Nottinghamshire County Landscape Character Assessment

The Trent Washlands Chapter

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1.0 Introduction

1.1 Introduction and Methodology

This Landscape Character Assessment was commissioned and funded by the Minerals and Waste Planning Team, Communities Department of Nottinghamshire County Council. It was carried out by the Landscape and Reclamation Team, Communities Department of Nottinghamshire County Council. The methodology for the assessment was developed by NCC and trialled in a pilot project for the Sherwood Regional Landscape Character Area and it is included as Appendix A of this document.

1.2 Purpose of the document

This LCA will eventually form the **Trent Washlands** chapter of the complete LCA for the whole of the County. The completed document will replace the existing Nottinghamshire Landscape Guidelines published in 1998. This document is being completed by a number of different agencies, and is expected to be complete by the end of 2009.

The **Trent Washlands** chapter is being produced to form part of the Minerals Core Strategy and the Minerals Development Control Policies Document which are part of the Local Development Framework which will replace the existing Minerals Local Plan.

The Minerals Core Strategy will set out overall approach to future minerals extraction in Nottinghamshire. Key issues will include estimates of how much mineral needs to be provided to meet expected demand over the next 10-15 years, what types of sites are suitable and where in broad terms should new or extended mineral sites be located. Recent revisions to the new planning system now mean that the Core Strategy may allocate strategic sites.

The Minerals Development Control Policies will be prepared at the same time as the Core Strategy. This document will set out policies for controlling development and making sure environmental standards are met. Policies will therefore cover issues such as traffic, noise and dust as well as policies aimed at protecting important wildlife, heritage sites and landscapes.

1.3 Context

The **Trent Washlands** covers 1 National Character Areas [NCA] as defined by Natural England; Trent and Belvoir Vales [48]. At a county level County Character Areas (CCAs) have been defined by NCC these relate to the NCAs ,which cover much broader areas, but do not have exactly the same boundaries. The CCAs have been created using the 'Living Landscapes Project' methodology. This is a GIS based process which not only relates to the NCA work carried out by Natural England but is an established methodology used by counties across the country, including Derbyshire and Leicestershire both of which border Nottinghamshire. Figure 1 shows these character areas in the context of the whole county. Each County Character Area forms a separate chapter within this Landscape Character Assessment. The CCAs are further divided into Landscape Description Units [LDUs] these are homogenous units within the broader CCAs.

1.4 Landscape Character Assessment

Within each County Character Area, the LDUs are subdivided into manageable survey units known as Landscape Character Parcels (LCPs). Each LCP is assessed in terms of its individual landscape character in accordance with the methodology. A photograph which is representative of the character of each LCP is also taken and its location recorded. This information is detailed on the Landscape Character Assessment Field survey sheets for each County Character Area, which are included at the relevant Appendices.

The **Trent Washlands** have been divided into 30 Landscape Description Units (LDUs) as shown on Figure 2. These LDUs were then subdivided into 34 Landscape Character Parcels (LCPs) as shown on Figure 3. The Landscape Character of each LCP has been surveyed and described in accordance with the methodology included as Appendix A. A representative photograph of each LCP was also taken and the associated 6 figure grid reference is recorded. This information is detailed on the Landscape Character Assessment survey sheets which are included as Appendix B of this document.

1.5 Draft Policy Zones

Following on from the Landscape Character Assessment of each LCP, a number of Draft Policy Zones (DPZs) were created using the completed survey information. Key characteristics were tabulated to help determine which LCPs may or may not be grouped together to form a DPZ, for instance LCPs with obvious similarities become one distinct DPZ. The DPZs combine either one or more LCP depending upon the similarities of their attributes. A table showing the derivation of each DPZ is included at the relevant appendix. A total of 53 DPZs were derived for the **Trent Washlands**, the table showing how they were amalgamated is included as Appendix C.

1.6 Landscape Condition and Sensitivity Assessment

The DPZs were assessed in terms of their condition and sensitivity in accordance with the methodology. This information was detailed on the Landscape Condition and Sensitivity assessment field sheets for each County Character Area, and forms the basis of Landscape Policy for each zone.

For the **Trent Washlands**, this information is detailed on the Landscape Condition and Sensitivity field survey sheets, which are included as **Appendix D** of this document.

1.7 Policy Zones

A series of Policy Sheets, one per Policy Zone, have been produced. These are supported by a plan showing the resultant policy for each Zone. Each Policy sheet includes an overall character summary, specific characteristic features, a matrix and summary of the Landscape Condition and Sensitivity, and a representative photograph.

Finally, a series of Landscape actions is defined for each Policy Zone. Collectively, this provides a Policy Framework for the conservation and restoration of the **Trent Washlands**.

A series of 53 Policy sheets covering the whole of the **Trent Washlands** was produced. A key plan is included as Figure 6. These collect together the key information for each Policy Zone, and are presented as Section 3 of this document.

This framework will help to ensure that landscape character is reflected in the many decisions and actions that affect its continuing evolution. The intention is not to fossilise change, but to provide a context that will enable policy making, planning and landscape management decisions to be made which respect and sustain the diversity and character of the countryside.

2.0 The Trent Washlands

2.1 Physical and human influences

Introduction

The **Trent Washlands** is principally formed from the broad valleys of the River Trent. The region is defined by alluvial and river terrace drift deposits and occupies around 10 % of the County. The Trent flows in a great arc through a number of counties including Staffordshire, Derbyshire and Nottinghamshire before eventually discharging into the North Sea, via the Humber. Stoke-on-Trent, Burton on Trent, Nottingham, Newark and Gainsborough are the main population centres located along its course.

The shape of the land

In Nottinghamshire the valley of the Trent strikes through the County from end to end over a distance of 80 kilometres. Throughout its length this valley, which has an average width of 2-3 kilometres, is floored by a succession of river-borne materials, each reflecting a stage in the development of the river system. The materials consist primarily of older flood gravels of varying age, covered in places by more recently deposited alluvium. While the gravels are predominantly coarse and composed mainly of Bunter Pebble Bed debris, the alluvium is of much firmer texture, varying from silty loam to light clay.

The gravels include both outwash material derived from the retreating pleistocene ice fronts, and more recent riverine deposits. Together these form a series of low terraces which occur mainly along the edge of the valley, but also as “islands” in the midst of the river floodplain. Most of these terraces are raised by a metre or more, providing areas of naturally dry land surrounded by river alluvium. In places the alluvial floodplain forms extensive areas of flat, low-lying land that would have been subject to periodic flooding prior to the advent of arterial drainage schemes. Alluvial deposits also flank the many smaller tributary streams which flow into the valley, mainly from the low mudstone hills to the west.

The Trent Valley in Nottinghamshire has been cut almost entirely in Mercia Mudstone, and for part of its length the region is flanked on either side by steep slopes to form a shallow trench. These slopes are particularly well developed between Long Eaton and Newark, where for long stretches they represent an old line of degraded river bluffs. In places, especially on the east bank, steep, often wooded river cliffs are a prominent feature rising above the flat alluvial floodplain. They are best developed at Clifton and Radcliffe, and again between Gunthorpe and East Stoke.

Downstream from Newark, the region broadens out, while the slopes rising from its edge gradually decrease in height and steepness until the valley becomes almost indiscernible from the adjacent lowland areas. In its lowest section beyond

Gainsborough the valley opens out onto a broad plain which stretches away northwards to the Humber estuary. This almost level area of former washland, lying at, or in places just below, sea level, is floored by a variable thickness of silty marine alluvium.

Soils

Soils developed on glaciofluvial deposits and river terraces within the main river corridor have predominately coarse loamy textures, often with sandy sub-soils overlying gravel. The larger and more extensive terraces that flank the river corridor downstream from Newark are dominated by deep permeable sandy and coarse sandy soils in glaciofluvial drift. The alluvial soils of the Trent consist of mottled clayey and clay loam soils, developed in greyish and brownish alluvium. Downstream of Gainsborough deposits of shallow coarse silty material overlie the marine alluvium.

Landscape history

This is the region with the most dynamic and complex environment in Nottinghamshire, where both human and natural activities have interacted not just to create successions of landscapes, but to change the actual form of the land. The region contains a rich resource of archaeological remains, many of which are visible on the surface as differential crop growth over buried ditches, pits and other infilled disturbances of the subsoil. The geology and soils of the region are particularly favourable to the development of these cropmarks, which have been recorded through aerial reconnaissance and photography. We now know that invisible archaeological remains also exist, buried in or beneath alluvium deposited by the Trent, and that organic remains which would normally decay may be preserved in the wet conditions of this burial. Such preservation is also a feature of ancient river channels which are to be found buried in many locations on the flood plain of the Trent. It is possible to deduce a great deal about past ecological circumstances and human land use from the tree trunks, brushwood, leaves, pollen, beetles, spiders, molluscs and other remains of flora and fauna found in the deposits filling these palaeochannels, or within flood deposits and archaeological remains. Much new evidence about the palaeoenvironments of the region has been gathered in recent years, giving new insight into the development of the river valley landscape. Research into the environmental and human history of the **Trent Washlands** continues. This brief overview of that history can not do justice to the detail of new evidence being revealed or to the studies involved, which are already considerable. But however much we know now, we have only made a beginning. A full description of the landscape history of the **Trent Washlands** is included as Appendix E of this document.

2.2 Visual Character of the Landscape

Introduction

The historical pattern of land use and settlement within the region is closely linked to the physical character of the valleys, with settlements along the Trent situated on the margins of the valley and the raised river terraces. The free-draining soils, water supplies and ease of communication have attracted people and settlement to the region at all dates.

The Trent flows through the large urban centres of Nottingham and Newark in Nottinghamshire. The urban edges of Nottingham and Newark have radically altered the character of the river corridors locally. A number of other pressures have greatly affected the traditional character of the region. These include the impact of power stations and pylon lines, mineral extraction, urban encroachment, road and rail developments and agricultural intensification. These changes have led to alterations in the traditional pattern of land use and a fragmentation of landscape structure in many areas. Away from the urban areas settlement is characterised by a nucleated pattern of villages and isolated farmsteads. These have retained their distinctive vernacular character, being of red brick and pantile roof construction. Modern houses have, however, been constructed in most settlements, introducing a suburban character to many villages, especially those situated close to the main cities and towns.

Arable cultivation now dominates large areas of the river corridors, whereas previously it was confined to the river terraces. Within the Trent corridor a narrow band of riverside grassland is all that remains of a once extensive tract of meadowland and pasture. The meandering river channels are dominant components of the river corridor landscapes; however, along the Trent, high floodbanks often shield the river from view. Within the Trent corridor the river is most visible where associated with the steep wooded bluffs of the Trent Trench, upstream of East Stoke. In this area, and many others, the traditional riverine character of the valleys has been retained. The strength and unity of this character is greatest where there are features such as flood meadows, grazing animals, wooded bluffs, willow holts, mixed hedgerows, historical settlements, permanent pastures and irregular field pattern. Many areas are also rich with archaeological and historical features including deserted medieval villages, Roman fort sites, ridge and furrow, and crop marks.

The **Trent Washlands** Regional Character Area has been divided by the desk based character assessment into 30 Landscape Description Units as shown in Figure 3. These fall into two distinct landscape types **Village Farmlands** and **River Meadowlands**, as shown on Figure 7**.** These have been classified generically which means that, theoretically, the landscape types could occur at any location within the country where there are similar physical resources and historical patterns of land use. In reality the landscape types possess a

distinctively local character, because they share the broad characteristics of the regional character area, or represent a particular aspect of that character.

Village Farmlands

A flat low-lying agricultural landscape characterised by a traditional pattern of hedged fields and nucleated village settlements

Characteristic features

- Broad flat river terraces
- Regular pattern of medium-to large-sized fields, breaking down and becoming open in many areas
- Hedgerow trees main component of tree with cover with Ash being the principle species
- Willow pollards
- Predominantly arable with permanent pasture around settlements and roads
- Nucleated villages with traditional red brick and pantile roofed buildings
- Large power stations
- Sand and gravel quarries

Landscape description

These are flat, intensively farmed landscapes located on river terrace deposits within the Trent river corridors. Topographically, the low lying terraces are of variable prominence, with the better-pronounced terraces rising up to 2 metres above the level of the surrounding alluvium. In the Trent Valley the majority of the terraces are located along the western flank of the river, downstream from Nottingham as far north as Sturton le Steeple. The river terrace deposits are found upstream of Sutton Bonnington. The river terraces provide dry sites for the nucleated pattern of village settlements, just above the level of the river floodplain. Other settlements within the river corridors are found at the valley margins along the fringe of the mudstone landscapes. Most of the smaller villages and farmsteads have retained their traditional character, being of red brick and pantile roof construction. However, modern housing styles have introduced a suburban character to certain of the larger villages. Narrow hedged lanes link many of the settlements. These run across the terraces to the river in a number of places. The river itself is often not a dominant feature. Flat terrain, floodbanks and hedgerows contrive to shield it from view.

There has been a strong tradition of cropping on the high quality terrace soils. This tradition has continued, with the terraces now dominated by intensive arable production, typically within a regular pattern of medium to large fields. This pattern is now highly variable due to field rationalisation. Where hedgerows are intact and well managed, summer views are rarely of any distance, the level landform and hedgerows helping to restrict longer distance views. More open views across the landscape are experienced in many areas, due to a break down in the field pattern, leading to a loss of continuity and character.

Where the field pattern is well defined the occurrence of hedgerow trees enhances the enclosed nature of the landscape and gives structure and form. Ash is the most numerous and widespread species, Oak is also found throughout. Willow is found along stream lines, ditches, and in many hedgerows. Willow pollards are a special feature found throughout the landscape and are particularly prevalent in the more intact enclosed areas. Mature Horse Chestnut trees are found in many parts of the landscape, especially in roadside hedges close to settlements. Hedgerows are mainly strong, trimmed, and Hawthorn, becoming low and gappy on the margins of the more degraded areas. Although hedgerows are dominated by Hawthorn, mixed species hedges are found locally throughout.

Although the village farmlands are dominated by arable farming, grassland landscapes are an important feature, usually being located adjacent to the red brick villages. These pastoral areas have a particularly strong character and are often associated with small irregular field patterns, mature hedgerow trees, strong and often mixed hedgerows, willow pollards, and small pockets of parkland. Some of the grassland contains ridge and furrow. These areas represent the most diverse and undisturbed parts of the landscape and are particularly worthy of protection. They are often associated with areas of historical and wildlife interest.

Small-scale broad-leaved woodlands are scattered throughout the landscape. These are generally small in size and do not constitute a major component of the landscape character. Hedgerow trees are the most important element of the landscape's overall tree cover.

There are relatively large tracts of landscape where field patterns have become poorly defined, fragmented or lost. The loss of field pattern has led to the development of more open landscapes with field edges defined by roads, stream lines and ditches. Remnant field hedgerows and hedgerow trees are often out of scale with the landscape and swamped by growing crops in summer. Occasional Ash trees provide reminders of the former landscape structure. Power stations,

pylon lines and mineral workings are even more prominent and visible when viewed from these open areas.

The Village Farmlands landscapes have a distinctly urban fringe character adjacent to the western edge of Newark and built areas of south Nottingham. Residential edges, industrial parks, railway lines and sewage works are a feature of these areas, along with landscaped embankments and formal parks.

River Meadowlands

A flat low-lying riverine landscape characterised by alluvial meadows, grazing animals and remnant wetland vegetation

Characteristic features

- Meandering river channels, often defined by flood banks
- Sparsely populated with few buildings
- Permanent pasture and flood meadow
- Steep wooded bluffs
- Willow holts
- Long sinuous hedges
- Pollarded willows
- Regular pattern of medium to large size arable fields, breaking down and becoming open in many areas
- Hedgerow trees main component of tree cover

Landscape description

These landscapes are located on flat, low-lying alluvial floodplains within the Trent river valleys, and the lower reach of the Devon. Few buildings are found in these sparsely settled landscapes because of the risk of inundation by flood waters. The River Meadowlands are characterised by areas of alluvial meadow and riverside pasture, flood meadows, extensive common grasslands, meandering river channels and steep wooded bluffs. The character and unity of the river corridors have broken down in recent decades, largely as a result of flood protection works which have allowed the arable conversion of large tracts of alluvial meadowland.

Significant areas of intact river corridor have survived along various sections of the Trent. These areas possess a peaceful, undisturbed pastoral character with meandering river channels, permanent pastures, flood meadows, willow holts and grazing animals. This gives the landscape a strong sense of place and a feeling of naturalness. Along the Trent Trench steeply inclined wooded bluffs form a dramatic backdrop to the river and contain ash, oak, sycamore, poplar, alder and

willow species. The bluffs are particularly pronounced on the east bank where they are undercut by the river. The flood meadows are sometimes associated with shingle beds. Old willows are locally important throughout the landscape. Remnant patches of marginal wetland vegetation fringe the river channels in some areas, enhancing the riparian character of the valleys. Willow holts are located at a number of points along the rivers; these increase diversity in the landscape and add to the strong sense of place.

The grasslands are often defined by long sinuous hedges which now mark the boundary with the arable landscapes. Much of the grassland runs in a strip parallel to the river protected by floodbanks; this is particularly so in the Trent Valley downstream from Cromwell where the river becomes tidal. The raised floodbanks confine views to the river channel and exclude the surrounding landscape and disrupt visual continuity. The pasture itself is featureless except for patches of fringing riparian scrub. Extensive areas of intact river meadowland are found near Sutton on Trent. These “Holme” grasslands are located on both sides of the river and have a spacious, open and treeless character.

Large areas of the River Meadowlands have now been converted to arable land. This encroaches to the river channel edges in many areas disrupting the unity of the river corridors, particularly along the Trent. Away from the river the landscape is defined by medium to large scale regular and semi-irregular field patterns. Field rationalisation has led to the loss of hedgerows in many areas, producing open landscapes with a very weak riverine character.

Despite only the occasional small deciduous woodland and Willow holt, the overall impression is of a well treed landscape. Ash, Oak and Willow hedgerow trees are the most important components of the overall tree cover. These enhance the sense of enclosure and allow filtered views down the valleys. Numerous Willow-lined streams flowing into the main river channels are also prominent landscape features, as are old Willow pollards which occur widely.

Although there are a few buildings located within the River Meadowlands, numerous mineral extraction sites and large power stations are located close by. These developments have a large impact upon the character of the landscape, further increasing the sense of disunity.

2.3 Landscape Evolution and Change

2.3.1 Introduction

This section examines the main forces that have brought about change and evolution within the **Trent Washlands** over recent decades. It does this by discussing how the current structure and pattern of land use has developed, paying particular regard to agriculture, woodland, transport, industrial/residential development, mineral extraction and tourism. It also considers the trends and pressures that may produce landscape change in the future, such as climate change, which has the potential to affect all of the above trends.

2.3.2 Agriculture

The traditional character of the Trent Valley between the border of Derbyshire and Newark has been one of mixed farming, serving the demands of the large population centres. Before the Second World War permanent pastures flanked the meandering river channel and carpeted the low-lying alluvial areas. These were the natural flood plains and washlands. Arable production was confined to the low terraces where the risk of inundation was less, occupying around 40% of the total area. Downstream of Newark the proportion of arable land was significantly less, with over 75% of the valley set to permanent pasture. An almost continuous ribbon of grassland therefore extended along the alluvial deposits of the Trent.

The character of the valley has changed radically in recent decades. Modifications involving floodbanks, the isolation of the Colwick loop, and the building of sluices have now allowed the encroachment of arable farming to the flood banks. Agricultural intensification has led to a dramatic increase in the area of arable land and the loss of almost 70 % of permanent grassland within the region. Much of this was prime water meadow.

Through its agricultural land classification work, DEFRA has identified most of the region as being of medium quality agricultural land. However, there are significant areas of high quality agricultural land, located on the river terraces between Stoke Bardolph and Low Marnham and to the north of the region in the vicinity of West Stockwith. The cropping potential of the arable land within the **Trent Washlands** is therefore generally good, particularly where free from flooding on the terraces. Much of the existing grassland area adjacent to the Trent is classified as low quality, again due to flooding constraints.

There has also been an important change in the way grasslands are managed, with the making of silage rather than hay. Many grass fields have been agriculturally improved, though not necessarily by ploughing and reseeding. The use of fertilisers and herbicides is now widespread, which has led to a general decline in the floristic interest of the grassland. However, less improved permanent grassland still forms a significant, although decreased, component of the region.

Cereals are the principal crops grown, accounting for almost two thirds of production. Other significant crops include oil seed rape, sugar beet, potatoes, horticultural crops, peas, and crops for stock feed. Livestock operators are found within most of the parishes in the region. There is a wide range of farm sizes.

With regard to the future, the general national trend towards farm diversification is likely to lead to a change in traditional field patterns and farming methods in the **Trent Washlands**. Equestrian activities are an increasingly popular form of countryside recreation, and coupled with commercial livery services, are often considered acceptable within an agricultural setting. These uses can introduce new opportunities for employment and diversification of the rural economy, providing an acceptable conversion of former agricultural premises. However, the cumulative effect of equestrian activities can redefine the agricultural landscape, particularly through the division of existing fields into individual paddocks, defined by post and wire fencing and provision of stables and liveries. This process is evident in the **Trent Washlands**, particularly around the eastern urban fringe of Nottingham.

Support for energy crops is likely to change the agricultural landscape of England, with predictions that biomass crops could cover 20% of farmland by 2040. The use of Willow as an energy crop is already being recorded as a land use in the Trent Valley, and is likely to increase.

2.3.3 Woodland/tree cover

Historically the **Trent Washlands** have been the least wooded part of the County. The total woodland cover now stands at 1.73 % (County: 7.27%). The character and pattern of woodland cover vary throughout the region. The largest areas of woodland in this region are located on the steep valley bluffs of the Trent Trench. Small willow holts are a feature of the River Meadowlands, wet woodlands are found within old sand and gravel workings, and a scattered distribution of small broad-leaved woodlands occurs elsewhere. The region has the lowest proportion of coniferous woodland in the County, at 1.5%. Mixed woodlands account for 5.5% of the total, new plantations 8.0% and broad-leaved woodlands 84.5%.

Dutch elm disease had a major impact upon the landscape during the period 1960-1980, leading to the loss of virtually all hedge and roadside elms. Despite this loss hedgerow trees still form the principal component of the region's tree cover, with Ash, Oak and Willow the dominant species.

2.3.4 Infrastructure

A number of roads have an impact including the A1 which runs in a north-side direction through part of the region. Imminent road improvement schemes include the widening of the A46 between Newark and Widmerpool.

The River Trent is a major transport route along which 250,000 tonnes of mainly gravel excavated from the Trent Valley is exported.

A number of railway lines dissect the area with the east coast main line running in a north-south direction through the region. The Nottingham to Lincoln line runs via Newark whilst two railway lines traverse the region in the vicinity of Gainsborough. Feeder lines supply power station sites at Cottam and West Burton.

The River Trent is a commercial waterway downstream from Nottingham providing a direct link to Gainsborough and the Humber Ports along with commercial waterways in Yorkshire. There are two leisure canals that join with the Trent, the Beeston Canal at Nottingham and the Chesterfield Canal at West Stockwith in the north of the County. The Grantham Canal is no longer navigable and is cut off from the Trent at West Bridgford, but plans are currently at a feasibility stage to look at re-establishing it as a navigable canal.

2.3.5 Urban and industrial development

The main urban areas within the region are centred on Nottingham and Newark. Past industrial and residential expansion of these areas has led to the coalescence of outlying villages and the loss of historical settlement pattern and rural character.

There is a continuing demand for land to accommodate new housing within Nottinghamshire. The East Midlands Regional Plan (Adopted March 09) defines 5 Principal Urban Areas (PUAs) which include Nottingham. These are settlement conurbations that can develop into sustainable urban communities where people will wish to work and invest. Sub Regional Centres (SRGs) are also identified which include Newark in the Northern sub area. These perform a complementary role to the PUAs and have potential to accommodate further growth.

In addition to these, the plan identifies New Growth Points where there is considered to be the potential to accelerate the delivery of new housing. The 3 Cities 3 Counties Growth point includes Nottingham and Newark parts of which are located in the **Trent Washlands**.

The plan identifies 100,600 new dwellings to be provided within Nottinghamshire Districts between 2006 – 2026, this comprises 36,600 in the outer Nottingham Housing Market Area HMA which includes the Newark Growth Point, 57,000 in the Nottingham Core HMA which includes the Nottingham Growth Point and 7000 in the Bassetlaw District Council Area.

Limited provision will be made for residential development in selected villages as identified in the Local Development Frameworks. Permission for affordable housing in rural areas will be in addition to allocations in the East Midlands Regional Plan.

Areas in the south of the **Trent Washlands** fall into the Nottinghamshire – Derby Greenbelt where there are greater restraints to development but this greenbelt is subject to review over the next 25 years.

East Midlands Regional policy also seeks to confine economic activity to, and adjacent to, the Principal Urban Area, since they have the greater needs and greater potential in terms of available labour and services. Provision will also be made for a limited amount of employment development in villages as identified in Local Development Frameworks. There are a number of areas within the region with proposals for future economic development.

The rehabilitation and conversion of old farm buildings to high quality residential dwellings is now widespread. The occupiers of these buildings are largely from the affluent service classes and their arrival has caused shifts in the economic and social structure of the countryside. The impact of these changes is only just being felt. If the trend continues there may be further consequences for the future pattern and character of the rural landscape.

Although new developments are being confined to the existing urban areas where possible, it is clear that economic and social factors will continue to exert pressure on rural areas of the region.

2.3.6 Energy

The power generating industry warrants separate consideration due to its enormous impact on the landscape of the region. There are two functioning coal-fired power stations located in the **Trent Washlands**, Cottam, and West Burton. (High Marnham has now been decommissioned). Their combined output amounts to 20% of the UK's generating capacity. The proximity of productive coalfields, a good water supply, adequate communications and favourable topography were the main factors in their siting, coal is now imported from outside the region.

The power stations and associated web of high voltage power lines constitute the most dominant and visually intrusive landscape features within the river valley corridors. In the Trent Valley the only areas where an observer can be out of sight of a power station are between West Bridgford and Fiskerton, and to the south and east of Besthorpe.

National Power are currently constructing a power station at Staythorpe on a redundant energy site. This will be a combined cycle gas turbine station (CCGT). It will produce enough electricity to power around 2 million homes. This is in line with the former Structure Plan policies for use and re-use of existing energy sites. The nature, location and scale of further developments will be dependant on future national and international economic factor. It is unlikely, however, that the development of gas powered plants will proceed, gradually replacing coal production capacity and reducing the life expectancy of existing power generation plant.

Renewable Energy

National policy is placing a greater emphasis on the promotion of renewable energy sources, such as wind-farms. The East Midlands Regional Plan states that by 2020, at least 20% of electricity supplied in the East Midlands should be provided from renewable energy sources. Currently, the figure is just 2%.

Regional policy encourages planning authorities to develop plans and strategies to promote and encourage (rather than restrict) the use of renewable energy resources. There are likely to be future applications for the location of wind-farms in the Trent Valley. These structures have the potential to change the landscape character of the **Trent Washlands**, particularly the more sparsely settled northern areas.

The power generation industry will continue, therefore, to be a dominant feature of the region.

2.3.7 Minerals: sand and gravel

Mineral extraction has had a considerable impact on the region. Nottinghamshire is the largest producer of sand and gravel in the East Midlands. Over 80% of the County's resources are derived from the alluvial (river terrace) sand and gravels of the Trent Valley. The deposits have an average thickness of 5-8 metres producing yields of 60-80,000 tonnes per hectare. There are a large number of active quarries, including sites at Holme Pierrepont, Hoveringham, Langford Lowfields, Cromwell, Besthorpe, Girton and Rampton. Individual quarries commonly exceed 150 ha in size. The total area of quarries and permitted land in the region is approximately 17.5 km2.

The degree to which the workings and associated processing plant affect the quality of the landscape varies from site to site. Tree and earth bank screens have been successful on certain sites. However, there are still many which have a detrimental effect on landscape quality. Plant, buildings, workings and the transportation of materials are visually intrusive. Dust, noise, pollution and dereliction of land are often associated with mineral extraction.

Past mineral workings have been reclaimed to a variety of different afteruses. Langford Lowfields and parts of Besthorpe are also to be put to nature conservation purposes. Holme Pierrepont, Hoveringham, Crankly and Girton all have water-based afteruses. Restoration to agriculture using PFA has been, or will be, occurring on sites at Hoveringham, Cromwell, Besthorpe, Girton and Rampton.

Before the 1970s the majority of workings were reclaimed to water, usually to quite poor standards. Reclamation to agriculture did not occur until the first PFA schemes were established, and accounted for only 30% of the reclaimed land in the Trent Valley before the 1980s. The 1984 Nottinghamshire Sand and Gravel Local Plan, later incorporated into the Minerals Local Plan, sought to ensure that

most allocations could be reclaimed to agriculture and encouraged the continued development of PFA infilling schemes. The proportion of land reclaimed to agriculture doubled to 60% during the 1980s. The main strategy of the Plan was to avoid the proliferation of further water areas.

Government guidance has now reduced the emphasis on agricultural restoration. This is a reflection of recent policies aimed at reducing overall levels of agricultural production. There is, however, still a strong presumption to protect the highest quality agricultural land and avoid water-based reclamation where there is already an abundance of water. The uncertain future for the power industry outlined in the previous section also has implications for reclamation to agriculture, with long-term supplies of PFA now less certain.

The allocations made in the Nottinghamshire Minerals and Waste Development Framework currently in preparation estimates that new allocations in excess 58 million tonnes will be required by 2016.

For the **Trent Washlands** this means an allocation of ha to maintain a 10 year landbank for the industry. It is clear that sand an gravel operations will continue to have a major impact on the landscape of the **Trent Washlands** with the level of land take destined to increase for the foreseeable future.

2.3.8 Tourism

A key project which is likely to have a great effect in attracting tourists to the area is the Trent River Park being promoted by Nottinghamshire City Council. This aims to develop the river as a regeneration corridor, and improve access to the river. The full length of the park extends 21 kilometres, from the east to the west of the City of Nottingham, but it impacts on the **Trent Washlands** from the western City boundary, as far as Gunthorpe.

2.3.9 Climate Change

Research has identified trends and emerging patterns of global climate change. Within the UK, implications for climate change include:

- Global temperature increases of between 1.8 and 4 degrees centigrade above the 1990s levels by the end of the 21st Century, with UK increases anticipated at 2 to 3.5 degrees by 2080.

- Greater warming in the South and East of the UK, rather than the West and North.

- Increasing temperatures resulting in milder winters and high summer temperatures.

- An increase in sea levels by 26-86 cm, by 2080. Extreme high water incidences 10 to 20 times more frequent, increasing coastal flood risks.

- Changes in rainfall patterns, with wetter winters and drier summers. The greatest changes are anticipated for the South and East of the UK, where summer rainfall could reduce by 50%, and snowfall reduced by 60 – 80% by 2080. **(1)**

These changes have the potential to impact on all other drivers for change in the future. The East Midlands Sustainability Round Table published a report highlighting the potential impact of climate change in the East Midlands. **(2)** The issues of the most relevance to the landscape character of the **Trent Washlands** include:

Built Development

- Increased development on land away from locations such as river corridors and low lying areas that are at risk from flooding.

- Sustainable design and layout of new development to result in less use of water, energy and raw materials.

Infrastructure

- Pressure for renewable energy infrastructure, such as wind turbines to reduce emissions

- Demand for new riverine defence works in response to tidal surges and high waves.

Minerals and Waste

- Reducing the amount of waste land filled and increasing the amount of waste recycled and composted.

Agricultural and Land Management

- Increased risk of river flooding and loss of land as a result of rising sea levels and coastal erosion.

- Changing weather conditions leading to longer growing seasons and the ability to grow different types of crops.

- The introduction of energy crops to provide an sustainable source of fuel.

- Gradual changes in flora and fauna in response to warmer, wetter conditions and more disturbed weather patterns.

Forestry and Woodland

• Sustainability of forest tree species may alter due to changes in climatic conditions.

• Lengthy period of drought and dry conditions may lead to an increased risk of upland forest fire.

Tourism and Recreation

• Increased number of visitors to the countryside due to higher temperatures.

(1) www.defra-gov.uk/environment/climatechange/about/ukeffect

(2) The potential impact of climate change in the East Midlands (2004) www.emra.gov.uk/publications/regional-communities-policy/climatechange