PART 3 : DISRUPTION DUE TO CONSTRUCTION

3.1 Methodology

Introduction

3.1.1 This assessment considers the potential disruption within the study area (see 3.1.6 below) resulting from the construction phase (as opposed to the operation of the completed road once opened for use) of the project. In most cases, effects during construction have been assessed as part of the specialist scheme environmental assessments of landscape and visual impact; noise and vibration; air quality; ecology; cultural heritage; water quality; geology and soils; land use (including agriculture); pedestrians, cyclists, equestrians, and community effects; vehicle travellers; geology and soils; and road drainage and the water environment. This assessment summarises the assessment of construction impacts within these specialist reports, and broadly considers likely cumulative effects. The full detailed assessment of construction impacts is reported in the A453 Environmental Assessment Disruption due to Construction report reference A021959-REP-E-ES-213, August 2008.

3.1.2 'Disruption due to Construction' is defined in the Design Manual for Roads and Bridges (DMRB) Volume 11, Section 3, Part 3 (see below) as 'a term which covers the effects on people and on the natural environment which can occur between the start of pre-construction works and the end of the contract maintenance period.' These effects need not be as a result of work directly on the road project itself but may also arise from advance works for example on site investigation or by utilities, which may extend beyond the highway construction site.

3.1.3 This assessment takes into account potential construction impacts to local residents, workers, vehicle travellers and non-motorised users (NMUs, including pedestrians, cyclists, and equestrians) arising from noise, vibration, dust and dirt, impact on views and access, and loss of amenity. The assessment also considers potential impacts on the natural environment associated with physical damage, vibration, drainage, accidental spillage, and dust generation. Compliance with current legislation, including implications for programming of the works, is also considered where appropriate.

3.1.4 Construction impacts are usually temporary which cease with the completion of the road. For example, a temporary element of the construction process such as a haul road may entail topsoil stripping, which could cause permanent damage to archaeological remains, but when removed and restored to its original function at the end of the construction period its impact on the historic landscape might also cease. However, long-term construction impacts can arise from many of the activities that take place from the first day of site clearance.

3.1.5 It is currently anticipated that construction of the scheme will take 120 weeks (29 months) from the end of May 2010 2009 to the end of December 2012. The urban section through Clifton, from the proposed Mill Hill Roundabout to the Farnborough Road junction, will be constructed in approximately 91 weeks (22 months) from the end of May 2010 to December 2011. The urban section will be completed approximately 7 months before the rural section is open to traffic. A summary draft construction programme is included at Appendix E. Programme dates and construction sequences given in this assessment are as accurate as they can be at the time of writing. They are intended as a guide to the nature, scope and timing of the works and may be subject to change as scheme design progresses.

Design Manual for Roads and Bridges (DMRB)

3.1.6 The methodology used in the assessment follows guidance in DMRB Volume 11, Section 3, Part 3 *Disruption due to Construction.* In accordance with this guidance the study area generally includes a corridor 100m either side of the A453 Widening Scheme, varying as required on a topic-by-topic basis. Thus the assessment of construction effects on properties and other sensitive buildings (such as schools and care homes) is largely taken from the noise assessment which extends to 300m either side of the scheme (as reported in Section 2 Part 7 *Traffic Noise and Vibration*). Effects on cultural heritage resources is largely taken from the specialist cultural heritage assessment (as reported in Section 2 Part 2 *Cultural Heritage*) in which the study area extends to those archaeological remains, historic buildings and historic landscapes which are likely to be affected. Similarly, effects of construction on ecology and nature conservation is largely derived from that specialist assessment (as reported in Section 2 Part 4 *Ecology and Nature Conservation)* which includes a detailed study area within 200m of the route but extends to 500m where particular features lie further away from the road.

3.1.7 Consideration during scheme design of the likely amounts of surplus material, taking into account where the road will be in cutting (i.e. below the level of the surrounding land) or on embankment (i.e. above the surrounding land) has enabled a broad assessment to be made of various route alternatives (as discussed in the ES Section 3 Part 2). This, together with consideration by the contractor, Laing O'Rourke of a methodology for construction (taking into account, for example, traffic management) has informed the engineering design of the proposed scheme.

3.1.8 The following construction operations and other considerations which could have a particularly significant impact have been included in the assessment of disruption due to construction:

- The scale of earth movements;
- The storage and treatment of surplus material before removal;
- The extent of special operations such as piling and bridgeworks;
- The likelihood of night-time working;

- Number, type and routes of vehicle movements;
- Storage and re-use of materials;
- Duration and nature of construction activities;
- Advance works by utilities if required;
- Construction programmes and traffic management plans including lane and Junction closures;
- Materials logistics such as origin of materials and routes to site;
- Quantities of materials required and an estimate on quantities to be discarded;
- Identification of wastes that will be generated including sources;
- The likelihood of contaminants being encountered.

3.1.9 Significance criteria are as defined in each relevant specialist environmental impact assessment. All have been assessed for their impact on the operational phase and where appropriate the construction phase in the individual topic sections. The disruption due to construction aspect of each topic is summarised in this assessment. An assessment score or comment as to the significance of impact during construction is given for each topic as appropriate, plus a statement as to whether any impact is likely to continue into the long term as a direct consequence of construction activities. Appropriate weighting is given according to whether impacts are temporary or long-term.

3.2 Key Guidance and Legislation

3.2.1 The following legislation and guidance is of relevance to the amount and disposal of waste from the site:

- DMRB Volume 11;
- Control of Pollution Act 1974;
- Environmental Protection Act 1990;
- European Landfill Directive (1999/31/EC)
- Landfill (England and Wales) Regulations 2002;
- Pollution Prevention Control Regulations SI 2000/1973;
- Pollution Prevention and Control Act 1999;
- Waste Management Licensing Regulations 1994 (as amended);
- Special Waste Regulations 1996;
- PPG Note 10 (Planning and Waste Management);
- National Waste Strategy 2000;
- Local Authority Waste plans, Environmental Strategies and Action plans.

3.3 Consultations

3.3.1 The Environmental Statement Scoping Report was issued to Statutory Environmental Consultees and local authorities for comment on 27th October 2006. In terms of construction aspects, comments were received from Natural England, English Heritage, the Environment Agency (EA) and Nottinghamshire County Council.

3.3.2 Environmental Health officers of Nottinghamshire County Council, Leicestershire County Council, Nottingham City Council, Rushcliffe Borough Council and North West Leicestershire District Council have been consulted.

3.3.3 The EA is a key consultee with regard to waste management licensing issues e.g. registration of exemptions for storage / treatment / re-use of any waste materials, such as construction / demolition waste and soils, arising from the works. The EA has been consulted during the initial design and assessment processes.

3.3.4 Construction impacts were discussed in a series of ecological workshops held between September 2006 and September 2007. Attendees were AMScott, the Environment Agency, Natural England, Leicestershire County Council, Nottinghamshire County Council, Nottinghamshire Wildlife Trust and E.ON.

3.3.5 Consultation and communication during construction is important in order to minimise disruption and to keep all interested parties informed of the on-going works. The Contractor's Construction Environmental Management Plan (CEMP) will include arrangements for consultation with statutory authorities, non-statutory authorities, interest groups and the public to ensure the methods and controls for safeguarding the environment and mitigating the effects of the scheme and its construction are carried out in accordance with the CEMP.

3.3.6 Listed below are some of the ways that we intend to maintain good communication:

- A section of the Highways Agency (HA) website will be dedicated for A453 Widening scheme. It will be regularly updated and include all traffic management information as well as all proposed closures and night working. The website is proposed to be the main way that we will communicate.
- An A453 Information Telephone Line (probably an 0845 number) will be established. The project 0845 telephone and Highways Agency Information Line (HAIL) operators will be briefed and provided with information to be able to supply callers directly with current and future project information.
- Major stakeholders will be invited to regular meetings where they will be informed of project progress and concerns will be addressed. Invitees will include representatives of local councils, government agencies and local service providers.

- Regular notices (probably weekly) will be displayed on local community notice boards highlighting forthcoming traffic management information, road closures and night work.
- Local media, including local radio stations and newspapers, will be informed of all major traffic diversions, road closures and night work.
- Presentations will be given at local schools and to interest groups.
- Links will be established with the emergency services to develop and implement an emergency call out procedure.
- A Public Liaison Manager (PLM) will liaise closely with the general public, landowners and others mentioned above, and monitor feedback received. This will be analysed to identify trends and recurring issues. An important role of the PLM will be to consult with residents and landowners at key stages in construction to ensure they are fully aware of where there will be localised effects such as noise, vibration and dust. This is regarded as an important mitigation measure to reduce the level of perceived nuisance.

3.4 Construction Activities

Pre-Construction Activities

3.4.1 Prior to the onset of the main scheme construction works, a range of activities would be required in order to minimise the operational constraints, which are imposed mainly by the area's ecology/archaeology. These activities are detailed in the individual environmental assessment reports and include the following:

- pre-construction monitoring in order to confirm ecological constraints;
- badger sett closure (if required) and installation of boundary fencing including badger fencing where appropriate;
- bat roost closure (if needed);
- site clearance prior to the onset of the bird breeding season;
- vegetation inspection and site clearance (if appropriate) during the bird breeding season;
- installation of protective fencing around areas of vegetation to be retained;
- treatment of injurious / invasive weeds such as Japanese Knotweed, Giant Hogweed and Himalayan Balsam (if needed);
- establishment of site accesses and signalised crossings (where required);
- archaeological mitigation including excavation, controlled soil strip, plan and excavate, and a watching brief where appropriate.

Main Construction Works

3.4.2 The main activities involved during scheme construction, which have the potential to cause adverse environmental impacts, would be as follows:

- setting up of construction compounds;
- traffic management;
- diversion of statutory services;
- site clearance - mainly trees, hedges and other vegetation;
- fencing;
- stripping and storage of topsoil;
- installation of pre-earthworks drainage;
- bulk excavation works;
- bridge construction;
- carriageway drainage;
- road pavement construction; and
- finishes (safety fencing. signs and markings).

Earthworks

3.4.3 The scheme would involve substantial earthworks in order to form the cuttings and embankments. Where possible, excavated material would be reused in embankments and landscaping areas, minimising both the environmental impact and the cost of the Scheme. Where appropriate or required, material would be modified to maximise its suitability for inclusion in the completed scheme.

3.4.4 Topsoils would be stripped using an excavator and transported by road haulage wagon or dump truck to temporary soil storage locations, where it would be stored for the shortest possible period, typically between 6 and 18 months, at a height of no more than 3m (typically 2m but this may need to be increased in confined locations). Proposed soil storage areas are shown on Drawing No. 21959/E/ES/2.3.1: Areas Required during Construction (located in the ES Volume 2 Figures).

3.4.5 The earthworks operation would be undertaken within the site construction area using tracked 15 to 45 tonne excavators, articulated dump trucks 25 to 45 tonne, tracked dozers D4 to D8-type machines or similar, rollers or compactors. The majority of lorry movements relating to earthworks will be contained within the site, and 25 tonne road wagons would be used on the public highway. On completion of the areas of embankment construction and backfilling, the balance of the excavated material would be used to form the landscape fill areas to the designed profile. These areas would then be covered with topsoil and planted according to the specified landscape design.

3.4.6 In 2010 approximately 148,000 m^3 of material will be moved in 60 days (310 wagons/day) by dump truck within the off-line section; and approximately 145,000 m^3 of material will be moved in 60 days (302 wagons/day) by road haulage wagon elsewhere. In 2011 approximately 325,000 m^3 of material will be moved in 140 days (290 wagons/day) by road haulage wagon. In 2012 approximately 37,000 m^3 of material will be moved in 100 days (47 wagons/day). All of the suitable material removed from the cuttings would be used within the works. The only export of material to a local licensed waste disposal site would be unsuitable fill estimated at 500 m^3. Approximately 42,000 m^3 of granular materials (e.g. roadstone, free-draining sands and gravels), would need to be imported as they are not available within the works area. These would be sourced locally to minimise haulage costs, haulage impact and the scheme's carbon footprint.

3.4.7 The bulk earthworks required for the scheme are met within the proposed boundary. This is a major benefit as it would greatly reduce the potential impact of the earthworks operation, and negate the requirement for the significant import of substantial quantities of bulk fill material to the site. The programme also aims to minimise any double-handling of material. Not only would this be economically beneficial, but it would also reduce unnecessary plant movements and limit the area of land required for temporary storage. All of the surplus excavated material will be used as general fill, in landscaping and / or in areas to be re-graded. All topsoil excavated will be reused on site in landscape areas and / or in areas to be returned to agriculture.

3.4.8 During the road construction periods there will also be lorry movements associated with roadstone, drainage and surfacing materials. These on average will be 25/day but ranging from 15/day to 40/day.

Structures

3.4.9 Preliminary designs for the bridges, underpasses and junctions have been prepared, however these would be finalised during the detailed design stage (which would be undertaken after confirmation of the Orders). These structures would be reinvestigated and subject to "value engineering" exercises, resulting in the preparation of the detailed design.

Post-Construction

3.4.10 Following completion of the construction works, there may be a small amount of completion work on landscaping and work on the correction of any defects that become apparent. However, it is expected that the level of activity would decrease quickly following Scheme opening.

Subsequent Maintenance Works

3.4.11 Under the Early Contractor Involvement (ECI) commission (subject to permission to proceed) and following completion of scheme construction, the Contractor would be responsible for the maintenance of environmental and landscape features for a

period of 5 years (i.e. to 2017). Maintenance activities, which would include the following, would be carried out in accordance with good site practice, and as such should cause only slight, temporary environmental impacts:

- ecological monitoring;
- water quality monitoring (surface and groundwater);
- cleaning of gullies;
- cleaning of signs;
- removal of litter;
- weeding (by hand or herbicide treatment as appropriate);
- mowing of verges and other areas of grass;
- re-seeding of bare grass patches;
- replacement planting of failed trees and shrubs;
- periodic pruning, thinning or coppicing of shrubs and trees;
- application of plant fertiliser; and
- de-silting of balancing ponds.

3.4.12 Small-scale repair work would inevitably be required over the lifespan of the scheme, and larger-scale maintenance such as resurfacing / re-strengthening is also likely to be necessary at intervals. The likely environmental effects of such long term management works are outside the scope of this assessment.

General Site Works

3.4.13 The scheme will be registered under the Considerate Constructors Scheme before work starts on site and will follow the requirements of the Scheme with the aims of undertaking all work with positive consideration of the needs of all people likely to be affected by the works. Dust, dirt and noise from construction operations and all other sources will be kept to a minimum at all times; attention will be paid to waste management, recycling and the avoidance of pollution; working areas will be kept clean and temporary safety barriers, lights and warning signs will be maintained in a clean and safe condition; and construction operatives and site vehicle movements will be carried out with great care and consideration for the safety of others.

3.4.14 All main construction works areas including the site compound will be clearly defined with hoarding / barriers / signage. The public will be prevented from entering works areas. Where access for the public is required, protection will be established and maintained at all times.

Road Works and Traffic Management

3.4.15 A separate 'buildability' report will be prepared by the Contractor, detailing the traffic management measures necessary during construction. The main objectives of the traffic management (TM) design will be to:

- provide safety for road users and workforce;
- maintain safe routes for all traffic for the duration of the works;
- minimise delays and disruption to local and trunk road traffic whilst allowing the works to be completed;
- minimise the disturbance to the local community by minimising the construction traffic on the local road network for the duration of the works.

3.4.16 All TM proposals would be subject to negotiations and agreement with relevant traffic authorities, the Police and Highways Agency (HA). There would be specific major activities that would require overnight closure of the A453 trunk road, otherwise the works would be sequenced to maintain a single carriageway in each direction on the A453.

3.4.17 Where specific works require closure of the A453 the diversion route will be via the A52 and/or A46. The closure will be notified via the Network Occupancy Management Process Document (NOM). In this way the works are coordinated through HA and relevant Maintaining Agent Contractor (MAC) and other major schemes on the network.

3.4.18 Fully detailed TM layouts will be prepared, in particular to:

- programme the works such that the TM will be substantially removed (where possible) during holidays and peak periods or arranged such that existing carriageway capacity is not undermined;
- develop TM schemes to maintain access to adjacent properties and minimise the need for traffic diversions onto local roads;
- plan the construction works to minimise the additional construction traffic that will use the existing junction.

Traffic Safety and Control Officer

3.4.19 A Traffic Safety and Control Officer (TSCO) will chair regular TM meetings with the HA's Agent, Police, HA MAC, local highways authorities and key stakeholders during the early part of construction The frequency of these meeting will be increased to weekly during construction.

Waste and Recycling

3.4.20 A detailed Waste Management Plan is included in an Outline CEMP which has been prepared for the scheme, and will be further developed for inclusion within the full CEMP. This document will highlight the types of material produced on site and material which can be reused and recycled. Disposal of waste material to landfill will only be used where no other viable disposal route is available.

3.4.21 At present the amount of unsuitable fill is estimated at 500 m^3 which would be taken to a local licensed waste disposal site.

3.4.22 No hazardous waste has been identified. If, during development, contamination not previously identified is found to be present at the site, then no further development shall be carried out until a Method Statement has been submitted and written approval obtained from the LPA. This Method Statement will detail how the unsuspected contamination shall be dealt with, as required by the Environment Agency. Company procedures and current best practice will be followed.

Approved Contractors Delivery Routes and Haul Roads

3.4.23 Contractor's delivery routes for incoming and outgoing materials will be agreed with the relevant Local Highway Authority prior to use and, wherever possible, would avoid sensitive receptors including residential areas, schools and hospitals. Appropriate signage will be erected banning use by contractor's traffic. The authorised delivery routes, likely to be off M1 Junction 24, will be communicated throughout the supply chain and all suppliers instructed to inform their drivers. There would be a commitment to optimise (with a view to minimising) the 'haulage miles' expended by the project.

3.4.24 There are no haul routes identified outside the proposed boundary of the works. However, temporary tracks may be required to enable construction of environmental mitigation works outside the highway, such as replacement badger setts for example.

Out of Hours and Night Working

3.4.25 On a project of this nature and duration there would inevitably be some out of hours and night-time working, although this would be kept to a minimum. Typically it would involve work to the carriageway requiring traffic restrictions that would not be allowed at other, busier times. Working hours are likely to be as described below:

- General site hours are assumed to be 0700 -1900 Monday to Friday and 0700 -1300 Saturday;
- Out of hours working is assumed to be Saturdays 1300 to 1900 and Sundays 0800 to 1900. Sunday working would only occur following prior notification to the local authority and neighbouring properties;
- Night-time working is assumed to be the hours between 1900 and 0700. Night-time working would only occur following prior notification to the local authority and neighbouring properties.

3.4.26 Types of activities undertaken in out of hours work might include:

- plant maintenance works Sundays 0900 – 1600;
- traffic management;
- construction of new and temporary carriageway tie-ins and also junction changes;
- utility connections;

- possible demolition of overbridge structure;
- lifting and placing of bridge beams.

3.4.27 Type of activities undertaken during Night work might include:

- traffic management (switching phases);
- construction of new and temporary road carriageway and junction tie-ins;
- a full closure of the A453 trunk road;
- demolition / removal of existing structures;
- lifting and placing of bridge beams;
- some final connections for utilities may be undertaken at night i.e. Telecommunications, gas, water and electricity.

Environmental Management

3.4.28 A list of key environmental requirements and actions will be developed identifying requirements to be incorporated into the detailed design and construction stages. This list will include all commitments and recommendations within the Environmental Statement and Public Inquiry as well as commitments made to Consultees and other third parties during the preliminary design. The list will be contained in the CEMP which is managed by the Environmental Manager who will be responsible for ensuring that all requirements are met and all actions undertaken.

3.4.29 Mitigation of any potential environmental impacts during the construction period would be by means of an Environmental Management System (EMS) as described in Section 1 Part 2 paragraphs 2.4.13 to 2.4.20 of this ES.

3.5 Areas Required Temporarily During Construction

3.5.1 Areas have been preliminarily identified at this stage for a main compound area in the urban section of the scheme (in Clifton), temporary topsoil storage areas, 'lay down' areas and working areas (for example around structures) in order that any environmental impact can be assessed, taking into consideration any mitigation measures to reduce impacts. These areas are included in the draft Compulsory Purchase Orders (CPO) and are shown on the scheme Land Reference Plans.

Urban Section Compound and Offices

3.5.2 An area has been identified for offices and a compound within the urban section in Clifton, and has been included within the Land Reference Plans for this purpose. The area is opposite the Man of Trent Public House on land owned by Nottingham City Council, and is shown on Drawing No. 21959/E/ES/2.3.1.7.

3.5.3 Security of plant and materials is of particular concern in the urban section, and it is important that the work areas are left safe at all times, and especially at night. The position of this compound area close to the works would mean that all plant can be

returned to the compound when not in use. Materials can be stored in the compound and would be transported to the work prior to use. All chemicals used during construction that have COSHH implications (control of substances hazardous to health) will be controlled from the stores, where operatives will receive a COSHH briefing prior to use (they will have to carry a relevant COSHH assessment with the product as this will give first aid requirements for the chemical). Secure welfare facilities could be provided for the workforce, including toilets, showers and changing.

3.5.4 A range of activities would be required prior to using the compound in order to minimise operational effects, such as:

- archaeological watching brief during groundworks (see Section 8);
- ecological walkover survey (see Section 8);
- top soil strip and fence the site;
- install temporary drainage and other services;
- lay hardstanding, carpark and access from A453;
- install temporary offices, security points, stores containers, compound lighting and closed circuit television;
- install recycle facility skips and bins;
- set up material storage areas and fuel storage areas.

3.5.5 Operation of the site compound will include the following procedures to minimise environmental impacts:

- fuel storage – double-skinned tank arrangement; spill control measures for fuel delivery and refuelling; and a site based emergency response team;
- lighting – units selected to minimise light spillage and positioned to face away from adjacent properties;
- noise and air quality – implications for nearby properties during construction and operation would be managed by working restrictions and the CEMP;
- dust/noise – road brush would keep the hard standing and carpark areas and approaches clear and dust suppression water sprays to be used during dry periods;
- drainage – temporary foul and surface water drainage system would be installed;
- surface water system would include interceptors; these interceptors would be emptied regularly and following any spills;
- restoration and end use proposals – built elements and hard standings would be removed and the topsoil would be replaced, reseeded and managed as appropriate.

3.5.6 The field is used on an annual basis as a fairground. It is currently grassland of low ecological value and there are no known archaeological features (although no archaeological field evaluation has been undertaken). Given the relatively short time scale for construction there is likely to be a period of some disturbance to residents, in particular noise and visual impact, but no long term effects. It is considered that the use of this field for a compound would not have any significant environmental impact.

Rural Section Compound and Offices

3.5.7 A site will be required in the rural area for the main offices and compound. At this stage a site has not been included within the CPO plans as it could be located in any one of a number of locations. Final location will be determined following approval to construct the A453 Widening scheme, taking into consideration known environmental constraints, access and other requirements. An environmental assessment of options will be undertaken in order to determine the most favourable location, subject to landowner agreement.

3.5.8 A range of activities would be required prior to using the compound in order to minimise operational effects, such as those described in paragraph 3.5.4 above. Similarly, operation of the site compound would include the procedures to minimise environmental impacts such as those described in paragraph 3.5.5 above. Operations may include facilities for crushing and screening in order to recycle site won material. On-site batching using equipment to provide a reliable and precise amount of material locally, such as ready mix concrete, is likely to be undertaken, thus reducing transport costs and environmental impact compared with deliveries being made from outside the area. However, such operations can potentially have significant environmental impact, for example noise, and thus careful siting and mitigation is important. The CEMP would control all aspects of the site compound operation.

Areas Adjacent to Structures

3.5.9 Small containerised office / welfare facility units may be required in areas adjacent to structures to facilitate their construction. Some of these will be within the flood plain, requiring consultation with the Environment Agency. The compact nature of these units means that they can be easily lifted onto a wagon fitted with a crane lifting arm to prevent them from being flooded.

Temporary Topsoil Storage Sites and Lay Down Areas

3.5.10 A number of areas temporarily required during construction for topsoil storage or as lay down areas (for the temporary storage of materials) have been identified and are indicated on Figure 2.3.1. All of these areas are included in the draft Orders for the project.

3.5.11 The location of these areas has been determined following evaluation of known environmental constraints and assessment of likely impacts. It is considered that the use of these areas would not result in any significant environmental impacts.

3.5.12 Topsoil would be stored in stockpiles up to 3m in height (but typically 2m), close to the site of origin. Subsoils will be stored separately. A soil management proposal, discussed in more detail in the soils assessment (and summarised in the ES Volume 1, Section 2, Part 12) would ensure correct handling, storage and reinstatement of material.

3.6 Potential Impacts (without Mitigation)

3.6.1 A range of effects on people and the natural environment are likely between the start of pre-construction works and the end of the contract maintenance period. These are temporary but may be significant.

3.6.2 Construction nuisance is generally a relatively localised phenomenon, but may extend beyond the road scheme itself, for example lorry movements or advance works by utilities such as re-routing water services and electricity cables.

3.6.3 Many of the operational effects described in other specialist environmental assessment reports for this scheme may occur to some extent during construction. Typical construction impacts include a localised increase in noise, vibration, dust and dirt, and a loss of amenity due to the presence of heavy construction traffic. Those affected are likely to include people in their homes or places of work; people shopping or visiting the area for other reasons; and pedestrians, cyclists, equestrians and vehicle travellers. Potential significant effects are likely to extend up to around 100m from the scheme boundary, and clearly those properties closest to the works are those most likely to be affected. Further details are given in the *A453 Widening Environmental Assessment: Traffic Noise and Vibration* report and *A453 Widening Environmental Assessment: Air Quality* report and summarised here in the Environmental Statement Volume 1, Section 2, Part 7 and Part 1 respectively.

3.6.4 Construction work can also potentially affect the natural environment. Wildlife may be disturbed, ecologically valuable land may be affected, for example by the storage of materials, and water quality may be reduced, for example by accidental spillage. Further details are given in the *A453 Widening Environmental Assessment: Ecology and Nature Conservation* report and summarised in the Environmental Statement Volume 1, Section 2, Part 4.

3.6.5 There is considerable archaeological potential within the route of the scheme and a number of archaeological sites have been identified that would potentially be impacted on during construction. A total of twenty nine sites have been identified, together with areas of listed buildings and other historic buildings in Ratcliffe on Soar, Thrumpton, Barton in Fabis, Clifton Village and other isolated properties. Historic landscapes throughout the scheme, in particular Clfton Village Green and Conservation Area and Thrumpton Conservation Area could potentially be affected

by the works. Further details are given in the *A453 Widening Environmental Assessment: Cultural Heritage* report (and summarised in the Environmental Statement Volume 1, Section 2, Part 2).

3.6.6 The Non-Motorised User (NMU) Context Report (Reference: A021959-REP-T-G-017, Revision 2) summarises the existing NMU situation within the study area and provides comments on opportunities and objectives to improve conditions for NMUs within the context of the scheme. One of the scheme NMU objectives in the NMU Context Report (Objective 20) is to *ensure appropriate access to NMU facilities is provided during scheme construction.* This objective will need to be considered as part of the detailed design of the scheme, in which the ECI contractor will endeavour to keep the existing facilities open or provide a suitable alternative in consultation with Nottinghamshire County Council, Nottingham City Council and Leicestershire County Council.

3.6.7 Construction works have the potential to result in temporary and long term impacts to surface water quality, surface water flows, groundwater quality and groundwater flows. Further details are given in *A453 Widening Environmental Assessment: Road Drainage and the Water Environment* report (and summarised in the Environmental Statement Volume 1, Section 2, Part 10).

3.6.8 Construction of the A453 Widening scheme will directly and indirectly affect the landscape of the Leicestershire and Nottinghamshire countryside, the townscape of Clifton, and views of both by local residents, commuters and others working, shopping or using the area for recreation or other reasons. These issues are considered in detail in the *A453 Widening Environmental Assessment: Landscape Effects* report (and summarised in the Environmental Statement Volume 1, Section 2, Part 5).

3.6.9 The construction process itself would have a slight overall effect on the soils of the area. Given the relatively small land-take, the value and sensitivity of agricultural land quality is at a local scale in the A453 improvement scheme. However, the flood compensation areas are predominantly best and most versatile agricultural land. The lowering of the land and increase in flood frequency will potentially downgrade the land quality to non-best and most versatile and probably to ALC Grade 4 due to wetness. Further details are given in the *A453 Widening Environmental Assessment: Soils and Agricultural Land Quality* report (and summarised in the Environmental Statement Volume 1, Section 2, Part 12).

3.6.10 Road users on the A453 and local side roads would be directly affected during construction of the widening scheme. Disruption will inevitably occur as a result of traffic management measures including temporary traffic lights, diversions on to adjacent carriageways and occasionally on to other roads (for example during night-time closure of the A453) as described in Section 4.4 above. Disruption is likely to be minimal in the section between Thrumpton and the proposed Mill Hill Roundabout where the existing Barton Lane and A453 carriageway would provide an appropriate route during construction of the off-line section.

3.6.11 There would be disruption to private accesses where properties currently have direct access on to the A453. Some form of access would be provided at all times, but this may be across temporary surfacing. Safety would be paramount at junctions of private accesses with the live A453 carriageway.

3.6.12 Throughout the construction period use of the A453 and surrounding roads by construction plant and delivery vehicles would cause indirect effects but which are unlikely to result in significant disruption.

3.7 Mitigation and Environmental Effects

Detailed Scheme Design

3.7.1 Several aspects of scheme design will help to minimise adverse effects during construction, whether by design or as an indirect benefit of other decisions. On-line widening to the south of the existing A453 between M1 junction 24 and Thrumpton will minimise disruption due to construction for most of the community in this area. Here the scheme would be more than 100m away from most properties, with the exception of Dowell's Barn and the adjoining property Keepers Cottage (approximately 50m), Cedar Isle (approximately 50m), Riverside Farm, Ratcliffe on Soar (approximately 40m), Southern Cottages, Thrumpton (approximately 60m), Tramway House, Thrumpton (approximately 50m), Fields Farm, Thrumpton (approximately 80m from the A453 but also adjacent to the realignment of Barton Lane) and The Orchard, Thrumpton (approximately 60m from the A453 but also adjacent to the realignment of Barton Lane).

3.7.2 Between Thrumpton and the proposed Mill Hill Roundabout, the scheme would be off-line further to the south and thus slightly further away from Keeper's Cottage and Barton Lodge at the current Barton Lane/New Road/A453 junction.

3.7.3 Construction impacts will be most severe in the urban section and many properties will be within 100m of the road. However, widening will occur on the northern side and thus further away from most properties which are on the south side of the road between the Mill Hill Roundabout and Crusader Roundabout, and between Green Lane Junction and Farnborough Road Junction. Through this latter section the widened carriageway will however be closer to properties on Meden Close. The four lane single alignment will minimise loss of existing planting and screen mounding, thus minimising visual impacts.

3.7.4 The alignment between these two sections at Green Lane will be to the south and has been chosen to enable construction to avoid the more sensitive parts of the Clifton Conservation Area and Village Green to the north. Most properties are set some way back from the road, although the new alignment and improvements to Grasby Walk will occur closer to residential properties.

3.7.5 The off-line section between Thrumpton and the proposed Mill Hill Roundabout would bring benefits during construction including:

- Avoiding the need for a long deep cutting through Brands Hill;

- Easier to build;
- Reduces the amount of surplus excavated material;
- Vehicle travellers and NMUs will be able to use the existing A453 unaffected by construction of the new off-line route;
- Avoid sensitive ecological features and existing vegetation close to the existing A453.

3.7.6 As discussed above, as much excavated material as possible would be reused in embankments and landscaping areas, minimising environmental impact during construction. Furthermore, material would be modified to maximise its suitability for inclusion in the completed scheme to achieve a materials balance and thus reduce impacts associated with haulage on and off-site. Should any contaminated material be encountered, it would either be remediated and re-used on-site, or disposed of at a licensed landfill site in accordance with applicable Waste Management Licensing Regulations.

Construction Phase Mitigation and Environmental Effects

Air Quality

3.7.7 The UK Air Quality Standards seek to control the health implications of respiratory particulate matter PM_{10} (less than 10 micrometers in diameter). However, the majority of particles released from construction will be greater than this in size. The primary source of particulates in the area surrounding the site is from vehicle emissions.

3.7.8 Construction works on site have the potential to elevate localised PM_{10} concentrations in the area. On this basis, mitigation measures would be taken to minimise these emissions as part of good site practice. Best practice measures to mitigate the effects of dust and particulate emissions during construction will be incorporated in accordance with "The Control of Dust and Emissions from Construction and Demolition, Best Practice Guidance" published by the London Councils and the Greater London Authority (Nov 2006). Such measures are likely to include:

- Seeding storage mound surfaces as soon as is practicable;
- Spraying exposed surfaces of mounds regularly;
- Restricting vehicle speeds;
- Watering roadways;
- Wheel or body washing.

3.7.9 Inevitably dust problems will occur, but overall the incorporation of effective site management procedures and mitigation measures to control dust, as part of good site practice, would help to minimise the impact of the construction works on nearby sensitive receptors.

Cultural Heritage

3.7.10 The most likely cultural heritage/archaeological effects of the A453 Widening scheme would be direct damage to archaeological remains during proposed construction activities. There would also be minor adverse impacts on the setting of some historic buildings and on the historic landscape of Clifton Village Green and the open landscape south of Clifton.

3.7.11 Surveys have been undertaken along the route corridor, including fieldwalking, geophysical survey and trial trenching. This has enabled an assessment of potential impacts and a scheme of further mitigation to be agreed with the County Archaeologists of Leicestershire and Nottinghamshire.

3.7.12 Overall impacts during construction on archaeological remains would mostly be neutral or slight adverse, although moderate adverse impacts after mitigation are likely at three sites, namely cropmark enclosures south of Brands Hill; Glebe Farm Roman Villa Scheduled Monument; and enclosures south of Clifton.

3.7.13 Overall impacts on historic buildings and historic landscapes would be slight adverse, although construction of the off-line route through the open landscape south of Clifton would be of moderate adverse significance.

Ecology and Nature Conservation

3.7.14 The CEMP will, amongst other things, identify risks of environmental harm and will set out method statements, designs and protocols to minimise the risk of pollution events or other environmental harm during the construction period. This will include protection of watercourses, sensitive ecological areas (including mitigation areas) and areas of retained trees and other vegetation.

3.7.15 The CEMP will also specify a monitoring programme for sensitive ecological habitats and protected and/or important species so that the success of mitigation measures may be assessed and so that the construction programme, methodology and the implementation and management of the ecological design may react to any significant changes to the baseline environment (e.g. changes in distribution of protected fauna). Monitoring would continue into the 5 year aftercare period.

3.7.16 No statutory designated sites of nature conservation value would be significantly affected by the proposed scheme, and thus no specific mitigation measures are necessary for these sites.

3.7.17 Potential indirect effects on designated sites arising from scheme construction include habitat losses and fragmentation of the wider ecological network which support designated nature conservation sites, and degradation of connecting

habitats (particularly watercourses) from pollution events during construction, leading to degradation of downstream habitats and sites.

3.7.18 The potential effects on designated sites as a result of construction activities on the connecting habitats are related to losses of existing vegetation within the proposed scheme boundaries and risks of pollution of watercourses during construction. They are assessed as likely to be small in magnitude, and are considered to be both temporary and reversible within the construction period and a post-construction period of approximately 5-10 years, within which replacement planting is likely to compensate for habitat losses and fragmentation.

Otter

3.7.19 No direct effects on otter such as harm or disturbance are anticipated as there are no holts within or in close proximity to the proposed scheme boundaries. There will also be no significant indirect effects through habitat loss (foraging habitat or potential holt sites) for otter due to the construction works.

Water Vole

3.7.20 No direct impacts of burrow loss or significant indirect effects of disturbance and habitat loss would occur as a result of construction activities along the River Soar.

3.7.21 The construction of the proposed scheme would result in the direct loss of approximately 150m of current water vole habitat (ditch) between Thrumpton and Barton in Fabis. In addition, approximately 200m of suitable (currently unoccupied) connecting ditch habitat along the eastern side of the existing A453 would be lost under the new southbound carriageway.

3.7.22 Indirect construction effects also include temporary disturbance from construction of roads and balancing ponds in this area, as well as a permanent reduction in habitat connectivity to either side of the A453.

3.7.23 A pond and new ditch habitats would be created in advance of construction on land between Thrumpton and Barton in Fabis. These would be connected to the existing field drainage network which currently supports water vole. Water voles would be captured and excluded from areas to be lost as a result of by construction, and transferred to the new habitats.

3.7.24 New culverts would include mammal ledges in order to minimise the barrier effect of culverting for water vole. The opportunity would also be taken here to split the culvert into two sections with new ditch habitat between the new and existing A453, to reduce the length of continuous closed culvert and maximise chance of voles moving between currently occupied habitats on either side of the A453.

Bats

3.7.25 The bat roost at Keeper's Cottage would not be directly affected by construction work and the road scheme design has been developed to ensure that this property is retained and would be slightly further from the heavy trafficked areas, which is considered to be a benefit of the scheme proposals.

3.7.26 The B5 floodspan (the bridge structure over the floodplain in-between the River Soar and the Ratcliffe Cut Canal) would not be directly affected by the construction of the new floodspan immediately to the south. However, during construction, maintenance work to the existing structure may involve exposure of parts of the bridge structure which support roosting bats. Where necessary, a European Protected Species licence would be obtained from Natural England to permit disturbance of the roost due to construction. This would specify working methods to minimise the risk of disturbance to bats.

3.7.27 Trees with potential to support bat roosts in proximity to the scheme would be clearly demarcated to prevent accidental damage. Other retained vegetation would be protected. Strategic tall planting would be employed to encourage overflight of road scheme above vehicle height at key points including Barton Lodge and Twenty Lands Plantation.

Barn Owl

3.7.28 No effects on barn owl nest sites are likely to result from construction as there are no such sites within or adjacent to the scheme boundaries and construction areas. Construction would result in the loss of roadside grassland habitats as well as hedgerows and field boundaries within the online widening sections in particular, with the loss of Barn Owl prey. The losses are not considered to represent a threat to the conservation status of this species and the presence of the new carriageway does not represent in itself a significant barrier to owl movements.

Badger

3.7.29 The majority of affected badger setts have been found to be not in current use, but this will be kept under review. Where loss is unavoidable, existing setts shall be closed under licence from Natural England in the period July-November inclusive. If affected setts are found to be in use prior to construction then artificial setts will be provided at two locations. Further information can be found within the A453 Widening Confidential Badger Survey and Assessment report (Ref A021959-REP-E-EN-216).

3.7.30 Badger resistant fencing will be installed along the majority of the rural section of the proposed scheme on both sides of the road to discourage badgers attempting to cross the main carriageway. In addition seven underpasses will be created and two extended to maintain movements either side of the carriageway.

Other Habitats

3.7.31 Vegetation clearance and stripping would be undertaken outside the nesting season wherever possible. Where this cannot be achieved, checks would be made in advance and any active nests left undisturbed until young have fledged.

3.7.32 Replacement planting alongside the road corridor would reinstate the habitat network and corridor function of areas lost to construction, and would include a higher proportion and total area of native species than the existing habitats.

Landscape Effects

3.7.33 Potential landscape, townscape and visual effects during construction are inevitable and could not be readily mitigated. Visual screening in the form of temporary mounds or fencing may be appropriate, but this would only be possible in a few isolated locations. Some properties overlooking the construction operations would be exposed to severe, albeit temporary visual effects. In the rural section these are the properties mentioned in paragraph 3.7.1 above which are within 100m of the scheme. In the urban section a number of properties will be close to the works, but in particular those at the locations mentioned in paragraph 3.7.3 above.

3.7.34 Overall impacts on landscape features and landscape character during construction of the scheme would be slight to moderate adverse, recognising that the existing A453 and associated transport network exerts a significant influence upon the character of the landscape.

Land Use and Agriculture

3.7.35 The majority of land take will be alongside the existing A453, thus limiting the effects of severance. There will be some severance where the scheme is off-line opposite Barton in Fabis. Where extra land is required for new junctions at Ratcliffe on Soar / Parkway and West Leake / Power Station, land within the junctions will be acquired for mitigation planting.

3.7.36 Adverse land use impacts would be minimised through appropriate scheme design. This includes minimising land take and, where possible, the avoidance of sensitive land uses and the provision of appropriate accesses and other accommodation works.

3.7.37 There would be temporary impacts on the Clifton Conservation Area as a result of construction, including siting of the urban compound site. All impacts are considered temporary and reversible.

3.7.38 Overall impact on agricultural and non-agricultural land uses during construction would be similar to that incurred during the operational phase post-road opening, due to the initial acquisition of land and the restriction on right-turn movements across the A453. Most temporary impacts during the construction phase will be of slight adverse significance, although interruption to accesses and the loss of use of

the fairground site in Clifton needed for the urban compound would create moderate adverse effects. Similarly, construction of the scheme would create moderate adverse impact on agricultural movements as long as access across the A453 was maintained. If this was disrupted impacts would be more significant to the farms affected. A Public Liaison Manager will liaise closely with landowners to minimise disruption to, for example, field drainage and harvesting operations and during other critical periods for farmers.

Noise and Vibration

3.7.39 Construction activities have the potential to increase local noise levels and be a source of ground-borne vibration. The severity of the impact varies with the activities in progress, the noisiest typically being site clearance, piling and bulk earthworks. Construction noise can be a nuisance to local people, although it is temporary and of limited duration.

3.7.40 Recommendations within British Standard BS5228: Part1: 1997 "*Noise and vibration control on construction and open sites*" will be followed for basic methods of noise and vibration control relating to construction and open sites where work activities/operations generate significant noise and/or vibration levels. Good practice measures in noise reduction will be incorporated.

3.7.41 Those properties listed in paragraph 3.7.1 as being within 100m of the works, including Keeper's Cottage and Barton Lodge, would also occasionally receive noise levels in excess of 70 dB(A) from construction. At these locations, the employment of temporary barriers and sensible work practices, such as limiting night-time working should bring noise levels to below the criterion level, although noise increases above existing levels would be of large to very large negative significance.

3.7.42 In the urban area noise from construction would be experienced by a number of properties, but principally those listed in 3.7.3 above. Noise levels from the urban compound are expected to be within the criteria and thus surrounding sensitive receptors should not be unduly affected. Again, where possible the employment of temporary barriers and sensible work practices should bring noise levels to acceptable limits, although noise increases above existing levels would be of large to very large negative significance to some properties.

3.7.43 Vibration associated with scheme construction is unlikely to cause actual building damage, but may well lead to justifiable complaints of vibration by local residents.

Pedestrians, Cyclists, Equestrians and Community Effects

3.7.44 The objective of ensuring that appropriate access to NMU facilities is provided during scheme construction will need to be considered as part of the detailed design of the scheme, in which the contractor will endeavour to keep the existing facilities open or provide a suitable alternative in consultation with Nottinghamshire

County Council, Nottingham City Council and Leicestershire County Council. In some cases, temporary closures may be necessary on safety grounds. The duration of closure or diversion would be kept to the minimum possible.

3.7.45 It is generally accepted that the presence of the A453 acts as a significant barrier to movements along PROW across the road, and currently reduces the amenity value of most PROW. Impacts during construction are likely to maintain this situation.

Disruption to Road Users

3.7.46 Construction of the scheme would directly affect the existing A453, as well as some of the associated side roads. Disruption to road users would be minimised through the provision of a traffic management scheme under the control of a Traffic Safety and Control Officer.

3.7.47 On-line widening alongside the existing carriageway would allow continued use of the A453 during construction, with minimum disruption. Disruption is likely to be worse at the southern end of the scheme, between M1 and the West Leake Junction, and through the urban section. In the middle section, between Thrumpton and Clifton, traffic would continue to use the A453 whilst the off-line route was constructed. There would be no need for diversion onto adjacent carriageways with the off-line route.

3.7.48 Temporary access arrangements would facilitate traffic flow in most locations, though there would inevitably be a need for some temporary traffic control with resultant traffic disruption. The duration of such disruption would likely be periodic and / or relatively short at any one location.

3.7.49 In addition to the above direct effects of construction on road users, there would be indirect effects due to access by construction plant and delivery vehicles to the A453 throughout the construction period. Such traffic flows are not anticipated to result in any noticeable noise or air quality effects.

Water Quality and Drainage

3.7.50 The CEMP will identify potential areas and activities that may lead to water pollution or other adverse impacts and will detail good site practice and management to avoid or minimise such outcome and provide instruction on emergency response procedures to be adopted following specific incidents. The most significant environmental protection measures which would be in place during the construction phase are briefly described as follows:

- Fuel storage: fuels and oil would be stored in designated areas away from watercourses, drains and other sensitive receptors;
- Refuelling: refuelling would be carried out by suitably trained personnel to minimise or prevent the risk of pollution to surface watercourses or

underlying groundwater. Emergency spill kits should be located at refuelling points and at strategic positions around the site;

- Location of construction works: laying wet concrete and washing out concrete mixing plant or ready mix lorries in close proximity to watercourses would be controlled to minimise the risk of leakage of wet cement into the watercourse;
- Timing of mitigation measures: Early construction of permanent attenuation ponds would provide locations for temporary lagoons. After sediment removal water would be discharged to a watercourse subject to agreement with the Environment Agency
- Monitoring: the monitoring of watercourses at risk from pollution would be carried out during the construction phase. This would comprise visual assessments for oil and silt and if necessary the monitoring of the watercourse using portable field equipment. During construction operations selected watercourses would be sampled at locations up and downstream of the works and tested for suspended solids, pH changes and hydrocarbons. Monitoring requirements during the construction phase should be discussed and approved by the Environment Agency prior to construction.

3.7.51 Effects on Surface Water: During construction the most common cause of pollution to surface waters is suspended silt washing off earthworks during storm events, entering surface watercourses either directly or via drains. The potential for adverse impacts to the water environment due to the disturbance of silt would be minimised by passing all pumped drainage through silt settlement treatment (e.g. straw bales, grassland soak away or silt settlement lagoons) prior to discharge; by keeping all roadways and hard standings as clean as possible to avoid build-up of oils and dirt but avoiding excessive use of water which could get washed into drains; and shielding watercourses with raised banks where appropriate.

3.7.52 The scheme construction has the potential to change the flow regimes of watercourses and drains within the vicinity of the A453 not only due to siltation but also changes to runoff regime and the receipt of additional pumped discharges. Adoption of mitigation measures including balancing ponds, attenuation ditches, bypass oil separators and penstock valves would minimise the potential for adverse impacts on surface water flows and water quality to occur. Therefore the potential for adverse effects to surface water flows and surface water quality as a result of construction with mitigation measures in place are regarded as minor adverse.

3.7.53 Effects on Groundwater: With the implementation of appropriate mitigation measures to protect underlying groundwater during the scheme construction the magnitude of potential adverse impacts to groundwater quality is regarded as negligible.

3.7.54 With the implementation of appropriate mitigation measures to protect underlying groundwater during the scheme construction, the magnitude of potential adverse impacts to groundwater flow is also regarded as negligible.

Geology and Soils

3.7.55 In geological terms mitigation measures would focus upon ensuring that:

- excavations of materials maximise the potential for their re-use and minimise the requirement for off site disposal;
- embankments and cuttings are stabilised;
- any potential sources of contamination are identified through ground investigation and pollution prevented by the removal or treatment of such materials as appropriate.

3.7.56 Current information indicates that contamination along the route of the A453 would be limited to excavation into the backfilled ash pits associated with the former power station and localised hydrocarbon contamination. Additional areas of contamination have not been identified in the scheme area and, if present, are likely to consist of localised areas of minor contamination. If additional small areas of contamination are encountered, during further investigation or during construction, source-pathway-receptor risk assessment would be made of the potential impact of the contamination. Mitigation would then be defined involving, as necessary, removal or treatment of the contamination to prevent pathways to sensitive receptors.

3.7.57 With regard to soils, essential mitigation measures that are appropriate and that have been included in the delivery of the A453 scheme are:

- Inclusion of soils in Scheme's Environmental & Construction Management Plans;
- Minimisation of land-take;
- Avoidance of best and most versatile land where possible;
- Recovery and retention of all topsoil resources as is practically possible;
- Segregation of contrasting soil types in storage and replacement;
- Topsoil storage mounds to be no more than 3m high and subsoil mounds no more than 5m high;
- Restoration of temporary soil storage areas to same or improved physical characteristics and land quality;
- Compliance with Ministry of Agriculture, Fisheries & Food (2000), Good Practice Guide for Handling Soils by Machine (2000).

Cumulative / Combined Effects

3.7.58 The paragraphs above in Section 3.7 consider the construction impacts upon sensitive receptors / environmental resources in terms of various environmental

topics. However, it is apparent that such sensitive receptors / environmental resources could be affected by combined or cumulative effects. For example, local residents may be affected in terms of noise, vibration, air quality and visual impact. Ecological features may be affected in terms of noise, vibration, air quality. Cumulative / combined effects could occur during scheme construction, as well as during the road's eventual operation in the short- and long-term.

3.7.59 Locations at most risk from cumulative impacts are those in close proximity to construction activities (e.g. within 100m of the works). Such properties could experience the combined impacts of visual intrusion, dust, noise and vibration. The severity of cumulative effects would be dependent upon the type of works being undertaken, the duration of the works, the distance between the works site and the sensitive location, and the visible presence of the works. The overall effect is likely to be at least as significant as the worst identified individual environmental effect. The impact assessments above highlight that a CEMP would aim to control and manage impacts associated with noise, dust and air quality.

3.7.60 Properties that are located some distance from the construction works (e.g. greater than 100m) but are considered to be severely impacted in terms of visual intrusion are less likely to experience cumulative effects caused by noise, dust or vibration.

3.7.61 During construction some sensitive ecological receptors may experience the cumulative impacts of habitat interference, in particular increased levels of noise and dust. As indicated above, such impacts would aim to be minimised through the implementation of the CEMP.

3.8 Summary

3.8.1 Construction of the A453 Widening scheme would inevitably cause a degree of disruption to local people and users of the trunk road despite the implementation of measures to minimise adverse effects. As well as effects on people, there will be impacts on the natural environment.

3.8.2 Construction of the scheme would be carefully managed to minimise disruption and, wherever possible, any impacts would be temporary and reversible, and any long-term adverse effects avoided. The Contractor for the scheme, Laing O'Rourke Infrastructure, has provided advice on construction techniques and programme which has enabled a preferred scheme to be designed, which, amongst other things, would minimise disruption during construction. A separate 'buildability' report will be prepared by the Contractor, detailing the traffic management measures necessary during construction.

3.8.3 The most significant effects are likely to be localised increases in noise and reduced air quality (from dust for example), particularly during site clearance, earthworks, bridge construction and the construction of the carriageway, and due to the daily movement of construction traffic around the works. Best practice measures including site management procedures to mitigate the effects of dust, particulate emissions and noise during construction will be incorporated. At times disruption to road users would also be significant.

3.8.4 Construction activities will create visual intrusion, some short term whilst certain activities within a part of the site are undertaken, whilst other visual impact would be for the duration of the construction period, for example due to the siting of compounds. Visual screening in the form of temporary mounds or fencing may be appropriate, but impacts on landscape, townscape and views are inevitable and could not be readily mitigated.

3.8.5 The temporary diversion of public rights of way (PROW) would cause some disturbance, although this is considered insignificant given that the A453 currently acts as a significant barrier to movements along PROW across the road which reduces the amenity value of most PROW. In some cases temporary closures may be necessary, for example on safety grounds, but would only be undertaken with the agreement of the Council Rights of Way Officers. The duration of diversion or closure would be kept to the minimum possible.

3.8.6 Construction activities also have the potential to have significant impacts upon the area's sensitive ecological, archaeological and water resources. Timely works to avoid seasonal impacts, archaeological evaluation at the start of construction, and good site practice measures, including monitoring during the construction period, would minimise the risk of damage.

3.8.7 Construction-phase environmental effects would be minimised through the definition and implementation of measures as detailed in the scheme Construction Environmental Management Plan (CEMP). An important part of this is the role of the Public Liaison Manager (PLM) who will liaise closely with the general public, landowners and others during construction, in particular to consult with residents at key stages to ensure they are fully aware of where there will be localised effects such as noise, vibration and dust. This is regarded as an important mitigation measure to reduce the level of perceived nuisance.

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