

VOLUME 4
CUMULATIVE IMPACT ASSESSMENT

JULY 2010



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1 BACKGROUND

1.1 Introduction

- 1.1.1 The information presented in this Environmental Appraisal (**Volumes 2 and 3**) has identified a number of potential environmental impacts that are either specifically related to the proposed new nuclear power station build at Hinkley Point (see **Volume 2** of the Environmental Appraisal) or with the individual elements of the Off-site Associated Development (**Volume 3** of the Environmental Appraisal).
- 1.1.2 The purpose of this Volume is to deal with the issue of cumulative impacts and to inform consultees on the proposed methodology in respect of such potential impacts from the Hinkley Point C site (**Volume 2**), the Associated Development (**Volume 3**), and other relevant development. It explains the methodology and describes the current assessment of such cumulative effects, upon which further work is being undertaken. The consultation responses at Stage 1 of the pre-application consultation included a number of comments as to the need for the assessment of cumulative effects and in particular of in-combination effects with other relevant projects, and that consultation with stakeholders should discuss the consideration of cumulative and in-combination effects. **Volume 4** seeks to respond to these points to the extent possible on the basis of information currently available.
- 1.1.3 The potential for cumulative effects to arise has been considered throughout the project design and evaluation process (see **Sections 4 and 5** below). Generally it can be stated that through the application of measures to either avoid or minimise potentially significant and adverse environmental impacts at the project level that the potential for any further accumulation of impact with other plans or projects is also reduced or avoided. Thus, ratings considered to be of negligible-minor significance for the impacts described and detailed in the technical chapters of **Volumes 2 and 3** of the Environmental Appraisal could also suggest that, for these impacts, the potential for further cumulative impact as a result of the development would be limited. However, it is important to be aware that in some instances (e.g. where several developments may affect the same receptor) that the additive or interactive effect of individually small-scale impacts on a resource may lead to thresholds being breached (e.g. noise levels) or processes being disturbed beyond a critical point. Hence it cannot be assumed that a negligible-minor impact identified in the relevant technical chapter will not have a more significant effect when assessed on a cumulative basis.
- 1.1.4 At this stage in the pre-application process some of the individual Project impacts have not yet been fully resolved due to either further definition of design elements being required and/or data not being fully available. Where this is the case, this has been highlighted in the relevant sections of the technical chapters in **Volumes 2 and 3** of the Environmental Appraisal. As a consequence, the cumulative assessment has to allow for potential uncertainties in the elaboration of some of the impacts. The same is true of other potentially relevant projects, which may not be at a stage where their details and potential impacts can fully be understood and assessed. The appraisal presented here for consultation is, therefore, of a provisional nature and will be subject to further development prior to finalisation of the environmental statement.
- 1.1.5 It is also important to ensure that the comments and views that will be gained through the Stage 2 consultation process on the appraisal process undertaken to date are fully taken into

account in the ultimate cumulative effects assessment. Issues and comments raised during the consultation process may affect the individual impact ratings currently defined, raise new issues/effects that require assessment, and/or provide further views on the assessment process itself and its methodology.

- 1.1.6 This Volume therefore sets out the overall approach that is being taken with regard to the cumulative assessment process and provides detail on specific steps in the process (e.g. definition of other plans or projects that may need to be considered in the assessment). It goes on to provide the current assessment of cumulative impacts based on the current state of knowledge and on available information.
- 1.1.7 The scale and complexity of the HPC development requires that cumulative assessment is undertaken at a number of levels in order to ensure that impacts are fully assessed across all components of the project and for the project as a whole. This approach is explained in the sections below.

1.2 Legislation and Guidance

- 1.2.1 There is no legislation that specifically applies to cumulative assessment or outlines how such assessment should be undertaken. However, the EC Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment and the amendment (11/97/EC) requires that EIA is carried out for certain types of major projects which are judged likely to have significant environmental effects. The EIA Directive requires consideration of the direct impacts and of any indirect, secondary and cumulative effects of a project.
- 1.2.2 The EIA Directive is implemented in the UK through the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 ("EIA Regulations"). Schedule 4, Part 1 of the EIA Regulations lists the information that must be included in an Environmental Statement, which includes, at paragraph 20:

"A description of the likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long term, permanent and temporary, positive and negative effects of the development"
- 1.2.3 Government guidance (Ref. 1.1) states that: "cumulative effects could refer to the combined effects of different development activities within the vicinity".
- 1.2.4 The EIA Regulations do not define 'cumulative', but guidance on cumulative effects assessment is provided in a number of 'good practice' documents (e.g. European Commission guidance (1999) (Ref. 1.2)).
- 1.2.5 This guidance has been utilised in framing and developing the approach to cumulative assessment for the HPC development, and will continue to be utilised for completion of this work up until submission of the full ES for the DCO application. The guidance is however not prescriptive, but rather suggests various approaches which may be used, depending on their suitability to the project. Various of the techniques referred to within it have been deployed, for example expert opinion, consultation, modelling, spatial analysis, carrying capacity analysis (e.g. transport assessment) and matrices to provide a visual summary of the conclusions.



References

Ref. 1.1 Department of Environment (1999). Circular 02/99. Environmental Impact Assessment: A Guide to Good Practice and Procedures.

Ref. 1.2 European Commission (1999). Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions.



2 APPROACH TO CUMULATIVE ASSESSMENT

2.1 Introduction

- 2.1.1 The assessment of cumulative impacts and impact interactions is an iterative process, and is essentially similar in approach to that used in the project specific assessment process.
- 2.1.2 Cumulative impacts can be broadly defined as additive or interactive. Additive impacts are those in which change in an environmental parameter (receptor) may be added to (or subtracted from) another change. Many small effects on one sensitive receptor could add up to a significant overall effect even if individually they are insignificant. Typically, additive impacts occur when different facets or activities within a project or between projects act upon the same environmental receptor (e.g. the additive impact of noise from different sources upon local residences, for example noise from piling activities during the construction phase plus transport related noise). Interactive impacts are assessed in relation to a specific receptor, but here the impact would be caused by the interactions of effects from different activities even if individually these effects are insignificant (e.g. the interaction of noise disturbance and light pollution on bat foraging). Cumulative impacts can also have an effect in terms of the overall temporal impact, scale of impact and/or spatial impact.
- 2.1.3 Of particular importance in defining the likely cumulative effects of the Project are the following aspects, all of which are important in deriving the overall cumulative impact significance:
- the temporal and geographic boundaries of the effects of individual project activities;
 - the interactions between the relevant activities and the overall environment/ecosystem;
 - the environmental effects of the Project, and past and future (proposed) projects and activities; and
 - the thresholds of sensitivity of the existing environment.
- 2.1.4 In taking account of the above aspects, there are also a number of further considerations that need to be applied in the assessment process. These considerations are:
- the definition of boundaries of potentially affected resources should be accurate in order to ensure that the temporal and spatial boundaries of effects can be set;
 - for any other project or activity that is defined and which has the potential for interaction with the temporal and spatial boundary(ies) identified for the effects of the Project, but for which no cumulative impact is identified, an adequate description of that project or activity is included and the reasons for the lack of any cumulative impacts are discussed so as to enable the decision to be understood; and
 - for the marine and coastal ecosystem, spatial boundaries are defined with due consideration of natural hydrological and coastal processes as project-related effects on these processes may be widely propagated.
- 2.1.5 The temporal boundary for the assessment includes existing projects, where impacts are still occurring or where mitigation measures are still operating (unless the effects of these projects already effectively form part of the existing environmental baseline conditions), present plans/projects in the course of development, and reasonable foreseeable future plans/projects in which there could be temporal or spatial overlap.



- 2.1.6 The timescale for the HPC development and its subsequent operation is set out in **Volume 2, Chapter 3** of the Environmental Appraisal and this provides the temporal framework within which other plans and projects need to be considered.
- 2.1.7 With regard to spatial extent, the focus for the assessment is the HPC site nuclear build and all of the Associated Development and therefore the spatial extent of the appraisal is based upon the maximum likely extent of potential impacts arising from the Project, as identified in **Volumes 2 and 3** of the Environmental Appraisal.

2.2 Methodology

- 2.2.1 Given the range of activities likely to occur, the number of locations in which development is proposed and the timescale over which the HPC development is to be constructed and operated, it is apparent that the determination of cumulative effects is not a simple affair. Potentially, cumulative effects may occur at a number of levels as briefly set out in the following paragraphs.
- 2.2.2 **Project component** effects are the effects specifically with regard to the development of the HPC site and for the various aspects of the Associated Developments, taking each separately. Different aspects of each type of development may themselves have additive or interactive effects. These effects are described and assessed in the environmental topic assessments within **Volumes 2 and 3** of the Environmental Appraisal and are not repeated or considered here other than as a consideration of the cumulative effect assessment for the assessment of the local effects (see section 2.2.3).
- 2.2.3 **Local** cumulative effects (see **Chapter 3**) are the additive and interactive effects that may occur between other relevant plans and projects and individually for the HPC site and/or any of the Associated Development proposals. This part of the cumulative assessment requires that each component of the Associated Development and the HPC site is assessed individually with reference to other plans and or projects that have the potential to affect or interact with the same parameters temporally and spatially.
- 2.2.4 The main reason for taking this local approach to the determination of cumulative effects, rather than assessing other local plans and projects at a whole development level (i.e. the HPC site + Associated Development), is that it enables potential in combination effects that may be important at an individual Associated Development level to be recognised and managed rather than being subsumed into the much larger and wider project. Moreover, since the various components of the Associated Development are spatially separated, each will be capable of having different cumulative effects depending on the projects at local level which have the potential to add to or interact with the effects of these components. As an example, the Project may have the potential for significant cumulative socio-economic impacts at a wide/regional level (e.g. with the proposed new build nuclear station at Oldbury). However, a park and ride scheme at Williton would not have such an interaction, but could have a significant cumulative effect with a proposed housing development in the local area, which would not necessarily be relevant at the project level if cumulative assessment were undertaken solely at the project scale. For traffic/transport, this interactive/additive assessment will already have been undertaken, as the traffic generating implications of committed development has been built into the forecasting and associated traffic modelling work. For those cumulative impacts which operate at the local level as opposed to the overall Project level, it appears more transparent to assess them at the individual Associated Development stage, rather than at the overall Project stage, and as such more consistent with the European Commission Guidance.

- 2.2.5 The list of plans and projects that have been considered for assessment at this local level are set out in Appendix A and initial information on the likely environmental effects of these further plans and projects is provided in Appendix B.
- 2.2.6 **Project** cumulative effects (see **Chapter 4**) are the total effects of the main site with the Associated Development acting together (additive or interactive). This part of the cumulative assessment combines the individual impacts for each of the project locations and assesses the total effect on relevant receptors for the development as a whole. So, for instance, the combined effects of the main site build + Combwich Wharf on the marine environment would be assessed in this section. Where appropriate, the assessment is undertaken firstly for a spatial grouping of project components (e.g. Cannington infrastructure) where it is apparent that a number of developments may have a greater/combined impact than the sum of their individual components suggests, and then the outcome of this spatial grouping has been used in the combined assessment.
- 2.2.7 For some of the environmental parameters, notably socio-economics and transport this full scheme assessment will already have been undertaken, as far as possible, and is reported upon in **Volume 2** of the Environmental Appraisal. A summary of the way in which cumulative effects have been considered for these parameters is included in **Chapter 5** of this Volume.
- 2.2.8 And finally, the **wider scheme** cumulative effects (see **Chapter 5**) are the effects of the ‘full-scheme’ together with the effects that may occur or are occurring with other developments or plans in the wider area. For some environmental parameters, these cumulative effects have already been taken into account in the appraisal process. As an example, the traffic flows predicted for committed development are built into the traffic modelling used in the assessment for the Project. The range of parameters for which this cumulative element is included are briefly discussed in **Chapter 5**. The projects for which this wider scheme cumulative assessment are undertaken have been derived from a number of sources, including consultation, but have been selected on their basis to potentially interact with the same environmental receptors that the Hinkley C project may affect. An obvious example of such potential is the proposed National Grid project to upgrade the 440Kv electricity transmission line coming into the Hinkley Point power station complex. The process for selecting relevant plans and projects and details of those selected for this phase in the assessment process is described below.
- 2.2.9 To facilitate the assessment process described above, tables and matrices, standard tools in cumulative impact assessment, are used to both summarise the assessment outcomes (as derived from **Volumes 2 and 3**) and to facilitate the cumulative assessment process. Due to the complexity of the process as set out above, particularly the need to assess impacts for the Off-site Associated Development at a local level, the cumulative assessment is both quantitative and qualitative in approach and expert judgement has been used throughout the process. Where this is the case, a clear description of the logic used in determining the cumulative effect is provided.



3 'LOCAL' CUMULATIVE EFFECTS

3.1 Introduction

- 3.1.1 This section examines the local cumulative effects between other relevant plans and projects and the individual components of the HPC development (i.e. the HPC site and the Associated Developments). Each infrastructure component is assessed with reference to other plans and/or projects which have the potential to affect the same parameters temporally and spatially.
- 3.1.2 Potential cumulative effects with other projects of regional and strategic importance are considered at the wider scheme level (see below) in order to deal with the differing scale elements of the HPC development. This stage in the process focuses on determining whether there are any cumulative effects in relation to the immediate surroundings of each of the infrastructure components.

3.2 Methodology

- 3.2.1 The following steps comprise this stage of the cumulative assessment:
- 3.2.2 **Stage 1:** this consists of a screening stage where specific projects within proximity to each of the HPC development components are identified using available information (e.g. strategic plans, consultation with relevant authorities, responses already provided via the IPC scoping response). For the purposes of this cumulative assessment it has been determined that relevant projects are:
- developments in the surrounding area with planning permission and for which environmental assessment and/or EIA has been undertaken (i.e. they have been or are considered likely to have a significant effect upon the environment); and
 - developments which are allocated in local land use plans, sufficiently advanced and for which it is considered that a potential environmental interaction (taking into account the potential for spatial overlap) with one or more of the proposed HPC development components could occur.
- 3.2.3 **Stage 2:** Following the screening exercise, scoping of the selected projects from the screening stage are analysed to determine the environmental resources and parameters that could potentially interact and overlap with the individual components of the Associated Development. An appraisal of the nature and likelihood of any cumulative impact is undertaken, based upon the information contained within the documentation available for the selected projects and the information provided in the Environmental Appraisal.
- 3.2.4 **Stage 3:** This stage comprises the determination of any potential change in impact significance that may result through interaction. This component of the assessment, for the majority of subject parameters, is a qualitative assessment and does not involve quantitative assessment other than for those environmental parameters where such assessment has been undertaken as part of the work for the Environmental Appraisal (e.g. transport assessment which takes into account traffic generated by committed development).

3.3 Relevant plans and projects

- 3.3.1 Plans and policies at a local level whose influence extends around the HPC development sites are referred to, where relevant, in **Volume 2** for the main site and **Volume 3** for the Off-site Associated Development. These plans include:
- Somerset & Exmoor Structure Plan 1991-2011.
 - Somerset Transport Plan (2006-2011).
 - The Sustainable Community Strategy for Somerset (2008-2026).
 - Somerset Local Area Agreement (2008-2011).
 - Sedgemoor District Local Plan (1991-2011).
 - Sedgemoor District Community Strategy (March 2006).
 - Sedgemoor Local Development Framework Core Strategy Preferred Options (2009).
 - Bridgwater Vision (July 2009).
 - West Somerset District Local Plan (Adopted 2006).
 - West Somerset Core Strategy Options Paper (January 2010).
- 3.3.2 In addition specific searches for developments that could interact with the individual sites have been made via the local authorities' Planning Portals.
- 3.3.3 Examination of these relevant materials identified a number of developments that were considered to have the potential for interaction with the Project. Invariably, these identified sites are ones for which information is available, and, in line with the adopted criteria, ones for which EIA has been undertaken (or for which significant environmental issues have been identified). While plans may delineate specific areas for development within proximity to the Project, it is generally not possible to determine the potential pathways and criteria by which these defined sites could interact. This is largely due to the fact that for areas of development allocation no specific schemes are defined and therefore cumulative assessment at this level is not feasible.
- 3.3.4 Developments that have been screened as part of the cumulative assessment process for this local stage in the assessment are presented in Appendix A.
- 3.3.5 The projects/developments that were, through this analysis considered appropriate for further analysis and assessment of potential cumulative impacts are shown in Table 3.1.
- 3.3.6 It should be noted that a search of the planning portal for developments (from 2006 onwards) in West Somerset in proximity to the main HPC station revealed no extant permissions or applications that would be considered likely to have any cumulative effect with the HPC site. The HPC site is therefore not included any further in this 'local' stage of the cumulative assessment.



Table 3.1. Screened projects for consideration of cumulative impacts with HPC Off-site Associated Development sites

Project	HPC development component							
	BRI-A	BRI - C	J23	J24	CAN-A	CAN - Bypass	Combwich	Williton
Hallam Masterplan	✓	✓	✓					
Housing development (125 house at Hamp Industrial Estate	✓	✓						
Housing development (53 houses), Monmouth Street, Bridgwater.	✓	✓						
East Bridgwater community school	✓	✓						
Energy skills centre, Bridgwater	✓	✓						
Food packaging and storage facility, Bridgwater	✓	✓						
Hospital, East Bower, Bridgwater	✓	✓						
Chilton Trinity Secondary School	✓	✓						
Colley Lane, southern access road				✓				
Extension to Castle Hill Quarry, Cannington					✓	✓	✓	
Replacement care home, Bridge st, Williton								✓

- 3.3.7 As can be seen from the screening results in Table 3.1, it is apparent that the majority of the proposed projects that could interact with the Associated Development are located in Bridgwater. Only one project for each of the Associated Development locations at Cannington, Comwich, J24 and Williton were identified. Further information on the potential effects of these projects for a range of environmental parameters is provided in Appendix B.

3.4 Assessment of cumulative effects

- 3.4.1 The assessment of the potential interactions between the selected projects and the individual Off-site Associated Development sites has to take account of :

- predicted significance of impacts for a range of parameters for each site;
- temporal overlap during construction and operation; and
- potential process interactions between sites (e.g. hydrological connectivity).

- 3.4.2 The following sections provide a summary of likely interactions and cumulative effects for each of the Associated Development proposals and the identified projects that could potentially interact with them.

Bridgwater Campuses – (BRI-A and BRI-C) and Junction 23

- 3.4.3 These three sites are treated together given their location on the north-eastern side of Bridgwater and potential spatial connections with other identified projects in the area that could potentially interact with them.

- 3.4.4 Impacts associated with the construction and operation of these three sites could potentially interact and combine with those of a number of other planned projects in the Bridgwater area. Of the projects identified from the screening process and listed in Appendix B, it is the proposed residential and commercial developments set out in the Hallam Masterplan that are of greatest consequence. The majority of the other identified projects are either of a relatively small-scale (e.g. housing development at Monmouth street) or sufficiently distant from the sites (e.g. housing development at Hamp Industrial Estate, Chilton Trinity Secondary School) that the potential for interaction is limited. This is not to say that there would not be some cumulative effects if all of these developments were progressed simultaneously or in rapid succession. However, these effects would probably be limited to transport related issues and possibly some acoustic disturbance during construction. As the majority of sites are either brownfield or comprise replacement infrastructure, effects on ecology, landscape and heritage would all be expected to be negligible. Control measures that could be employed during construction would be expected to ensure that transport and noise impacts could be managed to achieve environmentally acceptable levels.

- 3.4.5 With regard to the Hallam Masterplan, one of the Associated Development sites (BRI-A) lies within the footprint of the proposed development area, while BRI-C lies some 500m to the south and J23 is 500m to the north of the nearest proposed residential development. If the proposals set out in the Masterplan were to proceed at the same time as the Associated Development sites in this area then potentially there could be temporary noise impacts during construction on any sensitive receptors in the area, although much of the surrounding land is either undeveloped or in light commercial use. Again, timing and control of noise generating activities would be expected to help reduce the potential for cumulative noise levels. Given the scale of development proposed in the Hallam Masterplan it is likely that, if project works did coincide, that the impacts associated with the Masterplan development would predominate as set out in Appendix B.



- 3.4.6 With the combined development of the Hallam Masterplan and the Associated Development, there could be beneficial effects with regard to ecology, socio-economics and recreation and amenity as the quality of resources and facilities within the areas to be developed would be enhanced during the operational phases, particularly as a result of the Hallam development. In terms of duration of effect, it should also be considered that the legacy component of the Associated Development would be in operation and be likely to coincide with the main operational phase of the Hallam development, which again would be likely to deliver overall benefit for socio-economic interests.

M5 Junction 24

- 3.4.7 The Colley Lane access road proposal is the only scheme that could potentially interact with the works at J24. The distance between the sites (the Colley Lane site is approximately 1km to the north of J24), however suggests that the potential for significant interaction is extremely limited. The works at Colley Lane were also deemed as not requiring an environmental impact assessment, although a detailed analysis of potential noise impact and an archaeological assessment have been undertaken by the developer. It is anticipated that any small-scale impacts associated with the Colley Lane works could be managed through the use of appropriate mitigation measures and good practice during construction. Overall it is considered that there would be a **negligible** cumulative impact between the two sites.

Cannington bypass and park and ride

- 3.4.8 Based on the information available on the Castle Hill Quarry extension (see Appendix B) it is not anticipated that these works would significantly interact with those of the proposed bypass and the park and ride to alter the predicted impact significances for these two elements of Associated Development. A **negligible** cumulative effect is therefore predicted.

Combwich Wharf

- 3.4.9 The Combwich Wharf works are considered to be sufficiently distant from the proposed extension of the Castle Hill quarry that no significant cumulative effects would be likely to occur. An overall **negligible** cumulative effect is therefore predicted.

Williton park and ride

- 3.4.10 The only identified project with which potential cumulative effects could occur is the replacement of a care home facility some 300m to the east of the WIL-A site. It is considered, largely on the basis that the care home site is relatively small and a brownfield site that the potential for significant cumulative effects is extremely limited and the impact ratings as identified for WIL-A would remain as predicted. If the two projects were to be constructed at the same time, potentially the combined effect could give rise to an increase in noise levels. The construction phase for the care home is likely to be relatively short and given the distance between the two locations the potential for an increase in the predicted noise impact of WIL-A alone (i.e. through interaction) would be unlikely to be manifested. An overall **negligible** cumulative effect is therefore predicted.



4 HINKLEY POINT C PROJECT CUMULATIVE EFFECTS

4.1 Introduction

4.1.1 This section presents an initial view of the ‘total’ cumulative effects that could be predicted to occur for the Project as a whole. The full scheme effects therefore combine the individual impacts for each part of the Associated Development and the HPC site across the relevant environmental parameters.

4.2 Methodology

4.2.1 The methodology for assessing the full scheme cumulative effects is based upon examination of the predicted impacts determined for each environmental resource and parameter at each of the project sites (i.e. HPC site and Associated Development) taking into account any cumulative effect determined through the ‘local’ effects.

4.2.2 This aspect of the assessment identifies whether the environmental resource or parameters under consideration are likely to be linked by physical processes (e.g. development sites that are located within the same catchment and which may have a cumulative effect on water quality) or spatially for the same parameter (e.g. similar habitat types but at different locations). Using this identification of the strength of the interaction between sites on physical processes, receptors affected, or parameter affected, the magnitude of the effect on the resource can be determined and the significance of the impact identified. Given the nature of the process, the assessment is by necessity qualitative.

4.2.3 Determining the likely level of impact that could occur in combination between the various project components has to take into account a number of factors. These are:

- predicted significance of impacts for a range of parameters for each development site;
- proximity between development sites and potential for spatial overlap;
- temporal overlap during construction and operation; and
- process linkages (e.g. hydrology) between sites.

4.2.4 Taking each of the above in turn allows a picture to be built up of the potential linkages between the individual project components and the likely strength of these linkages in influencing the overall level of impact significance at the project level.

4.3 Appraisal of cumulative effects

Significance of impacts at individual sites

4.3.1 A summary of the predicted significance of each of the project components on the range of environmental parameters is provided in Tables 4.1-4.2 for the construction and operational phases of the HPC development. It should be noted that the significance rating assigned is reflective of the total impact of the development component on the receptor and not individual and specific effects on the receptor. This approach is taken in order to enable the cumulative



assessment to be progressed without getting bogged down in the large number of permutations that could result if all effects were taken into account between all of the individual sites. A judgement has therefore been made on the overall significance of impact which is based upon consideration of duration of effect, magnitude and scale in the context of the importance/sensitivity of the receptor. This requires a qualitative assessment of likely overall effect using expert judgment to balance the influence of different potential effects in each case. Where it is unclear at the present time how effects may potentially interact then the highest assessed significance rating for all effects on each receptor at each site has been adopted. This is a precautionary approach, and also takes into account the uncertainties associated with some of the impact assessment work.

Spatial connections between sites

- 4.3.2 The project components are spread across a fairly wide area although within this area some sites are relatively close and therefore potentially may possess greater connectivity with regard to environmental parameters. Clearly the potential for spatial interaction is largely related to proximity, but is also strongly linked to the magnitude of the effect on the receptor in question and potential physical and other environmental process linkages. So, the spatial extent of influence between sites may vary on a parameter by parameter basis. Having said this, it is apparent that some of the development sites are more likely to offer the potential for interaction. The groupings where this potential for interaction and overlap of effects can be identified are set out in Table 4.3. This Table provides an indication for each of the sites where interactions are considered unlikely (marked by an X) and for those sites where some interaction may occur, then the parameter is highlighted.

Temporal interactions between sites

- 4.3.3 From a temporal perspective, Figure 4.1 provides an overview of the potential overlap between the construction and operational phases for all of the project components. This clearly demonstrates that the likely magnitude of effect across the wider project area would vary over time. It is apparent that construction work for the Associated Development sites would largely be complete by the time that the first foundation works are scheduled for the HPC site and that construction of all Associated Development would be completed approximately 4 years prior to when operation of HPC begins.
- 4.3.4 This timeline complicates direct comparison of effects between the construction and operational phases of the HPC site and the Associated Development as the Associated Development sites will be operational during construction of the HPC site and many will have ceased operation and be in legacy use or restored when HPC is fully operational. Although from a temporal perspective this issue appears to introduce significant complexity into the determination of cumulative effects across the Project, in reality, the majority of effects would be unlikely to manifest due to the spatial separation between the sites. This aspect is taken into consideration in the summary of overall effects for each parameter given in the next section.
- 4.3.5 The timeline also demonstrates that the potential for the temporal interaction of impacts would not occur during construction for BRI-A and BRI-C and between BRI-A and J23 and J24.

Figure 4.1. Generalised timeline for implementation of the Hinkley Point C Project

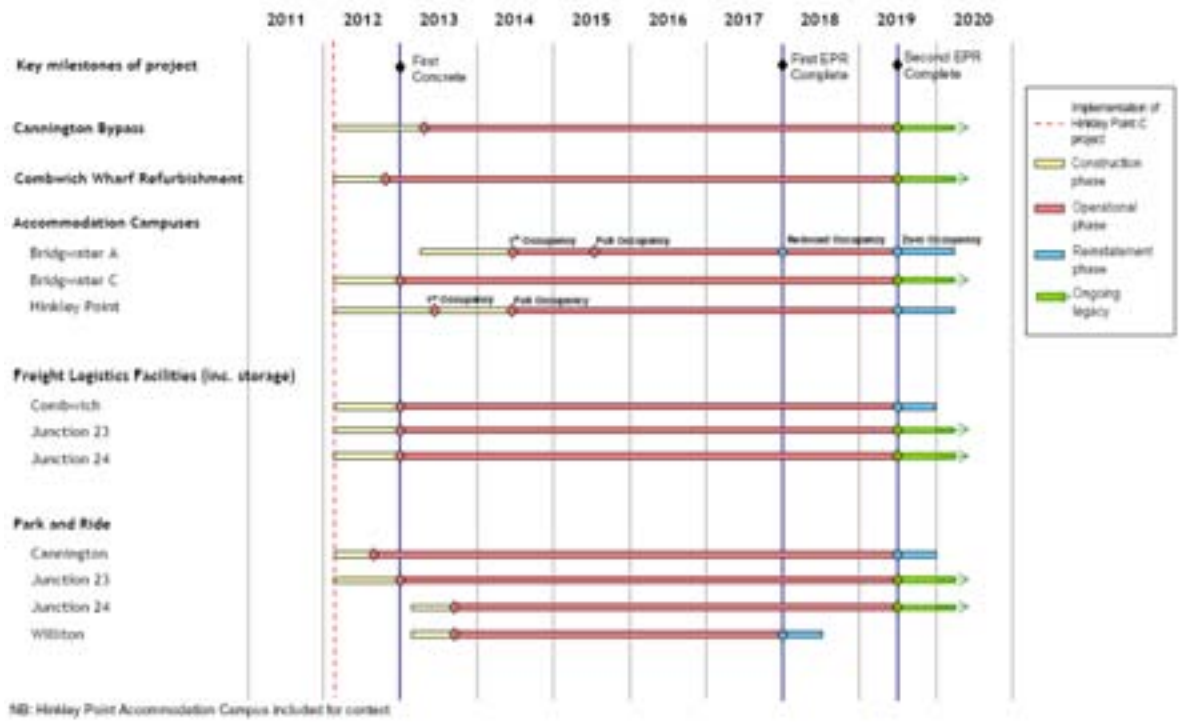


Table 4.1. Predicted impact significance rating on individual environmental parameters and all HPC development components during construction

Parameter	Development component									
	BRI-A	BRI-C	J23	J24	CAN-A	CAN - Bypass	Combwich	Williton		
Socio-economics	Minor benefit	Minor benefit	Neutral effect	Neutral effect	Neutral effect	Neutral effect	Neutral effect	Neutral effect		
Transport	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse		
Noise and vibration	Minor adverse	Minor adverse	Minor adverse	Minor adverse	Minor adverse	Moderate adverse (locally)	Moderate adverse (wharf)	Minor to moderate adverse		
Air quality	Minor adverse	Minor adverse	Negligible adverse	Minor adverse	Negligible adverse	Minor adverse	Minor adverse	Minor adverse		
Soils and land use	No impact	No impact	Negligible adverse	Moderate adverse	Minor adverse	Minor adverse	Minor adverse	Minor adverse		
Geology and Contaminated land	Minor adverse	Minor adverse	Minor adverse	Minor adverse	Minor adverse	Minor adverse	Minor adverse	Minor adverse		
Groundwater	Minor adverse	Minor adverse	Negligible adverse	Negligible adverse	Negligible adverse	Minor adverse	Negligible adverse	Negligible adverse		

Parameter		Development component									
Surface water	Minor adverse	Minor adverse	Minor adverse	Minor adverse	Minor adverse	Minor adverse	Minor adverse	Minor adverse	Minor adverse	Minor adverse	Minor adverse
Hydrodynamics	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Terrestrial ecology	Negligible adverse	Negligible adverse	Minor adverse	Minor adverse	Minor adverse	Minor adverse	Minor adverse	Minor adverse	Minor adverse	Minor adverse	Minor adverse
Marine ecology	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Marine water quality	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Radiological	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed
Landscape and visual	Moderate adverse	Moderate adverse	Moderate to minor adverse	Moderate to minor adverse	Moderate to minor adverse	Moderate to minor adverse	Moderate to minor adverse	Moderate to minor adverse	Moderate to minor adverse	Moderate to minor adverse	Moderate to minor adverse
Historic environment	Minor adverse	No impact	Minor adverse (TBC)	Minor adverse (TBC)	Minor adverse (TBC)	Minor adverse (TBC)	Minor adverse (TBC)	Minor adverse (TBC)	Minor adverse (TBC)	Minor to moderate adverse (TBC)	Minor to moderate adverse (TBC)
Offshore and intertidal archaeology	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Amenity and recreation	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse	Minor adverse (TBC)	Negligible adverse
Marine activities	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not assessed	N/A



Table 4.2. Predicted impact significance rating on individual environmental parameters and all HPC development components during construction

Parameter	Development component									
	BRI-A	BRI-C	J23	J24	CAN-A	CAN - Bypass	Combwich	Williton		
Socio-economics	Minor benefit	Minor benefit	Negligible benefit	Negligible benefit	Negligible benefit	No impact	Neutral effect	Negligible benefit		
Transport	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse		
Noise and vibration	Minor adverse	Minor adverse	Minor adverse	Minor adverse	Minor adverse	Moderate adverse - not permanent	Moderate adverse – wharf use	Minor adverse		
Air quality	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse		
Soils and land use	No impact	No impact	No impact	No impact	No impact	Minor adverse	Minor adverse	Minor adverse		
Geology and Contaminated land	Minor adverse	Minor adverse	No impact	No impact	No impact	Minor adverse	No impact	No impact		
Groundwater	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse	Minor adverse	Negligible adverse	Negligible adverse		
Surface water	No impact	No impact	Negligible	Negligible	Negligible	Negligible	Minor adverse	Negligible		

4. Hinkley Point C Project Cumulative Effects

Parameter	Development component									
			adverse	adverse	adverse	adverse	adverse	adverse	adverse	adverse
Hydrodynamics	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Minor adverse	N/A
Terrestrial ecology	Negligible adverse	No impact	Minor adverse	Minor adverse	Minor adverse	Minor adverse	Negligible adverse	Minor adverse	Minor adverse	Minor adverse
Marine ecology	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Minor adverse	N/A
Marine water quality	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Minor adverse	N/A
Radiological	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Landscape and visual	Moderate to minor benefit	Moderate to minor benefit	Minor adverse	Minor benefit	Moderate to minor adverse	Minor adverse	Minor adverse	Minor adverse	Moderate to minor adverse	Moderate to minor adverse
Historic environment	Minor adverse	No impact	Minor adverse	Minor adverse	Minor adverse	Minor adverse	TBC	Moderate adverse (TBC)	Minor to moderate adverse (TBC)	Minor to moderate adverse (TBC)
Offshore and intertidal archaeology	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not assessed	N/A	N/A
Amenity and recreation	No impact	Negligible adverse	Minor adverse	Minor adverse	Negligible adverse	Minor adverse (TBC)	Minor adverse (TBC)	Minor adverse (TBC)	Negligible adverse	Negligible adverse
Marine activities	Minor benefit	Minor benefit	Negligible benefit	Negligible benefit	Negligible benefit	Negligible benefit	No impact	Neutral effect	Negligible benefit	Negligible benefit

Table 4.3. Potential for spatial interactions between HPC development components with identified environmental parameters where it is considered that a spatial interaction (rather than through direct overlap or via a process pathway) exists during the project construction phase.

	HPC main site	BRI-A	BRI-C	J23	J24	CAN - Park and ride	CAN - bypass	Comblinch	Williton
HPC main site	X	X	X	X	X	Transport	Transport	Marine ecology Terrestrial ecology (birds) Hydrodynamics Marine activities	X
BRI - A	X	X	Noise and air quality	Transport	X	X	X	Hydrology	X
BRI - C	X	Noise and air quality	X	X	X	X	X	X	X
J23	X	Transport	X	X	X	X	X	Hydrology	X
J24	X	X	X	X	X	X	X	X	X

4. Hinkley Point C Project Cumulative Effects

	HPC main site	BRI-A	BRI-C	j23	j24	CAN – Park and ride	CAN - bypass	Combwich	Williton
CAN – Park and ride	Transport	X	X	X	X	X	Transport Noise and air quality Hydrology Visual/landscape	Hydrology	X
CAN – bypass	Transport	X	X	X	X	Transport Noise and air quality Hydrology Visual/landscape	X	Hydrology	X
Combwich	Marine ecology Terrestrial ecology (birds) Hydrodynamics Marine activities	X	X	Hydrology	X	Hydrology	Hydrology	X	X
Williton	X	X	X	X	X	X	X	X	X



Table 4.4 Potential for spatial interactions between HPC development components with identified environmental parameters where it is considered that a spatial interaction (rather than through direct overlap or via a process pathway) exists during operation of Associated Development sites and construction of the HPC site.

	HPC main site	BRI-A	BRI-C	J23	J24	CAN - Park and ride	CAN - bypass	Combwich	Williton
HPC main site	X	X	X	X	X	X	X	Marine ecology Terrestrial ecology (birds) Hydrodynamics Marine activities	X
BRI - A	X	X	Amenity and recreation	X	X	X	X	Hydrology	X
BRI - C	X	Amenity and recreation	X	X	X	X	X	X	X
J23	X	X	X	X	X	X	X	Hydrology	X
J24	X	X	X	X	X	X	X	X	X

4. Hinkley Point C Project Cumulative Effects

	HPC main site	BRI-A	BRI-C	J23	J24	CAN – Park and ride	CAN - bypass	Combwich	Williton
CAN – Park and ride	X	X	X	X	X	X	Noise and air quality Hydrology Visual/landscape	Hydrology	X
CAN – bypass	X	X	X	X	X	Noise and air quality Hydrology Visual/landscape	Hydrology	Hydrology	X
Combwich	Marine ecology Terrestrial ecology (birds) Hydrodynamics Marine activities	X	X	Hydrology	X	Hydrology	Hydrology	X	X
Williton	X	X	X	X	X	X	X	X	X



4.4 Cumulative assessment of interactions between sites and for the project as a whole

4.4.1 Taking the above spatial and temporal aspects into account, the following sections provide a summary of the predicted cumulative effects that may occur for all of the environmental parameters. As mentioned previously, by necessity this is a qualitative judgement and, at this stage, is preliminary with regard to the conclusions reached.

Socio-economics

4.4.2 The socio-economic effects of the Project are considered and assessed in **Chapter 8 of Volume 2** of the Environmental Appraisal. This assessment work sets out the socio-economic effects of the Project as a whole and includes assessment in relation to the following aspects:

- demographic change;
- direct and indirect employment change;
- local expenditure effects;
- wider economic effects;
- accommodation pressures and development;
- pressures on local social conditions and associated services (e.g. education; health; crime; travel); and
- other less tangible socio-cultural change: eg quality of life; community character/cohesion; distributional effects

4.4.3 The initial conclusions of the socio-economic assessment work, as presented in **Volume 2**, are summarised in Table 4.5. It is apparent that the Project as a whole, including the Associated Development, provides significant economic benefits and while there are some potential pressures on local social resources that could result from development, these could be offset through appropriate measures, including the Associated Development proposals themselves.

Table 4.5 Indicative socio-economic impacts assessment summary - with mitigation and enhancement measures

Impact type	Construction stage	Operational stage
<i>Demographic change</i> : changes in local population level and mix (eg age /gender)	large influx of predominantly male workforce population, 30-55 age range impacts mitigated through distributed accommodation campuses and other services provision (transport, health etc) Moderate (neutral)	smaller numbers, younger age group often with young families, but still substantial and with above average skills/ well paid, and long term presence; new blood in ageing communities Slight (+ve)
<i>direct and indirect employment change</i> ; changes in employment structure; local unemployment levels etc	generally very positive, with strong local recruitment and training policies/measures, and associated skill development; some limited loss of labour from other local employers/ local	as above—and as for construction, on a smaller scale, but with long term employment stability and high quality employment local employment benefits from

Impact type	Construction stage	Operational stage
	wage inflation Major (+ve)	recruitment and training initiatives Moderate (+ve)
<i>expenditure effects</i> ; use of local contractors; workers expenditure; multiplier effects etc	generally positive, with package of local procurement policies Moderate (+ve)	as for construction, but on a smaller basis, and longer term stability local procurement benefits from procurement strategy Slight/Moderate (+ve)
<i>wider economic effects</i> ; potential effects on key economic sectors (eg construction and tourism, and on the development potential of the area).	potential boost for some key sectors support for development of local high /tech and knowledge economy; local benefits from training and procurement/supply chain strategies Moderate (+ve)	as for construction, but on a smaller basis and longer term stability local benefits from training and procurement/supply chain strategies Moderate/Slight (+ve)
<i>accommodation pressures and development</i> ; changes in both the temporary and permanent local accommodation market	pressure on accommodation markets mitigated by associated campus etc provision. legacy benefits. mixed issue for tourism, but mitigation measures should reduce any negative impacts. Moderate (+ve); Minor (neutral)-- tourism	considerable legacy benefits of improved accommodation from construction stage boost to local owner occupation market Slight/Moderate (+ve)
<i>pressure on local social conditions and associated services</i> ; for example on health and local medical services; crime and policing; education and schools.	re health—appropriate measures (eg site Medical Centre, plus any GP surgery support) should mitigate health services impacts re education----may be beneficial in some cases –eg maintaining local school rolls. Slight (neutral)	may help to maintain services in local area and in more rural areas Slight (+ve)



Transport

- 4.4.4 The Transport Appraisal and Environmental Appraisal (**Chapter 9 in Volume 2**), provide a detailed description and reporting of the analysis undertaken for calculating development traffic flows and the criteria used for considering significance of impact of the environmental effects of the changes in traffic flows, including the Associated Development proposals.
- 4.4.5 Construction-related movement of people and materials associated with the HPC site and the Associated Development sites will occur at varying intensities for the duration of the nine year construction period. The most intensive year for movement associated with the project is projected to be 2016; this is the year when the construction work-force associated with the HPC site is projected to peak. All of the Off-site Associated Development sites are to be constructed in the period 2011 – 2014.
- 4.4.6 The TA sets out the trip generation during the construction and operational phases in terms of the number of trips by mode and summarises the trip distribution and assignment for the workforce. It also details freight movements during the construction peak and the operational phase for both typical and outage operation. The trip generation, distribution and assignment calculations have informed the forecast traffic flows which have been used in the appraisal.
- 4.4.7 The Associated Development build phasing indicates that there would be construction traffic associated with all sites (with the exception of the J24 and Williton P&R sites) using the Bridgwater (and possible strategic) highway network during 2012. The TA includes information on the estimated material quantities that will be required to construct the proposed development at the Associated Development sites and the estimated HGV movements for the peak quarters by year. In terms of HGV movements for the entire project, the TA indicates that there are 2 peaks for HGV movements 2012 - 2013 and 2015-2016 so for 4 years there is likely to be a relatively constant background level of HGV demand, with peaks on the highway network during those years. This is expected to result in an average of approximately 200 HGVs per direction during the entire 4-year period.
- 4.4.8 On the basis of the forecast trip generation, traffic flows and capacity of the network it is considered that the cumulative traffic attraction of the Associated Development sites' construction can be accommodated on the network. The development sites are reasonably dispersed geographically and traffic volumes associated with construction are low and will be on the highway network for a finite period. The low level of construction traffic in the context of background traffic flows would not materially affect the operational performance of the highway network. Construction related deliveries often occur in the inter-peak period of general demand conditions on the highway network and mitigation strategies could be implemented (e.g routing agreements, time restrictions on HGV arrival/departure profiles promoting an off-peak movement strategy) if so required in order to minimise any potential disruption.

Noise and vibration

- 4.4.9 Generally it can be stated that noise effects during both construction and operation would be confined to the immediate area of the project sites. Potentially, a cumulative effect would only be predicted for those sites within 1km of each other, and only then if noise levels generated at the individual sites were significant. Clearly, there is also very limited scope for interaction if the phasing of works would mean that noise generating activities (which would generally be at their most significant during construction) would be temporally separated.
- 4.4.10 Taking the above factors into account it is considered unlikely that there would be any cumulative noise effect, except potentially during development of the park and ride and CAN-A and the Cannington bypass. The construction works for the developments at BRI-A and BRI-C are scheduled to occur separately and would therefore not have the potential to interact during

construction. The potential for cumulative operational noise effects for these elements of the development are considered in **Chapter 3 of Volume 3** and overall the potential impact is considered of **minor adverse** significance.

- 4.4.11 Consideration has been given to the potential combined effects of the operation of the Cannington bypass and CAN-A in the noise modelling and assessment work (see **Chapter 4 Volume 3**) and therefore the derived impacts (**moderate-major adverse** for some receptors) reflect the cumulative situation for these sites.

Air quality

- 4.4.12 The cumulative air quality impacts would arise at sensitive receptor locations from the in-combination releases and dispersion from both on-site and off-site traffic exhaust emission sources.
- 4.4.13 In the construction phase, the main site preparation work activities and the seven associated Off-site Associated Development sites will each generate air pollutant emissions, including fugitive releases of construction dust and fine particulate, and direct vehicular exhaust emissions from the park-and-ride facilities, HGV haul-routes and on-site plant and machinery.
- 4.4.14 However, such emissions tend to potentially affect receptors in close proximity to their respective source. In the case of the main site, the maximum impacts were predicted at Doggetts, but the impact would be for a short period at the start of the accommodation campus construction which would include the establishment of an earth bund between the property and the development. At the Associated Development sites, the worst-case impacts would be at those residential properties adjacent to roadsides or the facilities themselves. Those impacts over various phases of the construction activities will be experienced at locations within the villages of Williton and Cannington, and the town of Bridgwater, as well as sites close to the M5 motorway junction works. It is very unlikely therefore that local air pollutant emissions will combine over such distances and that any significant cumulative impact would arise. The in-combination air quality impacts of the construction phase would therefore be **negligible**.
- 4.4.15 Operational impacts on ambient air quality will be less significant than those of the construction phase. Some of the Associated Development sites are to be provided only for construction facilities and will be decommissioned with the localities re-instated. The main site emission sources relate to process emissions, which were screened out from detailed dispersion modelling as they were considered insignificant. Releases during testing and operation of the emergency standby facilities for the HPC site were modelled and any air quality impacts would be experienced at receptors close to the site.
- 4.4.16 In respect of vehicular emissions, detailed modelling and assessment of operational traffic has yet to be completed. The potential cumulative effects of this aspect of the project will be reported upon in the ES that accompanies the DCO Application.

Soils and land use

- 4.4.17 The effect of the loss of agricultural grade land would cumulate across all of the Project sites. The individual losses across all sites add up to approximately 170ha of temporary (i.e. prior to reinstatement) loss of lower quality (Grade 3b or less) and approximately 34 ha of permanent loss of Grades 1, 2 and 3a land. Much of the temporary loss would result from land take at the HPC site during the construction phase. Restoration works planned at the HPC site and the Associated Development sites (those not being proposed for legacy use) would result in either the return of some of this land to agricultural use or for habitat creation purposes. This is taken into account in the individual assessments in **Volumes 2 and 3** of the appraisal. Although, there would be a resultant loss of agricultural land following restoration (particularly at the HPC site)



within the wider context of all agricultural land in Somerset these losses are considered of minor adverse significance at worst.

- 4.4.18 The permanent loss of land of higher agricultural value (Grade 1-3a) would be of greater significance. However, again when considered at the wider level such a loss would, based on the data presented in Chapter 12 of **Volume 2** of the Environmental Appraisal, constitute a small loss (less than 0.1%) of valuable agricultural land within Somerset. This is considered to represent an impact of **minor adverse** significance.

Geology and contaminated land

- 4.4.19 Any effects on these parameters would be confined to the immediate vicinities of the individual development sites. There is no scope for interaction between the sites or for a cumulative effect at the wider level. The impact significance ratings applied to each site are therefore considered to represent the Project situation.

Groundwater

- 4.4.20 Cumulative effects on groundwater could result from a situation where sites are located on the same aquifer and for which significant effects on groundwater have been identified via which an interaction could occur. As summarised in Tables 4.1 and 4.2, the predicted impacts on groundwater during construction and operation of the development components are largely of **negligible** significance with some impacts rated as of **minor adverse** significance during construction. This applies to the BRI-A and BRI-C sites which, given their proximity to each other, might be expected to offer the greatest potential for a cumulative effect to occur. However, although located within the same aquifer, the impact of construction and operation at these sites would be unlikely to have an influence outside of the immediate vicinity of the sites and therefore give rise to a combined effect. At worst, therefore, for these two sites the cumulative effect is considered to be of **minor adverse** significance and for all other sites the impact significance predicted alone would remain.

Surface water

- 4.4.21 Hydrologically, the Associated Development sites at Cannington, Combwich, BRI-A and J23 are all within the catchment for the River Parrett. Potentially, during both construction and operation there could be cumulative effects on water quality within this part of the Parrett catchment. For these sites the potential impact on surface water has been determined as **minor adverse** (during construction) and **negligible** during operation (apart from Combwich Wharf, which is considered to be **minor adverse**). Given these predicted significance ratings and the fact that dilution of any adverse water quality derived from a site would be likely to be relatively rapid, the potential for effects to combine is considered to be extremely low and a cumulative effect of greater than **minor adverse** at the catchment level would not be expected.

Hydrodynamics

- 4.4.22 This parameter is only of relevance to any potential interactions between the construction and operation works at Combwich and the HPC site. At both sites the effects of development on hydrodynamic processes are considered to be localised and very limited in magnitude. While, both sites may potentially be hydrodynamically linked, due to the significant distance between the locations, the dynamic nature of the system and the difference in processes that operate at both locations the potential for the propagation of effect and interaction is considered non-existent. No project-wide cumulative effect is therefore predicted and the effects on hydrodynamics would be confined to the vicinity of the two sites.

Terrestrial ecology (including coastal birds)

- 4.4.23 Potential cumulative effects on terrestrial ecological interests could arise through a number of mechanisms such as disruption to habitat corridors and disturbance at sites that may affect the same species populations.
- 4.4.24 Of particular concern is the effect that the Project may have with regard to coastal birds that may form part of the designated populations of the Severn Estuary SPA and Ramsar site. Potentially the works at the HPC site and Comwich Wharf, both of which lie adjacent to the Severn Estuary SPA could cause disturbance to these populations as works could be ongoing at the same time.
- 4.4.25 The River Parrett at Comwich is a relatively narrow channel with no immediate roosting potential for birds close by. At high water there is no exposed mud, and this (probably) combined with its proximity to the village of Comwich results in very few birds roosting on this stretch of the river. At mid and low tide, feeding birds along a 2km stretch of the river up and downstream of Comwich Wharf typically include redshank (1-20) and very small numbers of greenshank (1-2 birds). Other species that are occasionally recorded in this area include shelduck and wigeon, but these species range up and down the Parrett, and occur in far larger numbers and far more consistently further downstream. Any disturbance generated during construction work at Comwich would therefore be likely to result in only local displacement of small numbers of redshank and greenshank. It should also be borne in mind that disturbance to any birds using this stretch of the Parrett is likely to occur on a regular basis due to the activities of walkers and their dogs along this stretch of the Parrett.
- 4.4.26 The works along the HPC site frontage (construction and operation of the temporary jetty and construction of the seawall) may lead to some disturbance effects. Here the bird species likely to be affected would be ringed plover (on passage) and small numbers of curlew and shelduck. Displacement of any birds disturbed during construction could occur, but the presence of extensive areas of foreshore to the west that would remain free of activity suggests that this effect would not be significant.
- 4.4.27 Together the Cannington bypass and park and ride scheme could combine to have a greater impact upon ecological interests, particularly at the southern end of the bypass route. However, it is not anticipated that the significance ratings applied to the bypass scheme in isolation with regard to protected species and disruption to habitat corridors would, cumulatively be any greater than that already predicted.
- 4.4.28 The Associated Development sites in and around Bridgwater are all located on sites with limited ecological interests. It is not considered that they form part of any ecological corridors or habitat resources that may be used by specific species populations. Given their limited scale and the fact that mitigation (such as the retention of hedgerows) would be put in place to address any protected species issues, it is unlikely that there will be any resulting in-combination effects between these sites.

Marine ecology

- 4.4.29 The only two sites where the potential for interaction could occur are the HPC main site and Comwich Wharf. The marine/coastal habitats at these two sites are quite different, with rocky foreshore and offshore mixed fine-coarse sediments predominating at the HPC frontage and consolidated estuarine muds predominating at Comwich. The marine fauna and flora at both sites are therefore also of difference. There would, therefore be no combined effect with regard to the same habitat types as a result of development. There would, at the estuary level, be a combined effect of disturbance to habitats during construction, but given the temporary nature



of this effect the cumulative effect would not be considered to be greater than that already predicted for both sites in isolation. Similarly, it is not anticipated that the combined small-scale nature of habitat loss as a result of construction and operation at both sites would lead to a greater impact rating than that already predicted.

Marine water quality

- 4.4.30 The water quality issue associated with thermal plume during operation of the HPC power station would occur outside of the construction and main operational stages of the Wharf (although the wharf would continue to be used for occasional deliveries during the operation of HPC). The potential for a cumulative effect at this stage is therefore considered highly unlikely and the effects of the plume would remain those that are predicted for the HPC site.
- 4.4.31 The small scale nature of any changes in water quality during construction at the HPC site and Comwich would be highly unlikely to combine given the distance between the locations and the dynamic conditions that are inherent in the estuarine and coastal system.

Radiological

- 4.4.32 Any radiological effects would be confined to the operational and decommissioning stages at the HPC site and therefore the potential for interaction does not exist. The appraisal provided for the HPC site therefore represents the overall impact for the Project as a whole.

Landscape and visual

- 4.4.33 Although for each Associated Development site moderate adverse effects are predicted with respect to this parameter during the construction and operational phases, these effects largely relate to disturbance of viewpoints rather than alteration of the landscape character. In the context of disturbance to viewpoints, the highest levels of impact occur in locations closest to development site. Hence, these impacts are considered to be local and would not combine to cause a cumulative visual impact to arise.
- 4.4.34 Even where viewpoints coincide between the Cannington park and ride site and the proposed bypass, because disturbance from the park and ride is not predicted to be significant, a cumulative visual effect would not arise. Similarly, although the bypass (and to a lesser degree the park and ride) would affect the tranquillity of the landscape to the west and south of Cannington, because the park and ride site is enclosed a **minor adverse** effect is predicted in this case. Hence, if a cumulative effect was to arise, it would be no greater than the **minor to moderate adverse** affect predicted for the bypass and would be limited in time to the use of the park and ride site.
- 4.4.35 With respect to landscape character generally, minor to moderate adverse impacts are predicted (with the exception of the Bridgwater sites, where the landscape character will improve once the construction phase has been completed). In general these effects will be restricted to the locality of the development site and hence, aside from the effects of lighting, a cumulative effect of more significance than the effects predicted locally is not expected to arise. However, albeit that lighting effects will be minimised, they are expected to be visible (in all cases) in some longer distance views from elevated areas of the Quantock Hills AONB and in some cases the Lowland Hills. This will have a cumulative effect during the construction and operational phases of the Associated Development sites. However, the magnitude of this effect is expected to be low and, consequently, a **minor adverse** cumulative impact is expected to arise during this phase of the works.
- 4.4.36 Significantly, once the reinstatement of the Associated Development sites occurs (where applicable) **moderate to minor beneficial** impacts are predicted with respect to both viewpoints and landscape character as a result of landscaping and the maturation of planting; and it is this phase that would coincide with the operational phase of HPC. Hence a significant cumulative

impact would not occur at this point and the landscape and visual impact of the project would effectively be confined to the localised effects of the Cannington bypass, which would remain in place, and the local and wider effects of the HPC site (see **Chapter 21** of the Environmental Appraisal for further information).

Historic environment

- 4.4.37 The cumulative impacts that could occur to the historic environment resource are predominantly focused on the resource as a whole, as there is only one area where a specific heritage asset is affected by more than one Associated Development site, namely Cannington Hillfort Scheduled Monument. The setting of this site would be affected by the Cannington Bypass and by the Freight Logistics Facility at Combwich. However, given the relative proximity of the bypass to the site compared to the freight facility the scale of the intrusion on the setting of the Scheduled Monument is effectively limited to that of the bypass, representing no additional cumulative impact.
- 4.4.38 In terms of the historic environment resource as a whole, cumulative losses to heritage assets could occur from excavation and the disturbance to the visual setting of the Scheduled Monuments and Listed Buildings. However, given the additive nature of this impact and the 'individual' nature of the heritage assets (in that the heritage assets affected are in general heritage assets with limited connection to those surrounding them), the overall cumulative impact on the historic environment resource would remain as the impact identified individually for each heritage asset within the OAD site assessments.
- 4.4.39 The conclusion therefore is that the cumulative effect would be **negligible**.

Offshore and intertidal archaeology

- 4.4.40 The potential for interaction and cumulative effect only applies to the HPC site and Combwich Wharf. Given the disparate locations and settings of these sites it is not anticipated that a cumulative effect would arise as any archaeological interest would be site specific. The predicted impact ratings therefore remain.

Amenity and recreation

- 4.4.41 The spatial separation of development sites does not lead to any interaction between existing amenity and recreation functions (i.e. there is no amenity and recreational function that connects the sites). The predicted impacts for each site therefore prevail and no cumulative effects are predicted.

Marine activities

- 4.4.42 Given the locations of the works at the HPC site and Combwich Wharf, marine activities would be unlikely to interact to any degree on different sections of the Severn Estuary frontage. Appropriate management measures can be put in place to deal with the increase in vessel traffic along the HPC site frontage during construction (e.g. construction of cooling water system and temporary jetty and use of the temporary jetty) and the construction and use of the facilities at Combwich Wharf. Such measures could include the use of dedicated marker buoys and other navigational aids. With these measures in place it is not anticipated that there would be additional impact to those already identified for the individual sites and a **negligible** cumulative impact is therefore predicted.



5 WIDER PROJECT CUMULATIVE EFFECTS

5.1 Introduction

- 5.1.1 The next step in the process is the comparison and assessment at the “whole project” level of those effects likely to arise in association with other relevant projects in the wider (regional) area.
- 5.1.2 The cumulative assessment process described in previous sections enables impacts that could potentially arise as a result of the development and operation of the full HPC project to be determined. The project effects essentially contain an element of cumulative assessment as the effects of distinct activities as well as the potential influence of other local projects have been incorporated into the overall significance ratings for individual impacts.
- 5.1.3 This stage allows the potential effects of the whole Project to be assessed with those that could interact with other projects in the wider area (local projects have already been integrated into the assessment process) as explained in **Section 3** above.
- 5.1.4 At this level of assessment, the use of expert judgement in the process becomes of greater significance. This is due to the need to make judgements regarding potential interactions and their magnitude for projects which may have been assessed using different techniques, or for a differing array and/or grouping of parameters. Information on the environmental issues may also be unavailable or at an early stage in preparation.
- 5.1.5 Allowances therefore have to be made in the assessment process and the outcomes of the process are generally of a subjective nature. However, the process does allow potentially significant interactions to be identified and these can then be further defined and assessed in order to determine the level of significance. If cumulative effects of significance are identified it may be possible to put in place adequate measures at the project level in order to address any significant adverse impacts. If this is not appropriate then wider measures may be required that involve various parties working together to ensure that significant cumulative effects can be managed to prevent or reduce environmental harm.

5.2 Methodology

- 5.2.1 The process for this stage is as follows:
- screening - identification of projects likely to act cumulatively with the HPC development;
 - scoping - identification of key effects on the environment associated with the selected projects;
 - assessment – determination of likely interactions between projects (based on consideration of receptors) and assessment of potential impact significance; and
 - residual analysis – determine whether any change in the significance ratings as a result of the cumulative assessment would require alteration of proposed mitigation measures.
- 5.2.2 At this stage in the overall assessment process, the screening and initial scoping stages have been undertaken and are described below. The assessment phase has taken account of the outputs from the project cumulative assessment work described in the previous section. However, given both uncertainties associated with some of the individual projects (see below)

and elements of the HPC Project, the cumulative assessment is of an indicative nature. The comments and views that will be gained during the Stage 2 consultation process regarding both the list of selected projects chosen for the cumulative assessment and the robustness of the conclusions reached on the impact assessment work as presented in the Environmental Appraisal will assist in refining the conclusions reached by the cumulative assessment.

5.3 Identification of Relevant Projects

5.3.1 The list of relevant projects for consideration at the screening stage has been derived from:

- understanding of the key effects of the HPC development on the environment (e.g. spatial and temporal extent of effects);
- potential plans and projects identified in the draft National Policy Statement for Nuclear Power Generation (NPS);
- potential projects identified by consultees as part of the environmental scoping exercise undertaken by the IPC for the HPC development; and
- information gained during informal consultation undertaken as part of the assessment process to date (e.g. via meetings with relevant stakeholders such as West Somerset Council, Natural England, Countryside Council for Wales and the Environment Agency).

Projects identified in the NPS

5.3.2 As part of the process of preparing the NPS individual reports setting out sustainability issues (Assessment of Sustainability, Ref 5.1) were produced for the sites identified through the Strategic Siting Assessment. With regard to Hinkley Point, in the AoS it is stated that:

“Interactions and cumulative effects can occur between the plan or proposal being appraised and other key plans and policies. This AoS identified the other relevant plans and programmes with sustainability objectives that need to be considered.”

5.3.3 The key plans that might have significant interactions with cumulative effects for the Nuclear NPS and Hinkley Point were identified as follows:

- draft Regional Spatial Strategy for the South West 2006-2026, South West Regional Assembly (2007 - 2008);
- draft River Basin Management Plans (South West, Wales, Severn), Environment Agency (2008)
- rural Development Programme for England 2007-13, Department for Environment, Food and Rural Affairs (December 2007);
- strategic Flood Risk Assessment, Scott Wilson for West Somerset Council and Exmoor National Park Authority (March 2009); and
- Bridgwater Bay to Bideford Shoreline Management Plan, Halcrow, (1998), (now the Hartland Point – Anchor Head SMP2).

5.3.4 As a result of examination of these plans and the likely predicted effects of the proposed HPC nuclear power station, the AoS specifically identified several issues at the wider strategic level that may require cumulative assessment. These are summarized in Table 5.1.



Table 5.1. Appraisal of cumulative sustainability effects arising through interactions between the Hinkley Point and other key plans, programmes and projects. From the Hinkley Point, Appraisal of Sustainability Site Report (DECC 2009).

AoS Sustainable Development Theme	Interactions and Cumulative Effects, both positive and negative
Biodiversity and ecosystems	<p>Potential effects on biodiversity from the proposed development at Hinkley Point, combined with increased development growth proposed for the South West Region could place demands on sensitive ecosystems. However Regional Spatial Strategy offers possibilities for enhancing green infrastructure</p> <p>Potential adverse effects on Severn Estuary ecology from proposed development at Hinkley Point could add to the likely major significant effects from Severn Barrage tidal power generation proposals</p>
Climate Change	<p>Proposed nuclear development at Hinkley Point combined with low carbon energy proposals including the Severn tidal power proposals, will lead to reduction in dependence on fossil fuels.</p> <p>Proposed nuclear development at Hinkley Point and Oldbury combined with RSS targets for greenhouse gas production seek to minimise greenhouse gas emissions</p>
Communities: supporting infrastructure	<p>Decommissioning of existing nuclear facilities at Hinkley Point may coincide with construction of a new nuclear power station to create adverse effects on supporting infrastructure, in particular transport networks.</p> <p>There is potentially a large cumulative impact associated with the generation of various waste streams in association with other major development schemes.</p>
Communities: population, employment and viability	<p>Proposed nuclear development at Hinkley Point and Oldbury in combination with tidal power proposals may enhance employment and skills hub for low carbon technologies.</p>
Human health and well-being	<p>Proposed nuclear development at Hinkley Point and Oldbury will contribute to enhanced prosperity and secure long term employment, as will increased development (facilitated through RSS) and tidal power proposals. This is likely to have synergistic positive effects on health and well-being.</p>
Landscape	<p>In-combination effects through associated off-site works carried out by National Grid with regard to transmission infrastructure.</p>
Water quality and resources	<p>Proposed development at Hinkley Point could have adverse effects on baseline water quality and ecological status; this could contribute to likely major significant effects from tidal power proposals. However, all proposals will need to meet with the requirements of the EU Water Framework Directive as implemented through the Severn and South West River Basin Management Plans</p>

5.3.5 On the basis of the examination of the range of plans and programmes examined in the AoS and with regard to the above parameters, as detailed in Table 5.1 the following projects were identified within the AoS as having the potential for a cumulative effect with the HPC development:

- decommissioning of existing HPA and HPB Reactors;
- proposed new nuclear power station at Oldbury, Gloucestershire;
- tidal energy scheme(s) in the Severn Estuary; and
- the Bristol Deep Sea Container Terminal project.

5.3.6 In relation to these projects, it was noted in the AoS that there is the potential for:

- very significant negative cumulative effects if two new power stations (Hinkley Point and Oldbury) and the Severn Barrage are all developed. These include the loss of nationally and internationally important estuarine habitats, where the possibility of full mitigation is unlikely; and
- positive cumulative effects associated with long term employment and enhanced prosperity for communities at the sub-regional level if both power stations are built in the Severn Estuary.

Other projects identified through IPC scoping process and consultation

5.3.7 In addition to those projects listed in the NPS AoS, the following projects were highlighted in the IPC scoping response as ones that should be considered in any cumulative assessment:

- National Grid Hinkley Point C connection;
- north-west Bridgwater developments; and
- the Steart Peninsula coastal management project.

5.3.8 Based on the above sources, the following full list of projects has been taken forward into the scoping stage:

- National Grid, Hinkley Point C connection;
- decommissioning of HPA;
- decommissioning of HPB;
- proposed new nuclear power station at Oldbury;
- the Steart Peninsula coastal management project; and
- the Bristol Deep Sea Container Terminal project.

5.3.9 The north-west Bridgwater developments have been considered as projects in the assessment stage dealing with local cumulative effects and are therefore already included in the assessment process (see **Section 3** above). The Hartland Point –Anchor Head SMP2, which was considered as a plan in the AoS for the NPS, is a strategic document and is presently still a draft. There are no specific schemes identified in the SMP for the management units adjacent to the Hinkley frontage and, as such, no specific projects that could be assessed as part of the cumulative assessment.

5.4 Summary of relevant projects

5.4.1 A brief summary description of the selected projects is provided below. This sets out their proposed timescale for development, what stage they are presently at and their key components.



National Grid Transmission Lines and Substation

- 5.4.2 National Grid is currently consulting on its proposals to construct a new 400kV overhead line between Bridgwater in Somerset and Seabank in Avonmouth to connect the proposed HPC nuclear power station to the national grid high voltage electricity transmission network.
- 5.4.3 This project effectively comprises three components: a new 400kV overhead line between Bridgwater and Seabank and associated electrical infrastructure; modifications and diversions to existing overhead lines in the vicinity of Hinkley Point both of which will form a separate project and DCO application by National Grid to the IPC (or its successor); and a new 400kV Gas Insulated Switchgear (GIS) substation, overhead line landing gantries and terminal towers which will facilitate connections between HPC and the national grid high voltage transmission network and will be covered under the EDF DCO application. The details of this split are covered here, but for the purposes of description both components are dealt with in this section.
- 5.4.4 A number of routing options for the overhead lines have been identified and consulted upon by the National Grid and two preferred corridors for the overhead line route have been selected. These corridor options are summarised below.
- 5.4.5 Corridor one includes two options.
- **One option (1A)** involves removing an existing Western Power Distribution 132,000 volt overhead line and using its corridor for a new 400,000 volt overhead line. This option would also require a new substation at Churchill in North Somerset and a new 4km length of 400,000 volt overhead line to connect it with the new Bridgwater to Seabank overhead line.
 - **The second option (1B)** involves the construction of a new 400,000 volt overhead line next to the existing 132,000 volt overhead line. Under Option 1B the existing 132,000 overhead line would not be removed.
- 5.4.6 Corridor two is slightly more complicated as it contains a number of different route options. From the south, the corridor follows a route to the east of the existing Western Power Distribution 132,000 volt overhead line, before joining up with it at the Mendip Hills. From this point, two options for the corridor have been identified: one that follows the path of the M5 motorway, and a second which runs parallel to the existing line. These options come together north east of Weston-super-Mare, where corridor two continues to the east of Nailsea before re-joining the existing 132,000 volt overhead line near Portishead. Avonmouth has less open ground and is highly residential and as a result only one route corridor has been identified north of Portishead. Both corridor one and two would need to follow this route to achieve a connection into Seabank.
- 5.4.7 Stage 1 consultation on the overhead line route corridors is due to close at the end of July 2010 and a preferred corridor is expected to be announced in the Autumn of 2010.
- 5.4.8 The new 400kV overhead line between Bridgwater and Seabank will form part of a separate application for development consent to the IPC by National Grid in 2012, with the works planned to be undertaken 2014 – 2017.
- 5.4.9 A 400kV GIS substation is proposed to be constructed within the HPC site, the purpose of which is to connect the HPC power station to the national grid high voltage electricity transmission system. The substation will be linked to the national grid main interconnected transmission system by overhead lines.
- 5.4.10 At the centre of the northern end of the compound there are three single phase oil cooled windings or inductors and associated radiators/cooler banks. These inter-bus inductors act to limit possible fault currents to within switchgear ratings for specific busbar configurations. Each inductor is connected through sections of gas insulated line back into the main GIS building.

Also on the northern side of the compound are the overhead line connections and cable connections to the auxiliary transformers.

- 5.4.11 Four overhead line gantries will be situated along the south side of the compound to facilitate the transition from overhead line to gas insulated line and subsequent through wall entry into the GIS building. These four line entries form connections to the main interconnected transmission system. Similarly, two other overhead line gantries are provided to the east of the compound which forms the overhead line route to interconnect with the existing Hinkley Point B 400kV AIS substation to the east.
- 5.4.12 The landing gantries will connect via overhead line to three overhead line terminal towers (pylons) outside the substation compound to the south and east. Modifications to the existing overhead line network south east of the substation will also be required but will form part of a separate DCO application by National Grid.
- 5.4.13 Approximately 8 shipments will be required for the GIS, and although it is not confirmed at the present time, it has been assumed that these equipment shipments will be AIL's.
- 5.4.14 All of the works within the 400kV GIS substation compound, the overhead line landing gantries and terminal towers are included within and will form part of the HPC DCO application. The potential environmental impacts of the substation compound is therefore included in the assessment work described in the Environmental Appraisal and therefore does not form part of the cumulative assessment. The cumulative assessment therefore focuses on the overhead line modifications and diversions to overhead lines in the vicinity of the HPC site and the overhead line route corridors and associated infrastructure.

Hinkley Point A Decommissioning

- 5.4.15 Hinkley Point A power station ceased generation for the final time on 23rd May 2000. It is currently being defueled and decommissioned. The decommissioning project that is now underway at Hinkley Point A includes in the early phase, the removal of most of the buildings, the building of a radioactive waste storage building, and alteration to the reactor buildings. Then, following a period of deferment, total site clearance and delicensing will take place. A summary of the works is provided below:
 - construction of a Radioactive Waste Storage Building for the storage of intermediate level waste, until such time as an off-site disposal facility is available to receive those wastes;
 - construction of 4 temporary buildings, each required for a period of up to 15 years following construction, as follows:
 - 1 Low Level Radioactive Waste (LLW) Management building for the purpose of sorting and packaging low level wastes prior to despatch of those wastes off-site;
 - One Wet Intermediate Level Radioactive Waste (ILW) Encapsulation building for the purpose of encapsulating and packaging non solid ILW;
 - One Solid ILW Encapsulation Building for the purpose of encapsulating and packaging principally solid form ILW; and
 - One Access Control Building to control the movement of personnel and equipment to and from the Radiation Controlled Area (RCA); and
 - Construction of Reactor 1 Solid Waste Export Building and Reactor 2 Solid Waste Export Building, each required for a period of up to 5 years following construction;
 - temporary storage on land adjacent to the Hinkley Point A nuclear licensed site, for a period of no longer than 6 years from the start of construction of the development, of materials associated with this development;



- temporary storage on land adjacent to the Hinkley Point A nuclear licensed site, for a period of no longer than 5 years from the start of construction of the development, of material excavated during the construction of the Radioactive Waste Storage building referred to above, prior to re-use of that material for the purpose of in-filling below ground voids on the Hinkley Point A site; that is, to in-fill underground parts of existing structures following their demolition;
- installation of a new active effluent discharge pipeline; and,
- associated fence moves to facilitate the above development.

Hinkley Point B Decommissioning

- 5.4.16 Hinkley Point B is due to operate until at least 2016, although the station could conceivably continue operating beyond this period. A baseline decommissioning plan has been produced (British Energy 2008), which sets out the steps in the decommissioning process.
- 5.4.17 The majority of the buildings and machinery on the site, such as the turbine hall, cooling water system, ancillary buildings, workshops, administration and welfare buildings are non-radioactive. They can be demolished using conventional techniques, and the majority of the materials re-used or recycled as far as possible.
- 5.4.18 Similarly, much of the plant and equipment within the reactor building is uncontaminated, and can again be removed using conventional techniques employing additional radiological precautions. Some plant and equipment is contaminated with radioactive material to a level which requires the use of special working practices & stringent radiological precautions to ensure safety. In particular, the reactor building contains the two large nuclear reactors, which remain radioactive for a long time, and the fuel stringer debris vaults. These contain very highly irradiated materials, resulting initially in very high dose rates. A different approach must be used employing remote techniques to retrieve and process the wastes and to dismantle the reactors to ensure the safety of the workforce whilst protecting the public and the environment. British Energy has adopted an 11 Activity approach to describe the decommissioning plan.
- Activity 0: Pre-Closure Preparatory Work
 - Activity 1: Defuelling
 - Activity 2: Site Operation and Plant Preparation
 - Activity 3: Management of Potentially Mobile Operational Wastes
 - Activity 4: Plant Decommissioning
 - Activity 5: Safestore Development
 - Activity 6: Site Surveillance, Care and Maintenance
 - Activity 7: Site Reinstatement
 - Activity 8: Retrieval & Management of Stored Active Waste
 - Activity 9: Reactor Dismantling and Reactor Building Dismantling and Clearance
 - Activity 10: Site Clearance and Release for Reuse.
- 5.4.19 In many cases the activities overlap significantly in time, and are not necessarily sequential. Activities 0 to 5, culminate in completion of the Safestore, and will be completed within about ten years of station closure. The stations will then progress to Activity 6, a period of surveillance, care and maintenance. Activities 8 to 10 will then be deferred for a period of 85 years after shutdown, and again take about 10 years to complete.

Stear Peninsula Coastal Management Project

- 5.4.20 The Steart Peninsula is located approximately 7km east of the proposed Hinkley C Power Station on an area of low lying agricultural land on the Somerset coast of the Severn Estuary. It is flanked to the west by Bridgewater Bay and to the east by the lower reaches of the Parrett Estuary. As part of the Steart Peninsula Coastal Management Project the Environment Agency is currently consulting on various options available to manage flood risk in the area and to create up to 500ha of wetland and intertidal habitat and. These options are likely to involve the construction of new defences and bunded areas and removal or breaching of existing sea defences. Several options for realignment of existing defences are being considered and these could involve an opening into the site being made from the Severn Estuary or the Parrett.
- 5.4.21 No firm date is provided for the scheme, but a start prior to 2013 would be unlikely. The main elements of this type of development are likely to include construction activities, hydrodynamic and sediment transport effects and ongoing maintenance activities during the operational phase.
- 5.4.22 Within the overall proposals at the present time is a habitat creation scheme being promoted by the Bristol Port Company. This comprises a proposal to create approximately 150ha intertidal habitat north of the pylon line and west of Steart Road to provide habitat compensation for its proposed port expansion at Avonmouth. The Environment Agency is working with The Bristol Port Company on an overall vision for the Steart Peninsula, If The Bristol Port Company scheme goes ahead, it is expected to allow water to enter the site from the Severn Estuary to create intertidal habitat by managed realignment. A set-back embankment would protect Steart Road and the pylons from flooding.

Oldbury Nuclear Power Station

- 5.4.23 The draft National Policy Statement for Nuclear Energy identifies land at Oldbury, in South Gloucestershire, on the eastern bank of the Severn Estuary as a potential site for the development of a new nuclear power station. The site is being progressed by a Joint Venture (Horizon Nuclear Power Ltd.) between E.ON and RWE. The site is located immediately north east of the existing Oldbury nuclear power station, which lies approximately 60km upstream (north-east) of Hinkley Point. The land proposed for the permanent development covers an area of approximately 150ha, largely comprising mainly agricultural grassland. The proposed new nuclear development at Oldbury is expected to comprise the following:
- a power station comprising up to three nuclear reactors with a combined expected output of about 3300 megawatts (MW);
 - up to four cooling towers of between 70m and 200m in height;
 - Interim waste storage facilities;
 - electricity transmission infrastructure;
 - access roads and highways improvements and a possible Park & Ride facility;
 - a marine off-loading facility (MOF), and other such construction transport options (subject to the outcome of a Transport Options Study);
 - implementation of a flood defence strategy for the site (a range of options are being assessed);
 - construction areas and facilities;
 - ancillary development such as other buildings and infrastructure associated with the nuclear site; and
 - landscape and biodiversity initiatives and mitigation measures associated with the construction and operation of a new power station.



Bristol Deep Sea Container Terminal

- 5.4.24 The Bristol Port Company is proposing to develop the Bristol Deep Sea Container Terminal (BDSCT) on a site at Avonmouth Docks approximately 45km north of the proposed development up stream in the Severn Estuary. The new container terminal would be designed to service existing large container ships and future generations of Ultra Large Container Ships (ULCS) with a draught of up to 16m with the capacity to transport up to 14,000 containers per year. The proposals would involve:
- Capital and maintenance dredging to deepen and widen the existing approach channel. During construction there would be a requirement to dispose capital dredged material at an offshore disposal site. The footprint of the dredged area is predicted to extend from Avonmouth in the east to approximately 20km to the west; and
 - Redevelopment and reclamation of land for a new quay; and container storage facilities
- 5.4.25 The western limit of the dredged channel is located approximately 30km north of the location of the proposed Hinkley C Power Station. Dredged material deposited at Holm Deep (located approximately 8 km off Sand Point and approximately 24km from Hinkley C Power Station) would be expected to be transported to within approximately 15 – 20km of the proposed location of the Hinkley C Power Station. Capital dredging would remove mudstone, sand, gravel and silt. Analysis undertaken as part of the Bristol Deep Sea Container Terminal EIA indicates that during dredging there would be:
- Approximately 10.5 million tonnes of fine sediment released into the estuary
 - Approximately 16.9 million tonnes of mudstone to be deposited in a deepwater disposal site at Holm Deep
 - Approximately 2.05 million tonnes of sand sized mudstone released into the estuary.
- 5.4.26 Maintenance dredging would require the removal of muddy and sandy sediments that accumulate in the turning area and berths. Muddy sediments would be deposited locally and sandy sediments would be deposited at the new deepwater disposal site at Holm Deep.
- 5.4.27 Consent for the BDSCT was given by the Department for Transport in April 2010 and it is possible that work on developing the new facility could commence 2011/12 with the container terminal expected to be operational during 2015/16.

The Severn Barrage and other tidal power generation schemes in the Severn Estuary

- 5.4.28 The Government is currently in the process of conducting a comprehensive study of tidal power generation in the Severn Estuary (Severn Estuary Tidal Power). The main options currently under consideration include:
- Tidal stream generators;
 - Tidal lagoons;
 - Cardiff-Weston Barrage (The Severn Barrage); and
 - Shoots Barrage.
- 5.4.29 There are also numerous design variations of the main options listed above, including alternative barrage locations, ebb only and ebb/ flow operating barrages, barrages with additional basins, and various different lagoon designs. At present the Government is undertaking a Strategic Environmental Assessment (due to report in 2010) of all possible tidal power generation schemes in the Severn Estuary, including for example tidal stream generators.
- 5.4.30 At this present time there is no formal application for a Severn Barrage or any of the other potential tidal power generation options. Furthermore, there is insufficient information available at this time regarding the potential schemes and their likely impacts in order to undertake sufficiently informed cumulative impact assessment with the proposed HPC Project. According

to the proposed programme for the development of HPC it is likely that the power station would be either under construction or potentially operating before a full ES and application would be made for the Severn Barrage or any of these tidal power generation schemes.

- 5.4.31 It is clear, however, that a number of these tidal power generation schemes, particularly the Cardiff-Weston Barrage, would have significant adverse effects on the environment of the Severn Estuary. The Sustainable Development Commission states that the Severn Barrage would have a major impact on the local environment, with the loss of up to 75% of the existing intertidal habitat. The impact of this Barrage on the Estuary's hydrodynamic, sediment transport and ecological processes has not been sufficiently quantified or assessed. It is clear from work undertaken to date, that the scale of the impacts would be such that the physical and environmental conditions in the estuary would be fundamentally altered to such an extent that a new baseline environment would exist under post-barrage conditions.
- 5.4.32 Given the above, it is not considered practicable or meaningful at this time to seek to assess possible cumulative effects of the Project and a Severn Barrage or other tidal power generation schemes. Development of such schemes will be kept under review in the interim period between Stage 2 consultation and the finalisation of the ES.

5.5 Cumulative issues taken into account in the appraisal

Introduction

- 5.5.1 As stated previously, for a number of parameters, the assessment work undertaken, as reported in **Volume 2** of the Environmental Appraisal, has taken account of potential interactions with projects at a wider level. The main reasons for this inclusion of a cumulative component relates to the large-scale nature of the project and the need to understand its effects within a wider context (e.g. socio-economics). For some aspects where there is an existing or predicted overlap between project effects it makes sense to understand and assess the nature of the interaction in an integrated manner rather than through a staged process (e.g. landscape assessment of the HPC site with the National Grid transmission line proposals). The following sections provide a summary of the main subject areas where this cumulative component of interaction between projects has been built into the appraisal.

Socio-economics

- 5.5.2 The socio-economic assessment of the proposed new nuclear development at Hinkley Point is provided as **Chapter 8 of Volume 2** of the Environmental Appraisal. Given the scale of the project in terms of both its socio-economic demand (e.g. workforce requirements) and benefits (i.e. to the local and wider economy) the assessment takes a regional perspective with regard to its implications. Cumulative assessment is therefore an inherent part of that exercise.
- 5.5.3 The proposed new nuclear development at HPC has been considered in the context of an array of other major construction projects in the immediate sub-region and wider region, some of which are already underway and others which will commence in the next few years, and which may overlap with the Development both in terms of construction and/or operation.
- 5.5.4 In a report produced in 2006 (CITB-Construction Skills Network), a strong spatial shift was forecast in construction employment growth, from the North to the South and East of the country. The figure for the South West was approximately 5000 new construction industry recruits needed annually. Although the current economic downturn suggests that there may be some short term reduction in such estimates, the array of projects (many being public sector-



driven) which are noted in Table 5.2, also suggests that there will be considerable and continuing momentum in construction activity in the region in the medium term.

- 5.5.5 A more recent set of more short term forecasts for the construction sector in the South West region has recently been prepared by Experian for Construction Skills, the Sector Skills Council for the construction industry (Construction Skills Network, South West Labour Market Intelligence 2009-2013). The latest forecasts show changes in construction sector output and employment in the region between 2009 and 2013.
- 5.5.6 Construction output in the South West is forecast to decline marginally, by an annual average rate of 0.2%, between 2009 and 2013. The South West is the only UK region for which a decline in construction output is forecast over this period. The relatively poor outlook for the sector in the South West is due to the fact that the region is not expected to benefit to the same extent as other regions from growth in the infrastructure and public non-housing sectors. This is because there are only a few major civil engineering projects planned for the region within the 2009-2013 forecast period and only a few local authorities feature in the early phases of the Building Schools for the Future programme. The lack of construction output growth in the region is reflected in the employment forecasts for the sector. Total construction employment in the South West is projected to remain static between 2009 and 2013, after a reduction of 3.5% between 2007 and 2009.
- 5.5.7 However even to meet demand during the 2009-2013 period, after taking into account those entering the industry other than from training and those leaving (e.g. through retirement), there will be a requirement for 1,450 new workers per annum to join the industry in the region.
- 5.5.8 Of particular significance, and with some degree of certainty, is a substantial element of house building and associated services (e.g. hospitals, schools etc) associated with RSS housing allocation figures, and the NE Bridgwater expansion. However there will be some differences in construction skill demands compared with the nuclear new build. Additionally the associated services development (e.g. improved school and hospital facilities) will be of some benefit to the Project. The potential other nuclear new build at Oldbury could also be significant in terms of cumulative impact, although it is assumed that, if this project goes ahead, possible cumulative impacts will be partly offset by a later start than at HPC, potentially different design, and some difference in the daily commuting zone. Nevertheless, ranges have been built into the impact estimates for HPC construction to allow for this and other possibilities. The development of a Severn Barrage project could be another significant energy project with significant cumulative impacts; but it is not anticipated that, if this project was to go ahead, any construction activity would be before the peak period for Hinkley Point C construction.

Table 5.2. Other Major Construction Projects in the Sub-region/ Region—with Indicative Timelines (X = potential only; X = ongoing or defined)

Project	Time period		
	2008-2012	2013-2016	2017-2020
Other nuclear projects			
Hinkley Point A decommissioning	X	X	X
Hinkley Point B decommissioning			X?
Oldbury new nuclear build		X?	X?

Project	Time period		
Other major sub-regional projects			
New housing allocations as specified in RSS associated with population growth and higher intensity of housing allocations to the sub-region	X	X	X
NE Bridgwater urban expansion	X	X	X
Taunton urban expansion	X	X	X
New hospitals (Minehead; N. Petherton ; N. Bridgwater); Musgrove Park Hospital—continued evolution	X	X	X?
<i>Transport schemes (possible A358 work)</i>			X
<i>Stear managed realignment/habitat creation project</i>		X	X
Potential redevelopment of ROF at Puriton	X	X	X
Building Schools for the Future	X	X	
Bridgwater College/University for Somerset projects	X	X	
<i>BAE systems –site redevelopment</i>		X	X
Renewable energy projects (eg wind farms, wave hub)	X	X	X
<i>Severn barrage</i>		X	X?
<i>Parrett tidal surge barrier</i>		X	X?
Further afield			
London Olympics	X	X?	
Bristol Port/Avonmouth developments	X	X	
Swindon outer SE developments	X	X	

5.5.9 Cumulative impacts can be considered both narrowly, in relation to the socio-economic impacts of the array of Hinkley Point nuclear power station activities, and more widely in relation to



possible other major project developments in the local area, especially during the construction period of HPC.

- 5.5.10 In relation to the former, Table 5.3 provides a very indicative outline of the possible cumulative direct employment implications of new build, operation and decommissioning activity for Hinkley Point A, B and C over the period of the next 100+ years. The outage employment is approximately of approximately 100-person years pa (to be added to the total figures). The table is very indicative and contains many uncertainties related in particular to: the employment profile of NDA's decommissioning programme for Hinkley Point A; the possibility of a life extension to the operation of Hinkley Point B; the detailed phasing of the Hinkley Point C construction/employment programme pending finalization of contracts and contractors; and the future nature of B and C station decommissioning programmes. Nevertheless it does provide an overview of all the anticipated direct Hinkley Point nuclear power stations' employment, highlighting the major impacts of Hinkley Point C construction in the 2010-2020 decade, and the role of Hinkley Point C operation in offsetting the loss of employment from the A and B stations post 2020.

Table 5.3: Very indicative outline of possible composite of Hinkley Point A, B and C direct employment (rounded numbers)

Date	Hinkley Point A decommissioning	Hinkley Point B: operation and decommissioning (assumed operational station life extended by 5 years)	Hinkley Point C: all stages (indicative)	Outage activity: B & C (1-2 months only)	Total
2010	400	750		1000pa/1-2mths	1300
2011	400	750	50	"	1200
2012	400	750	300	"	1450
2013	400	750	600	"	1750
2014	400	750	1500	"	2650
2015	400	750	3500	"	4650
2016	400	750	5000	"	6150
2017	400	750	4000	"	5150
2018	400	750	2000	"	3150
2019	400	750	1000	"	2150
2020	200	750	1000	2000pa/1-2mths	1950
2025	200	600	900	"	1700
2030	200	600	900	"	1700
2040	50	400	900	1000pa/1-2mths	1350
2050	10	200	900	"	1110
2060	10	200	900	"	1110

Date	Hinkley Point A decommissioning	Hinkley Point B: operation and decommissioning (assumed operational station life extended by 5 years)	Hinkley Point C: all stages (indicative)	Outage activity: B & C (1-2 months only)	Total
2070	10	50	900	“	960
2080	10	10	900	“	920
2090	10	10	500	“	520
2100	300	10	500	“	810
2110	200	10			210
2120		10			10
2130		10			10
2140		300			300
2150		200			200

5.5.11 Any cumulative impacts will be partly offset by a later start than at Hinkley Point C, potentially different design and some difference in the CDCZ. Nevertheless, ranges have been built into the impact estimates for Hinkley Point C construction to allow for this and other possibilities. The development of a Severn Barrage project could be another significant energy project with significant cumulative impacts; but it is not anticipated that, if this project was to go ahead, any construction activity would take place before the peak period for Hinkley Point C construction.

5.5.12 Overall, it is apparent from the socio-economic assessment work that the HPC Project both in its own right but also cumulatively with other large projects in the region offer significant economic benefits, particularly with respect to both short term and more permanent employment prospects in the area.

Transport

5.5.13 The scope and methodology for the assessment of traffic and transport related issues is set out in **Chapter 9, Volume 2** of the Environmental Appraisal.

5.5.14 The assessment of the likely significant transport effects has been undertaken using established methodologies and has concentrated on examining the capacity of relevant local and strategic transport infrastructure to accommodate the HPC Project.

5.5.15 The potential effect of the HPC Project has been determined by comparing the ‘with development’ scenario to the ‘base’ scenario in the assessment years.

5.5.16 A SATURN model has been used, at a strategic level, to inform the development of the Transport Strategy. A separate Paramics micro-simulation model has been built in order to allow the operation of the highway network to be considered in more detail. Given the status of the models at this stage, it has been decided to use the results from the Paramics model to inform the Stage 2 Consultation. Neither the SATURN nor Paramics models extend as far as Williton and therefore stand alone modelling of key junctions in Williton has been undertaken.



- 5.5.17 The extent of the SATURN and Paramics models were agreed in consultation with the highway authorities. The extent of the SATURN and Paramics model networks is provided in **Chapter 9** of the Environmental Appraisal as **Figures 9.1** and **9.2** respectively.
- 5.5.18 Much of the traffic assessment methodology has centred on checking highway capacity, for which it is necessary to consider the quantification of the base flows. The base flows are those flows without traffic from the HPC Project but including traffic associated with all known committed development and existing operations within the vicinity and taking account of any changes predicted as a result of committed alterations to the network. The methodology for quantifying base flows is set out in the Environmental Appraisal chapter on transport (**Volume 2, Chapter 9**). The traffic flows associated with the existing activities at the HPA and HPB stations form part of the quantified base flow.
- 5.5.19 The inclusion of committed development traffic flows in the base flows quantification for the relevant assessment years therefore means that the assessment work undertaken, as reported in the Environmental Appraisal, represents cumulative assessment of the likely impact of HPC generated traffic on the road network. The outcomes of this assessment have been of paramount importance in determining the need for appropriate traffic management and travel planning measures as well as defining the need and purpose for much of the Associated Development (i.e. park and ride, freight logistics centres).

Landscape

- 5.5.20 The landscape assessment for the HPC site has included analysis of visual impacts from a number of viewpoints (see **Chapter 21, Volume 2** of the Environmental Appraisal). The photomontages taken for the assessment include an indicative arrangement of high voltage overhead transmission lines and towers (pylons) which will facilitate connections between HPC and the national grid high voltage electricity transmission system, as it was identified early on in the assessment process that a significant visual interaction between the two projects could arise. These photomontages are presented in the Environmental Appraisal. A summary of the cumulative impacts is set out below. This work was specifically undertaken in order to ensure that the visual appearance of the HPC site represented the full operational character of the site.
- 5.5.21 The viewpoints for cumulative view photomontages were selected on the following basis:
- analysis of the visibility of the existing overhead lines on photographs. This indicated that only viewpoints located up to 15km of the HPC site provide clear views of the existing overhead lines. From all other views, including a number of viewpoints within the Exmoor National Park, the existing overhead lines were not visible due to the distance from the HPC site;
 - after modelling and overlaying the proposed development at the HPC site onto photographs, viewpoints were selected that would provide the best views of the National Grid proposals. This exercise was supported by the analysis of OS maps and site visits;
 - following consultation with National Grid and site visits, Viewpoint 11 was added to the Principal Viewpoints to better represent the potential local cumulative impact around the settlement of Wick; and
 - in total, 10 views from various locations were selected for inclusion in the photomontage work in order to best represent the combined visual appearance of the HPC and the National Grid proposals.
- 5.5.22 An examination of the resultant photomontages shows that from Viewpoints 11 and 12 the new overhead lines and towers (pylons) would punctuate the skyline and be visible in the near distance (approximately up to 1.3km).

- 5.5.23 Viewpoints 13, 15 and 30 illustrate mid distance (1.3-5km) views. The new overhead lines and towers still punctuate the skyline, however at this distance, the proposed overhead line connections are much less visible than in the short distance.
- 5.5.24 Other short and mid distance cumulative views illustrate the limited cumulative visual impact of the proposals due to the topography, existing landscape features (see Viewpoint 9). The proposed mitigation to be implemented as part of the landscape strategy for the HPC site would also reduce the potential visual impact.
- 5.5.25 In the long distance, the only apparent proposed structures in the views would be of the HPC power station buildings. The overhead lines and towers would be barely visible from distances greater than 3.5km. This is illustrated by a number of viewpoints including Viewpoint 20, 22, 29, and 31.
- 5.5.26 Overall, it is concluded that the cumulative visual impact would be of local significance only and then from a limited number of viewpoints.
- 5.5.27 Due to the presence of the existing overhead lines in the Quantock Vale local Landscape Character Area, the landscape character of this area would not change significantly as a result of the cumulative impact. The main landscape impact in the area would be the HPC built form itself, which would be far more visually apparent than the overhead lines.

Marine water quality

- 5.5.28 One of the main marine water quality issues that would arise in relation to operation of the HPC station is the effect of the thermal plume from the cooling water system on water temperature. Any significant increase in water temperature, other than its inherent effect on water quality, could also have implications for marine ecology. At an early stage in the assessment process it was recognized that the potential situation could arise whereby HPB was still in operation when HPC becomes operational and thus the potential for a combined effect between the thermal plume for HPB and HPC could arise.
- 5.5.29 As part of the modelling work undertaken to determine a suitable configuration for the HPC outfall and intake structures, the situation of interaction with the thermal plume for HPB was also considered. This in-combination configuration produced a large intersect between thermal plume and intertidal habitat. The results of this work and further background to the issue are presented in **Chapter 19, Volume 2** of the Environmental Appraisal.
- 5.5.30 The results of the simulation for this combined configuration indicated that an area of 2.55 km² (2550 ha) of Stolford Bay and Stert Flats would be exposed to temperature increases of >2 °C, this temperature increase being considered to represent a threshold for possibly significant effects on marine fauna and flora. This area comprises 2.3 km² of 'low quality' and 0.24 km² of 'medium quality' habitat, based on a formal classification of the invertebrate populations involved and their availability as prey to birds and fish. The analysis of the configurations modelled is shown in Tables 5.4 and 5.5 below.
- 5.5.31 Such an in-combination impact would only occur over a period in which both HPB and HPC power stations were operational.
- 5.5.32 The HPB power station is currently scheduled to cease operation in 2016. If it does so then there will be no overlap between the operation of HPB and HPC power stations and therefore no opportunity for a potential in-combination impact involving the exhalent thermal plumes would arise (see Figures 19.13 and Table 19.16 in **Chapter 19, Volume 2**). If the operator of the HPB station, in agreement with the regulatory authorities, is able to extend the life of that operational site beyond 2016 then there would be an in-combination impact, albeit for a very



limited number of years (see Fig 19.14 and Table 19.17 in **Chapter 19, Volume 2**). This operational uncertainty will probably not be resolved for several years.

- 5.5.33 Pending the outcome of the ongoing studies and the operational uncertainty described above, although current modelling suggests no likely impact of a Hinkley Point C power station plume alone in relation to intertidal interests across Bridgwater Bay, it is not yet possible to state whether or not there will be an in-combination impact of the thermal plume associated with that of Hinkley Point C power station.
- 5.5.34 Should the baseline condition be that described by the operation of Hinkley Point B at 100% load the estimates provided in Table 5.4 suggest that the operation of Hinkley Point C alone, using the distribution of the >2 °C uplift, would effectively have no impact over potentially sensitive areas. Again, such considerations must be regarded as provisional and the matter is subject of further investigations

Table 5.4: Total estimated areas (in km²) of mean annual temperature uplift due to thermal plumes from different power station intake/outfall configurations and operational regimes.

Configuration under test		Thermal uplift (°C)				
Hinkley Point C load	Hinkley Point B load	>1	>2	>3	>4	>5
Tests for initial selection of Hinkley Point C discharge location – with simulated cooling water volumes of 120m³/sec at ΔT 12.2°C						
Cross shore discharge; 100%	0%	22.6	6.22	1.502	0.377	0.166
Intermediate discharge; 100%	0%	27.2	4.10	0	0	0
Offshore discharge; 100%	0%	25.2	0.43	0	0	0
Tests using refined engineering information on selected offshore discharge location – with simulated cooling water volumes of 125m³/sec at ΔT 11.6°C and, for Hinkley Point B station (100% load,) 53m³/sec at ΔT 10°C						
0%	100%	6.9	1.35	0.036	0	0
0%	70%	4.0	0.05	0	0	0
100%	70%	40.3	11.42	0.471	0.007	0
100%	0%	29.6	2.86	0.003	0	0

Table 5.5: Estimated areas (in km²) of intertidal habitat impacted by mean annual temperature uplift due to thermal plumes from different power station operational regimes, utilising offshore Hinkley Point C discharge location. TPA is ‘total prey availability’ – see chapter 19, Volume 2 for explanation.

Operational regime		TPA Class	Thermal uplift (oC)		
Hinkley Point C	Hinkley Point B		>1 Area (km)	>2 Area (km)	>3 Area (km)
0%	100%	Low	1.67	0.61	0
		Medium	0.45	0	0
		High	0.57	0	0
		Very high	0.29	0	0
0%	70%	Low	1.30	0	0
		Medium	0.18	0	0
		High	0.15	0	0
		Very high	0.09	0	0
100%	70%	Low	4.59	2.31	0.10
		Medium	2.78	0.24	0
		High	0.68	0	0
		Very high	0.29	0	0
100%	0%	Low	3.74	0.03	0
		Medium	1.20	0	0
		High	0.10	0	0
		Very high	0	0	0

5.6 Assessment of cumulative effects

5.6.1 The documentation that has been used in determining the likely level of significance associated with each of the projects, and thus the potential for and scale of cumulative effects is as follows:

- HPB – Baseline decommissioning plan (British Energy 2008) (Ref 5.2)



- NPS for nuclear power generation – Assessment of Sustainability (AoS) for new nuclear power station at Oldbury;
- Scoping report for new nuclear development at Oldbury (Horizon Nuclear Power (2009)) (Ref 5.3);
- Hinkley Point C Connection - strategic optioneering report (National Grid (2009)) (Ref 5.4);
- Bristol Deep Sea Container Terminal (BDSCT) – Environmental Statement (2008) (Ref 5.5);
- Steart Coastal Management Project – Scoping Consultation Document (2010) (Ref 5.6);

5.6.2 It is clear that most of the projects listed above, apart from the decommissioning of HPA and the BDSCT, are at a relatively early stage in the environmental assessment process. Information on the likely nature of effects and their significance is therefore either of an indicative nature or not available. The cumulative assessment presented here is therefore of an indicative nature at this stage in the assessment process and will be refined with further information if this becomes available prior to the DCO application being submitted.

5.6.3 Table 5.6 sets out the potential for interaction between projects across a range of parameters. The key potentials for cumulative impact as identified in this table are summarised in the following sections.

National Grid 440kv overhead line

5.6.4 There is a small-scale addition to the predicted impacts of the HPC station on landscape and visual sensitivities due to presence of new overhead lines and towers connecting into the 400kV substation.

5.6.5 Given the timing of the construction works it is unlikely that the additional construction activity and the impacts associated with the National Grid overhead lines and towers would add significantly to the effects on the environment already predicted for the HPC development by itself, which is of a much greater scale than the National Grid works.

5.6.6 National Grid's overhead lines for the new plant will approach the HPC site from the east, passing to the south of Wick Moor (part of the Severn SPA and Ramsar Site and Bridgwater Bay SSSI) and will connect into the new 400kV substation. The land take for the new overhead lines will be relatively minimal, and habitats that would be lost will be of low botanical interest, as much of the area is improved grassland. It is assumed that water courses will be avoided and appropriate pollution prevention controls will be agreed with the Environment Agency and put in place during construction to avoid potential effects on aquatic vegetation and invertebrate communities. Survey work conducted between September 2007 and March 2009 recorded infrequent use of this area (both diurnally and nocturnally) by very small numbers of birds. It is unlikely that following the stripping of the topsoil within the HPC site that there would be any significant displacement into this area. It is therefore considered very unlikely that there would be a cumulative significant effect resulting from the two proposals.

5.6.7 National Grid's overhead lines and tower (pylon) positions illustrated within the Stage 2 documentation are indicative only and will be refined following further environmental studies and public consultation. A full assessment of cumulative impacts associated with the overhead line modifications and diversions will be provided as part of the Environmental Statement that will accompany the HPC DCO application.

5.6.8 National Grid is currently consulting on two overhead line route corridors between Bridgwater and Seabank. At this stage the preferred route corridor and route of the overhead line have not been determined and therefore the potential for wider effects on birds cannot be established.



HPA decommissioning

- 5.6.9 These works, taking place from 2004-2016, would still be ongoing during construction of the HPC development. The vast majority of the works would be confined to the footprint of the existing HPA site and therefore effects outside of this area (e.g. noise, air quality) would be unlikely to be manifested. The visual impact of the works would be negligible in comparison to the HPC development and would be unlikely to be additional (in significance terms) to that already defined for the HPC development.
- 5.6.10 Transport requirements could lead to additional pressures on the local road network (with related noise and air quality issues). The potential traffic influence of HPA has been considered in the modelling work for HPC and thus the effects as determined would not be altered (i.e. the cumulative aspect of this interaction has already been factored into the HPC assessment).
- 5.6.11 The ecological effects of the decommissioning of the Hinkley 'A' Station are detailed in the decommissioning EIA (Magnox, 2004). Various potential ecological effects were identified in the document, but it was concluded that through basic measures such as speed limits on the plant approach road, the minimisation of dust, adopting controls to prevent the potential for discharge of effluents/contaminants to water courses and small scale local planting of woodland/scrub, these could be fully mitigated. It would be expected that individual phases of the decommissioning work will require additional specific assessment, as the work would be completed over a considerable time frame (approximately 100 years).

HPB Decommissioning

- 5.6.12 While still operational, the effects on the environment of the activities and operations associated with HPC effectively form part of the environmental baseline against which the impacts of HPC are assessed in the Environmental Appraisal. As a consequence, there is anticipated to be no additional cumulative effect with HPB.
- 5.6.13 The effect of the HPB outfall plume on water quality is considered in the water quality modelling work for the HPC development (see Chapter 4 above and Environmental Appraisal **Chapter 19 in Volume 2** on marine water quality). Although further work is being progressed in this area, it is determined at this stage that once operation of HPB ceases then the effect of HPC alone would be unlikely to have an adverse effect on aspects of intertidal ecology.
- 5.6.14 The traffic and transport logistics for HPB (including outages whilst still operational) have been factored into the transport modelling work for HPC. Similarly, workforce issues and consequential social and economic effects on the local and wider area have been taken into account into defining workforce requirements (e.g. accommodation need) for the HPC development.
- 5.6.15 During decommissioning of HPB, most of the activities would be confined to the existing site footprint. If decommissioning takes place once HPC is operational then it is possible that there could be some adverse cumulative effects with regard to air and noise quality and discharges, although it would be expected that any such effects would be confined to the immediate area of the power stations and would be of negligible to minor significance.
- 5.6.16 The assessment of permanent operational noise impacts for HPC is based on a prediction of noise propagation from HPC once fully operational. Baseline noise measurements and site observations indicate that the operation of HPB does not generate significant noise levels at the nearest noise-sensitive receptor locations. Similarly, whilst decommissioning of Hinkley Point A will generate intermittent noise, the resultant noise levels at neighbouring receptors are unlikely to be significant.



Stearat coastal management project

- 5.6.17 No specific option has been selected as of yet and therefore only comments of a generic nature can be made with regard to potential environmental issues that could interact and lead to a cumulative effect.
- 5.6.18 As the hydrodynamic and sediment transport effects of HPC are very small-scale and localised the potential for any interaction with the Stearat scheme is unlikely. Even if interaction were to occur, the localised and wider effects would be likely to be negligible and probably not discernible within background variation. This conclusion is also reached in the scoping consultation document for the Stearat project.
- 5.6.19 The scheme would be highly unlikely to contribute towards any additional flood risk to the HPC site.
- 5.6.20 As the realignment scheme is being designed to deliver both habitat creation and ecological benefit the overall cumulative impact with the HPC Project would be unlikely to differ from that which the Stearat scheme would deliver in its own right. There is the potential, however, for the habitat creation proposals within the HPC site, to be linked with management of water levels on Wick Moor and habitat creation on the Stearat Peninsula to deliver a wider biodiversity benefit to the Hinkley Point-Stearat area.

Oldbury

- 5.6.21 The proposed new nuclear power station at Oldbury is still at the scoping stage and information on the proposals is therefore limited, the following brief assessment takes this preliminary nature of the information into account.
- 5.6.22 The Oldbury site is probably sufficiently distant from the HPC site that any effects on the physical and ecological parameters of the Severn Estuary would be unlikely to interact or be additive to those at the HPC site (i.e. the impact footprints of the projects would not spatially interact). However, if viewed at the estuary level then there could be potential adverse cumulative effects on estuarine ecology (primarily fish) although this would depend on the phasing of the operation and decommissioning of the various nuclear power stations that could be present at the HPC site and Oldbury site and the potential impacts associated with the proposed indirect cooling water system at Oldbury in comparison to the existing direct cooling.
- 5.6.23 There may be positive, cumulative wider (regional) socio-economic effects associated with the construction of Oldbury B and HPC at the same time. Potentially, the workforce requirements for both stations (if constructed within the same timeframe) could overlap, but given commute times it is likely that the local workforce for Oldbury would be derived from a different area of the Region to that for Hinkley. While economic benefits could accrue at the Regional level, in reality much of the benefit would be retained within the immediate areas around each of the proposed stations.
- 5.6.24 The transport footprints for both stations during construction and operation may overlap, although again, the distance between the two sites suggests that any overlap would be relatively diffuse in traffic volumes and flows and be focused upon the M5 corridor. As the main transport issues for HPC are centred on the local road network it is difficult to envisage how interaction with Oldbury B would contribute to any change in the scale and level of the effects that have been identified for the HPC development.

Bristol deep sea container terminal

- 5.6.25 The BDSCT project gained consent in April 2010 and construction could begin in 2011-12 although this has to be confirmed.

5. Wider Project Cumulative Effects

- 5.6.26 Despite the large scale dredging works required for the BDSCT project, the hydrodynamic effects are relatively small-scale and confined largely to the reclamation works for the container terminal at the existing port. The alterations in tidal current speeds and sediment transport that would occur here would not be propagated beyond the immediate area of the reclamation. Similarly any small-scale changes in the hydrodynamics of the approach channel would not propagate widely. The potential for interaction with hydrodynamic and sediment transport processes predicted for HPC is therefore considered negligible.
- 5.6.27 The ecological impact of the BDSCT scheme will be compensated for by a large (150ha) estuarine habitat creation scheme at Steart (see above). With this scheme in place it is not envisaged that there would be a detrimental impact on the wintering bird populations of the Severn Estuary SPA. As such, there is considered to be a negligible cumulative effect with the HPC Project.
- 5.6.28 As with the larger regional projects, the BDSCT could combine with the HPC project to deliver wider socio-economic benefits.



Table 5.6. Potential interactions between the HPC Project and other selected projects in the wider area. An indication, based on data available and HPC assessment to date for the level of cumulative effect is provided (N/A – no potential for interaction, □ = not significant, x = adverse but not significant, X= adverse and significant, □ = positive but not significant, □ = positive and significant)

Parameter	Plan or Project (alone)							Comment
	NG overhead line	HPA decomm	HPB decomm	Oldbury B	Bristol Port DSC	Stear		
Socio-economics	+	+	x / +	+	+	N/A		NG – Would generate temporary employment during construction and demand for local services and goods HPA – generation of temporary employment and demand for accommodation, plus local expenditure. HPB – positive effects as for HPA, but negative effects are associated with the loss of permanent direct and indirect employment. Oldbury B – Likely to provide a strong positive benefit to the local and wider regional economy BDSCT – would generate a positive benefit to local and wider economy
Transport	x	x	x	x	N/A	N/A		NG – Potential for some small scale transport interaction and cumulative effect during construction of elements close to HPC HPA and HPB - transport base flows for HPC include HPA and HPB decommissioning traffic. Oldbury B – Traffic effects likely to be localised, although there could be wider effects on M5 junction 14



Parameter		Plan or Project (alone)					Comment
Noise and vibration	○	x	x	N/A	N/A	N/A	HPA – site noise largely mitigated (e.g. residential properties and the coastal path) except at Hinkley B and the Visitors Centre. Impacts due to vehicles in the wider area are not significant and no vibration effects. HPB – noise levels will vary on site; but with standard good practice mitigation measures in place impacts are predicted to be small (not consistent with the conclusion re. local noise for HPA, but detailed assessment has not been undertaken). Off-site increased HGVs will cause an adverse noise impact. No vibration effects.
Air quality	○	x	x	N/A	N/A	N/A	NG – Potential for some small scale cumulative effect during construction of elements in the vicinity of HPC, but not considered significant HPA – slight adverse due to dust generation, but confined to immediate area of site. HPB – assumed to be similar to that for HPA.
Soils and landuse	N/A	-	-	N/A	N/A	N/A	HPA – see groundwater and geology. HPB – see Waste Management (below) regarding the potential for pollution events.
Contaminated land	N/A	-	-	N/A	N/A	N/A	HPA – see groundwater and geology. HPB – see groundwater and geology
Groundwater and geology	N/A	x	x	N/A	N/A	N/A	HPA – slight and not significant with mitigation; limited to physical disturbance of existing contamination and (non-radioactive) spills/leaks. HPB – potentially negative due to (active and) non-active liquid effluent drainage, the use of oils etc. (pollution events) and potential remobilisation risks.



Parameter		Plan or Project (alone)				Comment	
Surface water	<input type="radio"/>	<input type="radio"/> /x	<input type="radio"/> /x	N/A	N/A	N/A	<p>NG – Potential for interaction with any works that connect into watercourses on Wick Moor, but cumulative effect not considered significant</p> <p>HPA – potentially significant without mitigation (run-off, spills, soiled vehicles etc.), but could be managed through use of best practice measures</p> <p>HPB (Drainage) – potential for pollution incidents – but could be managed through the use of best practice measures.</p>
Hydrodynamics	N/A	N/A	x	N/A	<input type="radio"/>	<input type="radio"/>	<p>HPB – decommissioning of the offshore (and onshore) water circulation system is included within the initial (first 20 years) decommissioning works. Hence a minor adverse effect is judged.</p> <p>BDSCT and Steart – Hydrodynamic linkages exist, but the effects are highly unlikely to propagate within the estuary and combine with the small-scale effects of HPC and Steart. Overall the potential cumulative effect is not considered significant</p>
Terrestrial ecology	x	<input type="radio"/>	x	N/A	N/A	N/A	<p>NG – Potential for small scale effects on terrestrial ecology during construction in the vicinity of HPC. Potential wider links with bird movements between Severn Estuary and Somerset Moors and Levels. Until a route option has been determined this potential effect cannot be determined.</p> <p>HPA – no significant effects with mitigation.</p> <p>HPB – main effects will be indirect due to dust, noise and potential disturbance of foraging habitats (no habitats of importance on site); which mitigation can largely resolve.</p>



Parameter	Plan or Project (alone)						Comment
Marine ecology	N/A	○	x	x	x	+	HPA – no significant effects predicted. Installation of a new active effluent discharge pipeline has taken place HPB – see Hydrodynamics Oldbury - construction of Marine Offloading Facility may be required. Additional infrastructure for cooling water system. Potentially estuary level cumulative effects on marine ecology, but significance cannot be established at this stage. BDSCT – Overall effects on marine ecology would be localised to the immediate area of the reclamation and the approach channel works. Unlikely to be significant cumulative effects given the mitigation and compensation measures put in place for the project Steart – This project would deliver overall ecological benefits to the estuarine system
Marine water quality	N/A	N/A?	N/A?				HPA – see Marine ecology. HPB – not assessed; see Hydrodynamics. A negligible adverse effect is judged.
Radiological	N/A	○	○?	N/A	N/A	N/A	HPA – waste retrieval and processing will result in the discharge of radioactive substances, but this will comply with the Radioactive Substances Act 1993 and EA authorisations. HPB – potentially negative due to handling of radioactive fuel and waste and active liquid effluent drainage (including the HPA radioactive effluent discharge line); known areas of radioactive contamination exist on site. However, this would be controlled and managed under consenting arrangements and no significant cumulative effect would therefore be anticipated.



Parameter		Plan or Project (alone)				Comment
Landscape and visual	x	x / +	x / +	N/A	N/A	<p>NG – potential for an adverse cumulative effect. The connection aspect of the overhead lines is included in the HPC appraisal. The routing for the overhead lines to Bridgwater has yet to be determined and no cumulative rating can therefore be determined at this time.</p> <p>HPA will have a negative impact during the works (2004 to 2016), although no significance has been associated with this, but a positive impact in the longer term (i.e. following site reinstatement and planting); see operation.</p> <p>HPB – minor negative effects associated with the construction of new buildings and positive effects due to the reduction of site operational land and massing.</p>
Historic environment	○	N/A	x	N/A	N/A	<p>NG – Potential for some cumulative effects to occur with regard to setting. The connection element has been considered in the HPC appraisal. Wider effects would be unlikely to cumulate, but no determination can be made at this stage until a route option is finalised.</p> <p>HPA - No surviving features.</p> <p>The HPB study area includes several registered archaeological sites and the site has 'potential' but no recorded remains.</p>
Offshore and intertidal archaeology	N/A	N/A	N/A	N/A	○	<p>HPA / HPB – assume that any resource will have been removed during the construction phases.</p> <p>BDSCT – Any interest would be lost during dredging works. Potential for significant interest determined as unlikely and no significant cumulative effect is predicted</p>
Amenity and recreation	○	N/A	N/A	N/A	N/A	<p>NG – There may be some limited cumulative effects in the vicinity of the HPC site during construction. The effects on the PROW network would need to be determined once further details of proposed works are available, but any effect would be likely to be negligible.</p>



5. Wider Project Cumulative Effects

Parameter	Plan or Project (alone)						Comment
Marine activities	N/A	N/A	○	○	N/A	○	<p>HPB – If there are any small-scale works in marine waters requiring management of vessels then a potential for cumulative effect exists. However, this could be managed through appropriate measures and any cumulative effect would be minimal.</p> <p>BDSCT – Dredging works would be under the control of a VHF system. Vessels unlikely to interact with movements associated with the HPC works.</p>



References

Ref 5.1 DECC (2009) Draft NPS for nuclear power generation – Assessment of Sustainability (AoS) for new nuclear power station at Oldbury;

Ref 5.2 British Energy (2008) Baseline decommissioning plan for Hinkley Point B

Ref 5.3 Scoping report for new nuclear development at Oldbury (Horizon Nuclear Power (2009))

Ref 5.4 National Grid (2009) Hinkley Point C Connection - strategic optioneering report

Ref 5.5 The Bristol Port Company (2008) Bristol Deep Sea Container Terminal (BDSCT) – Environmental Statement

Ref 5.6 Environment Agency (2010) Steart Coastal Management Project – Scoping Consultation Document.



APPENDIX A – PROJECTS SCREENED FOR POTENTIAL CUMULATIVE EFFECTS WITH ASSOCIATED DEVELOPMENT



Table A1 – Local Projects Occurring in the Bridgwater A and C Area

Planning Application Number	Development Site Location	Description of Development	Applicant
09/08/00017	<p>Land off A38, Bristol Road and A39, Bath Road and bounded by M5 Motorway and railway line, Bristol Road, Bridgwater.</p> <p>BRI-A falls within the Masterplan Development area.</p>	<p>To include residential development of up to 2,000 dwellings; a commercial services centre comprising up to 1200 square metres retail floor space (Use Classes A1, A2 & A5), leisure (A3 and A4), community facilities (D1), residential and/or B1 employment development; primary school; up to 110,000 square metres of employment development (B1, B2, B8); sui generis trade units and car showrooms; sports and recreation facilities to include sports pavilion and play areas; strategic landscaping; transport network and access connections; and associated engineering works, infrastructure, drainage, and car parking; and including full Planning Application details for the erection of part of the employment development comprising a Regional Distribution Centre (71,300, square metres of B8 warehousing and ancillary B1/B2 uses) and for 400 of the dwellings.</p>	Hallam Land Management
09/09/00004	<p>Land at Lower Sydenham Farm and east of the M5, Horsey, Bridgwater.</p> <p>This site is approximately 500m from Associated Development.</p>	<p>Creation of habitat reserve including excavation of conservation ponds, construction of hibernacula, and native species hedgerow and woodland planting as detailed in drawings nos. 3116/E/61 and 3116/E/62 received on 31st March 2009; and construction of drainage channel and swale with ancillary topsoil stripping, as amended by drawings nos. 1095/DR/23 Rev E and 1095/DR/24 Rev B received on 9th April 2009, land at Lower Sydenham Farm and east of the M5, Horsey, Bridgwater.</p>	Hallam Land Management
08/04/00057	<p>J Sainsbury Plc, The Leggar, Bridgwater, TA6 4AB.</p> <p>This site is approximately 500m Associated Development.</p>	<p>Erection of extension to SW elevation of supermarket and alterations to access, also the provision of land to assist in the completion of the Leggar as a through route, as amended by agents letter dated 18.06.04 deleting the residential element of the scheme and plan refs A014821/1, 4847-PO1A and 4847-PO5C attached. Also Agents letter dated 1 October 2004 and Traffic Impact assessment dated September 2004</p>	Sainsburys Supermarket Ltd

Planning Application Number	Development Site Location	Description of Development	Applicant
08/05/00168	Units 36-38, Wylids Road, Bridgwater. This site is approximately 350m from Associated Development.	Refurbishment of warehouse including part demolition and subdivision to form 3 units, as amended by agents letter received 10/08/05 and drawing no 419/04/804 Rev A and Drawing No. 419/04/801 Rev A.	Gresham Property Partners LP
08/05/00176	Unit 12, Parrett Way, Bridgwater, TA6 5LB. This site is approximately 1km from Associated Development.	Erection of extension to warehouse	Sharp Interpack Ltd
08/05/00248	Creswick & Son Engineering Ltd, The Drive, Bridgwater. This site is approximately 400m from Associated Development.	Erection of eight steel buildings for the purpose of warehousing	Mr P Creswick
08/06/00052	Unit ZZ, Wylids Road, Bridgwater. This site is approximately 350m from Associated Development.	Change of use and conversion of former go karting circuit to one industrial unit (use classes B1, B2, & B8) (ZZ3) and one unit (ZZ1/2) to be used for the sale of agricultural feeds and implements	PSJ Properties Ltd



Planning Application Number	Development Site Location	Description of Development	Applicant
08/07/00043	<p>42-44 St. John Street, Bridgwater, TA6 5HS.</p> <p>This site is approximately 400m from Associated Development.</p>	<p>Erection of three storey building, containing 22 flats, demolition of existing building</p>	<p>Freemantle Estates</p>
08/07/00047	<p>42 Market Street, Bridgwater, TA6 3EP.</p> <p>This site is approximately 1km from Associated Development.</p>	<p>Erection of building to form 7 one bedroom flats and 3 two bedroom flats and formation of parking, on site of existing dwelling and workshop (to be demolished)</p>	<p>Topdown Services Ltd</p>
08/07/00067	<p>Land to the rear and side of 36-38 Wyllys Road and Riverside House, Wyllys Road, Bridgwater.</p> <p>This site is approximately 350m from Associated Development.</p>	<p>Erection of 8 business units (use classes B1, B2 & B8) contained within three buildings, formation of parking and amended access</p>	<p>London & West Country Estates Ltd</p>
08/07/00068	<p>Land to the North of and 30-32, St. Mary Street, Bridgwater.</p> <p>This site is approximately 700m from Associated Development.</p>	<p>Erection of three storey building to form ground floor bar and nine, one bedroom apartments, and managers accommodation, on the first, second and third floors on site of existing buildings (to be demolished), as amended by agent's letter received on 09/05/07 and Drawing Nos 5008/113 Rev C; 5008/114 Rev A; 5008:116:(A) and; 5008:115(A) all also received on 09/05/07, and as also amended by agent's revised Drawing No. 5008/110/A received on 17/05/2007.</p>	<p>Abracore Ltd</p>

Planning Application Number	Development Site Location	Description of Development	Applicant
08/07/00069	Land to the North of and 30-32, St. Mary Street, Bridgwater. This site is approximately 700m from Associated Development.	Demolition of two storey retail premises and part of bowling alley.	Abracore Ltd
08/07/00224	Land between 21 & 35 Monmouth Street and East of, Church Street, Bridgwater. This site is approximately 600m from Associated Development.	Erection of 53 dwellings, demolition of existing buildings, formation of access together with associated parking and garaging	George Wimpey Bristol Ltd
08/07/00236	Bridgwater Post Office, 27-28, Cornhill, Bridgwater, TA6 3AY. This site is approximately 900m from Associated Development.	Change of use, conversion and erection of rear, first, second and third floor extensions to redundant offices to form 13 residential units on first, second and third floors, installation of replacement shop front to ground floor retail unit	Cornhill One and Two Ltd
08/07/00303	31 Friarn Street, Bridgwater, TA6 3LJ. This site is approximately 1km from Associated Development.	Demolition of existing buildings, erection of part two storey, part three storey building for twelve 1 bedroom apartments and ten, 2 bedroom apartments and erection of two 2 bedroom houses with provision of 24 parking spaces, erection of 1.5m high railings to Southern boundary and formation of access (amended scheme)	Bellway Homes Ltd (South West)

Planning Application Number	Development Site Location	Description of Development	Applicant
08/07/00321	<p>Residential Development at, Hamp Industrial Estate, Old Taunton Road, Bridgwater.</p> <p>This site is approximately 1km from Associated Development.</p>	<p>Erection of 125 dwellings</p>	Barratt Homes Ltd
08/08/00017	<p>Land opposite, The Railway Station, Wellington Road, Bridgwater.</p> <p>This site is approximately 600m from the Associated Development.</p>	<p>Erection of 10 dwellings and 15 parking spaces with associated access</p>	Mr and Mrs B Wynn
08/08/00025	<p>Land to the West and East of, The Leggar, Bridgwater.</p> <p>This site is approximately 500m from Associated Development.</p>	<p>Erection of extension to West elevation and entrance lobby to South elevation of the Sainsbury's store, realignment and completion of The Leggar Link and improvements to the junction with The Clink, erection of new Lidl food store to the North of the retail park, insertion of a mezzanine floor in existing Lidl store and erection of extension to East elevation to form two additional units (for unrestricted non-food, use class A1), insertion of mezzanine floors in units C (Wickes), B3 (MFI), B1A (Farm Foods), B1B (Jolleys), and extension of existing mezzanine floor in unit B2 (Allied Carpets), erection of extension to South elevation of Unit F (Currys) to form new unit (Use Class A3), and the remediation of the land to the north of the Retail Park to create public open space including soft and hard landscaping and provision of a base for future recreational facility</p>	<p>PR Bridgwater Ltd, Sainsbury's Supermarkets Ltd, Akzo Nobel Films (Holdings) Ltd</p>

Planning Application Number	Development Site Location	Description of Development	Applicant
08/08/00072	Units B3, B2, B1A, B1B & C, Bridgwater Retail Park, The Leggar, Bridgwater, TA6 4AB. This site is approximately 450m from Associated Development.	Variation of condition 9 of Planning Permission 1/08/94/55, condition 9 of Planning Permission 08/99/155 and condition 9 of Planning Permission 08/99/154 to read as condition 1 below	P R Bridgwater Ltd, Sainsbury's Supermarkets Ltd &Akzo Nobel Films (holdings Ltd
08/08/00079	Unit 8, Wylids Road, Bridgwater, TA6 4BH. This site is approximately 350m from Associated Development.	Change of use from class B8 (Storage and Distribution) to class B8 with Ancillary trade counter and show room	Rhodes Asset Management
08/08/00084	East Bridgwater Community School, Parkway, Bridgwater, TA6 4QY. This site is approximately 700m from Associated Development.	Outline planning application for a development zone for replacement two storey and part three storey school	Somerset County Council
08/08/00179	George Williams House, Friarn Avenue, Bridgwater, TA6 3RF	Demolition of existing George Williams House (YMCA) and erection of multi-use sports hall, including indoor health and fitness provision, changing rooms, bin store, energy centre/cycle stands, 15m high wind turbine and formation of car parking (Amended Plans received 14/11/08and 06/12/08)	Bridgwater YMCA Foyer



Planning Application Number	Development Site Location	Description of Development	Applicant
08/08/00261	<p>Bridgwater College, College Way, Bridgwater, TA6 4PZ.</p> <p>This site is approximately 500m from Associated Development.</p>	<p>Demolition of storage buildings, construction of road bridge, new two-storey Energy Skills Centre with associated car parking and new single-storey storage building</p>	Bridgwater College
08/08/00262	<p>Cranleigh House, College House and Avalon House, Broadway Park, Broadway, Bridgwater.</p> <p>This site is approximately 650m from Associated Development.</p>	<p>Extension and alterations of existing mental health units</p>	Somerset Partnership NHS Foundation Trust
08/08/00266	<p>392 Bristol Road, Bridgwater, TA6 4AT.</p> <p>This site is approximately 500m from Associated Development.</p>	<p>Formation of food preparation, packaging and storage facility, including refurbishment and extension of existing warehouse to form potato packing, chill warehouse, offices and canteen/locker extension, demolition of industrial buildings, erection of 2 gatehouses, weighbridge gantry and canopy, LPG store, formation of car parking</p>	Morrison Supermarkets PLC
08/09/00021	<p>Land at, Cranleigh Gardens, Bridgwater, TA6.</p> <p>This site is approximately 600m from Associated Development.</p>	<p>Erection of doctors surgery, pharmacy, formation of access and parking</p>	The Partners



Planning Application Number	Development Site Location	Description of Development	Applicant
08/09/00038	Elmcroft, Friarn Meadow, Bridgwater, TA6 3RE. This site is approximately 900m from Associated Development.	Erection of eleven dwellings contained within three, two storey buildings, partly on site of existing (to be demolished)	Staplegrove Construction Ltd
08/09/00096	Jasun Filtration, Riverside House, Parrett Way, Bridgwater, TA6 5LB. This site is approximately 1km from Associated Development.	Erection of extension to West elevation to provide additional manufacturing, warehousing and associated facilities	Jasun Filtration
08/09/00127	George Williams House, Friarn Avenue, Bridgwater, TA6 3RF This site is approximately 1km from Associated Development.	Erection of three storey building to form eight one bed flats, 35 bedrooms, communal kitchen/ lounges, laundries and office accommodation, and on site of existing (to be demolished) and apprentice workshop	Bridgwater YMCA Foyer
08/09/00131	56-66 Eastover, Bridgwater, TA6 5AR. This site is approximately 450m from Associated Development.	Erection of part four storey, part five storey building to form two ground floor retail units (use class A1 and A3) and 70 bed care home, formation of access, parking and garden area, demolition of existing buildings	D C Homes and Investments Ltd



Planning Application Number	Development Site Location	Description of Development	Applicant
08/09/00351	On land to the South of, Barhams Close, Bridgwater. This site is approximately 400m from Associated Development.	Erection of six industrial units, formation of parking and access	Mr P Jessopp
09/05/00003	Land at, Express Park, Bristol Road, Bridgwater. This site is approximately 650m from Associated Development.	Erection of extension to east elevation to form additional warehouse (B8) and production (B2) areas.	Gerber Foods Soft Drinks Ltd
09/06/00011	Land to the East of Bristol Road and North of, Horsey Lane, Bridgwater. This site is approximately 850m from Associated Development.	Erection of units B1 and B8 use	Roselea Properties LLP
09/06/00013	Land at, Express Park, Bristol Road, Bridgwater. This site is approximately 650m from Associated Development.	Erection of extension to form additional warehouse (use class B8) and production (use class B2) accommodation	Gerber Foods Soft Drinks Ltd



Planning Application Number	Development Site Location	Description of Development	Applicant
09/07/00020	Land to the East of Bristol Road and North of, Horsey Lane, Bridgwater. This is approximately 850m from Associated Development.	Erection of two storey office building.	Roselea Properties LLP
09/07/00024	Land at, Bower Lane, East Bower, Bridgwater. This site is approximately 600m from Associated Development.	Erection of hospital and formation of access	Somerset Primary Care Trust
09/08/00002	Land at (4), Express Park, Bristol Road, Bridgwater. This site is approximately 650m from Associated Development.	Erection of extension to east elevation to form additional warehouse (B8) and production (B2 use) facilities.	Gerber Foods Soft Drinks Ltd
09/08/00011	Mole Valley Farmers, Bath Road, Horsey, Bridgwater, TA7 8PE. This site is approximately 1km from Associated Development.	Erection of extension to NW elevation to form additional sales area and garden display area, installation of mezzanine level to form staff facilities, use of existing building as storage warehouse, formation of external storage and additional car parking area	Mole Valley Farmers



Planning Application Number	Development Site Location	Description of Development	Applicant
20/07/00008	Fishing Lakes, Straight Drove, Chilton Trinity, Bridgwater. This site is approximately 1km from Associated Development.	Erection of seven timber holiday cabins, earthworks in connection with landscaping, alterations to lake shape and formation of roadways and parking	Mr J Savage
20/08/00006	Chilton Trinity School, Chilton Street, Bridgwater, TA6 3JA. This site is approximately 1km from Associated Development.	Erection of replacement secondary school	Somerset County Council
37/08/00203	Land at Stockmoor Village, Taunton Road, North Petherton, Bridgwater	Erection of public house, care home, convenience store, six retail/commercial units and 27 dwellings, formation of access and parking (amended plans for care home received on 10/03/2009)	HDD Bridgwater Ltd
08/06/00256	Land to the North of and 30-32, St. Mary Street, Bridgwater. This site is approximately 1km from Associated Development.	Change of use and conversion of retail premises to bar, with first floor managers accommodation and including single storey rear extension, partly on site of existing premises and Ten Pin Bowling Alley (to be demolished) (Amended Plans Received 14/12/2006)	Abracore Ltd



Planning Application Number	Development Site Location	Description of Development	Applicant
08/06/00258	Land to the rear of 30-32, St. Mary Street, Bridgwater. This site is approximately 1km from Associated Development.	Erection of 22 one bedroom dwellings, contained within part three storey, part four storey building, on site of bowling alley (to be demolished) (Amended Plans received 14/12/2006)	Abracore Ltd
08/06/00262	St Johns Ambulance Headquarters (2), Albert Street, Bridgwater. This site is approximately 1km from Associated Development.	Erection of three and four storey residential development to include 8 one bedroom flats and 5 two bedroom flats with associated parking and demolition of existing building.	Raglan Housing Association Ltd
08/06/00271	R S Harris Ltd, Friarn Street, Bridgwater, TA6 3LJ. This site is approximately 900m from Associated Development.	Erection of 20 two bedroom apartments and 4 one bedroom apartments with associated access and parking as amended by agents letter dated 15 November 2006 and plans attached thereto and plans ref. 150/D and 152/E received 5 Dec 2006	C/o Hammond Yates Partnership



Table A2 – Local Projects Occurring in the Cannington – Combwich Area

Planning Application Number	Development Site Location	Description of Development	Applicant	Decision Date	Status (where information available)
13/05/00021	Cannington Centre for Land Based Studies, Rodway, Cannington. This site is approximately 500m from Associated Development.	Formation of a land based study centre including the erection of a building to form classrooms and accommodation for small animals, external animal accommodation, and demolition of existing buildings.	Cannington Centre for Land Based Studies	20/10/2005	Constructed
13/08/00028	Land at the Western end of, Castle Hill Quarry, Chads Hill, Cannington. This site is approximately 1km from Associated Development.	Southern and Western extensions (40m wide) of Castle Hill Quarry in conjunction with and utilising the existing infrastructure of the quarry (site area 1.4 Ha)	Castle Hill Quarry Co Ltd	28/08/2008	
13/09/00031	Land at, Tincknells Fuels, Main Road, Cannington, Bridgwater	Erection of three buildings to form 14 light industrial/business units (use class B1), formation of access and demolition of redundant buildings	Mr R Tincknell and Sons Ltd	No decision	



Table A3 – Local Projects Occurring in the Junction 23 Park and Ride and Freight Logistics Facility Area

Planning Application Number	Development Site Location	Description of Development	Applicant	Decision Date	Status (where information available)
09/08/00017	<p>Land off A38, Bristol Road and A39, Bath Road and bounded by M5 Motorway and railway line, Bristol Road, Bridgwater.</p> <p>This site is approximately 500m from the associated development site.</p>	<p>To include residential development of up to 2,000 dwellings; a commercial services centre comprising up to 1200 square metres retail floor space (Use Classes A1, A2 & A5), leisure (A3 and A4), community facilities (D1), residential and/or B1 employment development; primary school; up to 110,000 square metres of employment development (B1, B2, B8); sui generis trade units and car showrooms; sports and recreation facilities to include sports pavilion and play areas; strategic landscaping; transport network and access connections; and associated engineering works, infrastructure, drainage, and car parking; and including full Planning Application details for the erection of part of the employment development comprising a Regional Distribution Centre (71,300, square metres of B8 warehousing and ancillary B1/B2 uses) and for 400 of the dwellings.</p>	Hallam Land Management	24/03/2010	

Planning Application Number	Development Site Location	Description of Development	Applicant	Decision Date	Status (where information available)
09/09/00004	<p>Land at Lower Sydenham Farm and east of the M5, Horsey, Bridgwater.</p> <p>This site is approximately 500m from the associated development site.</p>	<p>Creation of habitat reserve including excavation of conservation ponds, construction of hibernacula, and native species hedgerow and woodland planting as detailed in drawings nos. 3116/E/61 and 3116/E/62 received on 31st March 2009; and construction of drainage channel and swale with ancillary topsoil stripping, as amended by drawings nos. 1095/DR/23 Rev E and 1095/DR/24 Rev B received on 9th April 2009, land at Lower Sydenham Farm and east of the M5, Horsey, Bridgwater.</p>	Hallam Land Management	14/04/2009	
42/08/00001	<p>A G Watts Transport Depot Ltd, Bristol Road, Dunball, Bridgwater.</p> <p>This site is approximately 50m from the associated development site.</p>	<p>Change of use from animal feed mill, warehouse and yard, to timber mill, warehouse and yard to include timber treatment plant, sawing and machining of timber, manufacture and storage of wood fuels, sales of timber and associated products, erection of new front security gate, associated improvement of fence security and an external toilet block (portacabin).</p>	Brookeridge Timber Ltd	13/03/2008	



Table A4 – Local Projects Occurring in the Junction 24 Park and Ride and Freight Logistics Facility Area

Planning Application Number	Development Site Location	Description of Development	Applicant	Decision Date	Status (where information available)
37/04/00054	Land to the West of Junction 24, M5 Motorway, Huntworth, Bridgwater.	Formation of Regional Business Centre to include livestock market, buildings to be used for agri-related businesses, parking, roads and access.	Mead Realisations Limited	19/12/2005	Constructed.
37/06/00041				08/06/2006	
37/06/00033				30/05/2006	
37/06/00066	This site is approximately 300m from the associated development site.			19/09/2006	
37/06/00067				19/09/2006	
37/07/00110				09/04/2008	
37/06/00004	Land at, Huntworth Business Park, Huntworth, Bridgwater. This site is approximately 300m from the associated development site.	Erection of light industrial/warehouse units with associated offices and parking.	P & V Gadsby	11/05/2006	
37/06/00025	Land to the South West Junction 24, M5 Motorway, Huntworth, Bridgwater. This site is approximately 300m from the associated development site.	Erection of building to form milk dairy and distribution depot and associated buildings	Robert Wiseman and Sons Ltd	08/06/2006	Constructed.



Planning Application Number	Development Site Location	Description of Development	Applicant	Decision Date	Status (where information available)
37/06/00157	Land to the West of Junction 24 M5 Motorway, Huntworth, Bridgwater. This site is approximately 500m from the associated development site.	Erection of waste water treatment plant and building to form vehicle maintenance depot, both in connection with proposed adjacent dairy.	Robert Wiseman & Sons Ltd	19/01/2007	Constructed.
37/08/00018	Land adjacent to, Marsh Lane and South of, Showground Road, Bridgwater. This site is approximately 500m from the associated development site.	Erection of 10 business units (use classes B1, B2, and B8), formation of parking and access	P S J Properties	15/10/2008	
37/08/00086	Land between Livestock Market & Dairy, west of Junction 24, M5 Motorway, Huntworth, Bridgwater. This site is approximately 300m from the associated development site.	Erection of building to form ground floor sales area and workshop for tractor maintenance and first floor office accommodation	Southern Tractors Ltd	05/02/2009	Constructed.



Planning Application Number	Development Site Location	Description of Development	Applicant	Decision Date	Status (where information available)
37/08/00197	<p>Mole Valley Farmers Ltd, Huntworth Mill, Marsh Lane, Huntworth, Bridgwater.</p> <p>This site is approximately 700m from the associated development site.</p>	Erection of extension to NE and NW elevations to provide additional storage space	Mole Valley Farmers	13/01/2009	
37/09/00081	<p>Colley Lane Southern Access Road from Parrett Way to, Marsh Lane, Huntworth, Bridgwater.</p> <p>This site is approximately 1km from the associated development site.</p>	Construction of new road (Colley Lane southern Access Road) including bridges to span the Bridgwater and Taunton Canal and the River Parrett.	Somerset County Council	No decision	



Planning Application Number	Development Site Location	Description of Development	Applicant	Decision Date	Status (where information available)
37/10/00015	<p>Land off, Huntworth Lane, North Petherton, Bridgwater, TA7 0AJ.</p> <p>This site is approximately 90m from the associated development site.</p>	<p>Variation of condition 6 of Planning Permission 37/91/0009 to read "The holiday cottages hereby permitted shall be used for holiday accommodation only and shall not be occupied as a person's sole or main residence. The site operators and owners shall maintain an up to date register of the names of owners/occupiers, including their guests, of individual cottages and their main home addresses and shall make this information available at all reasonable times to the Local Planning Authority."</p>	S Notaro Ltd	20/03/2010	



Table A5 – Local Projects Occurring in the Williton Park and Ride Facility Area

Planning Application Number	Development Site Location	Description of Development	Applicant	Decision Date	Status (where information available)
3/39/07/006	Tractor display site, Bank Street, Williton, TA4 4NH. This site is approximately 200m from the associated development site.	10 x 2 bedroom, 2 storey dwellings with parking	J Gliddon & Sons	29/03/2007	
3/39/08/001	Land at Bank Street, Williton. This site is approximately 150m from the associated development site.	Residential and small scale retail including infrastructure and alterations to vehicular access	J Gliddon & Sons Ltd, Bank Street, Williton, Taunton	31/07/2008	
3/39/08/006	Waste recycling centre, Roughmoor, Williton, TA4 4RF. This site is approximately 1km from the associated development site.	Extension of household waste recycling centre to include additional range of dedicated skips, including trade waste facility	Mr Steve Read, Waste Partnership, County Hall	28/07/2008	
3/39/08/016	Land off Bridge Street & Bank Street, Williton.	Replacement 64 bed care home for 'Croft House' & shared use adult learning building for SCC	Somerset Care Ltd and Somerset County	04/10/2009	



Planning Application Number	Development Site Location	Description of Development	Applicant	Decision Date	Status (where information available)
	This site is approximately 150m from the associated development site.		Council		
3/39/09/004	Bridge Farm, Bridge Street, Williton, TA4 4NR. This site is approximately 400m from the associated development site.	Conversion of existing barns to form two offices and nine dwellings, together with the provision of a new dwelling, two carports and associated site works and flood alleviation works. Proposal for listed building consent: partial demolition together with external and internal alterations to barns to form office and residential accommodation.	The Trustees of the Wyndham Estate	04/09/2009	
3/39/10/002	Gliddons Garage, High Street, Williton, TA4 4NW. This site is approximately 400m from the associated development site.	Demolition of existing car dealership and vehicle repair centre garage and erection of 21 dwellings and associated parking and landscaping	Summerfield Developments (SW) Ltd		



APPENDIX B – POTENTIAL EFFECTS OF SCREENED PROJECTS FOR THE ASSOCIATED DEVELOPMENT SITES



Table B1 Bridgwater Campuses

Development Proposal	Ecology	Noise	Landscape and Visual	Hydrology / Hydrogeology	Socio-economics	Recreation and Amenity
<p>Hallam Masterplan</p> <p>A masterplan comprising residential development of up to 2,000 dwellings; a commercial services centre comprising up to 1,200m² retail floor space; a primary school; community facilities; up to 110,000m² employment development; sports and recreation facilities; strategic landscaping; transport network and access connections; infrastructure drainage and car parking.</p>	<p>Minor beneficial – Hallam Masterplan includes development of Green Infrastructure (GI) network, including approximately 45ha of habitat building on existing features such as hedgerows and rhynes (ditches), including the creation of grassland and woodland areas, resulting in significant positive benefits to wildlife.</p>	<p>Minor adverse – Acoustic impacts associated with increased traffic will result in minor adverse impacts on residential development. Construction activities are considered to have a moderate adverse impact at some noise sensitive locations – these impacts are considered to be temporary in nature.</p>	<p>Negligible – The ES for the Hallam Masterplan states that the development is located predominantly within an industrial and urban fringe, agricultural landscape. It is contained within the existing urban area of Bridgwater, and views from the closest residential development would be limited. Current views of industrial development would be replaced with high quality landscaping and residential development. Existing redundant industrial development (Innovia) would be</p>	<p>Negligible – Hallam Masterplan ES concludes that Sustainable Urban Drainage (SUDS) developed for the masterplan will mimic existing conditions – a series of new drainage ditches (rhynes) constructed across the site will link with the existing Motorway Drain. Source control measures will also be implemented, ensuring that peak discharge from the site will be no greater than under baseline conditions. Measures will be implemented to improve water quality by way of passive treatment.</p>	<p>Minor beneficial – Hallam Masterplan is considered to have significant beneficial socio-economic impacts on Bridgwater, providing for approximately 2,000 new dwellings, high quality recreational facilities, supporting the existing retail offer, and underpinning the expansion of town centre services.</p>	<p>Minor beneficial – Hallam Masterplan ES concludes that the new residential development will be served by a high quality recreational facility that will offer a substantial qualitative improvement to existing facilities in the area, complementing and enhancing current provision.</p>



Development Proposal	Ecology	Noise	Landscape and Visual	Hydrology / Hydrogeology	Socio-economics	Recreation and Amenity
<p>BRI-A lies within the masterplan boundary, and BRI-C approximately 500m outside the boundary to the south.</p>			<p>removed. Development of a Green Infrastructure (GI) network would have a positive impact on the landscape. The ES concludes that overall the project would result in the enhancement of the landscape – and there would be no permanent, significant adverse effects associated with the development.</p>			



Development Proposal	Ecology	Noise	Landscape and Visual	Hydrology / Hydrogeology	Socio-economics	Recreation and Amenity
Housing Development – 125 Dwellings Residential Development at, Hamp Industrial Estate, Old Taunton Road, Bridgwater. This site is approximately 1km from the associated development site. Planning Application approved 07/02/2008.	Negligible – Development has been assessed and approved by Sedgemoor District Council, and impacts on biodiversity identified and managed.	Negligible – Development has been assessed and approved by Sedgemoor District Council, and impacts associated with noise generation identified and managed. Development site lies approximately 1km from BRI-A, and BRI-C, within a built-up urban area, and cumulative noise impacts are therefore considered to be negligible.	Minor beneficial – Development has been assessed and approved and is considered to be of satisfactory design and density by Sedgemoor District Council. Development will significantly improve appearance of site which is currently industrial in nature.	Negligible – Development has been assessed and approved by Sedgemoor District Council, and impacts associated with hydrology and hydrogeology identified and managed.	Minor beneficial – Development has been assessed and approved, and is considered by Sedgemoor Council to provide an appropriate level of affordable housing.	Minor beneficial – Development has been assessed and approved, and is considered by Sedgemoor District Council to be of satisfactory design and density, and to provide adequate provision for outside recreational / community space.



Development Proposal	Ecology	Noise	Landscape and Visual	Hydrology / Hydrogeology	Socio-economics	Recreation and Amenity
Housing Development – 53 Dwellings Erection of 53 dwellings, demolition of existing buildings, formation of access together with associated parking and garaging. Land between 21 & 35 Monmouth Street and east of Church Street, Bridgewater. Planning Application approved 04/12/2007.	Negligible – Development has been assessed and approved by Sedgemoor District Council, and impacts on biodiversity identified and managed. The development is located on a brownfield site with little biodiversity value.	Negligible – Development has been assessed and approved by Sedgemoor District Council, and impacts associated with construction noise identified and managed.	Minor beneficial – Development has been assessed and approved by Sedgemoor District Council. Existing site has a ‘run-down’ appearance – development will significantly improve general appearance of the area.	Negligible – Development has been assessed and approved by Sedgemoor District Council. A Flood Risk Assessment has been undertaken for the site, which includes consideration of run-off and drainage issues.	Minor beneficial – Development has been assessed and approved by Sedgemoor District Council. Development will result in minor employment generation.	Minor beneficial – Development has been assessed and approved by Sedgemoor District Council. Development includes adequate landscaping / amenity space.
East Bridgewater Community School	Negligible – Sedgemoor District Council has raised	Negligible – Sedgemoor District Council has raised	Negligible – Sedgemoor District Council has raised	Negligible – Sedgemoor District Council has raised	Minor Beneficial – Development is part of the Building	Negligible – Sedgemoor District Council has raised

Development Proposal	Ecology	Noise	Landscape and Visual	Hydrology / Hydrogeology	Socio-economics	Recreation and Amenity
<p>Outline planning application for a development zone for replacement two storey and part three storey school.</p>	<p>no objections to the proposed development. A detailed Phase 1 Habitat Survey and Arboricultural Survey has been undertaken in order to identify and appropriately manage any impacts on biodiversity.</p>	<p>no objections to the proposed development, and noise impacts associated with the proposed works are not considered to result in significant adverse impacts.</p>	<p>no objections to the proposed development. A Design and Access Statement has been prepared to ensure development is appropriate in context of surrounding land use and of high quality.</p>	<p>no objections to the proposed development. A Flood Risk Assessment has been undertaken for the site, which considers both the suitability of the site, and the application of measures to manage drainage and surface run-off.</p>	<p>Schools for the Future (BSF) project, and will have a beneficial impact in terms of schooling provision.</p>	<p>no objections to the proposed development. The proposal will result in the closure of a Public Right of Way (PRoW) running through the centre of the site – this will be replaced with a new footpath. However, any cumulative impacts on access and PRoW are considered to be negligible.</p>
<p>East Bridgwater Community School, Parkway, Bridgwater, TA6 4QY.</p>						
<p>This site is approximately 700m from the associated development site.</p>						
<p>Sedgemoor District Council has resolved to ‘raise no objection’ to the proposed development. Decision reached 06/05/2008.</p>						



Development Proposal	Ecology	Noise	Landscape and Visual	Hydrology / Hydrogeology	Socio-economics	Recreation and Amenity
Energy Skills Centre, Bridgwater College Demolition of storage buildings, construction of road bridge, new two-storey Energy Skills Centre with associated car parking and new single-storey storage building. Bridgwater College, College Way, Bridgwater, TA6 4PZ. This site is approximately 500m from the associated development site. Planning	Negligible – Sedgemoor District Council has assessed and approved the development. Impacts on ecology have been assessed, and a Management Plan for the semi-natural areas of the site developed to mitigate for any potential impacts.	Negligible – The site is 500m from the BRI-C campus but is already in construction and will be completed before the BRI-C campus construction commences. Furthermore, there are heavily used roads and a railway within this urban environment and negligible cumulative noise impacts would be expected if construction phases overlapped.	Minor beneficial – Sedgemoor District Council has assessed and approved the development. A Design and Access Statement has been prepared to ensure that the scheme is of a high standard. It is considered that the proposed development, including landscaping will provide a positive contribution to the landscape, and when considered in conjunction with the masterplan for BRI-C will have a minor beneficial cumulative impact.	Negligible – Sedgemoor District Council has assessed and approved the development. A Flood Risk Assessment has been prepared for the development, along with proposals for Sustainable Urban Drainage (SUDS).	Minor beneficial – Proposed development will result in minor employment generation.	Minor beneficial – Sedgemoor District Council has assessed and approved the proposed development. A Design and Access Statement has been prepared to ensure that the scheme is of a high standard, and incorporates adequate levels of amenity space.

Development Proposal	Ecology	Noise	Landscape and Visual	Hydrology / Hydrogeology	Socio-economics	Recreation and Amenity
Application approved 26/08/2009.						
Food Preparation, Packaging and Storage Facility Formation of food preparation, packaging and storage facility, including refurbishment and extension of existing warehouse to form potato packing, chill warehouse, offices and canteen/locker extension, demolition of industrial buildings, erection of 2 gathouses, weighbridge gantry and canopy, LPG store, formation of car parking.	Negligible – The proposed development is located on brownfield land, and impacts on biodiversity are considered to be negligible.	Negligible – Possible short-term construction impacts, should the proposed development be constructed at the same time as the proposals at BRI-A and BRI-B. However, given the distance between the development sites, and their setting within an urban landscape adjacent to the Bridgwater to Highbridge railway line and the A38 Bristol Road, it is considered that any such impacts would be of negligible significance. Design and Access Statement and Planning Statement	Minor beneficial – A Design and Access Statement has been prepared to ensure that the scheme is of a high standard. Scheme is located on a brownfield site, and Planning Statement concludes that development will represent a material improvement over the existing situation in terms of residential amenity and the appearance of the site.	Negligible – Flood Risk Assessment undertaken for the proposed development, and detailed measures identified to manage run-off.	Minor beneficial – Scheme will generate 650 new jobs.	No impact – Proposed development is located on an existing brownfield development site.



Development Proposal	Ecology	Noise	Landscape and Visual	Hydrology / Hydrogeology	Socio-economics	Recreation and Amenity
392 Bristol Road, Bridgwater, TA6 4AT. This site is approximately 500m from the associated development site.		include consideration of noise impacts and conclude that during operation, the proposed development will represent an improvement on existing conditions for adjacent sensitive receptors.				
Hospital Erection of hospital and formation of access. Land at, Bower Lane, East Bower, Bridgwater. This site is approximately 600m from the associated	Negligible – Planning Application approved 18/12/2008. Impacts on biodiversity considered and appropriately managed through the assessment process.	Negligible – Planning Application approved 18/12/2008. Noise impacts considered and appropriately managed through the assessment process.	Negligible – Planning Application approved 18/12/2008. A Design and Access Statement has been prepared to ensure the development is of a high quality, is appropriate within the context of the surrounding area, and includes adequate landscaping.	Negligible – Planning Application approved 18/12/2008. A Flood Risk Assessment has been prepared for the development which includes measures to manage potential flood risk.	Minor beneficial – Development will result in improved health service provision for Bridgwater. Planning Application approved 18/12/2008.	Negligible – Planning Application approved 18/12/2008. A Design and Access Statement has been prepared to consider provision of amenity space and landscaping.

Development Proposal	Ecology	Noise	Landscape and Visual	Hydrology / Hydrogeology	Socio-economics	Recreation and Amenity
development site. Planning Application approved 18/12/2008.						
Chilton Trinity Secondary School Erection of replacement secondary school. Chilton Trinity School, Chilton Street, Bridgwater, TA6 3JA. This site is approximately 1km from associated development site. Sedgemoor District Council has resolved to 'raise no	Negligible – Sedgemoor District Council has resolved to raise no objection to the proposed development. A Phase 1 Habitat Survey has been undertaken for the development to identify and mitigate for any possible impacts on biodiversity.	Negligible – Sedgemoor District Council has resolved to raise no objection to the proposed development. Construction activities may result in short-term noise impacts – development site lies approximately 1km from the BRI-Aand BRI-C sites.	Negligible – Sedgemoor District Council has resolved to raise no objection to the proposed development. A Design and Access Statement has been prepared to ensure the development is of a high quality, is appropriate within the context of the surrounding area, and includes adequate landscaping.	Negligible – Sedgemoor District Council has resolved to raise no objection to the proposed development. A Flood Risk Assessment has been prepared for the development which includes a surface water and drainage strategy.	Minor beneficial – Sedgemoor District Council has resolved to raise no objection to the proposed development. Development will have a beneficial impact for the surrounding area in terms of schooling provision.	Minor beneficial – Sedgemoor District Council has resolved to raise no objection to the proposed development. A Design and Access Statement has been prepared to ensure adequate provision of amenity space.



Development Proposal	Ecology	Noise	Landscape and Visual	Hydrology / Hydrogeology	Socio-economics	Recreation and Amenity
objection' to the proposed development. Decision made 06/05/2008.						



Table B2: Cannington and Combwich

Development Proposal	Ecology	Noise	Landscape and Visual	Hydrology / Hydrogeology	Socio-economics	Recreation and Amenity	Archaeology
Quarry Extension Southern and Western extensions (40m wide) of Castle Hill Quarry in conjunction with, and utilising, the existing infrastructure of the quarry (site area 1.4ha). Land at the Western end of, Castle Hill Quarry, Chads Hill, Cannington, approximately 1km north of the proposed development site.	Negligible – Sedgemoor District Council has resolved to raise no objection to the proposed scheme. A detailed ecological assessment has been undertaken for the site, and mitigation proposals development to address any impacts on protected species.	Negligible – Sedgemoor District Council has resolved to raise no objection to the proposed scheme. Development is located approximately 1km from the CAN-A development site, and cumulative noise impacts are therefore considered to be negligible.	Negligible – Sedgemoor District Council has resolved to raise no objection to the proposed scheme. A detailed visual impact assessment has been undertaken for the site to identify and manage and landscape and visual impacts.	Negligible – Sedgemoor District Council has resolved to raise no objection to the proposed scheme. A detailed hydrology and water management report has been undertaken for the site to identify and manage any potential impacts.	Minor beneficial – Sedgemoor District Council has resolved to raise no objection to the proposed scheme. The works will have a minor beneficial impact in terms of employment generation.	Negligible – Sedgemoor District Council has resolved to raise no objection to the proposed scheme. The works will not impact upon the existing recreation and amenity resource, including PRoW.	Negligible – Sedgemoor District Council has resolved to raise no objection to the proposed scheme. A detailed archaeological investigation, including desktop study, topographic assessment and mitigation strategy has been prepared for the site to identify and manage any potential impacts.



Development Proposal	Ecology	Noise	Landscape and Visual	Hydrology / Hydrogeology	Socio-economics	Recreation and Amenity	Archaeology
14 Light Industrial Business Units Erection of three buildings to form 14 light industrial/business units (use class B1), formation of access and demolition of redundant buildings.	No impact – Planning Application refused 22/03/2010.	No impact – Planning Application refused 22/03/2010.	No impact – Planning Application refused 22/03/2010.	No impact – Planning Application refused 22/03/2010.	No impact – Planning Application refused 22/03/2010.	No impact – Planning Application refused 22/03/2010.	No impact – Planning Application refused 22/03/2010.
Land at, Tincknells Fuels, Main Road, Cannington. Planning Application refused 22/03/2010.							



Table B3: Junction 23 Park and Ride and Freight Logistics Facility

Development Proposal	Ecology	Noise	Landscape and Visual	Hydrology / Hydrogeology	Socio-economics	Recreation and Amenity
<p>Hallam Masterplan</p> <p>A masterplan comprising residential development of up to 2,000 dwellings; a commercial services centre comprising up to 1,200m² retail floor space; a primary school; community facilities; up to 110,000m² employment development; sports and recreation facilities; strategic landscaping; transport network and access connections; infrastructure drainage and car parking.</p>	<p>Negligible – Hallam Masterplan includes development of Green Infrastructure (GI) network, including approximately 45ha of habitat building on existing features such as hedgerows and rhynes (ditches), including the creation of grassland and woodland areas, resulting in significant positive benefits to wildlife.</p>	<p>Negligible – Acoustic impacts associated with increased traffic will result in minor adverse impacts on residential development. Construction activities are considered to have a moderate adverse impact as some noise sensitive locations – these impacts are considered to be temporary in nature. The northern section of masterplan site is to be dedicated to wildlife and landscaping – and consequently the closest areas dedicated to built development lie approximately 500m south east of</p>	<p>Minor beneficial – The ES for the Hallam Masterplan states that the development is located predominantly within an industrial and urban fringe, agricultural landscape. It is contained within the existing urban area of Bridgwater, and views from the closest residential development would be limited. Current views of industrial development would be replaced with high quality landscaping and residential development. Existing redundant industrial development (Innovia) would be</p>	<p>No impact – Hallam Masterplan ES concludes that Sustainable Urban Drainage (SUDS) developed for the masterplan will mimic existing conditions – a series of new drainage ditches (rhynes) constructed across the site will link with the existing Motorway Drain. Source control measures will also be implemented, ensuring that peak discharge from the site will be no greater than under baseline conditions. Measures will be implemented to improve water quality by way of passive treatment.</p>	<p>Minor beneficial – Hallam Masterplan is considered to have significant beneficial socio-economic impacts on Bridgwater, providing for approximately 2,000 new dwellings, high quality recreational facilities, supporting the existing retail offer, and underpinning the expansion of town centre services.</p>	<p>Minor beneficial – Hallam Masterplan ES concludes that the new residential development will be served by a high quality recreational facility that will offer a substantial qualitative improvement to existing facilities in the area, complementing and enhancing current provision.</p>

Development Proposal	Ecology	Noise	Landscape and Visual	Hydrology / Hydrogeology	Socio-economics	Recreation and Amenity
<p>Located to the north of the A38, and to the east of the Bridgwater to Highbridge railway line – BRI-A lies within the masterplan boundary, BRI-C lies approximately 500m to the south.</p>		<p>the site at J23-A, on the other side of the A38 Bristol Road, the Bridgwater to Highbridge railway line, and existing industrial development (Dunball Wharf and the British Car Auctions site). Given the distance of the two sites it is considered that any cumulative impacts associated with both construction and operation of the proposed development are likely to be negligible. The masterplan has no influence on use of rail network, so noise impacts associated with the railway are no considered.</p>	<p>removed. Development of a Green Infrastructure (GI) network would have a positive impact on the landscape. The ES concludes that overall the project would result in the enhancement of the landscape – and there would be no permanent, significant adverse effects associated with the development.</p>			



Table B4: Junction 24 Park and Ride and Freight Logistics Facility

Development Proposal	Ecology	Noise	Landscape and Visual	Hydrology / Hydrogeology	Socio-economics	Recreation and Amenity	Archaeology
Colley Lane Southern Access Road	Negligible – Sedgemoor District Council has resolved to raise no objection to the proposed scheme. Planning Supporting Statement includes detailed consideration of impacts on ecology.	Negligible – Sedgemoor District Council has resolved to raise no objection to the proposed scheme. A detailed assessment of noise impacts has been undertaken for the development, and appropriate mitigation developed where necessary. Proposed road is located approximately 1 km north of the development site at J24-A.	Minor beneficial – Sedgemoor District Council has resolved to raise no objection to the proposed scheme. Planning Supporting Statement prepared for the development concludes that the landscape proposals aim to improve the visual character of the area, and states that through the introduction of a green corridor, the visual appearance and quality of the area will be improved.	Negligible – Sedgemoor District Council has resolved to raise no objection to the proposed scheme. Planning Supporting Statement prepared for the development states that drainage design takes into account the existing drainage system on the adjacent land and ensures there is no increase in surface water flooding as a result of the proposal, and that no increase in discharge will	Minor beneficial – Proposed development will result in minor employment generation.	Minor beneficial – Sedgemoor District Council has resolved to raise no objection to the proposed scheme. The development will assist in enhancing the safety and environment of busy urban roads on the northern edge of the town and improve traffic conditions on the road network.	Negligible – Sedgemoor District Council has resolved to raise no objection to the proposed scheme. An Archaeological Assessment has been prepared to identify and manage any potential impacts.
Construction of new road (Colley Lane Southern Access Road) including bridges to span the Bridgwater and Taunton Canal and the River Parrett.	Negligible – Sedgemoor District Council has resolved to raise no objection to the proposed scheme. Planning Supporting Statement includes detailed consideration of impacts on ecology.	Negligible – Sedgemoor District Council has resolved to raise no objection to the proposed scheme. A detailed assessment of noise impacts has been undertaken for the development, and appropriate mitigation developed where necessary. Proposed road is located approximately 1 km north of the development site at J24-A.	Minor beneficial – Sedgemoor District Council has resolved to raise no objection to the proposed scheme. Planning Supporting Statement prepared for the development concludes that the landscape proposals aim to improve the visual character of the area, and states that through the introduction of a green corridor, the visual appearance and quality of the area will be improved.	Negligible – Sedgemoor District Council has resolved to raise no objection to the proposed scheme. Planning Supporting Statement prepared for the development states that drainage design takes into account the existing drainage system on the adjacent land and ensures there is no increase in surface water flooding as a result of the proposal, and that no increase in discharge will	Minor beneficial – Proposed development will result in minor employment generation.	Minor beneficial – Sedgemoor District Council has resolved to raise no objection to the proposed scheme. The development will assist in enhancing the safety and environment of busy urban roads on the northern edge of the town and improve traffic conditions on the road network.	Negligible – Sedgemoor District Council has resolved to raise no objection to the proposed scheme. An Archaeological Assessment has been prepared to identify and manage any potential impacts.
Located at Colley Lane from Parrett Way to, Marsh Lane, Huntworth, Bridgwater, approximately 1 km from the associated development site.	Negligible – Sedgemoor District Council has resolved to raise no objection to the proposed scheme. Planning Supporting Statement includes detailed consideration of impacts on ecology.	Negligible – Sedgemoor District Council has resolved to raise no objection to the proposed scheme. A detailed assessment of noise impacts has been undertaken for the development, and appropriate mitigation developed where necessary. Proposed road is located approximately 1 km north of the development site at J24-A.	Minor beneficial – Sedgemoor District Council has resolved to raise no objection to the proposed scheme. Planning Supporting Statement prepared for the development concludes that the landscape proposals aim to improve the visual character of the area, and states that through the introduction of a green corridor, the visual appearance and quality of the area will be improved.	Negligible – Sedgemoor District Council has resolved to raise no objection to the proposed scheme. Planning Supporting Statement prepared for the development states that drainage design takes into account the existing drainage system on the adjacent land and ensures there is no increase in surface water flooding as a result of the proposal, and that no increase in discharge will	Minor beneficial – Proposed development will result in minor employment generation.	Minor beneficial – Sedgemoor District Council has resolved to raise no objection to the proposed scheme. The development will assist in enhancing the safety and environment of busy urban roads on the northern edge of the town and improve traffic conditions on the road network.	Negligible – Sedgemoor District Council has resolved to raise no objection to the proposed scheme. An Archaeological Assessment has been prepared to identify and manage any potential impacts.

Development Proposal	Ecology	Noise	Landscape and Visual	Hydrology / Hydrogeology	Socio-economics	Recreation and Amenity	Archaeology
Sedgemoor District Council has resolved to 'raise no objection' to the proposed development. Decision reached 29/03/2010.				be experienced over and above that of green field conditions for up to a 100 year storm event.			



Table B5: Williton Park and Ride

Development Proposal	Ecology	Noise	Landscape and Visual	Hydrology / Hydrogeology	Socio-economics	Recreation and Amenity
Replacement Care Home	No impact – Proposed development is on brownfield land and will have minimal impacts on flora and fauna.	Negligible – Proposed development would result in localised, short-term construction noise impacts associated with a relatively small construction site. Development site is located approximately 300m east of the WIL-A development site, and consequently any cumulative noise impacts are likely to be of negligible significance.	No impact – Proposed development is on brownfield land and will result in relatively minor changes to the landscape.	No impact – Proposed development is on brownfield land, and any changes to the footprint of the site, and to drainage, are likely to be minimal.	Minor beneficial – Construction of the development is likely to result in minor beneficial impacts on a local scale in terms of employment generation, but any impacts when combined with the proposed park and ride scheme would be of negligible significance.	No impact – Proposed development is on brownfield land and will have no impacts on the existing recreation and amenity resource, including Public Rights of Way (PRoW).
Replacement 64 bed care home at Croft House, and shared use adult learning building.						
Located on the corner of Bridge Street and Bank Street, approximately 300m east of the WIL-A development site.						