

High Speed Rail (West Midlands - Crewe) Supplementary Environmental Statement 2 and Additional Provision 2 Environmental Statement

Volume 5: Technical appendices map book

Sound, noise and vibration
(SV-01, SV-02, SV-03, SV-04)

High Speed Rail (West Midlands - Crewe)

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Additional Provision 2 Environmental Statement

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Department
for Transport

High Speed Two (HS2) Limited has been tasked by the Department for Transport (DfT) with managing the delivery of a new national high speed rail network. It is a non-departmental public body wholly owned by the DfT.

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A report prepared for High Speed Two (HS2) Limited:

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Map series description	<p>SV-01 presents the predicted operational sound from the new railway.</p> <p>The sound levels from the new railway (expressed as $L_{pAeq,T}$) are presented in typical noise mapping colours in 5 dB steps. There is a panel at the top right of the figure; the left-hand section of this panel contains a key communicating the night-time and daytime sound levels represented by the various colours. The right-hand part of the same panel contains text explaining how the sound levels presented on the figure inform the assessment of direct noise impacts and likely significant effects. A corresponding and similar panel is found on SV-02, along with the key sound contours that were used within the environmental assessment.</p>	<p>SV-02 presents the direct operational noise impacts and likely significant effects of the Proposed Scheme.</p> <p>The SV-02 figure series necessarily contains a large amount of information relating to the operational noise and vibration assessment. It is designed to communicate visually the assessment process from the prediction of impacts to the determination of likely residual significant effects. The corresponding text is included in Vol2 and Vol5.</p>	<p>The SV-03 figure series accompanies the construction noise & vibration assessments. It shows the locations at which a quantitative assessment of the direct effects of construction noise and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the construction noise and vibration reports contained in Volume 5: Appendix SV-002-0XX</p> <p>The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002-0XX.</p>	<p>The SV-04 figure series shows the locations at which a quantitative assessment of the direct effects of operational sound and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the operational sound and vibration reports contained in Volume 5: Appendix SV-002-0XX</p> <p>The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable crossreference to the baseline sound reports contained in Volume 5: Appendix SV-002-0XX</p>
Community Area name				
CA1 Fradley to Colton	✓	✓	✓	✓
CA2 Colwich to Yarlet	✓	✓	✓	✓
CA3 Stone and Sywnnerton	✓	✓	✓	✓
CA4 Whitmore Heath to Madeley	✓	✓	✗	✗
CA5 South Cheshire	✓	✓	✓	✗

Mapping explanatory notes

Structure of the HS2 Phase 2a Supplementary Environmental Statement 2 and the Additional Provision 2 Environmental Statement

This map book is part of the suite of documents that make up the Supplementary Environmental Statement 2 (SES2) and the Additional Provision Environmental Statement 2 (AP2 ES) for Phase 2a of the proposed High Speed Two (HS2) rail network between the West Midlands and Crewe.

The SES2 and the AP2 ES are separate documents. However, they are bound together and presented in a number of volumes as described below:

- Non-technical summary (NTS). This provides a summary in non-technical language of the SES2 (Part 1) and the AP2 ES (Part 2). It presents a summary of any likely residual significant environmental effects (i.e. effects that are likely to remain after mitigation measures are put in place), both beneficial and adverse, which are new or different to those reported in the Environmental Statement (ES) submitted to Parliament in July 2017 in support of the hybrid Bill for Phase 2a of HS2 ('the main ES'), as amended by SES1 and, where relevant, AP1 ES;
- Glossary of terms and list of abbreviations. This contains any new or different terms and abbreviations used throughout the SES2 and the AP2 ES, which are not already explained in the main ES or SES1 and AP1 ES;
- Volume 1: Introduction to the SES2 and the AP2 ES. This introduces the supplementary environmental information and changes to the design and construction assumptions included within the SES2 and amendments within the AP2 ES. The report explains the environmental impact assessment (EIA) process that has been applied;
- Volume 2: Community area reports and map books. These report the supplementary environmental information and changes to the design and construction assumptions included within the SES2 (Part 1), amendments within the AP2 ES (Part 2) and any new or different likely significant environmental effects arising from these changes or assumptions and amendments in each community area. These effects are compared to those reported in the main ES, as amended by SES1 (and by SES2 for AP2). The AP1 amendments are also taken into account where relevant. The maps relevant to each community area are provided in separate Volume 2 map books and should be read in conjunction with the relevant community area report;
- Volume 3: Route-wide effects. This describes any new or different likely significant environmental effects arising at a route-wide level from the supplementary environmental information and changes to the design and construction assumptions included within the SES2 (Part 1) and the amendments within the AP2 ES (Part 2) compared to those reported in the main ES, as amended by SES1 (and by SES2 for the AP2 amendments). The AP1 amendments are also taken into account where relevant; and
- Volume 5: Appendices and map books. These contain supporting environmental information and associated maps.

A Volume 4: Off-route effects report was produced as part of the main ES. A separate Volume 4 has not been produced as part of the SES2 and AP2 ES. Any new or different significant effects arising from the AP2 amendments are reported in the most relevant Volume 2 community area report.

Certain reports and maps containing background information and data (BID) have been produced, which do not form part of the SES2 and AP2 ES. These documents are available online at www.gov.uk/hs2. The BID documents and maps present background survey information and other relevant background material.

Copyright statements

Copyright statements are presented in the Data dictionary and definitions section at the front of the map book, due to limited space to include this on the individual maps themselves.

Ordnance Survey data

All maps produced as part of the SES2 and the AP2 ES contain Ordnance Survey (OS) data. HS2 Ltd use the most up to date mapping available, where possible, supplied by the OS and as such, we cannot be held responsible for any inaccuracies within this data.

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Chainage

Most of the maps presented as part of the SES2 and the AP2 ES have a chainage value shown next to the alignment. Chainage is presented on the maps in black font, in the form of XX+YYY. E.g. 192+000 or 239+500.

Chainage (known as reference chainage) is referenced from Euston Station, which is 0+000, and the value presented is in metres. E.g. 192+000 refers to the point, 192,000m, or 192km, from Euston Station. Chainage values increase in intervals dependant on the map scale. For maps at 1:50,000 scale chainage is shown at 5km intervals. For maps at 1:25,000 scale chainage is shown at 2km intervals. For maps at 1:20,000, 1:10,000, 1:5,000 and 1:2,500 scales, chainage is shown at 1km intervals.

Chainage has been included on the maps as a useful tool for comparing different map sets showing the different environmental themes or engineering plans, due to map sets having different scales and therefore showing differing amounts of alignment on the map.

Map sheet layout

Each map in Volume 2 is presented twice, with the main ES map (published July 2017) on the left hand page, where relevant, and the SES2 and the AP2 ES map on the right. For the maps which show the amendment to the Handsacre Junction connection the map from the relevant Phase One Additional Provision Environmental Statement (e.g. AP2 or AP4) is on the left hand page. For the CT-05 and CT-06 map series, the SES2 and the AP2 ES map is annotated with different coloured clouds which highlight the areas of change. The coloured text box provides a brief description of the design change and amendment, and gives the SES2 and the AP2 ES reference number. Only maps which have been amended as a result of the SES2 and the AP2 ES are included within the map books. Other design changes which are within the existing limits of the Bill and do not result in new or different likely significant effects are also shown on the maps, but are not indicated by a cloud. The below table highlights the coloured clouds used, and their description.

Cloud / text box colour	Description
Blue	Design changes relating to the SES2 (Part 1 of each Volume 2 report).
Red	Proposed amendments relating to the AP2 ES (Part 2 of each Volume 2 report).
Grey	Proposed design changes and amendments relating to SES1 changes and AP1 amendments, provided for reference.

SES changes and AP amendments (now referred to as SES1 changes and AP1 amendments) were denoted in the SES and AP ES documents and maps as follows: SES-00X-00X or AP-00X-00X. In order to clearly distinguish between SES1 and SES2 changes and AP1 and AP2 amendments, references in the SES2 and AP2 ES documents and maps relating to SES1 changes and AP1 amendments are now denoted as follows: SES1-00X-00X or AP1-00X-00X.

Each Volume 5 map is annotated to describe the change to a receptor or significant effect, and to give the SES2 and the AP2 ES reference number. For more detailed information about the SES2 and the AP2 ES annotation, refer to the map series legend. Only maps which have been amended as a result of the SES2 and the AP2 ES are included within the map book. Changes to receptors or significant effects relating to SES1 or AP1 ES are also provided for reference. Where this is the case they are shown in a faded box.

Further details on the approach to mapping is set out in Section 6 of Volume 1 of the SES2 and AP2 ES.

Map orientation

The majority of the maps presented in these map books are presented with the railway alignment running horizontally across the page. The direction of travel to London would be following the alignment to the right hand side of the page, and Crewe to the left.

The exception to this, are map series LV-03 and LV-04 which present the alignment running from bottom to top of the page. This is to allow more of the modelled outputs to be shown at the appropriate map scale. In this instance, the direction of travel to London would be to the bottom of the page, and Crewe to the top.

Map books

In total there are 16 map books which make up the SES2 and the AP2 ES, spread across volumes 2 and 5. A list of the titles is provided below for reference.

Name
Volume 2: Map book – CA1: Fradley to Colton
Volume 2: Map book – CA2: Colwich to Yarlet
Volume 2: Map book – CA3: Stone and Swynnerton
Volume 2: Map book – CA4: Whitmore Heath to Madeley
Volume 2: Map book – CA5: South Cheshire
Volume 5: Map book – Agriculture, forestry and soils (AG-01, AG-02, AG-04)
Volume 5: Map book – Air quality (AQ-01)
Volume 5: Map book – Community (CM-01)
Volume 5: Map book – Committed developments (CT-13)
Volume 5: Map book – Cultural heritage (CH-01, CH-02, CH-03)
Volume 5: Map book – Ecology - designated sites (EC-01)
Volume 5: Map book – Landscape and visual (LV-00, LV-02, LV-07, LV-08)
Volume 5: Map book – Socio-economics (SE-01)
Volume 5: Map book – Sound, noise and vibration (SV-01, SV-02, SV-03, SV-04)
Volume 5: Map book – Traffic and transport (TR-03, TR-04, TR-08)
Volume 5: Map book – Water resources (WR-05, WR-06)

High Speed Rail (West Midlands - Crewe)

**Supplementary Environmental Statement 2 and
Additional Provision 2 Environmental Statement**

Data dictionary and definitions

Data dictionary and definitions

Legend features	Definition	Source	Copyright
1km Airborne sound study area	This defines the area within which operational airborne sound impacts of the scheme have been quantitatively assessed. This area is defined as within 1km of surface sections of the route in rural areas and within 500m of surface sections of the route in urban areas.	High Speed Two (HS2) Ltd	
Airborne sound and vibration assessment location	Locations near surface sections of the route at which a quantitative assessment of airborne sound and ground-borne vibration impacts due to the operation of the Proposed Scheme has been carried out. These are labelled with an assessment location reference code to enable cross-reference to the operational sound and vibration reports contained in the relevant Volume 5: Appendix SV-002.	High Speed Two (HS2) Ltd	
Airborne sound assessment location	Locations at which a quantitative assessment of airborne sound impacts due to the operation of the Proposed Scheme has been carried out. These are labelled with an assessment location reference code to enable cross-reference to the operational sound and vibration reports contained in the relevant Volume 5: Appendix SV-002.	High Speed Two (HS2) Ltd	
Airborne sound, ground-borne sound and vibration assessment location	Locations at which a quantitative assessment of airborne sound, ground-borne sound and vibration impacts due to the operation of the Proposed Scheme has been carried out. These are labelled with an assessment location reference code to enable cross-reference to the operational sound & vibration reports contained in the relevant Volume 5: Appendix SV-002.	High Speed Two (HS2) Ltd	
Baseline measurement locations	These represent locations at which sound measurements were carried out as part of the baseline sound surveys. Measurements of existing baseline sound levels at these locations have been used to derive baseline sound levels at operational and construction sound assessment locations. These baseline measurement locations are labelled with a reference number which enables cross-reference to the baseline sound reports contained in the relevant Volume 5: Appendix SV-002, which also describes how these are linked to baseline levels at assessment locations.	High Speed Two (HS2) Ltd	
Committed developments – SV Only	<p>This informs the assessment of the future baseline.</p> <p>A development consent or allocation that has full or outline planning permission, or is allocated in an adopted development plan.</p>	High Speed Two (HS2) Ltd	© Crown copyright and database rights 2017 OS 100049190. You are permitted to use this data solely to enable you to respond to, or interact with, the organisation that provided you with the data. You are not permitted to copy, sub-licence, distribute or sell any of this data to third parties in any form.
Community area boundary	The Environmental Statement has been split into 5 sections called Community Areas.	High Speed Two (HS2) Ltd	© Crown copyright and database rights 2017 OS 100049190. You are permitted to use this data solely to enable you to respond to, or interact with, the organisation that provided you with the data. You are not permitted to copy, sub-licence, distribute or sell any of this data to third parties in any form.
Construction airborne sound and vibration assessment location	Locations at which a quantitative assessment of construction noise and vibration impacts of the Proposed Scheme has been carried out. These are labelled with an assessment location reference code to enable cross-reference to the construction sound & vibration reports contained in the relevant Volume 5: Appendix SV-002.	High Speed Two (HS2) Ltd	
Construction airborne sound assessment location	Locations at which a quantitative assessment of construction noise impacts of the Proposed Scheme has been carried out. These are labelled with an assessment location reference code to enable cross-reference to the construction sound & vibration reports contained in the relevant Volume 5: Appendix SV-002.	High Speed Two (HS2) Ltd	

Legend features	Definition	Source	Copyright
Construction vibration assessment locations	Locations at which a quantitative assessment of construction vibration impacts of the Proposed Scheme has been carried out. These are labelled with an assessment location reference code to enable cross-reference to the construction sound & vibration reports contained in the relevant Volume 5: Appendix SV-002.	High Speed Two (HS2) Ltd	
County boundary	County boundaries from Ordnance Survey boundary mapping.	Ordnance Survey	© Crown copyright and database rights 2017 OS 100049190. You are permitted to use this data solely to enable you to respond to, or interact with, the organisation that provided you with the data. You are not permitted to copy, sub-licence, distribute or sell any of this data to third parties in any form.
Depot, station, headhouse or portal building	Extends to cover operational footprint of each depot and station and the footprint of each tunnel vent shaft and headhouse at surface level. Excludes any ancillary buildings associated with these structures.	High Speed Two (HS2) Ltd	
District/Borough boundary	Ordnance Survey local authority boundary mapping.	Ordnance Survey	© Crown copyright and database rights 2017 OS 100049190. You are permitted to use this data solely to enable you to respond to, or interact with, the organisation that provided you with the data. You are not permitted to copy, sub-licence, distribute or sell any of this data to third parties in any form.
Engineering earthworks: Cutting	Cuttings created in the construction of the railway and associated works such as highways.	High Speed Two (HS2) Ltd	
Engineering earthworks: Embankment	Embankments created in the construction of the railway and associated works such as highways.	High Speed Two (HS2) Ltd	
Envisaged measures further reducing noise effects	Other environmental features e.g. landscaping: These lines represent environmental mitigation features provided for reasons other than noise mitigation which also reduce sound levels from the Proposed Scheme to the surrounding environment. These features are not placed specifically to reduce or remove a likely significant noise effect. Examples include landscaping and visual mitigation earthworks (non-engineering earthworks). Engineering e.g. cuttings: These lines represent engineering features which reduce sound levels from the Proposed Scheme to the surrounding environment but are not placed specifically to reduce or remove a likely significant noise effect. Examples include cuttings and safety barriers on viaducts which are not close to sensitive receptors.	High Speed Two (HS2) Ltd	
Envisaged mitigation to avoid / reduce significant noise effects	Landscaping and/or fence barriers: These lines represent the envisaged mitigation provided specifically to reduce sound levels from the Proposed Scheme at sensitive receptors in order to reduce or remove likely operational significant noise effects. Examples include noise fence barriers or earth bunds (non-engineering earthworks) acting as noise barriers. These features are labelled with the height of the top of the barrier/bund above rail level. Engineering e.g. cuttings: These lines represent engineering features of the route which reduce sound levels from the Proposed Scheme at potentially significant sensitive receptors. These features, therefore, serve a material purpose in reducing or avoiding likely significant noise effects. Examples include engineering cuttings near to sensitive receptors. These features are labelled with the height of the top of the feature above rail level.	High Speed Two (HS2) Ltd	

Legend features	Definition	Source	Copyright
Ground-borne noise or vibration impact	Buildings at which an operational ground-borne sound or vibration impact is predicted from the Proposed Scheme.	High Speed Two (HS2) Ltd	© Crown copyright and database rights 2017 OS 100049190. You are permitted to use this data solely to enable you to respond to, or interact with, the organisation that provided you with the data. You are not permitted to copy, sub-licence, distribute or sell any of this data to third parties in any form.
Ground-borne sound & vibration study area (highly sensitive non-residential)	This defines the area within which direct operational ground-borne sound and vibration impacts of the scheme at highly sensitive non-residential receptors have been quantitatively assessed. This area is defined as within 200m of the route.	High Speed Two (HS2) Ltd	
Ground-borne sound & vibration study area (residential and non-residential)	This defines the area within which direct operational ground-borne sound and vibration impacts of the scheme at residential and non-residential receptors have been quantitatively assessed. This area is defined as within 85m of the route.	High Speed Two (HS2) Ltd	
Ground-borne sound and/or vibration assessment location	Locations near tunnelled sections of the route at which a quantitative assessment of ground-borne sound and vibration impacts due to the operation of the Proposed Scheme has been carried out. These are labelled with an assessment location reference code to enable cross-reference to the operational sound & vibration reports contained in the relevant Volume 5: Appendix SV-002.	High Speed Two (HS2) Ltd	
L_{pAFmax} exceeds 60dB façade	Assessment locations where the predicted value of L_{pAFmax} is 60 dB or greater having applied a façade correction of +2.5 dB to the predicted free field value.	High Speed Two (HS2) Ltd	
Non engineering earthworks: Cutting	Cuttings created in the construction of landscape features and mitigation measures.	High Speed Two (HS2) Ltd	
Non engineering earthworks: Embankment	Embankments created in the construction of landscape features and mitigation measures.	High Speed Two (HS2) Ltd	
Operational airborne sound impacts at buildings	The buildings shown on SV-02 and SV-05 are colour-coded according to the magnitude of the predicted noise impacts of the Proposed Scheme. Noise impacts are calculated by comparing the sound levels predicted if the Proposed Scheme did not go ahead with those if it did (details of this process can be found in Volume 5: Appendix SV001-000). Panel B on SV-02/SV-05 contains a key showing the colours used with the corresponding impact categories. The impacts presented are the greatest (i.e. worst-case) of the impacts predicted for daytime and night-time.	High Speed Two (HS2) Ltd	© Crown copyright and database rights 2017 OS 100049190. You are permitted to use this data solely to enable you to respond to, or interact with, the organisation that provided you with the data. You are not permitted to copy, sub-licence, distribute or sell any of this data to third parties in any form.
Potential additional noise insulation (triggered by maximum sound levels at night)	This represents dwellings which would potentially be provided with noise insulation due maximum sound levels from the Proposed Scheme (further information regarding assessment criteria can be found in Volume 5 Appendix SV-001-000 of the main ES).	High Speed Two (HS2) Ltd	
Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)	This represents dwellings which would potentially be provided with noise insulation due to noise from the Proposed Scheme exceeding the World Health Organization (WHO) night noise guidelines interim target (further information regarding assessment criteria can be found in Volume 5 Appendix SV-001-000 of the main ES).	High Speed Two (HS2) Ltd	
Potential noise insulation (triggered by Noise Insulation Regulations 1996)	This represents dwellings which would potentially qualify for noise insulation under the Noise Insulation (Railways and Other Guided Transport Systems) Regulations 1996 (further information regarding assessment criteria can be found in Volume 5 Appendix SV-001-000 of the main ES).	High Speed Two (HS2) Ltd	
Route in tunnel Route on surface	Represents the proposed route of HS2, split into route on surface and tunnelled sections.	High Speed Two (HS2) Ltd	
Sound Contours (SV-01)	The sound levels from the Proposed Scheme (expressed as $L_{pAeq,T}$ and representing sound from the new railway only) are presented in 5 dB steps. The levels are shown in the panel in the top-right hand corner of SV-01.	High Speed Two (HS2) Ltd	
Sound contours (SV-02/SV-05)	The sound levels from the Proposed Scheme (expressed as $L_{pAeq,T}$ and representing sound from the new railway only) are presented at two sound levels: 40 dB $L_{Aeq,T 23:00 to 07:00}$ and 55 dB $L_{Aeq,T 23:00 to 07:00}$. The corresponding daytime levels ($L_{Aeq,T 07:00 to 23:00}$) are shown in Panel A of SV-02/SV-05.	High Speed Two (HS2) Ltd	

High Speed Rail (West Midlands - Crewe)

Supplementary Environmental Statement 2 and Additional Provision 2 Environmental Statement

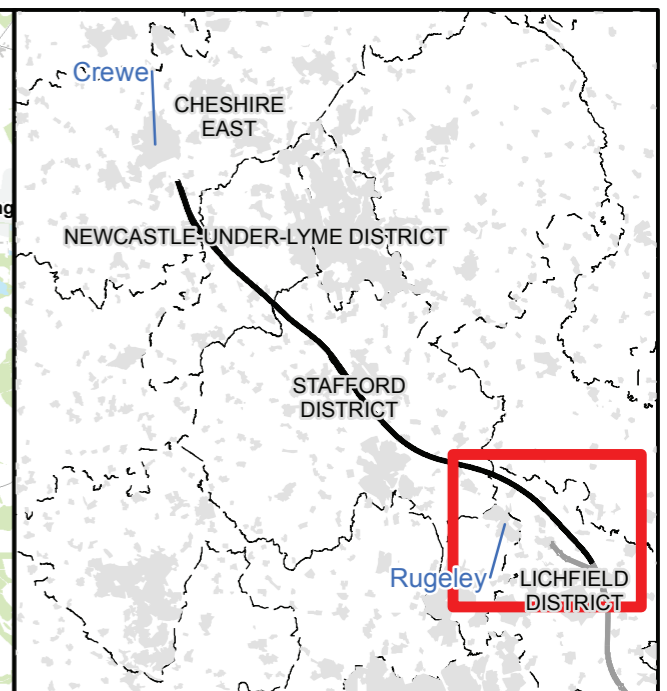
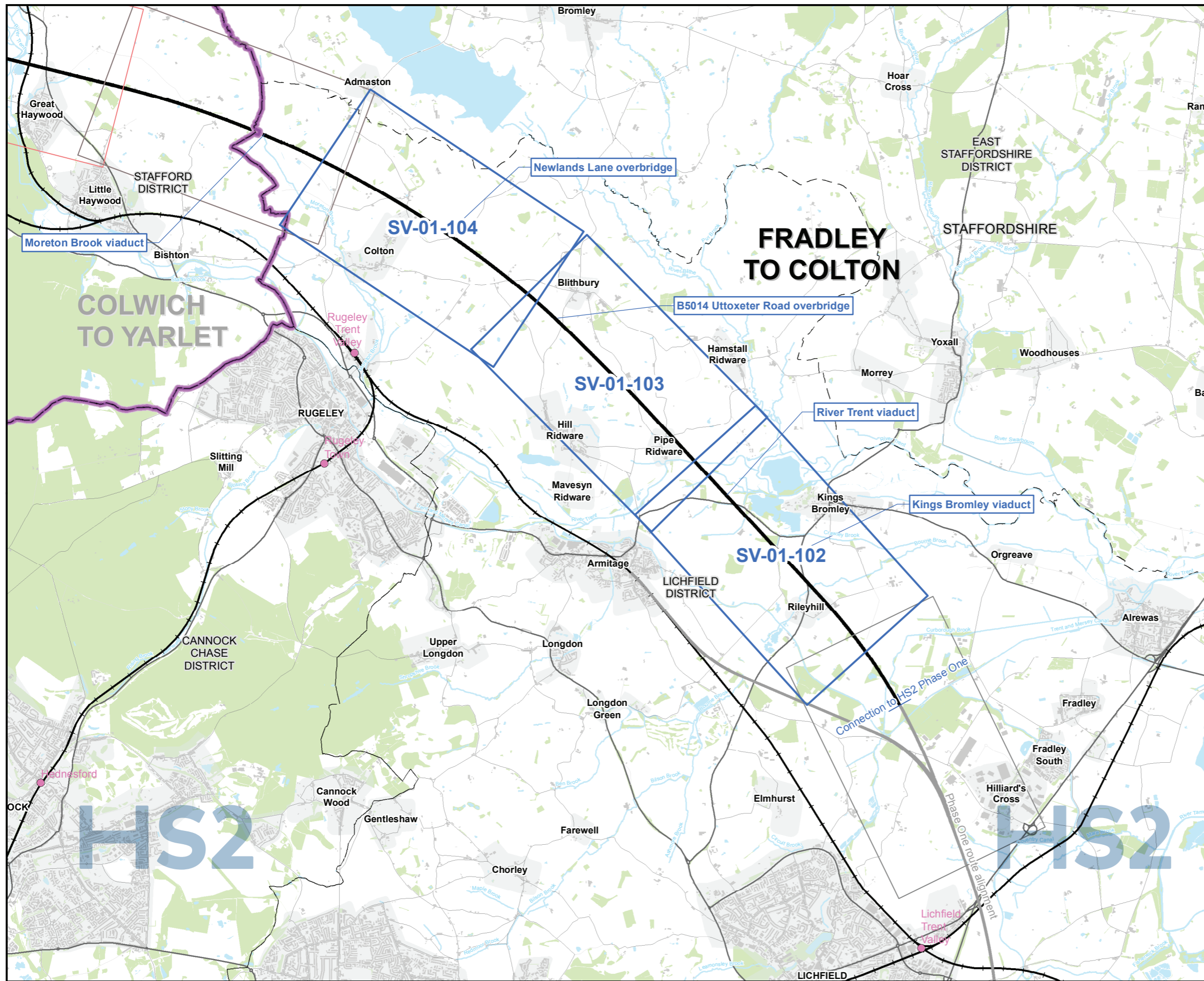
CA1 Fradley to Colton

SV-01 - Operational Sound Contour Maps and Likely Significant Effects

SV-02 - Operational Noise and Vibration Impacts and
Likely Significant Effects (with Assessment Locations)

SV-03 - Assessment and Monitoring Locations for
Construction Sound, Noise & Vibration Assessments

SV-04 - Assessment and Monitoring Locations for
Operational Sound, Noise & Vibration Assessments



Map Series Information:

SV-01 presents the predicted operational sound from the new railway.

The sound levels from the new railway (expressed as $L_{pAeq,T}$) are presented in typical noise mapping colours in 5 dB steps. There is a panel at the top right of the figure; the left-hand section of this panel contains a key communicating the night-time and daytime sound levels represented by the various colours. The right-hand part of the same panel contains text explaining how the sound levels presented on the figure inform the assessment of direct noise impacts and likely significant effects. A corresponding and similar panel is found on SV-02, along with the key sound contours that were used within the environmental assessment.

Also presented on SV-01 are the following (which are also included on SV-02):

- A representation of the Proposed Scheme, including the railway alignment (indicating whether it is on the surface or in tunnel), any new and altered roads and all associated engineering and environmental mitigation earthworks;
- blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
- symbols representing buildings that would potentially qualify for noise insulation;
- labels identifying the residual likely significant noise effects of the Proposed Scheme, and
- the extent of the study area within which the direct impacts and effects of the scheme have been quantitatively assessed.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

The design of the Proposed Scheme will be informed through stakeholder engagement and further engineering and environmental studies.

Note: Not all data layers in the legend are represented on every map.

Main Map Legend

Route in tunnel	Map sheets included in this community area with amendment
Route on surface	Map sheets included in this community area with no amendment
Depot, station, headhouse or portal building	Map sheets not included in this community area
Community area boundary	
Existing railway station	
County boundary	
District/Borough boundary	

Map Number	SV-01-INDEX-CA1
Map Name	Index Map of: Operational Sound Contour Maps and Likely Significant Effects SES2 and AP2 ES
	Community Area 1: Fradley to Colton

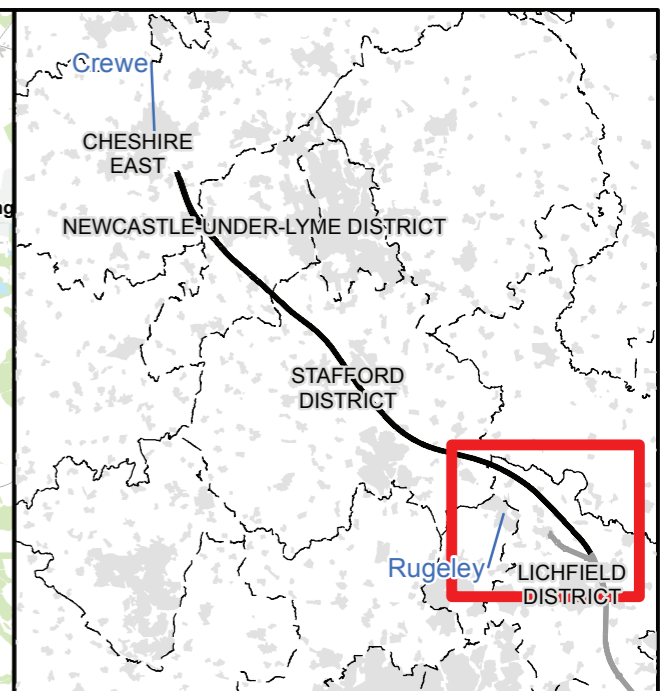
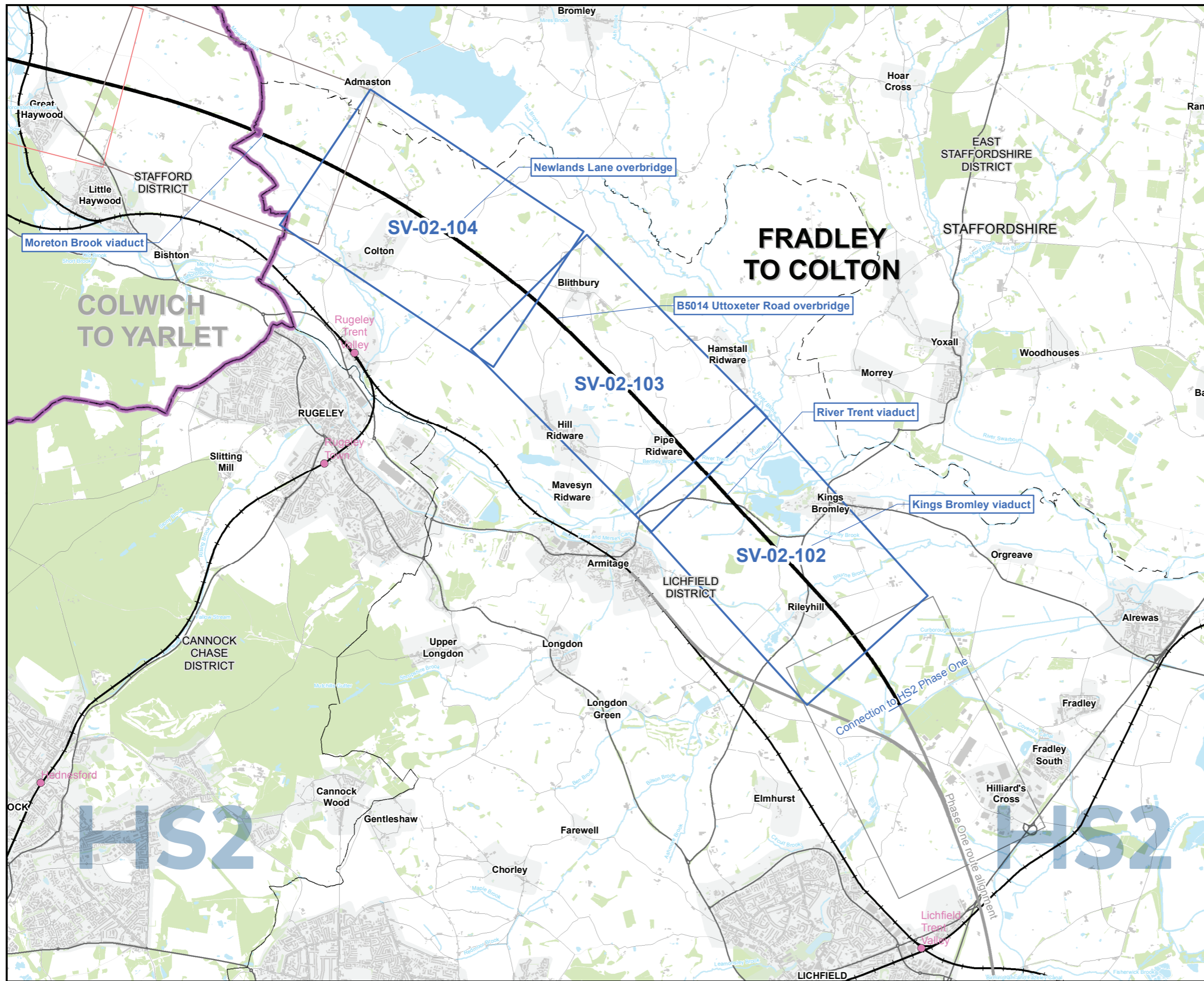
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Map Series Information:

SV-02 presents the direct operational noise impacts and likely significant effects of the Proposed Scheme.

The SV-02 figure series necessarily contains a large amount of information relating to the operational noise and vibration assessment. It is designed to communicate visually the assessment process from the prediction of impacts to the determination of likely residual significant effects. The corresponding text is included in Vol2 and Vol5.

- Key items on the map include the following:
- The Proposed Scheme (the proposed railway alignments and surrounding associated earthworks/roads);
 - blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
 - the study areas, which indicate the areas within which direct sound and vibration impacts of the scheme have been quantitatively assessed;
 - the calculated direct operational impacts of the scheme, displayed as colour-coded buildings and symbols representing buildings that would potentially qualify for noise insulation;
 - sound contours representing sound produced by the new railway displayed in a simpler manner than on SV-01 in order not to obscure the features on the map series;
 - the assessment locations at which a quantitative prediction of sound and impacts have been carried out (representing a number of nearby buildings). These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-002-0XX; and
 - labels indicating where the likely residual direct noise or vibration significant effects have been identified. These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-002-0XX.

The design of the Proposed Scheme will be informed through stakeholder engagement and further engineering and environmental studies.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.

Main Map Legend

	Route in tunnel		Map sheets included in this community area with amendment
	Route on surface		Map sheets included in this community area with no amendment
	Depot, station, headhouse or portal building		Map sheets not included in this community area
	Community area boundary		
	Existing railway station		
	County boundary		
	District/Borough boundary		

Map Number	SV-02-INDEX-CA1
Map Name	Index Map of: Operational Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations) SES2 and AP2 ES Community Area 1: Fradley to Colton

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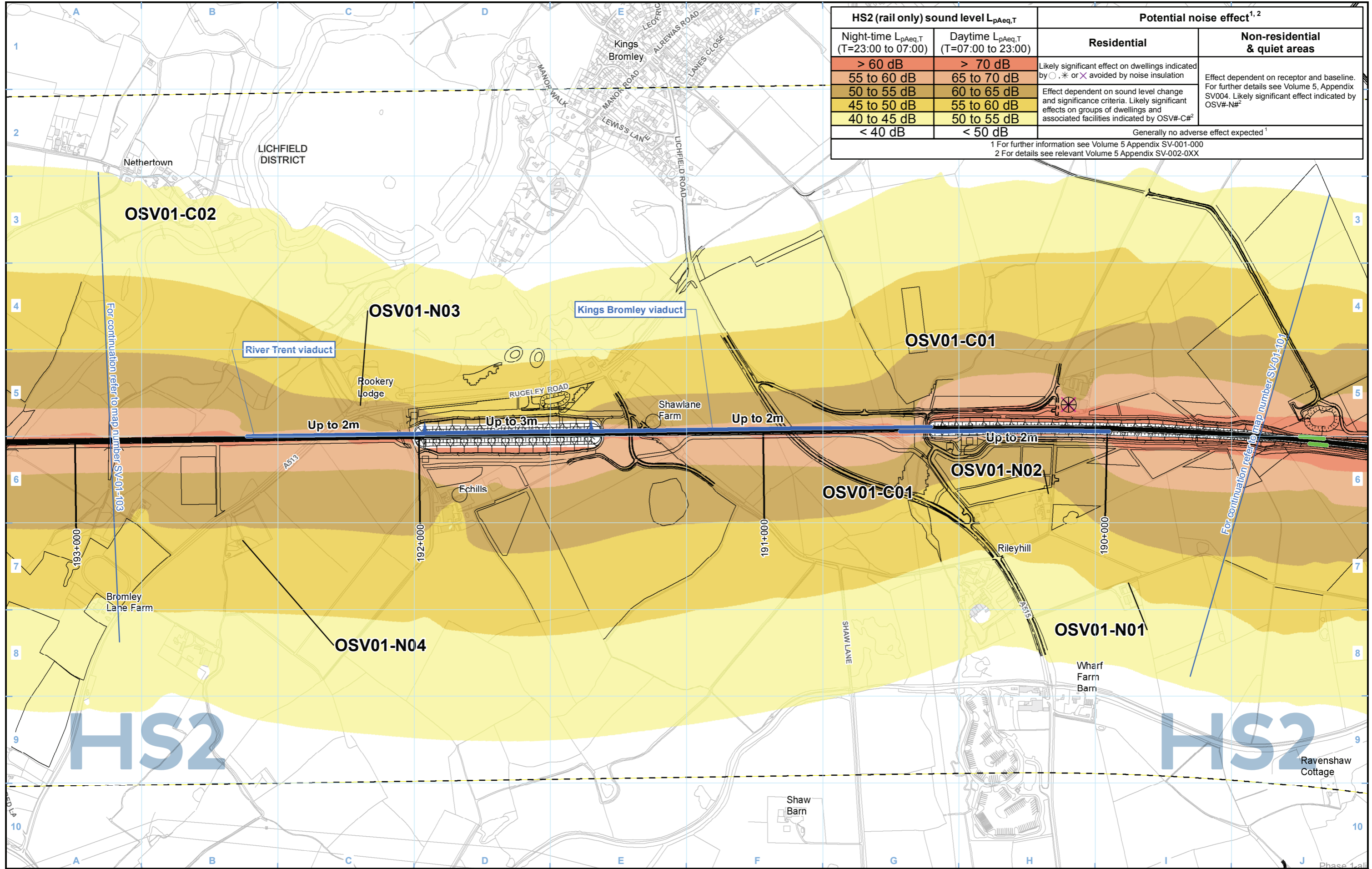
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Scale at A3: 1:60,000

0 600 1,200 1,800 2,400 Metres

Doc Number: 2PT02-ARP-EV-MAP-000-632001-P03 Date: 24/01/19



HS2 (rail only) sound level $L_{pAeq,T}$		Potential noise effect ^{1,2}	
Night-time $L_{pAeq,T}$ (T=23:00 to 07:00)	Daytime $L_{pAeq,T}$ (T=07:00 to 23:00)	Residential	Non-residential & quiet areas
> 60 dB	> 70 dB	Likely significant effect on dwellings indicated by ○, * or X avoided by noise insulation	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-N# ²
55 to 60 dB	65 to 70 dB	Effect dependent on sound level change and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# ²	
50 to 55 dB	60 to 65 dB		Generally no adverse effect expected ¹
45 to 50 dB	55 to 60 dB		
40 to 45 dB	50 to 55 dB		
< 40 dB	< 50 dB		

1 For further information see Volume 5 Appendix SV-001-000
2 For details see relevant Volume 5 Appendix SV-002-0XX

Legend - General features

- Route in bored tunnel
- Route in cut and cover tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community area boundary
- County boundary
- District/Borough boundary

Legend - Sound related features

Envisaged mitigation to avoid / reduce significant noise effects:

- Landscaping and/or fence barriers*
- Engineering e.g. cuttings (green tunnels separately marked)

Envisaged features further reducing noise effects:

- Other environmental e.g. landscaping
- Engineering e.g. cuttings

1km Airborne sound study area

- Potential additional noise insulation (triggered by maximum sound levels at night)¹
- Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)¹
- Potential noise insulation (triggered by Noise Insulation Regulations 1996)¹

* Labelled with total barrier height above rail level

Map Number: SV-01-102

Map Name: Operational Sound Contour Maps and Likely Significant Effects SES2 and AP2 ES

Community Area 1: Fradley to Colton

HS2

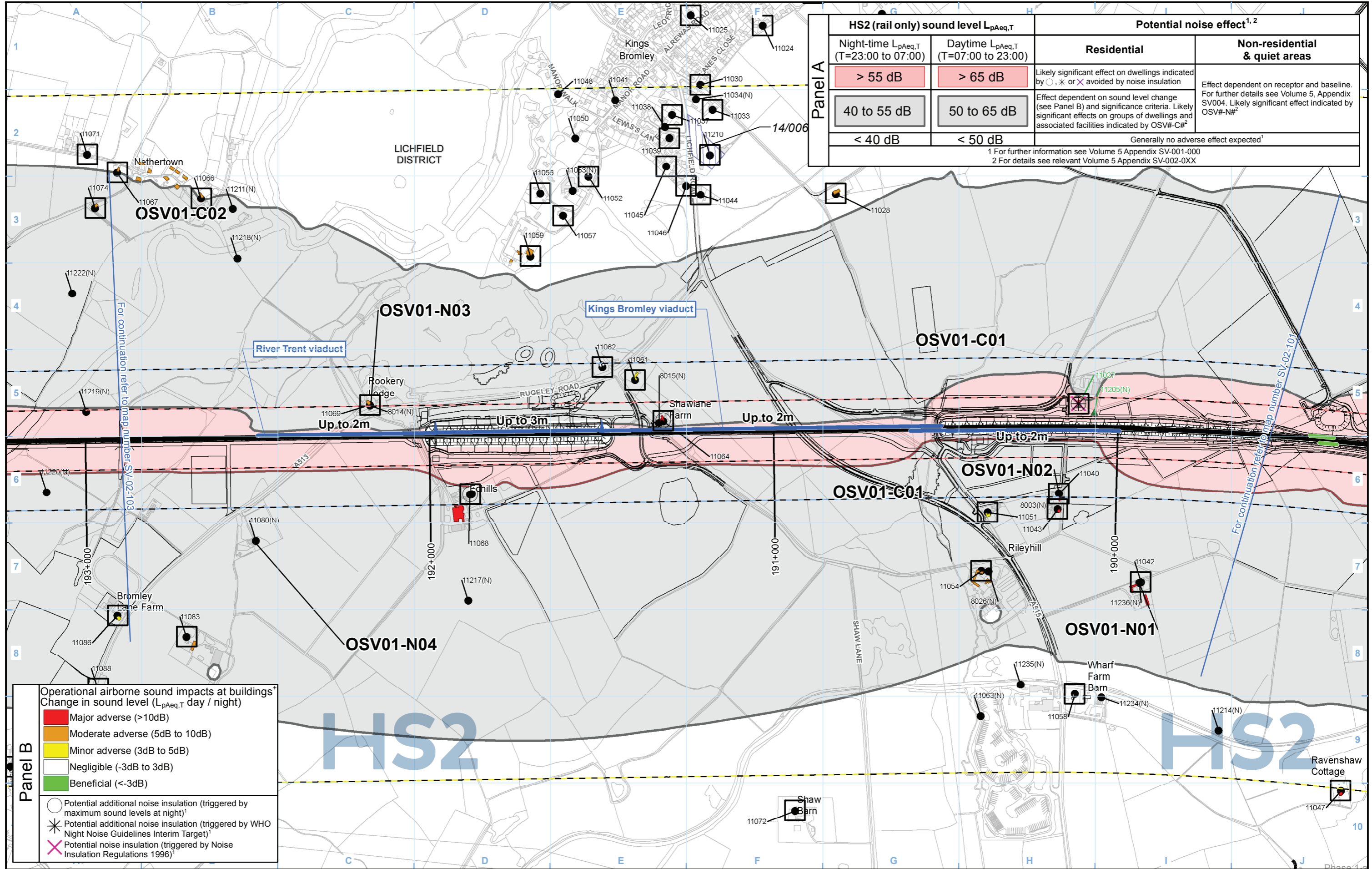
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Date: 15/01/19



Panel A	HS2 (rail only) sound level $L_{pAeq,T}$		Potential noise effect ^{1,2}	
	Night-time $L_{pAeq,T}$ (T=23:00 to 07:00)	Daytime $L_{pAeq,T}$ (T=07:00 to 23:00)	Residential	Non-residential & quiet areas
	> 55 dB	> 65 dB	Likely significant effect on dwellings indicated by ○, * or ✕ avoided by noise insulation	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-N# ²
40 to 55 dB	50 to 65 dB	Effect dependent on sound level change (see Panel B) and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# ²	Generally no adverse effect expected ¹	
< 40 dB	< 50 dB	Generally no adverse effect expected ¹		

1 For further information see Volume 5 Appendix SV-001-000
2 For details see relevant Volume 5 Appendix SV-002-0XX

Panel B

Operational airborne sound impacts at buildings
Change in sound level ($L_{pAeq,T}$ day / night)

Major adverse (>10dB)
Moderate adverse (5dB to 10dB)
Minor adverse (3dB to 5dB)
Negligible (-3dB to 3dB)
Beneficial (<-3dB)

○ Potential additional noise insulation (triggered by maximum sound levels at night)¹
* Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)¹
✕ Potential noise insulation (triggered by Noise Insulation Regulations 1996)¹

Legend - General features

- Route in bored tunnel
- Route in cut and cover tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community area boundary
- County boundary
- District/Borough boundary

Engineering earthworks:

- Embankment
- Cutting
- L_{pAFmax} exceeds 60dB façade**

Non engineering earthworks:

- Embankment
- Cutting

* Residential buildings only
* Labelled with total barrier height above rail level
** HS2 train only $L_{pAFmax} + 2.5dB$ façade correction

Legend - Sound related features

- Committed developments - SV Only
- Envisaged mitigation to avoid / reduce significant noise effects:
 - Landscaping and/or fence barriers*
 - Engineering e.g. cuttings (green tunnels separately marked)
 - Envisaged measures further reducing noise effects:
 - Other environmental e.g. landscaping
 - Engineering e.g. cuttings
 - 1km Airborne sound study area

- Ground-borne sound & vibration study area (residential and non-residential)
- Ground-borne sound & vibration study area (highly sensitive non-residential)
- Airborne sound assessment location
- Airborne sound and vibration assessment location
- Ground-borne sound and/or vibration assessment location
- Airborne sound, ground-borne sound and vibration assessment location
- Ground-borne noise or vibration impact*

Map Number: SV-02-102

Map Name: Operational Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations) SES2 and AP2 ES

Community Area 1: Fradley to Colton

HS2

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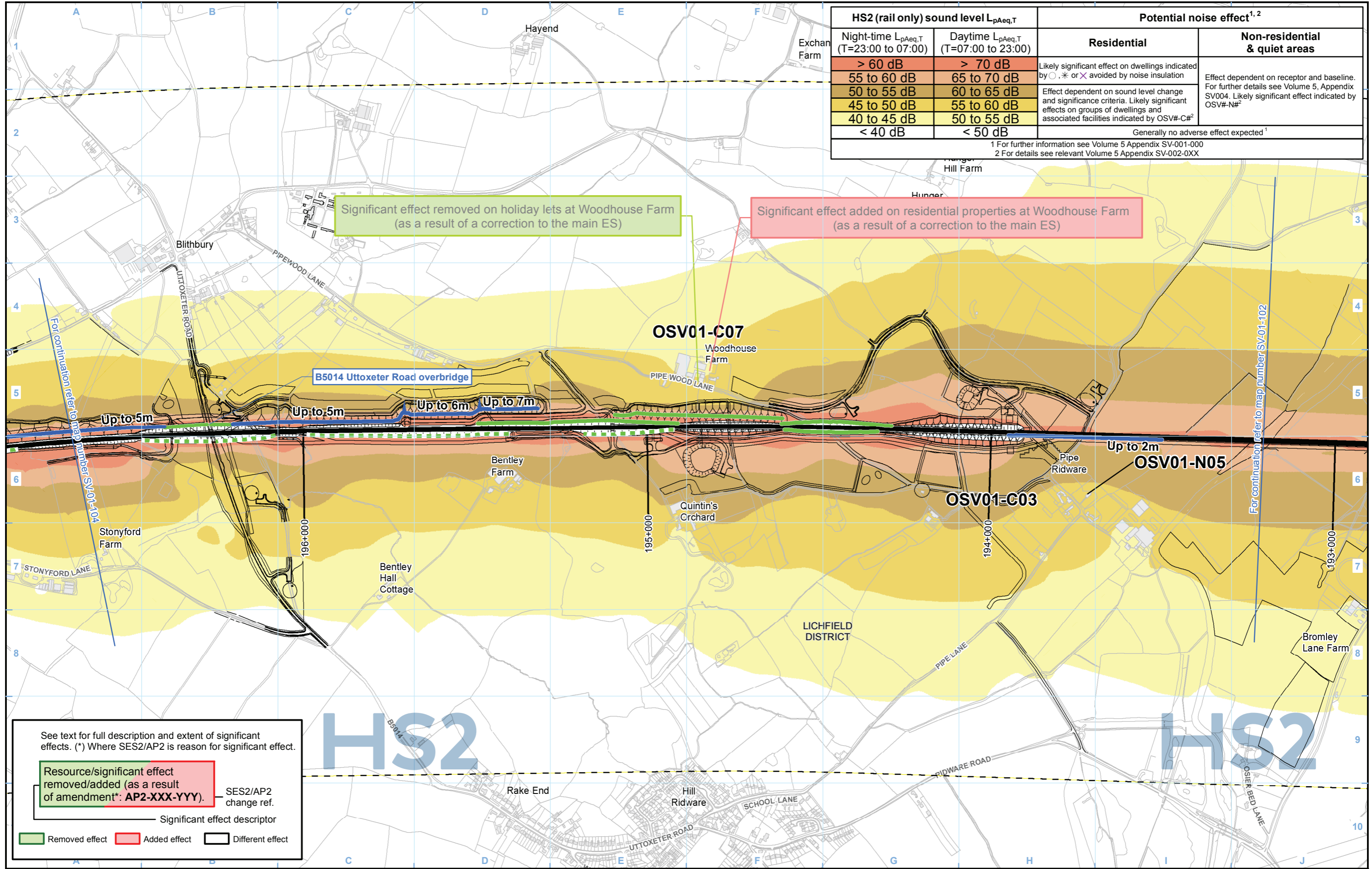
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Metres

Date: 15/01/19

HS2 (rail only) sound level L _{pAeq,T}		Potential noise effect ^{1,2}	
Night-time L _{pAeq,T} (T=23:00 to 07:00)	Daytime L _{pAeq,T} (T=07:00 to 23:00)	Residential	Non-residential & quiet areas
> 60 dB	> 70 dB	Likely significant effect on dwellings indicated by ○, * or X avoided by noise insulation	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-N# ²
55 to 60 dB	65 to 70 dB	Effect dependent on sound level change and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# ²	
50 to 55 dB	60 to 65 dB		
45 to 50 dB	55 to 60 dB		
40 to 45 dB	50 to 55 dB		
< 40 dB	< 50 dB	Generally no adverse effect expected ¹	

1 For further information see Volume 5 Appendix SV-001-000
2 For details see relevant Volume 5 Appendix SV-002-0XX



Significant effect removed on holiday lets at Woodhouse Farm (as a result of a correction to the main ES)

Significant effect added on residential properties at Woodhouse Farm (as a result of a correction to the main ES)

See text for full description and extent of significant effects. (*) Where SES2/AP2 is reason for significant effect.

Resource/significant effect removed/added (as a result of amendment*: AP2-XXX-YYY). — SES2/AP2 change ref.

Significant effect descriptor

Removed effect Added effect Different effect

- Legend - General features**
- Route in bored tunnel
 - Route in cut and cover tunnel
 - Route on surface
 - Depot, station, headhouse or portal building
 - Community area boundary
 - County boundary
 - District/Borough boundary

- Legend - Sound related features**
- Engineering earthworks: Non engineering earthworks:
- Embankment
 - Cutting
 - Embankment
 - Cutting
- Envisaged mitigation to avoid / reduce significant noise effects:
- Landscaping and/or fence barriers*
 - Engineering e.g. cuttings (green tunnels separately marked)
- Envisaged features further reducing noise effects:
- Other environmental e.g. landscaping
 - Engineering e.g. cuttings

- 1km Airborne sound study area
 - Potential additional noise insulation (triggered by maximum sound levels at night)¹
 - Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)¹
 - Potential noise insulation (triggered by Noise Insulation Regulations 1996)¹
- * Labeled with total barrier height above rail level

Map Number: SV-01-103

Map Name: Operational Sound Contour Maps and Likely Significant Effects SES2 and AP2 ES

Community Area 1: Fradley to Colton

HS2

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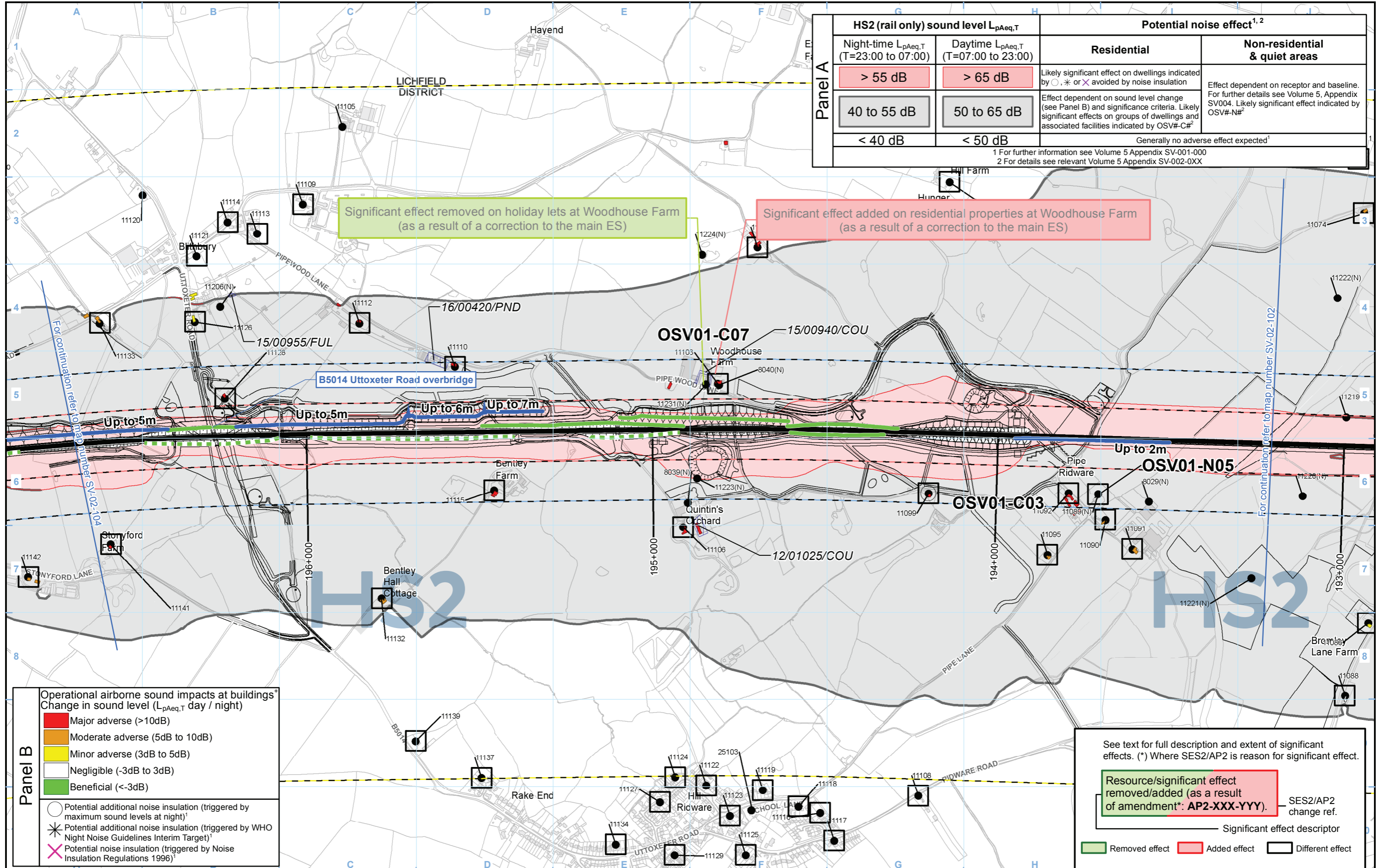
Date: 15/01/19

Scale at A3: 1:10,000

Metres

Panel A	HS2 (rail only) sound level $L_{pAeq,T}$		Potential noise effect ^{1,2}	
	Night-time $L_{pAeq,T}$ (T=23:00 to 07:00)	Daytime $L_{pAeq,T}$ (T=07:00 to 23:00)	Residential	Non-residential & quiet areas
	> 55 dB	> 65 dB	Likely significant effect on dwellings indicated by ○, * or ✕ avoided by noise insulation	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-N# ²
40 to 55 dB	50 to 65 dB	Effect dependent on sound level change (see Panel B) and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# ²	Generally no adverse effect expected ¹	
< 40 dB	< 50 dB			

1 For further information see Volume 5 Appendix SV-001-000
2 For details see relevant Volume 5 Appendix SV-002-0XX



Panel B

Operational airborne sound impacts at buildings
Change in sound level ($L_{pAeq,T}$ day / night)

- Major adverse (>10dB)
- Moderate adverse (5dB to 10dB)
- Minor adverse (3dB to 5dB)
- Negligible (-3dB to 3dB)
- Beneficial (<-3dB)

- Potential additional noise insulation (triggered by maximum sound levels at night)¹
- * Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)¹
- ✕ Potential noise insulation (triggered by Noise Insulation Regulations 1996)¹

See text for full description and extent of significant effects. (*) Where SES2/AP2 is reason for significant effect.

Resource/significant effect removed/added (as a result of amendment*: AP2-XXX-YYY). — SES2/AP2 change ref.

— Significant effect descriptor

Removed effect Added effect Different effect

Legend - General features

- Route in bored tunnel
- Route in cut and cover tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community area boundary
- County boundary
- District/Borough boundary

Engineering earthworks: Non engineering earthworks:

- Embankment
- Cutting
- L_{pAFmax} exceeds 60dB façade**

* Residential buildings only
* Labelled with total barrier height above rail level
** HS2 train only $L_{pAFmax} + 2.5dB$ façade correction

Legend - Sound related features

- Committed developments - SV Only
- Envisaged mitigation to avoid / reduce significant noise effects:
 - Landscaping and/or fence barriers*
 - Engineering e.g. cuttings (green tunnels separately marked)
 - Envisaged measures further reducing noise effects:
 - Other environmental e.g. landscaping
 - Engineering e.g. cuttings
 - 1km Airborne sound study area
- Ground-borne sound & vibration study area (residential and non-residential)
- Ground-borne sound & vibration study area (highly sensitive non-residential)
- Airborne sound assessment location
- Airborne sound and vibration assessment location
- Ground-borne sound and/or vibration assessment location
- Airborne sound, ground-borne sound and vibration assessment location
- Ground-borne noise or vibration impact*

Map Number: SV-02-103

Map Name: Operational Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations) SES2 and AP2 ES

Community Area 1: Fradley to Colton

HS2

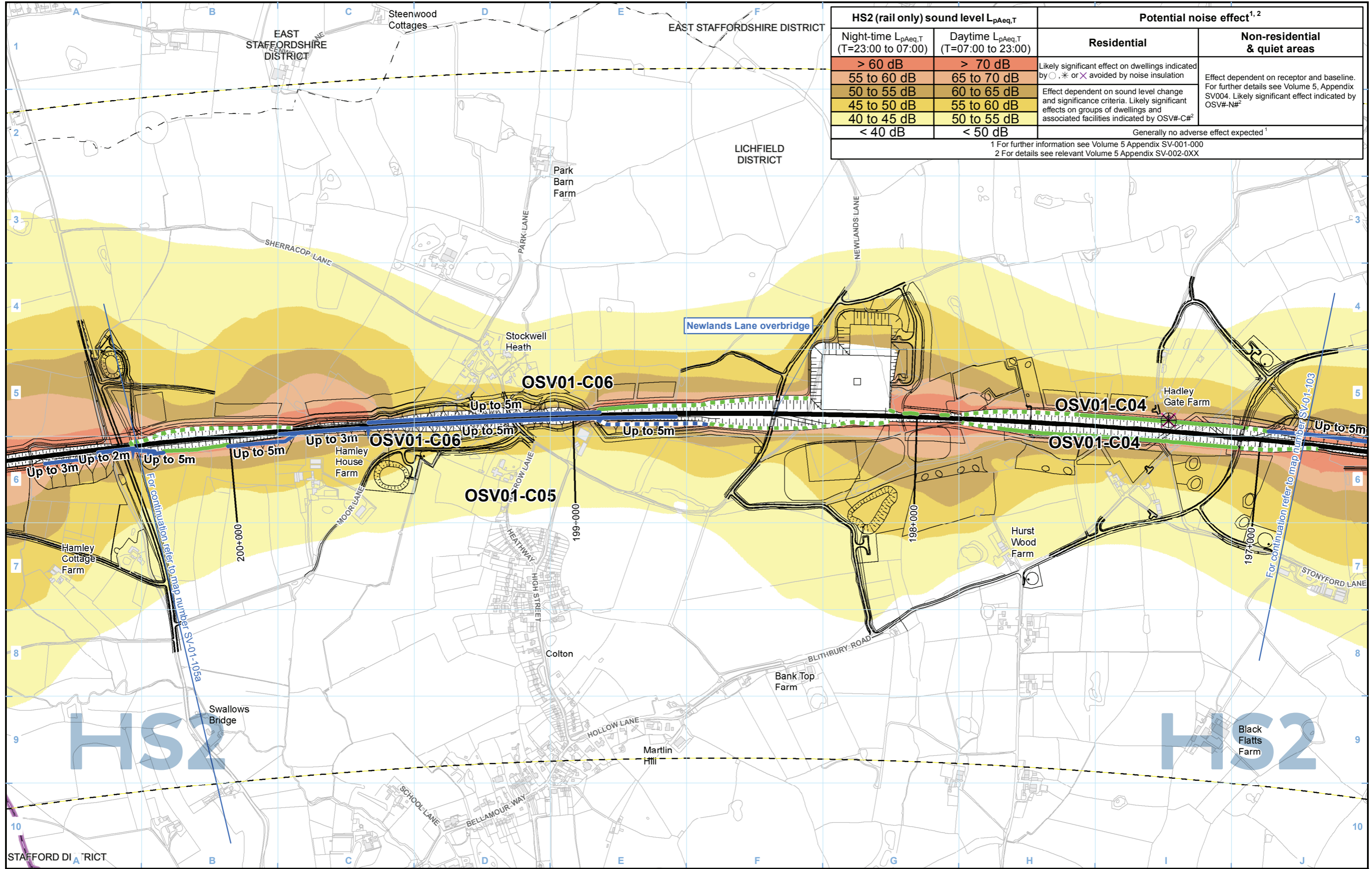
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Doc Number: 2PT02-ARP-EV-MAP-000-632103-P03

Date: 10/12/18



HS2 (rail only) sound level $L_{pAeq,T}$		Potential noise effect ^{1,2}	
Night-time $L_{pAeq,T}$ (T=23:00 to 07:00)	Daytime $L_{pAeq,T}$ (T=07:00 to 23:00)	Residential	Non-residential & quiet areas
> 60 dB	> 70 dB	Likely significant effect on dwellings indicated by ○, * or X avoided by noise insulation	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-N# ²
55 to 60 dB	65 to 70 dB	Effect dependent on sound level change and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# ²	
50 to 55 dB	60 to 65 dB		
45 to 50 dB	55 to 60 dB		
40 to 45 dB	50 to 55 dB	Generally no adverse effect expected ¹	
< 40 dB	< 50 dB	¹ For further information see Volume 5 Appendix SV-001-000 ² For details see relevant Volume 5 Appendix SV-002-0XX	

Legend - General features

- Route in bored tunnel
- Route in cut and cover tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community area boundary
- County boundary
- District/Borough boundary

Legend - Sound related features

Engineering earthworks:

- Embankment
- Cutting

Non engineering earthworks:

- Embankment
- Cutting

Legend - Sound related features

Envisaged mitigation to avoid / reduce significant noise effects:

- Landscaping and/or fence barriers*
- Engineering e.g. cuttings (green tunnels separately marked)

Envisaged features further reducing noise effects:

- Other environmental e.g. landscaping
- Engineering e.g. cuttings

Legend - Sound related features

- 1km Airborne sound study area
- Potential additional noise insulation (triggered by maximum sound levels at night)¹
- Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)¹
- Potential noise insulation (triggered by Noise Insulation Regulations 1996)¹

* Labelled with total barrier height above rail level

Map Number: SV-01-104

Map Name: Operational Sound Contour Maps and Likely Significant Effects SES2 and AP2 ES

Community Area 1: Fradley to Colton

HS2

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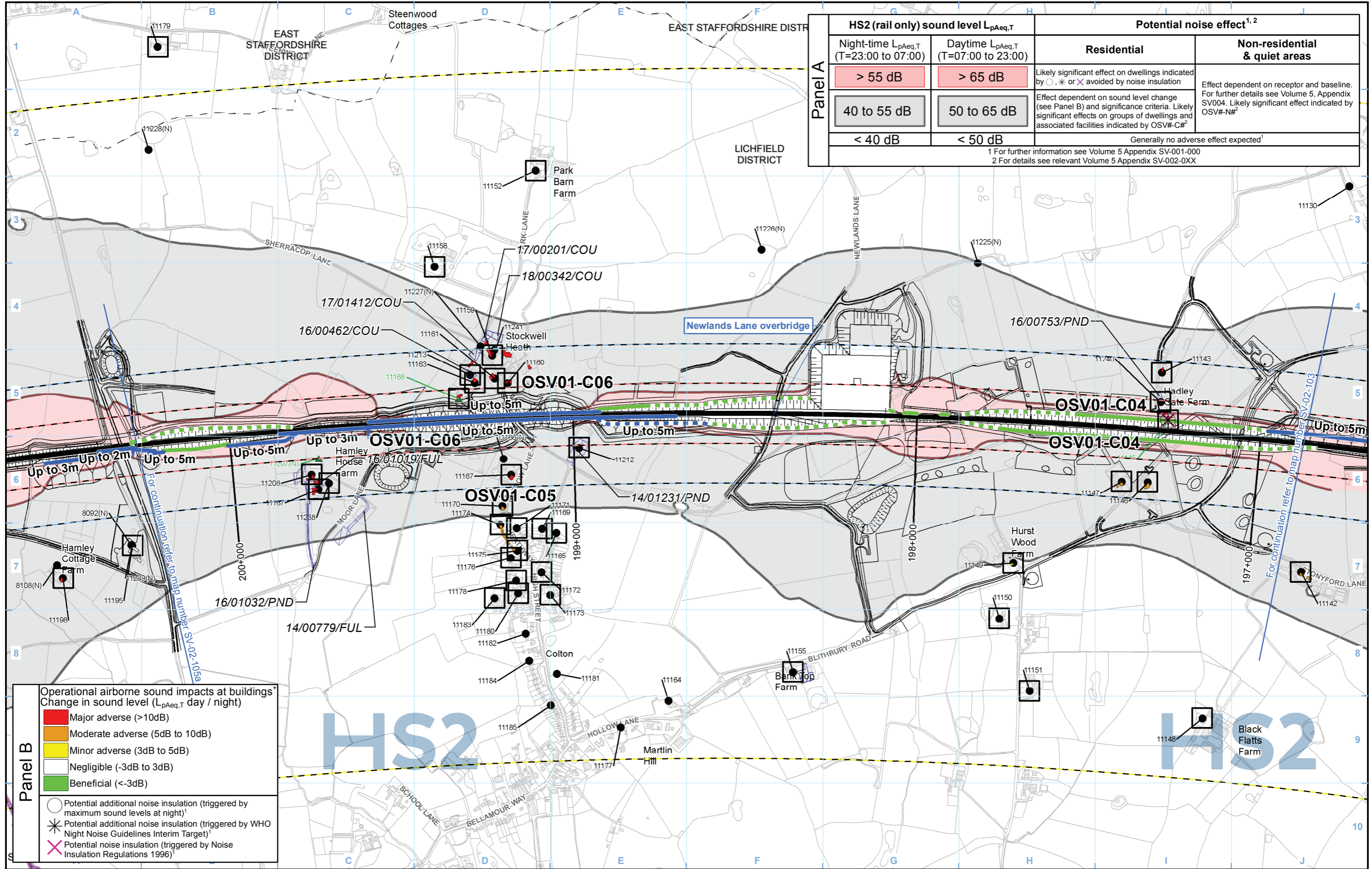
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Doc Number: 2PT02-ARP-EV-MAP-000-131104-P03

Date: 15/01/19

Scale at A3: 1:10,000

Metres



Panel A	HS2 (rail only) sound level $L_{pAeq,T}$		Potential noise effect ^{1,2}	
	Night-time $L_{pAeq,T}$ (T=23:00 to 07:00)	Daytime $L_{pAeq,T}$ (T=07:00 to 23:00)	Residential	Non-residential & quiet areas
	> 55 dB	> 65 dB	Likely significant effect on dwellings indicated by ○, * or ✕ avoided by noise insulation	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-N# ²
40 to 55 dB	50 to 65 dB	Effect dependent on sound level change (see Panel B) and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# ²	Generally no adverse effect expected ¹	
< 40 dB	< 50 dB	Generally no adverse effect expected ¹		

1 For further information see Volume 5 Appendix SV-001-000
2 For details see relevant Volume 5 Appendix SV-002-0XX

Panel B

Operational airborne sound impacts at buildings
Change in sound level ($L_{pAeq,T}$ day / night)

- Major adverse (>10dB)
- Moderate adverse (5dB to 10dB)
- Minor adverse (3dB to 5dB)
- Negligible (-3dB to 3dB)
- Beneficial (<-3dB)

- Potential additional noise insulation (triggered by maximum sound levels at night)¹
- * Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)¹
- ✕ Potential noise insulation (triggered by Noise Insulation Regulations 1996)¹

Legend - General features

- Route in bored tunnel
- Route in cut and cover tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community area boundary
- County boundary
- District/Borough boundary

Engineering earthworks:

- Embankment
- Cutting
- L_{pAFmax} exceeds 60dB façade**

Non engineering earthworks:

- Embankment
- Cutting

* Residential buildings only
* Labelled with total barrier height above rail level
** HS2 train only $L_{pAFmax} + 2.5dB$ façade correction

Legend - Sound related features

- Committed developments - SV Only
- Envisaged mitigation to avoid / reduce significant noise effects:
 - Landscaping and/or fence barriers*
 - Engineering e.g. cuttings (green tunnels separately marked)
 - Envisaged measures further reducing noise effects:
 - Other environmental e.g. landscaping
 - Engineering e.g. cuttings
 - 1km Airborne sound study area

- Ground-borne sound & vibration study area (residential and non-residential)
- Ground-borne sound & vibration study area (highly sensitive non-residential)
- Airborne sound assessment location
- Airborne sound and vibration assessment location
- Ground-borne sound and/or vibration assessment location
- Airborne sound, ground-borne sound and vibration assessment location
- Ground-borne noise or vibration impact*

Map Number: SV-02-104

Map Name: Operational Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations) SES2 and AP2 ES

Community Area 1: Fradley to Colton

HS2

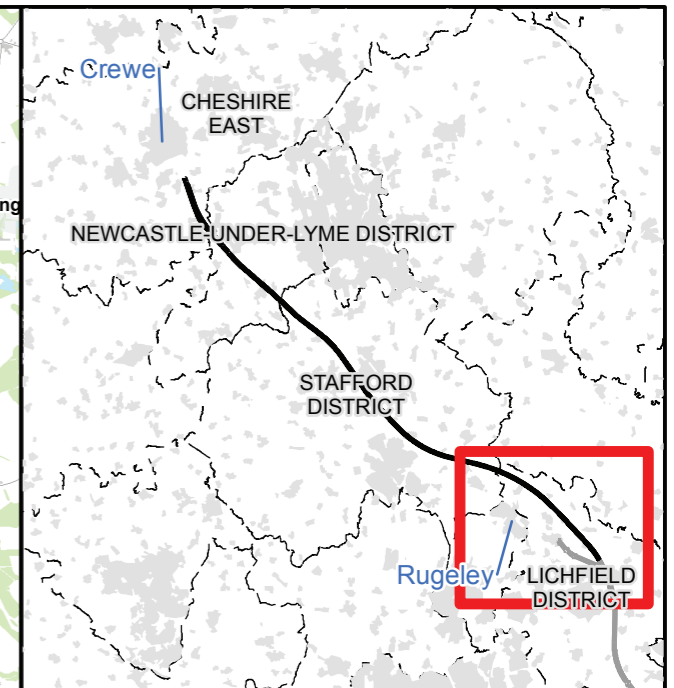
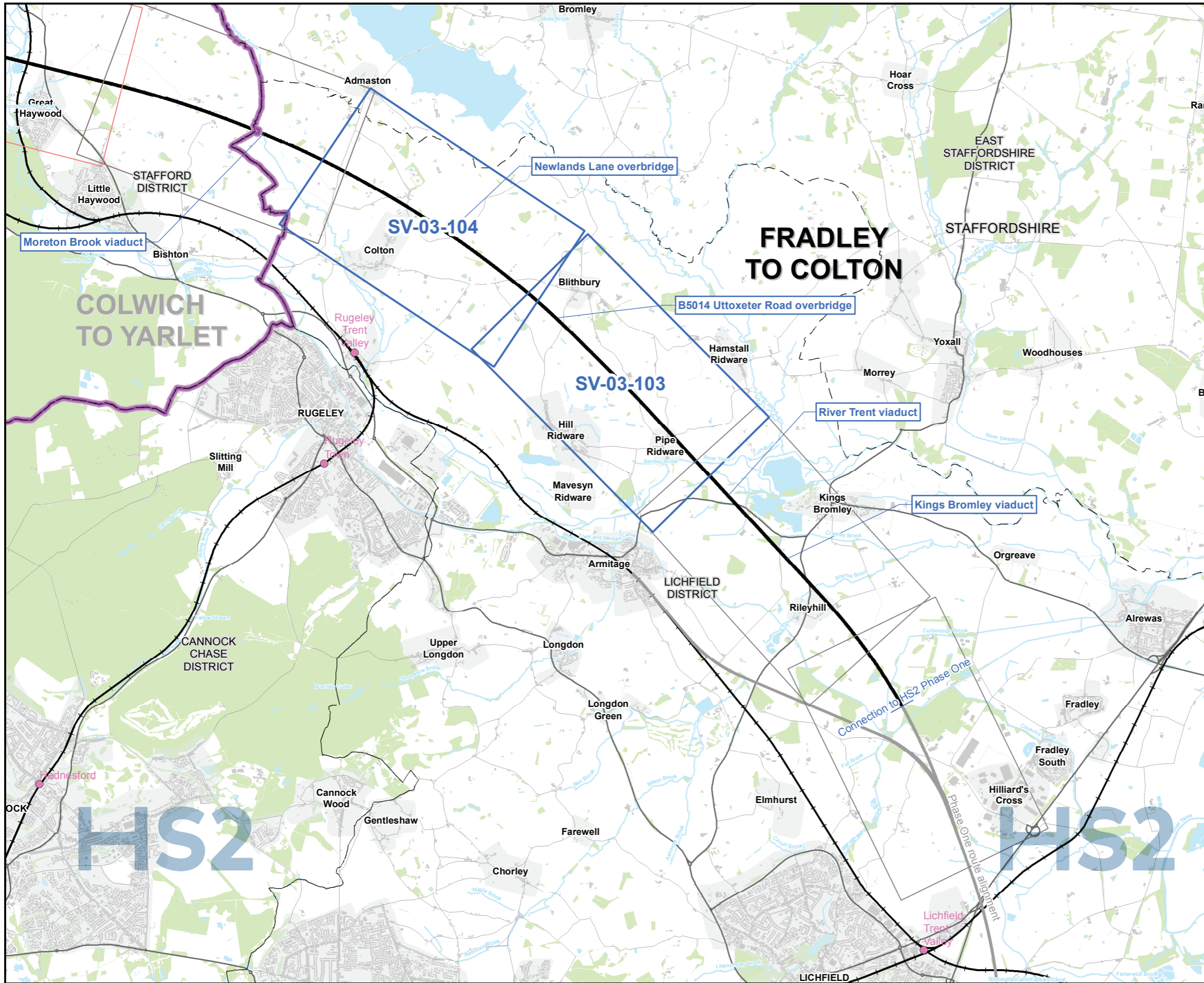
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Map Series Information:

The SV-03 figure series accompanies the construction noise & vibration assessments. It shows the locations at which a quantitative assessment of the direct effects of construction noise and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the construction noise and vibration reports contained in Volume 5: Appendix SV-002-0XX

The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002-0XX.

The design of the Proposed Scheme will be informed through stakeholder engagement and further engineering and environmental studies.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.

- Main Map Legend**
- Route in tunnel
 - Route on surface
 - Depot, station, headhouse or portal building
 - Community area boundary
 - Existing railway station
 - County boundary
 - District/Borough boundary
 - Map sheets included in this community area with amendment
 - Map sheets included in this community area with no amendment
 - Map sheets not included in this community area

Map Number	SV-03-INDEX-CA1
Map Name	Index Map of: Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments SES2 and AP2 ES Community Area 1: Fradley to Colton

HS2

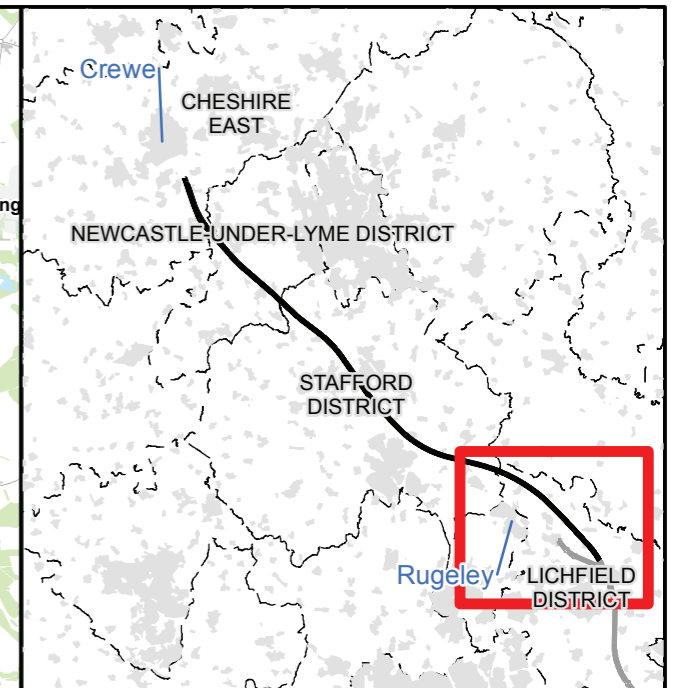
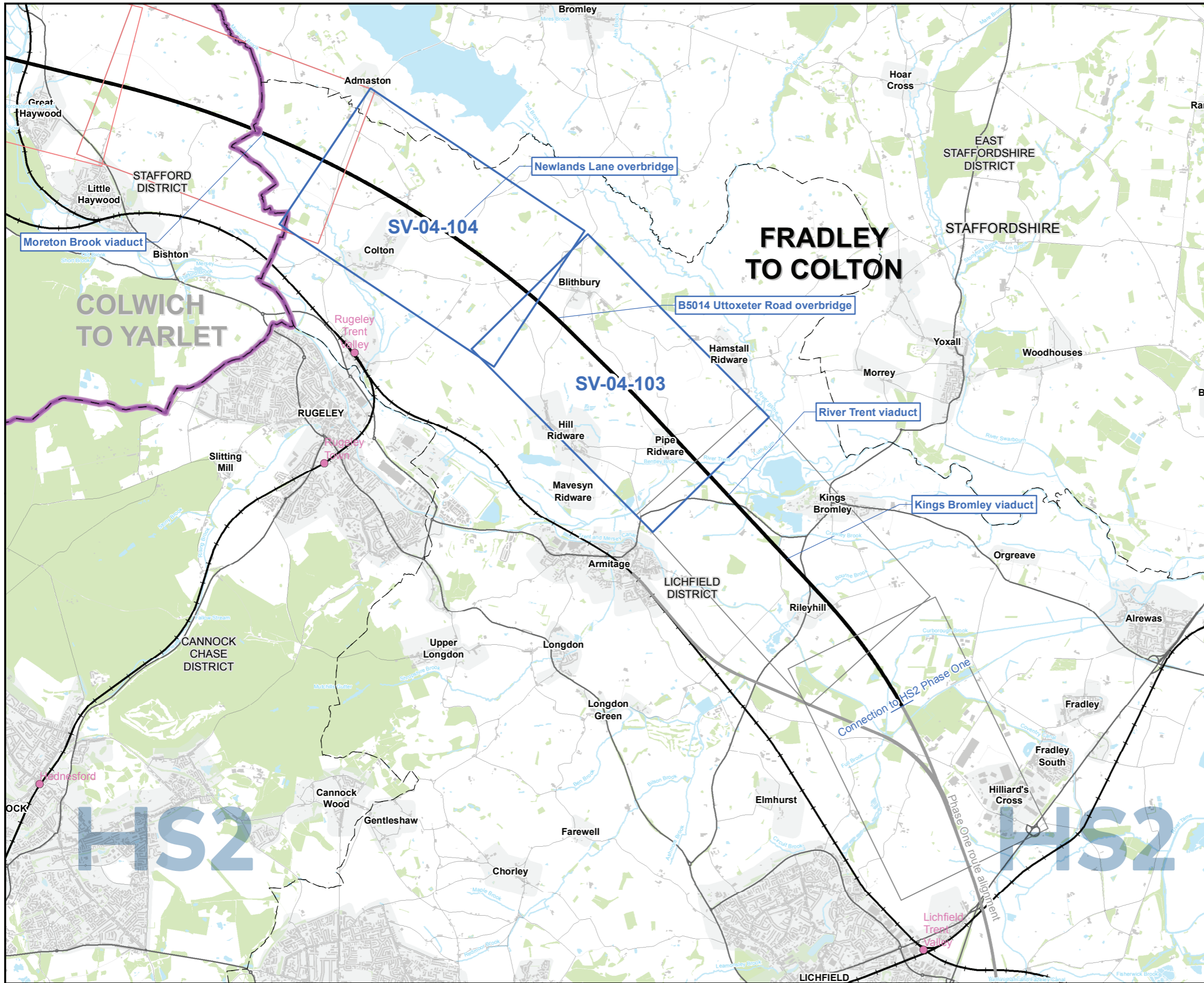
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Doc Number: 2PT02-ARP-EV-MAP-000-633001-P03

Date: 23/01/19



Map Series Information:

The SV-04 figure series shows the locations at which a quantitative assessment of the direct effects of operational sound and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the operational sound and vibration reports contained in Volume 5: Appendix SV-002-0XX

The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002-0XX

The design of the Proposed Scheme will be informed through stakeholder engagement and further engineering and environmental studies.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

- Main Map Legend**
- Route in tunnel
 - Route on surface
 - Depot, station, headhouse or portal building
 - Community area boundary
 - Existing railway station
 - County boundary
 - District/Borough boundary
 - Map sheets included in this community area with amendment
 - Map sheets included in this community area with no amendment
 - Map sheets not included in this community area

Map Number	SV-04-INDEX-CA1
Map Name	Index Map of: Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments SES2 and AP2 ES Community Area 1: Fradley to Colton

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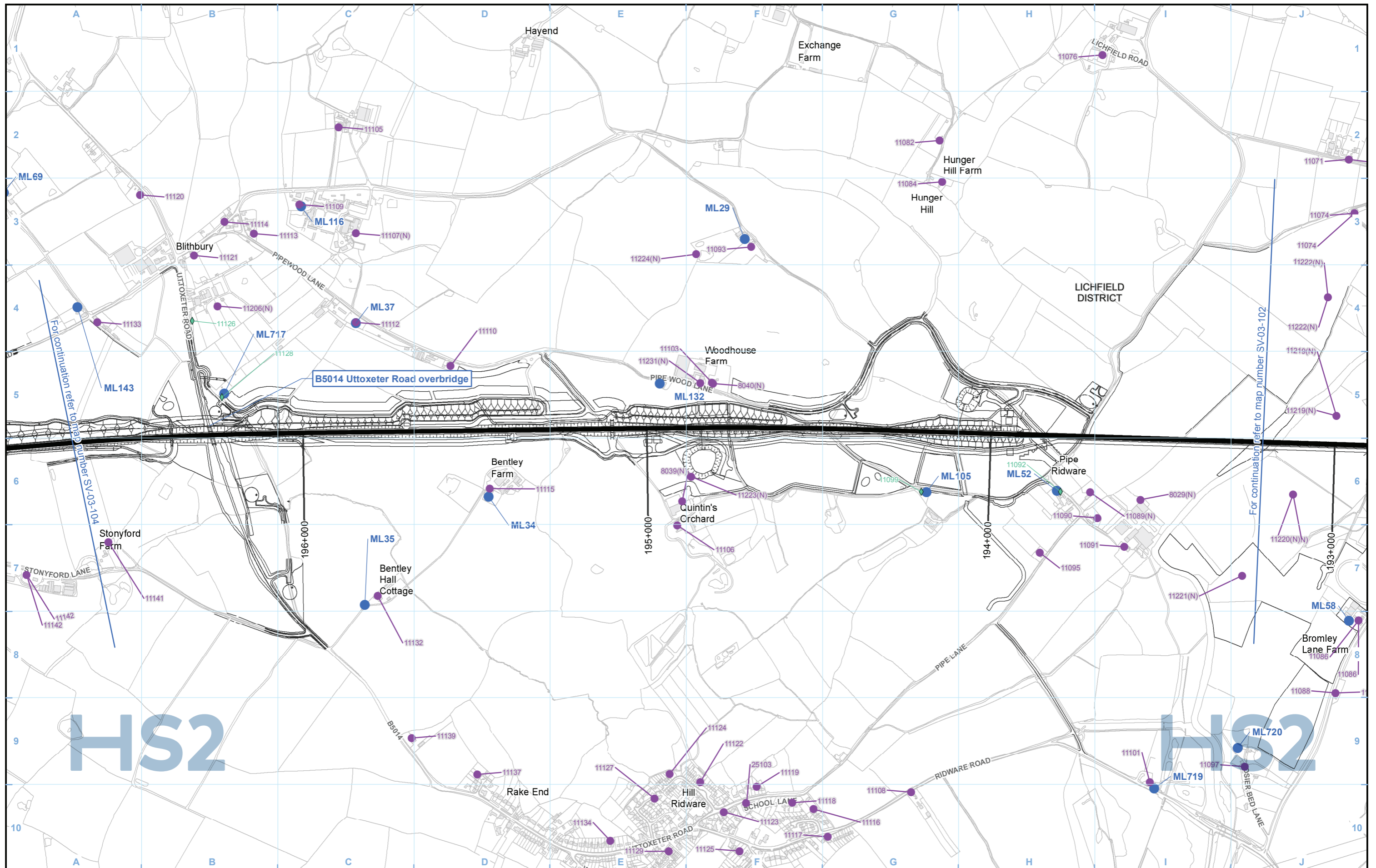
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Note: Not all data layers in the legend are represented on every map.



Legend - General features

- Route in bored tunnel
- Route in cut and cover tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community area boundary
- County boundary
- District/Borough boundary

Engineering earthworks:

- Embankment
- Cutting

Non engineering earthworks:

- Embankment
- Cutting

Legend - Sound related features

- Construction airborne sound assessment location
- Construction vibration assessment locations
- Construction airborne sound and vibration assessment location
- Baseline measurement locations

labelled with Assessment Location ID reference number (for details of the assessment results see Vol 5 Appendix SV-002-0XX)

(labelled with Measurement Location reference code)

Map Number: SV-03-103

Map Name: Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments SES2 and AP2 ES

Community Area 1: Fradley to Colton

HS2

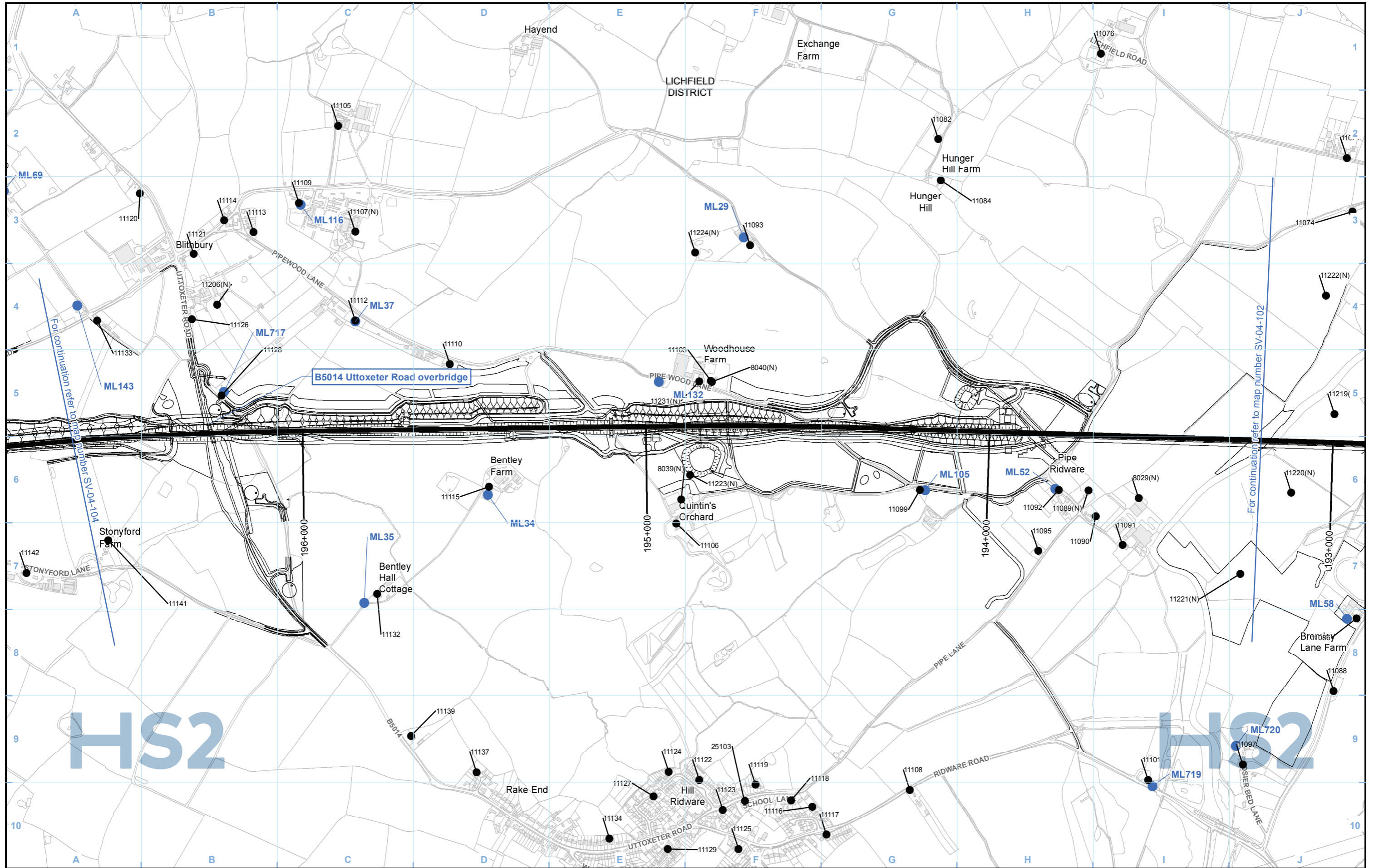
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Legend - General features

- Route in bored tunnel
- Route in cut and cover tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community area boundary
- County boundary
- District/Borough boundary

Engineering earthworks:

- Embankment
- Cutting

Non engineering earthworks:

- Embankment
- Cutting

Legend - Sound related features

- Airborne sound assessment location
- Airborne sound and vibration assessment location
- Ground-borne sound and/or vibration assessment location
- Airborne sound, ground-borne sound and vibration assessment location
- Baseline measurement locations

labelled with Assessment Location ID reference number (for details of the assessment results see Vol 5 Appendix SV-002-0XX)

(labelled with Measurement Location reference code)

Map Number: SV-04-103

Map Name: Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments SES2 and AP2 ES

Community Area 1: Fradley to Colton

HS2

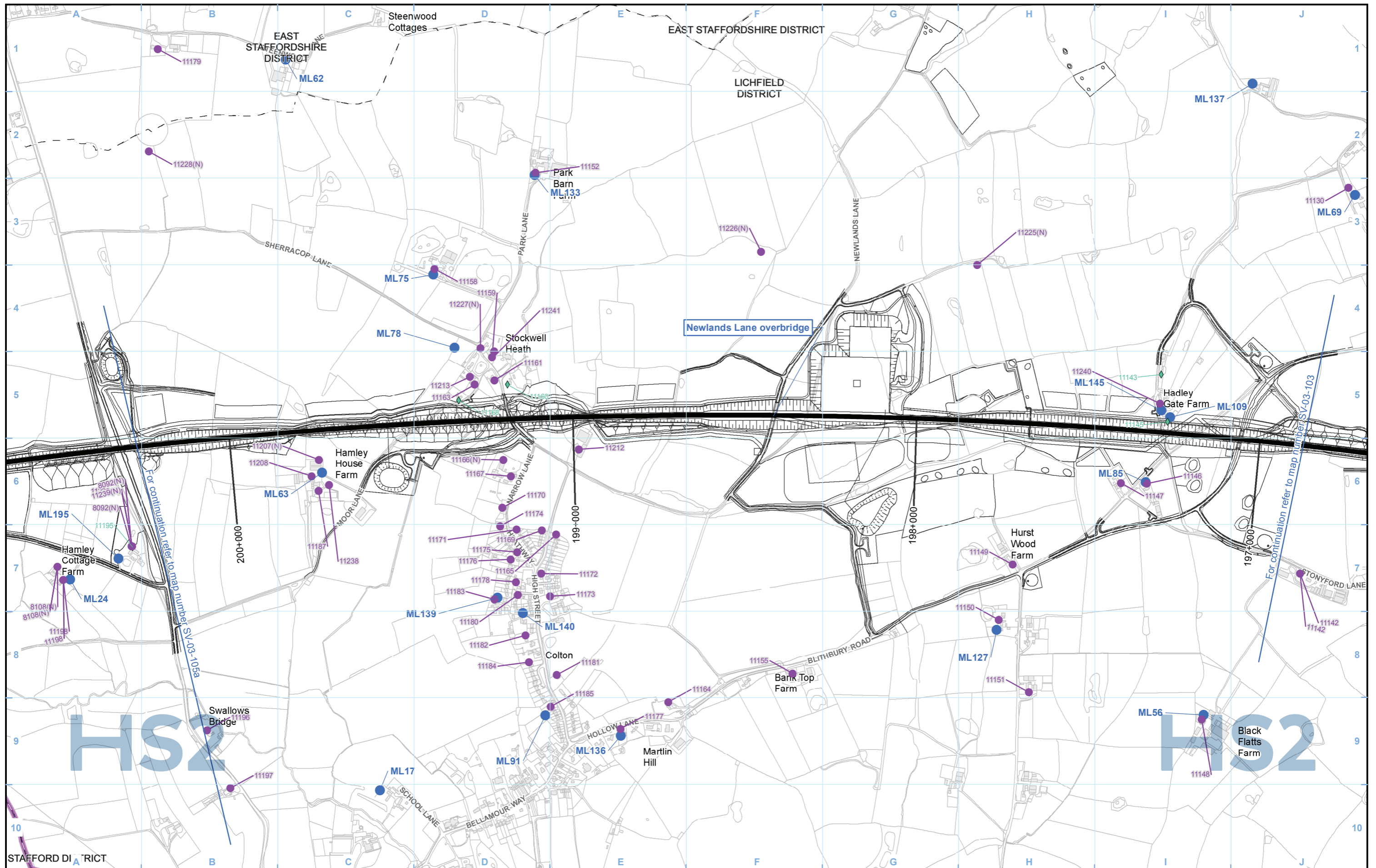
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Date: 10/12/18



Legend - General features

- Route in bored tunnel
- Route in cut and cover tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community area boundary
- County boundary
- District/Borough boundary

Legend - Sound related features

- Engineering earthworks:**
 - Embankment
 - Cutting
- Non engineering earthworks:**
 - Embankment
 - Cutting

Legend - Sound related features

- Construction airborne sound assessment location
- Construction vibration assessment locations
- Construction airborne sound and vibration assessment location
- Baseline measurement locations

labelled with Assessment Location ID reference number (for details of the assessment results see Vol 5 Appendix SV-002-0XX)

(labelled with Measurement Location reference code)

Map Number	SV-03-104
Map Name	Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments SES2 and AP2 ES
Community Area 1: Fradley to Colton	

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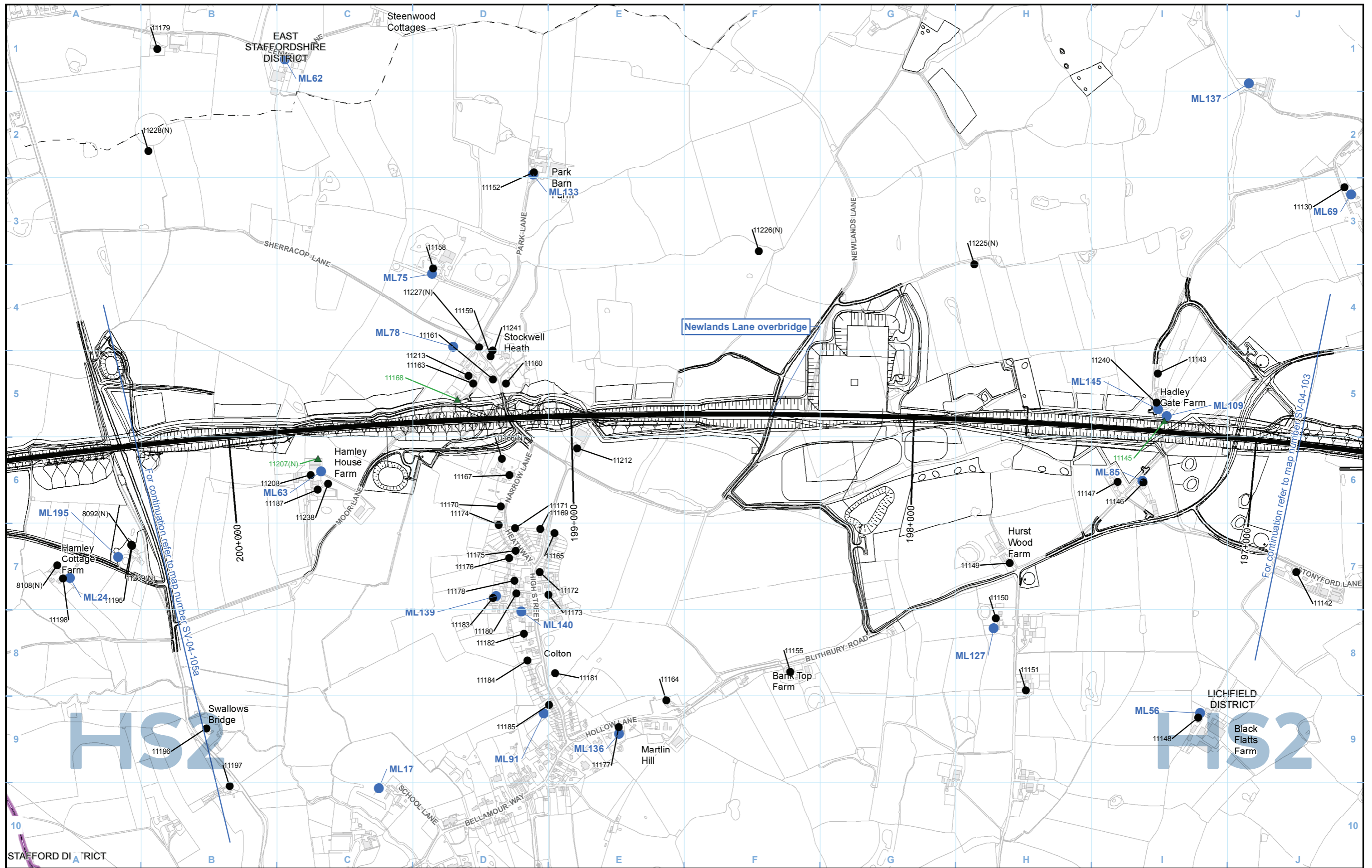
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Date: 06/12/18



Legend - General features

- Route in bored tunnel
- Route in cut and cover tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community area boundary
- County boundary
- District/Borough boundary

Legend - Sound related features

Embankment	Non engineering earthworks:
Cutting	Embankment
	Cutting

Legend - Sound related features

- Airborne sound assessment location
- Airborne sound and vibration assessment location
- Ground-borne sound and/or vibration assessment location
- Airborne sound, ground-borne sound and vibration assessment location
- Baseline measurement locations

labelled with Assessment Location ID reference number (for details of the assessment results see Vol 5 Appendix SV-002-0XX)

(labelled with Measurement Location reference code)

Map Number: SV-04-104

Map Name: Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments SES2 and AP2 ES

Community Area 1: Fradley to Colton

HS2

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Doc Number: 2PT02-ARP-EV-MAP-000-634104-P03

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High Speed Rail (West Midlands - Crewe)

Supplementary Environmental Statement 2 and Additional Provision 2 Environmental Statement

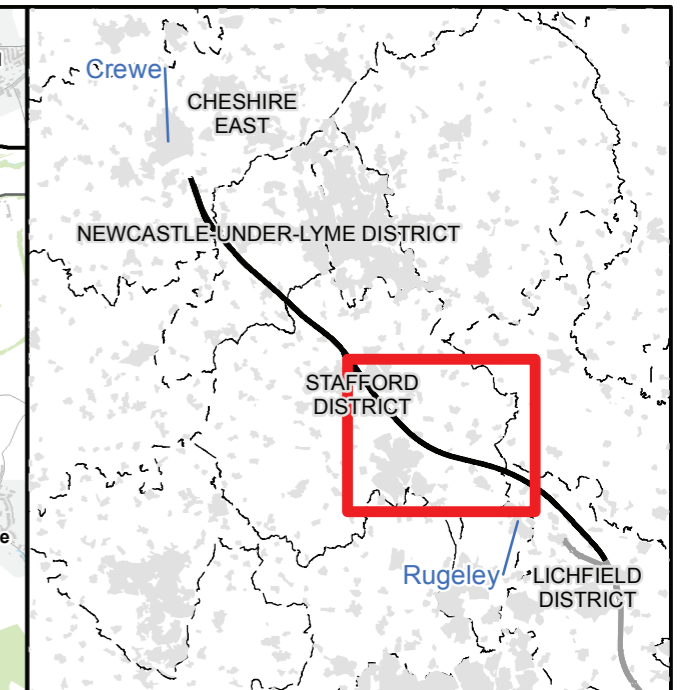
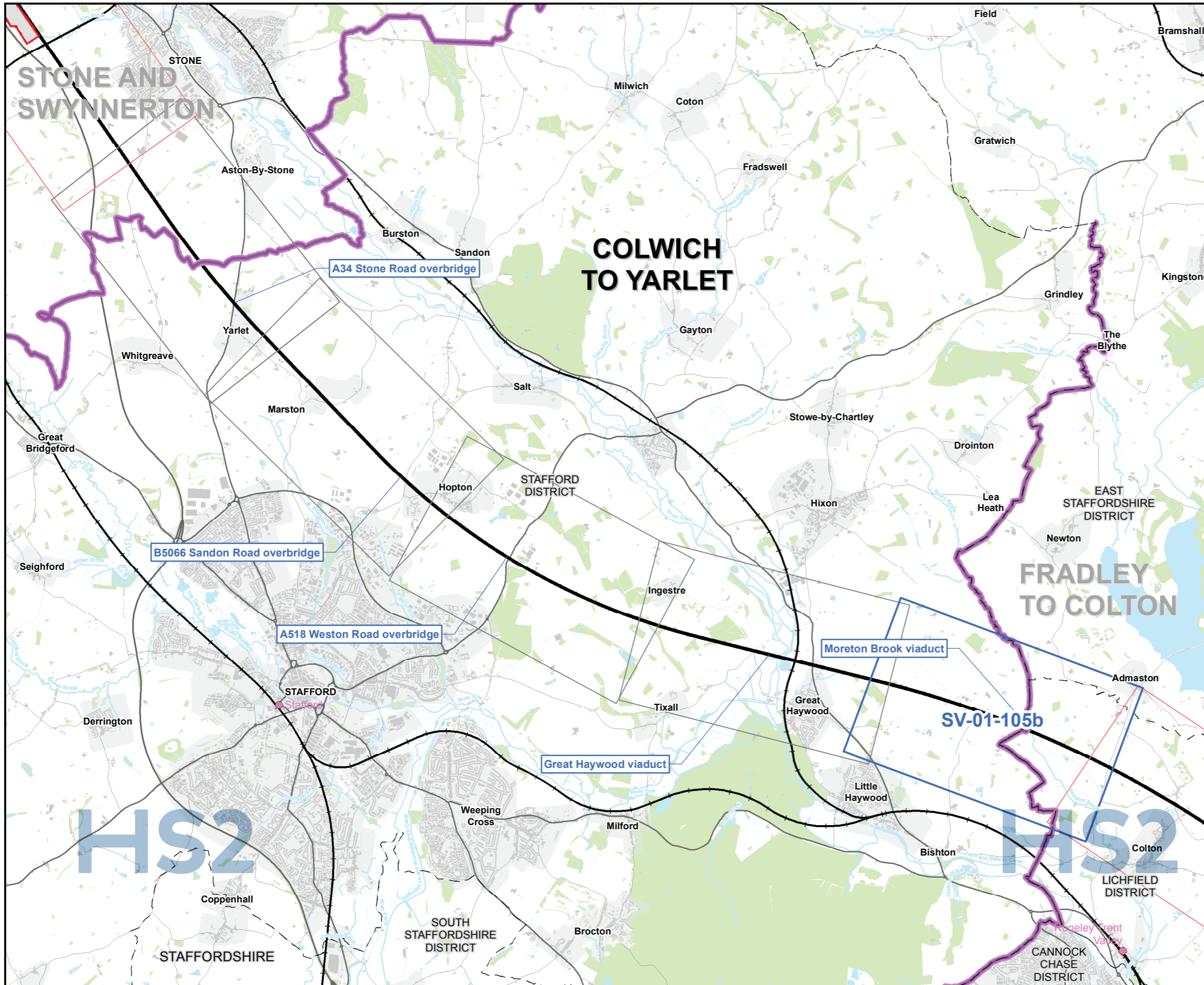
CA2 Colwich to Yarlet

SV-01 - Operational Sound Contour Maps and Likely Significant Effects

SV-02 - Operational Noise and Vibration Impacts and
Likely Significant Effects (with Assessment Locations)

SV-03 - Assessment and Monitoring Locations for
Construction Sound, Noise & Vibration Assessments

SV-04 - Assessment and Monitoring Locations for
Operational Sound, Noise & Vibration Assessments



Map Series Information:

SV-01 presents the predicted operational sound from the new railway.

The sound levels from the new railway (expressed as $L_{pAeq,T}$) are presented in typical noise mapping colours in 5 dB steps. There is a panel at the top right of the figure; the left-hand section of this panel contains a key communicating the night-time and daytime sound levels represented by the various colours. The right-hand part of the same panel contains text explaining how the sound levels presented on the figure inform the assessment of direct noise impacts and likely significant effects. A corresponding and similar panel is found on SV-02, along with the key sound contours that were used within the environmental assessment.

Also presented on SV-01 are the following (which are also included on SV-02):

- A representation of the Proposed Scheme, including the railway alignment (indicating whether it is on the surface or in tunnel), any new and altered roads and all associated engineering and environmental mitigation earthworks;
- blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
- symbols representing buildings that would potentially qualify for noise insulation;
- labels identifying the residual likely significant noise effects of the Proposed Scheme, and
- the extent of the study area within which the direct impacts and effects of the scheme have been quantitatively assessed.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

The design of the Proposed Scheme will be informed through stakeholder engagement and further engineering and environmental studies.

Note: Not all data layers in the legend are represented on every map.

Main Map Legend	
	Route in tunnel
	Route on surface
	Depot, station, headhouse or portal building
	Community area boundary
	Existing railway station
	County boundary
	District/Borough boundary
	Map sheets included in this community area with amendment
	Map sheets included in this community area with no amendment
	Map sheets not included in this community area

Map Number	SV-01-INDEX-CA2
Map Name	Index Map of: Operational Sound Contour Maps and Likely Significant Effects SES2 and AP2 ES
	Community Area 2: Colwich to Yarlet

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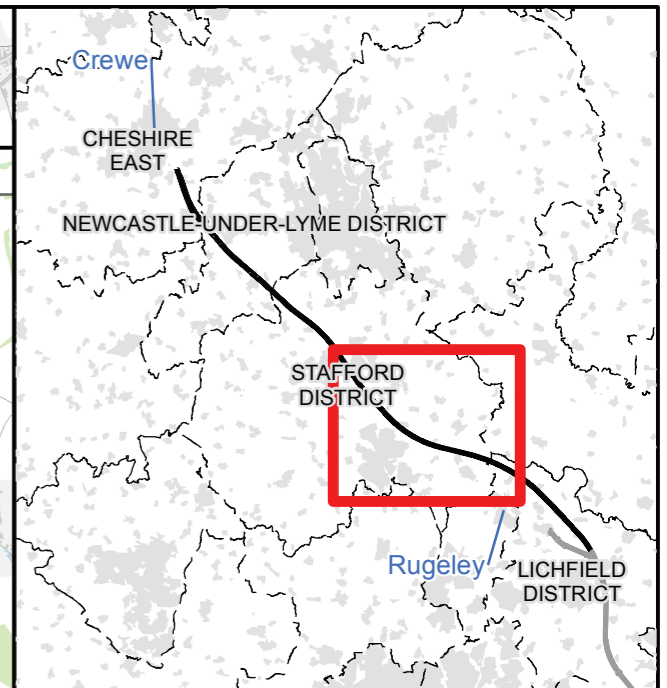
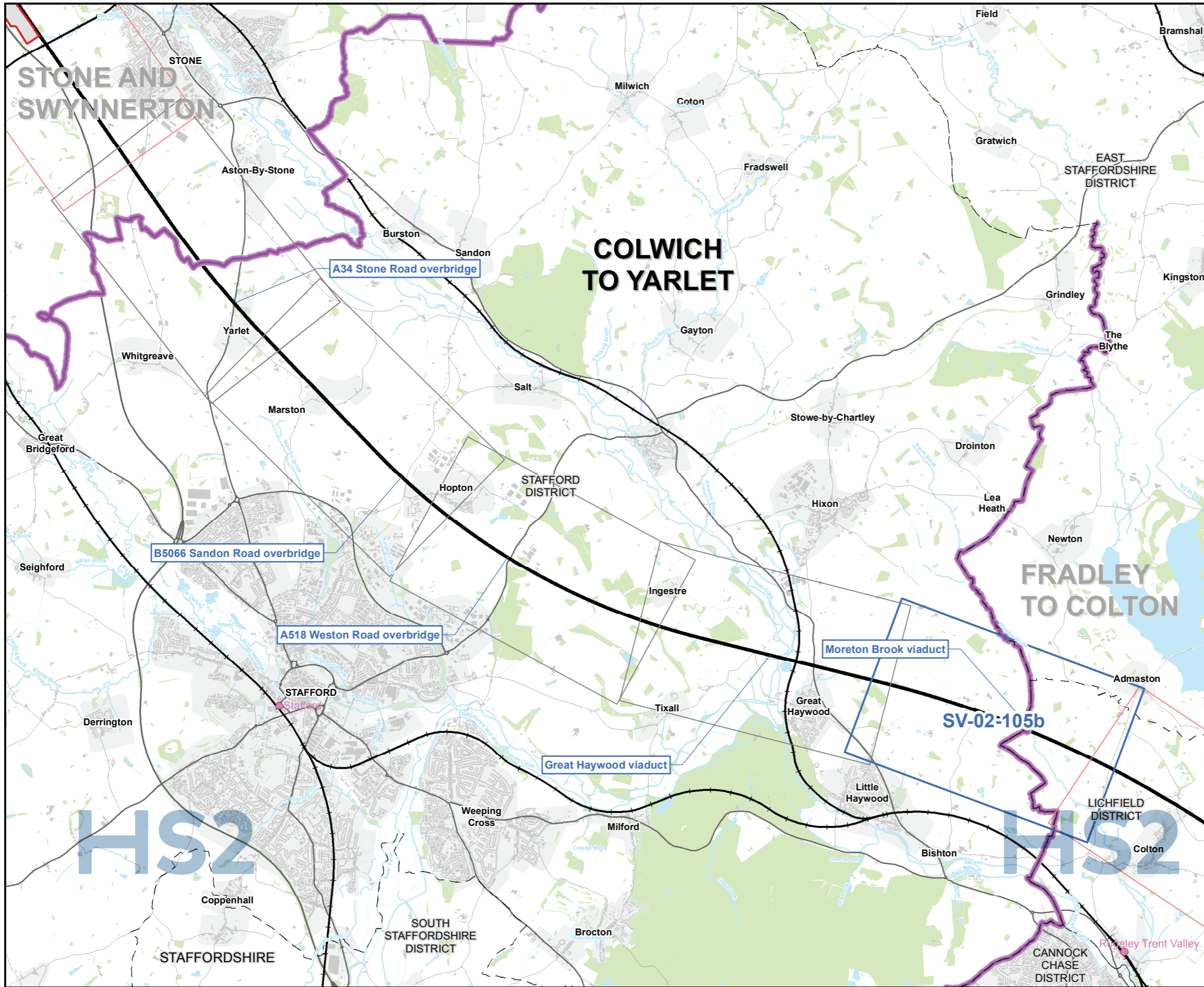
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Doc Number: 2PT02-ARP-EV-MAP-000-631002-P03

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Metres

Date: 23/01/19



Map Series Information:

SV-02 presents the direct operational noise impacts and likely significant effects of the Proposed Scheme.

The SV-02 figure series necessarily contains a large amount of information relating to the operational noise and vibration assessment. It is designed to communicate visually the assessment process from the prediction of impacts to the determination of likely residual significant effects. The corresponding text is included in Vol2 and Vol5.

- Key items on the map include the following:
- The Proposed Scheme (the proposed railway alignments and surrounding associated earthworks/roads);
 - blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
 - the study areas, which indicate the areas within which direct sound and vibration impacts of the scheme have been quantitatively assessed;
 - the calculated direct operational impacts of the scheme, displayed as colour-coded buildings and symbols representing buildings that would potentially qualify for noise insulation;
 - sound contours representing sound produced by the new railway displayed in a simpler manner than on SV-01 in order not to obscure the features on the map series;
 - the assessment locations at which a quantitative prediction of sound and impacts have been carried out (representing a number of nearby buildings). These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-002-0XX; and
 - labels indicating where the likely residual direct noise or vibration significant effects have been identified. These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-002-0XX.

The design of the Proposed Scheme will be informed through stakeholder engagement and further engineering and environmental studies.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.

Main Map Legend

	Route in tunnel		Map sheets included in this community area with amendment
	Route on surface		Map sheets included in this community area with no amendment
	Depot, station, headhouse or portal building		Map sheets not included in this community area
	Community area boundary		
	Existing railway station		
	County boundary		
	District/Borough boundary		

Map Number	SV-02-INDEX-CA2
Map Name	Index Map of: Operational Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations) SES2 and AP2 ES Community Area 2: Colwich to Yarlet

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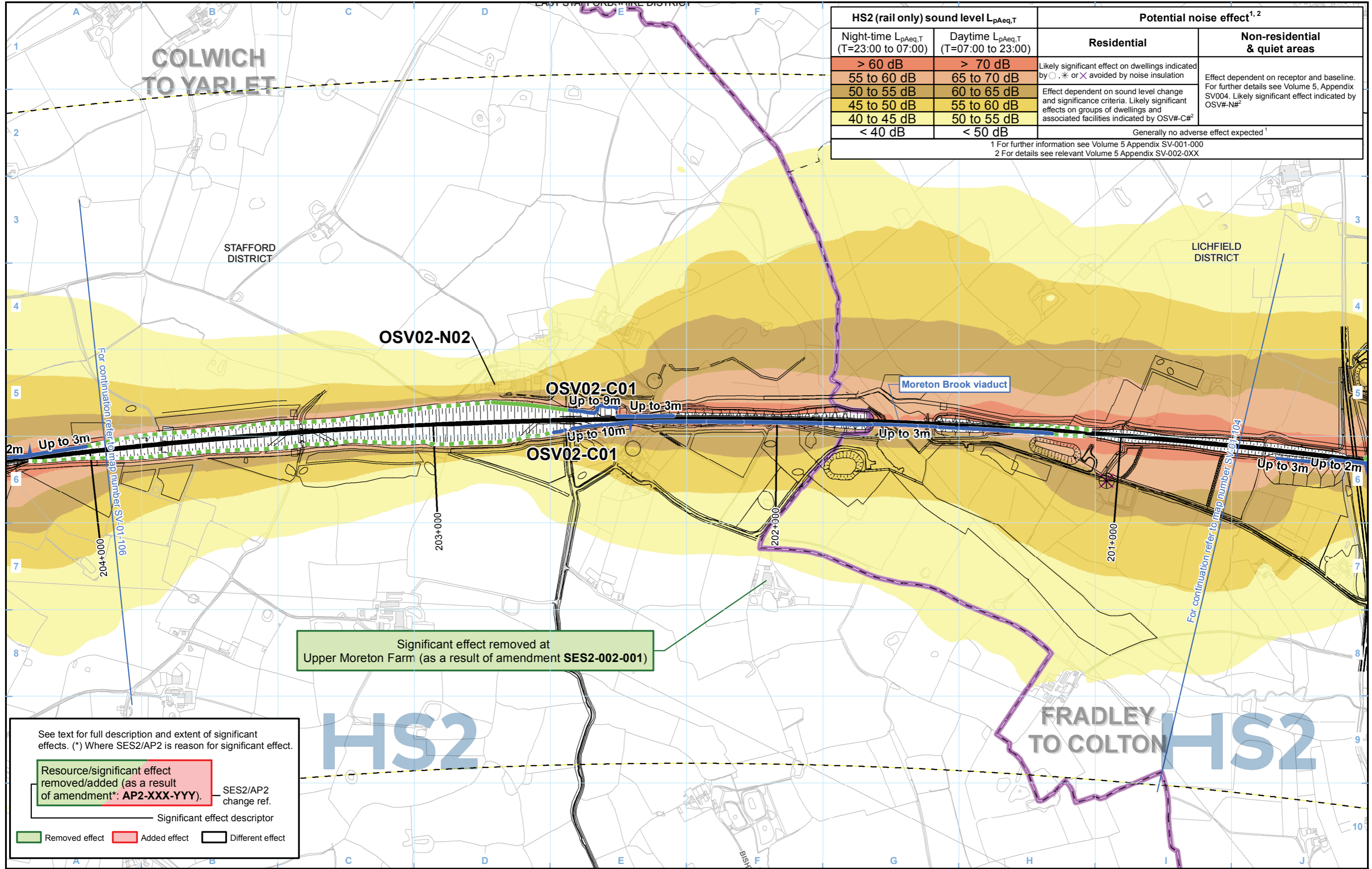
Doc Number: 2PT02-ARP-EV-MAP-000-632002-P03

Date: 24/01/19

COLWICH TO YARLET

HS2 (rail only) sound level $L_{pAeq,T}$		Potential noise effect ^{1,2}	
Night-time $L_{pAeq,T}$ (T=23:00 to 07:00)	Daytime $L_{pAeq,T}$ (T=07:00 to 23:00)	Residential	Non-residential & quiet areas
> 60 dB	> 70 dB	Likely significant effect on dwellings indicated by ○, * or X avoided by noise insulation	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-N# ²
55 to 60 dB	65 to 70 dB	Effect dependent on sound level change and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# ²	
50 to 55 dB	60 to 65 dB		Generally no adverse effect expected ¹
45 to 50 dB	55 to 60 dB		
40 to 45 dB	50 to 55 dB		
< 40 dB	< 50 dB		

1 For further information see Volume 5 Appendix SV-001-000
2 For details see relevant Volume 5 Appendix SV-002-0XX



Significant effect removed at Upper Moreton Farm (as a result of amendment SES2-002-001)

See text for full description and extent of significant effects. (*) Where SES2/AP2 is reason for significant effect.

Resource/significant effect removed/added (as a result of amendment*: AP2-XXX-YYY). — SES2/AP2 change ref.

— Significant effect descriptor

Removed effect (Green) Added effect (Red) Different effect (Black)

Legend - General features

- Route in bored tunnel
 - Route in cut and cover tunnel
 - Route on surface
 - Depot, station, headhouse or portal building
 - Community area boundary
 - County boundary
 - District/Borough boundary
- Engineering earthworks:
- Embankment
 - Cutting
- Non engineering earthworks:
- Embankment
 - Cutting

Legend - Sound related features

- Envisaged mitigation to avoid / reduce significant noise effects:
- Landscaping and/or fence barriers*
 - Engineering e.g. cuttings (green tunnels separately marked)
- Envisaged features further reducing noise effects:
- Other environmental e.g. landscaping
 - Engineering e.g. cuttings
- 1km Airborne sound study area
- Potential additional noise insulation (triggered by maximum sound levels at night)¹
 - Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)¹
 - Potential noise insulation (triggered by Noise Insulation Regulations 1996)¹
- * Labelled with total barrier height above rail level

Map Number: SV-01-105b

Map Name: Operational Sound Contour Maps and Likely Significant Effects SES2 and AP2 ES

Community Area 2: Colwich to Yarlet

HS2

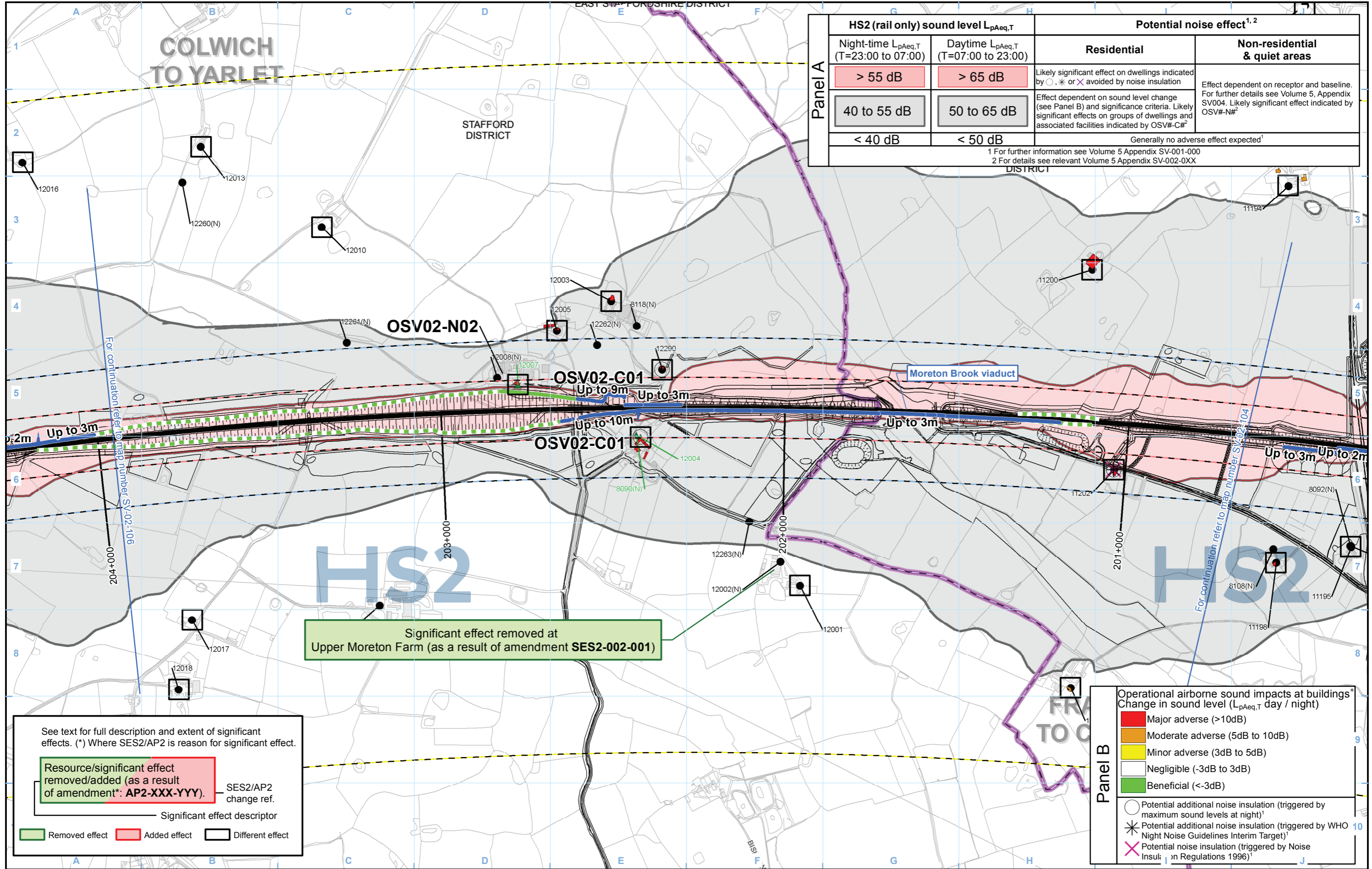
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Date: 15/01/19



Panel A	HS2 (rail only) sound level $L_{pAeq,T}$		Potential noise effect ^{1,2}	
	Night-time $L_{pAeq,T}$ (T=23:00 to 07:00)	Daytime $L_{pAeq,T}$ (T=07:00 to 23:00)	Residential	Non-residential & quiet areas
	> 55 dB	> 65 dB	Likely significant effect on dwellings indicated by ○, * or ✕ avoided by noise insulation	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-C# ²
40 to 55 dB	50 to 65 dB	Effect dependent on sound level change (see Panel B) and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# ²	Generally no adverse effect expected ¹	
< 40 dB	< 50 dB			

1 For further information see Volume 5 Appendix SV-001-000
2 For details see relevant Volume 5 Appendix SV-002-0XX

Operational airborne sound impacts at buildings ¹ Change in sound level ($L_{pAeq,T}$ day / night)	
Major adverse (>10dB)	○ Potential additional noise insulation (triggered by maximum sound levels at night) ¹
Moderate adverse (5dB to 10dB)	* Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target) ¹
Minor adverse (3dB to 5dB)	✕ Potential noise insulation (triggered by Noise Insulation Regulations 1996) ¹
Negligible (-3dB to 3dB)	
Beneficial (<-3dB)	

See text for full description and extent of significant effects. (*) Where SES2/AP2 is reason for significant effect.

Resource/significant effect removed/added (as a result of amendment*: AP2-XXX-YYY). SES2/AP2 change ref.

Significant effect descriptor

Removed effect (Green) Added effect (Red) Different effect (Black)

- Legend - General features**
- Route in bored tunnel
 - Route in cut and cover tunnel
 - Route on surface
 - Depot, station, headhouse or portal building
 - Community area boundary
 - County boundary
 - District/Borough boundary

- Engineering earthworks:**
- Embankment
 - Cutting
 - L_{pAFmax} exceeds 60dB façade**
- Non engineering earthworks:**
- Embankment
 - Cutting
- * Residential buildings only
* Labelled with total barrier height above rail level
** HS2 train only $L_{pAFmax} + 2.5dB$ façade correction

- Legend - Sound related features**
- Committed developments - SV Only
 - Envisaged mitigation to avoid / reduce significant noise effects:
 - Landscaping and/or fence barriers*
 - Engineering e.g. cuttings (green tunnels separately marked)
 - Envisaged measures further reducing noise effects:
 - Other environmental e.g. landscaping
 - Engineering e.g. cuttings
 - 1km Airborne sound study area

- Ground-borne sound & vibration study area (residential and non-residential)
- Ground-borne sound & vibration study area (highly sensitive non-residential)
- Airborne sound assessment location
- Airborne sound and vibration assessment location
- Ground-borne sound and/or vibration assessment location
- Airborne sound, ground-borne sound and vibration assessment location
- Ground-borne noise or vibration impact*

Map Number: SV-02-105b

Map Name: Operational Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations) SES2 and AP2 ES

Community Area 2: Colwich to Yarlet

HS2

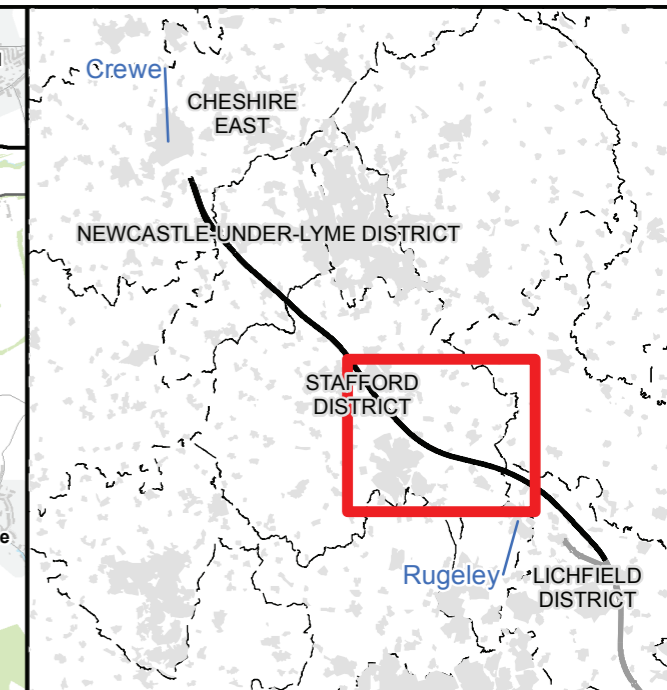
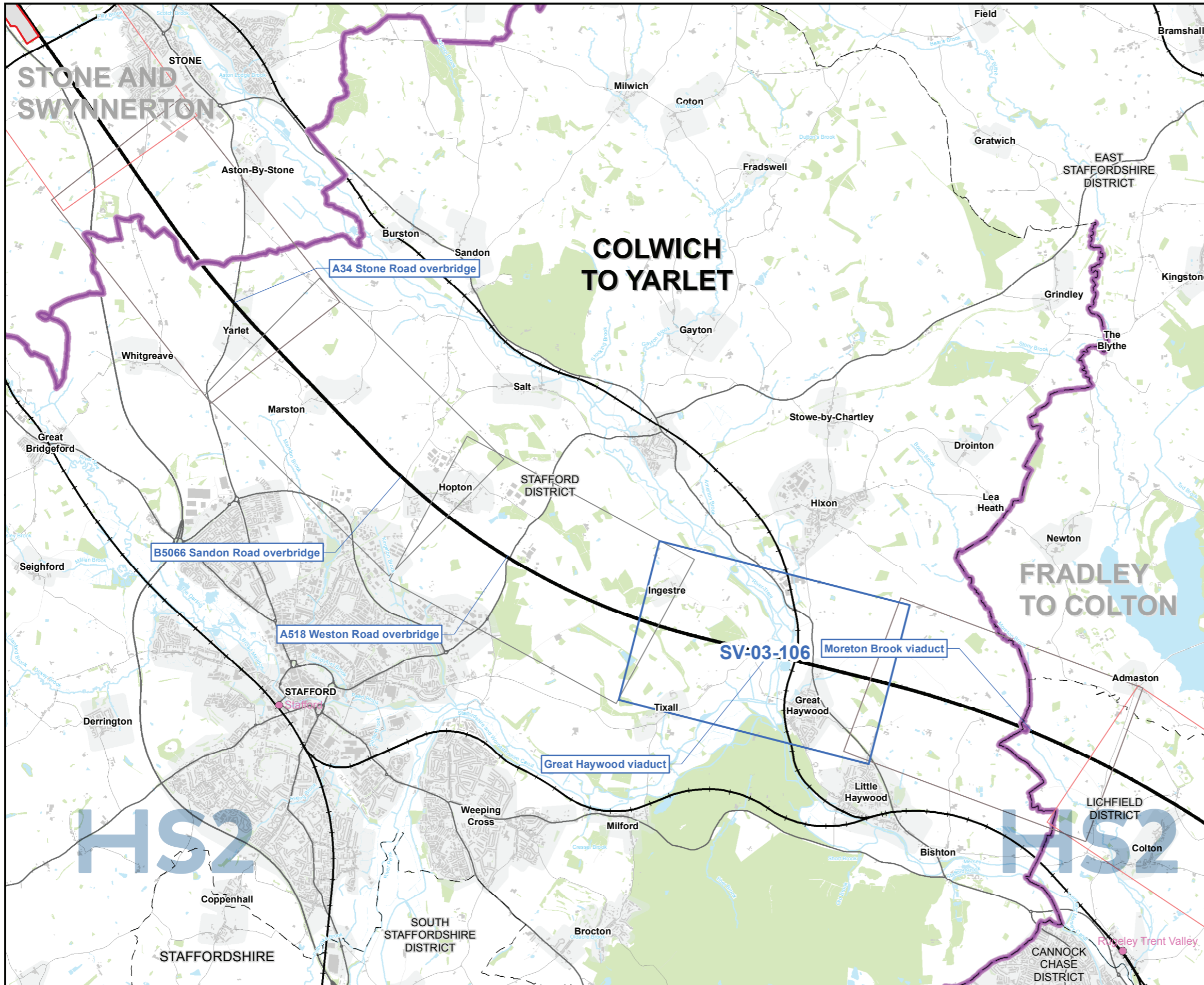
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Map Series Information:

The SV-03 figure series accompanies the construction noise & vibration assessments. It shows the locations at which a quantitative assessment of the direct effects of construction noise and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the construction noise and vibration reports contained in Volume 5: Appendix SV-002-0XX

The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002-0XX.

The design of the Proposed Scheme will be informed through stakeholder engagement and further engineering and environmental studies.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

- Main Map Legend**
- Route in tunnel
 - Route on surface
 - Depot, station, headhouse or portal building
 - Community area boundary
 - Existing railway station
 - County boundary
 - District/Borough boundary

- Map sheets included in this community area with amendment
- Map sheets included in this community area with no amendment
- Map sheets not included in this community area

Map Number	SV-03-INDEX-CA2
Map Name	Index Map of: Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments SES2 and AP2 ES Community Area 2: Colwich to Yarlet

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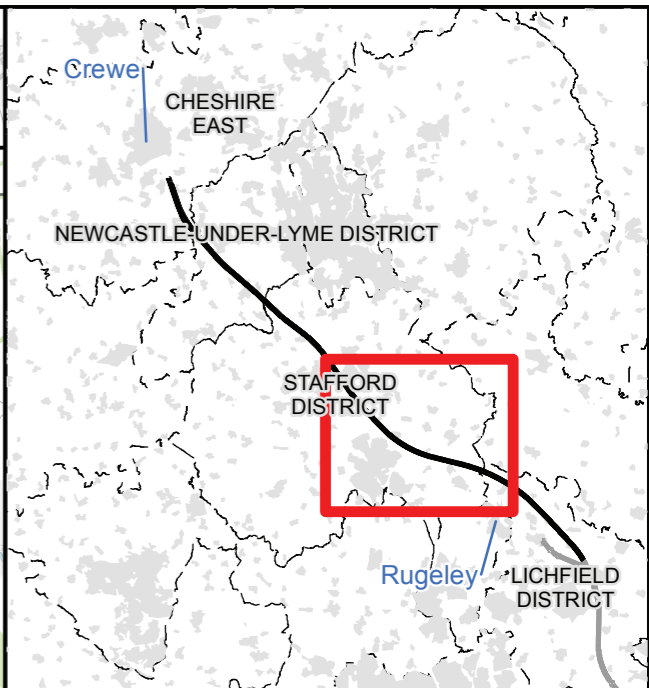
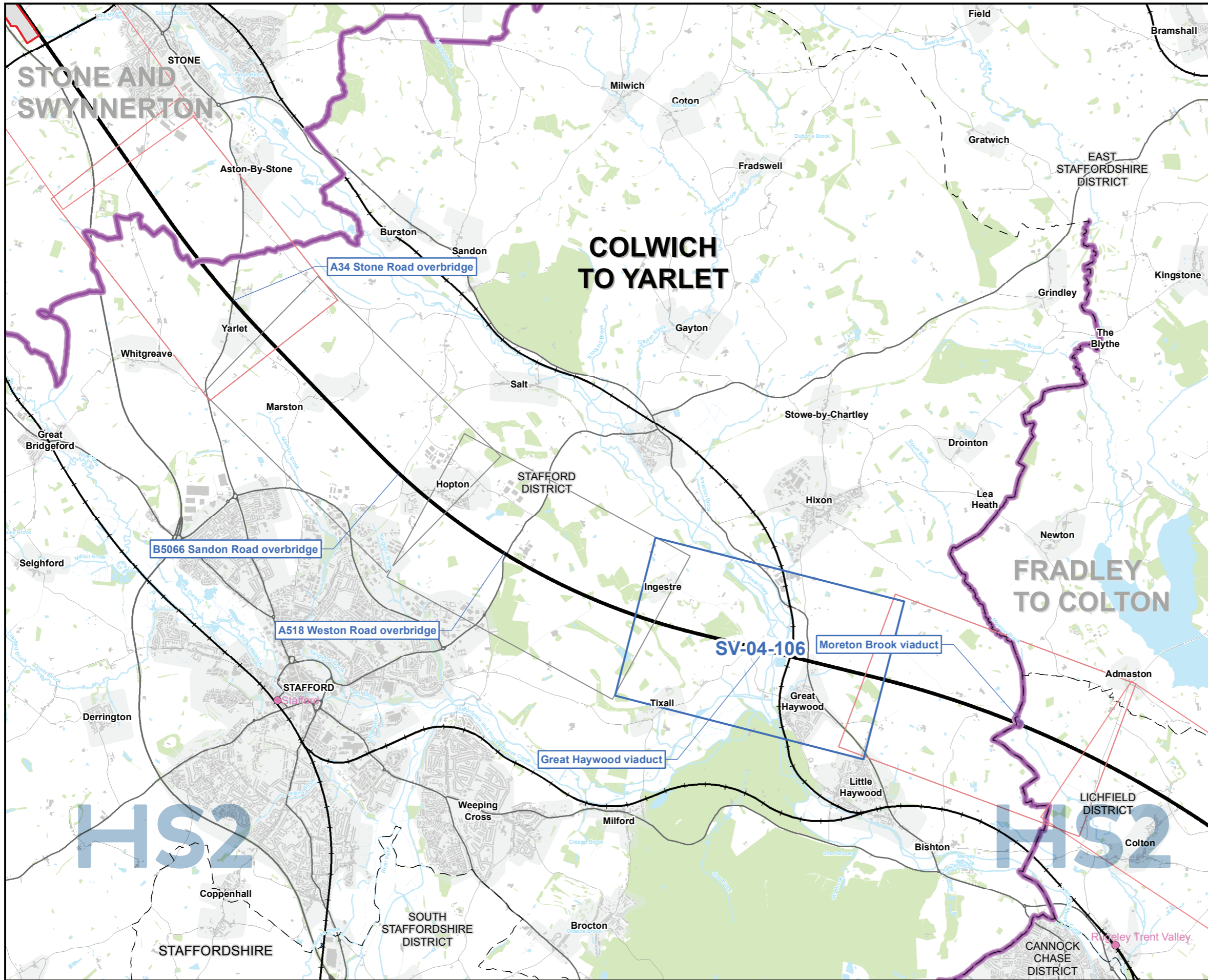
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Doc Number: 2PT02-ARP-EV-MAP-000-633002-P03

Date: 23/01/19

Note: Not all data layers in the legend are represented on every map.



Map Series Information:

The SV-04 figure series shows the locations at which a quantitative assessment of the direct effects of operational sound and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the operational sound and vibration reports contained in Volume 5: Appendix SV-002-0XX

The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002-0XX

The design of the Proposed Scheme will be informed through stakeholder engagement and further engineering and environmental studies.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

- Main Map Legend**
- Route in tunnel
 - Route on surface
 - Depot, station, headhouse or portal building
 - Community area boundary
 - Existing railway station
 - County boundary
 - District/Borough boundary
 - Map sheets included in this community area with amendment
 - Map sheets included in this community area with no amendment
 - Map sheets not included in this community area

Map Number: **SV-04-INDEX-CA2**

Map Name: **Index Map of:
Assessment and Monitoring Locations for
Operational Sound, Noise & Vibration
Assessments
SES2 and AP2 ES
Community Area 2:
Colwich to Yarlet**

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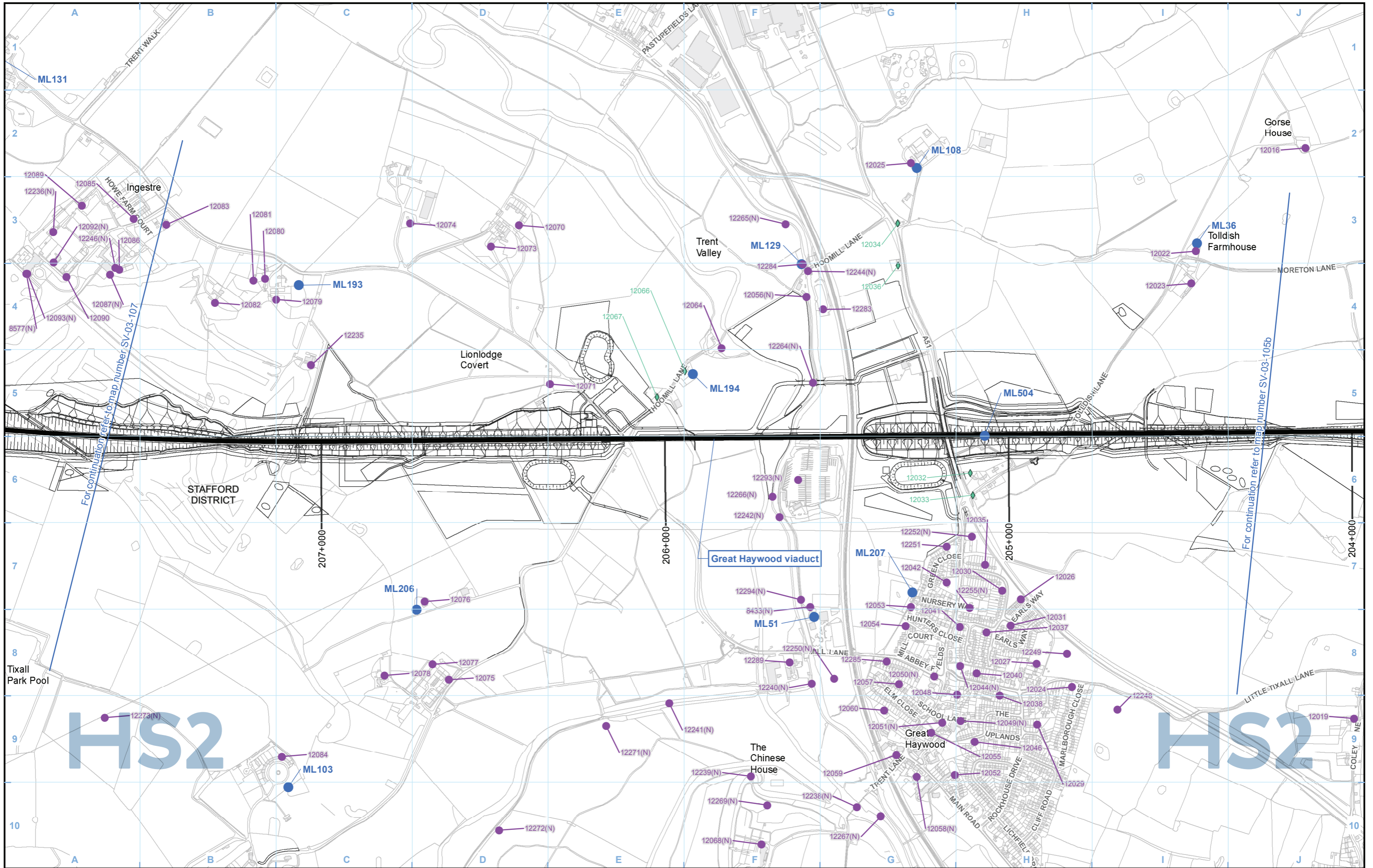
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Date: 23/01/19

Note: Not all data layers in the legend are represented on every map.



Legend - General features

- Route in bored tunnel
- Route in cut and cover tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community area boundary
- County boundary
- District/Borough boundary

- Engineering earthworks:**
- Embankment
 - Cutting
- Non engineering earthworks:**
- Embankment
 - Cutting

Legend - Sound related features

- Construction airborne sound assessment location
- Construction vibration assessment locations (labelled with Assessment Location ID reference number for details of the assessment results see Vol 5 Appendix SV-002-0XX)
- Construction airborne sound and vibration assessment location
- Baseline measurement locations (labelled with Measurement Location reference code)

Map Number: **SV-03-106**

Map Name: **Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments SES2 and AP2 ES**

Community Area 2: **Colwich to Yarlet**

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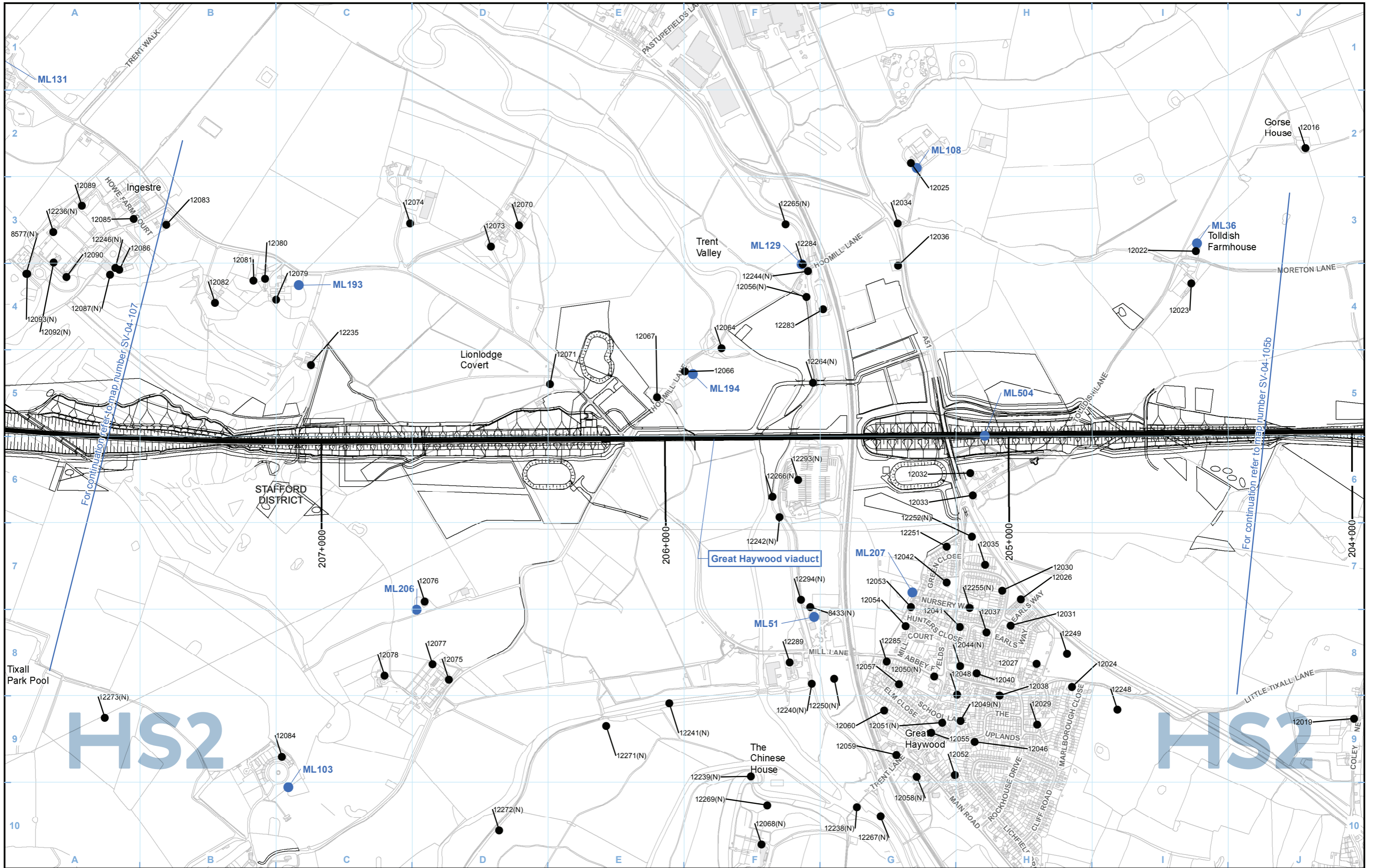
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Date: 10/12/18

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Legend - General features

- Route in bored tunnel
- Route in cut and cover tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community area boundary
- County boundary
- District/Borough boundary

Legend - Sound related features

Airborne sound assessment location	Airborne sound and vibration assessment location
Ground-borne sound and/or vibration assessment location	Airborne sound, ground-borne sound and vibration assessment location
Baseline measurement locations	

Engineering earthworks: Embankment Cutting

Non engineering earthworks: Embankment Cutting

labelled with Assessment Location ID reference number (for details of the assessment results see Vol 5 Appendix SV-002-0XX)

(labelled with Measurement Location reference code)

Map Number: **SV-04-106**

Map Name: **Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments SES2 and AP2 ES**

Community Area 2: **Colwich to Yarlet**

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High Speed Rail (West Midlands - Crewe)

Supplementary Environmental Statement 2 and Additional Provision 2 Environmental Statement

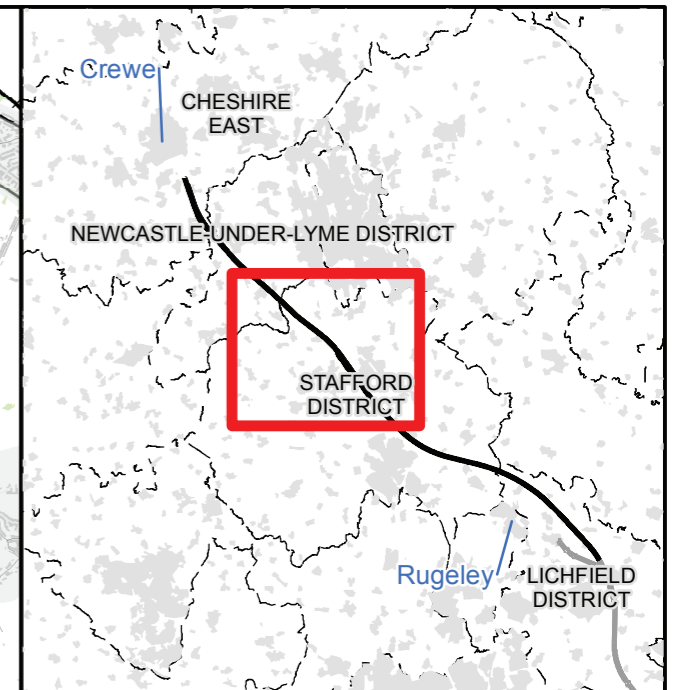
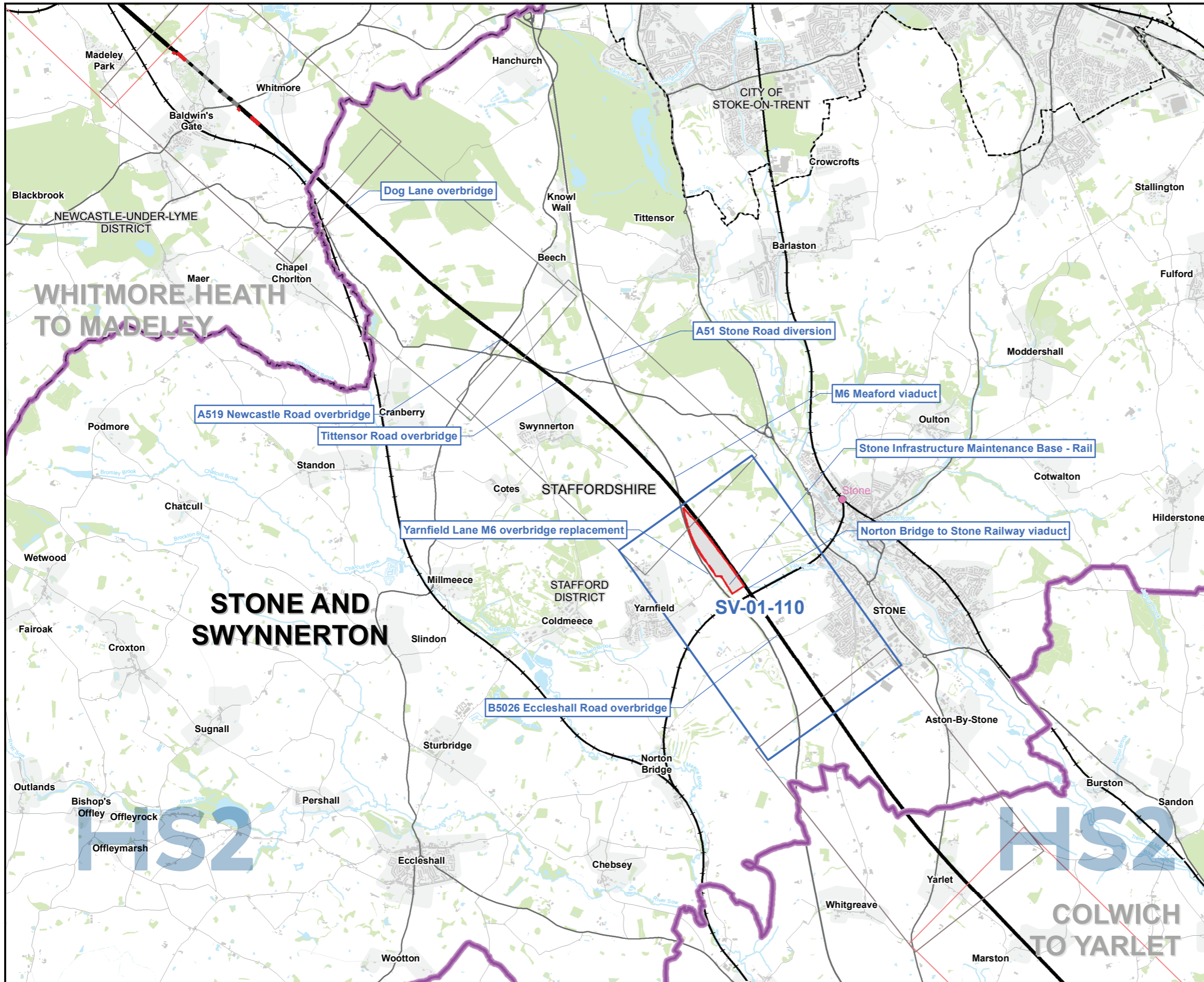
CA3 Stone and Swynnerton

SV-01 - Operational Sound Contour Maps and Likely Significant Effects

SV-02 - Operational Noise and Vibration Impacts and
Likely Significant Effects (with Assessment Locations)

SV-03 - Assessment and Monitoring Locations for
Construction Sound, Noise & Vibration Assessments

SV-04 - Assessment and Monitoring Locations for
Operational Sound, Noise & Vibration Assessments



Map Series Information:

SV-01 presents the predicted operational sound from the new railway.

The sound levels from the new railway (expressed as $L_{pAeq,T}$) are presented in typical noise mapping colours in 5 dB steps. There is a panel at the top right of the figure; the left-hand section of this panel contains a key communicating the night-time and daytime sound levels represented by the various colours. The right-hand part of the same panel contains text explaining how the sound levels presented on the figure inform the assessment of direct noise impacts and likely significant effects. A corresponding and similar panel is found on SV-02, along with the key sound contours that were used within the environmental assessment.

Also presented on SV-01 are the following (which are also included on SV-02):

- A representation of the Proposed Scheme, including the railway alignment (indicating whether it is on the surface or in tunnel), any new and altered roads and all associated engineering and environmental mitigation earthworks;
- blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
- symbols representing buildings that would potentially qualify for noise insulation;
- labels identifying the residual likely significant noise effects of the Proposed Scheme, and
- the extent of the study area within which the direct impacts and effects of the scheme have been quantitatively assessed.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

The design of the Proposed Scheme will be informed through stakeholder engagement and further engineering and environmental studies.

Note: Not all data layers in the legend are represented on every map.

Main Map Legend	
	Route in tunnel
	Route on surface
	Depot, station, headhouse or portal building
	Community area boundary
	Existing railway station
	County boundary
	District/Borough boundary
	Map sheets included in this community area with amendment
	Map sheets included in this community area with no amendment
	Map sheets not included in this community area

Map Number	SV-01-INDEX-CA3
Map Name	Index Map of: Operational Sound Contour Maps and Likely Significant Effects SES2 and AP2 ES Community Area 3: Stone and Swynnerton

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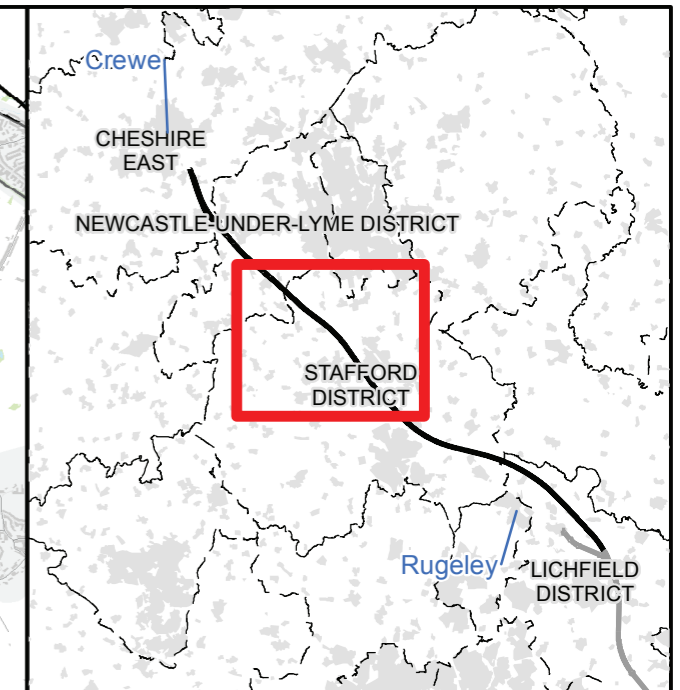
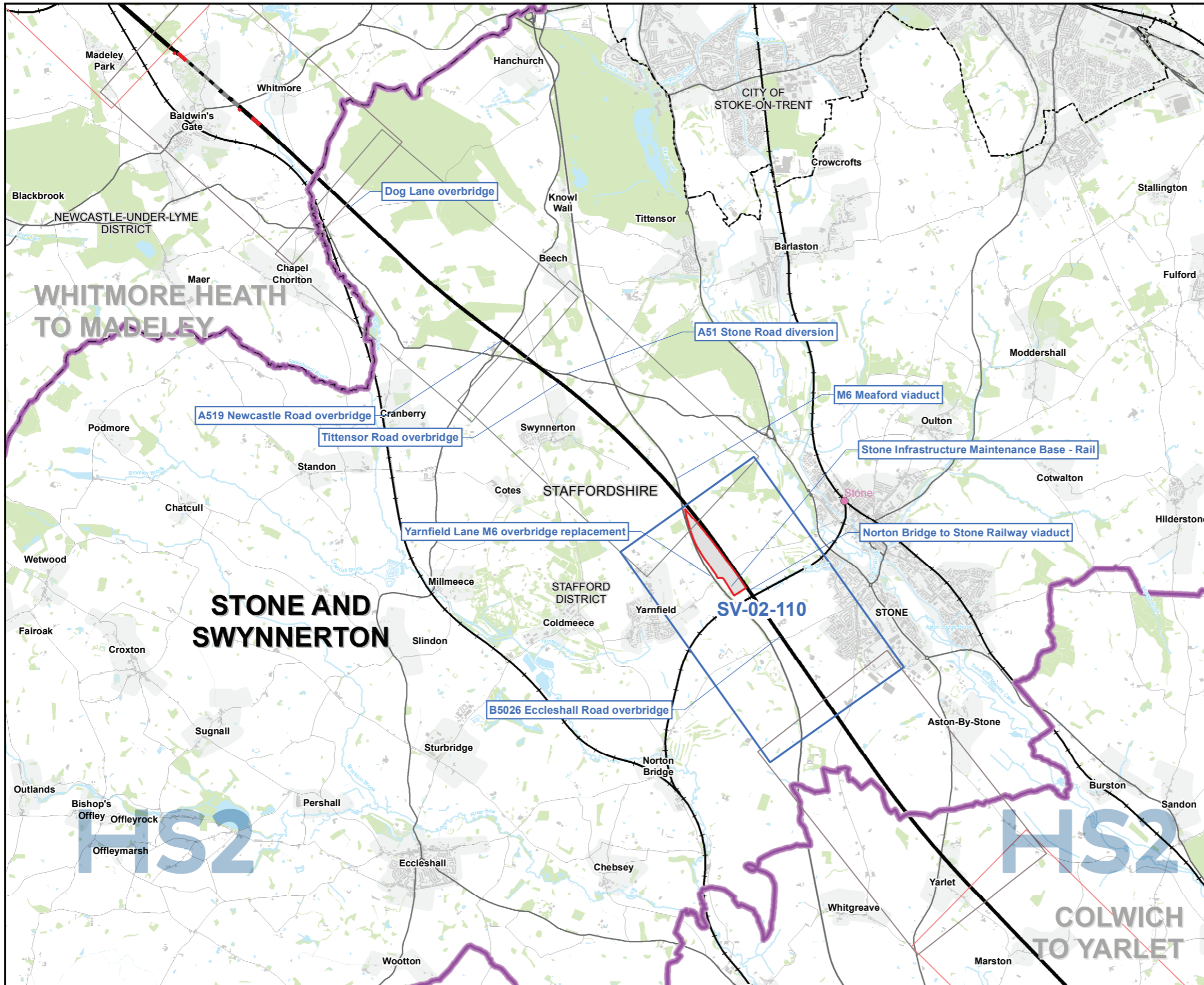
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Date: 23/01/19



Map Series Information:

SV-02 presents the direct operational noise impacts and likely significant effects of the Proposed Scheme.

The SV-02 figure series necessarily contains a large amount of information relating to the operational noise and vibration assessment. It is designed to communicate visually the assessment process from the prediction of impacts to the determination of likely residual significant effects. The corresponding text is included in Vol2 and Vol5.

- Key items on the map include the following:
- The Proposed Scheme (the proposed railway alignments and surrounding associated earthworks/roads);
 - blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
 - the study areas, which indicate the areas within which direct sound and vibration impacts of the scheme have been quantitatively assessed;
 - the calculated direct operational impacts of the scheme, displayed as colour-coded buildings and symbols representing buildings that would potentially qualify for noise insulation;
 - sound contours representing sound produced by the new railway displayed in a simpler manner than on SV-01 in order not to obscure the features on the map series;
 - the assessment locations at which a quantitative prediction of sound and impacts have been carried out (representing a number of nearby buildings). These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-002-0XX; and
 - labels indicating where the likely residual direct noise or vibration significant effects have been identified. These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-002-0XX.

The design of the Proposed Scheme will be informed through stakeholder engagement and further engineering and environmental studies.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.

- #### Main Map Legend
- Route in tunnel
 - Route on surface
 - Depot, station, headhouse or portal building
 - Community area boundary
 - Existing railway station
 - County boundary
 - District/Borough boundary
 - Map sheets included in this community area with amendment
 - Map sheets included in this community area with no amendment
 - Map sheets not included in this community area

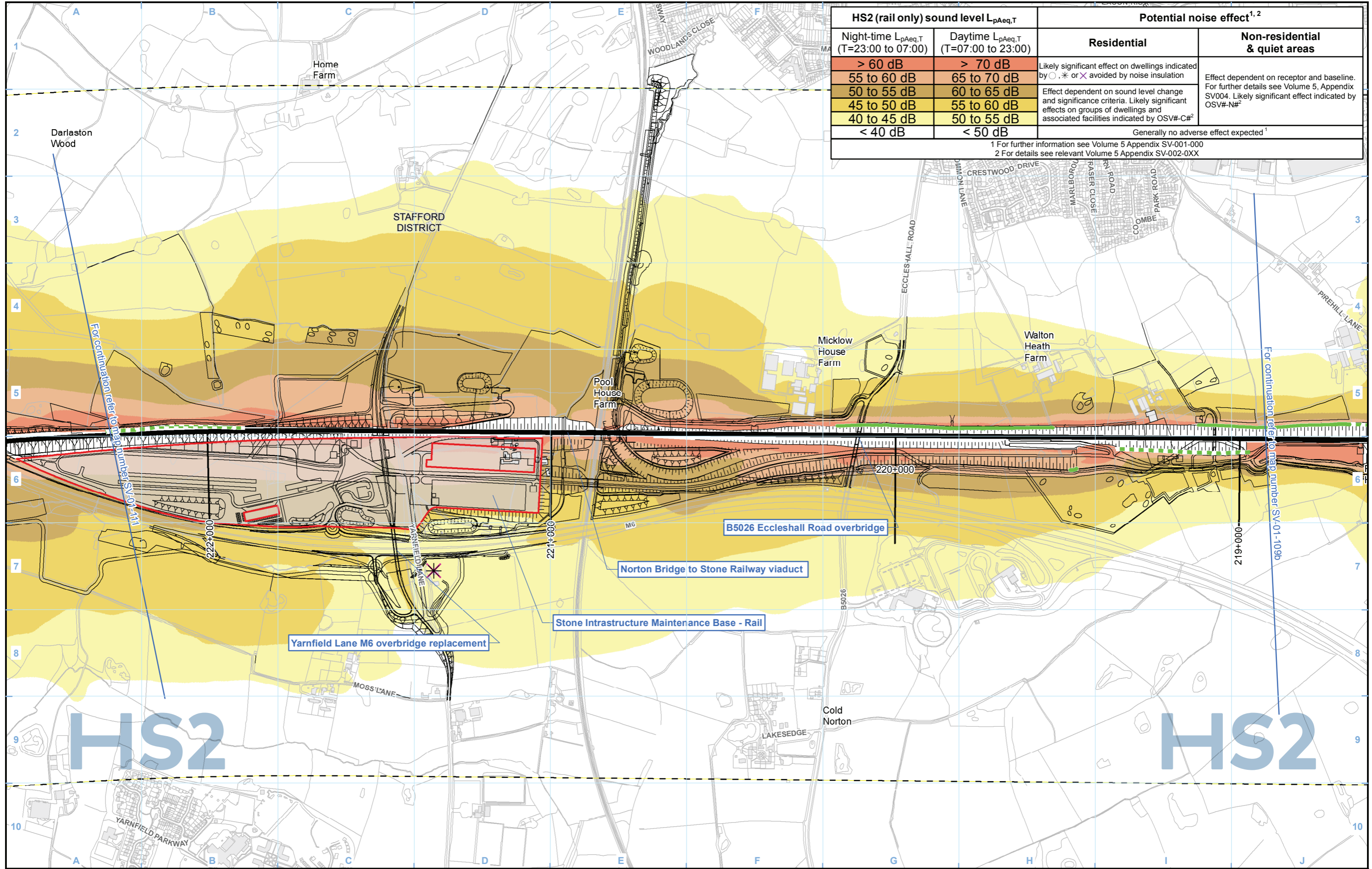
Map Number	SV-02-INDEX-CA3
Map Name	Index Map of: Operational Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations) SES2 and AP2 ES Community Area 3: Stone and Swynnerton

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Doc Number: 2PT02-ARP-EV-MAP-000-632003-P03 Date: 24/01/19



HS2 (rail only) sound level L _{pAeq,T}		Potential noise effect ^{1,2}	
Night-time L _{pAeq,T} (T=23:00 to 07:00)	Daytime L _{pAeq,T} (T=07:00 to 23:00)	Residential	Non-residential & quiet areas
> 60 dB	> 70 dB	Likely significant effect on dwellings indicated by ○, * or X avoided by noise insulation	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-N# ²
55 to 60 dB	65 to 70 dB	Effect dependent on sound level change and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# ²	
50 to 55 dB	60 to 65 dB		
45 to 50 dB	55 to 60 dB		
40 to 45 dB	50 to 55 dB	Generally no adverse effect expected ¹	
< 40 dB	< 50 dB		

1 For further information see Volume 5 Appendix SV-001-000
2 For details see relevant Volume 5 Appendix SV-002-0XX

Legend - General features

- Route in bored tunnel
- Route in cut and cover tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community area boundary
- County boundary
- District/Borough boundary

Legend - Sound related features

Envisaged mitigation to avoid / reduce significant noise effects:

- Landscaping and/or fence barriers*
- Engineering e.g. cuttings (green tunnels separately marked)

Envisaged features further reducing noise effects:

- Other environmental e.g. landscaping
- Engineering e.g. cuttings

Engineering earthworks:

- Embankment
- Cutting

Non engineering earthworks:

- Embankment
- Cutting

1km Airborne sound study area

Potential additional noise insulation (triggered by maximum sound levels at night)¹

Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)¹

Potential noise insulation (triggered by Noise Insulation Regulations 1996)¹

* Labeled with total barrier height above rail level

Map Number: SV-01-110

Map Name: Operational Sound Contour Maps and Likely Significant Effects SES2 and AP2 ES

Community Area 3: Stone and Swynnerton

HS2

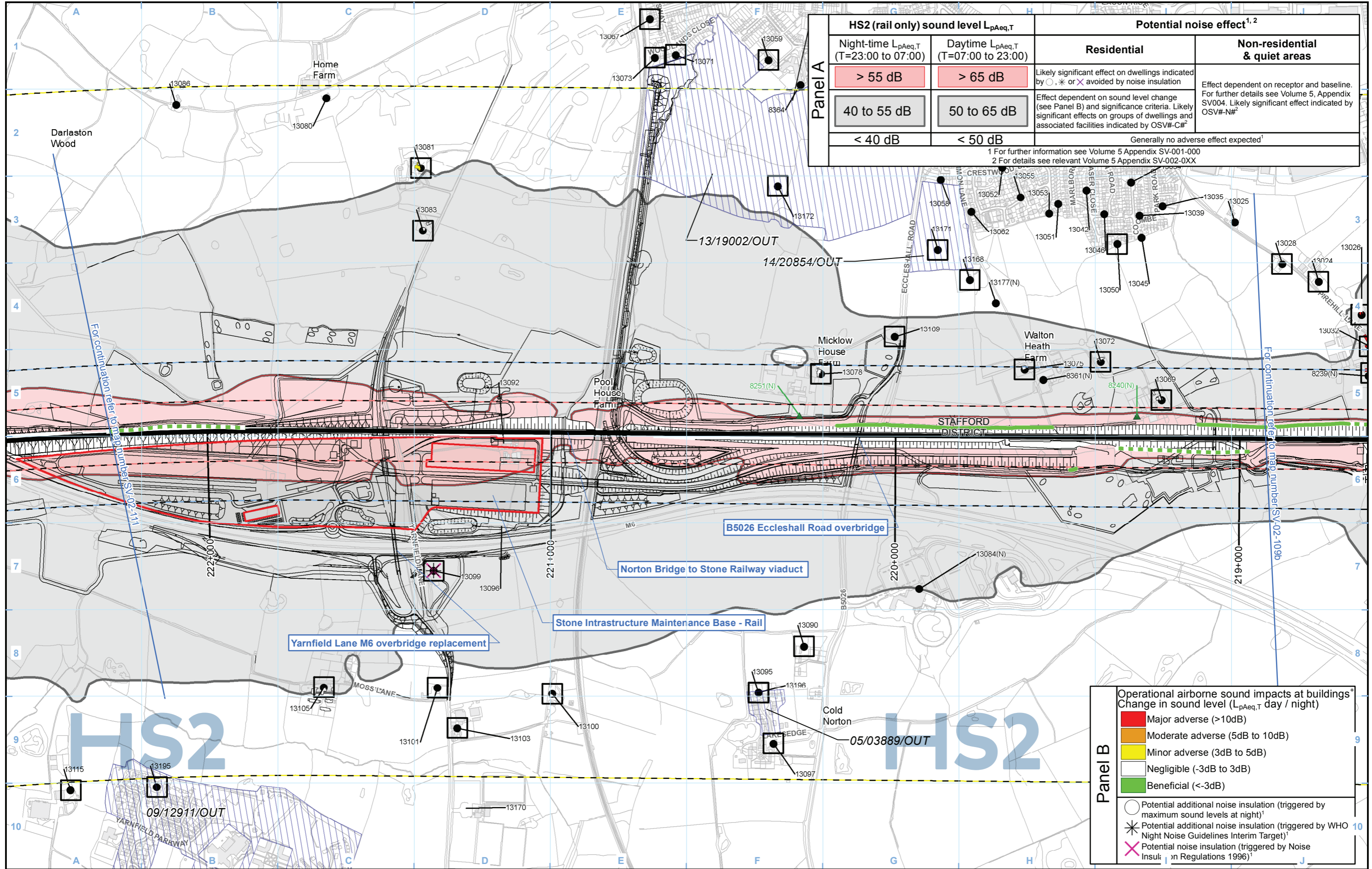
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Scale at A3: 1:10,000

Doc Number: 2PT02-ARP-EV-MAP-000-631110-P03

Date: 15/01/19



HS2 (rail only) sound level $L_{pAeq,T}$		Potential noise effect ^{1,2}	
Night-time $L_{pAeq,T}$ (T=23:00 to 07:00)	Daytime $L_{pAeq,T}$ (T=07:00 to 23:00)	Residential	Non-residential & quiet areas
> 55 dB	> 65 dB	Likely significant effect on dwellings indicated by ○, * or ✕ avoided by noise insulation	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-N# ²
40 to 55 dB	50 to 65 dB	Effect dependent on sound level change (see Panel B) and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# ²	Generally no adverse effect expected ¹
< 40 dB	< 50 dB		

1 For further information see Volume 5 Appendix SV-001-000
2 For details see relevant Volume 5 Appendix SV-002-0XX

Panel B

Operational airborne sound impacts at buildings¹
Change in sound level ($L_{pAeq,T}$ day / night)

- Major adverse (>10dB)
- Moderate adverse (5dB to 10dB)
- Minor adverse (3dB to 5dB)
- Negligible (-3dB to 3dB)
- Beneficial (<-3dB)

- Potential additional noise insulation (triggered by maximum sound levels at night)¹
- * Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)¹
- ✕ Potential noise insulation (triggered by Noise Insulation Regulations 1996)¹

- Legend - General features**
- Route in bored tunnel
 - Route in cut and cover tunnel
 - Route on surface
 - Depot, station, headhouse or portal building
 - Community area boundary
 - County boundary
 - District/Borough boundary

- Engineering earthworks:**
- Embankment
 - Cutting
 - L_{pAFmax} exceeds 60dB façade**
- Non engineering earthworks:**
- Embankment
 - Cutting
- * Residential buildings only
* Labelled with total barrier height above rail level
** HS2 train only $L_{pAFmax} + 2.5dB$ façade correction

- Legend - Sound related features**
- Committed developments - SV Only
 - Envisaged mitigation to avoid / reduce significant noise effects:
 - Landscaping and/or fence barriers*
 - Engineering e.g. cuttings (green tunnels separately marked)
 - Envisaged measures further reducing noise effects:
 - Other environmental e.g. landscaping
 - Engineering e.g. cuttings
 - 1km Airborne sound study area

- Ground-borne sound & vibration study area (residential and non-residential)
- Ground-borne sound & vibration study area (highly sensitive non-residential)
- Airborne sound assessment location
- Airborne sound and vibration assessment location
- Ground-borne sound and/or vibration assessment location
- Airborne sound, ground-borne sound and vibration assessment location
- Ground-borne noise or vibration impact*

Map Number: SV-02-110

Map Name: Operational Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations) SES2 and AP2 ES

Community Area 3: Stone and Swynnerton

HS2

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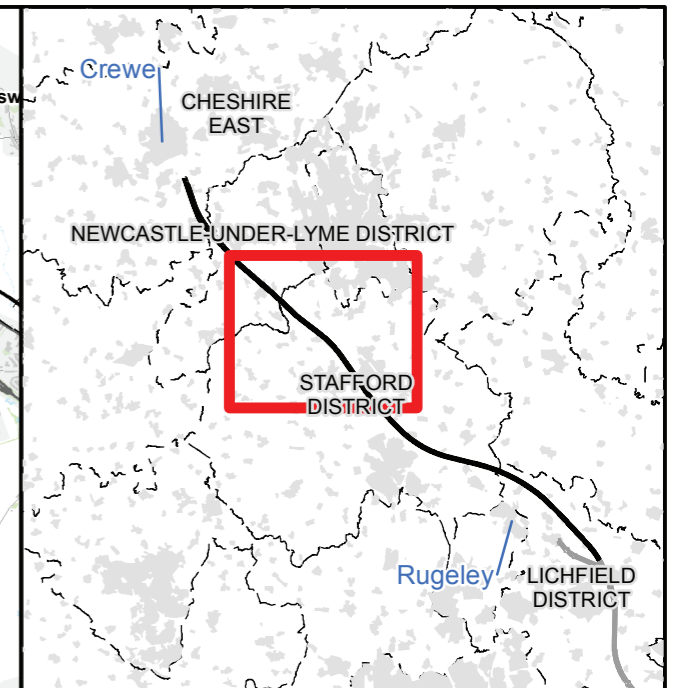
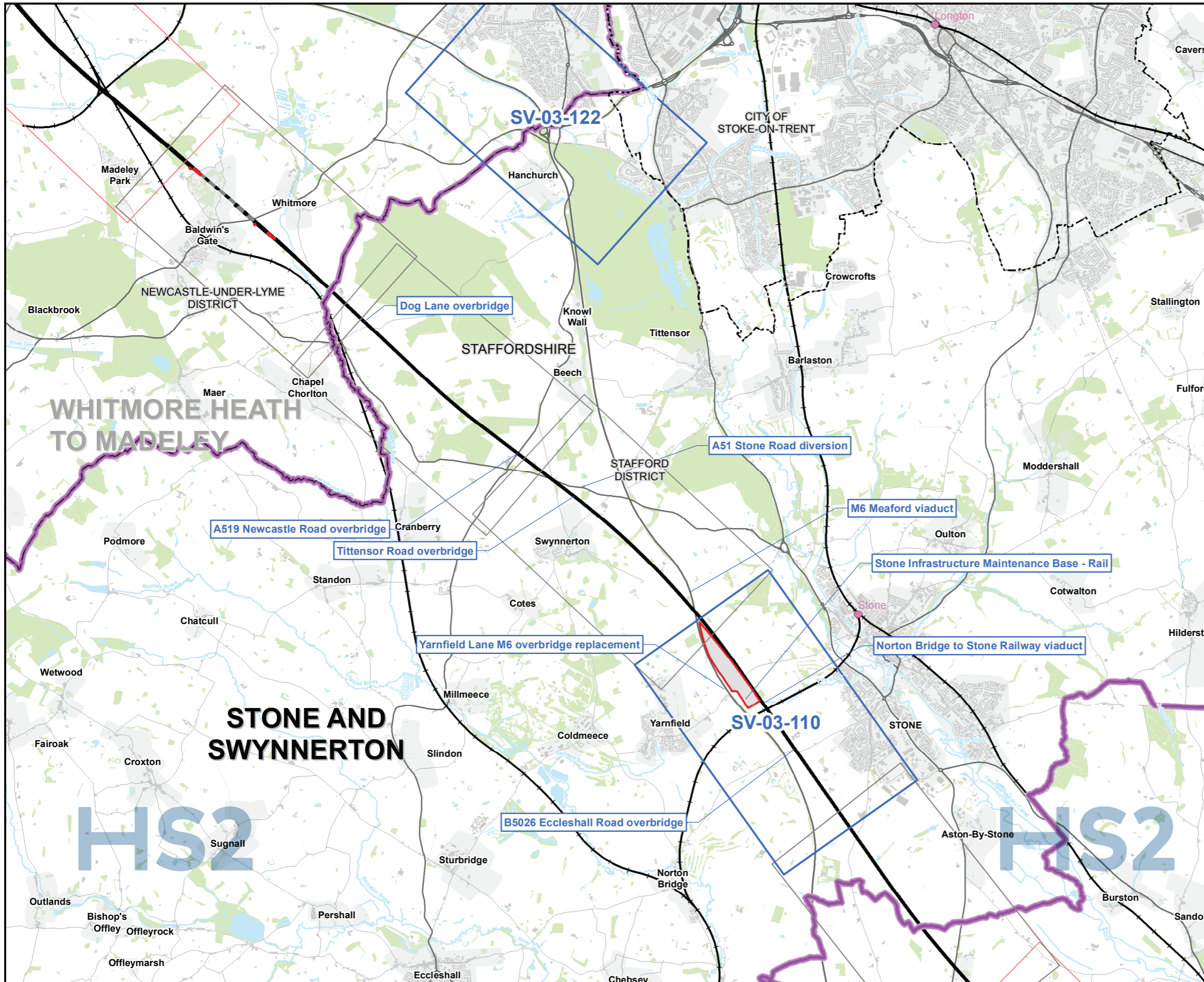
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Doc Number: 2PT02-ARP-EV-MAP-000-632110-P03

Date: 15/01/19

Scale at A3: 1:10,000

Metres



Map Series Information:

The SV-03 figure series accompanies the construction noise & vibration assessments. It shows the locations at which a quantitative assessment of the direct effects of construction noise and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the construction noise and vibration reports contained in Volume 5: Appendix SV-002-0XX

The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002-0XX.

The design of the Proposed Scheme will be informed through stakeholder engagement and further engineering and environmental studies.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

- Main Map Legend**
- Route in tunnel
 - Route on surface
 - Depot, station, headhouse or portal building
 - Community area boundary
 - Existing railway station
 - County boundary
 - District/Borough boundary
 - Map sheets included in this community area with amendment
 - Map sheets included in this community area with no amendment
 - Map sheets not included in this community area

Map Number	SV-03-INDEX-CA3
Map Name	Index Map of: Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments SES2 and AP2 ES Community Area 3: Stone and Swynnerton

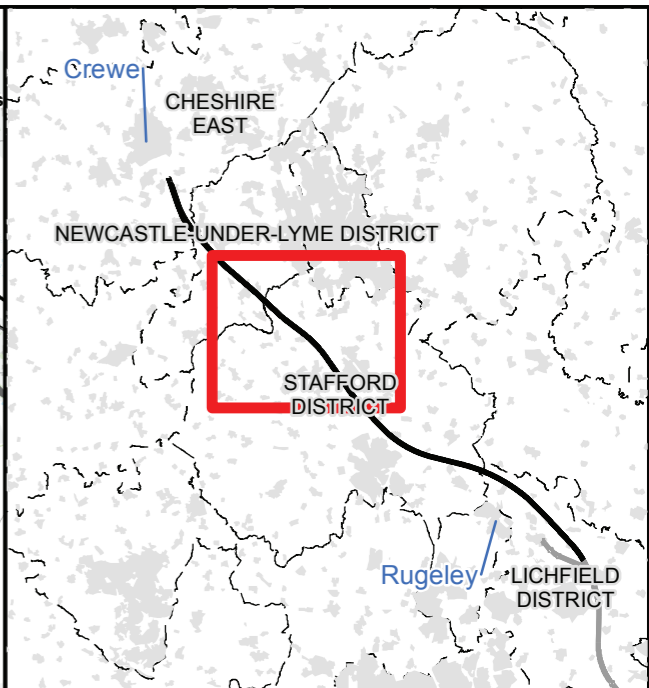
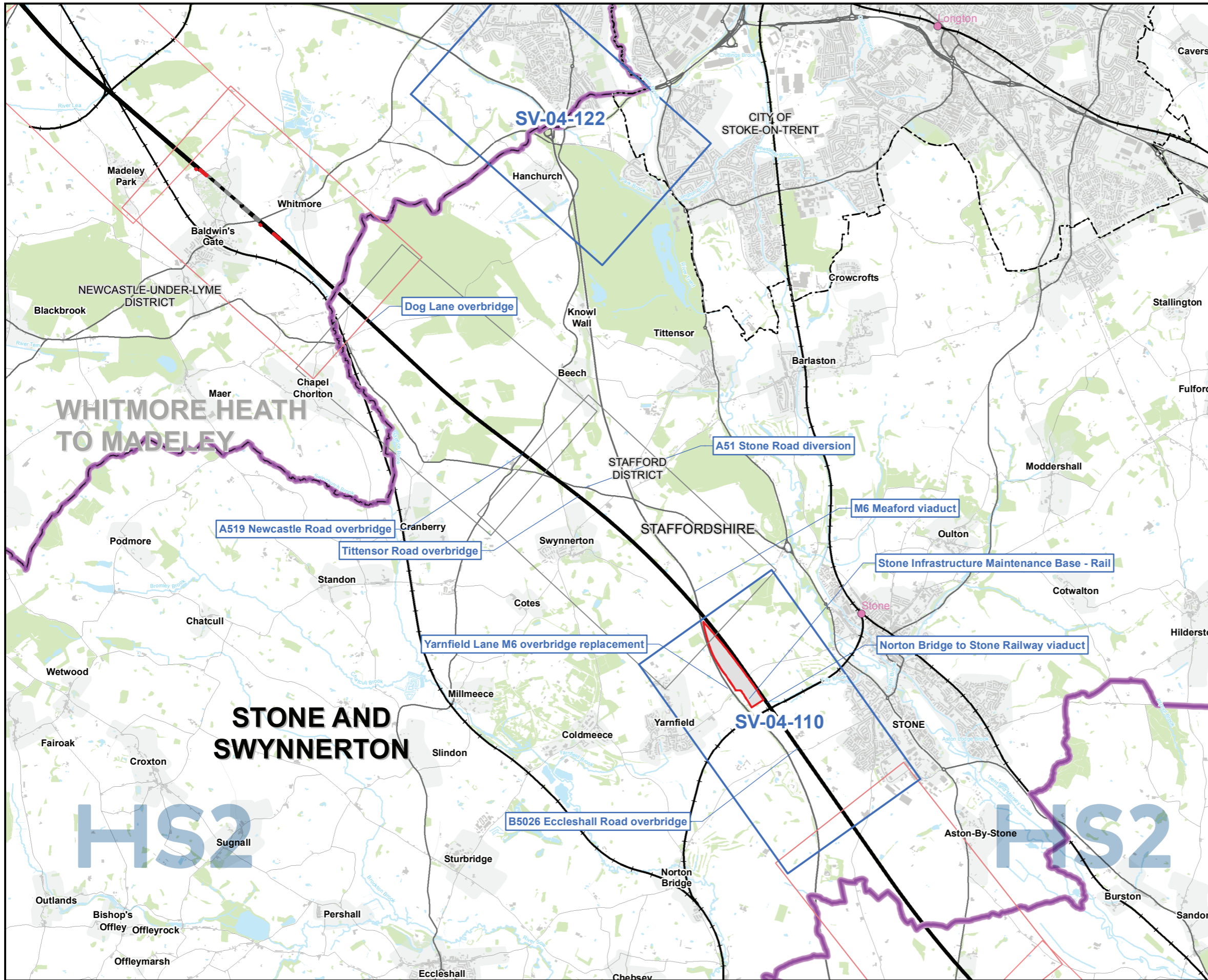
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Doc Number: 2PT02-ARP-EV-MAP-000-633003-P03 Date: 23/01/19



Map Series Information:

The SV-04 figure series shows the locations at which a quantitative assessment of the direct effects of operational sound and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the operational sound and vibration reports contained in Volume 5: Appendix SV-002-0XX

The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002-0XX

The design of the Proposed Scheme will be informed through stakeholder engagement and further engineering and environmental studies.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

- Main Map Legend**
- Route in tunnel
 - Route on surface
 - Depot, station, headhouse or portal building
 - Community area boundary
 - Existing railway station
 - County boundary
 - District/Borough boundary
 - Map sheets included in this community area with amendment
 - Map sheets included in this community area with no amendment
 - Map sheets not included in this community area

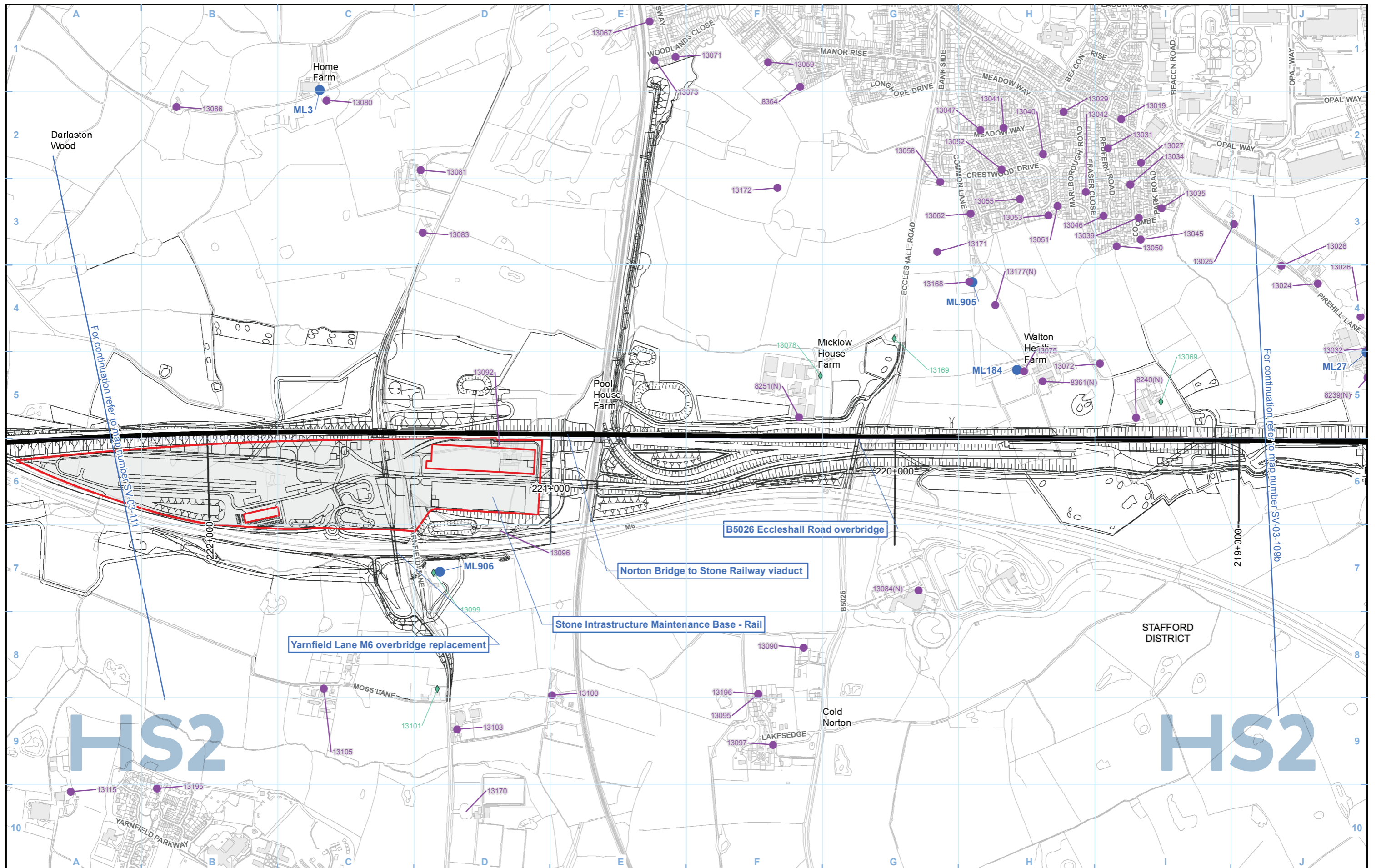
Map Number: SV-04-INDEX-CA3
 Map Name: Index Map of: Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments SES2 and AP2 ES Community Area 3: Stone and Swynnerton

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Legend - General features

	Route in bored tunnel		Engineering earthworks: Embankment
	Route in cut and cover tunnel		Non engineering earthworks: Embankment
	Route on surface		Engineering earthworks: Cutting
	Depot, station, headhouse or portal building		Non engineering earthworks: Cutting
	Community area boundary		
	County boundary		
	District/Borough boundary		

Legend - Sound related features

	Construction airborne sound assessment location	} labelled with Assessment Location ID reference number (for details of the assessment results see Vol 5 Appendix SV-002-0XX)
	Construction vibration assessment locations	
	Construction airborne sound and vibration assessment location	
	Baseline measurement locations	(labelled with Measurement Location reference code)

Map Number	SV-03-110
Map Name	Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments SES2 and AP2 ES
Community Area 3: Stone and Swynnerton	

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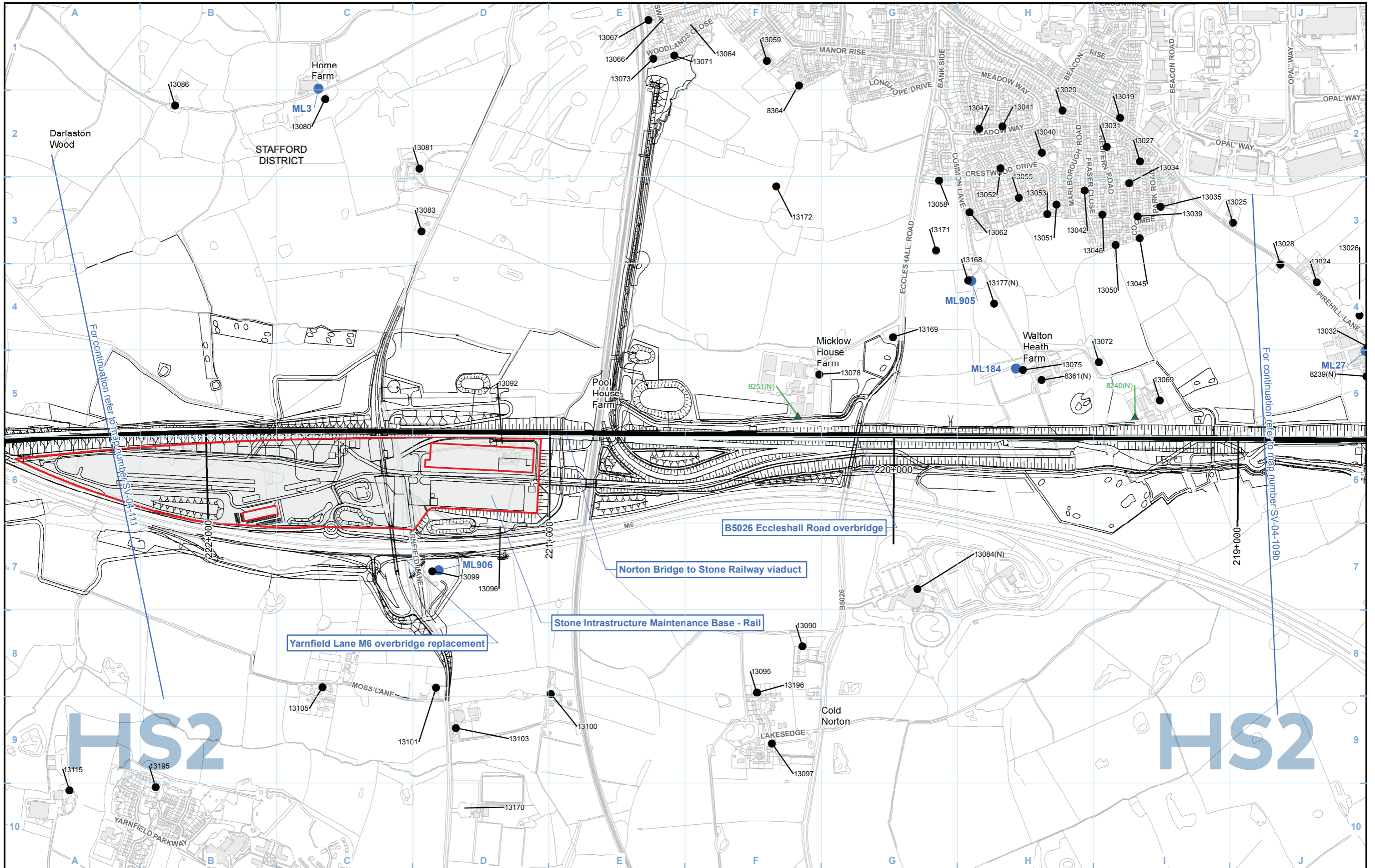
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Doc Number: 2PT02-ARP-EV-MAP-000-633110-P03

Date: 10/12/18

Scale at A3: 1:10,000

0 100 200 300 400 Metres



Legend - General features

- Route in bored tunnel
- Route in cut and cover tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community area boundary
- County boundary
- District/Borough boundary

Legend - Sound related features

- | | |
|---|--|
| Airborne sound assessment location | Airborne sound and vibration assessment location |
| Ground-borne sound and/or vibration assessment location | Baseline measurement locations |

Legend - Engineering earthworks:

- | | |
|------------|------------|
| Embankment | Embankment |
| Cutting | Cutting |

labelled with Assessment Location ID reference number (for details of the assessment results see Vol 5 Appendix SV-002-0XX)

labelled with Measurement Location reference code

Map Number	SV-04-110
Map Name	Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments SES2 and AP2 ES
Community Area 3: Stone and Swynnerton	

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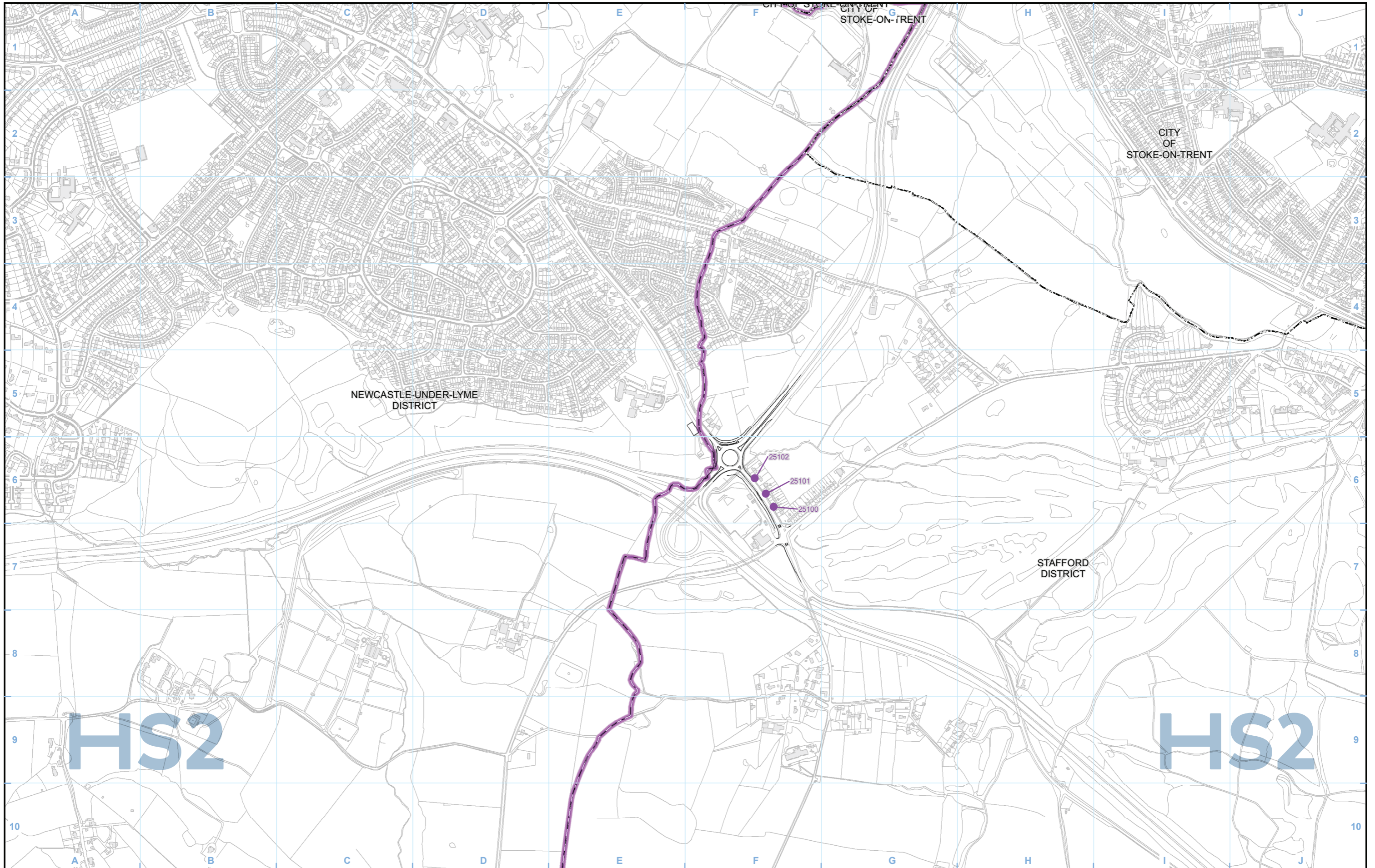
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Scale at A3: 1:10,000

Metres

Date: 10/12/18



Legend - General features

- Route in bored tunnel
 - Route in cut and cover tunnel
 - Route on surface
 - Depot, station, headhouse or portal building
 - Community area boundary
 - County boundary
 - District/Borough boundary
- | | |
|---|---|
| <p>Engineering earthworks:</p> <ul style="list-style-type: none"> Embankment Cutting | <p>Non engineering earthworks:</p> <ul style="list-style-type: none"> Embankment Cutting |
|---|---|

Legend - Sound related features

- Construction airborne sound assessment location
- Construction vibration assessment locations
(labelled with Assessment Location ID reference number
for details of the assessment results see Vol 5 Appendix
SV-002-0XX)
- Construction airborne sound and vibration assessment location
- Baseline measurement locations
(labelled with Measurement Location reference code)

Map Number	SV-03-122
Map Name	Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments SES2 and AP2 ES
	Community Area 3: Stone and Swynnerton

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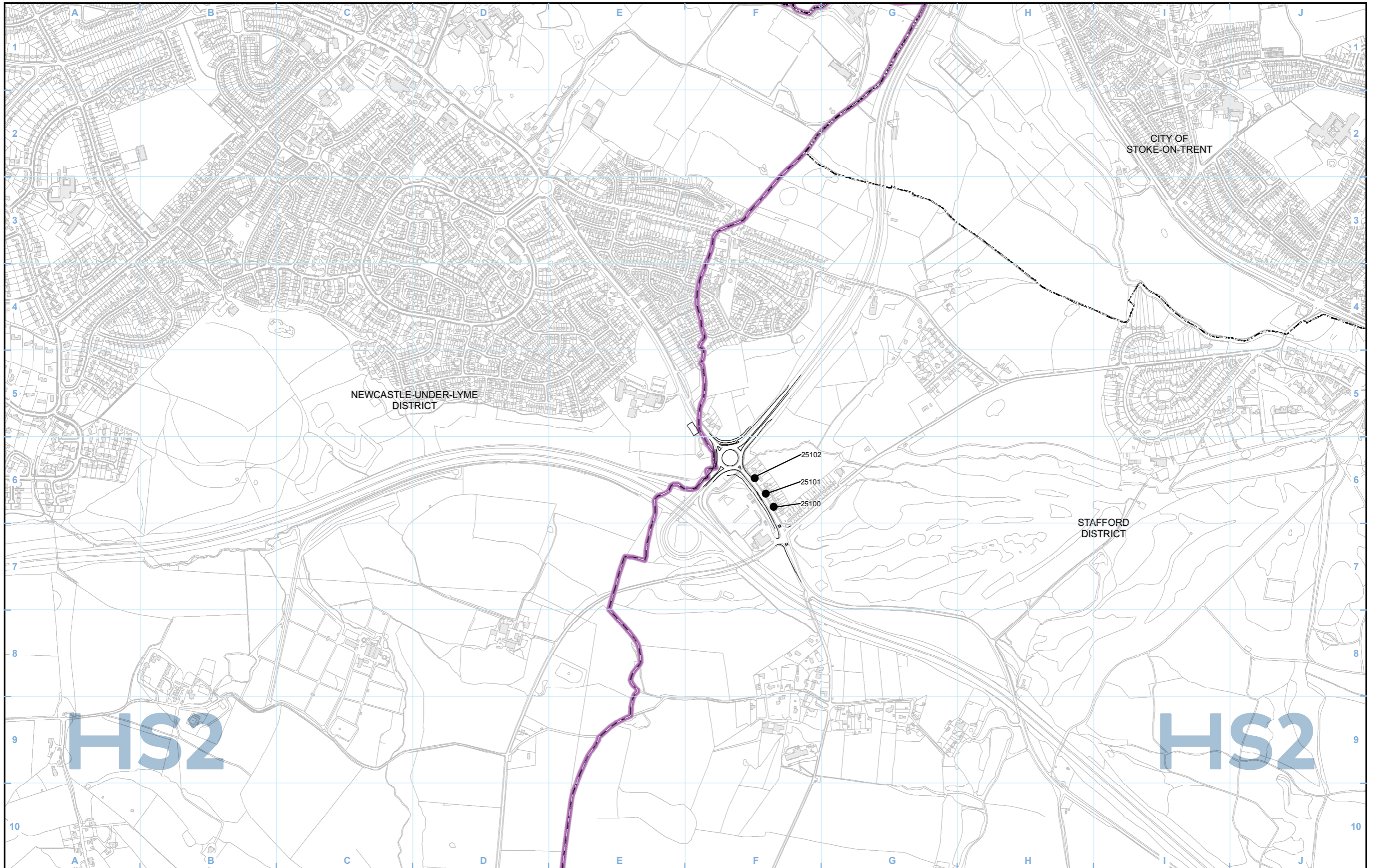
Doc Number: 2PT02-ARP-EV-MAP-000-633118-P03

Scale at A3: 1:10,000

Metres

Date: 16/01/19

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Legend - General features

- Route in bored tunnel
- Route in cut and cover tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community area boundary
- County boundary
- District/Borough boundary

- Engineering earthworks:**
- Embankment
 - Cutting
- Non engineering earthworks:**
- Embankment
 - Cutting

Legend - Sound related features

- Airborne sound assessment location
- Airborne sound and vibration assessment location
- Ground-borne sound and/or vibration assessment location
- Airborne sound, ground-borne sound and vibration assessment location
- Baseline measurement locations

labelled with Assessment Location ID reference number (for details of the assessment results see Vol 5 Appendix SV-002-0XX)

labelled with Measurement Location reference code

Map Number	SV-04-122
Map Name	Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments SES2 and AP2 ES
	Community Area 3: Stone and Swynnerton

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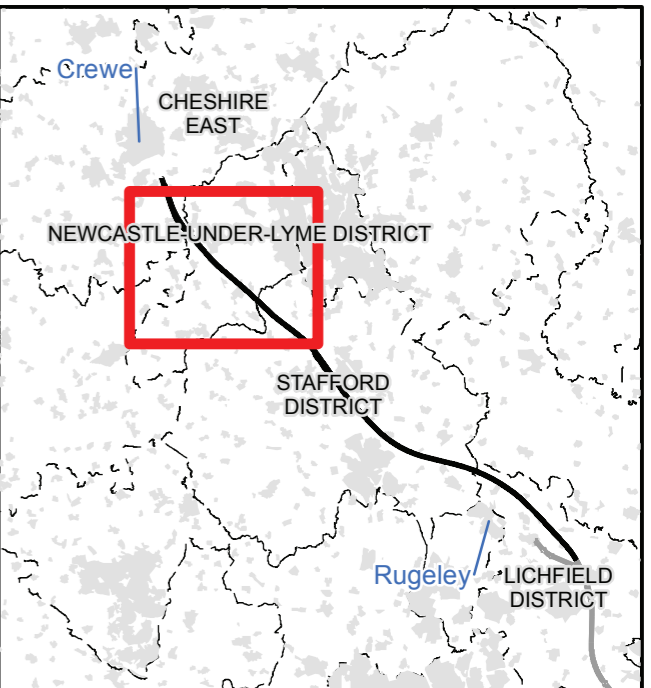
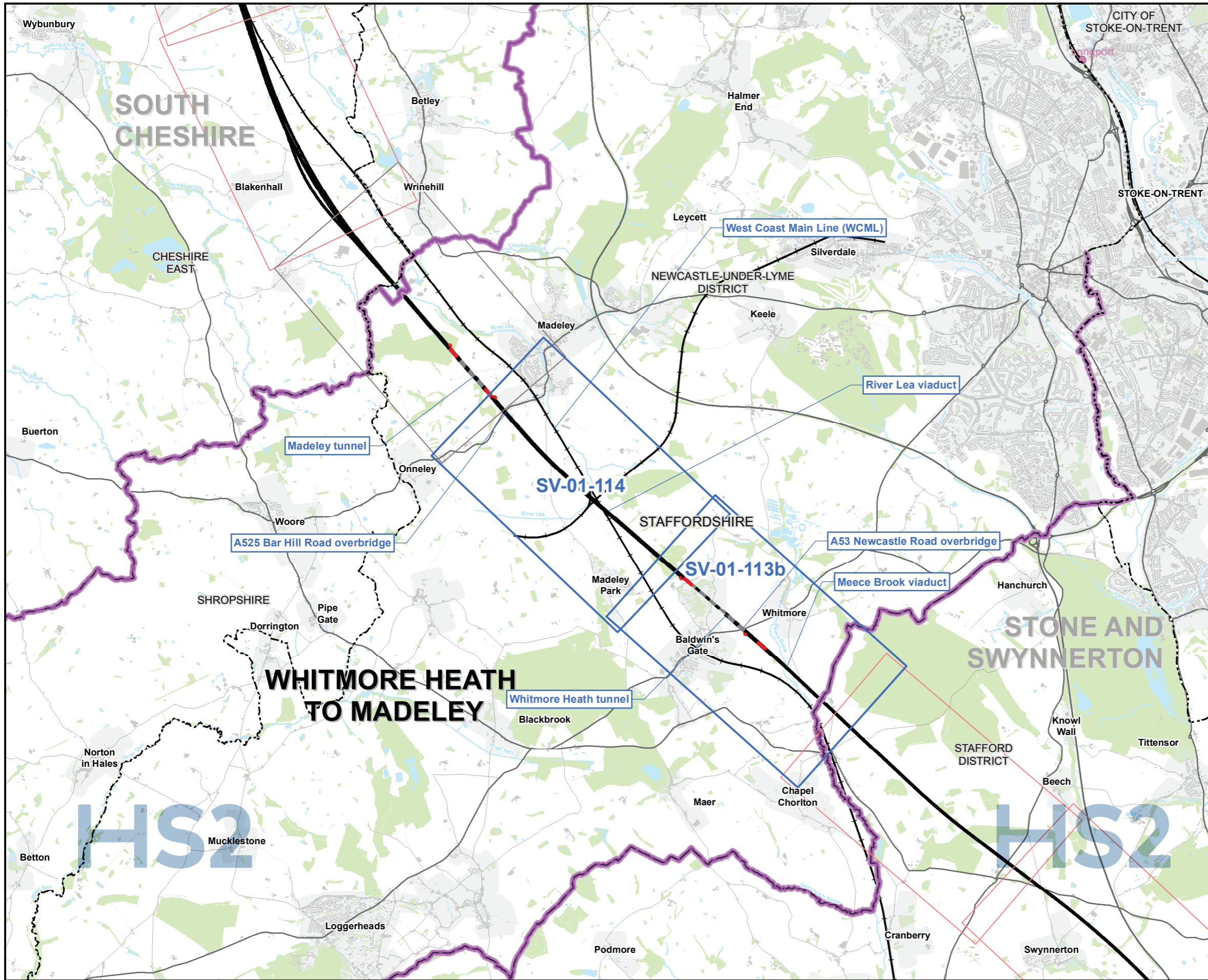
High Speed Rail (West Midlands - Crewe)

Supplementary Environmental Statement 2 and Additional Provision 2 Environmental Statement

CA4 Whitmore Heath to Madeley

SV-01 - Operational Sound Contour Maps and Likely Significant Effects

SV-02 - Operational Noise and Vibration Impacts and
Likely Significant Effects (with Assessment Locations)



Map Series Information:

SV-01 presents the predicted operational sound from the new railway.

The sound levels from the new railway (expressed as $L_{pAeq,T}$) are presented in typical noise mapping colours in 5 dB steps. There is a panel at the top right of the figure; the left-hand section of this panel contains a key communicating the night-time and daytime sound levels represented by the various colours. The right-hand part of the same panel contains text explaining how the sound levels presented on the figure inform the assessment of direct noise impacts and likely significant effects. A corresponding and similar panel is found on SV-02, along with the key sound contours that were used within the environmental assessment.

Also presented on SV-01 are the following (which are also included on SV-02):

- A representation of the Proposed Scheme, including the railway alignment (indicating whether it is on the surface or in tunnel), any new and altered roads and all associated engineering and environmental mitigation earthworks;
- blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
- symbols representing buildings that would potentially qualify for noise insulation;
- labels identifying the residual likely significant noise effects of the Proposed Scheme, and
- the extent of the study area within which the direct impacts and effects of the scheme have been quantitatively assessed.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

The design of the Proposed Scheme will be informed through stakeholder engagement and further engineering and environmental studies.

Note: Not all data layers in the legend are represented on every map.

Main Map Legend

Route in tunnel	Map sheets included in this community area with amendment
Route on surface	Map sheets included in this community area with no amendment
Depot, station, headhouse or portal building	Map sheets not included in this community area
Community area boundary	
Existing railway station	
County boundary	
District/Borough boundary	

Map Number	SV-01-INDEX-CA4
Map Name	Index Map of: Operational Sound Contour Maps and Likely Significant Effects SES2 and AP2 ES
	Community Area 4: Whitmore Heath to Madeley

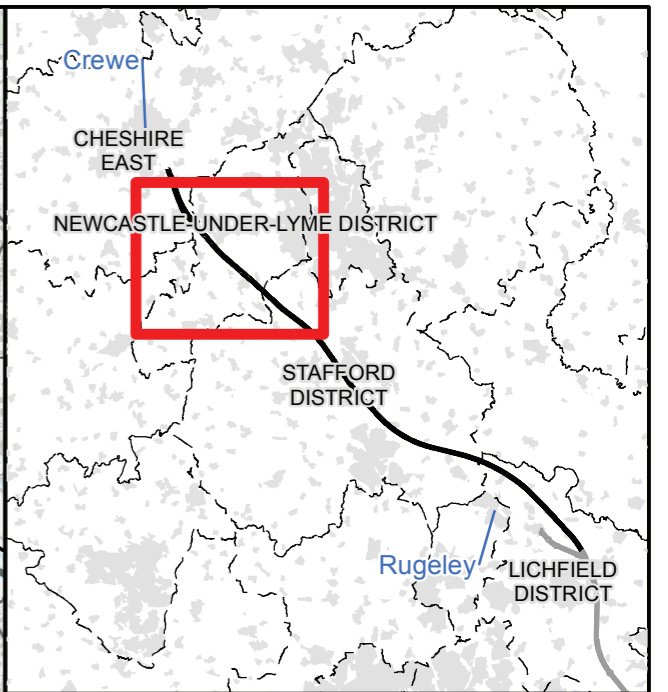
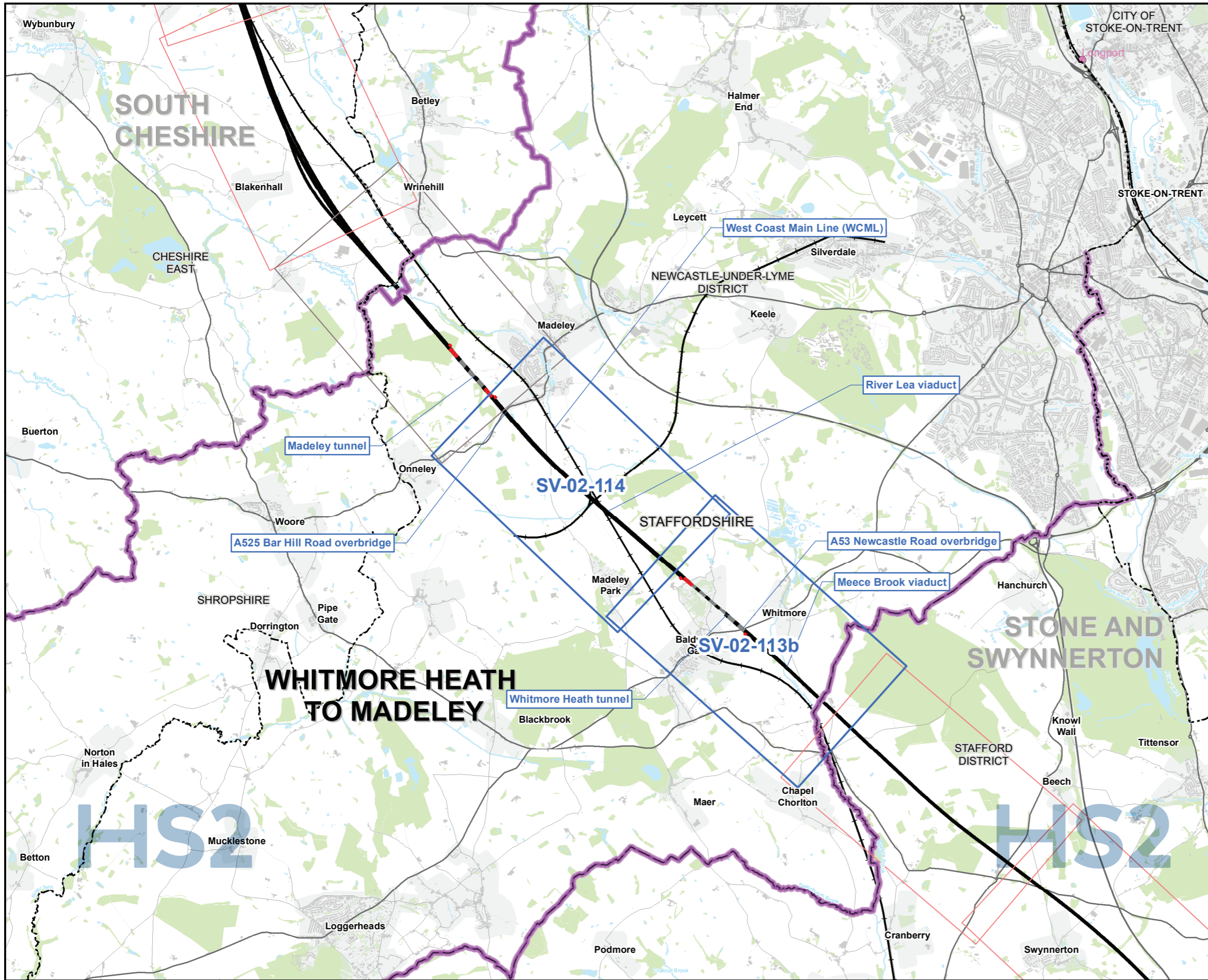
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Doc Number: 2PT02-ARP-EV-MAP-000-631004-P03 **Date: 23/01/19**



Map Series Information:

SV-02 presents the direct operational noise impacts and likely significant effects of the Proposed Scheme.

The SV-02 figure series necessarily contains a large amount of information relating to the operational noise and vibration assessment. It is designed to communicate visually the assessment process from the prediction of impacts to the determination of likely residual significant effects. The corresponding text is included in Vol2 and Vol5.

- Key items on the map include the following:
- The Proposed Scheme (the proposed railway alignments and surrounding associated earthworks/roads);
 - blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
 - the study areas, which indicate the areas within which direct sound and vibration impacts of the scheme have been quantitatively assessed;
 - the calculated direct operational impacts of the scheme, displayed as colour-coded buildings and symbols representing buildings that would potentially qualify for noise insulation;
 - sound contours representing sound produced by the new railway displayed in a simpler manner than on SV-01 in order not to obscure the features on the map series;
 - the assessment locations at which a quantitative prediction of sound and impacts have been carried out (representing a number of nearby buildings). These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-002-0XX; and
 - labels indicating where the likely residual direct noise or vibration significant effects have been identified. These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-002-0XX.

The design of the Proposed Scheme will be informed through stakeholder engagement and further engineering and environmental studies.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.

Main Map Legend

Route in tunnel	Map sheets included in this community area with amendment
Route on surface	Map sheets included in this community area with no amendment
Depot, station, headhouse or portal building	Map sheets not included in this community area
Community area boundary	
Existing railway station	
County boundary	
District/Borough boundary	

Map Number	SV-02-INDEX-CA4
Map Name	Index Map of: Operational Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations) SES2 and AP2 ES Community Area 4: Whitmore Heath to Madeley

HS2

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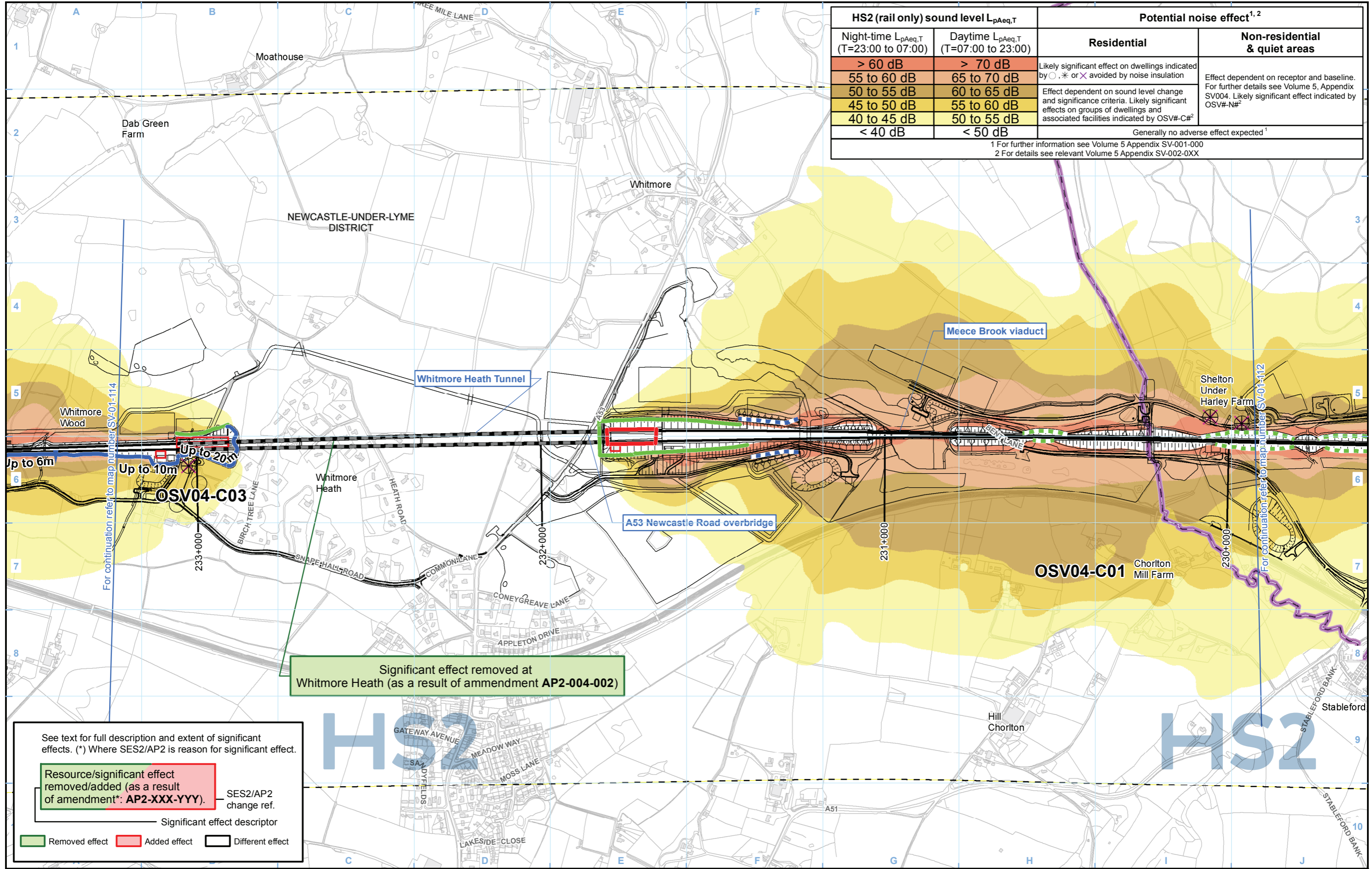
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Metres

Doc Number: 2PT02-ARP-EV-MAP-000-632004-P03

Date: 24/01/19



HS2 (rail only) sound level $L_{pAeq,T}$		Potential noise effect ^{1,2}	
Night-time $L_{pAeq,T}$ (T=23:00 to 07:00)	Daytime $L_{pAeq,T}$ (T=07:00 to 23:00)	Residential	Non-residential & quiet areas
> 60 dB	> 70 dB	Likely significant effect on dwellings indicated by ○, * or X avoided by noise insulation	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-N# ²
55 to 60 dB	65 to 70 dB	Effect dependent on sound level change and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# ²	
50 to 55 dB	60 to 65 dB		
45 to 50 dB	55 to 60 dB		
40 to 45 dB	50 to 55 dB	Generally no adverse effect expected ¹	
< 40 dB	< 50 dB		

1 For further information see Volume 5 Appendix SV-001-000
2 For details see relevant Volume 5 Appendix SV-002-0XX

Significant effect removed at Whitmore Heath (as a result of ammendment AP2-004-002)

See text for full description and extent of significant effects. (*) Where SES2/AP2 is reason for significant effect.

Resource/significant effect removed/added (as a result of ammendment*: AP2-XXX-YYY). SES2/AP2 change ref.

Significant effect descriptor

Removed effect Added effect Different effect

- Legend - General features**
- Route in bored tunnel
 - Route in cut and cover tunnel
 - Route on surface
 - Depot, station, headhouse or portal building
 - Community area boundary
 - County boundary
 - District/Borough boundary
- Engineering earthworks:**
- Embankment
 - Cutting
- Non engineering earthworks:**
- Embankment
 - Cutting
- Legend - Sound related features**
- Envisaged mitigation to avoid / reduce significant noise effects:
- Landscaping and/or fence barriers*
 - Engineering e.g. cuttings (green tunnels separately marked)
- Envisaged features further reducing noise effects:
- Other environmental e.g. landscaping
 - Engineering e.g. cuttings
- 1km Airborne sound study area
- Potential additional noise insulation (triggered by maximum sound levels at night)¹
 - Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)¹
 - Potential noise insulation (triggered by Noise Insulation Regulations 1996)¹
- * Labelled with total barrier height above rail level

Map Number: SV-01-113b

Map Name: Operational Sound Contour Maps and Likely Significant Effects SES2 and AP2 ES

Community Area 4: Whitmore Heath to Madeley

HS2

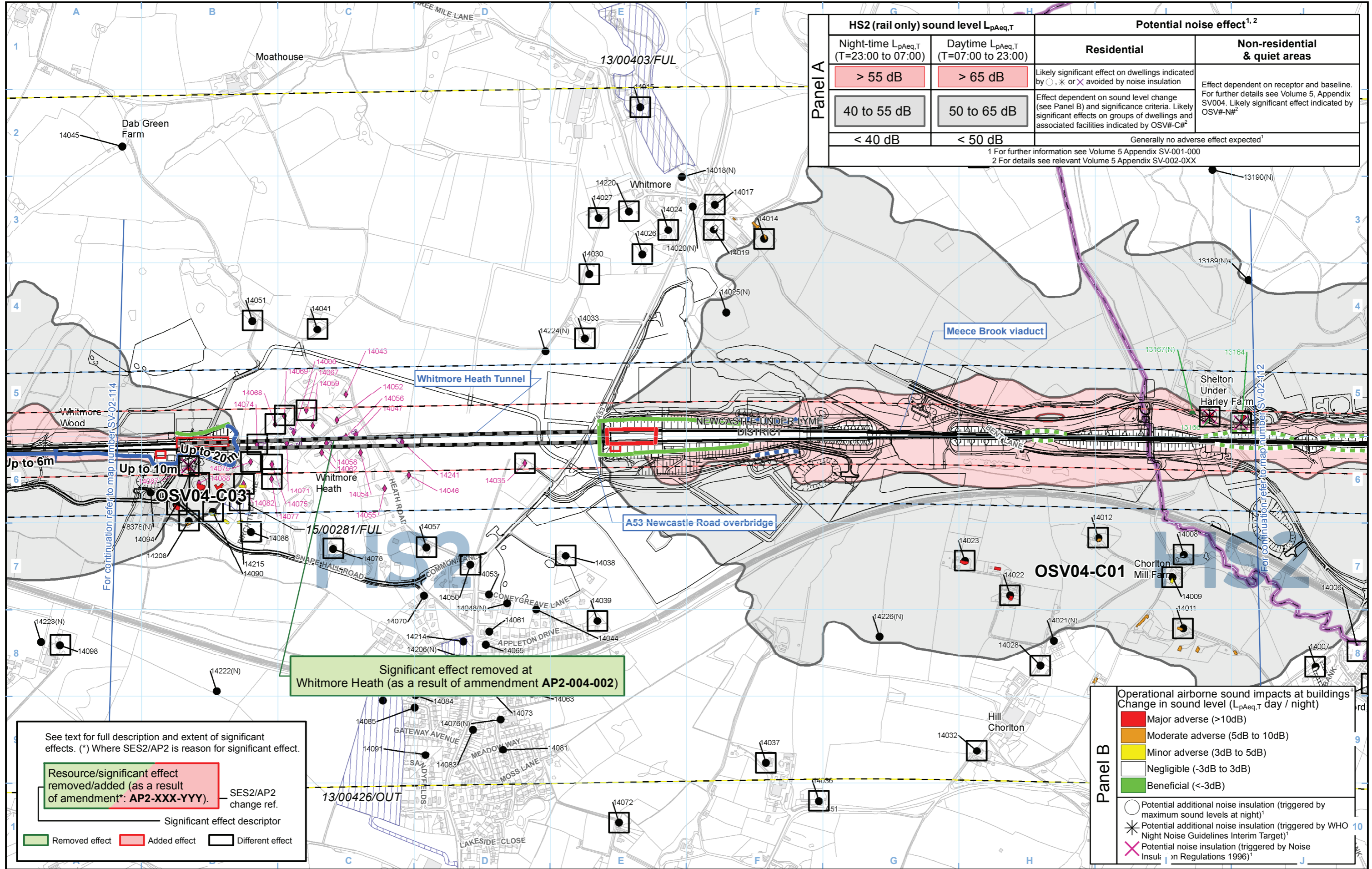
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Doc Number: 2PT02-ARP-EV-MAP-000-631613-P03

Date: 15/01/19



Panel A	HS2 (rail only) sound level $L_{pAeq,T}$		Potential noise effect ^{1,2}	
	Night-time $L_{pAeq,T}$ (T=23:00 to 07:00)	Daytime $L_{pAeq,T}$ (T=07:00 to 23:00)	Residential	Non-residential & quiet areas
	> 55 dB	> 65 dB	Likely significant effect on dwellings indicated by ○, * or ✕ avoided by noise insulation	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-N# ²
40 to 55 dB	50 to 65 dB	Effect dependent on sound level change (see Panel B) and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# ²	Generally no adverse effect expected ¹	
< 40 dB	< 50 dB	Generally no adverse effect expected ¹		

1 For further information see Volume 5 Appendix SV-001-000
2 For details see relevant Volume 5 Appendix SV-002-0XX

Operational airborne sound impacts at buildings ¹ Change in sound level ($L_{pAeq,T}$ day / night)	
Major adverse (>10dB)	Minor adverse (3dB to 5dB)
Moderate adverse (5dB to 10dB)	Negligible (-3dB to 3dB)
Beneficial (<-3dB)	Potential additional noise insulation (triggered by maximum sound levels at night) ¹
	Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target) ¹
	Potential noise insulation (triggered by Noise Insulation Regulations 1996) ¹

See text for full description and extent of significant effects. (*) Where SES2/AP2 is reason for significant effect.

Resource/significant effect removed/added (as a result of ammendment*: AP2-XXX-YYY). SES2/AP2 change ref.

Significant effect descriptor

Removed effect (Green) Added effect (Red) Different effect (Black)

- Legend - General features**
- Route in bored tunnel
 - Route in cut and cover tunnel
 - Route on surface
 - Depot, station, headhouse or portal building
 - Community area boundary
 - County boundary
 - District/Borough boundary

- Engineering earthworks:**
- Embankment
 - Cutting
 - L_{pAmax} exceeds 60dB façade**
- Non engineering earthworks:**
- Embankment
 - Cutting
- * Residential buildings only
* Labelled with total barrier height above rail level
** HS2 train only $L_{pAmax} + 2.5dB$ façade correction

- Legend - Sound related features**
- Committed developments - SV Only
 - Envisaged mitigation to avoid / reduce significant noise effects:
 - Landscaping and/or fence barriers*
 - Engineering e.g. cuttings (green tunnels separately marked)
 - Envisaged measures further reducing noise effects:
 - Other environmental e.g. landscaping
 - Engineering e.g. cuttings
 - 1km Airborne sound study area

- Ground-borne sound & vibration study area (residential and non-residential)
- Ground-borne sound & vibration study area (highly sensitive non-residential)
- Airborne sound assessment location
- Airborne sound and vibration assessment location
- Ground-borne sound and/or vibration assessment location
- Airborne sound, ground-borne sound and vibration assessment location
- Ground-borne noise or vibration impact*

Map Number: SV-02-113b

Map Name: Operational Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations) SES2 and AP2 ES

Community Area 4: Whitmore Heath to Madeley

HS2

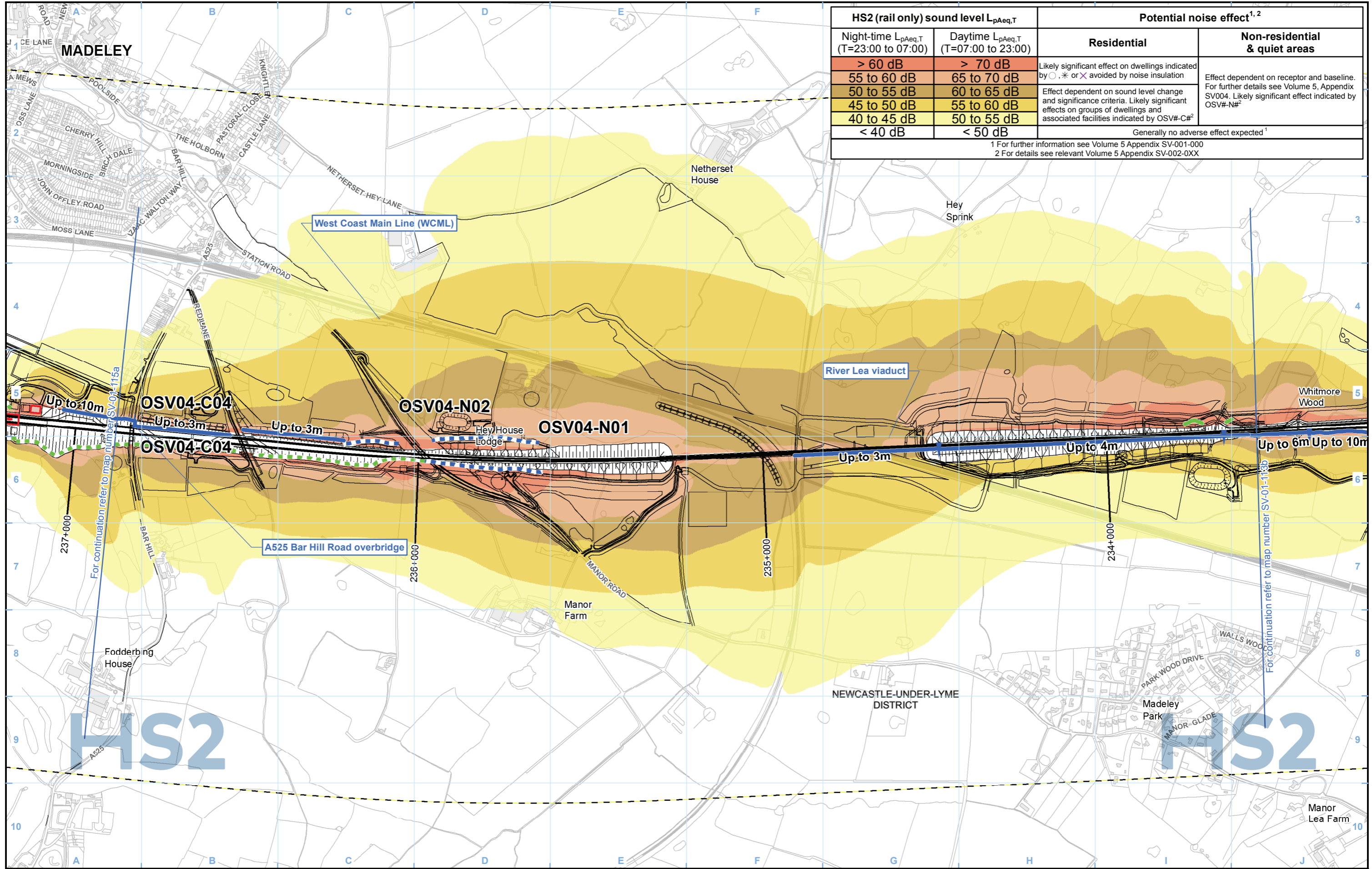
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Doc Number: 2PT02-ARP-EV-MAP-000-632613-P03

Date: 15/01/19



HS2 (rail only) sound level $L_{pAeq,T}$		Potential noise effect ^{1,2}	
Night-time $L_{pAeq,T}$ (T=23:00 to 07:00)	Daytime $L_{pAeq,T}$ (T=07:00 to 23:00)	Residential	Non-residential & quiet areas
> 60 dB	> 70 dB	Likely significant effect on dwellings indicated by ○, * or X avoided by noise insulation	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-N# ²
55 to 60 dB	65 to 70 dB	Effect dependent on sound level change and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# ²	
50 to 55 dB	60 to 65 dB		Generally no adverse effect expected ¹
45 to 50 dB	55 to 60 dB		
40 to 45 dB	50 to 55 dB		
< 40 dB	< 50 dB		

1 For further information see Volume 5 Appendix SV-001-000
2 For details see relevant Volume 5 Appendix SV-002-0XX

Legend - General features

- Route in bored tunnel
- Route in cut and cover tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community area boundary
- County boundary
- District/Borough boundary

Legend - Sound related features

Engineering earthworks:

- Embankment
- Cutting

Non engineering earthworks:

- Embankment
- Cutting

Legend - Sound related features

Envisaged mitigation to avoid / reduce significant noise effects:

- Landscaping and/or fence barriers*
- Engineering e.g. cuttings (green tunnels separately marked)

Envisaged features further reducing noise effects:

- Other environmental e.g. landscaping
- Engineering e.g. cuttings

Legend - Sound related features

- 1km Airborne sound study area
- Potential additional noise insulation (triggered by maximum sound levels at night)¹
- Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)¹
- Potential noise insulation (triggered by Noise Insulation Regulations 1996)¹

* Labelled with total barrier height above rail level

Map Number: SV-01-114

Map Name: Operational Sound Contour Maps and Likely Significant Effects SES2 and AP2 ES

Community Area 4: Whitmore Heath to Madeley

HS2

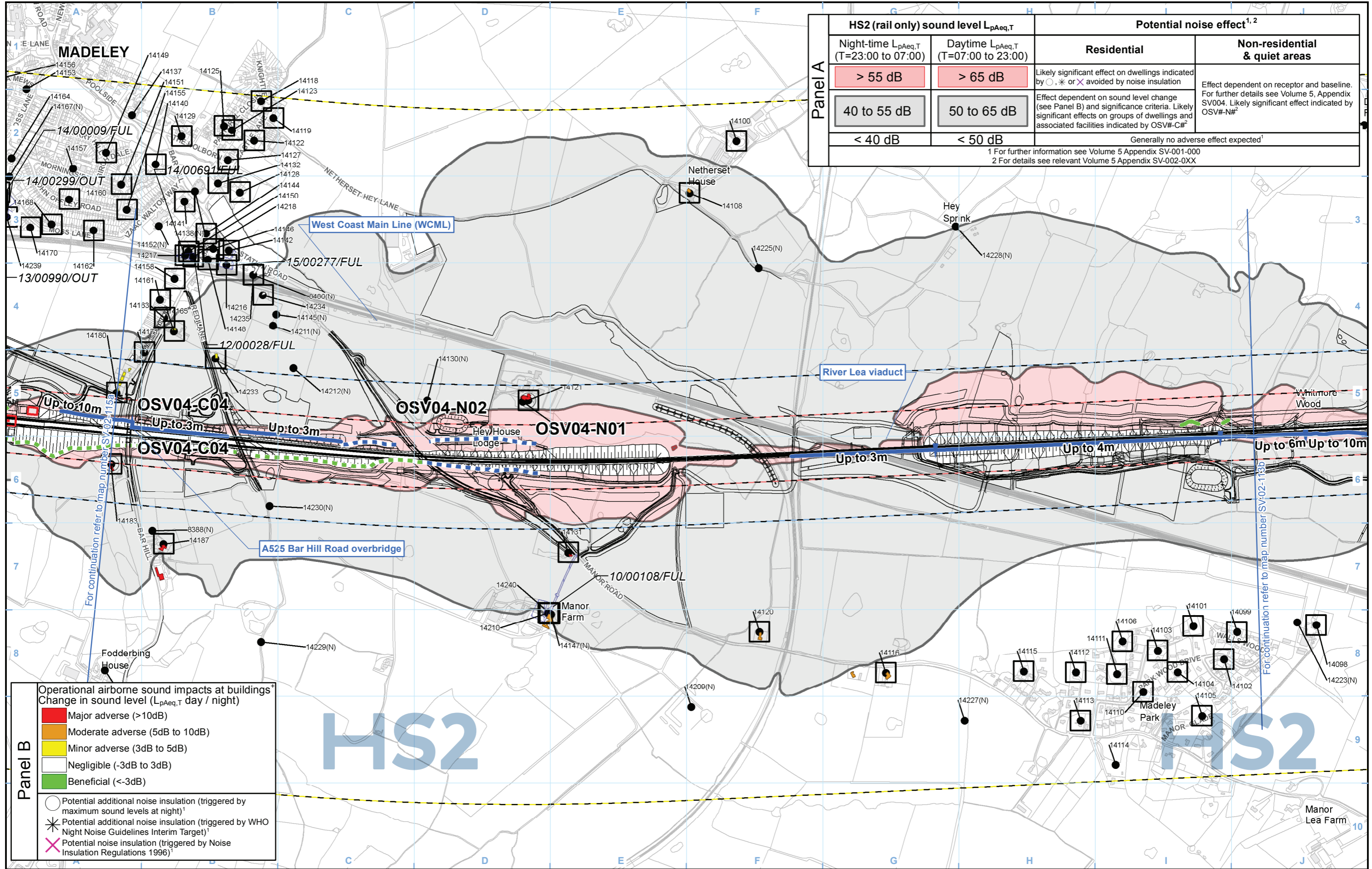
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Date: 15/01/19



Panel A	HS2 (rail only) sound level $L_{pAeq,T}$		Potential noise effect ^{1,2}	
	Night-time $L_{pAeq,T}$ (T=23:00 to 07:00)	Daytime $L_{pAeq,T}$ (T=07:00 to 23:00)	Residential	Non-residential & quiet areas
	> 55 dB	> 65 dB	Likely significant effect on dwellings indicated by ○, * or ✕ avoided by noise insulation	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-N# ²
40 to 55 dB	50 to 65 dB	Effect dependent on sound level change (see Panel B) and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# ²	Generally no adverse effect expected ¹	
< 40 dB	< 50 dB	Generally no adverse effect expected ¹		

1 For further information see Volume 5 Appendix SV-001-000
2 For details see relevant Volume 5 Appendix SV-002-0XX

Panel B

Operational airborne sound impacts at buildings[†]
Change in sound level ($L_{pAeq,T}$ day / night)

Major adverse (>10dB)
Moderate adverse (5dB to 10dB)
Minor adverse (3dB to 5dB)
Negligible (-3dB to 3dB)
Beneficial (<-3dB)

○ Potential additional noise insulation (triggered by maximum sound levels at night)¹
* Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)¹
✕ Potential noise insulation (triggered by Noise Insulation Regulations 1996)¹

Legend - General features

- Route in bored tunnel
- Route in cut and cover tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community area boundary
- County boundary
- District/Borough boundary

Engineering earthworks:

- Embankment
- Cutting
- L_{pAFmax} exceeds 60dB façade**

Non engineering earthworks:

- Embankment
- Cutting

[†] Residential buildings only
^{**} Labelled with total barrier height above rail level
^{**} HS2 train only $L_{pAFmax} + 2.5dB$ façade correction

Legend - Sound related features

- Committed developments - SV Only
- Envisaged mitigation to avoid / reduce significant noise effects:
 - Landscaping and/or fence barriers*
 - Engineering e.g. cuttings (green tunnels separately marked)
 - Envisaged measures further reducing noise effects:
 - Other environmental e.g. landscaping
 - Engineering e.g. cuttings
 - 1km Airborne sound study area

- Ground-borne sound & vibration study area (residential and non-residential)
- Ground-borne sound & vibration study area (highly sensitive non-residential)
- Airborne sound assessment location
- Airborne sound and vibration assessment location
- Ground-borne sound and/or vibration assessment location
- Airborne sound, ground-borne sound and vibration assessment location
- Ground-borne noise or vibration impact*

Map Number: SV-02-114

Map Name: Operational Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations) SES2 and AP2 ES

Community Area 4: Whitmore Heath to Madeley

HS2

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Date: 15/01/19

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High Speed Rail (West Midlands - Crewe)

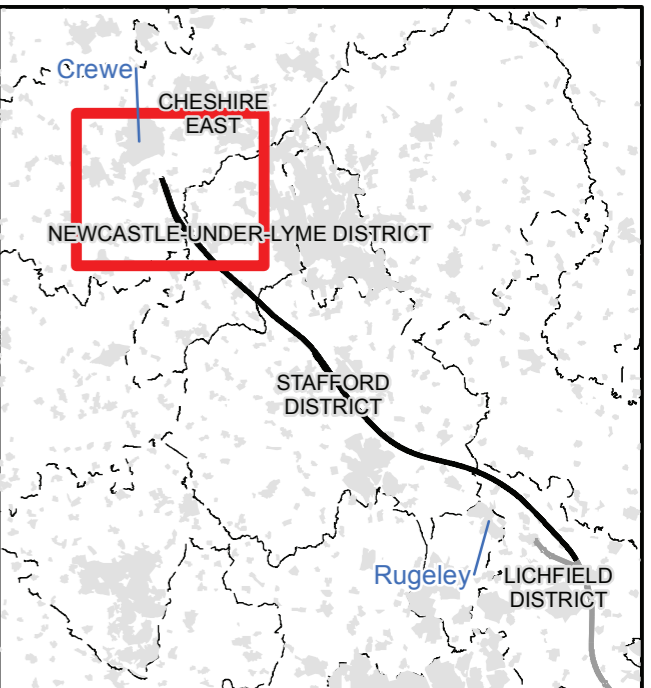
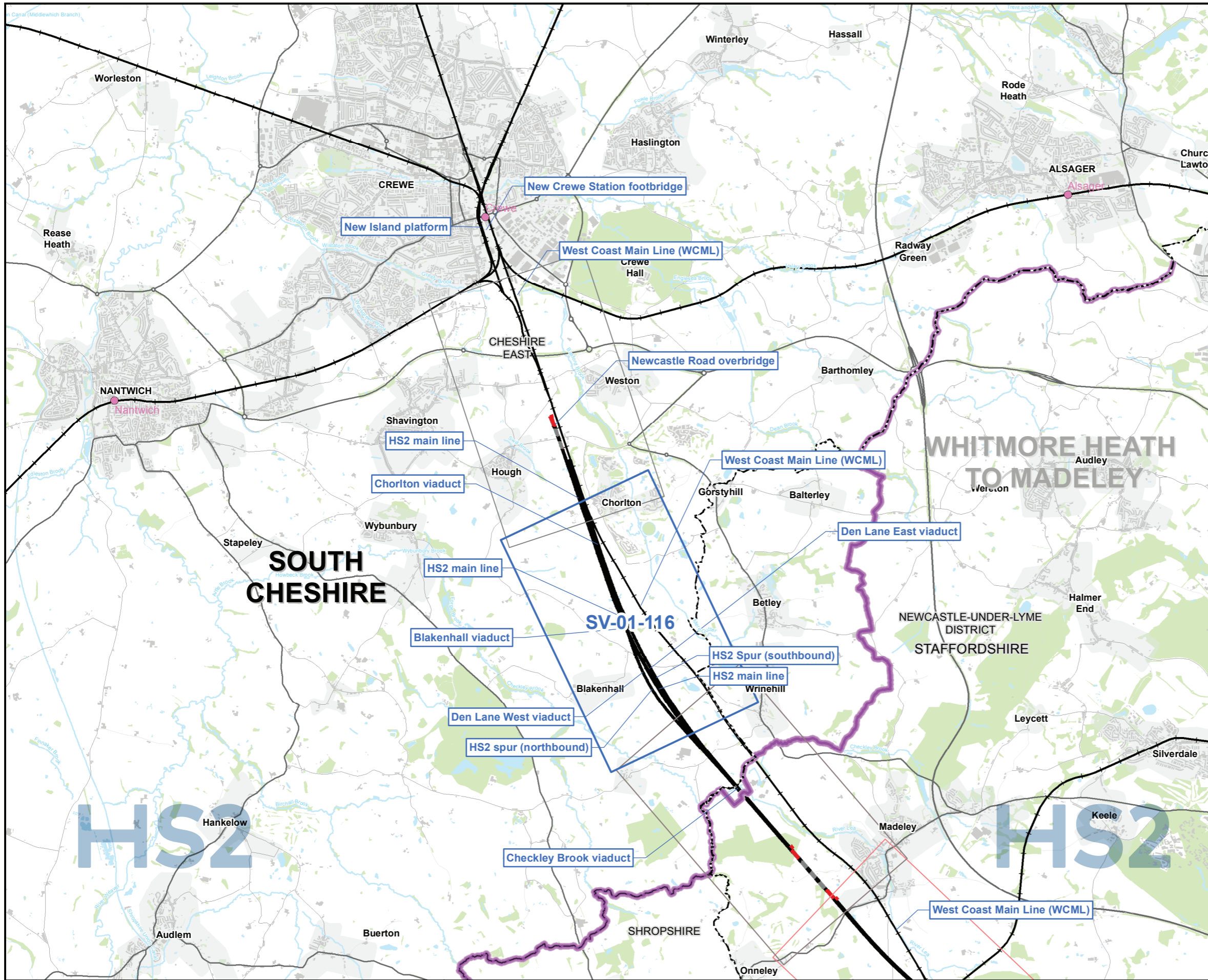
Supplementary Environmental Statement 2 and Additional Provision 2 Environmental Statement

CA5 South Cheshire

SV-01 - Operational Sound Contour Maps and Likely Significant Effects

SV-02 - Operational Noise and Vibration Impacts and
Likely Significant Effects (with Assessment Locations)

SV-03 - Assessment and Monitoring Locations for
Construction Sound, Noise & Vibration Assessments



Map Series Information:

SV-01 presents the predicted operational sound from the new railway.

The sound levels from the new railway (expressed as $L_{pAeq,T}$) are presented in typical noise mapping colours in 5 dB steps. There is a panel at the top right of the figure; the left-hand section of this panel contains a key communicating the night-time and daytime sound levels represented by the various colours. The right-hand part of the same panel contains text explaining how the sound levels presented on the figure inform the assessment of direct noise impacts and likely significant effects. A corresponding and similar panel is found on SV-02, along with the key sound contours that were used within the environmental assessment.

Also presented on SV-01 are the following (which are also included on SV-02):

- A representation of the Proposed Scheme, including the railway alignment (indicating whether it is on the surface or in tunnel), any new and altered roads and all associated engineering and environmental mitigation earthworks;
- blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
- symbols representing buildings that would potentially qualify for noise insulation;
- labels identifying the residual likely significant noise effects of the Proposed Scheme, and
- the extent of the study area within which the direct impacts and effects of the scheme have been quantitatively assessed.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

The design of the Proposed Scheme will be informed through stakeholder engagement and further engineering and environmental studies.

Note: Not all data layers in the legend are represented on every map.

Main Map Legend

Route in tunnel	Map sheets included in this community area with amendment
Route on surface	Map sheets included in this community area with no amendment
Depot, station, headhouse or portal building	Map sheets not included in this community area
Community area boundary	
Existing railway station	
County boundary	
District/Borough boundary	

Map Number: SV-01-INDEX-CA5

Map Name: Index Map of:
Operational Sound Contour Maps and Likely Significant Effects
SES2 and AP2 ES

Community Area 5:
South Cheshire

HS2

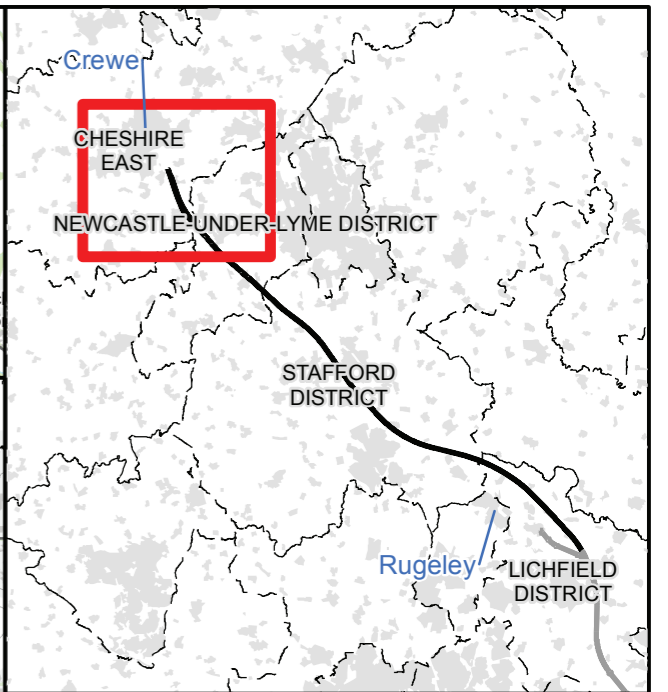
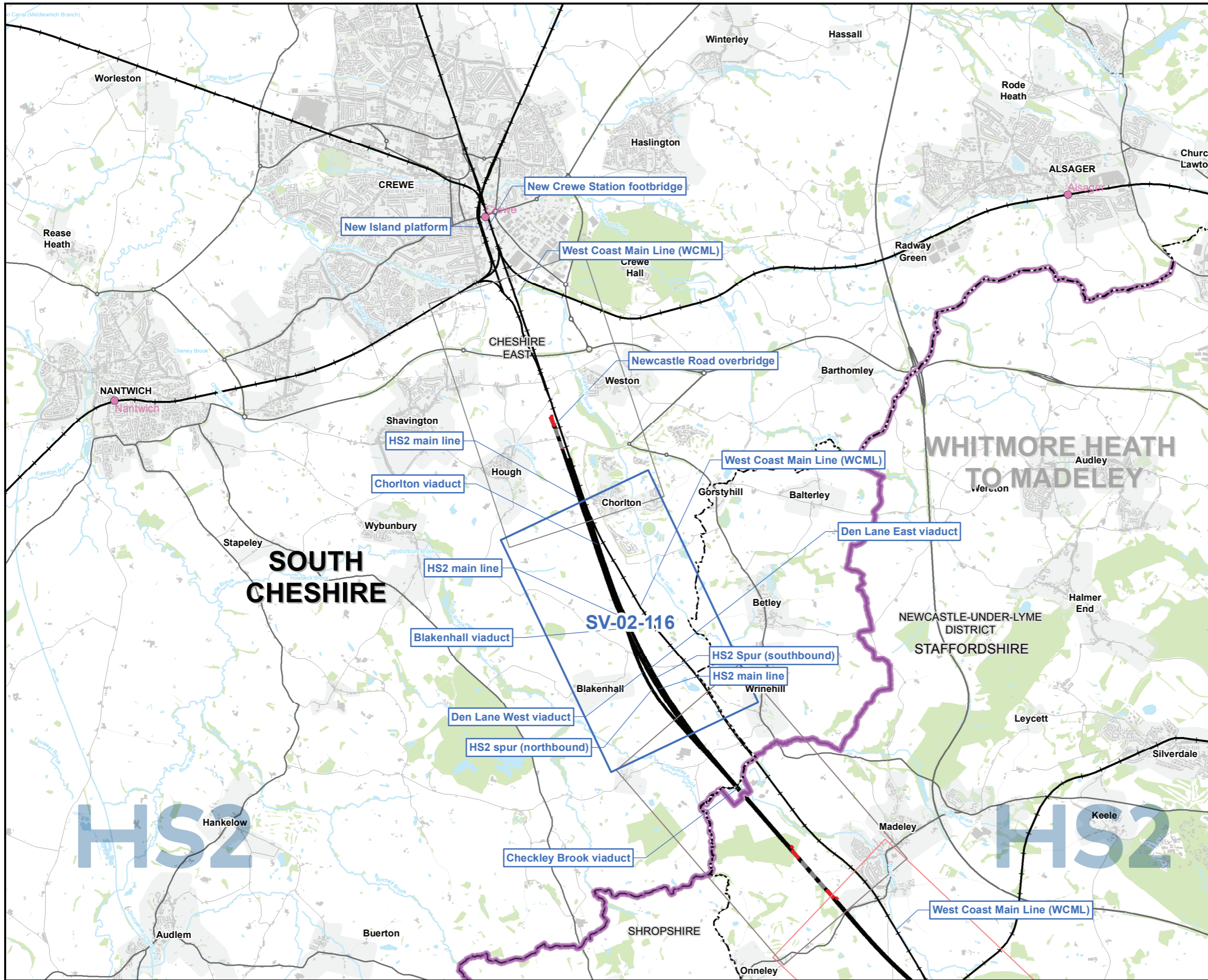
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Date: 23/01/19



Map Series Information:

SV-02 presents the direct operational noise impacts and likely significant effects of the Proposed Scheme.

The SV-02 figure series necessarily contains a large amount of information relating to the operational noise and vibration assessment. It is designed to communicate visually the assessment process from the prediction of impacts to the determination of likely residual significant effects. The corresponding text is included in Vol2 and Vol5.

- Key items on the map include the following:
- The Proposed Scheme (the proposed railway alignments and surrounding associated earthworks/roads);
 - blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
 - the study areas, which indicate the areas within which direct sound and vibration impacts of the scheme have been quantitatively assessed;
 - the calculated direct operational impacts of the scheme, displayed as colour-coded buildings and symbols representing buildings that would potentially qualify for noise insulation;
 - sound contours representing sound produced by the new railway displayed in a simpler manner than on SV-01 in order not to obscure the features on the map series;
 - the assessment locations at which a quantitative prediction of sound and impacts have been carried out (representing a number of nearby buildings). These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-002-0XX; and
 - labels indicating where the likely residual direct noise or vibration significant effects have been identified. These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-002-0XX.

The design of the Proposed Scheme will be informed through stakeholder engagement and further engineering and environmental studies.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.

Main Map Legend

	Route in tunnel		Map sheets included in this community area with amendment
	Route on surface		Map sheets included in this community area with no amendment
	Depot, station, headhouse or portal building		Map sheets not included in this community area
	Community area boundary		
	Existing railway station		
	County boundary		
	District/Borough boundary		

Map Number	SV-02-INDEX-CA5
Map Name	Index Map of: Operational Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations) SES2 and AP2 ES Community Area 5: South Cheshire

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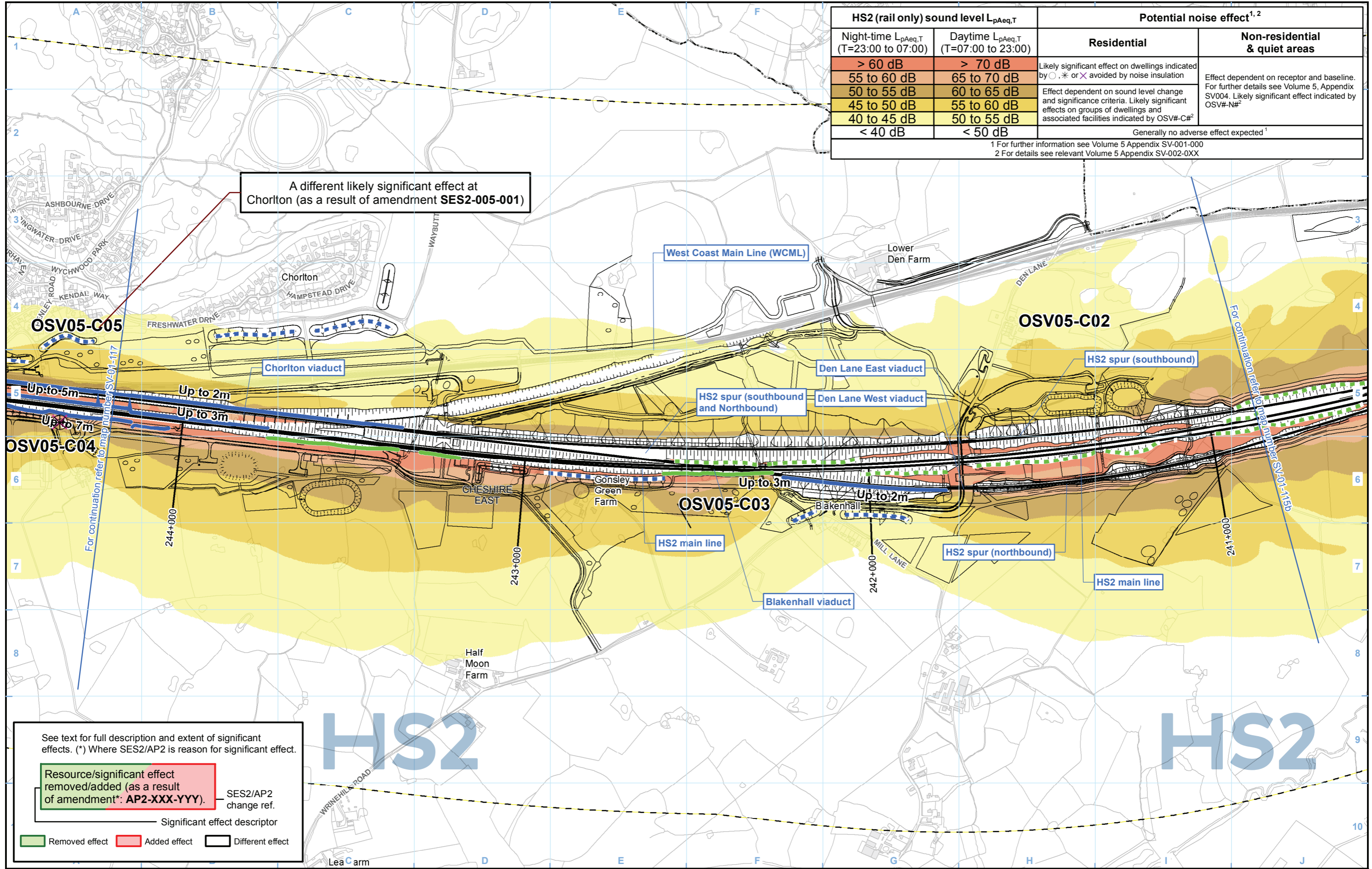
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Doc Number: 2PT02-ARP-EV-MAP-000-632005-P03

Date: 24/01/19



HS2 (rail only) sound level $L_{pAeq,T}$		Potential noise effect ^{1,2}	
Night-time $L_{pAeq,T}$ (T=23:00 to 07:00)	Daytime $L_{pAeq,T}$ (T=07:00 to 23:00)	Residential	Non-residential & quiet areas
> 60 dB	> 70 dB	Likely significant effect on dwellings indicated by ○, * or X avoided by noise insulation	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-N# ²
55 to 60 dB	65 to 70 dB	Effect dependent on sound level change and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# ²	
50 to 55 dB	60 to 65 dB		Generally no adverse effect expected ¹
45 to 50 dB	55 to 60 dB		
40 to 45 dB	50 to 55 dB		
< 40 dB	< 50 dB		

1 For further information see Volume 5 Appendix SV-001-000
2 For details see relevant Volume 5 Appendix SV-002-0XX

A different likely significant effect at Chorlton (as a result of amendment SES2-005-001)

See text for full description and extent of significant effects. (*) Where SES2/AP2 is reason for significant effect.

Resource/significant effect removed/added (as a result of amendment*: AP2-XXX-YYY). SES2/AP2 change ref.

Significant effect descriptor

Removed effect Added effect Different effect

- Legend - General features**
- Route in bored tunnel
 - Route in cut and cover tunnel
 - Route on surface
 - Depot, station, headhouse or portal building
 - Community area boundary
 - County boundary
 - District/Borough boundary
- Legend - Sound related features**
- Engineering earthworks: Non engineering earthworks:
- Embankment
 - Cutting
 - Embankment
 - Cutting
- Envisaged mitigation to avoid / reduce significant noise effects:
- Landscaping and/or fence barriers*
 - Engineering e.g. cuttings (green tunnels separately marked)
- Envisaged features further reducing noise effects:
- Other environmental e.g. landscaping
 - Engineering e.g. cuttings
- 1km Airborne sound study area
- Potential additional noise insulation (triggered by maximum sound levels at night)¹
 - Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)¹
 - Potential noise insulation (triggered by Noise Insulation Regulations 1996)¹
- * Labelled with total barrier height above rail level

Map Number SV-01-116

Map Name Operational Sound Contour Maps and Likely Significant Effects SES2 and AP2 ES

Community Area 5: South Cheshire

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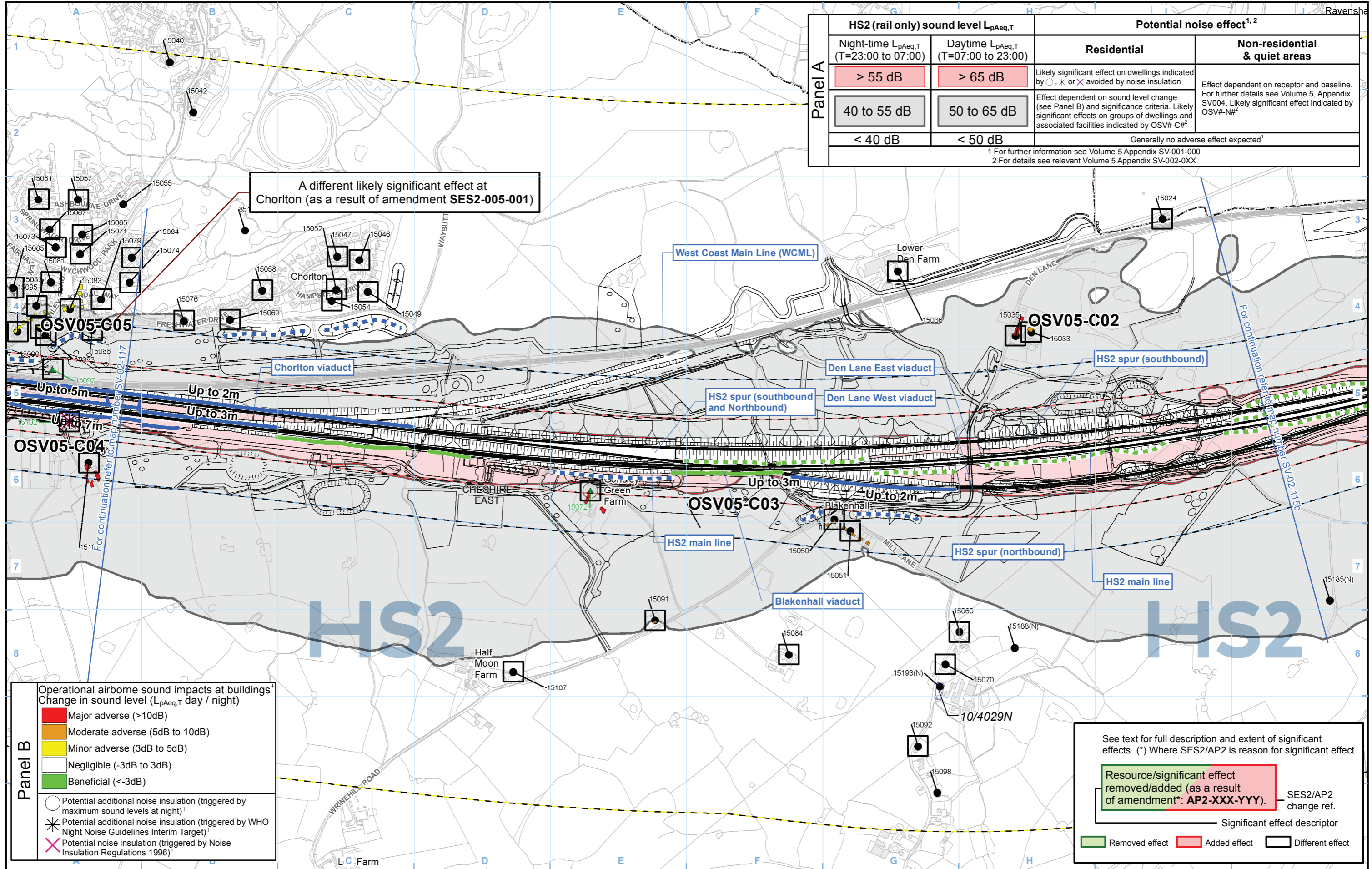
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Date: 15/01/19

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Panel A	HS2 (rail only) sound level $L_{pAeq,T}$		Potential noise effect ^{1,2}	
	Night-time $L_{pAeq,T}$ (T=23:00 to 07:00)	Daytime $L_{pAeq,T}$ (T=07:00 to 23:00)	Residential	Non-residential & quiet areas
	> 55 dB	> 65 dB	Likely significant effect on dwellings indicated by ○, * or ✕ avoided by noise insulation	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-C# ²
40 to 55 dB	50 to 65 dB	Effect dependent on sound level change (see Panel B) and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# ²	Generally no adverse effect expected ¹	
< 40 dB	< 50 dB			

1 For further information see Volume 5 Appendix SV-001-000
2 For details see relevant Volume 5 Appendix SV-002-0XX

Panel B

Operational airborne sound impacts at buildings[†]
Change in sound level ($L_{pAeq,T}$ day / night)

- Major adverse (>10dB)
- Moderate adverse (5dB to 10dB)
- Minor adverse (3dB to 5dB)
- Negligible (-3dB to 3dB)
- Beneficial (<-3dB)

- Potential additional noise insulation (triggered by maximum sound levels at night)¹
- * Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)¹
- ✕ Potential noise insulation (triggered by Noise Insulation Regulations 1996)¹

See text for full description and extent of significant effects. (*) Where SES2/AP2 is reason for significant effect.

Resource/significant effect removed/added (as a result of amendment*: AP2-XXX-YYY). — SES2/AP2 change ref.

Significant effect descriptor

- Removed effect
- Added effect
- Different effect

Legend - General features

- Route in bored tunnel
- Route in cut and cover tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community area boundary
- County boundary
- District/Borough boundary

Engineering earthworks:

- Embankment
- Cutting
- L_{pAFmax} exceeds 60dB façade**

Non engineering earthworks:

- Embankment
- Cutting

* Residential buildings only
* Labelled with total barrier height above rail level
** HS2 train only $L_{pAFmax} + 2.5dB$ façade correction

Legend - Sound related features

- Committed developments - SV Only
- Envisaged mitigation to avoid / reduce significant noise effects:
 - Landscaping and/or fence barriers*
 - Engineering e.g. cuttings (green tunnels separately marked)
 - Envisaged measures further reducing noise effects:
 - Other environmental e.g. landscaping
 - Engineering e.g. cuttings
 - 1km Airborne sound study area

- Ground-borne sound & vibration study area (residential and non-residential)
- Ground-borne sound & vibration study area (highly sensitive non-residential)
- Airborne sound assessment location
- Airborne sound and vibration assessment location
- Ground-borne sound and/or vibration assessment location
- Airborne sound, ground-borne sound and vibration assessment location
- Ground-borne noise or vibration impact*

Map Number: SV-02-116

Map Name: Operational Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations) SES2 and AP2 ES

Community Area 5: South Cheshire

HS2

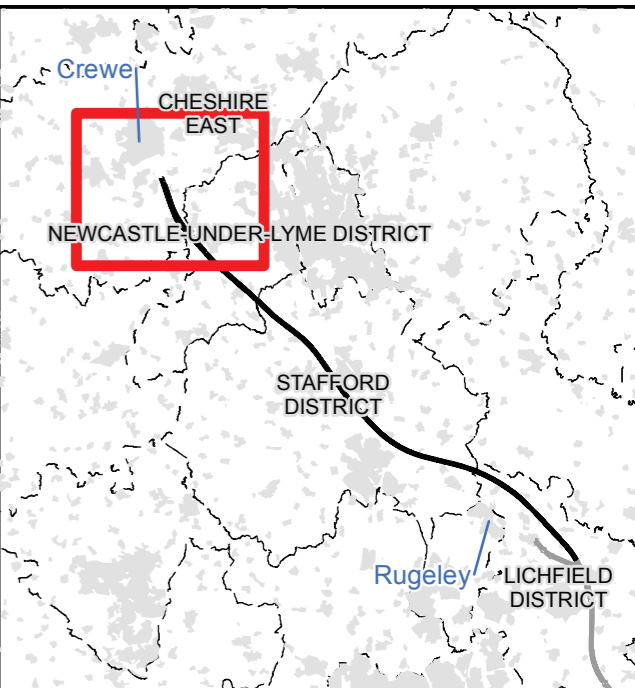
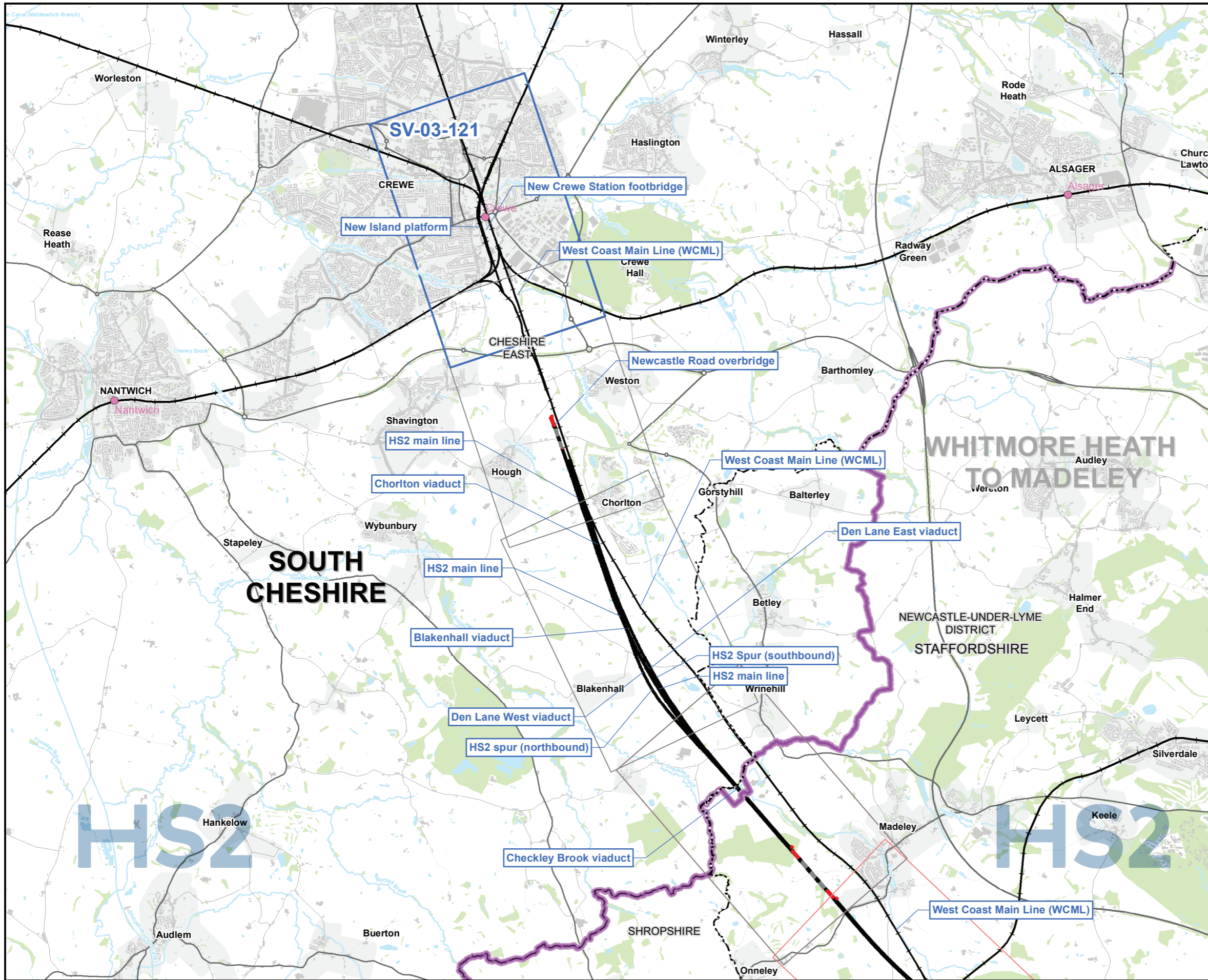
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Map Series Information:

The SV-03 figure series accompanies the construction noise & vibration assessments. It shows the locations at which a quantitative assessment of the direct effects of construction noise and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the construction noise and vibration reports contained in Volume 5: Appendix SV-002-0XX

The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002-0XX.

The design of the Proposed Scheme will be informed through stakeholder engagement and further engineering and environmental studies.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Main Map Legend

- Route in tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community area boundary
- Existing railway station
- County boundary
- District/Borough boundary
- Map sheets included in this community area with amendment
- Map sheets included in this community area with no amendment
- Map sheets not included in this community area

Map Number	SV-03-INDEX-CA5
Map Name	Index Map of: Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments SES2 and AP2 ES Community Area 5: South Cheshire

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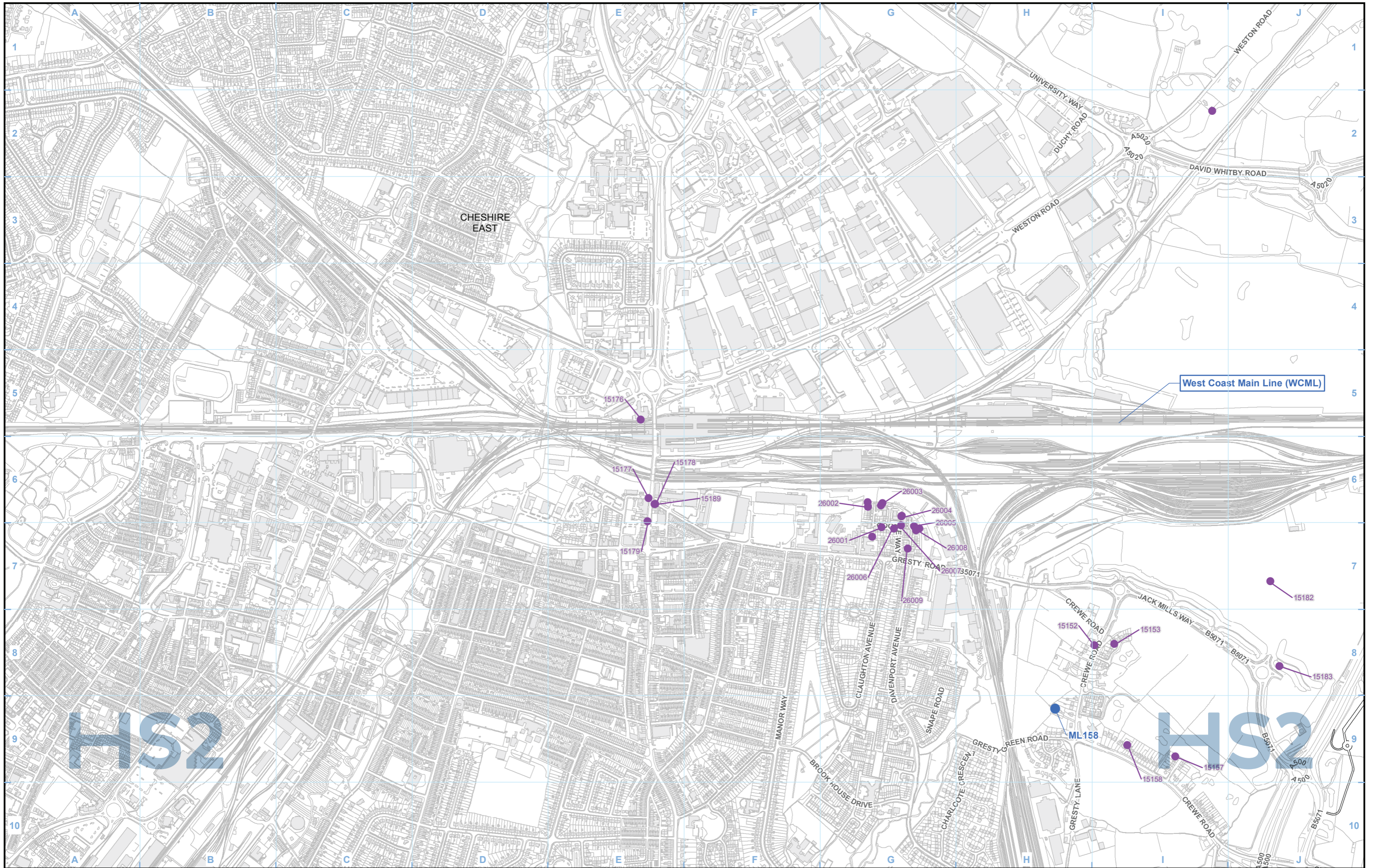
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Date: 23/01/19

Note: Not all data layers in the legend are represented on every map.



Legend - General features

- Route in bored tunnel
- Route in cut and cover tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community area boundary
- County boundary
- District/Borough boundary

Engineering earthworks: Non engineering earthworks:

- Embankment
- Cutting
- Embankment
- Cutting

Legend - Sound related features

- Construction airborne sound assessment location
- Construction vibration assessment locations (labelled with Assessment Location ID reference number (for details of the assessment results see Vol 5 Appendix SV-002-0XX))
- Construction airborne sound and vibration assessment location
- Baseline measurement locations (labelled with Measurement Location reference code)

Map Number **SV-03-121**

Map Name
Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments SES2 and AP2 ES

Community Area 5:
 South Cheshire

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