

## 6 Method of Assessment

### 6.1 Introduction

6.1.1 This chapter sets out the methodology for undertaking the Environmental Impact Assessment (EIA) for the Bank Station Capacity Upgrade (BSCU), including the process for determining the topics and issues to be included within the scope of assessment and the approach to assessing the significance of likely environmental effects.

### 6.2 General Assessment Approach

6.2.1 This Environmental Statement (ES) has been prepared to comply with the requirements of the *Transport and Works (Applications and Objections Procedure) (England and Wales) Rules 2006* (the *TWA Rules*). Where a project requires EIA, the *TWA Rules* require an assessment in accordance with *European Union EIA Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment* as amended by *Council Directives 97/11/EC, 2003/35/EC and 2009/31/EC* (and codified by *Directive 2011/92/EU*).

6.2.2 It is acknowledged that the European Commission is currently discussing and negotiating a new EIA Directive which is expected to be passed in 2014. Should this timing be met, implementation into UK Regulations is likely in 2016. Whilst this timing means that the regulations are unlikely to directly apply to the BSCU Transport and Works Act Order (TWAO) application, URS has been cognisant of the potential forthcoming regulatory changes as well as meeting extant requirements. For example, potential key EIA Directive amendments relevant to the BSCU relate to the consideration of climate change and the monitoring of environmental effects post consent. Such elements are included in the scope of this assessment.

6.2.3 In preparing the ES, the following general guidance has been considered:

- *A Guide to Transport and Works Act Procedures* (Department for Transport (DfT), 2006);
- *TWA Orders Unit – TWA Good Practice Tips for Applicants* (DfT, 2008);
- *Planning Practice Guidance* (Department for Communities and Local Government (DCLG), 2014);
- *Environmental Impact Assessment – A Guide to Procedures* (Department for Environment and Transport and the Regions (DETR), 2000);
- *Note on Environmental Impact Assessment Directive for Local Planning Authorities* (Office of the Deputy Prime Minister, 2004);

- *Preparation of Environmental Statements for Planning Projects that require Environmental Assessment – A Good Practice Guide* (Department of the Environment (DoE) 1995);
- *Design Manual for Roads and Bridges, Volume 11 (Environmental Assessment), Section 2 (Environmental Impact Assessment), Part 5 (Assessment and Management of Environmental Effects)* (Highways Agency, 2008);
- *Guidelines for Environmental Impact Assessment (Institute of Environmental Management and Assessment (IEMA) 2004); and*
- *Scoping Guidance on the Environmental Impact Assessment of Projects* (Environment Agency, 2002).

6.2.4 Topic specific guidance is referenced in the relevant chapters of the ES.

6.2.5 The assessment of each topic included in the scope of the EIA has been carried out by specialists with relevant professional expertise and experience. The specialists have been responsible for ensuring that the methods they use are appropriate and reflect best practice. The assessment process for each topic will adopt a common framework comprising the following steps:

- definition of works, activities and characteristics to be assessed;
- identification and scoping of issues;
- consultation with relevant stakeholders where required to identify key concerns and to obtain data;
- confirmation of scope;
- collection of any required baseline environmental data by research and survey;
- evaluation of appropriateness and limitations of assessment methodology (including data constraints);
- identification of resources and receptors;
- confirmation of incorporated mitigation as standard good construction practice or assumed design;
- prediction of impacts (using modelling where appropriate) and potential effects;
- evaluation of likely significant environmental effects;
- identification of any additional mitigation options and evaluation of any impacts associated with the mitigation;

- evaluation of likely residual effects assuming mitigation options are adopted;
  - consideration of any potential cumulative effects both between different topics resulting from the BSCU and with other developments; and
  - any requirements for future monitoring and wider environmental management to verify predictions and implement mitigation.
- 6.2.6 The way that each of these elements of the assessment is reported within each topic chapter of the ES is outlined in Section 6.5.
- ### 6.3 The Need for EIA and the Purpose of this ES
- 6.3.1 The *TWA Rules* require submission of ‘environmental information’ (typically considered an ES) for development which constitutes a project which is of a type mentioned in *Annex I* or *Annex II* to the *EIA Directive (European Council Directive 85/337/EEC as amended)* (the *Directive*).
- 6.3.2 The BSCU falls within the description of development which require EIA listed in *Annex II* to the *Directive*. *Paragraph 10 Infrastructure Projects* includes (g) *Tramways, elevated and underground railways, suspended lines or similar lines of a particular type, used exclusively or mainly for passenger transport*.
- 6.3.3 Given the dense urban location of the BSCU , and the potential for environmental effects, London Underground Limited (LUL) have elected to carry out an EIA to accompany the TWAO application without seeking a screening opinion from the Secretary of State (TWA Orders Unit).
- 6.3.4 The EIA has been prepared in accordance with *Rule 4(1), 11* and *Schedule 1* of the *TWA Rules*.
- 6.3.5 The online *Planning Practice Guidance* (DCLG, 2014) states that *the aim of EIA is to protect the environment by ensuring that a local planning authority when deciding whether to grant planning permission for a project, which is likely to have significant effects on the environment, does so in the full knowledge of the likely significant effects, and takes this into account in the decision making process...the aim of EIA is also to ensure that the public are given early and effective opportunities to participate in the decision making procedures*.

## 6.4 Determination of the Scope

### Background

- 6.4.1 *Schedule 1 of the TWA Rules requires the ES to include (inter alia) a description of the likely significant effects of the development on the environment. This should cover the direct effects and any indirect, secondary, cumulative, short, medium and long term, permanent and temporary, positive and negative effects of the project as well as a description of the forecasting methods used to assess the effects on the environment. Schedule 1 also identifies a number of aspects of the environment that should be considered, namely population (human), fauna, flora, soil, water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the interrelationship between the above factors.*
- 6.4.2 Environmental topics that have been considered by the EIA are judged likely, without effective mitigation, to have potential to cause significant effects. Topics that have been scoped out of the EIA are those not expected to result in significant effects.
- 6.4.3 The ES is intended to consider likely significant effects. Accidents and emergencies are, by their nature, unlikely. However, the potential for more commonplace hazards and emergencies have been included in the relevant chapters within the ES, for example:
- potential pollution of the shallow aquifer due to spillages during construction (Chapter 13: Water Resources and Flood Risk);
  - flood risk to the tunnels and platforms from the River Thames or from the water mains (Chapter 13: Water Resources and Flood Risk); and
  - risk of an explosion from Unexploded Ordnance (Chapter 14: Land Contamination).
- 6.4.4 The mitigation relating to these and other risks is set out within the Draft Code of Construction Practice CoCP (see Appendix A4.1) which also includes a section on 'Emergency Preparedness and Response' during construction.

### Process for Determining the Scope

- 6.4.5 Establishing the scope of the EIA in a rigorous and transparent manner is a key step in the assessment process. To aid understanding of the site and its surroundings and to contribute to scoping the EIA, the assessment team visited the application site and the surrounding area between August and September 2013. Previous survey work commissioned by LUL was reviewed and informed the scoping process; Table 6.1 sets out which topics or aspects of topics have been 'scoped in' and 'scoped out' of the EIA.

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- 6.4.6 The decision to scope out issues was determined where impacts would be negligible, where potential receptors would be absent or of low sensitivity, or where the pathway between impact and receptor would be absent or tenuous. These factors are accepted by the industry as the appropriate basis on which decisions to scope out issues should be made.
- 6.4.7 Consultation with the TWA Orders Unit, local planning authority, relevant statutory organisations and other stakeholders is an essential element of the scoping process. Such consultation is designed to ensure that all the issues potentially giving rise to significant effects will be addressed by the EIA.
- 6.4.8 As part of the consultation exercise, an EIA scoping opinion was sought from the TWA Orders Unit in September 2013, and was received in November 2013. A Scoping Report (provided in Appendix A1.1) was submitted as the vehicle through which a Scoping Opinion was sought. This outlined the proposed spatial and technical scope of the assessment and drew upon information obtained from desk top research, site visits, previous studies and earlier consultation undertaken or commissioned by LUL. The Scoping Report and the request for a scoping opinion were also sent to the City of London Corporation, Environment Agency, English Heritage and Natural England.
- 6.4.9 The scoping opinion received from the TWA Orders Unit and responses from the City of London Corporation, Environment Agency and English Heritage are provided in Appendix A1.2.
- 6.4.10 Appendix A1.3 tabulates the scoping opinion comments and provides LUL's responses, including reference to where any points have been addressed within this ES or reasons for their exclusion. Informed by responses to the Scoping Report, Table 6.1 summarises the final scope of the EIA, together with the main rationale for consideration of each topic. Environmental topic chapters are ordered according to a preliminary view regarding their potential for significant environmental effects.
- 6.4.11 Consultation with the public, users of Bank and Monument Stations and targeted consultation with building owners and businesses is on-going and has been conducted at various stages in the project to allow responses to be considered in the development of the scheme.
- 6.4.12 Various consultation activities, including leafleting, website, letters, public exhibitions, meeting and fact sheets have been used to communicate:
- the concept of the BSCU;
  - the project concept including the proposed southbound running tunnel alignment and main work site;
  - Over Site Development (OSD);

- the location of the second work site at Arthur Street;
- location and design of the proposed new Station Entrance Hall; and
- the proposed blockade of the Northern Line in 2020.

6.4.13 As highlighted in Chapter 5: Consideration of Alternatives, passenger preference for escalators over lifts has been incorporated into the design.

6.4.14 During development of the design, consultation with stakeholders, including English Heritage, Greater London Archaeological Advisory Services, City of London Corporation Heritage and Environmental Health Officers and the Greater London Authority has been maintained to identify and agree suitable design principles and mitigation requirements associated with the BSCU.

6.4.15 A separate consultation report summarises all consultation for the BSCU.

**Table 6.1:** Summary of the EIA Scope

Environmental Topic	Included in the EIA Scope	Rationale
Townscape and Visual Effects	Yes	The demolition of existing buildings at the Whole Block Site will result in a change to the townscape within a sensitive setting. The significance of impacts upon the townscape and visual receptors around the Whole Block and Arthur Street Sites will be assessed.
Transport and Movement	Yes	The BSCU would place demands on the local highway network, primarily during the construction phase. The development and its construction could also impact upon pedestrians, cyclists and public transport. A Transport Assessment is included as Appendix A8.1 and this informs the assessment of transport impacts within this ES.
Noise and Vibration	Yes	Construction and operation of the BSCU has the potential to result in noise and/or vibration impacts on the closest receptors.
Built Heritage	Yes	The BSCU could impact directly or on the setting of nearby designated heritage assets. Ground settlement associated with tunnelling work has the potential to directly impact built heritage assets. A built heritage assessment is therefore included within the ES.
Archaeology	Yes	The BSCU Work Sites have the potential to contain below ground archaeological remains which are considered within the assessment.

<b>Environmental Topic</b>	<b>Included in the EIA Scope</b>	<b>Rationale</b>
Air Quality	Yes	Construction of the BSCU has the potential to affect air quality through emissions to air – primarily from transport related impacts. The significance of impacts upon receptors around the BSCU Work Sites is assessed, including consideration of dust during demolition and construction.
Water Resources and Flood Risk	Yes	It is possible that the shallow aquifer and the presence of potential groundwater receptors associated with the deep aquifer could be impacted and therefore the consideration of these receptors is included in the assessment. Early scoping work dismissed the potential for flood risk from or to the BSCU Work Sites from tidal/fluviol, surface water, sewers or artificial sources. However, after further consideration of baseline conditions and potential impacts, these are now included within the scope and a Flood Risk Assessment has been included within this assessment.
Land Contamination	Yes	Development of the BSCU Work Sites has the potential to disturb any pre-existing ground contamination and open pathways for pollution. This has been considered within the scope of the EIA.
Waste	Yes	The management of construction related waste, including excavated material, could give rise to significant environmental effects. Waste arisings and methods of management will be assessed.
Socio-Economics	Yes	The BSCU has the potential to impact upon local businesses which are considered in the assessment. The operational station will also have implications for the productivity of the City of London through its relief of passenger congestion, increased patronage and the secondary effects of these on development capacity in the area.
Ecology	No	Baseline survey work has identified almost no ecological potential within or close to the BSCU Work Sites and therefore no scope for the project to result in significant ecological effects, positive or negative. Ecology is therefore scoped out of the EIA.
Daylight, Sunlight, Overshadowing and microclimate (local wind) effects	No	The new station entrance consists of a single storey structure within what will later be an OSD. It is therefore not considered likely that the BSCU will result in any permanent significant adverse daylight, sunlight, overshadowing or wind effects and these topics are therefore scoped out of this EIA.
Electromagnetic Compatibility (EMC)	No	The construction method and project characteristics, such as the depth of the running tunnels, combined with design according to European, UK Regulations and LUL standards, obviates the risk of significant environmental effects and unintended electromagnetic interference during construction and operation. Electromagnetic compatibility is therefore scoped out of this EIA.

- 6.4.16 In addition to the assessments included within the scope of the ES as described in Table 6.1, additional work has been undertaken and is appended to the ES as follows:
- **Health Impact Assessment:** The Mayor of London is under an obligation to promote the health of Londoners and to take into account the effect of his policies on the health of London's population. As part of the Greater London Authority (GLA) agencies, TfL is supporting the delivery of these obligations. A health impact assessment has therefore been undertaken for the BSCU to consider the opportunities to enhance public health and reduce health inequalities during the design and consent processes for the BSCU. The assessment is included in Appendix A6.1.
  - **Sustainability Statement:** A sustainability statement has been undertaken for the BSCU which examines the project against the national, regional and local policies, the client's objectives and the Mayor's Essential and Preferred Standards as set out in the GLA *Sustainable Design and Construction Supplementary Planning Guidance*. The statement also includes the results of a CEEQUAL preliminary assessment. The statement is included in Appendix A6.2.
  - **Energy Statement:** An energy statement has been undertaken for the BSCU which outlines the proposed energy strategy for the project in line with *The London Plan 2011*. In compliance with GLA policies, this estimates the achievable energy and carbon dioxide emissions savings associated with the BSCU. The statement is included in Appendix A6.3.

### **Spatial Scope**

- 6.4.17 The environmental topic chapters within this ES describe the rationale for determining the general or specific area within which the assessment is focussed. Study areas vary depending on the nature of the impacts and the locations of the resources and receptors that are potentially affected. Where there was uncertainty in relation to certain design parameters, maximum/minimum limits were defined to allow for a realistic worst case assessment. This is explained further within the relevant topic chapters.

### **Temporal Scope: Baseline and Assessment Years**

- 6.4.18 The assessment addressed environmental impacts of the BSCU at key stages in its life cycle. These are compared to the situation prevailing before the construction of the BSCU has commenced (i.e. the current baseline), and if relevant, to a future situation that would prevail without the BSCU (i.e. the projected future baseline).

6.4.19 The 'current baseline year' is taken as 2013 since this is the period in which the majority of baseline work was undertaken. In some cases other current baseline years have been used and this is explained (e.g. where a particular baseline survey occurs in 2014 or where data from the public record is utilised which may only be available for previous years). Assessment years that are considered where appropriate include:

1. current baseline (2013);
2. future baseline in the absence of development (where relevant), 2016/17 when demolition and construction work would commence;
3. demolition within Whole Block Site (2016/17);
4. construction of the BSCU (2016–2021); and
5. commencement of operation of the BSCU (2021).

6.4.20 It is expected that construction of an OSD is likely to be undertaken between 2021/22 and 2023/25 (commencement within one year of completion of the BSCU, however, assessments have also considered a potential overlap in works of up to one year).

6.4.21 The future baseline, which is defined for certain topics, is the theoretical situation that would exist in the absence of the development. It is typically based upon extrapolating the current baseline forward using data on prevailing changes (e.g. traffic growth over time).

## 6.5 Structure of Assessment Chapters

6.5.1 For ease of reference, the assessment of each topic in the ES will be presented within a common chapter structure as follows:

- Introduction;
- Legislative and Planning Policy Context;
- Assessment Methodology;
- Baseline Conditions;
- Incorporated Mitigation;
- Assessment of Effects;
- Mitigation Options;
- Residual Effects;
- Inter-relationships and Cumulative Effects;
- Assumptions and Limitations; and
- Conclusions.

## 6.6 Assessment of Effects and Defining Significance

6.6.1 EIA assesses environmental effects on resources and receptors, which for this assessment are defined as follows:

- resources are defined as bio-physical features or items of ‘environmental capital’; examples include listed buildings, aquifers, access routes, and community facilities.
- receptors comprise human beings, either individually or as defined groups, and the socio-economic systems on which they depend; for example, residents, employees, communities and economies.

6.6.2 For consistency and in an attempt to allow comparison between topics, the methodology described in this section will be applied where appropriate. Notable amongst the exceptions to this are the assessment of air quality which is assessed in terms of the predicted concentrations of key emissions to air; noise and vibration impacts which are assessed according to British Standards; and transport which utilises criteria established for comparable transport schemes such as Crossrail. Assessment of ground contamination additionally integrates consideration of risk (likelihood and severity of impacts).

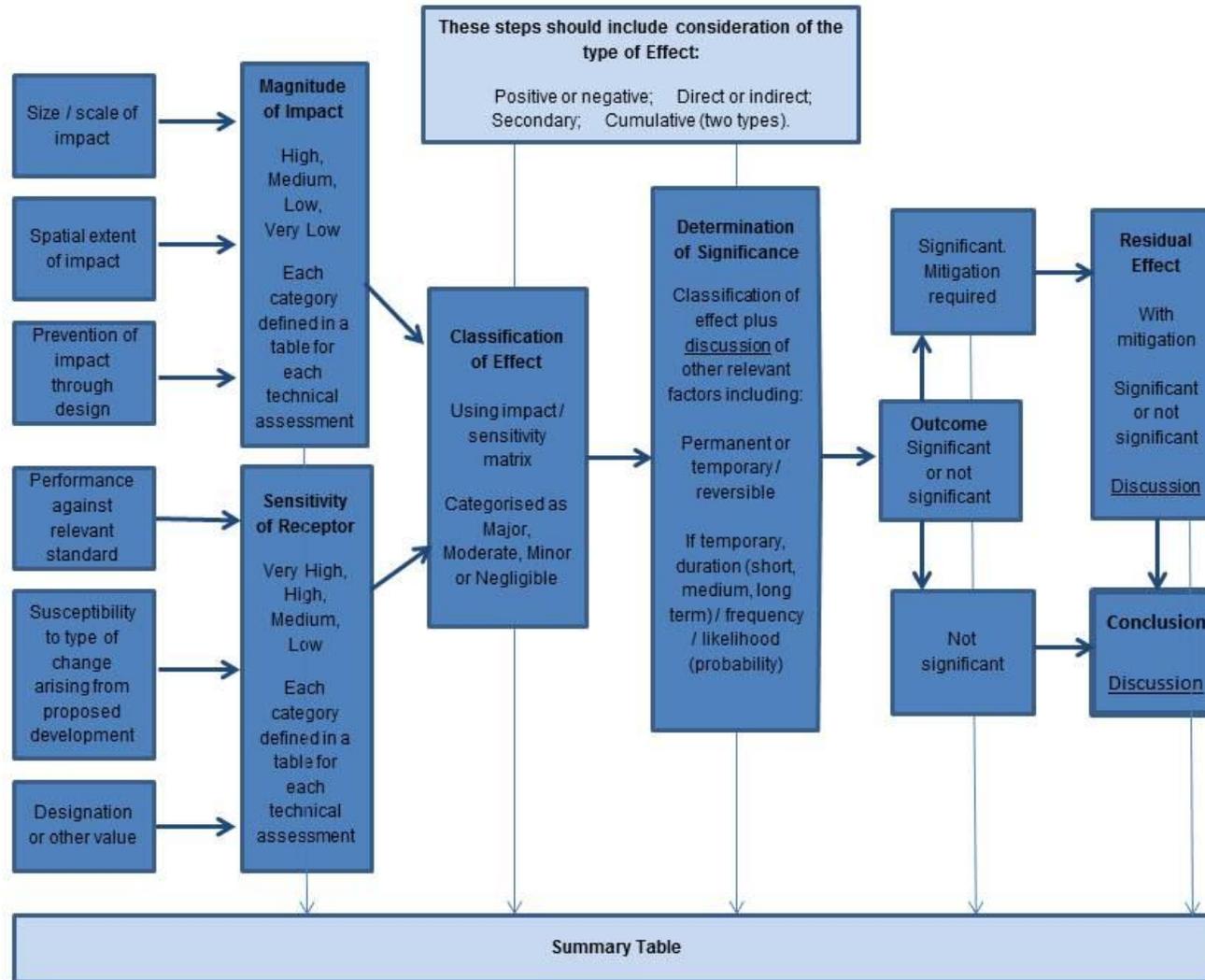
6.6.3 It should be noted that in the context of this assessment and the general methodology utilised, the terms impact and effect are distinctly different. The *TWA Rules* require that an assessment of project environmental impacts is provided; however, the impacts of the BSCU may or may not result in significant effects on the environment. For example, a loud noise impact in an entirely commercial area during the night is unlikely to result in a significant environmental effect as no receptors are present to hear it. Furthermore, it is an assessment of *effects* that is required by *Rule 11* and *Schedule 1* of the *TWA Rules*. In this regard, an impact is broadly defined as a change in the environment, whereas an effect is the implication of that change for the resources and receptors that experience it.

6.6.4 The methodology followed by most assessment chapters is designed to consider whether impacts from the project would have an effect on any resources or receptors. Assessments broadly consider the magnitude of impacts (classified as high to very low) and sensitivity of resources/receptors (classified as very high to low) that could be affected in order to classify effects according to the categories shown in Table 6.2, but the assessment process considers a number of factors as illustrated in Figure 6.1.

6.6.5 If applicable, the ways that environmental effects have been prevented or reduced through design or through standard working practices (during construction or demolition) are described within the ‘Incorporated Mitigation’ section of chapters and are considered as part of initial assessment. The mitigation measures to be applied during construction are set out within the

draft CoCP (see Appendix A4.1). These measures have been adopted as part of the design and EIA process (addressed in topic chapters under the Incorporated Mitigation section). However, it is important that mitigation or enhancement measures are dealt with transparently in the assessment process in order that the effectiveness of such measures is clear. Therefore, the effectiveness of designed-in or standard working practices is reported briefly where appropriate.

**Figure 6.1: EIA Assessment Methodology**



- 6.6.6 The definition of environmental effect from negligible to major (as shown in Table 6.2) is applied for most topics (exceptions are set out where relevant). The generic definitions of these terms is shown in Table 6.3.

**Table 6.2: Classification of Effects**

Sensitivity of Receptor	Magnitude of Impact			
	High	Medium	Low	Very Low
Very High	Major	Major	Moderate	Moderate
High	Major	Moderate	Moderate	Minor
Medium	Moderate	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible

**Table 6.3: Effect Definitions**

Effect	Criteria
Major	These effects may represent key factors in the decision making process. Potentially associated with sites and features of national importance or likely to be important considerations at a regional or district scale. Major effects may relate to resources or features which are unique and which, if lost, cannot be replaced or relocated. This would be considered a significant effect.
Moderate	These effects, if adverse, while important at a local scale, are not likely to be key decision making issues. Nevertheless, the cumulative effects of such issues may lead to an increase in the overall effects on a particular area or on a particular resource. This is likely to be considered significant, although a judgement needs to be applied.
Minor	These effects may be raised as local issues but are unlikely to be of importance in the decision making process. They may be of relevance in the detailed design of the project, but are unlikely to be considered significant.
Negligible	Effects which are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error. These are not considered to be significant.

- 6.6.7 Following the classification of effects using this methodology, further consideration of whether an effect is significant and requires mitigation is carried out using professional judgement, but taking account of:
- the positive or negative nature of the effect;
  - whether the effect is permanent or temporary;
  - the duration/frequency of the effect;
  - the likelihood of the effect;
  - whether the effect is direct, i.e. arising from activities that form an integral part of the project, or indirect, for example effects caused elsewhere, e.g. by the Northern Line blockade during construction; and
  - any secondary effects (where one environmental impact of the project gives rise to others, such as generated traffic causing noise and the consequential effects of this).
- 6.6.8 If mitigation is proposed, the residual effect taking account of that mitigation has been categorised using the same system. The final stage of the assessment has considered whether residual effects are likely and significant.

## 6.7 Mitigating Adverse Effects

- 6.7.1 *Schedule 1 of the TWA Rules* states that an EIA should include: *a description of the measures envisaged to prevent, reduce and where possible remedy any significant adverse effects on the environment.*
- 6.7.2 The EIA process provides the opportunity for likely significant environmental effects to be determined at an early stage in the formulation of development proposals, for the design to be developed to reduce or eliminate undesirable environmental effects, and where elimination is not possible, for mitigation measures to be incorporated to reduce undesirable environmental effects.
- 6.7.3 Mitigation measures can be applied through the consideration of alternatives, physical design, provision of specific control equipment, project management or operation and other means.
- 6.7.4 The fundamental aim of mitigation is to reduce impacts which result in adverse environmental effects. Following mitigation any remaining effect is referred to as the residual effect.

## 6.8 Inter-relationships and Cumulative Effects

- 6.8.1 As required by *Schedule 1 of the TWA Rules*, the EIA also considers cumulative effects. Whilst the technical chapters will address the environmental effects of the BSCU for each environmental discipline, it is also important to consider how these effects may combine with one another (inter-

relationships) and with those of other proposed development projects in the vicinity (cumulative effects).

6.8.2 To fully define the terms:

- 'inter-relationships' occur where individual (possibly non-significant) environmental effects of the BSCU have the potential to act in combination and lead to significant effects; and
- 'cumulative effects' arise as a result of the BSCU in combination with other large scale developments in the vicinity of the BSCU.

6.8.3 Inter-relationships and cumulative effects are considered within Chapter 17: Inter-relationships and Cumulative Effects and within relevant topic chapters.

6.8.4 The assessment of cumulative effects requires information regarding other major developments which have been identified through consultation with the local planning authority and other relevant authorities. Based on the advice of *Advice Note Nine: Rochdale Envelope (Version 2)* (Planning Inspectorate, April 2012), developments have been considered for inclusion as part of the cumulative effects assessments on the basis that they are either:

1. *under construction;*
2. *permitted application(s), but not yet implemented;*
3. *submitted application(s), not yet determined;*
4. *identified in the relevant development plan (and emerging development plans – with appropriate weight being given as they move closer to adoption) recognising that much information on any relevant proposals will be limited, or*
5. *identified in other plans and programmes (as appropriate) which set the framework for future development consents/approvals, where such development is reasonably likely to come forward.*

6.8.5 Information regarding nearby developments (including the OSD) has been incorporated within the chapters on a topic by topic basis but are also discussed in Chapter 17: Inter-relationships and Cumulative Effects.