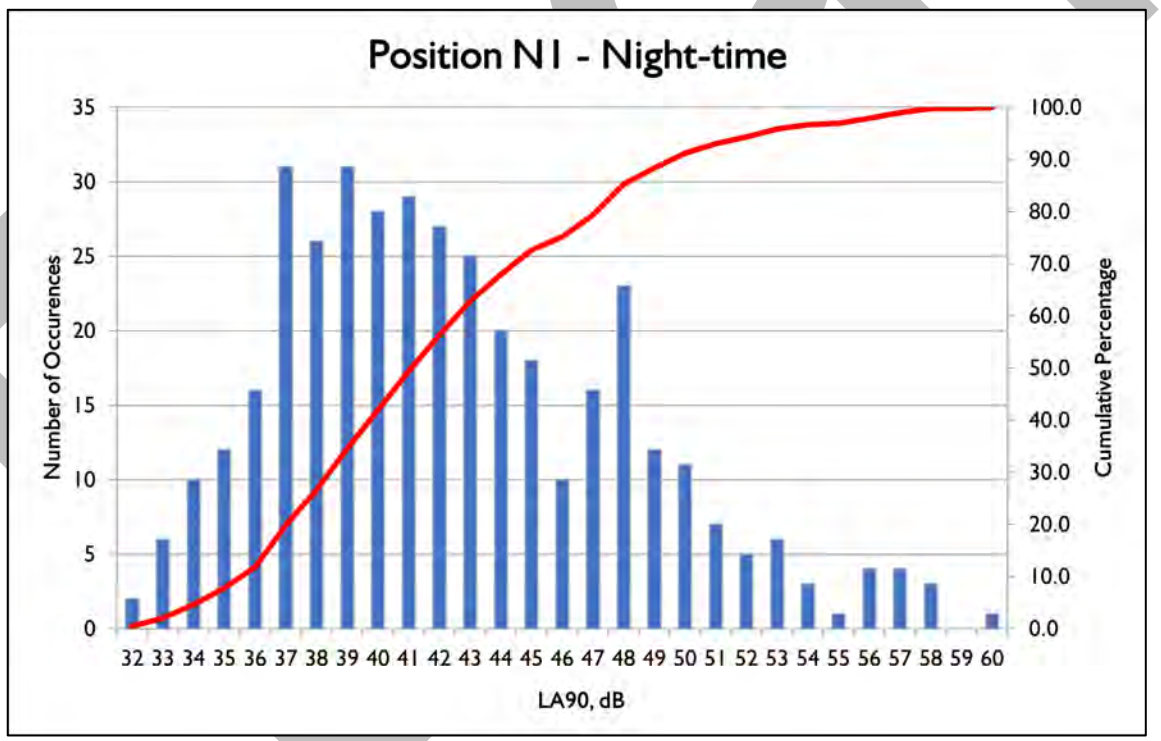


Figure F.9: L_{A90} Distribution - Position N2, daytime (07:00 to 23:00)

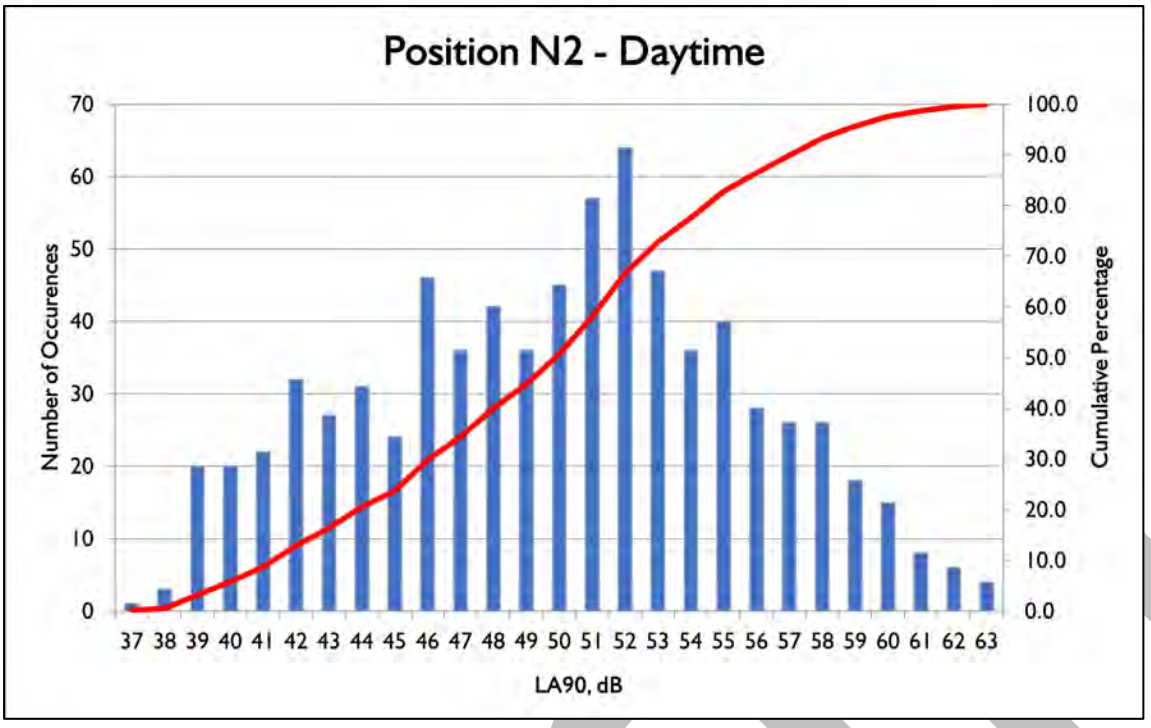


Figure F.10: L_{A90} Distribution - Position N2, night-time (23:00 to 07:00)

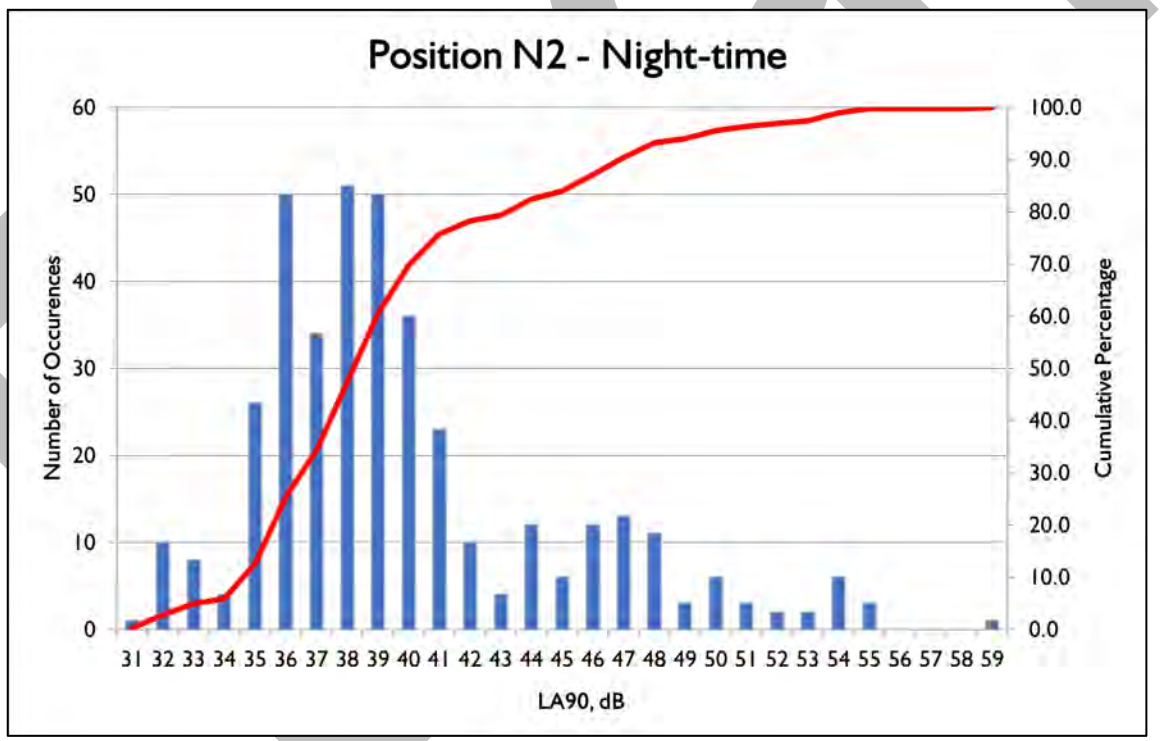


Figure F.11: L_{A90} Distribution - Position N4, daytime (07:00 to 23:00)

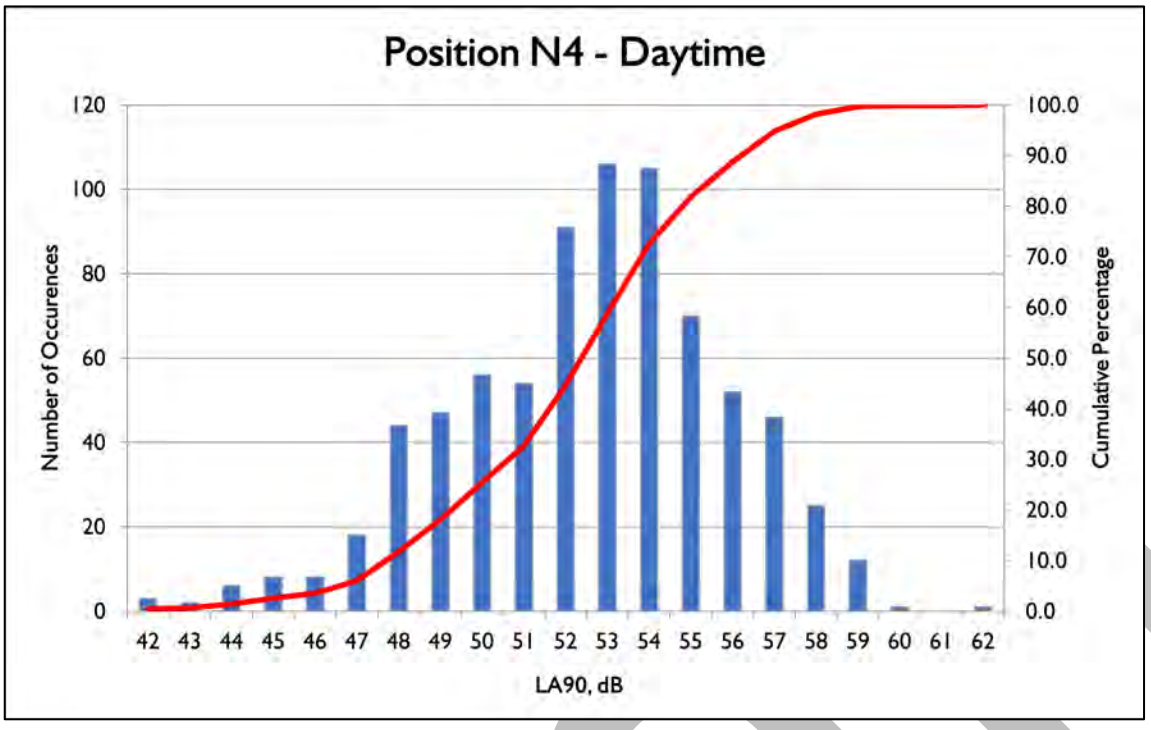


Figure F.12: L_{A90} Distribution - Position N4, night-time (23:00 to 07:00)

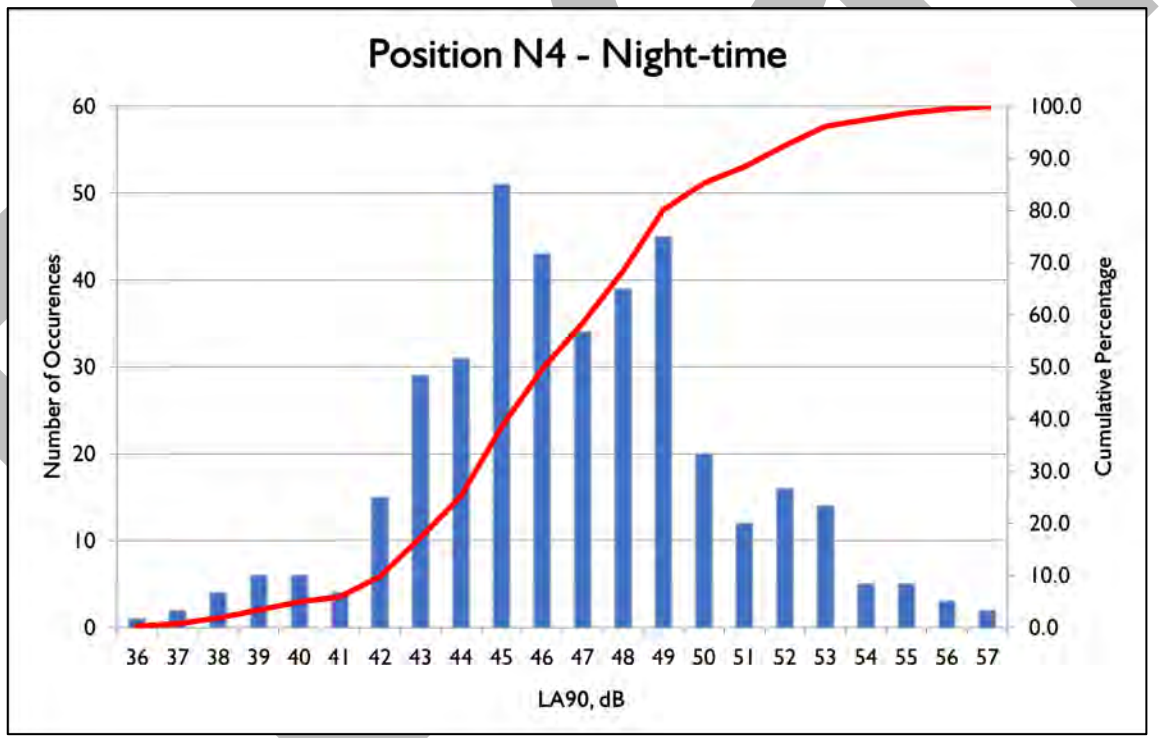


Figure F.13: L_{A90} Distribution - Position N5, daytime (07:00 to 23:00)

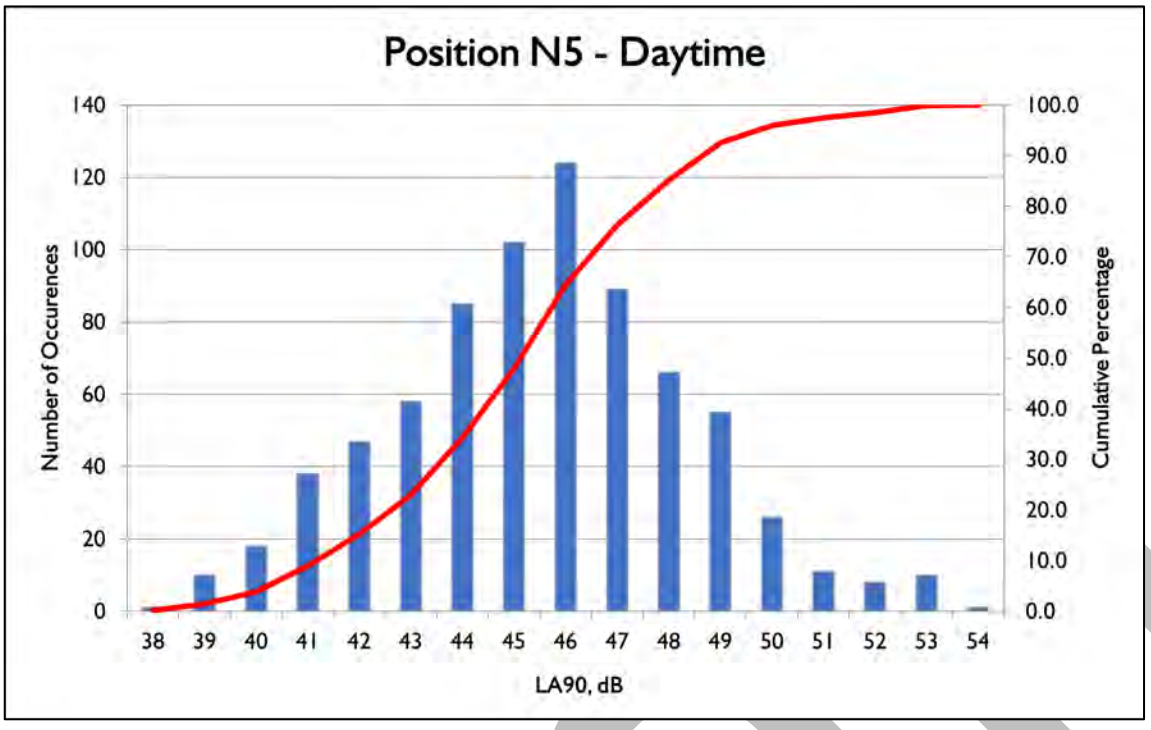


Figure F.14: L_{A90} Distribution - Position N5, night-time (23:00 to 07:00)

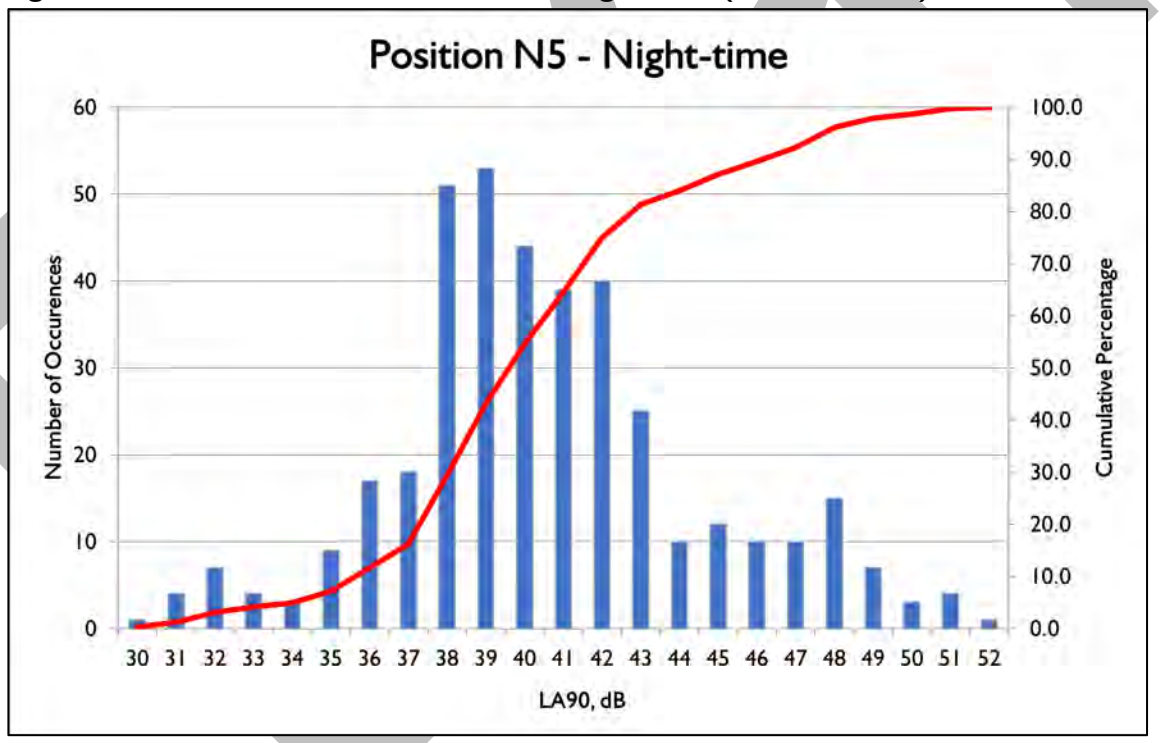


Figure F.15: L_{A90} Distribution - Position N7, daytime (07:00 to 23:00)

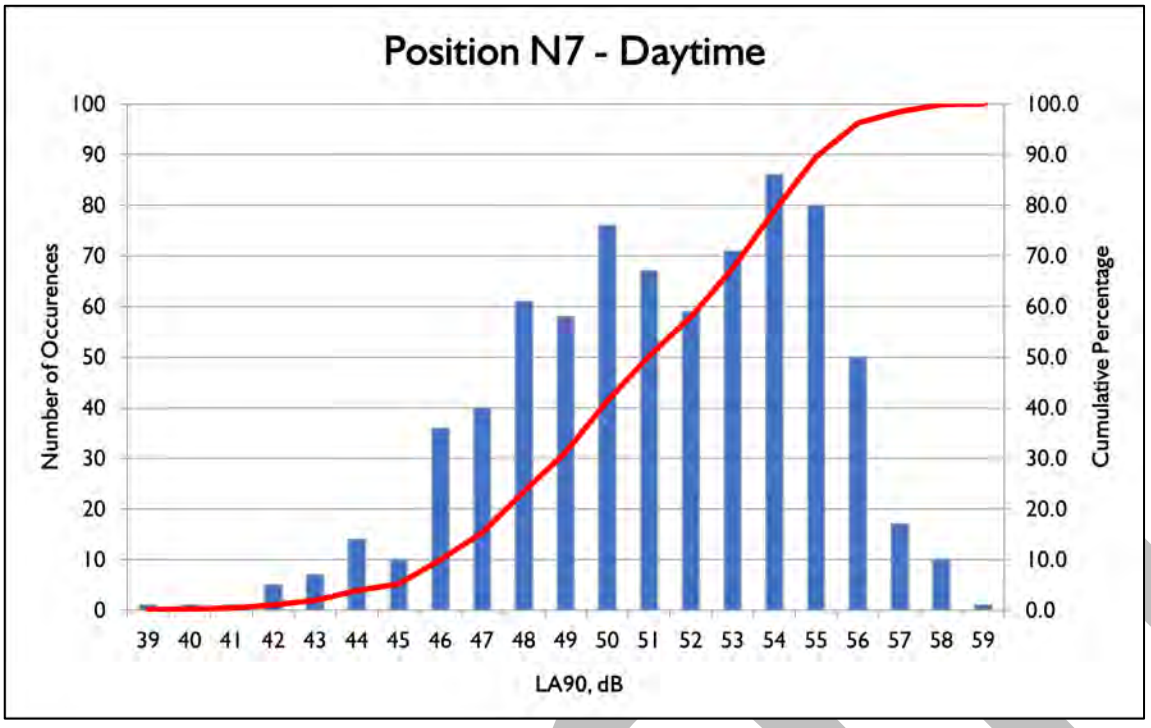


Figure F.16: L_{A90} Distribution - Position N7, night-time (23:00 to 07:00)

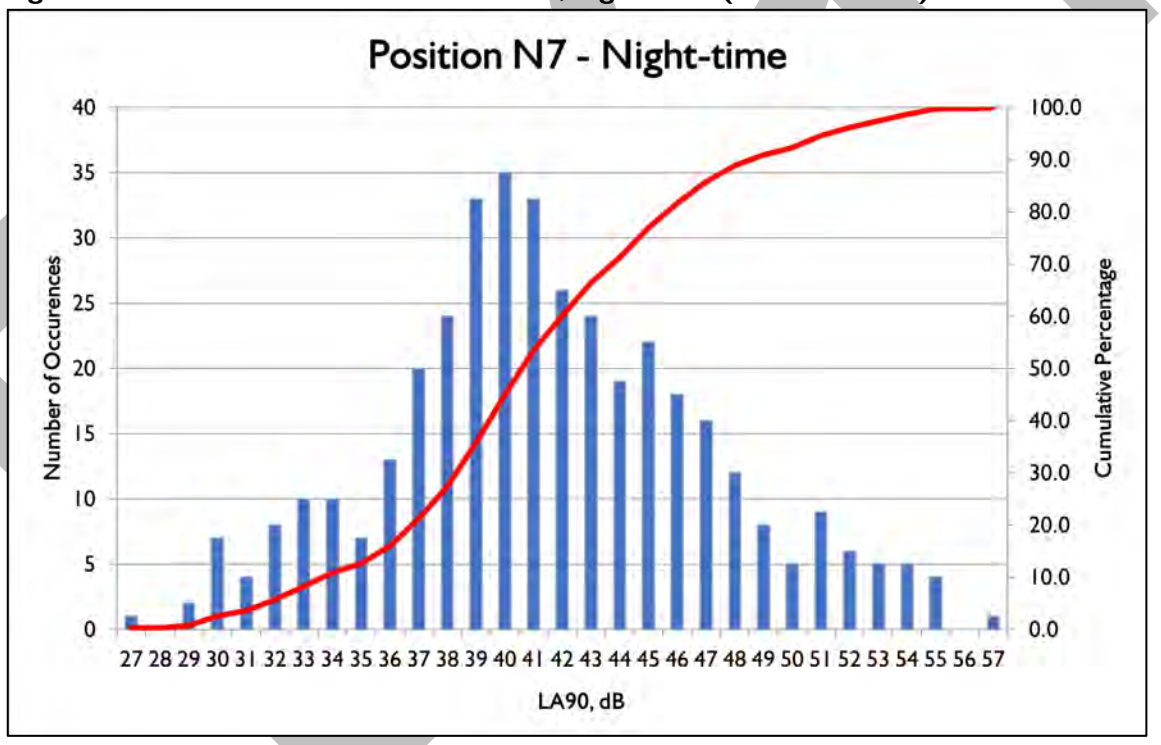


Figure F.17: L_{A90} Distribution - Position N9, daytime (07:00 to 23:00)

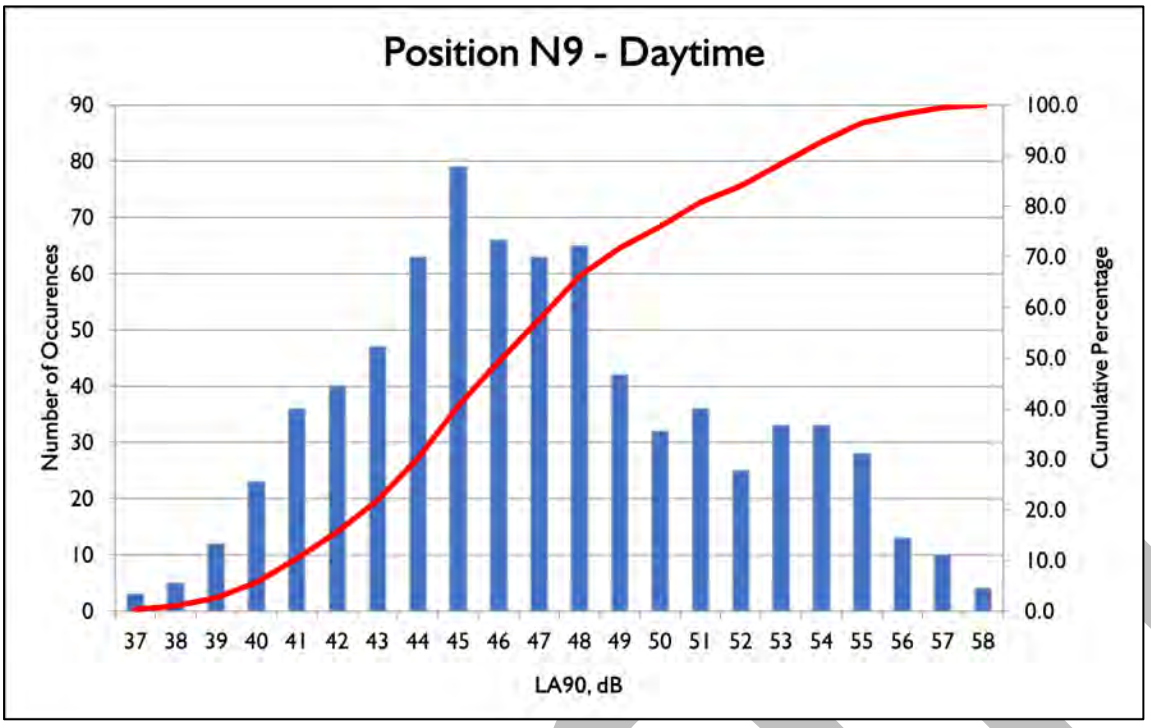


Figure F.18: L_{A90} Distribution - Position N9, night-time (23:00 to 07:00)

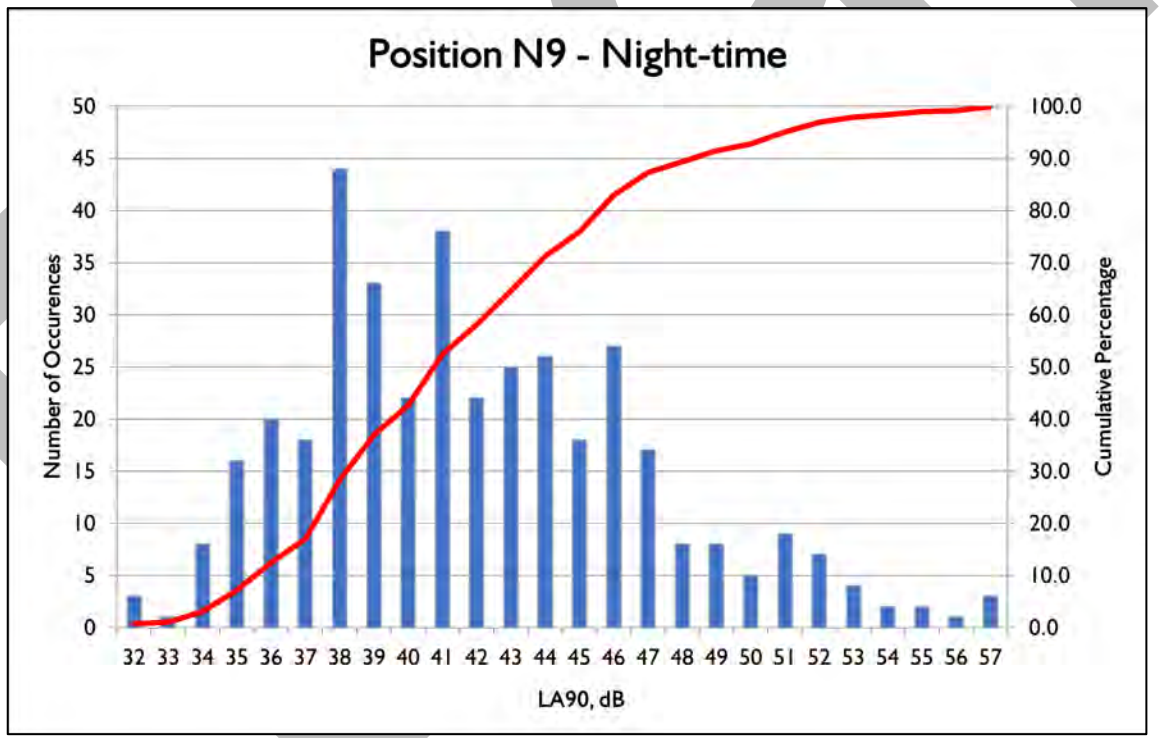


Figure F.19: L_{Aeq} Distribution - Position N1, daytime (07:00 to 23:00)

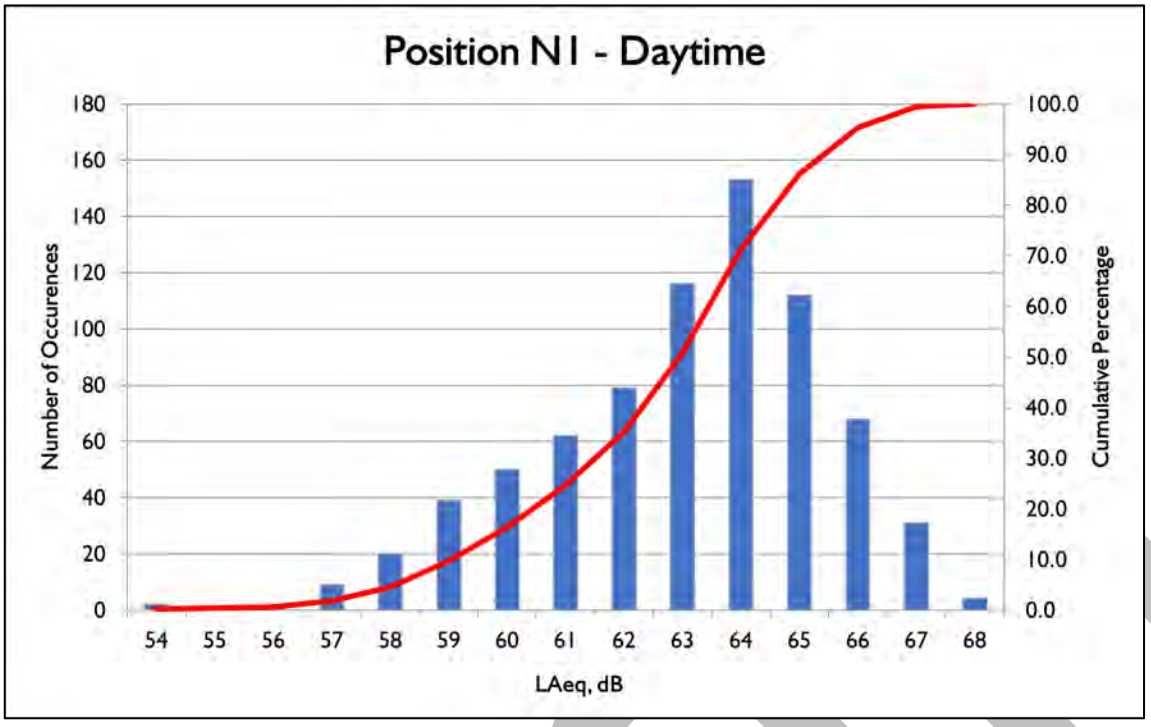


Figure F.20: L_{Aeq} Distribution - Position N1, night-time (23:00 to 07:00)

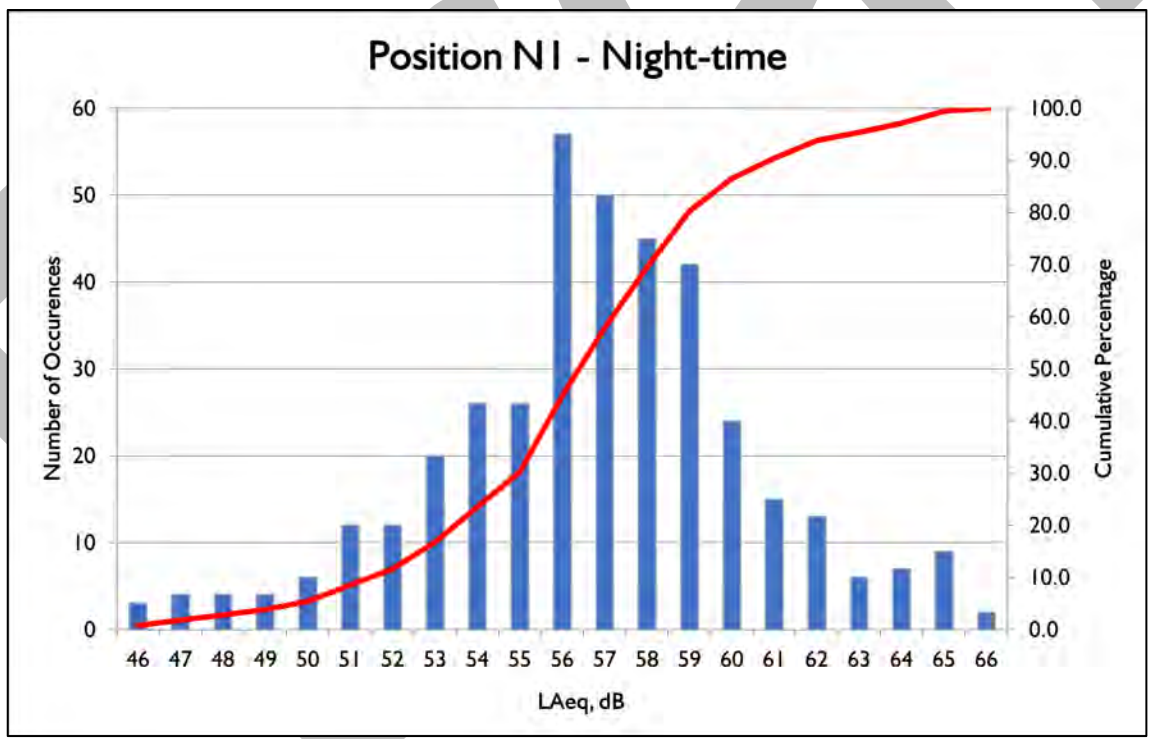


Figure F.21: L_{Aeq} Distribution - Position N2, daytime (07:00 to 23:00)

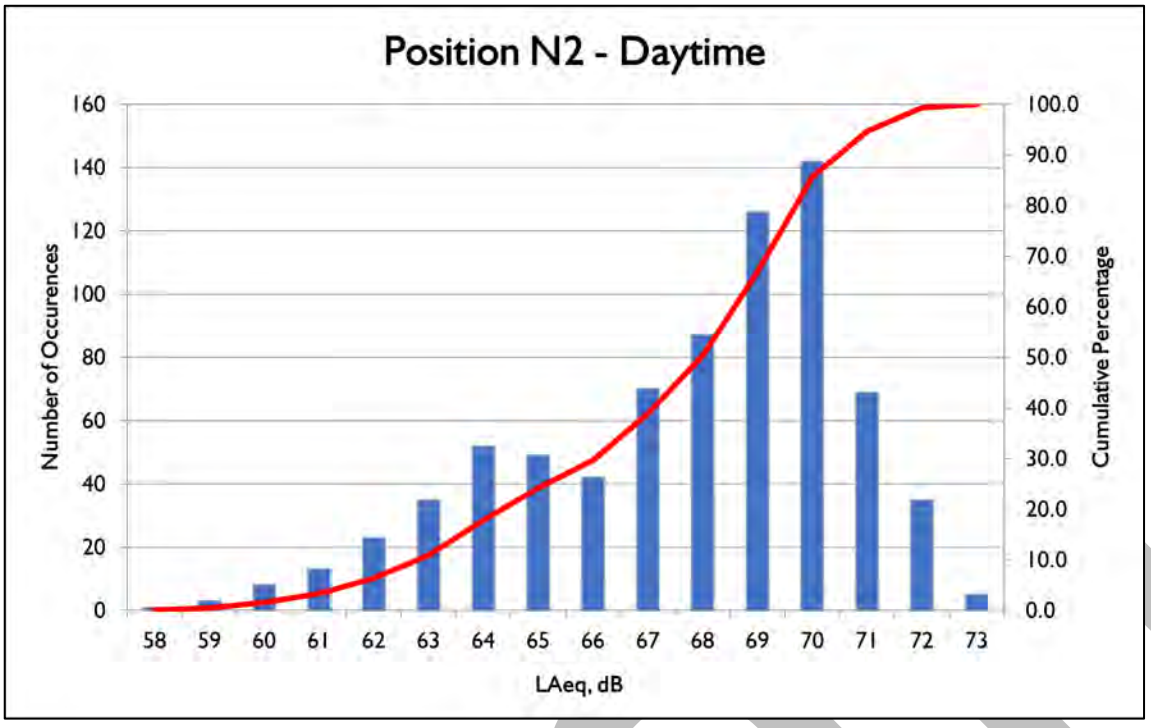


Figure F.22: L_{Aeq} Distribution - Position N2, night-time (23:00 to 07:00)

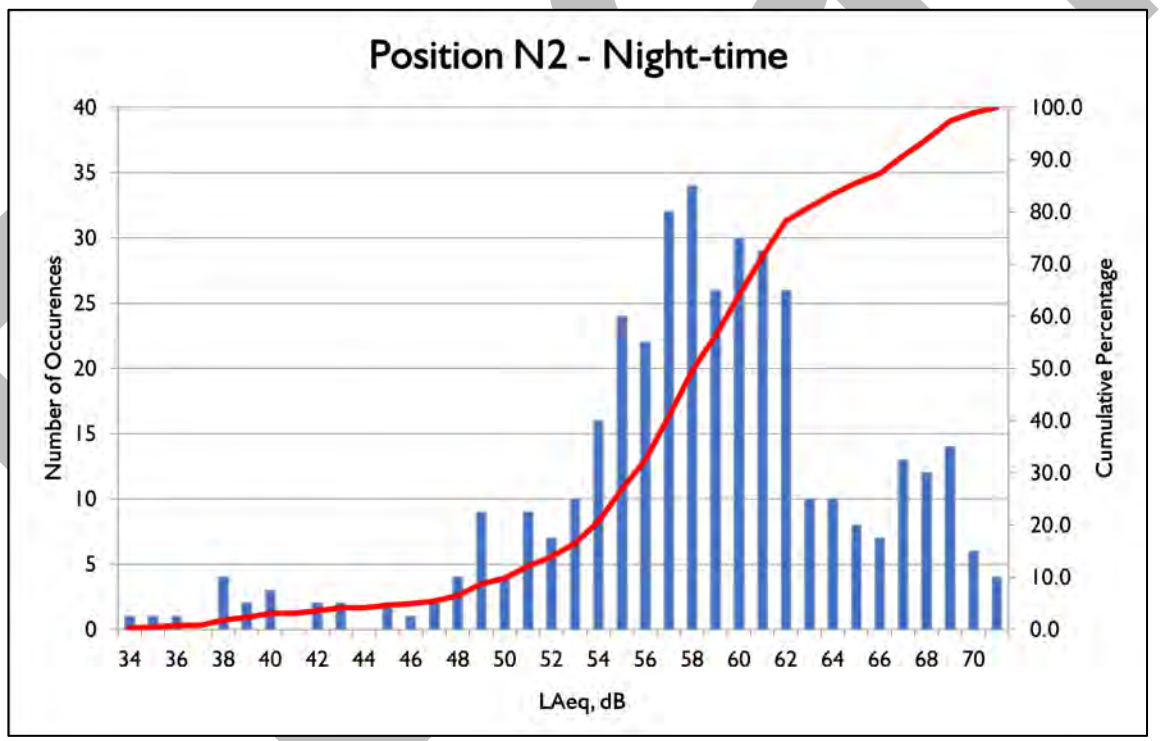


Figure F.23: L_{Aeq} Distribution - Position N4, daytime (07:00 to 23:00)

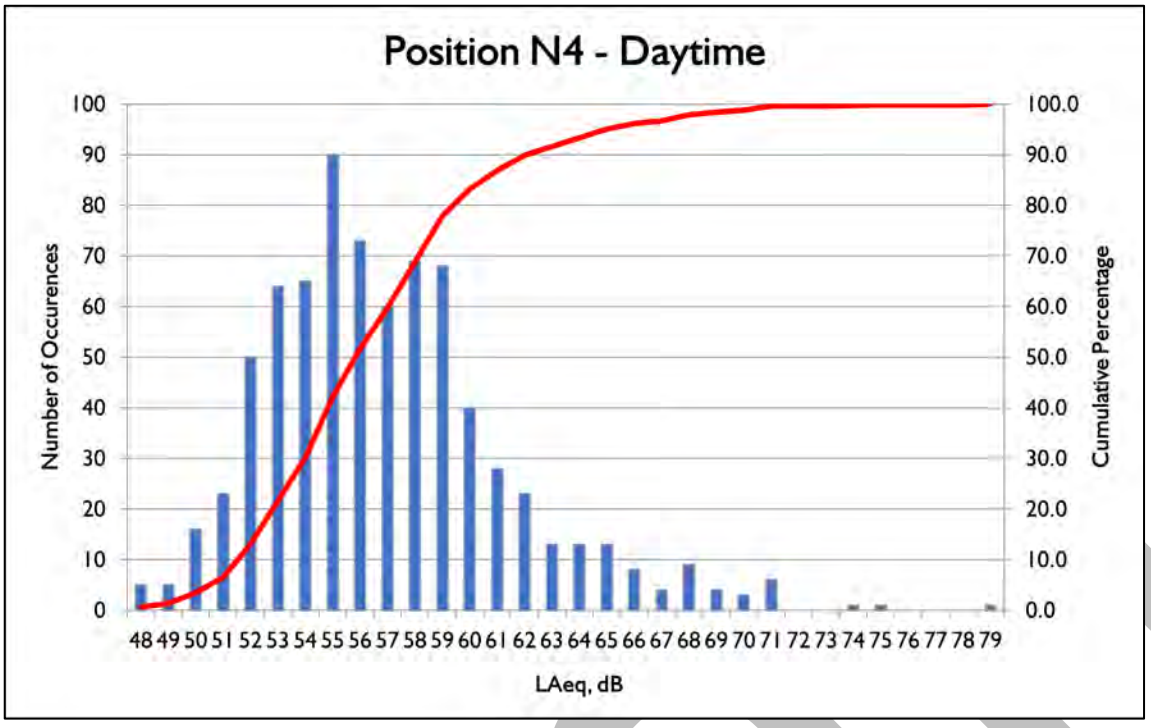


Figure F.24: L_{Aeq} Distribution - Position N4, night-time (23:00 to 07:00)

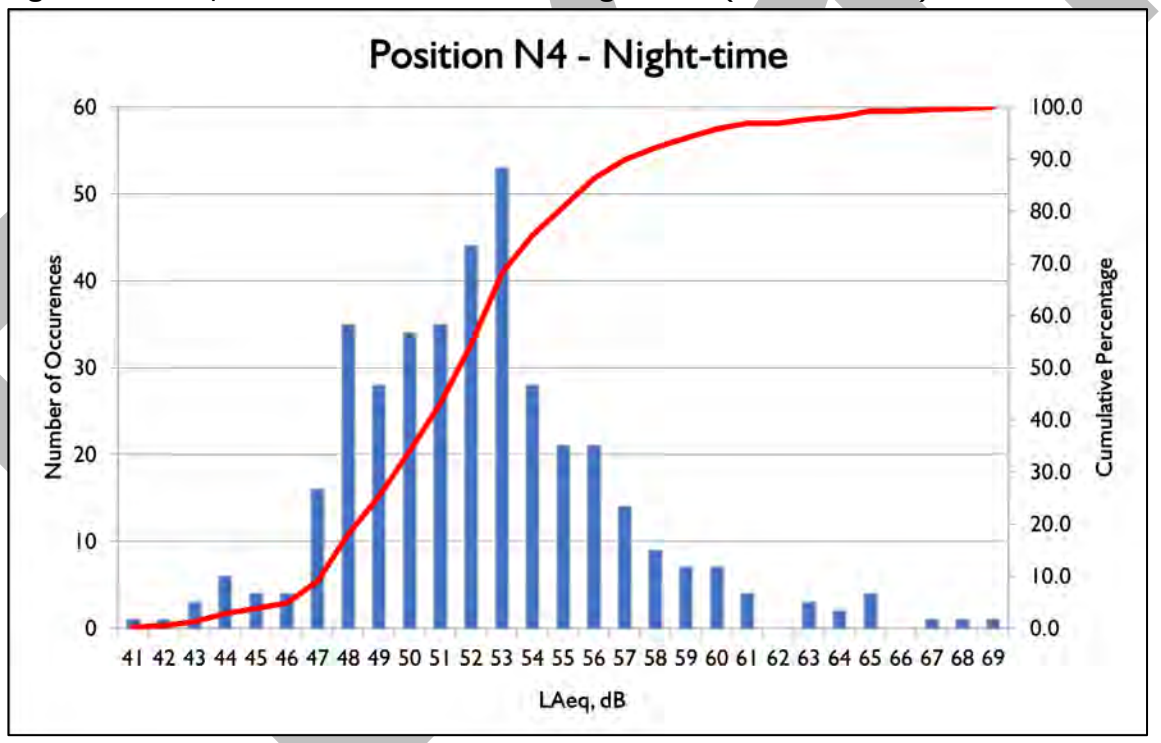


Figure F.25: L_{Aeq} Distribution - Position N5, daytime (07:00 to 23:00)

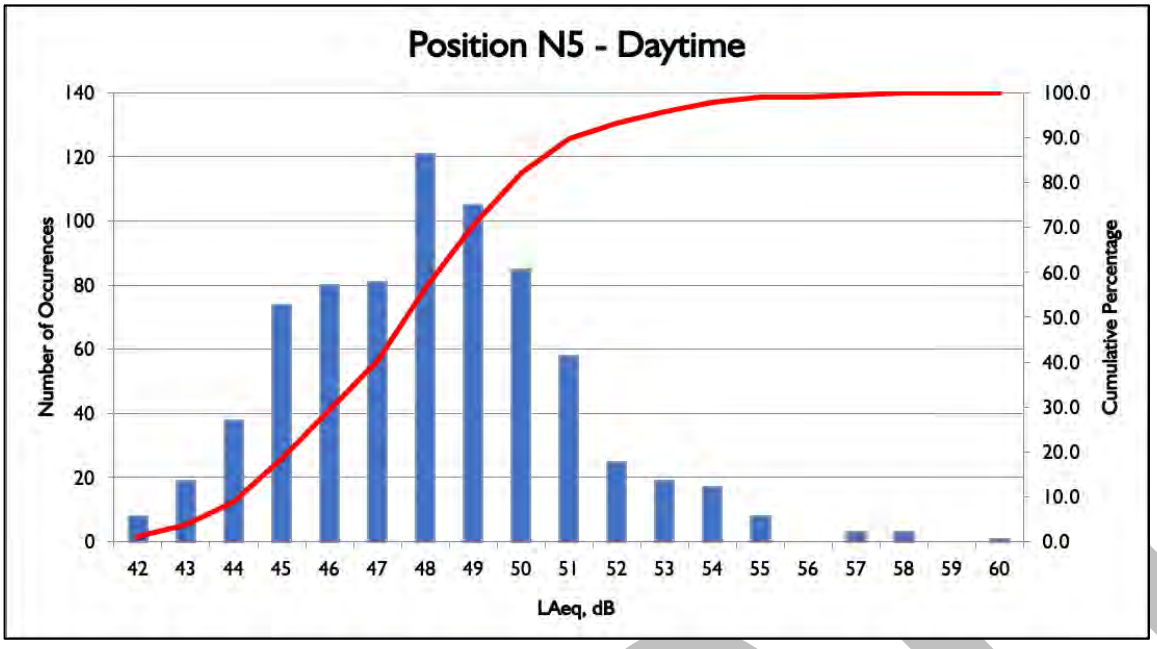


Figure F.26: L_{Aeq} Distribution - Position N5, night-time (23:00 to 07:00)

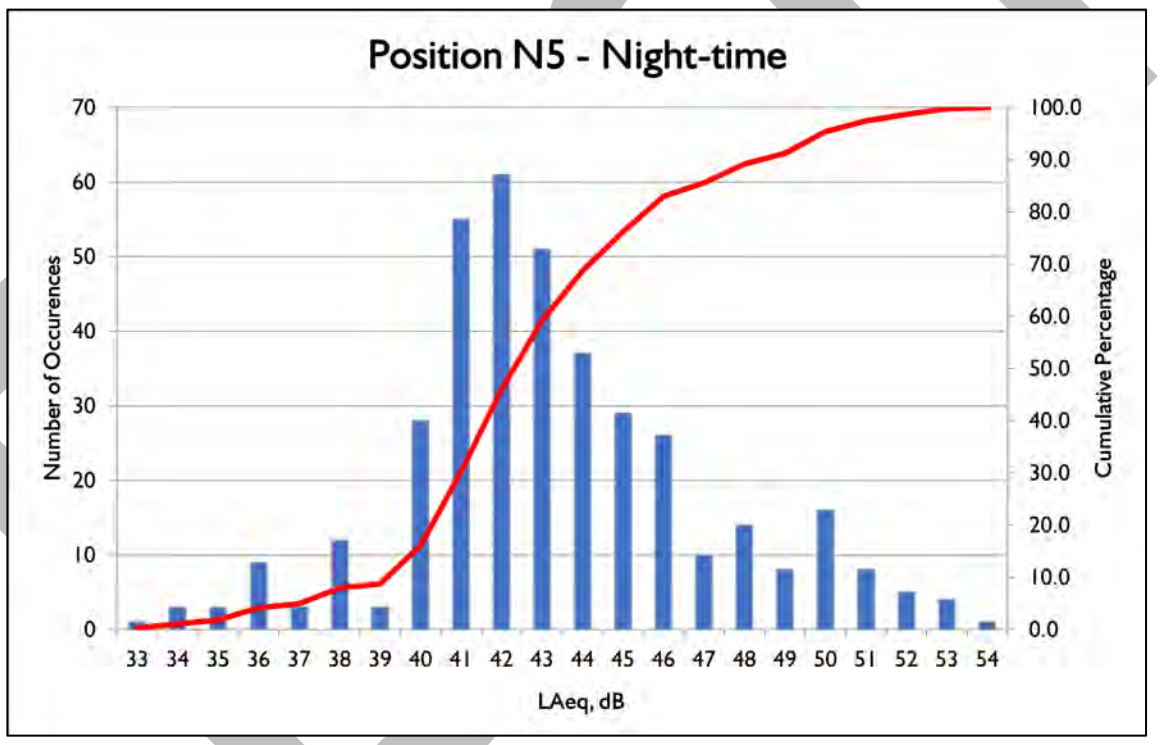


Figure F.27: L_{Aeq} Distribution - Position N7, daytime (07:00 to 23:00)

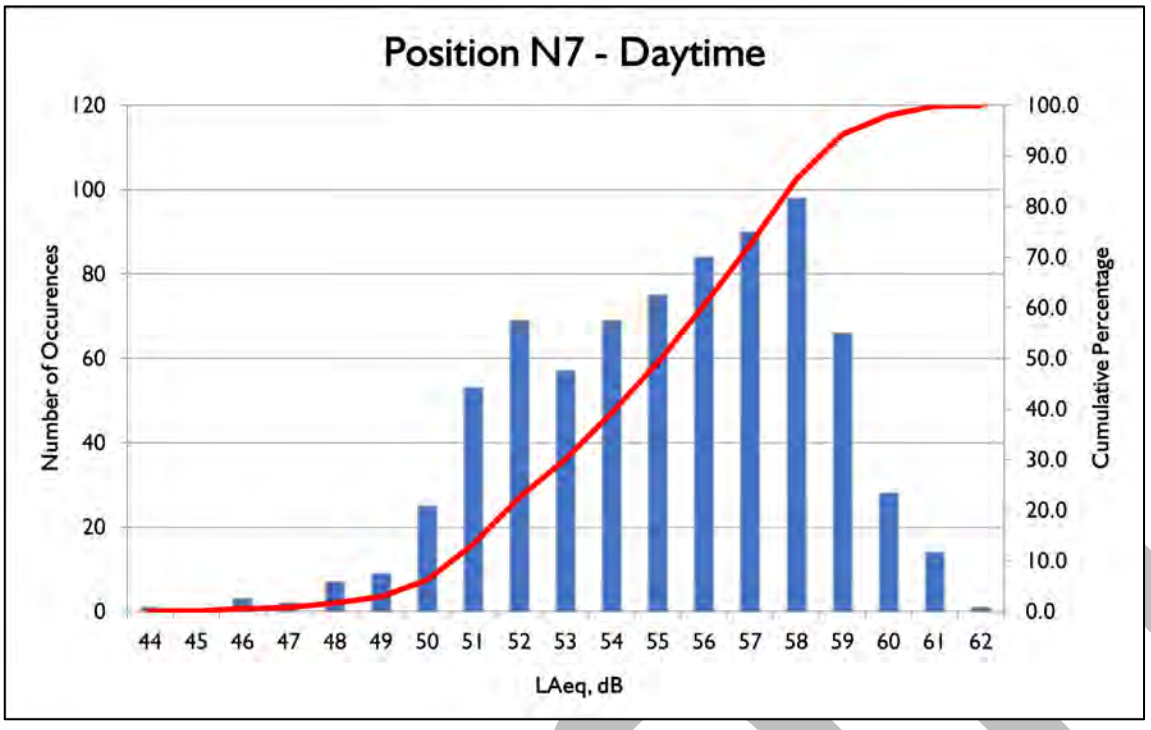


Figure F.28: L_{Aeq} Distribution - Position N7, night-time (23:00 to 07:00)

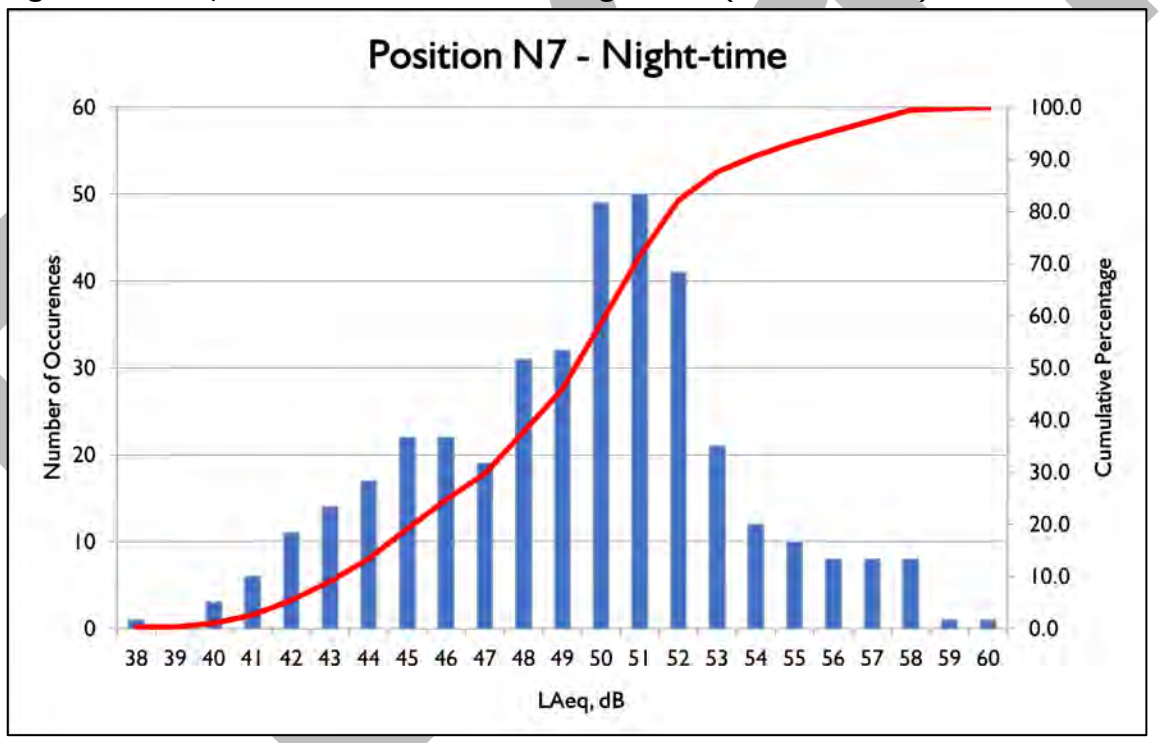


Figure F.29: L_{Aeq} Distribution - Position N9, daytime (07:00 to 23:00)

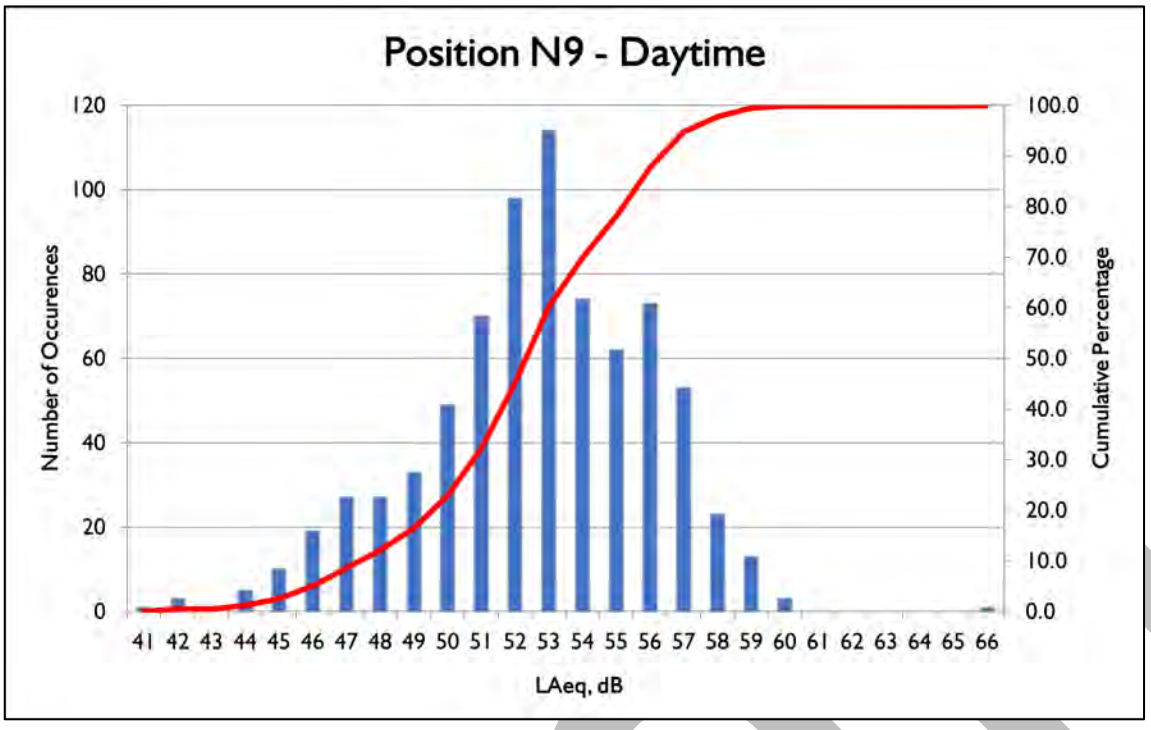
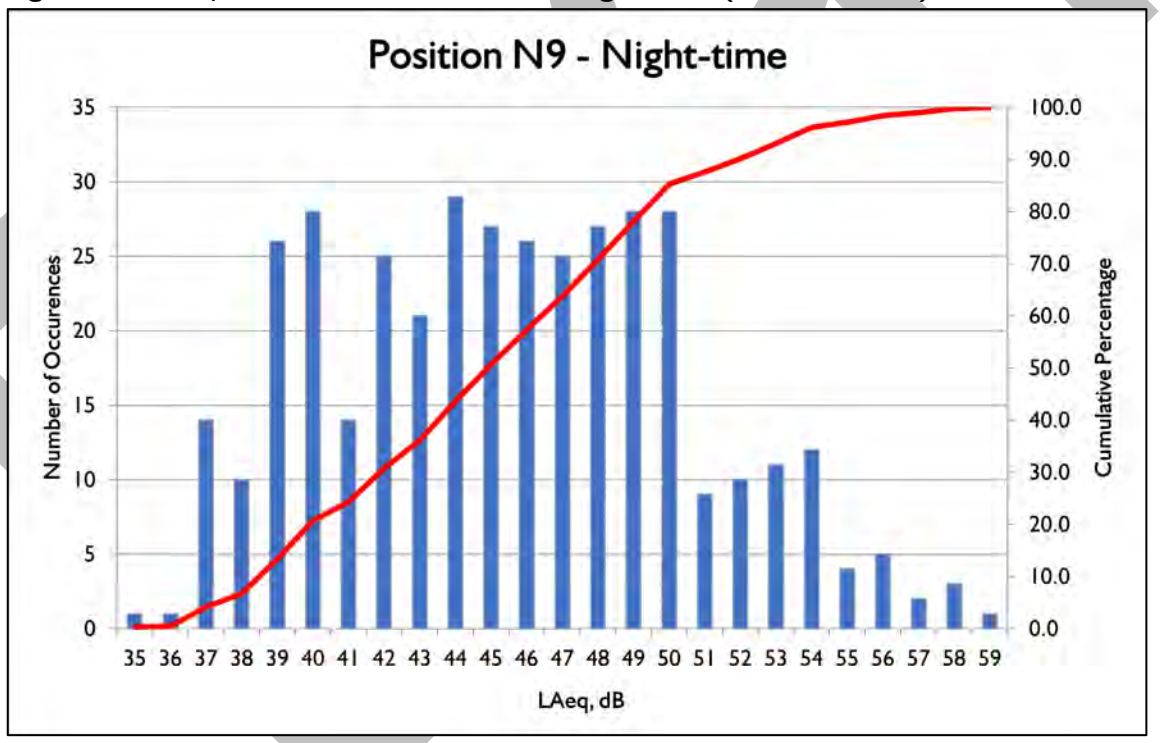


Figure F.29: L_{Aeq} Distribution - Position N9, night-time (23:00 to 07:00)



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Registered Address: Resound Acoustics Limited, One Eastwood, Harry Weston Road, Binley Business Park, Coventry, Warwickshire CV3 2UB
Registered in England and Wales, Number 5316313

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Registered Address: Resound Acoustics Limited, One Eastwood, Harry Weston Road, Binley Business Park, Coventry, Warwickshire CV3 2UB
Registered in England and Wales, Number 5316313