

# Six56 – Land At Bradley Hall Farm Grappenhall Lane, Grappenhall, Warrington WBC Ref: 2019/34799

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## Shadow Habitats Regulations Assessment

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The conclusions and recommendations contained in this document are based upon information gathered by TEP and provided by third parties. Information provided by third parties and referred to herein has not been independently verified by TEP, unless otherwise expressly stated in the document.

Nothing in this report constitutes legal opinion. If legal opinion is required, the advice of a qualified legal professional should be secured.

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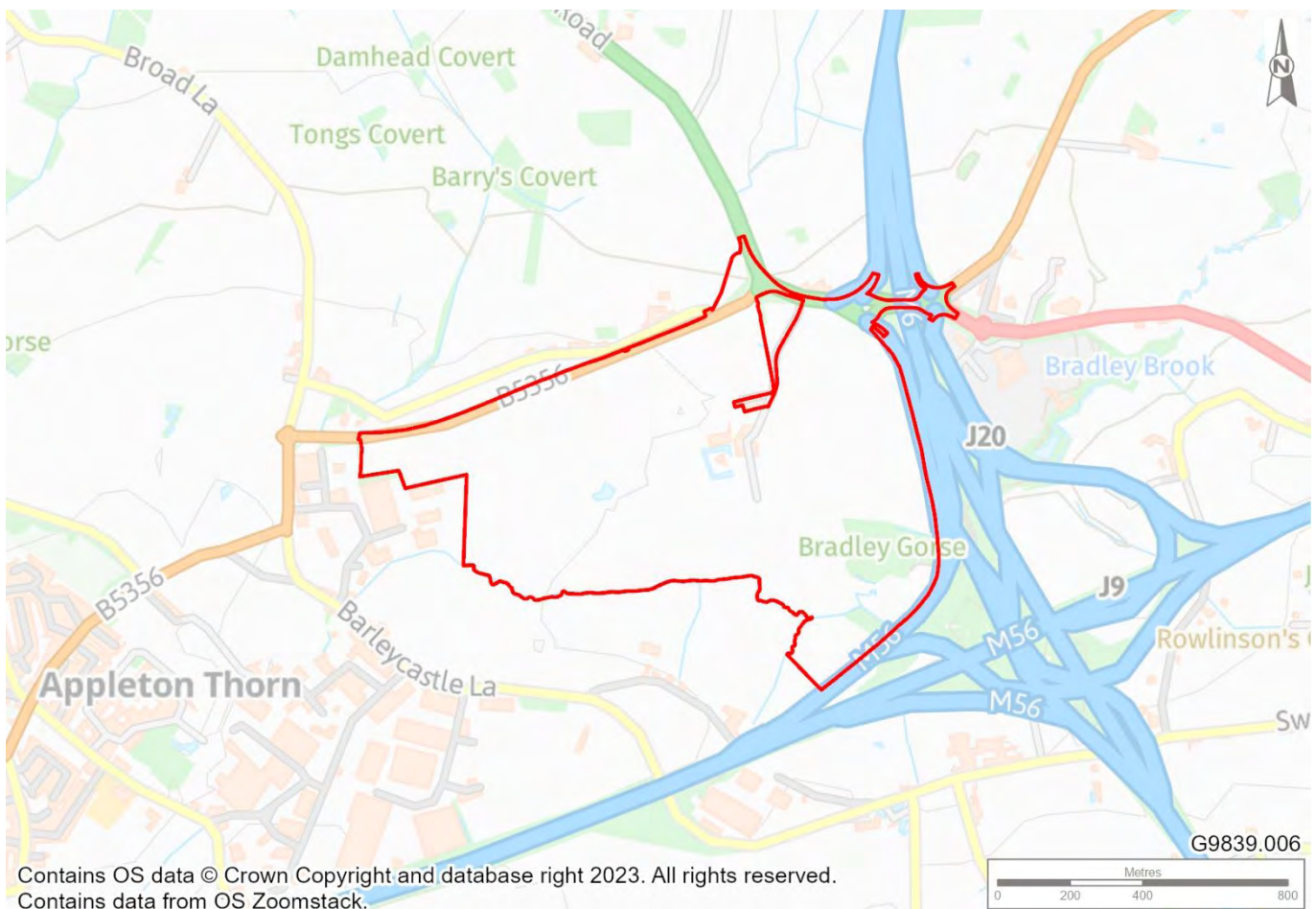
# 1.0 Introduction

- 1.1 The Environment Partnership (TEP) was commissioned by Langtree Property Partners LLP to produce a Shadow Habitats Regulations Assessment (HRA) to inform the Secretary of State's HRA for the land adjacent to Junction 20 of the M6 Motorway and Junction 9 of the M56 Motorway for a scheme known as Six56 Warrington (hereafter referred to as the Scheme).

## Site Location

- 1.2 The Scheme is located to the south-east of Warrington. The location of the Scheme is depicted by the red line shown in Figure 1.

*Figure 1: Site Location*



- 1.3 The Scheme is 98.09ha and includes 92.16ha land within the administrative boundaries of Warrington Borough Council and, in the southeast to the south of Bradley Brook, 5.93ha land Cheshire East Council.



- 1.4 The M56 Motorway and M6 Motorway interchange (Junction 20 and 20A of the M6 and Junction 9 of the M56 Motorways) are located adjacent to the south-east of the Scheme. The M56 Motorway runs east-west to the south of the Scheme and the M6 Motorway running north-south to the east of the Scheme. The B5356 Grappenhall Lane and the A50 Cliff Lane border the Scheme to the north. Appleton Thorn Trading Estate, Barleycastle Trading Estate and Stretton Green Distribution Park are located to the west.
- 1.5 The Scheme comprises predominantly farmland (arable and pastoral), with a series of hedgerows and trees along field boundaries. Bradley Hall Farm is located in the centre of the site and includes Bradley Hall and Barn locally listed buildings and Bradley Hall Moated Site identified as a Scheduled Monument (list entry number 1011924). There are also a number of other neighbouring residential properties that are adjacent to, but outside the Scheme boundary, including Bradley Hall Cottages. Beyond the northern Scheme boundary (within the triangle of land outside of the site and to the south of Cliff Lane) there is a residential property and associated outbuildings, which are accessed from the A50 Cliff Lane via the same access as Bradley Hall Farm.
- 1.6 The wider locality is generally rural, with farms and agricultural land beyond the boundaries of the Scheme to the north and south. The Strategic Highway Network and industrial/logistic development interrupt the wider arable landscape to the south, south-west and east. Vehicular access to the Scheme is via Bradley Hall Farm from the A50 Cliff Lane. There are also three designated Public Rights of Way (PROWs) across the site, all of which are footpaths.

## Proposed Scheme

- 1.7 The application for the Six56 Development is an outline application, with all matters reserved except for means of access, for.
- “A construction of up to 287,909m<sup>2</sup> (gross internal) of employment floor space (Use Class B8 and ancillary B1(a) offices), demolition of existing agricultural outbuildings and associated servicing and infrastructure, including car parking and vehicle and pedestrian circulation, alteration of existing access road into the site including works to the M6 junction 20 dumbbell roundabout and realignment of the existing A50 junction, noise mitigation, earthworks to create development platforms and bunds, landscaping including buffers, creation of drainage features, electrical substation, pumping station and ecological works”.*

## Planning Context

- 1.8 The Six56 Development is located within the planning authorities of Warrington Borough Council (WBC) and Cheshire East Council (CEC). The site is currently designated as Green Belt within the Warrington adopted Local Plan Core Strategy (July 2014<sup>1</sup>) and Saved Proposals Map<sup>2</sup>, which also identify the PROWs running through the site. The Warrington

<sup>1</sup> [https://www.warrington.gov.uk/sites/default/files/2020-09/Local\\_Plan\\_Core\\_Strategy\\_Feb\\_2015.pdf](https://www.warrington.gov.uk/sites/default/files/2020-09/Local_Plan_Core_Strategy_Feb_2015.pdf)

<sup>2</sup> [https://mapping.warrington.gov.uk/wml/Map.aspx?MapName=Planning\\_and\\_LLC\\_External](https://mapping.warrington.gov.uk/wml/Map.aspx?MapName=Planning_and_LLC_External)

Updated Proposed Submission Version Local Plan 2021-2038 (September 2021)<sup>3</sup> proposes the site as an Employment Allocation (DEV4 Economic Growth and Development) area (known as South East Warrington Employment Area – Policy MD6), as shown on the Warrington Local Plan Proposed Submission Version 2021 Policies Map<sup>4</sup>.

- 1.9 During determination Greater Manchester Ecology Unit (GMEU), who advise WBC, had no objection subject to conditions or obligations requiring submission and approval with reserved matters applications, and a S106 obligation to secure offsite compensation measures in respect of farmland birds.
- 1.10 No objections or requests for conditions were made by Natural England (NE) or the Environment Agency (EA). NE did provide suggestions for improving and creating wetland habitats with reference to Wetland Nature Recovery Network and advised the developer should use an experienced soil specialist to advise on and supervise soil handling.
- 1.11 Both planning authorities resolved to grant planning permission for the elements of the scheme in their administrative areas. The application was referred to the Secretary of State who, subsequently called the Warrington Borough Council (WBC) application in for determination (22.11.22). The CEC application was not called in.
- 1.12 The Secretary of State stated that the primary issues in relation to the call-in are:
  - the extent to which the Development is consistent with Green Belt Policies in the National Planning Policy Framework;
  - the extent to which the Development is consistent with the Development Plan; and
  - any other matters the Inspector considers relevant.
- 1.13 A Public Inquiry commenced in May 2023. The Inquiry was adjourned on 12 May 2023, with the Inspector making a request for Further Information under Regulation 25 of the Environmental Impact Assessment (EIA) Regulations 2017 (reference APP/M0655/V/22/3322877, Dated 20 June 2023).
- 1.14 The applicant was requested to supply an assessment which considers whether or not there would be an adverse effect on the integrity of Manchester Mosses Special Area of Conservation (SAC) with particular regard to Holcroft Moss. The impact pathway identified by the Inspectorate related to the cumulative emissions from the increased traffic movements that would be generated by the proposed development, which could have the potential to affect “degraded raised bogs still capable of natural regeneration” and potentially compromise the delivery of associated Conservation Objectives.

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<sup>3</sup> [https://www.warrington.gov.uk/sites/default/files/2021-09/warrington\\_updated\\_proposed\\_submission\\_version\\_local\\_plan\\_upsvlp\\_2021-2038\\_-\\_september\\_2021.pdf](https://www.warrington.gov.uk/sites/default/files/2021-09/warrington_updated_proposed_submission_version_local_plan_upsvlp_2021-2038_-_september_2021.pdf)

<sup>4</sup> [https://www.warrington.gov.uk/sites/default/files/2021-09/warrington\\_local\\_plan\\_-\\_policies\\_map\\_2021.pdf](https://www.warrington.gov.uk/sites/default/files/2021-09/warrington_local_plan_-_policies_map_2021.pdf)

## The Habitat Regulations Procedure

- 1.15 HRA is an assessment of the potential effects of a proposed project or plan on one or more sites of international nature conservation importance.
- 1.16 The Habitat Regulations Directive (92/43/EEC) established a network of Natura 2000 sites, within the European Community, with the objective of protecting sites that are considered to be of exceptional importance to rare, endangered and vulnerable natural habitats and species. These sites are European designated sites and are known as Special Areas of Conservation (SAC), Special Protection Areas (SPA's) and Offshore Marine Sites (OMS).
- 1.17 The Habitats Directive (92/43/EEC) transposed into UK law in 1994 as The Habitats Regulations, which was subsequently amended and is known as the Conservation of Habitats and Species Regulations 2017. A number of changes have been made to this including by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, referred to as the 2019 Regulations. Under the 2019 Regulations, SACs and SPAs in the UK no longer form part of the EU's Natura 2000 ecological network. The 2019 Regulations have created a National Site Network (NSN) on land and at sea, including both the inshore and offshore marine areas in the UK.
- 1.18 Ramsar sites are wetlands of international importance, designated under the International Wetlands Convention, which took place at Ramsar, Iran. Although Ramsar sites do not form part of the NSN, National Planning Policy recommends that Ramsar sites should be afforded the same level of consideration as SAC and SPA designated sites.
- 1.19 Under the Habitats Regulations the granting of approval (i.e., planning permissions, licenses and consents) for developments is restricted if they are likely to have a significant effect on an SAC, SPA or Ramsar site.
- 1.20 Guidance (EC, 2001<sup>5</sup>, the HRA Handbook<sup>6</sup>) on undertaking assessment of plans or projects that may impact upon designated NSN sites recommends a staged approach to the assessment process:
- Screening (Stage 1): The process of identifying potentially relevant NSN sites and the likely impacts of a project upon the designated features of a NSN site, either alone or in combination with other plans and projects, and considering whether the impacts are likely to be significant.
  - Appropriate Assessment (Stage 2): Assessment of the impacts, taking into account proposed mitigation measures, on the integrity of the NSN site, either alone or in combination with other plans and projects, with regard to the site's structure and function

<sup>5</sup> European Commission (2001) Assessment of plans and projects significantly affecting Natura 2000 Sites. Methodological guidance on the provisions of Article 6 (3) and (4) of the Habitats Directive 92/43/EEC

<sup>6</sup> Tyldesley, D., and Chapman, C. (2013) The Habitats Regulations Assessment Handbook (April) (2021) edition UK: DTA Publications Limited



and its conservation objectives. If it cannot be concluded beyond reasonable scientific doubt that the project would not adversely affect site integrity then development consent cannot be issued unless the steps set out in Stages 3 and 4 are successfully concluded.

- Assessment of Alternative Solutions (Stage 3): Examining alternative ways of achieving the objectives of the project, to establish whether there are solutions that would avoid an adverse effect on the integrity of a NSN site(s).
- Assessment of IROPI (Stage 4): If it is shown that there are no alternative solutions then the project can receive development consent only if it can also be demonstrated that it should proceed for imperative reasons of overriding public interest (IROPI). Where IROPI can be shown then compensatory measures required to maintain the overall coherence of the site or integrity of the NSN site network will need to be identified and secured.

1.21 All four stages of the process are referred to cumulatively as the HRA.

1.22 In this instance, the Secretary of State is the competent authority for this Scheme ensuring that development management decisions do not adversely affect the integrity of the NSN sites. As such this document is termed a 'shadow' Habitat Regulations Assessment.

## Scope

1.23 This Shadow HRA has been produced to consider the effect of the project alone before proceeding to consider potential in combination effects. It includes:

- details of the application site location in relation to the SAC units most likely to be affected;
- the implications of the scheme in terms of potential impact pathways;
- the likely significant effects alone and in combination;
- an assessment of potential adverse effects on integrity as they relate to the relevant Conservation Objectives and current condition of the site;
- a reasoned conclusion on whether there would be an adverse effect (the integrity test) capable of compromising its ecological structure, function or recovery;
- consideration of mitigation capable of reducing adverse effects to a de minimis level; and
- an overall conclusion on the findings of the HRA.

1.24 This Shadow HRA takes account of the *People over Wind* ruling<sup>7</sup> that mitigation cannot be taken into consideration at the screening stage prior to Appropriate Assessment.

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<sup>7</sup> Court of Justice of the European Union Case C-323/16 *People Over Wind & Peter Sweetman v Coillte Teoranta* 12th April 2018

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## Supporting Information

- AECOM (2018) Local Plan Air Quality Modelling Executive Summary and Technical Report, Warrington Borough Council 29 October 2018<sup>8</sup>
- AECOM (2019) Warrington Borough Council Proposed Submission Version Local Plan Habitat Regulations Assessment Warrington Borough Council, 15 March 2019<sup>9</sup>
- AECOM (2021) Warrington Borough Council Updated Proposed Submission Version Local Plan Updated Habitat Regulations Assessment, Warrington Borough Council August 2021<sup>10</sup>
- AECOM (2022) Warrington Borough Council Air Quality Assessment for Warrington Local Plan Habitats Regulations Assessment Updated Modelling of Manchester Mosses SAC, 1 November 2022<sup>11</sup>
- AECOM (2023) Warrington Borough Council Local Plan Main Modifications, Updated Habitat Regulations Assessment. March 2023<sup>12</sup>
- Tyler Grange (2022) Langtree PP and Panattoni ES Ecology Addendum to Environmental Statement Part 2 – Ecology Technical Paper 5, 9 June 2022 <sup>13</sup>
- Langtree PP and Panattoni Environmental Statement Part 2 – Air Quality, Odour and Dust Technical Paper 8, 18 February 2019<sup>14</sup>
- TEP (2023) Six56 Inquiry Ecology Proof of Evidence, 6 April 2023<sup>15</sup>
- Royal HaskoningDHV (2023) Six56 Inquiry Proof of Evidence Air Quality, 5 April 2023<sup>16</sup>
- Curtins (2023) Six56 Inquiry Proof of Evidence Transport, 4 April 2023<sup>17</sup>
- Core Document CD8.3 Draft S106 Six56 dated 25/04/23<sup>18</sup>

9 [https://www.warrington.gov.uk/sites/default/files/2019-09/habitat\\_regulations\\_assessment.pdf](https://www.warrington.gov.uk/sites/default/files/2019-09/habitat_regulations_assessment.pdf)

11 [https://www.warrington.gov.uk/sites/default/files/2022-11/E10%20HRA%20Addendum%20Nov%2022\\_Redacted.pdf](https://www.warrington.gov.uk/sites/default/files/2022-11/E10%20HRA%20Addendum%20Nov%2022_Redacted.pdf)

13 <https://www.warrington.gov.uk/sites/default/files/2023-04/CD%204.6%20%20%20%20%20Technical%20Paper%205%20-%20Ecology%20%28with%20Appendices%29.pdf>

15 <https://www.warrington.gov.uk/sites/default/files/2023-04/CD%206.6%20%20%20%20%20Proof%20of%20Evidence%20-%20Ecology%20-%20Liz%20Seal%20-%20Final.pdf>

<sup>17</sup> Land to the west of Junction 20 of the M6 Motorway and Junction 9 of the M56 Motorway and to the south of Grappenhall Lane and Cliff Lane, Grappenhall, Warrington – known as Six:56

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## Structure of this Report

- 1.26 Section 2.0 'Summary of Baseline' provides details of the National Site Network (NSN) within proximity to the Scheme as well as known existing baseline information for the qualifying features of these protected sites. This section also summarises the conclusions of Air Quality Assessment (AQA) produced by Royal HaskoningDHV.
- 1.27 Section 3.0 'Screening Assessment' describes the test of Likely Significant Effect (LSE), which comprises Stage 1 of the HRA process, to determine which qualifying species and habitat features associated with NSN designations included in the assessment will be taken forward to Appropriate Assessment stage.
- 1.28 Section 4.0 'Appropriate Assessment' provides the assessment for effects on the integrity of the NSN from the Scheme proposals (Stage 2 of HRA process) and assesses those projects or plans that have the potential to result in an adverse effect on the integrity of the NSN 'in combination' with the Scheme proposals.
- 1.29 Section 5.0 'Assessment of Alternative Solutions' determines if there are alternative solutions to a potentially damaging plan or project, where residual likely significant effects may not be ruled out after mitigation.
- 1.30 Section 6.0 'Assessment of IROPI' determines if risk of harm is overridden by imperative reasons of public interest and identifies necessary compensatory measures.
- 1.31 Section 7.0 'Conclusions' provides a summary of this Shadow HRA.

## 2.0 Summary of Baseline

2.1 Table 1 identifies the NSN designations located within 10km of the Scheme. These designations are illustrated in Figure 2. Table 2 identifies the Sites of Special Scientific Interest (SSSI) underpinning these NSN designations.

*Table 1: NSN designations within 10km of the Scheme*

Site Name and Designation	Reasons for Designation	Threats and Pressures	Distance (km)
Rixton Clay Pits SAC  Link to: <a href="#">Standard Data Form (SDF)</a>	<p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> <li>▶ Not Applicable</li> </ul> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site</p> <ul style="list-style-type: none"> <li>▶ Not Applicable</li> </ul> <p>Annex II species that are a primary reason for selection of this site</p> <ul style="list-style-type: none"> <li>▶ 1166 Great crested newt <i>Triturus cristatus</i></li> </ul> <p>Situated east of Warrington, this site comprises parts of an extensive disused brickworks excavated in glacial boulder clay. The excavation has left a series of hollows, which have filled with water since workings ceased in the 1960s, leading to a variety of pond sizes. New ponds have also been created more recently for wildlife and amenity purposes. Great crested newt <i>Triturus cristatus</i> are known to occur in at least 20 ponds across the site. The site also supports species-rich grassland, scrub and mature secondary woodland.</p> <p>Annex II species present as a qualifying feature, but not a primary reason for site selection</p> <ul style="list-style-type: none"> <li>▶ Not Applicable</li> </ul>	<p>SDF Threats, pressures and activities with impacts on the site identifies:</p> <ul style="list-style-type: none"> <li>▶ GO5 'Other human intrusions and disturbances' as a risk of negative impact.</li> </ul> <p>Supplementary Advice on Conserving and Restoring Site Features<sup>19</sup> notes "The supporting freshwater and terrestrial habitat of this feature is considered sensitive to changes in air quality"</p>	5.5km north-east
Manchester Mosses SAC Link to: <a href="#">Standard Data Form (SDF)</a>	<p>Annex I habitats that are a primary reason for selection of this site</p> <ul style="list-style-type: none"> <li>▶ 7120 Degraded raised bogs still capable of natural regeneration</li> </ul> <p>Mossland formerly covered a very large part of low-lying Greater Manchester, Merseyside and southern Lancashire, and provided a severe obstacle to industrial and agricultural expansion. While most has been converted to agriculture or lost to development, several examples have survived as degraded raised bog, such as Risley Moss, Astley &amp; Bedford Mosses and Holcroft Moss on the Mersey floodplain. Their surfaces are now elevated above surrounding land due to shrinkage of the surrounding tilled land, and all except Holcroft Moss have been cut for peat at some time in the</p>	<p>SDF Threats, pressures and activities with impacts on the site identifies</p> <ul style="list-style-type: none"> <li>▶ HO4 'Air pollution, air-borne pollutants'</li> <li>▶ J02 Human induced changes in hydraulic conditions'</li> </ul> <p>Supplementary Advice on Conserving and Restoring Site</p>	6.3km north

<sup>19</sup> Rixton Clay Pits SAC Conservation Objectives Supplementary Advice, Natural England 27 April 2016

Site Name and Designation	Reasons for Designation	Threats and Pressures	Distance (km)
	<p>past. While past drainage has produced dominant purple moor grass <i>Molinia caerulea</i>, bracken <i>Pteridium aquilinum</i> and birch <i>Betula</i> spp. scrub or woodland, wetter pockets have enabled the peat-forming species to survive. Recent rehabilitation management on all three sites has caused these to spread.</p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site</p> <ul style="list-style-type: none"> <li>▶ Not Applicable</li> </ul> <p>Annex II species that are a primary reason for selection of this site</p> <ul style="list-style-type: none"> <li>▶ Not Applicable</li> </ul> <p>Annex II species present as a qualifying feature, but not a primary reason for site selection</p> <ul style="list-style-type: none"> <li>▶ Not Applicable</li> </ul>	<p>Features<sup>20</sup> notes “This habitat type is considered sensitive to changes in air quality, especially acidity and nitrogen. Critical values are currently being exceeded at this SAC (APIS, 2016)”</p>	
<p>Midland Meres and Mosses Phase I Ramsar</p> <p>Link to <a href="#">JNCC RIS</a></p>	<p>The site qualifies under Ramsar criterion 1<sup>21</sup> for inland wetland. Habitats listed include:</p> <ul style="list-style-type: none"> <li>▶ Peatlands (including peat bog, and swamp and fen)</li> <li>▶ Permanent freshwater lakes</li> <li>▶ Permanent freshwater marshes / pools</li> <li>▶ Shrub dominated wetlands</li> <li>▶ Seasonal / intermittent freshwater marshes / pools</li> </ul> <p>The site qualifies under Ramsar criterion 2<sup>22</sup>:</p> <ul style="list-style-type: none"> <li>▶ Supports a number of rare species of plants associated with wetlands including five nationally scarce species together with an assemblage of rare wetland invertebrates (three endangered insects and five other British Red Data Book species of invertebrates)</li> </ul>	<p>The JNCC RIS identifies factors adversely affecting the site as:</p> <ul style="list-style-type: none"> <li>▶ Eutrophication</li> <li>▶ Introduction of non-native animal species</li> </ul>	7.2km east
<p>Rostherne Mere Ramsar</p> <p>Link to <a href="#">JNCC RIS</a></p>	<p>The site qualifies under Ramsar criterion 1 for inland wetland. Habitats listed include:</p> <ul style="list-style-type: none"> <li>▶ Permanent freshwater lakes</li> <li>▶ Peatlands (including peat bog, and swamp and fen)</li> </ul> <p>Vegetation consists of fringing reedbeds, wooded and agricultural land. Noteworthy fauna includes wintering waterbirds at nationally important numbers – great cormorant <i>Phalacrocorax carbo carbo</i>, great bittern <i>Botaurus stellaris stellaris</i> and water rail <i>Rallus aquaticus</i>.</p>	<p>The JNCC RIS identifies factors adversely affecting the site as:</p> <ul style="list-style-type: none"> <li>▶ Eutrophication</li> <li>▶ Introduction of non-native animal species</li> </ul>	7.4km east

<sup>20</sup> Manchester Mosses SAC Conservation Objectives Supplementary Advice, Natural England 27 April 2016

<sup>21</sup> Ramsar criterion 1: A wetland should be considered internationally important if it contains a representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region

<sup>22</sup> Ramsar criterion 2: A wetland should be considered internationally important if it supports vulnerable, endangered, or critically endangered species or threatened ecological communities



Figure 2: NSN designations within 10km of the Scheme

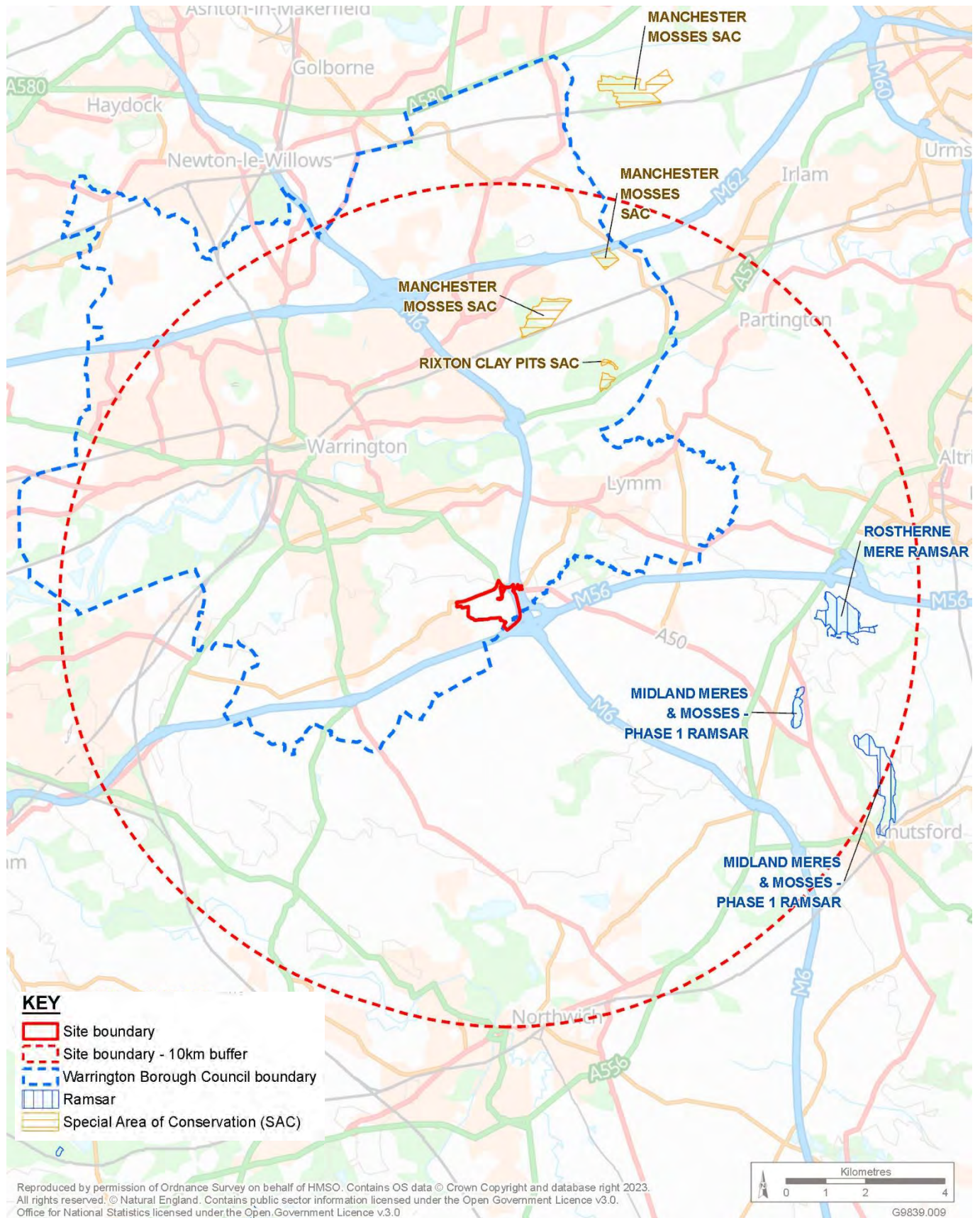


Table 2: SSSI underpinning NSN designations within 10km of the Scheme

NSN	SSSI Name	Features of Interest and SSSI Condition	Distance (km)
Rixton Clay Pits SAC	Rixton Clay Pits SSSI  Link to <a href="#">citation</a>	The site is designated for its calcareous grassland communities. The site supports the county's largest known breeding population of great crested newts <i>Triturus cristatus</i> . Both features are identified by Natural England to be in favourable condition <sup>23</sup> .	5.5 km north-east
Manchester Mosses SAC	Holcroft Moss SSSI  Link to <a href="#">citation</a>	The site is the only known unexploited area of raised bog remaining in Cheshire. The single feature (raised bog (lowland)) and SSSI unit (Bogs – lowland) is described to be 'unfavourable recovering' <sup>24</sup> . Rewetting interventions are enabling recovery.	8.2km north
Manchester Mosses SAC	Risley Moss SSSI  Link to <a href="#">citation</a>	The site is of the last remaining fragments of the raised bog system that once covered large areas of South Lancashire and North Cheshire. It is one of only 2 examples in Cheshire where the water level has been raised and steps taken to encourage the regeneration of an active mire surface. Two of the three features (assemblages of breeding birds – lowland open waters and their margins <sup>25</sup> and assemblages of breeding birds – mixed scrub, woodland <sup>26</sup> ) are described to be in favourable condition. The third feature (raised bog (lowland) <sup>25</sup> ) is described to be 'unfavourable recovering'. Two of three SSSI units, comprising 'broadleaved, mixed and yew woodland' are described as favourable <sup>27</sup> . The third unit, comprising 'bog – lowland' is unfavourable recovering <sup>28</sup> . Rewetting interventions are enabling recovery.	6.3 km north
Midland Meres and Mosses Phase I Ramsar	The Mere, Mere SSSI  Link to <a href="#">citation</a>	The site consists of two lakes -- The Mere and Little Mere -- separated by a spillway. They are moderately nutrient-rich and have been designated because of their very diverse aquatic flora including 12 species of submerged macrophyte the highest diversity recorded in any of the Shropshire and Cheshire meres as well as floating and emergent species. The aquatic invertebrate fauna is also diverse and includes the red-eyed damselfly <i>Erythromma najas</i> which has a restricted distribution in Britain. The single feature (eutrophic lakes) comprising two SSSI units, is described to be unfavourable with no change <sup>29</sup> . Reasons for	7.2km south east

23 Rixton Clay Pits SSSI Condition of Features, Natural England 2015

24 Holcroft Moss SSSI Condition of Features, Natural England 2021

25 Risley Moss SSSI Condition of Features, Natural England 2010

26 Risley Moss SSSI Condition of Features, Natural England 2015

27 Risley Moss SSSI Condition of Features, Natural England 2018

28 Risley Moss SSSI Condition of Features, Natural England 2020

29 The Mere, Mere SSSI Condition of Features, Natural England 2010

NSN	SSSI Name	Features of Interest and SSSI Condition	Distance (km)
		adverse condition include invasive freshwater species and water pollution (agricultural run-off and other discharges).	
Midland Meres and Mosses Phase I Ramsar	Tatton Meres SSSI  Link to <a href="#">citation</a>	Tatton Meres consists of two meres which have been selected as some of the best examples in the county of meres with moderate fertility and a rich and well-developed aquatic flora. The site also includes a large area of fen, flushed acidic grassland and woodland.	8.9km south east
Rostherne Mere Ramsar	Rostherne Mere SSSI  Link to <a href="#">citation</a>	<p>The Mere is nationally important for its birds. It acts as a winter roost for large numbers of ducks and holds nationally significant numbers of pochard <i>Aythya ferina</i> and pintail <i>Anas acuta</i> as well as good numbers of all other common species associated with freshwater. Over 10,000 gulls regularly roost on the water and up to 90 cormorants <i>Phalacrocorax carbo</i> roost in the trees along the edge. Rostherne Mere lies at the end of a single stream system, receiving water from Little Mere and Mere Mere. All three Meres drain a catchment of agricultural, urban and parkland. Because of its size and depth it is the last freshwater body in the area to freeze in winter and is consequently an important refuge in severe weather.</p> <p>Three of the four features (aggregations of non-breeding birds -pintail and -pochard, and eutrophic lakes) are described to be in unfavourable condition with no change<sup>30</sup>. One feature (Karst) is described as favourable<sup>31</sup>. Condition of SSSI units<sup>32</sup> comprising 'improved grassland' are favourable. A unit comprising 'standing open water and canals' is unfavourable with no change. Critically low diversity in native macrophyte community is attributed to water pollution and invasive plant species. Reduction of anthropogenic threats is being achieved through Water Level Management Plans. The restoration of water levels and prevention of vegetation incursion is being achieved through Site Management Statements and management agreements.</p> <p>A unit comprising 'broadleaved, mixed and yew woodland – lowland' is unfavourable recovering. Himalayan balsam in under a controlled programme of management.</p>	7.4km east

30 Rostherne Mere SSSI Condition of Features, Natural England 2008, 2022

31 Rostherne Mere SSSI Condition of Features, Natural England 2022

32 Rostherne Mere SSSI Condition of Features, Natural England 2009

## 3.0 Stage 1 Screening Assessment

### Description of Project

- 3.1 The application is in outline with matters of principle/parameters and access for consideration; all other matters (appearance, landscaping, layout and scale) are reserved for determination at a later date through a further submission. The majority of the application site is located within Warrington with a very small amount, in the southeast corner, within the administrative boundary of Cheshire East Council, which relates to the Ecological Mitigation Zone.
- 3.2 The components of the Scheme would include:
- Up to 287,909sqm gross internal employment floorspace (use class B8 – storage and distribution) with ancillary B1(a) offices;
  - Demolition of existing agricultural outbuildings;
  - Alteration to the existing access into the site with two new roundabouts into the site from Grappenhall Lane;
  - Works to the M6 J20 dumbbell roundabout and realignment of the existing A50 roundabout;
  - Associated car parking and service areas;
  - Internal vehicle circulation roads;
  - Pedestrian and cycle circulation routes;
  - Earthworks to create development platforms and bunds;
  - Drainage features including attenuation areas and Sustainable Drainage Systems (SuDS);
  - Landscaping;
  - Noise mitigation features;
  - Ecological works including wetland ponds; and
  - Electricity substation and pumping station.
- 3.3 Development cells divides the Scheme into four zones, outside of which new buildings would not be located. The development cells have a combined maximum developable area of 62.9ha. Strategic landscaping is proposed around the boundaries of the Scheme and within the ‘south-north open green corridor’, including new tree planting, and the retention of trees along parts of the western, southern and northern boundaries of the Scheme, around Bradley Hall moated site and within Bradley Gorse and Wrights Covert. The Scheme accommodates a 15m standoff (from built development) to Bradley Brook, which runs east-west along the southern boundary.



- 3.4 Although the application is only for outline at this stage, except for access, construction activities for the Scheme as a whole (once fully consented) would include construction traffic (heavy goods vehicles and staff vehicles), site clearance activities (vegetation removal, soil stripping and storage, and demolition of some existing structures), protection of retained features, construction of the proposed development including infrastructure, drainage and landscaping.
- 3.5 The Scheme is non-residential. The Scheme provides employment floorspace, particularly for logistics.
- 3.6 All elements of the Scheme are within the red line boundary, with the exception of compensatory measures delivered offsite through contributions.
- 3.7 The Scheme is not linked to the Conservation Objectives of any of the NSN designations or Ramsar sites located within 10km.

## Impact Pathways

- 3.8 The combination of threats to the NSN designations and Ramsar sites are identified as:
- Human intrusion and disturbance;
  - Air pollution and airborne pollutants;
  - Human induced changes in hydraulic conditions;
  - Eutrophication;
  - Introduction of non-native species.
- 3.9 Further examination of the threats and potential impact pathways is provided below.

### Direct Loss

- 3.10 No part of the Scheme lies within or within 5km of any of the NSN designations or Ramsar sites. There are no impact pathways that would lead to direct loss of habitat within any NSN designation or Ramsar site within 10km, nor will the Scheme result in the loss of any supporting habitat for such sites.

### Human Intrusions and Disturbances

- 3.11 Fly-tipping of waste and introduction of predatory fish species and invasive animal and plant species are examples of human intrusions and disturbances of relevance to the identified NSN designations and Ramsar sites, in addition to public recreation pressures (e.g. resulting species disturbance) and predation by pets.
- 3.12 The Scheme lies beyond 5km from the closest NSN designation or Ramsar site. Furthermore, the Scheme does not include any element of residential use. The distance of the Scheme from the NSN designations and Ramsar sites and the nature of the Scheme are



such that no impact pathways exist that could give rise to human intrusion or disturbance effects.

### Human Induced Changes In Hydraulic Conditions

- 3.13 Human induced changes in hydraulic conditions may include effects such as:
- run-off from agricultural land which may lead to eutrophication and sediment loading;
  - water pollution from inappropriately controlled or accidental discharges; and
  - changes in surface water or groundwater flows which may affect water levels.
- 3.14 The Scheme lies beyond 5km from the closest NSN designation or Ramsar site. Given this spatial separation and considering intervening topography between the Scheme and these designations, there are no opportunities for human induced changes in hydraulic conditions within the NSN designations or Ramsar to arise as consequence of the Scheme during construction or operation.

### Eutrophication

- 3.15 Eutrophication may increase plant growth rates or contribute to algal blooms, which can increase turbidity and decrease light penetration into surface waters, the effects of which can be to alter species compositions within a habitat.
- 3.16 Eutrophication through nitrogen enrichment from point sources such as discharges or spillages or diffuse source from agricultural run-off would not arise as consequence of the Scheme during operation or construction. Pathways for eutrophication of this type do not exist due to the nature of the Scheme and the distance of the Scheme to the NSN designations or Ramsar sites.
- 3.17 Eutrophication through nitrogen deposition from traffic emissions during the operation of the site is examined as part of air pollution and airborne pollutants.

### Air Pollution and Airborne Pollutants

- 3.18 Concentrations of pollutants in the air and deposition of nitrogen can harm vegetation directly or affect plant health and productivity. Deposition of pollutants to the ground and vegetation can alter the characteristics of the soil, affecting the pH and nitrogen availability that can then affect plant health, productivity and species composition<sup>33</sup>.
- 3.19 The air pollutant of most concern for sensitive vegetation is in relation to excessive road traffic emissions is oxides of nitrogen (NOx) concentrations. NOx is composed of nitric

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<sup>33</sup> Bobbink, R., Hicks, K., Galloway, J., Spranger, T., Alkemade, R., Ashmore, M., Bustamante, M., Cinderby, S., Davidson, E., Dentener, F. and Emmett, B. (2010) Global assessment of nitrogen deposition effects on terrestrial plant diversity: a synthesis. Ecological applications, 20(1), pp.30-59

oxide (NO) and its oxidation product nitrogen dioxide (NO<sub>2</sub>). Concentrations of NO<sub>2</sub> are higher close to roads and so vegetation in these areas is exposed to a larger source of nitrogen (N). Potential ecological consequences in response to high levels or prolonged exposure to such emissions can include:

- Changes in species composition especially in nutrient poor ecosystems with a shift towards species associated with higher nitrogen availability (e.g. dominance of tall grasses);
- Reduction in species richness;
- Increases in plant production;
- Decrease or loss of sensitive lichens and bryophytes.

- 3.20 With regard to potential risks from road traffic emissions, Natural England and Highways England agree that only protected sites falling within 200m of the edge of a road affected by a plan or project need to be considered further. This is based on evidence presented in ENRR580 (Bignal et al. 2004<sup>34</sup>) and remains consistent with more current literature (e.g. Ricardo-AEA, 2016<sup>35</sup> and Holman et. al., 2020<sup>36</sup>) which concludes that roadside effects of NO<sub>x</sub> and nitrogen deposition will have reduced to background concentrations/rates within 200m of a roadside.
- 3.21 The only site located within 200m of a road that would carry traffic movements to and from the Scheme is Holcroft Moss SSSI, a component of Manchester Mosses SAC. Holcroft Moss SSSI is adjacent to the M62 motorway and qualifies as a SAC due to its 'degraded raised bog which is capable of natural regeneration'. The closest point of the designation is 23m from the edge of the M62 and the closest bog habitat is 90m from the M62.
- 3.22 For all other sites, separation from the Scheme is substantially beyond than 200m. Consequently, air pollution or airborne pollutants from increased traffic emissions generated by the Scheme would not affect these other sites.

## Screening Assessment

- 3.23 The Screening Assessment for the Scheme is presented in Table 1. Supporting information is also provided for predicted impacts that are scoped out at this stage, based on the impact pathways described above.

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34 Bignal, K., Ashmore, M. & Power, S. (2004) The ecological effects of diffuse air pollution from road transport. English Nature Research Report No. 580, Peterborough

35 Ricardo-AEA (2016) The ecological effects of air pollution from road transport: an updated review. Natural England Commissioned Report no.199

36 Holman et. al. (2020) A guide to the assessment of air quality impacts on designated nature conservation sites – version 1.1, Institute of Air Quality Management, London.

**Table 3: Screening Assessment**

Impact Pathway	Screening	Carried forward for Assessment
Direct loss	The Scheme will not result in the direct loss of any of the NSN designations and Ramsar sites, or the loss of supporting habitats for these sites.	No Due to the distance from the Scheme, there would be no effect on the NSN designations or Ramsar sites.
Other human intrusions and disturbances	No human intrusions or disturbances within any of the NSN designations and Ramsar sites will arise from the Scheme. There are no impact pathways for such effects as a consequence of the distances between the Scheme and the NSN designations and Ramsar sites.	No Due to the distance from the Scheme and the nature of the Scheme, there would be no effect on the NSN designations or Ramsar sites.
Human induced changes in hydraulic conditions	No human induced hydraulic changes would arise within any of the NSN designations and Ramsar sites will arise from the Scheme. There are no impact pathways for such effects as a consequence of the distances between the Scheme and the NSN designations and Ramsar sites.	No Due to the distance from the Scheme and intervening topography, there would be no effect on the NSN designations or Ramsar sites.
Eutrophication	Eutrophication through soil or water based pathways (fouling, tipping, discharges, run-off etc) would not arise within any of the NSN designations and Ramsar sites due to the distance of the Scheme from these sites and the nature of the Scheme (non-residential). Eutrophication arising from nitrogen deposition from traffic emissions is considered under 'air pollution and airborne pollutants'.	No Due to the distance from the Scheme and the nature of the Scheme, there would be no effect on the NSN designations or Ramsar sites.
Air pollution, airborne pollutants	Holcroft Moss SSSI, a component of the Manchester Mosses SAC, is within 200m of the major transport network to be used by the Scheme. While some of the other NSN sites and Ramsar sites may also support features at risk of the threats of air pollution and air-borne pollutants, or to eutrophication, all other sites are sufficiently distant (>200m) from the transport network to avoid air quality impact pathways arising from the Scheme alone or in combination.	Yes Holcroft Moss SSSI component of Manchester Mosses SAC lies within potential zone of influence (200m) for potential increases in traffic emissions to give rise to significant adverse effects.

## Screening Assessment In combination

- 3.24 Air pollution is identified as the only impact pathway with the potential to have a likely significant effect alone and this is carried forward to Stage 2. Therefore, there is no need to consider in combination effects for this impact pathway at screening stage as it is already carried through for assessment.

- 3.25 There are no impact pathways identified for direct loss, human disturbance or changes to hydraulic conditions and therefore no potential for in combination effects to arise.

## 4.0 Stage 2 Appropriate Assessment

- 4.1 The Appropriate Assessment stage of the HRA focuses on those impacts judged likely at the screening stage to have a significant effect and seeks to conclude whether they would result in an adverse effect on the on the integrity of the qualifying features of a NSN designation(s), or where insufficient certainty regarding this remains.
- 4.2 Guidance on what constitutes the integrity of a NSN site has been provided by the European Commission (EC, 2019<sup>37</sup>). In this guidance, the 'integrity of the site' is defined as *"the coherence of the site's ecological structure and function, across its whole area, which enables it to sustain the habitat, complex of habitats and/or populations of species for which the site has been designated"*.
- 4.3 The integrity of a site depends on the site being able to sustain its 'qualifying features' across the whole of the site and ensure their continued viability.
- 4.4 Stage 1 Screening identified one component of the Manchester Mosses SAC (Holcroft Moss SSSI) to be taken forward to Stage 2 Appropriate Assessment (AA). The HRA pack of documents relating to Manchester Mosses SAC and Holcroft Moss SSSI is provided in Annex A and a summary of key information is provided in Table 4.

**Table 4: Holcroft Moss SSSI (Manchester Mosses SAC) Site Information**

Qualifying Features	Conservation objectives	Threats and Pressures	Condition Assessment
H7120 Degraded raised bog	<p>Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring:</p> <ul style="list-style-type: none"> <li>▶ The extent and distribution of qualifying natural habitats;</li> <li>▶ The structure and function (including typical species) of qualifying natural habitats; and</li> <li>▶ The supporting processes on which qualifying natural habitats rely.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Hydrological changes</li> <li>▶ Air Pollution: impact of atmospheric nitrogen deposition</li> </ul>	<p>August 2021 condition assessment<sup>38</sup> notes both the single SSSI feature and SSSI unit of Holcroft Moss are 'unfavourable – recovering'.</p> <p>Re-wetting interventions have improved the site since 2013 and target species have increased, although there are areas which have not improved as expected despite being equally wet. A number of possible causes are identified for this including:</p>

<sup>37</sup> European Commission (2019) Commission notice 'Managing Natura 2000 sites. The provisions of Article 6 of the Habitats Directive 92/43/EEC' (2019/C 33/01), available at: [https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52019XC0125\(07\)](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52019XC0125(07)) [Accessed July 2023]

<sup>38</sup> Holcroft Moss SSSI Condition of Features, Natural England 2021



Qualifying Features	Conservation objectives	Threats and Pressures	Condition Assessment
			<ul style="list-style-type: none"> <li>▶ the historic grazing on the moss</li> <li>▶ the proximity of this site to the M62</li> <li>▶ the thinner woodland on the East boundary,</li> <li>▶ exposure to air pollution and N deposition</li> </ul>

## Impact Pathways Assessed

- 4.5 The only impact pathway under consideration is air borne pollutants arising from road traffic movements, primarily HGVs associated with the proposed Six56 logistics facility. The amount of construction traffic was assessed in the Environmental Impact Assessment to be less than the thresholds set by IEMA guidelines. The completed development and operational impacts are therefore the focus of the assessment with regards to potential air quality impacts.
- 4.6 The Holcroft Moss component of the SAC is within 200m of the M62 motorway. The application site is adjacent to the M56 and M6 motorways, only traffic movements associated with the proposal that travel along the M62 motorway (between Junctions 11 and 12) have the potential to impact the SAC.
- 4.7 An Air Quality Assessment (AQA) was undertaken by Royal HaskoningDHV (Annex B) to determine potential impacts both alone and in combination with other projects and plans. The AQA was informed by traffic flows advice provided by Curtins (Annex C). This assessment of traffic flows adopts a more conservative approach than the traffic allocation assumed for the Scheme within the WBC HRA air quality assessments<sup>8,9,10,11,12</sup>.
- 4.8 The approach and assumptions used in the emissions model are outlined in these documents and not generally repeated here but are made with reference to the applicant's ES and Inquiry transportation evidence as well as the Warrington Borough Council Local Plan HRA documents. The WBC Local Plan HRA has been accepted by Natural England and provides a robust basis to guide this assessment include use for the in combination assessment. Before proceeding, Natural England were consulted and were in agreement on the approach of relying upon the WBC document as the basis for the in combination assessment.
- 4.9 The assessment of potential air quality impacts on ecology was undertaken in accordance with the IAQM habitats guidance<sup>36</sup>, which states that impacts of greater than 1% of the applicable critical load / level is considered potentially significant and warrants further investigation by an ecologist to determine the likely risk of harm.

- 4.10 The bog habitats are 90m from the M62 motorway at its closest point, impacts will diminish the further from the motorway to imperceptible levels at 200m. The deposition results at the 90m receptor points are used here to identify worst-case scenarios and predictions are modelled alone, in combination with existing background levels and with predicted (2029) growth in background levels plus the contribution of the WBC Local Plan.

## Effects from the Six56 Application Alone and In combination with Background Growth and Draft WBC Local Plan

- 4.11 Predictions are modelled alone (Process contribution), in combination with existing background pollutant levels (predicted environmental contribution) and with predicted growth in background levels (2029) plus the contribution of the WBC Local Plan as identified in the WBC Local Plan HRA. The results of the model are summarized as follows:
- NO<sub>x</sub> critical levels are 0.1% reducing to 0.0% in 2029,
    - ▶ This contribution is within the context of 94% and 71% when including background levels.
  - NH<sub>3</sub> critical levels are 0.9% and remain so in 2029
    - ▶ this contribution is within the context of 274% and 309% when including background levels.
  - N deposition critical loads are 1% of the lower range and 0.5% of the higher range and remain so in 2029
    - ▶ This contribution is within the context of 236% and 253% when including background levels.
  - Acid deposition critical loads are 0.6% of the lower and upper range and remain so in 2029
    - ▶ this contribution is within the context of 236% and 344% when including background levels.

### Conservative approach to assessment

- 4.12 The background pollutant levels used were taken from the latest available data set (2019 – 2021) which is an updated from the data available to use in the WBC Local Plan HRA.
- 4.13 The bog habitats are 90m from the M62 motorway at the closest point, the results at the 90m receptors are used here to identify worst-case scenarios but impacts will diminish the further from the motorway to be insignificant at 200m.
- 4.14 The future baseline used in the WBC assessment predicts an increase in traffic on the M62 of 49,102 two-way AADT, of this 2,102 two-way AADT would arise from the WBC Local Plan and within that, 841 two-way AADT is attributed to the South East Warrington Employment Area. By developable area, the Six:56 application comprises 72% of this allocation and therefore 601 two-way AADT in the WBC Local Plan assessment were attributed to this

application site. Therefore, this shadow HRA takes an exceptionally robust approach for the contribution of Six:56 alone and assumes 755 AADT.

- 4.15 This in combination assumes all Local Plan development will be delivered in six years by 2029 which is before the end of the 20-year period of the Local Plan and, in reality, would never occur.
- 4.16 This in combination assessment include baseline changes and the predicted contribution of the WBC Local Plan. The Local Plan projections already included the traffic movements from the Six:56 development so the in combination assessment presented here effectively double counts the contribution of this application.
- 4.17 The WBC Local Plan HRA has retained the traffic flow numbers from earlier versions of the assessment despite site allocations being removed during the local plan process.
- 4.18 A sensitivity test was undertaken to assess the impact of potential LDV movements combined with HGV movements. The stress test used a conservative estimate of LDVs together with the HGVs, exceeds the total Six:56 allocation of vehicle movements used in the WBC HRA. No changes to predicted NO<sub>x</sub> and NH<sub>3</sub> critical levels were identified and only marginal increases to N and acid deposition critical loads were identified as set out below, confirming the predictions remain robust.
- N deposition critical loads were very marginally increased from 1% to 1.1% of the lower range and from 0.5% to 0.6% of the upper range.
  - Acid deposition critical loads were very marginally increased from 0.6% to 0.7% of the lower and upper range.
- 4.19 A 1% change in the Critical Load or Level is regarded as a threshold of insignificance, it is likely to be within the natural range of fluctuations in deposition and is unlikely to be perceptible<sup>39</sup>. However, 1% is not a threshold of harm and exceeding this threshold does not, of itself, imply damage to a habitat just that it requires further consideration. Existing and predicted background levels already exceed critical levels/loads with the contribution of the application site at no more than 1% representing a very small proportion of this.

#### Summary results in combination with background growth and WBC Local Plan

- 4.20 No prediction exceeds the 1% threshold. N deposition levels are the only marker to reach 1% and only against the lower range. APIS indicates that the high end of the range should be used with high precipitation or a high water table, and the low end of the range should be used with low precipitation and a low water table. The western UK has relatively high precipitation compared to the eastern UK and therefore the lower range is not applicable, and 1% would not be experienced.

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<sup>39</sup> Institute of Air Quality Management (2020) A guide to the assessment of air quality impacts on designated nature conservation sites, May 2020 v1.1

- 4.21 The thresholds are not exceeded and no impacts on the Manchester Mosses SAC are predicted to arise as a result of the Six:56 proposals either alone or in combination with background growth and the Draft WBC Local Plan.

## Effects In combination with Greater Manchester Local Plans

- 4.22 The air quality assessment for the WBC Local Plan HRA was updated in November 2022 following consultation with Natural England. This included reconsideration of in combination impacts with Greater Manchester local plans. Neither plan alone exceeded the 1% thresholds for air pollutants but in combination NH<sub>3</sub> critical levels and nitrogen deposition critical loads were exceeded (1.22% and 1.48%, respectively). It calculated that approximately 10% of the area of raised bog would exceed the lower nitrogen deposition threshold (WBC HRA AQ Assessment Nov 2022<sup>11</sup>, Figure 2 pdf page 15).
- 4.23 However, this assumes both plans are fully built out and does not take account of vehicle emission reduction beyond 2035. The assessment, which is agreed with Natural England, noted that improvement in air quality due to changes in the vehicle fleet would outweigh the impact from the two local plans year on year in relation to nitrogen deposition. Rates at the SAC have reduced and will continue to decline, the in combination impact of the two local plans would slow that reduction by 4 months compared to a situation without the local plans. Ammonia levels at Holcroft Moss have increased since 2015 and are predicted to rise in the short term and then decrease in the long term. Ammonia from road transport is responsible for a large proportion close to the M62 motorway but across the majority of the site other sources of ammonia dominate. At 14.6% ammonia from traffic is not a minor contributor but agriculture is the largest single source. The assessment concluded that ammonia pollution from traffic only affects 10% of the bog habitat and sources are reducing/improving, while agricultural sources affect the entire site and are increasing/deteriorating.
- 4.24 The WBC HRA (Nov 22<sup>11</sup>, para 4.40) concludes as follows:
- “The worst-case ‘in combination’ effect from the Warrington and Greater Manchester Local Plans at the closest area of bog to the M62 is likely to be very botanically subtle (if observed at all it is most likely restricted to some possible impact on lichen diversity, with some possible impact on higher plant species richness when other sources of traffic growth are also considered) and may never actually arise even without mitigation. Moreover, this would only apply to 10% of the bog with the remaining 90% falling below the 1% threshold due to the two plans. Furthermore, the botanical effect that is forecast may prove to be even more subtle than identified in this report if the full improvement in vehicle emissions that Defra expect to arise by 2030 and beyond does occur.”*
- 4.25 That being said, there is a ‘restore objective’ relating to air quality on the Supplementary Advice on the Conservation Objectives for the SAC (Annex A), which states: ‘Restore as necessary the concentrations and deposition of air pollutants to below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System ([www.apis.ac.uk](http://www.apis.ac.uk))’. Therefore, achieving no deterioration compared to the current

baseline pollution levels would not be sufficient to achieve this specific target. Mitigation was proposed to confidently draw a conclusion of no adverse effect on integrity. It was noted that the combined local plans are responsible for less than 10% of the critical load, with background growth in traffic responsible for the vast majority of the exceedance. As such, it was agreed that the mitigation must be proportionate to the small contribution of the local plans to the overall impact.

### Mitigation

4.26 Following the Local Plan HRA (Aug 2021<sup>40</sup>), a three-tier approach to achieving positive air quality for Warrington and Manchester Mosses SAC has been included in the Local Plan via policies INF1 (Parts 1-4 and 7) and ENV8 (Parts 3/4) and is summarised as follows:

- Tier One – WBC will deliver a programme of borough-wide initiatives to reduce reliance on private cars and promote low emission vehicles via the Local Transport Plan
- Tier Two – WBC will require the larger developments (MD1 to MD6 and OS 1, OS2 and OS6) to devise a scheme-specific range of measures to reduce reliance on cars, trip generation and promote ultra-low emission vehicles.
- Tier Three – WBC will require all other developments that would exceed thresholds for transport assessments to devise a scheme-specific range of measures to reduce reliance on cars, trip generation and promote ultra-low emission vehicles.

4.27 In combination with these three tiers, draft Local Plan policy ENV8(4) states:

*“The main allocations (Policies MD1 to MD6) and the smaller settlement allocations, which line the M62 corridor (Policies OS1, OS2 and OS6) and all other new development that exceeds the thresholds for requiring a Transport Assessment, as specified in the Council’s Transport SPD, will be required to consider air quality impacts on the Manchester Mosses Special Area of Conservation (SAC). Any proposals that would result in increased traffic flows on the M62 past the Manchester Mosses SAC of more than 100 vehicles per day or 20 Heavy Goods Vehicles (HGVs) per day must devise a scheme-specific range of measures to reduce reliance on cars, reduce trip generation and promote ultra-low emission vehicles.”*

4.28 With reference to published studies<sup>40</sup> to determine likely minimum effectiveness, the WBC HRA identified that these types of measures are anticipated to reduce traffic by 2-3% for low intensity interventions and 11% for high intensity interventions. A review across several Sustainable Travel Towns<sup>41</sup> which implemented a limited package of measures, showed an average reduction in car-based trips by residents of 9%. This compares favourably with the aim WBC Local Plan requirements which show a 1.8% increase in traffic along the M62

40 DfT, 2004. Smarter Choices - Changing the Way We Travel <https://www.gov.uk/government/publications/smarter-choices-main-report-about-changing-the-way-we-travel>

41 DfT, 2010. The Effects of Smarter Choice Programmes <https://www.gov.uk/government/publications/the-effects-of-smarter-choice-programmes-in-the-sustainable-travel-towns-full-report>



motorway. Furthermore, the three-tier approach includes more than soft interventions and puts specific requirements on developments.

- 4.29 To further increase confidence in the mitigation approach, Natural England required options for hard interventions which were reported in the updated HRA AQ assessment (Nov 2022<sup>12</sup>) such as extending the tree belt, installing a solid barrier, introducing a speed restriction and reducing stocking densities on adjacent fields. However, the preferred approach agreed with Natural England, WBC and GMCA was the delivery of long-term resilience measures via hydrological restoration. Specifically, the measures must demonstrate benefit to the part of the bog affected by the traffic movements (i.e. the 10% of bog habitat closest to the M62 motorway) and be over and above any management measure currently planned. With this in mind, the Supplementary Advice on Conserving and Restoring Site Features (SACORSF) (Annex A) backs up this approach as follows:
- Describes site resilience as the ability “to cope with, and adapt to, environmental stress and change whilst retaining the same basis structure and ways of functioning”.
  - Degraded raised bog only includes examples capable of natural regeneration.
  - About half of the qualifying habitat is developing towards active bog.
  - Restoration measures for this habitat usually include raising water levels.
  - Management of peripheral peat and land immediately surrounding will be critical to restoration or maintenance of active bog.
- 4.30 In relation to any residual uncertainty to the level of restoration that will be achieved, the acceptability of this approach and supporting case law is described in para 5.5 of the Nov 2022 HRA AQ update which is accepted by Natural England.
- 4.31 A Habitat Mitigation Plan will confirm the specification and costs of the interventions and is anticipated to be completed by December 2023. WBC will use its regulatory powers if necessary to deliver the mitigation works. An appropriate mechanism would put in place to secure proportionate contribution from developments that will result in increased traffic flows on the M62 past Holcroft Moss over 100 vehicles or 20 HGVs per day through the additional text at the end of ENV8(4) as follows:
- “and provide a contribution towards restoration measures in accordance with the Holcroft Moss Habitat Mitigation Plan”*
- 4.32 It is therefore concluded in the WBC Local Plan HRA that with the policy mitigation included in the Local Plan, it will not result in adverse effects on the integrity of any European site either alone or in combination with other projects and plans. As the Six56 application is included within the WBC Local Plan HRA, the conclusions of ‘no likely significant effect’ on the integrity of the Manchester Mosses SAC holds true.

## 5.0 Stage 3 Assessment of Alternative Solutions

5.1 This stage is not required.

## 6.0 Stage 4 Assessment of IROPI

6.1 This stage is not required.

## 7.0 Conclusion

- 7.1 A conservative approach to the assessment of potential air quality impacts on Manchester Mosses SAC has been adopted. This assessment has concluded there will be no likely significant effects arising from the Scheme alone; furthermore, and taking account of mitigation, there will be no in combination effects on the Manchester Mosses SAC.
- 7.2 WBC will be implementing Tier One of the mitigation proposals set out in the HRA via the Local Transport Plan.
- 7.3 With regards to the Six:56 application being considered ahead of the WBC Local Plan being adopted; the applicant has already committed within the S106 to:
- producing a Travel Plan;
  - providing Travel Plan contribution;
  - providing a Bespoke Public Transport Service contribution;
  - providing a Footway / Cycleway contribution.
- 7.4 The above will include the soft mitigation measures outlined in Tier Two of the draft Local Plan policy INF1 (Parts 1-4 and 7) and will be implemented irrespective of the adoption of the draft Local Plan.
- 7.5 At the time of writing this shadow HRA, the SAC Habitat Mitigation Plan referred to in policy ENV8(4) of the draft Local Plan has not been developed. As such, there is currently no mechanism to calculate a contribution from Six:56 towards restoration measures. However, this situation does not introduce any uncertainty into the conclusions of no adverse effects on site integrity from the Six:56 proposals either alone or in combination for the following reasons:
- It is established that it is appropriate to rely upon policies that will secure mitigation to determine no likely significant effect on site integrity.
  - The funding of the Habitat Mitigation Plan is not reliant on a contribution from any one allocation, costs for delivery, once calculated can be apportioned across the likely upcoming developments that meet the ENV8(4) criteria post adoption of the Local Plan.
  - If the Local Plan is adopted prior to Six:56 being granted, then this development would be tested against the ENV(8) contribution criteria.
  - There will only be in combination effects if the Local Plan is adopted. If the Local Plan is adopted, then the Three Tiers of measures and ENV8(4) will be implemented and mitigate any potential in combination effect<sup>42</sup>.

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<sup>42</sup> R(Forest of Dean Friends of the Earth) -v- Forest of Dean Council (2015) EWCA Civ 683

## Annex A: Holcroft Moss SSSI – Site Information

Manchester Mosses SAC Standard Data Form

Manchester Mosses SAC Citation

Manchester Mosses SAC Site Improvement Plan

European Site Conservation Objectives for Manchester Mosses SAC

Manchester Mosses SAC European Site Conservation Objectives: Supplementary  
Advice on Conserving and Restoring Site Features

Holcroft Moss SSSI Citation

Holcroft Moss SSSI Views About Management

## **STANDARD DATA FORM for sites within the 'UK national site network of European sites'**

Special Protection Areas (SPAs) are classified and Special Areas of Conservation (SACs) are designated under:

- the Conservation of Habitats and Species Regulations 2017 (as amended) in England and Wales (including the adjacent territorial sea) and to a limited extent in Scotland (reserved matters) and Northern Ireland (excepted matters);
- the Conservation (Natural Habitats &c.) Regulations 1994 (as amended) in Scotland;
- the Conservation (Natural Habitats, &c) Regulations (Northern Ireland) 1995 (as amended) in Northern Ireland; and
- the Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended) in the UK offshore area.

Each SAC or SPA (forming part of the UK national site network of European sites) has its own Standard Data Form containing site-specific information. The information provided here generally follows the same documenting format for SACs and SPAs, as set out in the [Official Journal of the European Union recording the Commission Implementing Decision of 11 July 2011 \(2011/484/EU\)](#).

Please note that these forms contain a number of codes, all of which are explained either within the data forms themselves or in the end notes.

More general information on SPAs and SACs in the UK is available from the [SPA homepage](#) and [SAC homepage](#) on the JNCC website. These webpages also provide links to Standard Data Forms for all SAC and SPA sites in the UK.

<https://jncc.gov.uk/>



# NATURA 2000 - STANDARD DATA FORM

For Special Protection Areas (SPA),  
Proposed Sites for Community Importance (pSCI),  
Sites of Community Importance (SCI) and  
for Special Areas of Conservation (SAC)

SITE UK0030200  
SITENAME Manchester Mosses

## TABLE OF CONTENTS

- [1. SITE IDENTIFICATION](#)
- [2. SITE LOCATION](#)
- [3. ECOLOGICAL INFORMATION](#)
- [4. SITE DESCRIPTION](#)
- [5. SITE PROTECTION STATUS AND RELATION WITH CORINE BIOTOPES](#)
- [6. SITE MANAGEMENT](#)

## 1. SITE IDENTIFICATION

<b>1.1 Type</b> B	<b>1.2 Site code</b> UK0030200	<a href="#">Back to top</a>
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### 1.3 Site name

Manchester Mosses
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<b>1.4 First Compilation date</b> 2001-03	<b>1.5 Update date</b> 2015-12
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### 1.6 Respondent:

<b>Name/Organisation:</b> Joint Nature Conservation Committee
<b>Address:</b> Joint Nature Conservation Committee Monkstone House City Road Peterborough PE1 1JY
<b>Email:</b>

<b>Date site proposed as SCI:</b>	2001-03
<b>Date site confirmed as SCI:</b>	2004-12
<b>Date site designated as SAC:</b>	2005-04
<b>National legal reference of SAC designation:</b>	Regulations 11 and 13-15 of the Conservation of Habitats and Species Regulations 2010 ( <a href="http://www.legislation.gov.uk/uksi/2010/490/contents/made">http://www.legislation.gov.uk/uksi/2010/490/contents/made</a> ).

## 2. SITE LOCATION

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## 2.1 Site-centre location [decimal degrees]:

### Longitude

-2.465555556

### Latitude

53.471111111

## 2.2 Area [ha]:

170.49

## 2.3 Marine area [%]

0.0

## 2.4 Sitelength [km]:

0.0

## 2.5 Administrative region code and name

### NUTS level 2 code

### Region Name

UKD3	Greater Manchester
UKD2	Cheshire

## 2.6 Biogeographical Region(s)

Atlantic (100.0  
%)

# 3. ECOLOGICAL INFORMATION

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## 3.1 Habitat types present on the site and assessment for them

Annex I Habitat types						Site assessment			
Code	PF	NP	Cover [ha]	Cave [number]	Data quality	A B C D	A B C		
						Representativity	Relative Surface	Conservation	Global
7120B			151.74	0	G	B	C	C	B

- **PF:** for the habitat types that can have a non-priority as well as a priority form (6210, 7130, 9430) enter "X" in the column PF to indicate the priority form.
- **NP:** in case that a habitat type no longer exists in the site enter: x (optional)
- **Cover:** decimal values can be entered
- **Caves:** for habitat types 8310, 8330 (caves) enter the number of caves if estimated surface is not available.
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation)

# 4. SITE DESCRIPTION

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## 4.1 General site character

Habitat class	% Cover
---------------	---------

N07	89.0
N16	11.0
<b>Total Habitat Cover</b>	<b>100</b>

#### Other Site Characteristics

1 Terrestrial: Soil & Geology: acidic,peat 2 Terrestrial: Geomorphology and landscape: lowland,floodplain

#### 4.2 Quality and importance

Degraded raised bogs still capable of natural regeneration for which this is considered to be one of the best areas in the United Kingdom.

#### 4.3 Threats, pressures and activities with impacts on the site

The most important impacts and activities with high effect on the site

Negative Impacts			
Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i o b]
H	H04		B
H	J02		B

Positive Impacts			
Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i o b]
H	B02		I
H	A04		I
H	A02		I

Rank: H = high, M = medium, L = low

Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification,

T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions

i = inside, o = outside, b = both

#### 4.5 Documentation

Conservation Objectives - the Natural England links below provide access to the Conservation Objectives (and other site-related information) for its terrestrial and inshore Natura 2000 sites, including conservation advice packages and supporting documents for European Marine Sites within English waters and for cross-border sites. See also the 'UK Approach' document for more information (link via the JNCC website).

Link(s): <http://publications.naturalengland.org.uk/category/6490068894089216>

<http://publications.naturalengland.org.uk/category/3212324>

[http://jncc.defra.gov.uk/pdf/Natura2000\\_StandardDataForm\\_UKApproach\\_Dec2015.pdf](http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf)

### 5. SITE PROTECTION STATUS (optional)

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#### 5.1 Designation types at national and regional level:

Code	Cover [%]	Code	Cover [%]	Code	Cover [%]
UK04	100.0				

### 6. SITE MANAGEMENT

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#### 6.1 Body(ies) responsible for the site management:

Organisation:	Natural England
Address:	
Email:	

## 6.2 Management Plan(s):

An actual management plan does exist:

- |                                     |                        |
|-------------------------------------|------------------------|
| <input type="checkbox"/>            | Yes                    |
| <input type="checkbox"/>            | No, but in preparation |
| <input checked="" type="checkbox"/> | No                     |

## 6.3 Conservation measures (optional)

For available information, including on Conservation Objectives, see Section 4.5.
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## EXPLANATION OF CODES USED IN THE SPECIAL AREA OF CONSERVATION (SAC) AND SPECIAL PROTECTION AREA (SPA) STANDARD DATA FORMS

The codes in the table below generally follow those explained in the [official European Union guidelines for the Standard Data Form](#) (also referencing the relevant page number).

### 1.1 Site type

CODE	DESCRIPTION	PAGE NO
A	SPA (classified Special Protection Area)	53
B	cSAC, SCI or SAC (candidate Special Area of Conservation, Site of Community Importance, designated Special Area of Conservation)	53
C	SPA area/boundary is the same as the cSAC/SCI/SAC i.e. a co-classified/designated site (Note: this situation only occurs in Gibraltar)	53

### 3.1 Habitat code

CODE	DESCRIPTION	PAGE NO
1110	Sandbanks which are slightly covered by sea water all the time	57
1130	Estuaries	57
1140	Mudflats and sandflats not covered by seawater at low tide	57
1150	Coastal lagoons	57
1160	Large shallow inlets and bays	57
1170	Reefs	57
1180	Submarine structures made by leaking gases	57
1210	Annual vegetation of drift lines	57
1220	Perennial vegetation of stony banks	57
1230	Vegetated sea cliffs of the Atlantic and Baltic Coasts	57
1310	Salicornia and other annuals colonizing mud and sand	57
1320	Spartina swards (Spartinion maritimae)	57
1330	Atlantic salt meadows (Glaucio-Puccinellietalia maritimae)	57
1340	Inland salt meadows	57
1420	Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi)	57
2110	Embryonic shifting dunes	57
2120	Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")	57
2130	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	57
2140	Decalcified fixed dunes with Empetrum nigrum	57
2150	Atlantic decalcified fixed dunes (Calluno-Ulicetea)	57
2160	Dunes with Hippophya• rhamnoides	57
2170	Dunes with Salix repens ssp. argentea (Salicion arenariae)	57
2190	Humid dune slacks	57
21A0	Machairs (* in Ireland)	57
2250	Coastal dunes with Juniperus spp.	57
2330	Inland dunes with open Corynephorus and Agrostis grasslands	57
3110	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)	57
3130	Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea	57
3140	Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.	57
3150	Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation	57

CODE	DESCRIPTION	PAGE NO
3160	Natural dystrophic lakes and ponds	57
3170	Mediterranean temporary ponds	57
3180	Turloughs	57
3260	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitriche-Batrachion vegetation	57
4010	Northern Atlantic wet heaths with Erica tetralix	57
4020	Temperate Atlantic wet heaths with Erica ciliaris and Erica tetralix	57
4030	European dry heaths	57
4040	Dry Atlantic coastal heaths with Erica vagans	57
4060	Alpine and Boreal heaths	57
4080	Sub-Arctic Salix spp. scrub	57
5110	Stable xerothermophilous formations with Buxus sempervirens on rock slopes (Berberidion p.p.)	57
5130	Juniperus communis formations on heaths or calcareous grasslands	57
6130	Calaminarian grasslands of the Violetalia calaminariae	57
6150	Siliceous alpine and boreal grasslands	57
6170	Alpine and subalpine calcareous grasslands	57
6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)	57
6230	Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe)	57
6410	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	57
6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	57
6510	Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis)	57
6520	Mountain hay meadows	57
7110	Active raised bogs	57
7120	Degraded raised bogs still capable of natural regeneration	57
7130	Blanket bogs (* if active bog)	57
7140	Transition mires and quaking bogs	57
7150	Depressions on peat substrates of the Rhynchosporion	57
7210	Calcareous fens with Cladium mariscus and species of the Caricion davallianae	57
7220	Petrifying springs with tufa formation (Cratoneurion)	57
7230	Alkaline fens	57
7240	Alpine pioneer formations of the Caricion bicoloris-atrofuscae	57
8110	Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)	57
8120	Calcareous and calcshist scree of the montane to alpine levels (Thlaspietalia rotundifoliae)	57
8210	Calcareous rocky slopes with chasmophytic vegetation	57
8220	Siliceous rocky slopes with chasmophytic vegetation	57
8240	Limestone pavements	57
8310	Caves not open to the public	57
8330	Submerged or partially submerged sea caves	57
9120	Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion robur-petraeae or Ilici-Fagenion)	57
9130	Asperulo-Fagetum beech forests	57
9160	Sub-Atlantic and medio-European oak or oak-hornbeam forests of the Carpinion betuli	57
9180	Tilio-Acerion forests of slopes, scree and ravines	57
9190	Old acidophilous oak woods with Quercus robur on sandy plains	57
91A0	Old sessile oak woods with Ilex and Blechnum in the British Isles	57
91C0	Caledonian forest	57
91D0	Bog woodland	57
91E0	Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)	57
91J0	Taxus baccata woods of the British Isles	57

### 3.1 Habitat representativity (abbreviated to 'Representativity' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent representativity	57
B	Good representativity	57
C	Significant representativity	57
D	Non-significant presence representativity	57

### 3.1 Relative surface

CODE	DESCRIPTION	PAGE NO
A	> 15%-100%	58
B	> 2%-15%	58
C	≤ 2%	58

### 3.1 Degree of conservation (abbreviated to 'Conservation' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	59
B	Good conservation	59
C	Average or reduced conservation	59

### 3.1 Global assessment (abbreviated to 'Global' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent value	59
B	Good value	59
C	Significant value	59

### 3.2 Population (abbreviated to 'Pop.' in data form)

CODE	DESCRIPTION	PAGE NO
A	> 15%-100%	62
B	> 2%-15%	62
C	≤ 2%	62
D	Non-significant population	62

### 3.2 Degree of conservation (abbreviated to 'Con.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	63
B	Good conservation	63
C	Average or reduced conservation	63

### 3.2 Isolation (abbreviated to 'Iso.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Population (almost) Isolated	63
B	Population not-isolated, but on margins of area of distribution	63
C	Population not-isolated within extended distribution range	63

### 3.2 Global Grade (abbreviated to 'Glo.' or 'G.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent value	63
B	Good value	63
C	Significant value	63

### 3.3 Other species – essentially covers bird assemblage types

CODE	DESCRIPTION	PAGE NO
WATR	Non-breeding waterbird assemblage	UK specific code
SBA	Breeding seabird assemblage	UK specific code

BBA	Breeding bird assemblage (applies only to sites classified pre 2000)	UK specific code
-----	--	------------------



#### 4.1 Habitat class code

CODE	DESCRIPTION	PAGE NO
N01	Marine areas, Sea inlets	65
N02	Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins)	65
N03	Salt marshes, Salt pastures, Salt steppes	65
N04	Coastal sand dunes, Sand beaches, Machair	65
N05	Shingle, Sea cliffs, Islets	65
N06	Inland water bodies (Standing water, Running water)	65
N07	Bogs, Marshes, Water fringed vegetation, Fens	65
N08	Heath, Scrub, Maquis and Garrigue, Phygrana	65
N09	Dry grassland, Steppes	65
N10	Humid grassland, Mesophile grassland	65
N11	Alpine and sub-Alpine grassland	65
N14	Improved grassland	65
N15	Other arable land	65
N16	Broad-leaved deciduous woodland	65
N17	Coniferous woodland	65
N19	Mixed woodland	65
N21	Non-forest areas cultivated with woody plants (including Orchards, groves, Vineyards, Dehesas)	65
N22	Inland rocks, Screes, Sands, Permanent Snow and ice	65
N23	Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites)	65
N25	Grassland and scrub habitats (general)	65
N26	Woodland habitats (general)	65

#### 4.3 Threats code

CODE	DESCRIPTION	PAGE NO
A01	Cultivation	65
A02	Modification of cultivation practices	65
A03	Mowing / cutting of grassland	65
A04	Grazing	65
A05	Livestock farming and animal breeding (without grazing)	65
A06	Annual and perennial non-timber crops	65
A07	Use of biocides, hormones and chemicals	65
A08	Fertilisation	65
A10	Restructuring agricultural land holding	65
A11	Agriculture activities not referred to above	65
B01	Forest planting on open ground	65
B02	Forest and Plantation management & use	65
B03	Forest exploitation without replanting or natural regrowth	65
B04	Use of biocides, hormones and chemicals (forestry)	65
B06	Grazing in forests/ woodland	65
B07	Forestry activities not referred to above	65
C01	Mining and quarrying	65
C02	Exploration and extraction of oil or gas	65
C03	Renewable abiotic energy use	65
D01	Roads, paths and railroads	65
D02	Utility and service lines	65
D03	Shipping lanes, ports, marine constructions	65
D04	Airports, flightpaths	65
D05	Improved access to site	65
E01	Urbanised areas, human habitation	65
E02	Industrial or commercial areas	65

CODE	DESCRIPTION	PAGE NO
E03	Discharges	65
E04	Structures, buildings in the landscape	65
E06	Other urbanisation, industrial and similar activities	65
F01	Marine and Freshwater Aquaculture	65
F02	Fishing and harvesting aquatic resources	65
F03	Hunting and collection of wild animals (terrestrial), including damage caused by game (excessive density), and taking/removal of terrestrial animals (including collection of insects, reptiles, amphibians, birds of prey, etc., trapping, poisoning, poaching, predator control, accidental capture (e.g. due to fishing gear), etc.)	65
F04	Taking / Removal of terrestrial plants, general	65
F05	Illegal taking/ removal of marine fauna	65
F06	Hunting, fishing or collecting activities not referred to above	65
G01	Outdoor sports and leisure activities, recreational activities	65
G02	Sport and leisure structures	65
G03	Interpretative centres	65
G04	Military use and civil unrest	65
G05	Other human intrusions and disturbances	65
H01	Pollution to surface waters (limnic & terrestrial, marine & brackish)	65
H02	Pollution to groundwater (point sources and diffuse sources)	65
H03	Marine water pollution	65
H04	Air pollution, air-borne pollutants	65
H05	Soil pollution and solid waste (excluding discharges)	65
H06	Excess energy	65
H07	Other forms of pollution	65
I01	Invasive non-native species	65
I02	Problematic native species	65
I03	Introduced genetic material, GMO	65
J01	Fire and fire suppression	65
J02	Human induced changes in hydraulic conditions	65
J03	Other ecosystem modifications	65
K01	Abiotic (slow) natural processes	65
K02	Biocenotic evolution, succession	65
K03	Interspecific faunal relations	65
K04	Interspecific floral relations	65
K05	Reduced fecundity/ genetic depression	65
L05	Collapse of terrain, landslide	65
L07	Storm, cyclone	65
L08	Inundation (natural processes)	65
L10	Other natural catastrophes	65
M01	Changes in abiotic conditions	65
M02	Changes in biotic conditions	65
U	Unknown threat or pressure	65
XO	Threats and pressures from outside the Member State	65

## 5.1 Designation type codes

CODE	DESCRIPTION	PAGE NO
UK00	No Protection Status	67
UK01	National Nature Reserve	67
UK04	Site of Special Scientific Interest (GB)	67
UK05	Marine Conservation Zone	67
UK06	Nature Conservation Marine Protected Area	67
UK86	Special Area (Channel Islands)	67
UK98	Area of Special Scientific Interest (NI)	67
IN00	Ramsar Convention site	67
IN08	Special Protection Area	67
IN09	Special Area of Conservation	67

# EC Directive 92/43 on the Conservation of Natural Habitats and of Wild Fauna and Flora

## Citation for Special Area of Conservation (SAC)

**Name:** Manchester Mosses  
**Unitary Authority/County:** Warrington, Wigan  
**SAC status:** Designated on 1 April 2005  
**Grid reference:** SJ691973  
**SAC EU code:** UK0030200  
**Area (ha):** 172.81  
**Component SSSI:** Astley and Bedford Mosses SSSI, Holcroft Moss SSSI, Risley Moss SSSI

### Site description:

Mossland formerly covered a very large part of Greater Manchester, Merseyside, south Lancashire and north Cheshire, and provided a severe obstacle to industrial and agricultural expansion. While most has been converted to agriculture or lost to development, several examples have survived as degraded raised bog, such as Risley Moss, Astley and Bedford Mosses, and Holcroft Moss on the Mersey floodplain. Their surfaces are now elevated above adjacent land due to shrinkage of the surrounding tilled land, and all except Holcroft Moss have been cut for peat at some time in the past. While past drainage has produced dominant purple moor-grass *Molinia caerulea*, bracken *Pteridium aquilinum* and birch *Betula* spp. scrub or woodland, wetter pockets have enabled peat-forming species to survive.

**Qualifying habitats:** The site is designated under **article 4(4)** of the Directive (92/43/EEC) as it hosts the following habitats listed in Annex I:

- Degraded raised bogs still capable of natural regeneration

This citation relates to a site entered in the Register of European Sites for Great Britain.

Register reference number: UK0030200

Date of registration: 14 June 2005

Signed: *Trevor Salmon*

On behalf of the Secretary of State for Environment,  
Food and Rural Affairs

# Site Improvement Plan

## Manchester Mosses

Site Improvement Plans (SIPs) have been developed for each Natura 2000 site in England as part of the Improvement Programme for England's Natura 2000 sites (IPENS). Natura 2000 sites is the combined term for sites designated as Special Areas of Conservation (SAC) and Special Protected Areas (SPA). This work has been financially supported by LIFE, a financial instrument of the European Community.

The plan provides a high level overview of the issues (both current and predicted) affecting the condition of the Natura 2000 features on the site(s) and outlines the priority measures required to improve the condition of the features. It does not cover issues where remedial actions are already in place or ongoing management activities which are required for maintenance.

The SIP consists of three parts: a Summary table, which sets out the priority Issues and Measures; a detailed Actions table, which sets out who needs to do what, when and how much it is estimated to cost; and a set of tables containing contextual information and links.

Once this current programme ends, it is anticipated that Natural England and others, working with landowners and managers, will all play a role in delivering the priority measures to improve the condition of the features on these sites.

The SIPs are based on Natural England's current evidence and knowledge. The SIPs are not legal documents, they are live documents that will be updated to reflect changes in our evidence/knowledge and as actions get underway. The information in the SIPs will be used to update England's contribution to the UK's Prioritised Action Framework (PAF).

The SIPs are not formal consultation documents, but if you have any comments about the SIP or would like more information please email us at [IPENSLIFEProject@naturalengland.org.uk](mailto:IPENSLIFEProject@naturalengland.org.uk), or contact Natural England's Responsible Officer for the site via our enquiry service 0300 060 3900, or [enquiries@naturalengland.org.uk](mailto:enquiries@naturalengland.org.uk)

**This Site Improvement Plan covers the following Natura 2000 site(s)**

**UK0030200     Manchester Mosses SAC**

## Site description

The Mersey floodplain was once covered by complex of large lowland raised bogs covering over 3500 ha. While most of this bog has been converted to agriculture or lost to development, several examples have survived as degraded raised bog; the largest and best preserved examples Risley Moss, Astley & Bedford Mosses and Holcroft Moss make up the component SSSI of the Manchester Mosses SAC.

All of the Manchester mosses with the exception of Holcroft Moss have been cut over and all were drained resulting in the dominance of purple moor grass *Molinia caerulea*, bracken *Pteridium aquilinum* and birch *Betula spp.* However all of the mosses have now been re-wet and a more typical wet bog community of common cotton grass *Eriophorum angustifolia*, hare's tail cotton grass *Eriophorum vaginatum* and bog mosses *Sphagnum sp.* has now established over large areas of the mosses with sundew *Drosera rotundifolia*, cross leaved heath *Erica tetralix*, bog myrtle *Myrica gale*, cranberry *Vaccinium oxycoccus* and bog rosemary *Andromeda polifolia* all starting to spread.

## Plan Summary

*This table shows the prioritised issues for the site(s), the features they affect, the proposed measures to address the issues and the delivery bodies whose involvement is required to deliver the measures. The list of delivery bodies will include those who have agreed to the actions as well as those where discussions over their role in delivering the actions is on-going.*

Priority & Issue	Pressure or Threat	Feature(s) affected	Measure	Delivery Bodies
1 Hydrological changes	Pressure	H7120 Degraded raised bog	Combination of re-wetting within site and creation of wetland buffers	Cheshire Wildlife Trust, Forestry Commission, Lancs, Manchester and Nth Merseyside Wildlife Trust, Natural England, The Wildlife Trust for Lancs, Manchester and Nth Merseyside, Warrington Borough Council, Great Manchester Mossland Project
2 Air Pollution: impact of atmospheric nitrogen deposition	Pressure	H7120 Degraded raised bog	Development and implementation of a Site Nitrogen Action Plan	Not yet determined



## Issues and Actions

*This table outlines the prioritised issues that are currently impacting or threatening the condition of the features, and the outstanding actions required to address them. It also shows, where possible, the estimated cost of the action and the delivery bodies whose involvement will be required to implement the action. Lead delivery bodies will be responsible for coordinating the implementation of the action, but not necessarily funding it. Delivery partners will need to support the lead delivery body in implementing the action. In the process of developing the SIPs Natural England has approached the delivery bodies to seek agreement on the actions and their roles in delivering them, although in some cases these discussions have not yet been concluded. Other interested parties, including landowners and managers, will be involved as the detailed actions are agreed and delivered. Funding options are indicated as potential (but not necessarily agreed or secured) sources to fund the actions.*

### 1 Hydrological changes

The combination of historic peat cutting, fragmentation, drainage and peat wastage and some of the early restoration work has significantly modified the hydrological function of all the component mosses. Considerable work has been done and is ongoing within the sites to manage the hydrology and restore the conditions for bog development. Working with partners and stakeholder we have been able to establish hydrological buffer zones around parts of the moss. However there are still areas where agricultural and transport infrastructure requires deep drainage on adjacent land that still dry out or impact on parts of the mosses.

Action	Action description	Cost estimate	Timescale	Mechanism	Funding option	Delivery lead body	Delivery partner(s)
<b>1A</b>	Re-wetting project at Risley Moss to create wet woodland and lagg to buffer the moss and to allow more natural hydrological function.	£21,000	2014-15	Existing Local Project	SITA funding	Warrington Borough Council	Great Manchester Mossland Project
Action	Action description	Cost estimate	Timescale	Mechanism	Funding option	Delivery lead body	Delivery partner(s)
<b>1B</b>	A small area of the bund at the south end of Holcroft Moss has a leak and needs small scale piling to fix the problem.	£3,000	2014-15	Rural Development Programme for England (RDPE): Common Agricultural Policy 2014-20 (New Environmental Land Management Scheme)	Great Manchester Mossland Project, New Environmental Land Management Scheme (NELMS)	Cheshire Wildlife Trust	Great Manchester Mossland Project

<i>Action</i>	<i>Action description</i>	<i>Cost estimate</i>	<i>Timescale</i>	<i>Mechanism</i>	<i>Funding option</i>	<i>Delivery lead body</i>	<i>Delivery partner(s)</i>
<b>1C</b>	Consider notification of Lancashire Wildlife Trust and Forestry Commission land at Astley and Bedford Mosses as a hydrological buffer.	Not yet determined	2015-16	Designation strategy (SSSI)	Not yet determined	Natural England	Forestry Commission, The Wildlife Trust for Lancs, Manchester and Nth Merseyside
<i>Action</i>	<i>Action description</i>	<i>Cost estimate</i>	<i>Timescale</i>	<i>Mechanism</i>	<i>Funding option</i>	<i>Delivery lead body</i>	<i>Delivery partner(s)</i>
<b>1D</b>	Create new areas of wetland to buffer the mosses and develop linkages between the three components of the SAC, to address ongoing offsite drainage impacts.	Not yet determined	2014-34	Habitat creation / restoration strategy: Creation of new habitat	Heritage Lottery Fund (HLF), New Environmental Land Management Scheme (NELMS), Landfill Community Fund (LCF)	The Wildlife Trust for Lancs, Manchester and Nth Merseyside	Cheshire Wildlife Trust, Great Manchester Mossland Project
<b>2 Air Pollution: impact of atmospheric nitrogen deposition</b>							
Nitrogen deposition exceeds site relevant critical loads.							
<i>Action</i>	<i>Action description</i>	<i>Cost estimate</i>	<i>Timescale</i>	<i>Mechanism</i>	<i>Funding option</i>	<i>Delivery lead body</i>	<i>Delivery partner(s)</i>
<b>2A</b>	Control, reduce and ameliorate atmospheric nitrogen impacts	Not yet determined	2014-20	Site Nitrogen Action Plan	Not yet determined	Not yet determined	Not yet determined

Site details

The tables in this section contain site-relevant contextual information and links

Qualifying features	
#UK Special responsibility	
Manchester Mosses SAC	H7120 Degraded raised bogs still capable of natural regeneration

Site location and links			
Manchester Mosses SAC			
Area (ha)	172.81	Grid reference	SJ691973 <a href="#">Map link</a>
Local Authorities	Warrington; Wigan		
Site Conservation Objectives	<a href="#">European Site Conservation Objectives for Manchester Mosses SAC</a>		
European Marine Site conservation advice	<a href="#">n/a</a>		
Regulation 33/35 Package	<a href="#">n/a</a>		
Marine Management Organisation site plan	<a href="#">n/a</a>		

# Water Framework Directive (WFD)

*The Water Framework Directive (WFD) provides the main framework for managing the water environment throughout Europe. Under the WFD a management plan must be developed for each river basin district. The River Basin Management Plans (RMBP) include a summary of the measures needed for water dependent Natura 2000 sites to meet their conservation objectives. For the second round of RBMPs, SIPs are being used to capture the priorities and new measures required for water dependent habitats on Natura 2000 sites. SIP actions for non-water dependent sites/habitats do not form part of the RBMPs and associated consultation.*

## Manchester Mosses SAC

River basin	<a href="#">North West RBMP</a>
WFD Management catchment	Mersey Estuary
WFD Waterbody ID (Cycle 2 draft)	GB112069061020

Overlapping or adjacent protected sites

Site(s) of Special Scientific Interest (SSSI)	
Manchester Mosses SAC	Holcroft Moss SSSI
	Astley & Bedford Mosses SSSI
	Risley Moss SSSI

National Nature Reserve (NNR)	
Manchester Mosses SAC	n/a

Ramsar	
Manchester Mosses SAC	n/a

Special Areas of Conservation (SAC) and Special Protection Areas (SPA)	
Manchester Mosses SAC	n/a

<i>Version</i>	<i>Date</i>	<i>Comment</i>
1.0	10/11/14	

[www.naturalengland.org.uk/ipens2000](http://www.naturalengland.org.uk/ipens2000)





# European Site Conservation Objectives for Manchester Mosses Special Area of Conservation

Site code: UK0030200



With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

**Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;**

- The extent and distribution of qualifying natural habitats
- The structure and function (including typical species) of qualifying natural habitats, and,
- The supporting processes on which qualifying natural habitats rely

This document should be read in conjunction with the accompanying *Supplementary Advice* document, which provides more detailed advice and information to enable the application and achievement of the Objectives set out above.

## **Qualifying Features:**

H7120. Degraded raised bogs still capable of natural regeneration

## Explanatory Notes: European Site Conservation Objectives

These Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2017 as amended from time to time (the “Habitats Regulations”). They must be considered when a competent authority is required to make a ‘Habitats Regulations Assessment’, including an Appropriate Assessment, under the relevant parts of this legislation.

These Conservation Objectives and the accompanying Supplementary Advice (where available) will also provide a framework to inform the measures needed to conserve or restore the European Site and the prevention of deterioration or significant disturbance of its qualifying features.

These Conservation Objectives are set for each habitat or species of a [Special Area of Conservation \(SAC\)](#). Where the objectives are met, the site will be considered to exhibit a high degree of integrity and to be contributing to achieving Favourable Conservation Status for that species or habitat type at a UK level. The term ‘favourable conservation status’ is defined in regulation 3 of the Habitats Regulations.

**Publication date:** 27 November 2018 (version 3). This document updates and replaces an earlier version dated 30 June 2014 to reflect the consolidation of the Habitats Regulations in 2017.



## **European Site Conservation Objectives: Supplementary Advice on Conserving and Restoring Site Features**

**Manchester Mosses Special Area of Conservation (SAC)  
Site code: UK0030200**



*Risley Moss/ P. Thomas©Natural England*

**Date of Publication: 27 April 2016**

## **About this document**

This document provides Natural England's supplementary advice about the European Site Conservation Objectives relating to Manchester Mosses SAC. This advice should therefore be read together with the [SAC Conservation Objectives](#).

You should use the Conservation Objectives, this Supplementary Advice and any case-specific advice given by Natural England, when developing, proposing or assessing an activity, plan or project that may affect this site. Any proposals or operations which may affect the site or its qualifying features should be designed so they do not adversely affect any of the attributes listed in the objectives and supplementary advice.

This supplementary advice to the Conservation Objectives describes in more detail the range of ecological attributes on which the qualifying features will depend and which are most likely to contribute to a site's overall integrity. It sets out minimum targets for each qualifying feature to achieve in order to meet the site's objectives.

The tables provided below bring together the findings of the best available scientific evidence relating to the site's qualifying features, which may be updated or supplemented in further publications from Natural England and other sources. The local evidence used in preparing this supplementary advice has been cited. The references to the national evidence used are available on request. Where evidence and references have not been indicated, Natural England has applied ecological knowledge and expert judgement. You may decide to use other additional sources of information.

In many cases, the attribute targets shown in the tables indicate whether the current objective is to 'maintain' or 'restore' the attribute. This is based on the best available information, including that gathered during monitoring of the feature's current condition. As new information on feature condition becomes available, this will be added so that the advice remains up to date.

The targets given for each attribute do not represent thresholds to assess the significance of any given impact in Habitats Regulations Assessments. You will need to assess this on a case-by-case basis using the most current information available.

Some, but not all, of these attributes can also be used for regular monitoring of the actual condition of the designated features. The attributes selected for monitoring the features, and the standards used to assess their condition, are listed in separate monitoring documents, which will be available from Natural England.

These tables do not give advice about SSSI features or other legally protected species which may also be present within the European Site.

**If you have any comments or queries about this Supplementary Advice document please contact your local Natural England adviser or email [HDIRConservationObjectivesNE@naturalengland.org.uk](mailto:HDIRConservationObjectivesNE@naturalengland.org.uk)**

## **About this site**

### **European Site information**

<b>Name of European Site</b>	Manchester Mosses Special Area of Conservation (SAC)
<b>Location</b>	Warrington; Wigan
<b>Site maps</b>	The designated boundary of this site can be viewed <a href="#">here</a> on the MAGIC website
<b>Designation Date</b>	1 April 2005
<b>Qualifying Features</b>	See section below
<b>Designation Area</b>	172.81 ha
<b>Designation Changes</b>	N/A
<b>Feature Condition Status</b>	Condition assessment information relating to this site can be found using Natural England's <a href="#">Designated Sites search tool</a> .
<b>Names of component Sites of Special Scientific Interest (SSSIs)</b>	Astley and Bedford Mosses SSSI Holcroft Moss SSSI Risley Moss SSSI
<b>Relationship with other European or International Site designations</b>	N/A
<b>Further information</b>	<a href="#">Natura 2000 Standard Data Form</a> for Manchester Mosses

### **Site background and geography**

The Mersey floodplain was once covered by a complex of large lowland raised bogs covering over 3500 ha with peat up to 9m deep. While most of this bog has been converted to agriculture or lost to development, several examples have survived as degraded raised bog within the Mersey Valley National Character Area (NCA); the largest and best preserved examples at Risley Moss, Astley & Bedford Mosses and Holcroft Moss make up the component SSSI of the Manchester Mosses SAC.

Most of the Manchester mosses, with the exception of Holcroft Moss, have been directly impacted by peat cutting in the early 20<sup>th</sup> century. All the component sites have been impacted by drainage and hydrological effects from this peat cutting; as a consequence of this by the 1980s the vegetation of the mosses was largely dominated by purple moor grass *Molinia caerulea* with, bracken *Pteridium aquilinum* and birch *Betula* species.

Despite the historical removal of peat, the mosses have still remained elevated above the land around them with an average peat depth of 2.5m still remaining. Within flooded peat cuttings localised relic areas of wet bog survived providing a refuge for Sphagnum mosses and cotton grass. Today the mosses have been re-wet and vegetation more typical of unmodified bog is starting to develop over large areas of the sites. At Holcroft Moss about 8.6 ha has started to develop towards active bog, with a further 34.5 ha at Astley and Bedford Mosses and 30 ha at Risley Moss. There are still areas of *Molinia* dominated

mossland at Risley Moss 4.5 ha and at Astley and Bedford Mosses 31 ha that are still in the process of being re-wet and are restorable back to bog. The remaining areas along the edges of the mosses and on shallower peats support wet woodland and fen. This habitat is critical to the integrity of the bog as it supports the hydrology of the core areas of bog habitat.

## About the qualifying features of the SAC

The following section gives you additional, site-specific information about this SAC's qualifying features. These are the natural habitats and/or species for which this SAC has been designated.

### Qualifying habitats:

- **H7120 Degraded raised bogs still capable of natural regeneration**

Degraded raised bogs occur where there has been widespread disruption to the structure and function of the bog's peat body. This can involve changes to the hydrology, vegetation, and physical structure of the bog, leading to peat desiccation and oxidation and the loss of characteristic species or changes in the balance of the species composition. In contrast to the H7110 active raised bog habitat, peat is not currently forming in degraded bog. These examples are however considered capable of natural regeneration through repair and management.

This SAC supports an example of Degraded raised bogs still capable of natural regeneration. The deep acid peat still supports species typical of raised bogs, with a distinctive and specialised flora. This site is included as Natura 2000 sites to provide an example of the habitat type under restoration back to active bog.

This raised bog vegetation corresponds to the UK NVC types; M2 *Sphagnum cuspidatum/recurvum* (*fallax*) bog pool community, M3 *Eriophorum angustifolium* bog pool community, M20 *Eriophorum vaginatum* blanket and raised mire and M25 - *Molinia caerulea* - *Potentilla erecta* mire (Rodwell, 1991).

Floristically the re-wet mosses are developing a community typical of lowland raised bog with an abundance of common cotton grass *Eriophorum angustifolium*, hare's-tail cotton grass *Eriophorum vaginatum* and bog mosses such *Sphagnum fallax*, *Sphagnum cuspidatum* and *Sphagnum palustre* now established over large areas. The lawns of *Sphagnum* are providing habitat for sundew *Drosera rotundifolia*, cross leaved heath *Erica tetralix*, bog myrtle *Myrica gale*, cranberry *Vaccinium oxycoccus* and bog rosemary *Andromeda polifolia*. Also present at currently low levels within the areas of well-established bog are *Sphagnum palustre*, *Sphagnum magellanicum* and *Sphagnum capillifolium*.

### Qualifying Species:

Not applicable

### References:

RODWELL, J.S. (ed.) 1991. *British Plant Communities. Volume 2. Mires and heath*. Cambridge University Press.



**Table 1: Supplementary Advice for Qualifying Features: H7120 Degraded raised bogs still capable of natural regeneration**

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
<b>Extent and distribution of the feature</b>	Extent of the feature within the site	Avoid the further degradation of the extent of the H7120 feature, whilst restoring 172.81 of the H7120 feature to H7110 Active Raised Bog by 2035	<p>'Degraded raised bogs' only includes examples which are 'capable of natural regeneration', i.e. <i>"where the hydrology can be repaired and where, with appropriate rehabilitation management there is a reasonable expectation of re-establishing vegetation with peat-forming capability within 30 years"</i> (European Commission, 2013).</p> <p>There should be no measurable increase in the extent and area of this feature, and in most cases, the full extent of the feature should be restored to H7110 Active Raised Bog. The baseline-value of extent given has been generated using data gathered from the listed site-based surveys. Area measurements given may be approximate depending on the methods, age and accuracy of data collection, and as a result this value may be updated in future to reflect more accurate information.</p> <p>The extent of an Annex I habitat feature covers the sum extent of all of the component vegetation communities present and may include transitions and mosaics with other closely-associated habitat features. Where a feature is susceptible to natural dynamic processes, there may be acceptable variations in its extent through natural fluctuations. Where a reduction in the extent of a feature is considered necessary to meet the Conservation Objective for another Annex I feature, Natural England will advise on this on a case-by-case basis.</p> <p>For this feature, 'Bog' is taken here to be the peat deposit together with typical bog vegetation, irrespective of the precise nature and condition of that vegetation. 'Lagg fen' comprises both peat deposit and vegetation, irrespective of nature and condition.</p> <p>Approximately 106ha of the site supports the SAC feature in a Degraded raised bogs still capable of natural regeneration. The remainder of the site comprises approximately 66.81 ha of W4 and W2 wet woodland on peat critical to the hydrological integrity of the bog.</p> <p>At Holcroft Moss about 8.6 ha has started to develop towards active bog, with a further 34.5 ha at Astley and Bedford Mosses and 30 ha at Risley</p>	<p>EUROPEAN COMMISSION, 2013.</p> <p>NATURAL ENGLAND, 2005, 2008, 2014.</p> <p>ENGLISH NATURE, 2005.</p> <p>NATURAL ENGLAND, 2010a.</p> <p>NATURAL ENGLAND, 2010b.</p> <p>NATURAL ENGLAND, 2008.</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>Moss.</p> <p>There are still areas of <i>Molinia</i>-dominated mossland at Risley Moss 4.5 ha and at Astley and Bedford Mosses 31 ha that are still in the process of being re-wet and are restorable back to bog.</p>	
<b>Structure and function (including its typical species)</b>	Vegetation community composition	<p>Restore the component vegetation communities of the H7210 feature to those resembling and characterised by the following National Vegetation Classification type(s) typical of H7110 Active Raised Bog;</p> <p>M2 <i>Sphagnum cuspidatum/fallax</i> bog pool community, M3 <i>Eriophorum angustifolium</i> bog pool community, M20 <i>Eriophorum vaginatum</i> raised and blanket mire and M25 <i>Molinia caerulea</i> – <i>Potentilla erecta</i> mire</p> <p>M18 <i>Erica tetralix</i> – <i>Sphagnum papillosum</i> raised &amp; blanket mire</p>	<p>This habitat feature will comprise a number of associated semi-natural vegetation types and their transitional zones, reflecting the geographical location of the site, altitude, aspect, soil conditions (especially base-status and drainage) and vegetation management. In the UK these have been categorised by the National Vegetation Classification (NVC).</p> <p>Restoring degraded vegetation to characteristic and distinctive active bog vegetation types, and the range of types as appropriate, will be important to restoring the overall habitat feature. This will also help to conserve their typical plant species (i.e. the constant and preferential species of a community), and therefore that of the SAC feature, at appropriate levels (recognising natural fluctuations).</p>	<p>NATURAL ENGLAND, 2005, 2008, 2014. ENGLISH NATURE, 2005. NATURAL ENGLAND, 2010a. NATURAL ENGLAND, 2010b. NATURAL ENGLAND, 2008.</p> <p>This attribute will be periodically monitored as part of Natural England's site condition assessments.</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		(note that this is the target community for this site and is not yet present, though some of the developing habitat is starting to show affinities to this community)		
<b>Structure and function (including its typical species)</b>	Structural diversity	<p>Restore the full range of typical structural features associated with active bogs at this site, e.g. vegetation cover, surface patterning and hydrological zonations</p> <p>There should be reduction in extent of micro-topographic features (e.g. bog pools) and no obvious modification to structural features (e.g. vegetation cover, surface patterning and natural drainage), in relation to the established baseline.</p>	<p>Active raised bogs in particular show varying degrees of structural variation and surface patterning reflecting hydrological gradations (which may be natural or the result of previous damage).</p> <p>These can occur at both macro and micro scales across the habitat and include alternative aquatic and terrestrial surface features, such as pools and hummocks, and terrestrial features such as ridges and hollows. These features will support distinctive patterns of bog vegetation, and so will be sensitive to changes in topography and hydrology. These can be modified or disrupted by activities such as drainage, burning, grazing, vehicular access and peat digging.</p>	
<b>Structure and function (including its typical species)</b>	Key structural, influential and distinctive species	<p>Restore the abundance of the species listed below to enable each of them to be a viable component of the Annex 1 habitat;</p> <p>Assemblage of bog-mosses including <i>Sphagnum capillifolium</i>, <i>S. magellanicum</i>, <i>S. papillosum</i>, <i>S. tenellum</i>, <i>S. cuspidatum</i>, <i>S. pulchrum</i></p>	<p>Some plant or animal species (or related groups of such species) make a particularly important contribution to the structure, function and/or quality of an Annex I habitat feature at a particular site. These species will include;</p> <ul style="list-style-type: none"> <li>– <b>Structural species</b> which form a key part of the habitat's structure or help to define an Annex I habitat on a site (see also the attribute for 'vegetation community composition').</li> <li>– <b>Influential species</b> which are likely to have a key role affecting the structure and function of the habitat (such as bioturbators (mixers of soil/sediment), grazers, surface borers, predators or other species with a significant functional role linked to the habitat).</li> <li>– <b>Site-distinctive species</b> which are considered to be a particularly</li> </ul>	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		<p><i>Heather Calluna vulgaris</i>, cross-leaved heath <i>Erica tetralix</i>, common cotton-grass <i>Eriophorum angustifolium</i>, Hare's-tail cotton-grass <i>E. vaginatum</i>, deer-grass <i>Trichophorum cespitosum</i> Bog rosemary <i>Andromeda polifolia</i>, sundew <i>Drosera rotundifolia</i>, crowberry <i>Empetrum nigrum</i>, bog asphodel <i>Narthecium ossifragum</i> and cranberry <i>Vaccinium oxycoccos</i></p>	<p>special and distinguishing component of an Annex I habitat on a particular site.</p> <p>There may be natural fluctuations in the frequency and cover of each of these species. The relative contribution made by them to the overall ecological integrity of a site may vary, and Natural England will provide bespoke advice on this as necessary.</p> <p>The list of species given here for this Annex I habitat feature at this SAC is not necessarily exhaustive. The list may evolve, and species may be added or deleted, as new information about this site becomes available.</p> <p>For this feature, the vegetation of the mire expanse should comprise an inter-mix of typical bryophytes (predominantly <i>Sphagnum</i> species), grasses and dwarf shrubs, with no one group dominating at the expense of others on 'active' sites. Although <i>Sphagnum</i> may predominate on hyper-oceanic sites, purple moor-grass <i>Molinia</i> may be typical and abundant on the bog margin ('rand') of active sites and more widely on degraded sites.</p>	
<b>Structure and function (including its typical species)</b>	Invasive, non-native and/or introduced species	Ensure invasive and introduced non-native species are either rare or absent, but if present are causing minimal damage to the H7210 feature	<p>Invasive or introduced non-native species can be a serious potential threat to the structure and function of these habitats, because they are able to exclude, damage or suppress the growth of their associated typical species, reduce structural diversity of the habitat and prevent the natural regeneration of characteristic site-native species.</p> <p>Once established, the measures to control such species may also impact negatively on the features of interest (e.g. use of broad spectrum pesticides).</p>	This attribute will be periodically monitored as part of Natural England's
	Supporting off-site habitat	Restore the extent, quality and spatial configuration of land or habitat surrounding or adjacent to the site which is known to support either the current H7210 feature or a H7110 active bog feature.	<p>Include only where applicable. The structure and function of the qualifying habitat, including its typical species, may rely upon the continued presence of areas which surround and are outside of the designated site boundary. Changes in surrounding land-use may adversely (directly/indirectly) affect the functioning of the feature and its component species.</p> <p>This supporting habitat may be critical to the typical species of the feature to support their feeding, breeding, roosting, population dynamics ('metapopulations'), pollination or to prevent/reduce/absorb damaging impacts from adjacent land uses e.g. pesticide drift, nutrient enrichment. For this feature the protection and management of peripheral peat and the land</p>	<p>NATURAL ENGLAND, 2004, 2008, 2014</p> <p>2007-2015 rewetting programme (held by Natural England)</p> <p>LEAH. M.D. et al. 1997.</p> <p>HALL et al. 1995.</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>immediately around the peat body will be of critical functional importance to the restoration or maintenance of the hydrology of active bog and its management must also be compatible with long-term maintenance of the bog.</p> <p>Land adjacent to Bedford moss at Windy bank farm and next to Astley moss has been re-wet and supports the hydrology of the SAC. Risley moss supports wet woodland and relic bog that is directly hydrological linked to the SAC.</p> <p>Restoration/ re wetting works at Little Woolden Moss are critical to reducing the fragmentation of the SAC. This is part of the Manchester wetland partnership project.</p>	<p>Deeper borehole logs held by BGS  <a href="http://mapapps.bgs.ac.uk/boreholescans_mobile/MobileBoreholeScans.html#/boreholescans_mobile/MobileBoreholeScans.html&amp;ui-state=dialog">http://mapapps.bgs.ac.uk/boreholescans_mobile/MobileBoreholeScans.html#/boreholescans_mobile/MobileBoreholeScans.html&amp;ui-state=dialog</a></p> <p>LANCASHIRE WILDLIFE TRUST &amp; NATURAL ENGLAND (2010)</p>
<b>Structure and function (including its typical species)</b>	Hydrology	At a site, unit and/or catchment level restore natural hydrological processes to provide the conditions necessary to sustain the current H7210 feature and a H7110 active bog within the site.	<p>Defining and maintaining the appropriate hydrological regime is a key step in moving towards achieving the conservation objectives for this site and sustaining this feature.</p> <p>Changes in source, depth, duration, frequency, magnitude and timing of water supply can have significant implications for the assemblage of characteristic plants and animals present.</p> <p>This target is generic and further site-specific investigations may be required to fully inform conservation measures and/or the likelihood of impacts.</p>	<p>LEAH. M.D. et al. 1997.</p> <p>HALL et al. 1995.</p> <p>Deeper borehole logs held by BGS  <a href="http://mapapps.bgs.ac.uk/boreholescans_mobile/MobileBoreholeScans.html#/boreholescans_mobile/MobileBoreholeScans.html&amp;ui-state=dialog">http://mapapps.bgs.ac.uk/boreholescans_mobile/MobileBoreholeScans.html#/boreholescans_mobile/MobileBoreholeScans.html&amp;ui-state=dialog</a></p> <p>This attribute will be periodically monitored as part of Natural England's site condition assessments.</p>
<b>Structure and function</b>	Water chemistry	Restore the surface water and groundwater supporting the	This habitat type is predominantly rain-fed and should be naturally low in nutrients to sustain its characteristic bog communities and associated typical	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
(including its typical species)		hydrology of the rain-fed bog at a low nutrient status.	<p>species.</p> <p>Any sources of water which contributes to supporting the bog habitat, including the margins of the bog and the lagg (the peripheral zone around the bog), should similarly be lacking in nutrients.</p>	
	Soils, substrate and nutrient cycling	Avoid further degradation of the peat substrate of the H7120 feature and restore its properties, including its structure, bulk density, total carbon, pH, soil nutrient status and fungal/bacterial ratio, to within typical values for H7110 Active Raised Bog habitat.	<p>Changes to natural peat properties may affect the ecological structure, function and processes associated with this Annex I feature.</p> <p>The typical substrate for this feature is acidic and nutrient-poor peat. Peat is distinguished from other soil types by its high content of organic matter, which results from plant growth and waterlogging combining to reduce decomposition rates and allow a build-up, over time, of semi-decomposed plant material to form peat. Peat is naturally lacking in nutrients with typically low values of calcium, phosphate, nitrate and pH.</p> <p>The surface of a restored bog should be made up of two distinct layers; an acrotelm and a catotelm. The thin upper layer, or 'acrotelm', is typically up to 30cms deep, aerobic and consists of living and dead plant material. Below this is the 'catotelm', a much thicker layer of peat (up to 10 metres), which comprises an accumulation of partially decayed plant material in anaerobic and saturated conditions.. The surface acrotelm layer of degraded raised bogs affected by past drainage or burning may be replaced with a single layer of damaged catotelm ('haplotelm').</p>	
Structure and function (including its typical species)	Adaptation and resilience	Restore the H7210 feature's ability, and that of its supporting processes, to adapt or evolve to wider environmental change, either within or external to the site	<p>This recognises the increasing likelihood of natural habitat features to absorb or adapt to wider environmental changes. Resilience may be described as the ability of an ecological system to cope with, and adapt to environmental stress and change whilst retaining the same basic structure and ways of functioning.</p> <p>Such environmental changes may include changes in precipitation and temperature for example, which are likely to affect the extent, distribution, composition and functioning of a feature within a site. The vulnerability and response of features to such changes will vary. Using best available information, any necessary or likely adaptation or adjustment by the feature and its management in response to actual or expected climatic change should be allowed for, as far as practicable, in order to ensure the feature's long-term viability.</p>	<p>NATURAL ENGLAND, 2015.</p> <p>LANCASHIRE WILDLIFE TRUST AND NATURAL ENGLAND. Greater Manchester Wetland project and the Carbon Landscape project (information held by Lancashire Wildlife trust and Natural England)</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>The overall vulnerability of this particular SAC to climate change has been assessed by Natural England as being <i>moderate</i>, taking into account the sensitivity, fragmentation, topography and management of its habitats. This means that some adaptation action for specific issues may be required, such as reducing habitat fragmentation, creating more habitat to buffer the site or expand the habitat into more varied landscapes and addressing particular management and condition issues. Individual species may be more or less vulnerable than their habitat itself. In many cases, change will be inevitable so appropriate monitoring would be required.</p> <p>The Greater Manchester Wetland project and the Carbon Landscape project aim to create a biological network to help link and buffer the SAC.</p>	
<b>Supporting processes (on which the feature relies)</b>	Air quality	Restore as necessary the concentrations and deposition of air pollutants to below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System ( <a href="http://www.apis.ac.uk">www.apis.ac.uk</a> ).	<p>This habitat type is considered sensitive to changes in air quality, especially acidity and nitrogen. Critical values are currently being exceeded at this SAC (APIS, 2016).</p> <p>Exceedance of these critical values for air pollutants may modify the chemical status of its substrate, accelerating or damaging plant growth, altering its vegetation structure and composition and causing the loss of sensitive typical species associated with it.</p> <p>Critical Loads and Levels are recognised thresholds below which such harmful effects on sensitive UK habitats will not occur to a significant level, according to current levels of scientific understanding. There are critical levels for ammonia (NH<sub>3</sub>), oxides of nitrogen (NO<sub>x</sub>) and sulphur dioxide (SO<sub>2</sub>), and critical loads for nutrient nitrogen deposition and acid deposition. There are currently no critical loads or levels for other pollutants such as Halogens, Heavy Metals, POPs, VOCs or Dusts. These should be considered as appropriate on a case-by-case basis. Ground level ozone is regionally important as a toxic air pollutant but flux-based critical levels for the protection of semi-natural habitats are still under development.</p> <p>It is recognised that achieving this target may be subject to the development, availability and effectiveness of abatement technology and measures to tackle diffuse air pollution, within realistic timescales.</p>	More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System (APIS)
<b>Supporting processes (on which the</b>	Functional connectivity with wider	Restore the overall extent, quality and function of any supporting features within the local	This recognises the potential need at this site to maintain or restore the connectivity of the site to its wider landscape in order to meet the conservation objectives. These connections may take the form of landscape	More information about restoration of the local mossland



Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
<b>feature relies)</b>	landscape	landscape which provide a critical functional connection with the site.	<p>features, such as habitat patches, hedges, watercourses and verges, outside of the designated site boundary which are either important for the migration, dispersal and genetic exchange of those typical species closely associated with qualifying Annex I habitat features of the site.</p> <p>These features may also be important to the operation of the supporting ecological processes on which the designated site and its features may rely. In most cases increasing actual and functional landscape-scale connectivity would be beneficial.</p> <p>Where there is a lack of detailed knowledge of the connectivity requirements of the qualifying feature, Natural England will advise as to whether these are applicable on a case by case basis. Great Manchester Wetlands is undertaking study on ecological network and are using this data to target habitat restoration works across all of the Manchester Mosses and Wigan flashes wetland complex.</p>	landscape and the development of an ecological network can be found at Great Manchester Wetlands (information held by Lancashire Wildlife Trust and Natural England (April 2016)
<b>Supporting processes (on which the feature relies)</b>	Conservation measures	Maintain the management measures within and outside the site boundary which are necessary to restore the structure, functions and supporting processes associated with the H7120 feature to H7110 Active Raised Bog	<p>Active and ongoing conservation management is needed to protect, maintain or restore this feature at this site and to restore it to H7110 Active Raised Bog habitat. Usually, raised bog restoration measures will aim to elevate and stabilise the underlying water table and re-establish waterlogged conditions, so the bog can re-grow and regain its characteristic structural features (e.g. bog pools) and its typical plant assemblages</p> <p>Further details about the necessary conservation measures for this site can be provided by contacting Natural England. This information will typically be found within, where applicable, supporting documents such as Natura 2000 Site Improvement Plan, Site Management Strategies or Plans, the Views about Management Statement for the underpinning SSSI and management agreements.</p>	NATURAL ENGLAND, 2014. ENGLISH NATURE, 2005.
<b>Version Control:</b> not applicable				
<b>Variations from national feature-framework of integrity-guidance:</b> Not applicable				



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<b>County:</b>	Cheshire	<b>Site Name:</b>	<b>Holcroft Moss</b>
<b>District:</b>	Warrington		
<b>Status:</b>	Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act, 1981, as amended.		
<b>Local Planning Authority:</b>	Cheshire County Council Warrington Borough Council		
<b>National Grid Reference:</b>	SJ 685933	<b>Area:</b>	19.13 (ha) 47.27 (ac)
<b>Ordnance Survey Sheet 1:50 000</b>	109	<b>1:10 000</b>	SJ 69 SE
<b>Date Notified (Under 1949 Act):</b>	–	<b>Date of Last Revision:</b>	–
<b>Date Notified (Under 1981 Act):</b>	1991	<b>Date of Last Revision:</b>	–

**Other Information:**

This is a new site.

**Description and Reasons for Notification:**

The meres and mosses of the north-west Midlands forms a nationally important series of open water and peatland sites not represented elsewhere in lowland Britain. They have developed in natural depressions in the glacial drift left by ice sheets as they retreated from the Cheshire–Shropshire plain some 15,000 years ago. The majority lie in Cheshire and north Shropshire, with a small number of outlying sites in adjacent parts of Staffordshire and Clwyd. A series of extensive mosses also occurs to the south-west of Manchester.

Although the majority of the meres are nutrient rich (eutrophic) the water chemistry is very variable reflecting the variable nature of the drift deposits surrounding each site. Associated fringing habitats such as reedswamp, fen, carr and damp pasture add to the value of the meres.

The development of these associated habitats has often resulted in peat accumulation which, in some cases, has led to the complete infilling of the basin. During this process the nutrient status of the peat surface changes, and typically becomes nutrient poor (oligotrophic) and acidic, thus allowing species such as bog mosses *Sphagnum* spp. to colonise it. The resulting peat bogs are the mosses.

Holcroft Moss, situated 9 km north-east of Warrington on the south side of the M62 motorway, lies in the Triassic Plain of Greater Manchester and Cheshire. The moss occupies several small depressions in the Upper Terrace of the Mersey Valley and is an isolated remnant of the once extensive area of mossland formerly associated with this valley. Although historical information suggests that the majority of Holcroft Moss was cut for peat this portion is believed never to have been cut, and is the only known unexploited area of raised bog remaining in Cheshire.

The surface vegetation of the moss is dominated by purple moor-grass *Molinia caerulea* with abundant heather *Calluna vulgaris*, cross-leaved heath *Erica tetralix* and cranberry *Vaccinium oxycoccus*. Wetter hollows support common cottongrass *Eriophorum angustifolium* and deergrass *Trichophorum cespitosum*. Five species of bog moss have been recorded from these hollows, including *Sphagnum papillosum* and *S. tenellum*. The latter is of particular interest because it was formerly considered to be extinct in south Lancashire. Drier areas along the eastern and western margins are dominated by bracken *Pteridium aquilinum*.

A strip of clay spoil associated with the M62 motorway, along the northern edge of the site, has been colonised by willow *Salix* sp. and birch *Betula* sp. An open area of calcareous grassland supports a large stand of spotted-orchid *Dactylorhiza* sp. and fragrant orchid *Gymnadenia conopsea*.

## Views About Management



### **A statement of English Nature's views about the management of Holcroft Moss Site of Special Scientific Interest (SSSI).**

This statement represents English Nature's views about the management of the SSSI for nature conservation. This statement sets out, in principle, our views on how the site's special conservation interest can be conserved and enhanced. English Nature has a duty to notify the owners and occupiers of the SSSI of its views about the management of the land.

Not all of the management principles will be equally appropriate to all parts of the SSSI. Also, there may be other management activities, additional to our current views, which can be beneficial to the conservation and enhancement of the features of interest.

The management views set out below do not constitute consent for any operation. English Nature's written consent is still required before carrying out any operation likely to damage the features of special interest (see your SSSI notification papers for a list of these operations). English Nature welcomes consultation with owners, occupiers and users of the SSSI to ensure that the management of this site conserves and enhances the features of interest, and to ensure that all necessary prior consents are obtained.

## **Management Principles**

### **Lowland raised bog**

Lowland raised bogs are peat forming wetlands. Peat forms where certain plants decompose very slowly under waterlogged conditions. The wet, nutrient-poor growth conditions provided by peat means that lowland raised bogs and their associated habitats support unique communities of specialised plants and animals. A raised bog is so-called because its plants die, consolidate and stack up as peat above the groundwater. The surface is then kept wet by rainwater. It means that plant nutrients are few – except where atmospheric nitrogen is provided by gaseous emissions from combustion of fossil fuels. It becomes very acid in the absence of groundwater, actively increased by Sphagnum mosses. Under natural conditions fens surround the raised bog dome. Lowland raised bogs can also be an important habitat for breeding populations of wading birds. Like all peat-forming wetlands, and provided no peat has been cut away or eroded by natural processes, lowland raised bogs contain a continuous record of their vegetation and local land use that can span several thousand years. However, a large proportion of lowland raised bogs have been damaged where peat has been removed and the wetland environment in which they formed is no longer there.

The aim of management is to re-start the peat-forming process, ideally without going through the fen phases that in most cases preceded acid peat formation in the first instance. Management must restore a high and stable water table in the peat, not falling more than about 10 cm below the surface over the course of the year. This is done in damaged bogs by blocking ditches and repairing baulks left by peat extraction or by creating new ones. The water used must come from rainfall. Cut and drained peatlands are prone to encroachment by trees and scrub, especially birch, and the amount of water lost by them to the atmosphere in summer can seriously dry out the bog surface. Encroaching scrub and trees must be removed, or at least reduced to a few scattered individuals or clumps.

The bog originally grew in equilibrium with the surrounding fen, whether this was a narrow fringe or a more extensive wetland. It is important to consider abandoning the drainage where the fen or part of the original bog is now agricultural land, allowing reversion to fen or at least to grazing marsh. This will help the centre of the bog to grow more peat by reducing the rate at which water drains away from it.

Low intensity sheep grazing can be helpful in checking the growth of saplings, trampling grass tussocks and providing a small proportion of open peat for plant seedlings and invertebrates by hoof erosion and by wallowing. However, the raised bog is a nutrient poor wetland and stock and game bird feeding should not be carried out on the surface of the bog in order to avoid the addition of unwanted plant nutrients. Inclusion of the bog in a larger grazing unit involving more productive pasture may also mean that the bog becomes enriched if dunging occurs there preferentially and this should be avoided.

# Annex B: Six56 Development Assessment of Transport Emissions Impacts on Designated Ecological Sites

(Ref PC3791-RHD-ZZ-XX-RP-Z-0001)

# REPORT

## **Six:56 Development**

Assessment of Transport Emissions Impacts on  
Designated Ecological Sites

Client: Langtree Developments

Reference: PC3791-RHD-ZZ-XX-RP-Z-0001

Status: Final/01

Date: 24 July 2023

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Document title: Six:56 Development

Subtitle: Assessment of Transport Emissions Impacts on Designated Ecological Sites

Reference: PC3791-RHD-ZZ-XX-RP-Z-0001

Your reference

Status: Final/01

Date: 24 July 2023

Project name: Six56 HRA Support

Project number: PC3791

Author(s): IOM, JDD

Drafted by: IOM

Checked by: JDD

Date: 24 July 2023

Approved by: AP

Date: 24 July 2023

Classification

Project related

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Appendix 1 Model outputs for all receptor locations
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## 1 Introduction

A planning application reference 2019/34799 was submitted to Warrington Borough Council by Langtree Property Partners LLP for the development of land to the west of junction 20 of the M6 motorway and junction 9 of the M56 motorway and to the south of Grappenhall Lane and Cliff Lane, Grappenhall, Warrington – known as the Six:56 development. The application was called in by the Secretary of State and a Public Inquiry commenced in May 2023. The Inquiry was adjourned on 12 May 2023, with the Inspector making a request for Further Information under Regulation 25 of the Environmental Impact Assessment (EIA) Regulations 2017 (reference APP/M0655/V/22/3322877, Dated 20 June 2023). The applicant was requested to supply the following information:

*An assessment which considers whether or not there would be an adverse effect on the integrity of Manchester Mosses Special Area of Conservation (SAC) with particular regard to Holcroft Moss. The critical load modelling should consider the cumulative impacts arising from all vehicle movements associated with the development in terms of the levels of nitrogen, ammonia and acid deposition.*

*This should include the current baseline and projected impacts from all schemes that have been granted consent which are likely to have a combined effect on the SAC. Reason: On the basis of a submission by Natural England to the Inquiry on the 11 May 2023, in its opinion an in-combination, likely significant effect (LSE) on the Manchester Mosses SAC cannot be ruled out. The impact pathway relates to the cumulative emissions from the increased traffic movements that would be generated by the proposed development. This could have the potential to affect the following qualifying feature; “degraded raised bogs still capable of natural regeneration” and potentially compromise the delivery of the associated Conservation Objectives.*

This report describes a road traffic emissions dispersion modelling study and provides the details of associated deposition impacts upon the relevant designated site. The potential effects on the habitat are assessed in a separate Shadow Habitats Regulations Assessment (HRA) report (reference TEP Report 9839.07<sup>1</sup>).

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<sup>1</sup> TEP (2023). Six:56 Shadow Habitats Regulations Assessment Report ref 9839.07

## 2 Development and Cumulative Traffic Data

The Six:56 development will provide a logistics and storage and distribution facility which will generate road traffic, primarily HGVs, the impacts of which were assessed in the application and in its supporting Environmental Statement (ES).

The proportion of generated road traffic which would be expected to travel northwards on the M6 was set out in the ES and in the Transportation evidence submitted to the adjourned Inquiry. The proportion of this traffic which would then travel eastwards on the M62 (and return to the Six:56 site), and which would therefore pass the Manchester Mosses SAC (particularly Holcroft Moss), has been estimated by the Transportation specialists within the project team, together with an assessment of baseline flows and those which are estimated to be generated by future developments (reference Curtins Technical Note 083081<sup>2</sup>). These estimates in turn cross-refer to the HRA air quality assessment reports which were undertaken to support the Warrington Borough Council (WBC) Local Plan (Aecom, 2022-2023<sup>3,4,5</sup>).

The traffic data were provided in the form of 24-hour Annual Average Daily Traffic (AADT) data, based on annual National Highways WebTRIS database traffic counts in 2022 (west of Holcroft Lane, adjacent to the SAC) for the base year, and as projected for the Six:56 development. A cumulative assessment considered the traffic growth assumed in the Local Plan air quality assessment, together with the traffic contribution projected to arise as a consequence of the Local Plan. In order to align with the original ES submitted in the Six:56 application, a future opening year of 2029 was assumed (but using 2038 traffic data provided in the HRA, which is a conservative approach). A sensitivity assessment was also undertaken to consider light duty vehicle (LDV) generation from the Six:56 development. Details of the traffic data used in the modelling study are set out in the Technical Note<sup>2</sup>, and are summarised in **Table 1**.

Table 1: Traffic data used in the Six:56 modelling study

Link	Speed	2023 base year		Baseline (2023) + Six:56 HGVs		Growth (incl. WBC Local Plan)		Six:56 HGV + LDV test	
	kph	AADT	%HGV	AADT	%HGV	AADT	%HGV	AADT	%HGV
M62 J11 - J12 westbound	97	54,743	15.8	54,987	16.2	28,677	8.2	378	64.5
M62 J11 - J12 eastbound	103	55,423	16.2	55,667	16.6	27,997	7.3	378	64.5

<sup>2</sup> Curtins (2023) Six:56 Traffic Note on HRA ref 083081

<sup>3</sup> Air Quality Assessment for Warrington Local Plan Habitats Regulations Assessment, Updated Modelling of Manchester Mosses SAC. Aecom, April 2022

<sup>4</sup> Updated Air Quality Assessment for Warrington Local Plan Habitats Regulations Assessment, Further Modelling of Manchester Mosses SAC. Aecom, November 2022

<sup>5</sup> Warrington Borough Council Local Plan Main Modifications, Updated Habitat Regulations Assessment. Aecom, March 2023.

### 3 Methodology

#### 3.1 Critical Levels and Critical Loads

Whilst Critical Levels apply regardless of habitat type, Critical Loads for habitat sites in the UK are habitat-specific and are published on the Air Pollution Information System (APIS) website<sup>6</sup>. These are the maximum levels of nutrient nitrogen and acid deposition that can be tolerated without harm to the most sensitive features of these habitat sites.

The Critical Levels and Critical Loads of relevance to the assessment are detailed in **Table 2** and **Table 3**.

Table 2: Critical Levels

Pollutant	Critical Level	
	Concentration	Measured as
Oxides of Nitrogen (NO <sub>x</sub> )	30 µg.m <sup>-3</sup>	Annual Mean
Ammonia (NH <sub>3</sub> )	3 µg.m <sup>-3</sup> *	Annual Mean
*Critical Level is 1 µg.m <sup>-3</sup> if certain lichen/bryophyte species are present		

Table 3: Critical Loads

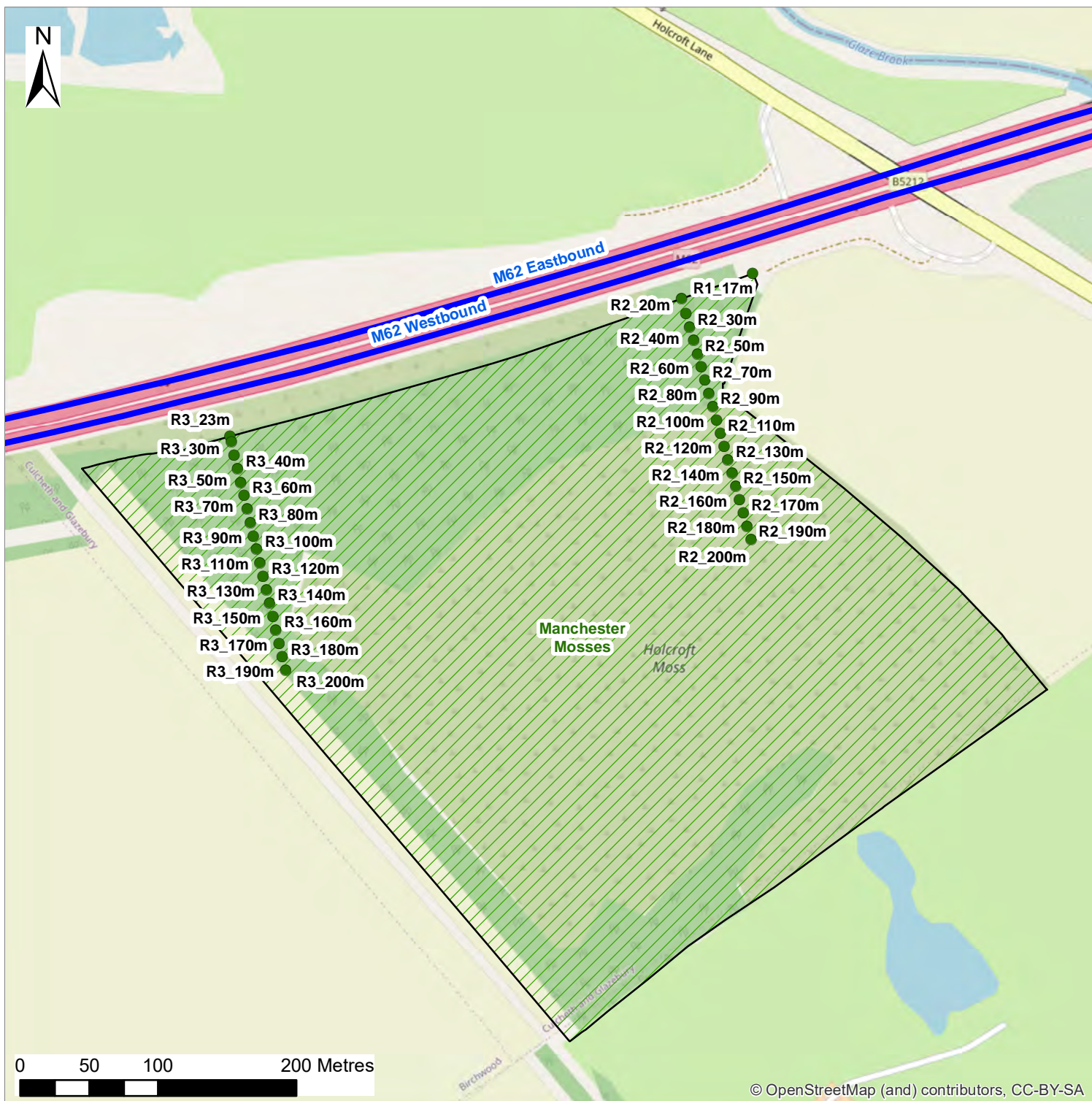
Site	Nutrient Nitrogen (N-Dep) Critical Load (kgN.ha <sup>-1</sup> .yr <sup>-1</sup> )		Acidity (Acid-Dep) Critical Load (keq.ha <sup>-1</sup> .yr <sup>-1</sup> )					
			Minimum			Maximum		
	Min	Max	CLminN	CLmaxN	CLmaxS	CLminN	CLmaxN	CLmaxS
Manchester Mosses SAC	5	10	0.321	0.564	0.243	0.321	0.58	0.259

#### 3.2 Dispersion Model

The Atmospheric Dispersion Modelling System for Roads (ADMS-Roads) v5.0.1.3 was used to assess the dispersion of road traffic emissions and the associated potential impact upon the Manchester Mosses SAC, specifically Holcroft Moss.




The model setup aligned with the WBC HRA air quality assessment reports<sup>3,4,5</sup>, for example in using the same meteorological dispersion dataset (see **Section 3.3**) and in considering a series of receptor locations along two transects perpendicular to the M62, across the designated site. Other alignments between this report and the WBC HRA air quality reports are identified in **Sections 3.4** and **3.5**. Locations along these transects were included in the model at 10 m intervals from the edge of the M62 up to 200 m, as depicted in **Figure 1**. Beyond 200 m of the road edge, impacts are considered to be insignificant as sufficient dilution and dispersion of pollutants will occur across this distance to minimise effects.

<sup>6</sup> UK Centre for Ecology and Hydrology (CEH) (2023). APIS. Available at: <https://www.apis.ac.uk/app>



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## Key:

-  Manchester Mosses SAC
-  Ecological Receptors
-  ADMS Road Source

## Title

Modelled Ecological Receptors at  
10m Transects Across the SAC

## Project

PC3791

## Client

Langtree Property LLP

## Datum

29/06/2023

## Schaal

1:4000

## Figure

Figure 1

## Checked by

JD

## Number

1



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### 3.3 Meteorological Data

Hourly sequential meteorological data from the Rostherne recording station for 2018 were used in the ADMS-Roads model. This is the closest and most representative recording station to the study area and was the dataset used in WBC's HRA air quality assessment reports. The annual wind rose plot for 2018 data is displayed in **Figure 2**.

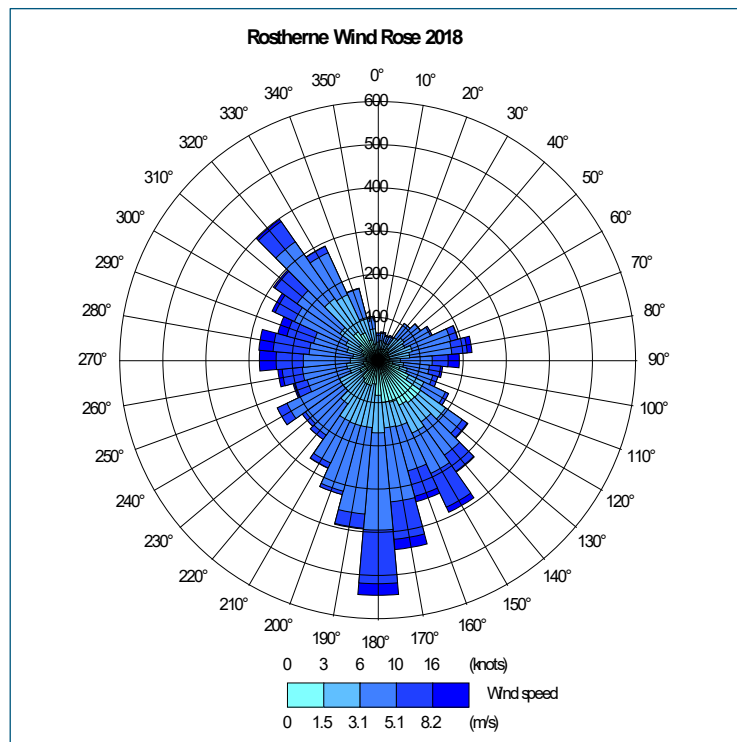


Figure 2 Rostherne Annual Wind Rose 2018

### 3.4 Model Inputs and Post-Processing

#### 3.4.1 Model Inputs

NO<sub>x</sub> emission factors were obtained from the Emission Factors Toolkit v11.0<sup>7</sup> provided by Defra (the emission factors applied were 2023 for the baseline and 2029 for future year). Vehicles are also a source of ammonia, which can impact upon designated ecological sites. Defra's Emission Factors Toolkit does not provide vehicle emission factors for ammonia; as such, to enable a quantification of the impact of ammonia from road traffic, the Air Quality Consultants tool 'CREAM V1A'<sup>8</sup> was used to provide ammonia emission factors for consideration of ecological impacts (Air Quality Consultants, 2020b). The Emission Factors Toolkit v11.0 and CREAM V1A were used in WBC's HRA air quality assessment reports.

The M62 east and west bound carriageways were modelled as separate emission line sources. As per the WBC HRA air quality assessment reports, a flat terrain was assumed, with surface roughness set at 0.3 m and minimum Monin-Obukhov length for stable conditions at 10 m.

<sup>7</sup> Defra (2021) Emission Factors Toolkit, EFT v11.0 (released November 2021)

<sup>8</sup> Air Quality Consultants (2020b) Calculator for Road Emissions of Ammonia (CREAM) v1A 14/02/2020

### 3.4.2 Model Post-Processing

As identified in the WBC HRA air quality assessment<sup>3</sup>, there are no local air quality monitoring stations within the study area that are suitable for model verification; therefore, adjustment factors of 1.5 for NO<sub>x</sub> and 1.0 for NH<sub>3</sub> have been applied to model results, as per the WBC air quality assessments. It should be noted that *"these adjustment factors are likely to be conservative as lower adjustment factors are generally required near motorways due to the increase dispersion that occurs near wide open roads with fast moving traffic compared with urban roads"*, as stated in the WBC air quality assessment.

NO<sub>x</sub> concentrations were predicted using the ADMS-Roads model. The modelled road contribution of NO<sub>x</sub> at the identified receptor locations was converted to nitrogen dioxide (NO<sub>2</sub>) using the NO<sub>x</sub> to NO<sub>2</sub> calculator v8.1<sup>9</sup>, in accordance with Defra guidance<sup>10</sup>.

Deposition of nitrogen from road traffic derived NO<sub>2</sub> and NH<sub>3</sub> were estimated as per the WBC HRA air quality assessments approach, taken from the Air Quality Technical Advisory Group (AQTAG) 06 guidance<sup>11</sup>, as shown in **Table 4**. All modelled receptor locations have been modelled and analysed as heathland/grassland, as appropriate for the habitat designation of raised/blanket bog.

Table 4: Recommended dry deposition velocities and flux conversion factors (AQTAG06)

	NO <sub>2</sub>	NH <sub>3</sub>
<b>Recommended dry deposition velocities</b>		
Deposition velocity – grassland (m.s <sup>-1</sup> )	0.0015	0.020
<b>Dry deposition flux conversion factors</b>		
Conversion to nitrogen deposition (from µg.m <sup>-2</sup> .s <sup>-1</sup> of species to kgN.ha <sup>-1</sup> .yr <sup>-1</sup> )	95.9	260
Conversion to acid deposition (from µg.m <sup>-2</sup> .s <sup>-1</sup> of species to keq.ha <sup>-1</sup> .yr <sup>-1</sup> )	6.84	18.5

## 3.5 Background Concentrations

Background air pollutant concentrations of NO<sub>x</sub> and NO<sub>2</sub> were obtained from the LAQM support tools provided by Defra<sup>12</sup> for the 1 km x 1 km grid square (368500, 393500) covering the SAC for the base year (2023) and future year (2029) scenarios.

APIS was used to provide background NH<sub>3</sub> and nutrient nitrogen and acid deposition concentrations for the 1 km x 1 km grid square covering the SAC. APIS data are provided as three-year averages and are not factored forward. The WBC HRA air quality assessments used data available for the year range 2017-2019; however, the latest available year range is 2019-2021 and these were used in this assessment. The background concentrations used in this assessment are shown in **Table 5**.

<sup>9</sup> Defra (2020). NO<sub>x</sub> to NO<sub>2</sub> Calculator, Version 8.1

<sup>10</sup> Defra (2022). Local Air Quality Management Technical Guidance (TG22). August 2022

<sup>11</sup> AQTAG06 Technical guidance on detailed modelling approach for an appropriate assessment for emissions to air, March 2014

<sup>12</sup> Defra (2020). Background Mapping data for local authorities 2018



Table 5: Predicted annual mean background concentrations used in the assessment

Year	NO <sub>x</sub>	NO <sub>2</sub>	NH <sub>3</sub>	Nitrogen Deposition	Acid Deposition
	µg.m <sup>-3</sup>	µg.m <sup>-3</sup>	µg.m <sup>-3</sup>	kgN.ha <sup>-1</sup> .yr <sup>-1</sup>	keq.ha <sup>-1</sup> .yr <sup>-1</sup>
2023	21.0	15.4	2.1	19.7*	1.6
2029	15.7	11.8			

\*The WBC HRA air quality assessments consider the Nitrogen Futures<sup>13</sup> study forecasted minimum rate of background nitrogen deposition improvement of 0.07 kgN.ha<sup>-1</sup>.yr<sup>-1</sup> (at Ashdown Forest, with other areas predicting greater reduction rates). This assessment has considered no reduction in future nitrogen deposition, however using the approach used in the WBC HRA air quality assessments, the reduction in nitrogen deposition at the SAC from 2019-2021 (2020) to 2029 (i.e. nine years) equates to 0.63 kgN.ha<sup>-1</sup>.yr<sup>-1</sup> and a nitrogen deposition background of 19.07 kgN.ha<sup>-1</sup>.yr<sup>-1</sup>.

### 3.6 Assessment Criteria

A 1% change in the Critical Load or Level is regarded as a threshold of insignificance. A change of this magnitude is likely to be within the natural range of fluctuations in deposition and is unlikely to be perceptible. Equally, this is not a threshold of harm and exceeding this threshold does not, of itself, imply damage to a habitat<sup>14</sup>.

However, consideration should be given to impacts associated with a project or plan both in isolation, and in addition to other plans or projects which may affect the same designated site (an 'in-combination' assessment). The outcome of recent court judgements (notably the Wealden Judgement, 2017) has led to the requirement for the 1% criterion to be applied to the in-combination impact to determine whether impacts remain insignificant, or whether further ecological investigation is required.

This assessment considered the impacts of the traffic generated by the proposed Six:56 development in isolation, in addition to the in-combination effect of background traffic growth and the predicted impacts of the WBC Local Plan (although the Local Plan projections included a component of the Six:56 development and so the assessment was conservative in this respect, as explained in the Curtins Technical Note<sup>2</sup>).

<sup>13</sup> Dragosits, U., Carnell, E.J., Tomlinson, S.J., Misselbrook, T.H., Rowe, E.C., Mitchell, Z., Thomas, I.N., Dore, A.J., Levy, P., Zwagerman, T., Jones, L., Dore, C., Hampshire, K., Raoult, J., German, R., Pridmore, A., Williamson, T., Marner, B., Hodgins, L., Laxen, D., Wilkins, K., Stevens, C., Zappala, S., Field, C. & Caporn, S.J.M. 2020. Nitrogen Futures. JNCC Report No. 665, JNCC, Peterborough, ISSN 0963-8091. Available at: <https://hub.jncc.gov.uk/assets/04f4896c-7391-47c3-ba02-8278925a99c5>

<sup>14</sup> Institute of Air Quality Management (2020) A guide to the assessment of air quality impacts on designated nature conservation sites, May 2020 v1.1

## 4 Modelling Results

In alignment with the WBC HRA air quality assessment reports, the summary impacts are reported at the nearest area of sensitive bog within the SAC, which is 90 m from the M62, for both transects (R2\_90m and R3\_90m). The impacts of road traffic exhaust emissions on sensitive ecological sites diminishes with distance from the road source, and so the reported summary results at this point are considered to be the worst-case; the predicted concentrations at all receptor points are set out in **Appendix 1**.

In the result tables below, 'PC' refers to the 'Process Contribution', that is, the impact of solely the Six:56 development HGV traffic; 'PEC' is the 'Predicted Environmental Concentration', which is the HGV PC plus the background concentration. The 2029 in-combination PEC includes the (1) Six:56 development HGV traffic PC, (2) future baseline traffic, (3) contribution of background traffic growth from 2023 to 2029 (as discussed in **Section 2**, this is actually the traffic growth from the base year to 2038 traffic data provided in the HRA, which is a conservative approach to assume this would occur by 2029), and (4) the WBC Local Plan traffic projection.

### 4.1 Critical Level – NO<sub>x</sub> and NH<sub>3</sub>

Table 6: NO<sub>x</sub> Concentration 2023

Receptor	Background NO <sub>x</sub>	Six:56 PC	PC/CL	Six:56 PEC	PEC/CL
	µg/m <sup>3</sup>	µg/m <sup>3</sup>	%	µg/m <sup>3</sup>	%
R2_90	21.0	0.03	0.1%	28.33	94%
R3_90	21.0	0.02	0.1%	28.27	94%

Table 7: NO<sub>x</sub> Concentration 2029

Receptor	Background NO <sub>x</sub>	Six:56 PC	PC/CL	Six:56 PEC	PEC/CL
	µg/m <sup>3</sup>	µg/m <sup>3</sup>	%	µg/m <sup>3</sup>	%
R2_90	15.7	0.01	0.0%	21.32	71%
R3_90	15.7	0.01	0.0%	21.26	71%

Table 8: NH<sub>3</sub> Concentration 2023

Receptor	Background NH <sub>3</sub>	Six:56 PC	PC/CL (lower)*	Six:56 PEC	PEC/CL (lower)**
	µg/m <sup>3</sup>	µg/m <sup>3</sup>	%	µg/m <sup>3</sup>	%
R2_90	2.1	0.01	0.9%	2.74	274%
R3_90	2.1	0.01	0.9%	2.74	274%
*0.3% of the upper Critical Level					
**91% of the upper Critical Level					

Table 9: NH<sub>3</sub> Concentration 2029

Receptor	Background NH <sub>3</sub>	Six:56 PC	PC/CL (lower)*	Six:56 PEC	PEC/CL (lower)**
	µg/m <sup>3</sup>	µg/m <sup>3</sup>	%	µg/m <sup>3</sup>	%
R2_90	2.1	0.01	0.9%	3.09	309%
R3_90	2.1	0.01	0.9%	3.08	308%
*0.3% of upper Critical Level					
**103% of the upper Critical Level					

The HGV traffic generated by the Six:56 development would give rise to less than 1% of the NO<sub>x</sub> and NH<sub>3</sub> Critical Levels, in 2023 and in 2029. The values in **Table 8** and **Table 9** show that the existing background NH<sub>3</sub> concentration is above the lower Critical Level (1 kgN.ha<sup>-1</sup>.yr<sup>-1</sup>).

## 4.2 Critical Load – Nitrogen and Acid Deposition

Table 10: Nitrogen Deposition 2023

Receptor	Background N-Dep	Six:56 Total PC	PC/CL (lower)	PC/CL (upper)	Six:56 Total PEC	PEC/CL (lower)	PEC/CL (upper)
	kg N/ha/yr	kg N/ha/yr	%	%	kg N/ha/yr	%	%
R2_90	19.7	0.050	1.01%	0.5%	23.6	472%	236%
R3_90	19.7	0.048	0.97%	0.5%	23.6	471%	236%

Table 11: Nitrogen Deposition 2029

Receptor	Background N-Dep	Six:56 Total PC	PC/CL (lower)	PC/CL (upper)	Six:56 Total PEC	PEC/CL (lower)	PEC/CL (upper)
	kg N/ha/yr	kg N/ha/yr	%	%	kg N/ha/yr	%	%
R2_90	19.7	0.049	0.98%	0.5%	25.3	506%	253%
R3_90	19.7	0.049	0.97%	0.5%	25.2	505%	252%

The HGV traffic generated by the Six:56 development would give rise to equal to or marginally less than 1% of the lower, more stringent Critical Load for nitrogen deposition, in 2023 and in 2029, and to less than 1% of the upper Critical Load. The values in **Table 10** and **Table 11** show that the existing background nitrogen deposition values are above the Critical Load (5 to 10 kgN.ha<sup>-1</sup>.yr<sup>-1</sup>) in 2023 and remain so in 2029 (even if the Nitrogen Futures study reduction rate is applied to 2029 nitrogen deposition background, see **Table 5**).

**Figure 3** shows the contour plot of nitrogen deposition across the Manchester Mosses SAC as a result of HGV traffic generated by the Six:56 development in 2029. As can be seen from the figure, pollutant concentrations and deposition reduced rapidly with distance from the edge of the M62.

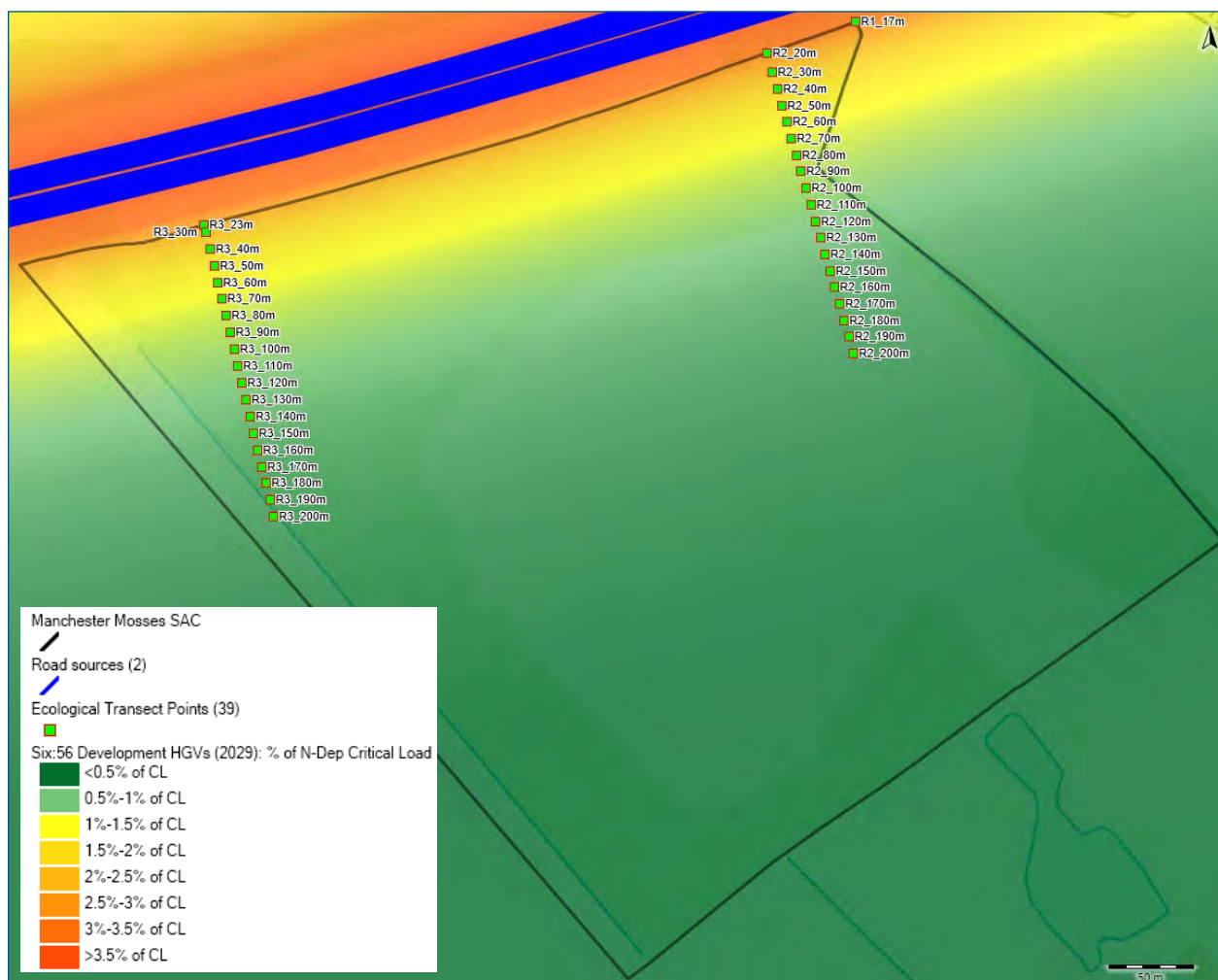


Figure 3 Contour plot of nitrogen deposition across the Manchester Mosses SAC as a result of Six:56 Development generated HGV traffic (in 2029)

Table 12: Acid Deposition 2023

Receptor	Background Acid-Dep	Six:56 Total PC	PC/CL (lower)	PC/CL (upper)	Six:56 Total PEC	PEC/CL (lower)	PEC/CL (upper)
	keq/ha/yr	keq/ha/yr	%	%	keq/ha/yr	%	%
R2_90	1.6	0.004	0.6%	0.6%	1.88	333%	324%
R3_90	1.6	0.003	0.6%	0.6%	1.87	332%	323%

Table 13: Acid Deposition 2029

Receptor	Background Acid-Dep	Six:56 Total PC	PC/CL (lower)	PC/CL (upper)	Six:56 Total PEC	PEC/CL (lower)	PEC/CL (upper)
	keq/ha/yr	keq/ha/yr	%	%	keq/ha/yr	%	%
R2_90	1.6	0.003	0.6%	0.6%	2.00	354%	344%
R3_90	1.6	0.003	0.6%	0.6%	1.99	354%	344%

The HGV traffic generated by the Six:56 development would give rise to less than 1% of the lower, more stringent Critical Load for acid deposition in 2023 and in 2029, and to less than 1% of the upper Critical Load. The values in **Table 12** and **Table 13** show that the existing background acid deposition values are above the Critical Load in 2023 and 2029.

Overall, given the conservative approach adopted in the assessment, it is concluded that HGV traffic generated by the Six:56 development would not give rise to a significant impact of greater than 1% of any Critical Level or Critical Load value. The summary results set out the projected values at the worst-case receptor locations, in closest proximity to the M62 motorway, and pollutant concentrations and deposition beyond the 90 m point will be reduced. The Six:56 development HGV traffic, added to future growth as well and WBC Local Plan traffic projections, in combination with the existing and projected baseline values, show that the ammonia Critical Level and the nitrogen and acid deposition Critical Load values are exceeded, but this is the case in the existing situation.

### 4.3 LDV Sensitivity Test

The Curtins Technical Note<sup>2</sup> sets out a robust projection of potential LDV movements associated with the Six:56 development, and model sensitivity test runs were also undertaken to assess the likely impacts of combined HGV and LDV vehicles which might travel on the M62 past the SAC and Holcroft Moss.

**Table 14** to **Table 17** below set out a summary of the consideration of impacts of combined HGV and potential LDV traffic which may be generated from the Six:56 development.

Table 14: NO<sub>x</sub> from Six:56 HGV + LDV in 2023 and 2029

Receptor	Background NO <sub>x</sub>	Six:56 PC HGV	Six:56 PC HGV + LDV	HGV PC/CL	HGV+ LDV PC/CL
	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	%	%
<b>2023</b>					
R2_90	21.0	0.025	0.044	0.1%	0.1%
R3_90	21.0	0.025	0.043	0.1%	0.1%
<b>2029</b>					
R2_90	15.7	0.014	0.023	0.0%	0.1%
R3_90	15.7	0.014	0.023	0.0%	0.1%

Table 15: NH<sub>3</sub> from Six:56 Development HGV + LDV in 2023 and 2029

Receptor	Background NH <sub>3</sub>	Six:56 PC HGV	Six:56 PC HGV + LDV	HGV PC/CL (lower)	HGV+ LDV PC/CL (lower)*
	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	%	%
<b>2023</b>					
R2_90	2.1	0.009	0.010	0.9%	1.0%
R3_90	2.1	0.009	0.010	0.9%	1.0%
<b>2029</b>					
R2_90	2.1	0.009	0.010	0.9%	1.0%
R3_90	2.1	0.009	0.010	0.9%	1.0%
* 0.3% of the upper Critical Level					

Table 16: Nitrogen Deposition from Six:56 Development HGV + LDV in 2023 and 2029

Receptor	Background N-Dep	Six:56 Total HGV PC	HGV PC/CL (lower)	HGV PC/CL (upper)	Six:56 Total HGV + LDV PC	HGV + LDV PC/CL (lower)	HGV + LDV PEC/CL (upper)
	kg N/ha/yr	kg N/ha/yr	%	%	kg N/ha/yr	%	%
<b>2023</b>							
R2_90	19.7	0.050	1.0%	0.5%	0.057	1.1%	0.6%
R3_90	19.7	0.048	1.0%	0.5%	0.055	1.1%	0.5%
<b>2029</b>							
R2_90	19.7	0.049	1.0%	0.5%	0.054	1.1%	0.5%
R3_90	19.7	0.049	1.0%	0.5%	0.054	1.1%	0.5%

Table 17: Acid Deposition from Six:56 Development HGV + LDV in 2023 and 2029

Receptor	Background Acid-Dep	Six:56 Total HGV PC	HGV PC/CL (lower)	HGV PC/CL (upper)	Six:56 Total HGV + LDV PC	HGV + LDV PC/CL (lower)	HGV + LDV PEC/CL (upper)
	keq/ha/yr	keq/ha/yr	%	%	keq/ha/yr	%	%
<b>2023</b>							
R2_90	1.6	0.004	0.6%	0.6%	0.004	0.7%	0.7%
R3_90	1.6	0.003	0.6%	0.6%	0.004	0.7%	0.7%
<b>2029</b>							
R2_90	1.6	0.003	0.6%	0.6%	0.004	0.7%	0.7%
R3_90	1.6	0.003	0.6%	0.6%	0.004	0.7%	0.7%

**Table 14 to Table 17** show that a conservative estimate of LDVs, when added to the HGV traffic associated with the Six:56 development, would not give rise to any significant impact on the closest receptor positions within the SAC and Holcroft Moss. Impacts remain at or below 1% of the NO<sub>x</sub> and ammonia Critical Levels and acid deposition Critical Loads. There is a very marginal increase in nitrogen deposition which remains around 1% of the lower, more stringent Critical Load value, and below the upper Critical Load value. As set out in the Curtins Technical Note<sup>2</sup>, this assessment is more conservative than the total (HGV + LDV) Six:56 development traffic allocation assumed in the WBC HRA air quality assessments.

## Appendix 1 Model outputs for all receptor locations

Receptor ID	NOx					NH <sub>3</sub>				
	2023 Baseline	2029 Future Baseline	2029 Future Baseline + Growth	2029 Future Baseline + Growth + Six: 56 HGVs	2030 Future Baseline + Growth + Six: 56 HGVs and LGVs	2023 Baseline	2029 Future Baseline	2029 Future Baseline + Growth	2029 Future Baseline + Growth + Six: 56 HGVs	2030 Future Baseline + Growth + Six: 56 HGVs and LGVs
R1_17m	45.8	28.2	34.8	34.8	34.9	4.3	4.5	5.5	5.5	5.5
R2_20m	44.0	27.4	33.4	33.5	33.5	4.1	4.3	5.2	5.2	5.3
R2_30m	38.1	24.3	28.8	28.9	28.9	3.6	3.7	4.4	4.4	4.4
R2_40m	35.0	22.8	26.4	26.5	26.5	3.3	3.4	4.0	4.0	4.0
R2_50m	32.8	21.7	24.8	24.8	24.8	3.1	3.2	3.7	3.7	3.7
R2_60m	31.3	20.9	23.6	23.6	23.6	3.0	3.1	3.5	3.5	3.5
R2_70m	30.0	20.3	22.6	22.7	22.7	2.9	3.0	3.3	3.3	3.3
R2_80m	29.1	19.8	21.9	21.9	21.9	2.8	2.9	3.2	3.2	3.2
R2_90m	28.3	19.4	21.3	21.3	21.3	2.7	2.8	3.1	3.1	3.1
R2_100m	27.7	19.0	20.8	20.8	20.8	2.7	2.7	3.0	3.0	3.0
R2_110m	27.1	18.8	20.4	20.4	20.4	2.6	2.7	2.9	2.9	2.9
R2_120m	26.7	18.5	20.0	20.0	20.0	2.6	2.6	2.9	2.9	2.9
R2_130m	26.3	18.3	19.7	19.7	19.7	2.6	2.6	2.8	2.8	2.8
R2_140m	25.9	18.2	19.5	19.5	19.5	2.5	2.6	2.8	2.8	2.8
R2_150m	25.6	18.0	19.2	19.2	19.2	2.5	2.5	2.7	2.7	2.7
R2_160m	25.3	17.9	19.0	19.0	19.0	2.5	2.5	2.7	2.7	2.7
R2_170m	25.1	17.7	18.8	18.8	18.8	2.5	2.5	2.6	2.7	2.7
R2_180m	24.9	17.6	18.6	18.7	18.7	2.4	2.5	2.6	2.6	2.6
R2_190m	24.7	17.5	18.5	18.5	18.5	2.4	2.4	2.6	2.6	2.6
R2_200m	24.5	17.4	18.4	18.4	18.4	2.4	2.4	2.6	2.6	2.6
R3_23m	39.7	25.2	30.1	30.1	30.2	3.7	3.9	4.6	4.7	4.7
R3_30m	37.9	24.3	28.7	28.8	28.8	3.6	3.7	4.4	4.4	4.4
R3_40m	34.9	22.7	26.4	26.4	26.4	3.3	3.4	4.0	4.0	4.0
R3_50m	32.7	21.6	24.7	24.7	24.7	3.1	3.2	3.7	3.7	3.7
R3_60m	31.2	20.8	23.5	23.5	23.5	3.0	3.1	3.5	3.5	3.5
R3_70m	30.0	20.2	22.6	22.6	22.6	2.9	3.0	3.3	3.3	3.3
R3_80m	29.0	19.7	21.8	21.9	21.9	2.8	2.9	3.2	3.2	3.2
R3_90m	28.2	19.3	21.3	21.3	21.3	2.7	2.8	3.1	3.1	3.1
R3_100m	27.6	19.0	20.8	20.8	20.8	2.7	2.7	3.0	3.0	3.0
R3_110m	27.1	18.7	20.3	20.4	20.4	2.6	2.7	2.9	2.9	2.9
R3_120m	26.6	18.5	20.0	20.0	20.0	2.6	2.6	2.9	2.9	2.9
R3_130m	26.2	18.3	19.7	19.7	19.7	2.5	2.6	2.8	2.8	2.8
R3_140m	25.9	18.1	19.4	19.4	19.4	2.5	2.6	2.8	2.8	2.8
R3_150m	25.5	18.0	19.2	19.2	19.2	2.5	2.5	2.7	2.7	2.7
R3_160m	25.3	17.8	19.0	19.0	19.0	2.5	2.5	2.7	2.7	2.7
R3_170m	25.0	17.7	18.8	18.8	18.8	2.4	2.5	2.6	2.6	2.6
R3_180m	24.8	17.6	18.6	18.6	18.6	2.4	2.5	2.6	2.6	2.6
R3_190m	24.6	17.5	18.5	18.5	18.5	2.4	2.4	2.6	2.6	2.6
R3_200m	24.4	17.4	18.3	18.3	18.3	2.4	2.4	2.6	2.6	2.6



Receptor ID	Nitrogen deposition					Acid deposition				
	2023 Baseline	2029 Future Baseline	2029 Future Baseline + Growth	2029 Future Baseline + Growth + Six: 56 HGVs	2030 Future Baseline + Growth + Six: 56 HGVs and LGVs	2023 Baseline	2029 Future Baseline	2029 Future Baseline + Growth	2029 Future Baseline + Growth + Six: 56 HGVs	2030 Future Baseline + Growth + Six: 56 HGVs and LGVs
R1_17m	32.7	33.0	38.6	38.8	38.8	2.5	2.5	2.9	3.0	3.0
R2_20m	31.8	32.0	37.3	37.4	37.4	2.5	2.5	2.9	2.9	2.9
R2_30m	28.7	28.8	32.7	32.8	32.8	2.2	2.2	2.5	2.5	2.5
R2_40m	27.1	27.2	30.3	30.4	30.4	2.1	2.1	2.4	2.4	2.4
R2_50m	25.9	26.0	28.7	28.8	28.8	2.0	2.0	2.2	2.2	2.2
R2_60m	25.1	25.2	27.5	27.6	27.6	2.0	2.0	2.2	2.2	2.2
R2_70m	24.5	24.5	26.6	26.6	26.6	1.9	1.9	2.1	2.1	2.1
R2_80m	24.0	24.0	25.8	25.9	25.9	1.9	1.9	2.0	2.0	2.0
R2_90m	23.5	23.6	25.2	25.3	25.3	1.9	1.9	2.0	2.0	2.0
R2_100m	23.2	23.3	24.8	24.8	24.8	1.8	1.9	2.0	2.0	2.0
R2_110m	22.9	23.0	24.3	24.4	24.4	1.8	1.8	1.9	1.9	1.9
R2_120m	22.7	22.7	24.0	24.0	24.0	1.8	1.8	1.9	1.9	1.9
R2_130m	22.5	22.5	23.7	23.7	23.7	1.8	1.8	1.9	1.9	1.9
R2_140m	22.3	22.3	23.4	23.5	23.5	1.8	1.8	1.9	1.9	1.9
R2_150m	22.1	22.2	23.2	23.2	23.2	1.8	1.8	1.8	1.9	1.9
R2_160m	22.0	22.0	23.0	23.0	23.0	1.8	1.8	1.8	1.8	1.8
R2_170m	21.9	21.9	22.8	22.8	22.8	1.8	1.8	1.8	1.8	1.8
R2_180m	21.7	21.8	22.6	22.7	22.7	1.7	1.7	1.8	1.8	1.8
R2_190m	21.6	21.7	22.5	22.5	22.5	1.7	1.7	1.8	1.8	1.8
R2_200m	21.5	21.6	22.3	22.4	22.4	1.7	1.7	1.8	1.8	1.8
R3_23m	29.5	29.7	34.0	34.1	34.1	2.3	2.3	2.6	2.6	2.6
R3_30m	28.6	28.8	32.6	32.7	32.7	2.2	2.2	2.5	2.5	2.5
R3_40m	27.0	27.1	30.2	30.3	30.3	2.1	2.1	2.3	2.4	2.4
R3_50m	25.9	26.0	28.6	28.7	28.7	2.0	2.0	2.2	2.2	2.2
R3_60m	25.0	25.1	27.4	27.5	27.5	2.0	2.0	2.1	2.2	2.2
R3_70m	24.4	24.5	26.5	26.6	26.6	1.9	1.9	2.1	2.1	2.1
R3_80m	23.9	24.0	25.8	25.8	25.8	1.9	1.9	2.0	2.0	2.0
R3_90m	23.5	23.6	25.2	25.2	25.2	1.9	1.9	2.0	2.0	2.0
R3_100m	23.2	23.2	24.7	24.8	24.8	1.8	1.9	2.0	2.0	2.0
R3_110m	22.9	22.9	24.3	24.3	24.3	1.8	1.8	1.9	1.9	1.9
R3_120m	22.6	22.7	23.9	24.0	24.0	1.8	1.8	1.9	1.9	1.9
R3_130m	22.4	22.5	23.6	23.7	23.7	1.8	1.8	1.9	1.9	1.9
R3_140m	22.3	22.3	23.4	23.4	23.4	1.8	1.8	1.9	1.9	1.9
R3_150m	22.1	22.1	23.2	23.2	23.2	1.8	1.8	1.8	1.8	1.8
R3_160m	22.0	22.0	22.9	23.0	23.0	1.8	1.8	1.8	1.8	1.8
R3_170m	21.8	21.9	22.8	22.8	22.8	1.8	1.8	1.8	1.8	1.8
R3_180m	21.7	21.7	22.6	22.6	22.6	1.7	1.7	1.8	1.8	1.8
R3_190m	21.6	21.6	22.4	22.5	22.5	1.7	1.7	1.8	1.8	1.8
R3_200m	21.5	21.5	22.3	22.3	22.3	1.7	1.7	1.8	1.8	1.8

# Annex C: Six56 Habitat Regulations Assessment Air Quality Traffic Flows

(Ref Curtins Project Number 083081)

Curtins Project Number: 083081

07 July 2023

## Six:56 – Habitat Regulations Assessment Air Quality Traffic Flows

### 1.0 Introduction

Curtins has been instructed to provide traffic and transport advice in relation to an Outline Planning Application (2019/34799) for a site known as Six:56, Warrington. The Proposed Development comprises:

*'Construction of up to 287,909m<sup>2</sup> (3,099,025ft<sup>2</sup>) gross internal employment floorspace (Use Class B8 and B1(a) offices) including change of use of Bradley Hall Farmhouse to B1(a) office use (335m<sup>2</sup> (3,600ft<sup>2</sup>)) and associated servicing and infrastructure including car parking and vehicle and pedestrian circulation, alteration of existing access road into site including works to the M6 J20 dumbbell roundabouts and realignment of the existing A50 junction, noise mitigation, earthworks to create development platforms and bunds, landscaping including buffers, creation of drainage features, electrical substation, pumping station, and ecological works.'*

Following determination by Warrington Borough Council (WBC) on the 10<sup>th</sup> March 2022, the Application was referred to the Secretary of State and was called in for his determination on the 22<sup>nd</sup> November 2022.

A Public Inquiry started on the 9<sup>th</sup> May 2023, but this was adjourned on Friday 12<sup>th</sup> May to enable further assessment on whether or not there would be an adverse effect on the integrity of Manchester Mosses Special Area of Conservation (SAC) with particular regard to Holcroft Moss.

In subsequent correspondence dated the 20<sup>th</sup> June 2023 the Inspector requested:

*'An assessment which considers whether or not there would be an adverse effect on the integrity of Manchester Mosses Special Area of Conservation (SAC) with particular regard to Holcroft Moss. The critical load modelling should consider the cumulative impacts arising from all vehicle movements associated with the development in terms of the levels of nitrogen, ammonia and acid deposition. This should include the current baseline and projected impacts from all schemes that have been granted consent which are likely to have a combined effect on the SAC. Reason: On the basis of a submission by Natural England to the Inquiry on the 11 May 2023, in its opinion an in-combination, likely significant effect (LSE) on the Manchester Mosses SAC cannot be ruled out. The impact pathway relates to the cumulative emissions from the increased traffic movements that would be generated by the proposed development. This could have the potential to affect the following qualifying feature; "degraded raised bogs still capable of natural regeneration" and potentially compromise the delivery of the associated Conservation Objectives.'*

### 2.0 Availability of Traffic Data

The Holcroft Moss site is located approximately 700m to the east of the M62 Junction 11. This is approximately 8.5 miles away from the Six:56 site in terms of actual distance travelled and circa 5.5 miles as the crow flies.

Given the distances involved and the widespread traffic distribution options, the Six:56 Transport Assessment (TA) did not provide traffic forecasts for the area surrounding the Holcroft Moss site and particularly on the M62. This is applicable to both baseline traffic on the M62 and development traffic on the M62.

The Transport Assessment did consider traffic flows on the M6 to the north of the Six:56 site and traffic data was provided to the air quality consultant for the M6 link.

This data is set out in the RPS Air Quality ES chapter at Appendix 8.3 (page 76), Tables 8.3.1 and 8.3.2, Link 28.

The data suggests that the Six:56 proposals could generate a daily two-way vehicle flow expressed as an Annual Average Daily Traffic (AADT) figure, of 6,223.

The traffic forecasting methodology for the Six:56 site, which informs the above figure, has been reviewed in detail by WBC Highways, National Highways and their consultants. No issues have been raised with the validity of the data as evidenced by their position of no objection in relation to the application.

Whilst the above figure is a useful starting point, it does not provide traffic flows on the M62 and a series of additional assumptions are required to determine the quantum of development that could reach this location.

### 3.0 M62 Traffic Flows

For the purpose of the air quality assessment it is necessary to understand the Heavy Goods Vehicles (HGV's) component of the traffic flows.

HGV traffic generation for the Six:56 site was determined based on surveys at Omega North as agreed with WBC Highways and National Highways. Neither WBC Highways or National Highways has raised any concern with this as part of the planning application.

HGV assignment for the Six:56 site was determined based on existing HGV proportions on the M6 in the vicinity of Junction 20. Neither WBC Highways or National Highways has raised any concern with this as part of the planning application.

This traffic forecasting has been used to determine that the HGV component of the 6,223 AADT on the M6 north of the site would be 1,923 AADT.

If a similar distribution/assignment methodology is applied to the M6/M62 junction, as was adopted in the TA for the M6 Junction 20, then circa 25% of the HGV's would arrive/depart via the east (M62). It is assumed that all of this would travel past Holcroft Moss.

Utilising this methodology, the two-way AADT HGV flow in the vicinity of Holcroft Moss is predicted to be 487 AADT two-way HGVs.

The Six:56 development flows provided above are HGV only. The traffic data that supports the Transport Assessment and Air Quality Analysis suggests there could be up to 4,300 cars/light vehicles two-way AADT potentially travelling north/south on the M6.

Of the cars travelling north, almost none are predicted to travel east as the distribution is based on journey to work data for the area to the west of Six 56 – Stretton Green and this suggests only 0.5% towards Manchester/Salford.

Some LGVs may travel east on the M62 and as an overly conservative assessment, it could be assumed that 25% of traffic travelling north is LGV which equates to 1,075 AADT. If it is then assumed that 25% of this would travel east (same as HGV distribution) this would equate to 268 AADT travelling past Holcroft Moss.

This 268 has been added to the HGV flow to provide an exceptionally robust assessment.

The total flow past the M62 therefore equates to 755 AADT.

## 4.0 Warrington Local Plan Habitat Regulations Assessment

The above development traffic generation figure of 755 AADT in the vicinity of Holcroft Moss has been determined based on the traffic forecasting in the Six:56 TA.

However, a number of Air Quality Assessments for the Warrington Local Plan Habitats Regulations Assessment have been submitted and approved by Natural England and it is therefore logical to see how these compare and importantly what baseline cumulative flow assumptions were applied.

The Air Quality Assessment for the Warrington Local Plan Habitats Regulations Assessment dated April 2022 states at Para 2.1 that:

*“Traffic data were provided by the AECOM Transport team for the M62 and B5212 links within 200m of Manchester Mosses SAC. The modelled links are shown in Figure 1 and are as follows:*

- M62 Junction 11-12; and
- B5212 which crosses over the M62.

*Traffic data were provided for each link in the form of 24-hour Annual Average Daily Traffic (AADT) based on 2016 data and forecast to 2038, both with and without the scheme. The traffic data are presented in Table 2.”*

**Table 2 Traffic Data**

Link	2016 Base AADT	2016 HDV %	2016 Base Speed (kph)	2038 DM AADT	2038 DM HDV %	2038 DM Speed (kph)	2038 DS AADT	2038 DS HDV %	2038 DS Speed (kph)	Difference (between 2038 DS and 2038 DM) (AADT)
B5212 Holcroft Lane	1,528	1%	69	1,721	0.2%	69	1,722	0.2%	69	+1
M62 Junction 11-12	115,635	20.4%	70	164,737	13.2%	93	166,839	13.2%	93	+2,102

Table 2 suggests that the WBC Local Plan would generate 2,102 two-way vehicles on the M62 (the difference between the 2038 Do-Minimum and the Do Something scenarios).

The report continues at para 4.7:

*“It is clear from this modelling that Warrington Local Plan will make a very small, but not imperceptible, contribution to the overall forecast impact.”*

Updated Air Quality Assessments to support the HRA were submitted in August and November 2022 and these generally adopt the same figures set out above.

A final Air Quality Assessment was submitted in March 2023 in relation to the Local Plan Main Modifications. This document again utilised the same figures and explains that whilst some of the Local Plan sites have been removed from the Local Plan the original traffic figures have been retained for robustness.

To provide greater clarity on the above figures, Curtins met with AECOM (who were responsible for the traffic data in the Air Quality Assessments) on the 23<sup>rd</sup> June 2023.

AECOM confirmed during this meeting that the 2038 Do Minimum figures were significantly higher than the 2016 base year to reflect consented development, background traffic growth, Local Plan assumptions and committed infrastructure. This increase in traffic on the M62 was agreed to be 49,102 two-way AADT which is considered a robust consideration of cumulative impacts.

On the basis that the baseline figures are robust and have been approved by Natural England, the 2038 figures are considered to be suitable baseline figures for use in an updated Six:56 assessment.

With regard to development traffic, AECOM confirmed that the increase in traffic in the Do Something scenario, as a result of the of the Warrington Local Plan was 2,102 two-way AADT. AECOM also confirmed that circa 40% of this traffic was associated with the zone that included the South East Warrington Employment Area. 40% of the 2,102 two-way AADT would equate to 841 two-way AADT.

It is understood that the Six 56 Development Proposals account for circa 98 hectares of the South East Warrington Employment Area which has a total developable area of circa 137 hectares. Six 56 therefore equates to 72% of this area.

If this proportion is applied to the 841 two-way AADT figure, the result is 601 two-way AADT.

To summarise, the Air Quality Assessment to support the Habitat Regulations Assessment for the Local Plan included the Six 56 site and assumed that 601 two-way AADT would utilise the M62 in the vicinity of Holcroft Moss. This is less than that predicted in Section 3 of this note.

## 5.0 Conclusion

In conclusion, two methodologies have been considered to determine the development traffic that could reach the M62. The results of both methodologies are broadly comparable and for robustness the higher figure is recommended for use in an air quality assessment of the potential effects of the Six:56 development on the relevant designated sites.

Testing of the development traffic against the 2038 Do Something Baseline adopted in the approved WBC HRA assessment is considered to be a reasonable approach for use in the air quality assessment. As this already includes a Six:56 contribution, there is an element of double counting that provides a further level of robustness and a conservative assessment.

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