



Sefton Agricultural Land Study

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SUMMARY

Like all Local Authorities, Sefton Council is required to prepare a **Local Plan**^{G1} to set out, amongst other requirements, the strategic priorities including the delivery of the homes and jobs it needs in its area. In assessing the impact that this will have on the natural environment, it has to take into account the economic and other benefits of the best and most versatile agricultural land. Where the significant development of agricultural land is shown to be necessary, local authorities should seek to use areas of poorer quality land in preference to that of a higher quality.

This study was commissioned in order to review and update the evidence on soil quality in Sefton and assess the other benefits arising from Sefton's soil resource, to provide an analysis of the agriculture sector and the rural economy and to consider the impacts of development on these functions (paragraph 1.7).

The study refers to the Sefton Green Belt Study² which identified land that may be suitable for development should this be required. To enable comparisons to be made between these studies, the same reference system has been used to refer to areas of land in the Green Belt.

Sefton Green Belt

The Green Belt covers an area of 7,840 hectares, approximately 51% of the area of the Borough. This includes significant areas of high quality agricultural land as well as substantial areas of nature conservation value and recreational use. In 2010, there were 60 agricultural holdings in Sefton, excluding minor holdings (paragraphs 3.6 - 3.8).

Agriculture in Sefton is not typical of NW or of England due to the predominance of productive lowland soils and proximity to urban areas which traditionally provided a market for fresh produce. Farming is characterised by arable cropping (cereals, oilseeds and potatoes) and horticulture (fruit and vegetables) based on the availability of good quality soils, with limited livestock production. Specialisation of production and less reliance on local markets has reduced the number of horticultural units. However, they still represent a higher proportion of cropped land compared to North West and England (paragraphs 3.16 - 3.37).

European and national policy requirements

EU and national policy for agriculture combines an emphasis on supporting farmers and food production alongside efforts to reduce associated environmental impacts. The most important policy influence on agricultural land use in the UK is the Common Agricultural Policy³, a system of EU agricultural subsidies and programmes to support agriculture and promote rural development. Farmers depend heavily on this support and in turn the programme aims to encourage sustainable practices to address the environmental impacts associated with food production. Key issues for Sefton include any future changes to pumped drainage systems, the need to protect land for pink footed geese, supporting farmland birds and reducing soil carbon loss (paragraphs 2.28 - 2.41).

Recent analysis has highlighted the need to produce more food globally but within a context of no more land in agriculture (paragraphs 2.19 - 2.26). At a local level, these priorities need to be balanced to deliver food production, wildlife conservation and meet any need for sufficient land for development (paragraphs 2.1 - 2.3). The National Planning Policy Framework⁴ requires Local Plans to identify needs for housing, employment and other development and to demonstrate how they will be met. In meeting these needs, they should be balanced against other relevant planning matters, including the protection of best and most versatile agricultural land (paragraphs 2.43 - 2.45).

Sefton's Agricultural Economy

Agriculture contributes £7 to £11 million⁵ a year to the total economy in Sefton, accounting for only 0.2-0.3% of the Gross Value Added (GVA) generated by the economy in the Borough. This compares to the contribution of GVA from the agricultural sector at 0.6% for the North West region and 0.7% for England and reflects the urban nature of the Borough (paragraph 3.38).

Similarly, employment in agriculture represents a very small percentage of total employment in Sefton in 2010 at 0.2%⁶. Employment in the agricultural sector in Sefton has declined, from 485 full time employees in 1995 to 244 in 2000, and has remained relatively constant since (paragraphs 3.39 - 3.42). This is in line with regional and national trends for agricultural employment.

While the absolute contribution of agriculture to the wider Sefton economy is modest, there is also an element of farm diversification activities in Sefton, including leisure and horseculture (paragraphs 3.43 - 3.46).

Sefton soils

Sefton forms part of a low lying area on the western edge of the West Lancashire plain, with four main soil types which are very diverse, ranging from light sands through medium textured soils to heavy clays and peats (paragraphs 4.5 - 4.10). These soils are a valuable resource, contributing towards the cycling of nutrients, filtering and storing water and they can retain carbon as well as produce food and wood. They support nationally and internationally important nature conservation areas along the coast and provide Sefton's best and most versatile agricultural land (see Table 10 and paragraphs 4.14 - 4.32). The peaty and sandy agricultural soils are very good for agriculture if sufficiently drained and they should be protected from development wherever possible, as they are a limited resource nationally. If land is lost to development, any surplus soils can be used to restore Brownfield sites or depleted agricultural land.

The best agricultural land is capable of supporting a wide range of crops which can be harvested at any time of year and is afforded some protection under the National Planning Policy Framework (paragraphs 2.43 - 2.45). The Provisional Land Classification maps, produced in the 1970's, grade land into 1 of 5 grades according to the degree to which its physical characteristics impose long term limitations on agricultural use (maps are only accurate on areas to within 80ha). These maps show Sefton to have a large proportion of the best and most versatile agricultural land (i.e. Grade 1 – Subgrade 3a), inland of the sand dunes which occur on the coast.

Detailed studies of land quality, undertaken over the last 25 years to support planning applications or to inform local plans, generally show a reduction in land quality through out Sefton. Survey work undertaken for this study shows that while some of the sites have a lower grading than indicated by the Provisional Land Classification, the majority of land identified as being suitable for development in the Options paper is still within Grades 1, 2 and 3a, which is considered to be the 'best and most versatile' land in the country. While some of the organic rich soils such as those found around Maghull are no longer classed as organic and are now mainly Grade 2 and Subgrade 3a (downgraded from Grades 1 and 2); other soils such as those around Formby, mapped as Grade 4 on the Provisional maps, have been upgraded to Subgrade 3b because the watertable appears to be maintained at a depth which allows cultivation (see Chapter 5).

Development impacts

The desk-based assessment of development (Options 2 and 3 in the Options paper) indicates that food production impacts are very modest at a regional or national scale in view of the relatively small land areas concerned (estimated at 175 and 275 hectares, respectively). Based on 2010 agriculture production in Sefton, and allowing for non-agricultural land use (18%, based on the surveyed sites), the area of crop production that could be lost due to development is estimated at 99 ha and 156 ha for Options 2 and 3 respectively. For both potatoes and horticulture production, the loss would be 7 and 12 ha, respectively. The impact on livestock production would be based on the loss of 45-70ha of grassland (see Tables 18 and 19).

To put that in context, the impact of losing agricultural land to development is estimated at 2.1% and 3.4% of Sefton food production for Options 2 and 3, respectively. Assuming average national yields, this equates to a loss of food production of 0.02% at NW level and 0.003% at England level under Option 2 and 0.03% at NW level and 0.006% at England level under Option 3. Allowing for higher yields on Sefton's best and most versatile land would increase these estimates by a factor of 20-50%. This would result in a loss of food production in the North West of up to 0.03% and 0.005% under Option 2, and of 0.05% and 0.009% under Option 3 (paragraphs 6.5 - 6.17).

Impacts on Sefton's agricultural economy and employment are also very limited due to the urban nature of the Borough. Option 2 is estimated to result in a decrease in GVA of £107,000 and 2.5 jobs from agriculture across the whole of Sefton. Option 3 is estimated to result in a decrease in GVA of £168,000 and 3.7 jobs from agriculture. Additionally, there would be a loss of Farm subsidies and environmental payments and potentially loss of income and employment from diversified enterprises, if affected. These impacts would be offset against a compensatory short term increase in GVA in the construction sector and in the longer term where land is developed for employment purposes (paragraphs 6.18 - 6.24).

Other site-specific factors, including potential impacts on water, biodiversity etc, would need to be considered by the Council in prioritising land for development, if land in the Green Belt is required to meet future development need identified through the preparation of its Local Plan. It should be noted that development can be regulated to ensure that, in the longer term, the loss of agricultural land does not lead to a significant loss of the other benefits of soil, for example through sustainable drainage schemes and provision of green spaces (paragraph 6.31).

The study concludes that the impact of loss of Green Belt land to development is small, both in terms of food production displaced and in terms of the rural economy. It recommends that if land in the Green Belt is required to meet future identified development needs, non-agricultural land or agricultural land of Grades 3b and 4 should be preferred for development where possible but the proposed Options 2 and 3 are likely to require development of some best and most versatile land. Where this cannot be avoided, small areas which are isolated from other agricultural land should be developed in preference to blocks of land which could lead to further agricultural land loss in the future. Areas where the highest value infrastructure exists, such as modern glasshouses, should also be avoided if possible.

This Study should be seen as one of many pieces of evidence which will be used to inform the preparation of Sefton's Local Plan, along with a number of other important studies, key legislative requirements and emerging case law and best practice. The updated assessment of agricultural land quality will therefore be one of several factors in deciding what Green Belt sites, if any, should be identified for development in the next stage of preparing the Local Plan.

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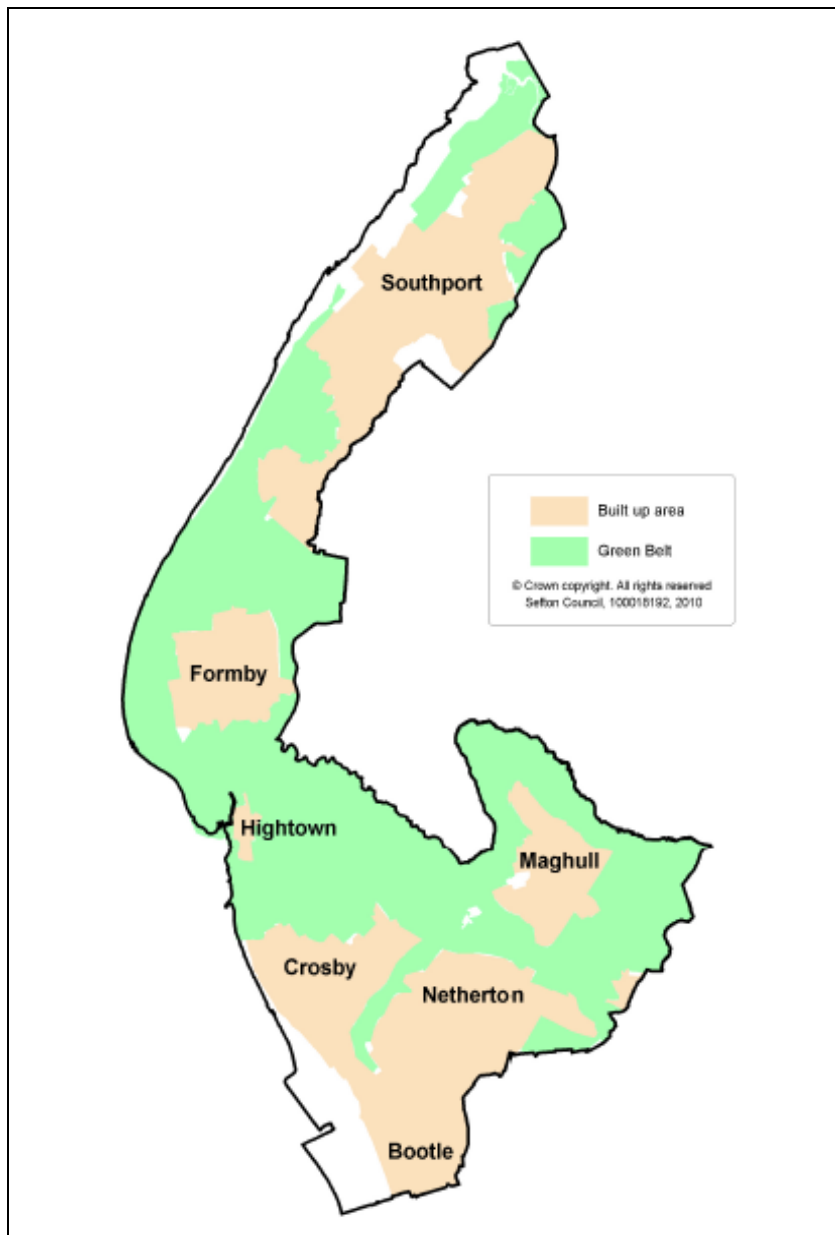
1. INTRODUCTION

- 1.1 Sefton comprises a coastal Borough situated on the northern edge of the Merseyside conurbation. It contains five main urban areas as well as a number of smaller villages and hamlets set in a rural landscape. The built up area comprises about half the area of the Borough and is where 95% of its residents live. The rural half of the Borough is covered by the **Merseyside Green Belt**⁶.
- 1.2 In Sefton all land outside of urban areas - that is, Sefton's countryside - is within the Green Belt. This is shown on Figure 1. The Green Belt covers an area of 7,840 hectares. This includes significant areas of high quality agricultural land and substantial areas of nature conservation value. It also embraces the majority of the undeveloped coast. It includes most of the land to the east of Southport, Formby and Crosby, and all of the agricultural land in Sefton's eastern parishes around Maghull, Aintree and Waddicar.
- 1.3 As part of its Local Plan⁶ preparation, Sefton Council consulted on an Options paper⁷ in mid-2011. A key concern raised in the consultation was possible development on the best and most versatile agricultural land (and particularly on Grade 1 agricultural land). Other related issues raised included food security and the loss of potential to produce food to meet future needs; and the impact of development on agriculture and agricultural employment. Consequently, the Council identified a need to update its evidence on the economic and other benefits of the best and most versatile agricultural land and the rural economy in accordance with the requirements of the National Planning Policy Framework (NPPF)⁸.
- 1.4 The NPPF also states that when significant development of agricultural land is demonstrated to be necessary, planning authorities should seek to use areas of poorer quality land in preference to that of a higher quality.
- 1.5 A number of more detailed Agricultural Land Classification assessments have been carried out for parts of Sefton since the early 1990's, and there was a need to verify the accuracy of these.
- 1.6 Sefton Council therefore commissioned ADAS to undertake the following tasks:
 - (i) To undertake a desk-based review of the extent and coverage of agricultural land quality across Sefton based on published Agricultural Land Classification data, and to validate additional partial Agricultural Land Classification survey data which have become available since the national **provisional maps**⁶ were prepared in the 1970's and to undertake further primary assessments on selected sites as necessary;
 - (ii) To update the 1990 analysis of the Sefton rural economy and assess the contribution that the agricultural economy makes to Sefton's rural economy in 2012. This includes making an assessment of the impact development would have on the loss of agricultural land, and the scope for bringing land currently not used back into use for agriculture / food production

- (iii) To carry out an assessment of the other benefits arising from Sefton's soil resource, including benefits relating to ecosystem services, recreation, amenity, biodiversity, and managing flood risk on agricultural land and the rural economy; and
- (iv) To consider the effects of land loss on soil functions and the impact on the soil resource from development (construction and operation) and potential land-banking.

1.7 This Study provides evidence that, with other studies, will help the Council to decide on the Preferred Option for its Local Plan. Its recommendations relating to agricultural land quality will also feed into the Green Belt Study when this is finalised and updated.

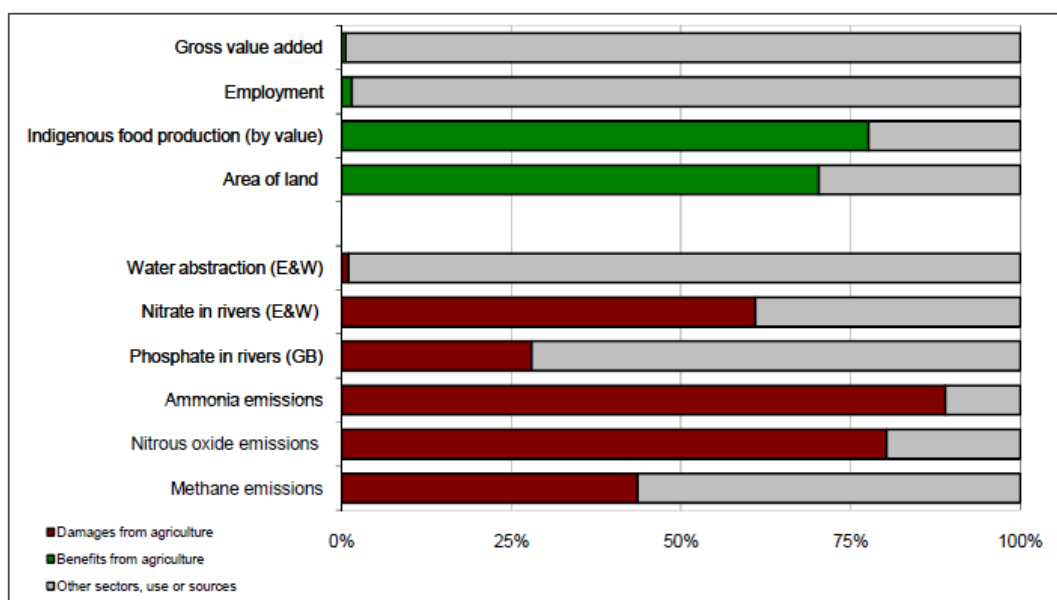
Figure 1: Sefton rural and urban areas



2. POLICY CONTEXT

- 2.1 This chapter considers the policy context for rural areas; this is necessarily generic as the land sector is heavily influenced by European and national priorities, given the unique support for the farming sector under the **Common Agricultural Policy (CAP)**^G and the influence of European directives in protecting key environmental matters such as biodiversity, soil as a global resource, climate regulation and water quality. It focuses on what is most pertinent to Sefton.
- 2.2 Alongside these European and national priorities are a series of regional and local strategies which reflect the needs and priorities at a more local scale. The Local Plan for Sefton must indicate how local housing and employment needs will be met in the future. The Local Plan is also required to take account of national policies on issues such as climate change, environmental protection and food security, as set out in the National Planning Policy Framework and the Natural Environment White Paper⁹ in particular.
- 2.3 The requirement to address these wider social and economic issues (employment, services and housing), together with specific rural issues (land use, food production and management of the countryside) means that the policy agenda is complex, often with competing priorities.
- 2.4 Nationally, policies relating to agricultural land are driven to a large extent by the contribution of the agriculture sector to the economy and the environment. This is illustrated in Figure 2 below which shows both damages from agriculture (in red) and benefits (in green).

Figure 2: UK agriculture's contribution to the economy and the environment



Source: Defra Agriculture in the UK (2012)

- 2.5 The chart highlights the fact that the economic benefits of the agricultural sector in terms of its contribution to the economy (expressed as **Gross Value Added (GVA)**^G) and employment is modest and that the main contribution is in terms of food production.
- 2.6 It is clear that agriculture also has significant environmental impacts, notably in terms of pollutants which affect water quality (nitrate and phosphate from fertilisers), contributes to climate change (nitrous oxide and methane emissions) and reduces air quality (ammonia emissions). Other impacts on biodiversity, soil quality, landscape, water use and the recreational value of the countryside are also important. These two themes, food and environment are critical in shaping EU and UK agriculture policy.
- 2.7 The other key influence on land use in the UK is development, reflecting the need to provide more homes and to support economic activity and employment as demographics change over time. The Government is proposing 'Land Use and Development' as one of a number of new sustainable development indicators¹⁰.
- 2.8 The relevance and impact of these policies is considered below to set the scene for how land use and agriculture has changed in Sefton over the past two decades and how it might change in future (in Chapter 3).

Agriculture and horticulture

- 2.9 There are three key factors that influence how land is used for food production in the UK:
- (i) The productivity of the land (soil quality, altitude, slope, drainage etc) is a key factor. While this is largely static in the short-term, changes to the availability of water, increased risk of flooding, changing climate and soil erosion can all affect productivity in the medium to long term (paragraphs 2.27-2.40).
 - (ii) Economic returns from food production (paragraphs 2.10-2.12), which is dependent on global markets for food commodities and prices of agricultural inputs such as fertiliser, chemicals etc. For example, in 2008 there was a sharp increase in the price for cereals and oilseeds in response to market concerns over low global stocks, a shortfall in production and a significant increase in oil price.
 - (iii) Incentives and constraints on land use related to EU and UK agriculture policy (paragraphs 2.13-2.26). For example, UK farmers receive an annual subsidy for each hectare of land in the form of the **Single Payment Scheme (SPS)**^G as long as they comply with basic environmental and animal welfare standards. There are also incentives for managing the land for environmental objectives, often at the expense of intensive food production, through **agri-environment schemes**^G. At the national level, there is a requirement to maintain the overall area of permanent grassland (relative to an historical base year).

Food markets

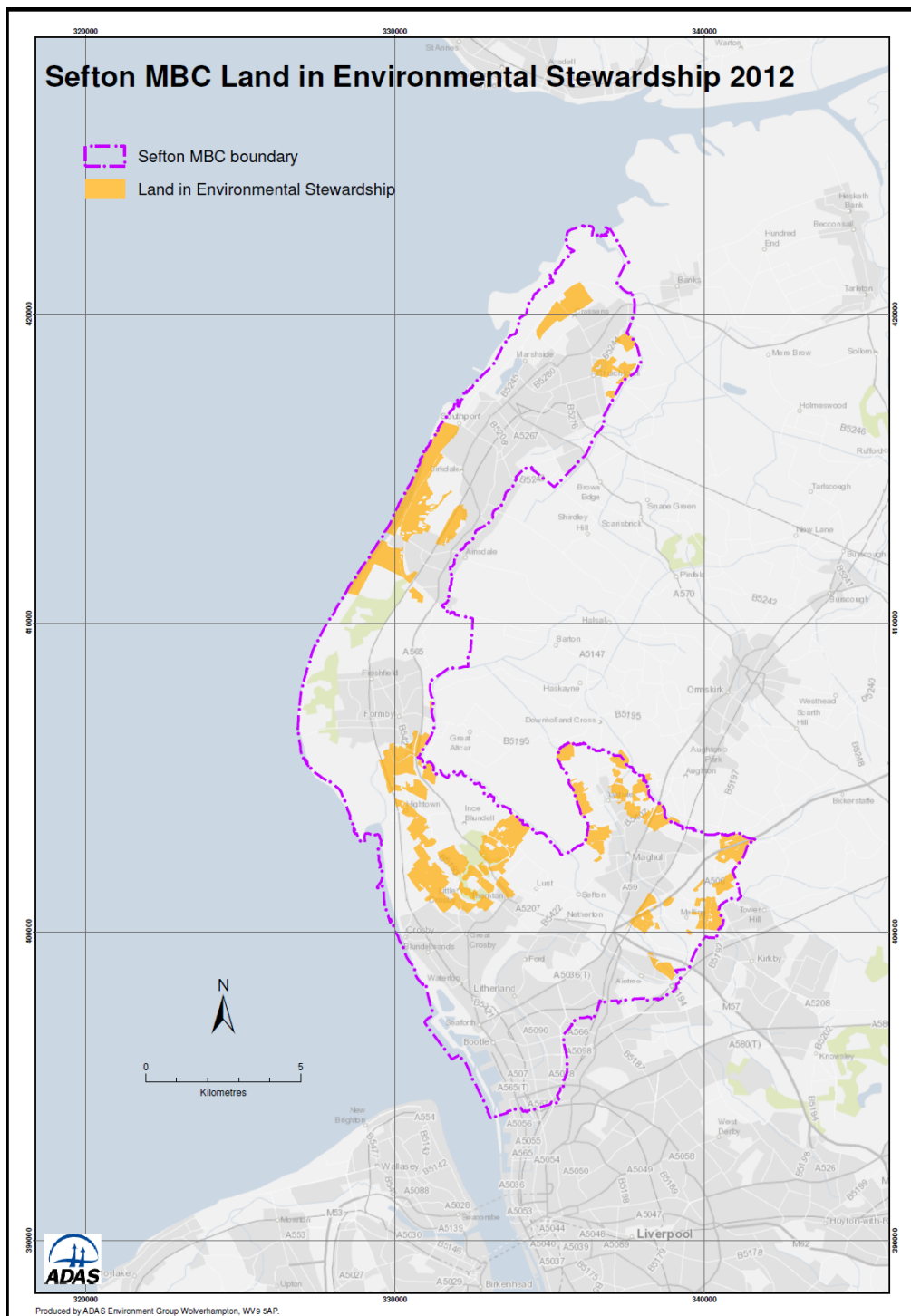
- 2.10 While the area of land used for agriculture in the UK has remained relatively unchanged since 2000, there have been shifts in the land areas occupied by different types of cropping and livestock systems. The total area of uncropped land fell sharply in 2008, reflecting high cereal prices and the setting of a zero rate of '**set-aside**' land^G, and has remained low due to good planting and market conditions.

- 2.11 Market conditions also reflect longer term changes, including:
- The status of the global economy and demographic change; a growing world population increases absolute demand for food while increasing incomes in high growth economies such as China and India may increase demand for meat and dairy products.
 - The availability of key inputs to agriculture, such as energy and water together with the impact of climatic change and unsustainable farming practices (for example, loss of soil to erosion) on the suitability of land for food production.
 - The influence of policy and technological advancement. For example, energy security policies providing incentives for ethanol production from maize in the USA reduces land available for food production, while the development of drought-resistant crops and **sustainable farming systems**⁶ could increase productivity in developing countries.
- 2.12 In the UK, improved returns from grains and oilseeds together with SPS direct payments will encourage more farmers to grow these crops rather than horticultural crops which are more demanding to grow and market. Higher grain and protein prices are also likely to have a negative impact on the competitiveness of the livestock sector, especially the pig, poultry and dairy sectors, which are dependent on high feed inputs.

Farm subsidies and environmental stewardship

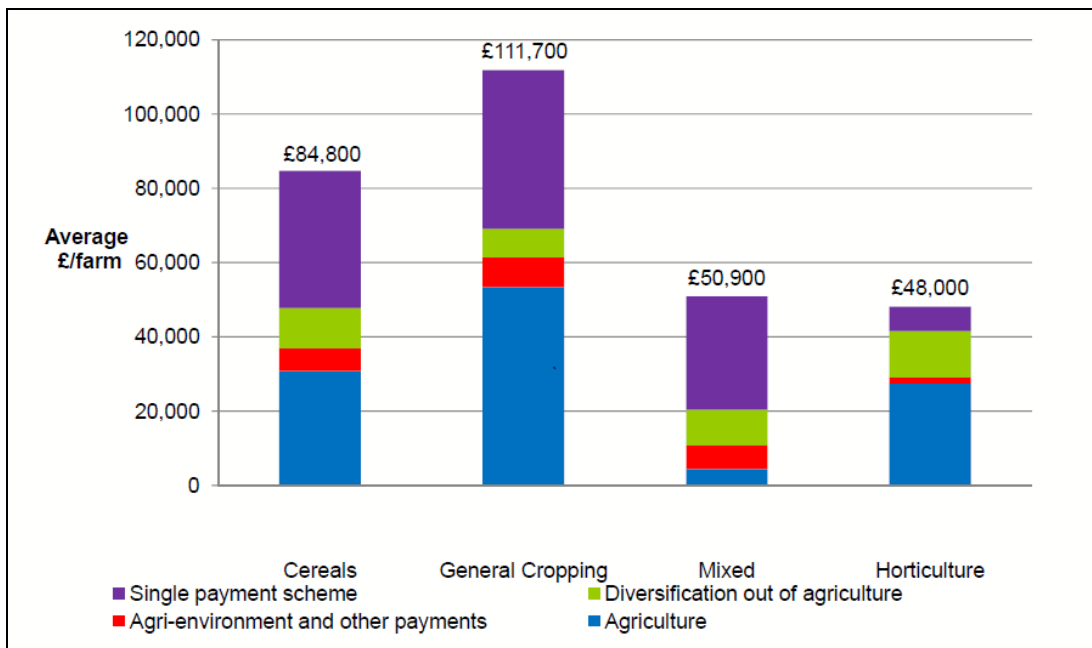
- 2.13 The most important policy influence on agricultural land use in the UK is the CAP, a system of EU agricultural subsidies and programmes to support agriculture and promote rural development¹¹. Following major reform of the support arrangements in 2004, payments to farmers have been separated from land use and livestock numbers. The effect of this is, by 2012, that all farmers in lowland England will receive a direct payment for each hectare of land, subject to meeting various environmental conditions, with no requirement to produce food.
- 2.14 Additionally, the introduction of the Environmental Stewardship scheme in England from 2005, with its universally available Entry Level and competitively funded Higher Level schemes has increased access to, and uptake of, funding agreements for environmental management shows the current area and location of land in Environmental Stewardship schemes in Sefton in 2012. The total amount of land in Environmental Stewardship in Sefton in 2012 is 1,908 hectares (see Figure 3). There is considerable opportunity for this to increase, notably to support the large numbers of farmland birds in Sefton and the wider West Lancashire Plain¹².
- 2.15 The relevance of these policy developments to Sefton and other areas is twofold. Firstly, landowners continue to be supported financially, helping maintain the viability of smaller businesses, but limiting structural change and competitiveness; and secondly, farmers can opt to manage land for environmental purposes, at the expense of food production.

Figure 3: Sefton land in Environmental Stewardship



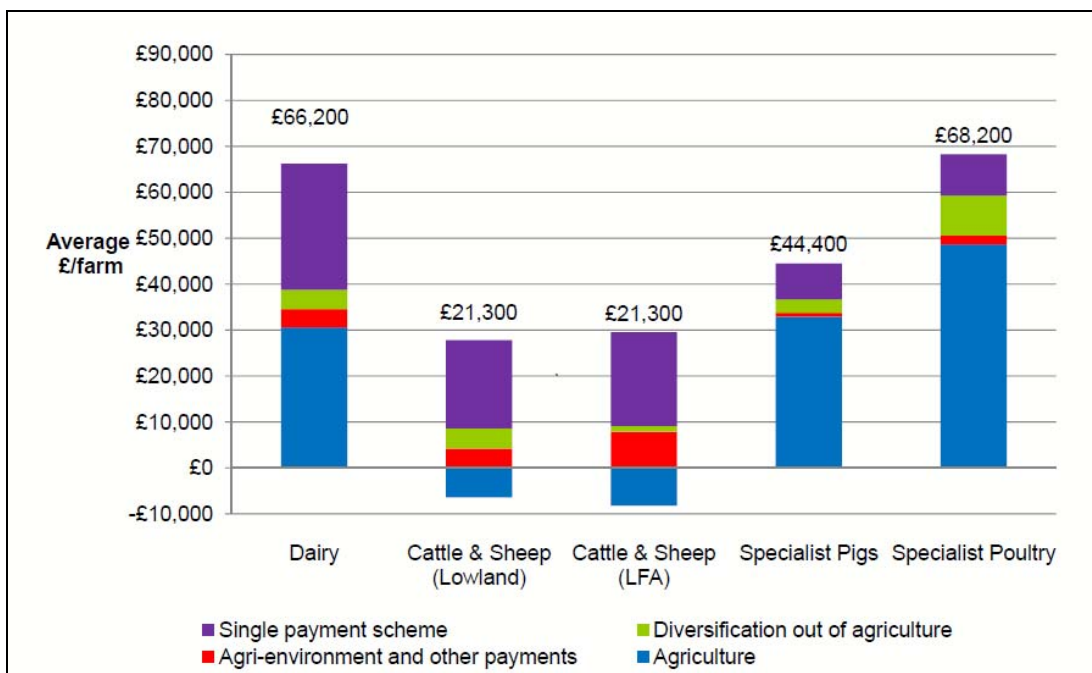
2.16 The reliance of farmers on direct support payments (SPS) and Environmental Stewardship payments for income is significant. Figure 4 shows the national average breakdown of farm income (defined as Farm Business Income) for arable farms in 2010/11 and highlights the relative dependence on public subsidy with the notable exception of the horticulture sector. In the grazing livestock sector (see Figure 5), lowland beef cattle and sheep farms nationally made a loss from agricultural production, relying entirely on SPS, diversification and Environmental Stewardship payments. Figures are not available for Sefton on its own, but would be expected to follow national trends.

Figure 4: Farm Business Income and Public Subsidies: arable farms, 2010/11



Source: Defra¹³

Figure 5: Farm Business Income and Public Subsidies: livestock farms, 2010/11



Source: Defra¹³

Note: Farm Business Income represents the surplus or deficit before imputing any notional charges such as unpaid family labour costs and rental value and is similar to net profit as used in financial accounts. The Cattle and Sheep (LFA) category refers to livestock farms in the uplands (Less Favoured Areas and is not relevant to Sefton).

- 2.17 The impact of the 2004 CAP reform has been apparent in terms of a fall in the numbers of livestock nationally (the incentives of a payment for each animal having been removed), particularly for cattle and sheep, while a requirement to maintain permanent grassland limits an expansion of cropping.
- 2.18 The introduction of SPS also saw some losers and winners. Under the scheme, entitlements allocated in 2005 are used as the basis for subsidy payments; an entitlement gives a farmer the right to a payment, provided it is supported by a hectare of eligible land. Vegetable producers started to receive SPS income for the first time while subsidy levels to livestock farms reduced. However, SPS has limited the ability of vegetable and potato growers to expand. In summary, while there is increased opportunity to respond to market demand, the incentive to do so is limited by public subsidies (and associated rules).

Sustainable food production

- 2.19 Despite this shift of emphasis in agricultural production from a policy perspective, the world-wide spike in food prices in 2007-08 brought attention to the fact that the global demand for food was starting to rise faster than supply. The Royal Society, in its 2009 assessment of global food security¹⁴, addressed the challenge of how food availability might be increased without repeating the environmental damage of the mid-20th century. It promoted the concept of 'sustainable intensification' of global agriculture, in which the amount of food grown is increased without adverse environmental impact and without the cultivation of more land.
- 2.20 This concept was developed by the highly influential Foresight report in 2011¹⁵. The UK Government responded very positively to this report, promising to '*work in partnership with our whole food chain including consumers to ensure the UK leads the way on sustainable intensification of agriculture*'¹⁶.
- 2.21 Although food production is now given more attention along with energy, water supply, land use, biodiversity and other ecosystem services, the Foresight report recognised that "*there are strong environmental grounds for limiting any significant expansion of agricultural land in the future (although restoration of derelict, degraded or degrading land will be important) and more food must be produced sustainably to feed the world, including addressing climate change*".
- 2.22 A key issue for policymakers is the extent to which, in a UK context, this might lead to a strategy whereby there could be intensification of food production in some areas (where environmental impacts are limited) with a focus on delivering environmental outcomes in others (where this is a priority).
- 2.23 In 2011, Defra published a national food strategy¹⁷ to provide a framework for a sustainable food system locally and globally. The strategy set out objectives to increase UK food production and enhance food security but with less impact on the natural resources such as soil and water, on which food production depends. It is also recognised within the strategy that uncropped land (including field margins and land set-aside for environmental use) provides a range of important and valuable benefits that may outweigh the smaller and short term economic benefits realised through conversion to food production, housing or other uses.
- 2.24 The strategy recommends that food production ought to be flexibly integrated with other types of land use where possible to gain wider benefits, such as water management, outdoor access and habitat creation. In Sefton, as elsewhere, the challenge in realising this strategy is that most land is privately owned and public

priorities for land use can only be achieved through regulation or by providing incentives such as public subsidies.

- 2.25 In conclusion, it is clear that a wide range of policy priorities exist for agricultural land use, with a focus on maintaining farming incomes and producing more food but also on providing better environmental outcomes. A central theme is not to increase the area given over to agriculture, but to maximise the yield from the agricultural area.
- 2.26 For Sefton, this requires a detailed analysis of the agricultural area to determine its suitability for a range of competing priorities. Subsequent chapters of this report describe the Sefton rural economy (Chapter 3) including its importance in terms of food production and economic activity and consider key attributes of the soil resource (Chapters 4 and 5). This provides evidence for decision-making in terms of land use priorities. The Local Plan should provide clear guidance for individual landowners in Sefton's rural area, taking European and national policies into account.

Environmental protection

- 2.27 Policies that give greater protection to the environment are an important factor in shaping changes in agriculture. Key environmental themes are considered below along with relevant European and national policies and the possible implications for Sefton.

Soil protection

- 2.28 In its 2009 strategy for soils (Safeguarding our Soils)¹⁸ the Government recognised that soil cannot be replaced and is an essential growing medium. *'Current policies focus on protecting English soils and the important ecosystem services they provide.Research is focused on addressing evidence gaps to adapt and refine these policies in order to strengthen protection and their resilience as the climate changes.'* A detailed analysis of soil services is developed further in Chapter 4 (paragraphs 4.11 – 4.32).
- 2.29 CAP reforms introduced some requirements relating to soil protection and soil-friendly agricultural practices, although they do not cover all soils or address all soil threats. Safeguarding our Soils supports the aims of the EU Thematic Strategy on Soil Protection¹⁹ but focuses on national action to protect soils which is responsive to local circumstances. A Soil Framework Directive was proposed by the EU as the best means of ensuring a comprehensive approach to soil protection but to date this is still being discussed.
- 2.30 In the Natural Environment White Paper⁵¹, it is recognised that *"soil is essential for achieving a range of important ecosystem services and functions, including food production, carbon storage and climate regulation, water filtration, flood management and support for biodiversity and wildlife"*. A target is also set in the White Paper that by 2030 all of England's soils will be managed sustainably and degradation threats will be tackled successfully, in order to improve the quality of soils and to safeguard their ability to provide essential ecosystem services and functions for future generations (paragraph 4.1).
- 2.31 Together these policy statements and regulations highlight the need to protect and manage soils sustainably, for food production and for other ecosystem services. In Sefton, it is necessary to scope the key soil functions – both current and potential – and consider the implications of land development on these.

Nature Conservation

- 2.32 In addition to addressing the implications of climate change and promoting food security, the Natural Environment White Paper emphasises that it is important to connect people and nature for a better quality of life, including setting up Nature Improvement Areas, biodiversity offsetting, new Local Nature Partnerships and the phasing out of peat workings where appropriate (none in Sefton). Local authorities are encouraged to use their new duties and powers to promote access to a good natural environment.
- 2.33 The White Paper also emphasises the importance of environmental protection in planning decisions. Of particular relevance to Sefton is protection of areas with high biodiversity value or other ecological importance including the dune systems, native pine woodlands and marine sites along the coast.
- 2.34 For example, the very sandy soils along the coast are internationally and nationally recognised as important nature conservation sites and tend to be in non-agricultural uses.
- 2.35 The importance of feeding wintering flocks of protected species such as Pink Footed Geese highlights nature conservation issues affecting agricultural land, whilst emerging farmland birds and initiatives such as the Natural England/RSPB Bird Hotspot scheme should also be taken into account.

Water Protection and Management

- 2.36 Policies on water quality, flood and water management influence land use decisions. The EU Water Framework Directive²⁰ provides the European policy framework while nationally, the Flood and Water Management Act, 2010²¹ is the legal requirement. The Environment Agency is the primary body responsible for managing flood and coastal erosion risk.
- 2.37 In Sefton, the Environment Agency is responsible for operating a number of pumping stations and maintaining some raised flood defence embankments in the Alt and Crossens pumped drainage catchments. They are currently considering how water should be managed in the Lower Alt and Crossens catchments in the future with possible implications for land use and productivity for agriculture (see paragraph 4.18).

Carbon Storage/ Climate Change

- 2.38 Mitigating the effects of climate change is also important in determining future changes in agriculture and land use. The Climate Change Act 2008²² established a new approach to managing and responding to climate change in the UK, and created a legally binding target to reduce the UK's emissions of greenhouse gases to at least 80% below 1990 levels by 2050. The UK Low Carbon Transition Plan 2009²³ sets out the responsibilities for reducing emissions for each sector of the economy (including agriculture) along with policies to enable the UK to meet the carbon reduction targets²⁴.
- 2.39 To deliver the UK target for agriculture in England, the Government is committed to working with the farming industry. This has led to the production of an industry-led action plan (developed by an Industry Delivery Partners group) to reduce emissions²⁵.
- 2.40 Sefton has significant peaty and organic soils (see paragraph 4.6) which, under arable cultivation, are prone to carbon release but advances in cultivation techniques are beginning to return organic matter to the soil.

- 2.41 Some of the actions to reduce greenhouse gas emissions in the food system have benefits for the wider natural environment. However there are competing demands for land between food and bioenergy (renewable energy generated from biological sources, for example, electricity, fuel or heat generated from biomass such as wood chips, straw, cereals, sugar beet etc.). In addition, while grazing livestock makes a significant contribution to emissions through methane production, the role of livestock is often important in grassland habitat management for wildlife. These highlight some of the trade-offs between mitigation, protecting the wider natural environment and food production that need to be recognised in policy design.

Planning Policy

- 2.42 Planning policy provides a legislative framework and protocols for decisions on land use. These current operate at national, regional and local level as detailed below.

National Planning Policy Context

- 2.43 The National Planning Policy Framework (NPPF)²⁶ sets out the Government's planning policies for England. Its purpose is to achieve sustainable development. The Council must take the Framework into account when preparing its Local Plan, and is a material consideration when making planning decisions. Importantly, the NPPF requires Local Plans to identify what their area's housing, employment and other development needs are and to demonstrate how they will be met. These needs should be balanced against other relevant planning matters and securing sustainable development.
- 2.44 Guidance of relevance to the rural areas of Sefton indicates that planning policies should:
- support economic growth in rural areas (paragraph 28) ;
 - protect the Green Belt (paragraphs 79 - 92);
 - contribute to and enhance the natural environment by (paragraph 109);
 - protecting and enhancing valued landscapes, geological conservation interests and soils;
 - recognising the wider benefits of ecosystem services;
 - minimising impacts on biodiversity and providing net gains in biodiversity.
 - take into account the economic and other benefits of the best and most versatile agricultural land. Where significant development of agricultural land is demonstrated to be necessary, seek to use areas of poorer quality land in preference to that of a higher quality (paragraph 112) ;
 - where development is required, allocate land with the least environmental or amenity value, where consistent with other policies in the Framework (paragraphs 151 -157).
- 2.45 Since the adoption of the NPPF, in March 2012, there have been a number of appeal decisions determined by the Secretary of State for Communities and Local Government, where development was proposed on best and most versatile agricultural land and where the local Council had been unable to demonstrate an adequate supply of land for development.
- 2.46 Although these decisions relate to particular sets of circumstances and it is not possible to draw general conclusions, they illustrate how the Secretary of State is balancing different policies within the Framework (see Appendix 1).

- 2.47 The Planning (Grade 1 Agricultural Land Protection) Bill 2010-2012 aimed to prohibit Councils from granting planning permission on Grade 1 agricultural land other than in exceptional circumstances. However it is not being pursued.

The Regional Planning Context

- 2.48 The Regional Spatial Strategy (RSS) for Northwest England (September 2008)²⁷ set out the main planning priorities for Northwest England until 2021. When the Coalition came into power in May 2010, they announced their intention to abolish all Regional Spatial Strategies. Following a series of legal challenges, the RSS still remains in place as part of the development plan. However, it is expected to be revoked within the next twelve months.
- 2.49 The RSS does not set out specific policies on agricultural land quality. However it does set out in policy RDF2 *Rural Areas* that strengthening the rural economy was a priority for the Northwest and of particular relevance, supports sustainable farming and food. On the whole, the policies on rural areas in the RSS are aimed at the more remote rural regions within the Northwest, rather than rural areas on the urban fringes such as those found in Sefton. Specific policies on the Liverpool City region and in particular Policy LCR4 *The remaining rural parts of Liverpool City Region* do not include any of Sefton within the “defined rural area” in Merseyside.

The Local Planning Context

- 2.50 The current planning policy for agriculture in Sefton is contained in Sefton’s Unitary Development Plan which was adopted in 2006. The current Development Plan is becoming dated and where the NPPF is more up to date than policies in the Development Plan, the NPPF will take precedence.
- 2.51 The Council has begun to prepare a Local Plan. Consultation on Options took place during 2011. Two of the options included release of land in the Green Belt to meet development needs. There was a lot of opposition to this, especially to the loss of the best and most versatile agricultural land in Sefton. The Council therefore decided to commission this Study to assess agricultural land quality in Sefton and the implications of possible development on some of this land.

Summary

- 2.52 The policy context for the land sector is summarised below:
- European and national policies together with regional and local strategies set out a wide range of priorities for land use and management. These are often competing and require trade-offs to be made between policy objectives at a local level. Competing pressures on land use in Sefton include productive agriculture, nature conservation and environmental protection as well as meeting development needs.
 - Agriculture policy combines an emphasis on supporting farmers and food production alongside efforts to reduce associated environmental impacts. While farming and environment can coexist, there may be clear priorities at a local scale. This is especially relevant to Sefton which has significant areas of best and most versatile agricultural land as well as internationally recognised habitats along the Sefton coast.

- The Natural Environment White Paper highlights the need to manage the impacts that food production has on the natural environment. It is recognised that farmers and land managers are key to resolving the tensions that exist between improving the environment and increasing food production. Key issues for Sefton include any future changes to pumped drainage systems, the need to protect land for pink footed geese, supporting farmland birds and reducing soil carbon loss.
- The National Planning Policy Framework requires Local Plans to identify needs for housing, employment and other development and to demonstrate how they will be met. In considering priorities, recent appeal decisions indicate that while the protection of best and most versatile agricultural land is a priority, it needs to be balanced with the need for sufficient land for development.

3 SEFTON'S RURAL ECONOMY

- 3.1 Sefton's rural area is essentially the area covered by the Green Belt, and comprises approximately 51% of the Borough. It contains both the coastal area and more traditional farmed countryside surrounding the main towns and villages. The focus for this study is the latter and includes activities linked to agricultural land use, notably farming and horticulture, and diversified enterprises such as horsiculture, leisure and tourism. In this chapter we consider the extent of these sectors in Sefton and consider trends and implications for future land use.
- 3.2 The Environment, Food and Rural Affairs (EFRA) Committee reported in 2008²⁸ that England's rural districts are home to just under a fifth of the population, but are responsible for 30% of the country's economic activity. Importantly farming constitutes just 2.6% of rural employment in England. The Sefton Green Belt is not typical of England's rural areas, as no part of Sefton is more than 3 kilometres from the metropolitan area, with farming less significant in economic terms (see paragraphs 3.38 and 3.39).

Agriculture in Sefton

- 3.3 The last report on agriculture in Sefton was produced in 1990²⁹ and highlighted the following issues:
- *The study area is one of high land quality and high value cropping is a feature of the area; arable cropping predominates but horticultural cropping is important.*
 - *Pigs and poultry are the most important livestock enterprises in the study area. With a comparatively small area of grassland, grazing livestock are less significant and both dairy and beef cattle numbers have declined in the previous 10 years.*
 - *Farm businesses are small and individual farm incomes can be low and are likely to be subject to further economic pressures arising from a number of factors, notably CAP reform and market concentration.*
 - *While there are additional pressures arising from farming within the urban fringe, there are also opportunities, which if developed within a positive framework could benefit both farmers and the wider community.*
 - *Diversification enterprises that farmers are considering (in order of priority) vegetable processing, farm shops, farm contracting, conversion of redundant buildings for tourist accommodation, equine enterprises, sport and leisure and conversion of buildings to rural workshops.*
- 3.4 Since that time there have been significant changes in the agriculture sector across England. These reflect a response to changes in markets and in the policies set out in Chapter 2. In this section changes in agriculture and land use are set out, based on published statistics for 1995, 2000, 2005 and 2010³⁰ together with a more detailed analysis of enterprises (paragraphs 3.16 - 3.38). The analysis for Sefton is presented alongside regional land use and agricultural production data for Merseyside and national (UK) data to give some indication of the distinctness of the area and its relative importance in terms of food production.
- 3.5 The Defra June census (2010) reported 4,298 ha of agricultural land in Sefton and Liverpool, virtually all of which is in Sefton. This is down from 5,253 ha in 2007, largely

due to a change in the way these data have been recorded (from 2010 minor holdings with very little agricultural activity are excluded from these statistics). Agricultural land includes crops, bare fallow land and grassland (temporary grass, permanent grass and rough grazing) as well as farm woodland.

Farm holdings

- 3.6 The total number of agricultural holdings in Sefton fell from over 100 in 1995 to 60 in 2010 (see Table 1). However, this is largely due to a change in the way these data have been recorded since 2010; in particular, holdings where there is very little agricultural activity are now excluded from these statistics³¹.

Table 1: Number of farm holdings in Sefton by size

Year	<5 ha	5<20 ha	20<50 ha	50<100 ha	>=100 ha	Total
1995	48	#	18	13	#	107
2000	66	#	13	#	11	114
2005	69	#	#	#	13	130
2010	6	18	8	15	13	60

Total may not necessarily agree with the sum of their components due to rounding;

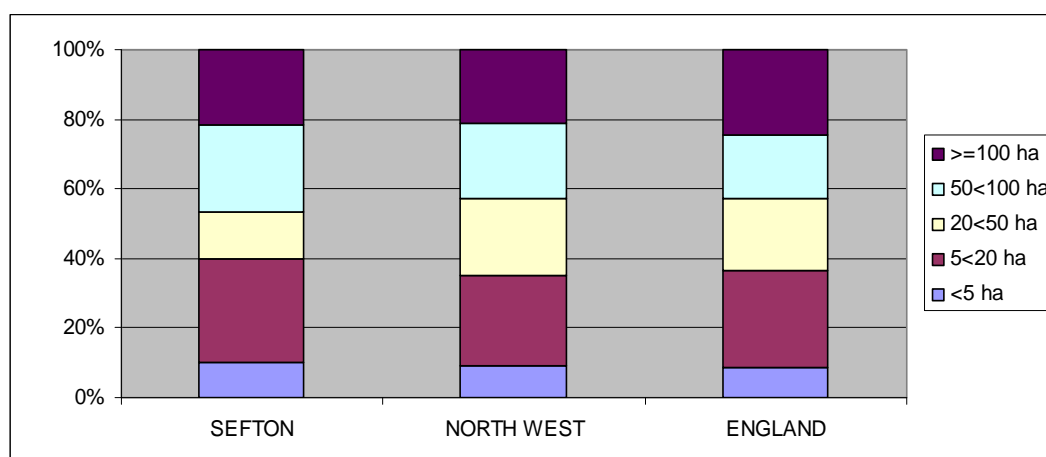
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** includes farms which were renting out all their land at the time of the census.

Source: Defra June Survey of Agriculture and Horticulture.

- 3.7 The historical data shows that in years 2000 and 2005, more than 50% of the farms in Sefton were 'very small' with less than 5ha of land. The number of farms in this category is significantly less in 2010 than in previous years due to the change in data protocols (paragraph 3.6). Compared with the regional and national composition of farms by size, there is a higher proportion (40%) of farms with land less than 20 ha in Sefton (see Figure 6) compared to the North West and England.

Figure 6: Number of farms by size for Sefton, NW and England in 2010



Source: Defra June Survey of Agriculture and Horticulture.

- 3.8 The high proportion of smaller holdings can be explained in part by the proximity to urban areas, where land values can be inflated, limiting the scope for expansion, and also by the increased opportunities to diversify (as an alternative to expansion) in response to demand for recreation activities, locally-branded food and tourism. The higher number of horticultural units in Sefton is also consistent with smaller units as the output per hectare of land is much higher.

Farm Type

- 3.9 Defra classifies farm holdings into a number of ‘farm types’ on the basis of the balance of sales of different crops and livestock. The inclusion of **minor holdings**⁶ within this classification since 2000 has increased the number of holdings classified to each farm type, particularly for horticulture where units are often smaller.
- 3.10 The number of these farm types in Sefton is shown in Table 2. This shows that the most prevalent farms types are based around arable cropping (*Cereals and General Cropping*) and horticulture (*Horticulture*); there are few livestock farms but some arable farms will include grassland with arable crops in a **cropping rotation**⁶ and may keep some livestock. The small number of pig and poultry farms and mixed units means that some of this data is not available. This is consistent with the analysis in the unpublished 2008 agriculture baseline study for Merseyside³² which suggests that there were small numbers of pig, poultry and mixed farms in Sefton.

Table 2: Number of holdings by dominant farm type in Sefton 1995-2010

Main enterprises	Defra Farm type	1995	2000	2005	2010
Cereals and oilseeds	Cereals	#	13	12	12
Cereals, potatoes and vegetables	General Cropping	35	20	20	20
Fruit and vegetables	Horticulture	26	35	24	12
Pigs	Specialist Pigs			#	#
Poultry	Specialist Poultry	9	8	#	0
Dairy	Dairy	0	0	0	0
Beef cattle and/or sheep	Grazing Livestock (lowland)	10	#	14	11
Other enterprises	Other	17	#	49	0

Note: #: Data not available.

Source: Defra June Survey of Agriculture and Horticulture³³.

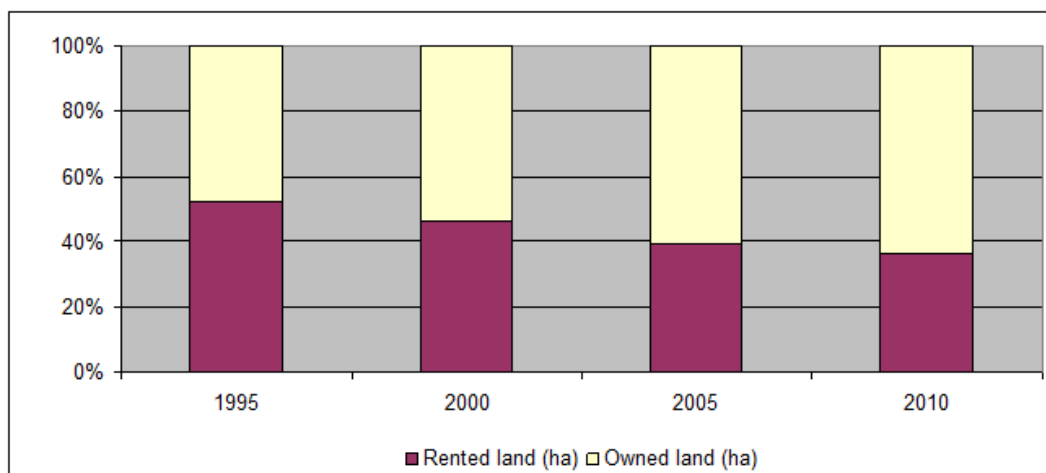
- 3.11 Overall the number of holdings has decreased from 1995, largely on the basis of changes in data classification (see paragraph 3.6) but is very variable across the period. Farms in the ‘Other’ category are often represented in urban or urban fringe areas, and in Sefton are likely to reflect the number of horse-based enterprises. The absence of these farms in 2010 reflects the exclusion of holdings with limited agricultural activity (see paragraph 3.6).
- 3.12 Nationally, there has been increased specialisation in arable farms, leading to the amalgamation of farms growing crops such as potatoes and **field-grown vegetables**⁶ on fewer, more specialist units (*General Cropping* and *Horticulture* farms). Arable farms which no longer grow potatoes and vegetables have tended to focus on cereals, oilseeds (mainly oilseed rape) and other crops such as peas and beans (*Cereals* farms). Since 2000, the number of holdings classified as *General Cropping* and *Horticulture* at England level has continued to decline while the number of *Cereals* farms has tended to increase. This is also reflected with the *Horticulture* sector in Sefton where the number of farms has declined (see Table 2); however, in Sefton the number of *Cereals* farms and *General Cropping* farms has been static.
- 3.13 There are only limited numbers of agricultural livestock in Sefton with cattle and sheep mainly concentrated in the areas north and east of Maghull as well as at Marshside and south of Ainsdale and Formby. The majority of cattle are fully housed on *Cereals* farms and *General Cropping* farms, making use of available straw, cereals and waste vegetables; sheep are mainly kept on pasture and parkland where cultivation is not an

option. While there were a number of isolated dairy units back in the mid 1980's, there are now no dairy farms in Sefton; this is consistent with a wider decline in the number of dairy farms nationally in response to poor market returns and high investment costs³⁴. Commercial pig units are few with numbers limited to the eastern part of Sefton.

Land Tenure

- 3.14 Statistics on land tenure in Sefton show that owned land has increased while rented land has decreased over recent years, falling from over 50% of land area in 1995 to less than 40% in 2010 (see Figure 7). This reflects a wider national trend of increasing land ownership based on restructuring of agriculture and fewer farm businesses due to marginal profitability and uncertainty (ADAS, 2004)³⁵.

Figure 7: Owned and Rented Farmland in Sefton



Source: Defra June Survey of Agriculture and Horticulture.

- 3.15 Whilst there are a large number of farmers that own their land, some with substantial land holdings, much of the agricultural land within Sefton forms part of estates which are rented out. Tenant farmers have less control over land use change and often rely on landlords to support investment in infrastructure (buildings, diversification etc); in contrast, landlords may take a longer-term view of land use and have the financial strength to invest. Significant landowners include the Hesketh Estate, Sefton Council, the Blundell of Crosby Estate, and Nuffield College, University of Oxford.

Trends in cropping & stocking

- 3.16 The main crops in Sefton are cereals (1,440 hectares), which account for over half the total crop area; oilseeds, potatoes and field-grown vegetables are also important.
- 3.17 Table 3 shows a shift in recent years towards more cereals and oilseed rape being grown at the expense of crops such as potatoes and vegetables which require specialist equipment and facilities. The steep increase in fallow land (not cropped) may be accounted for by a single holding which was not farmed in 2005 or 2010. Other year-to-year fluctuations reflect the small sample size from which these statistics are drawn.

Table 3: Changes in cropping areas in Sefton (ha)

	1995	2000	2005	2010
Cereals	1,473	1,397	1,329	1,440
Fallow land	19	21	339	409
Oilseeds	#	95	137	271
Potatoes	365	238	216	201
Beans	165	#	#	103
Field-grown vegetables	309	176	217	166
Glasshouse crops	7	5	11	6

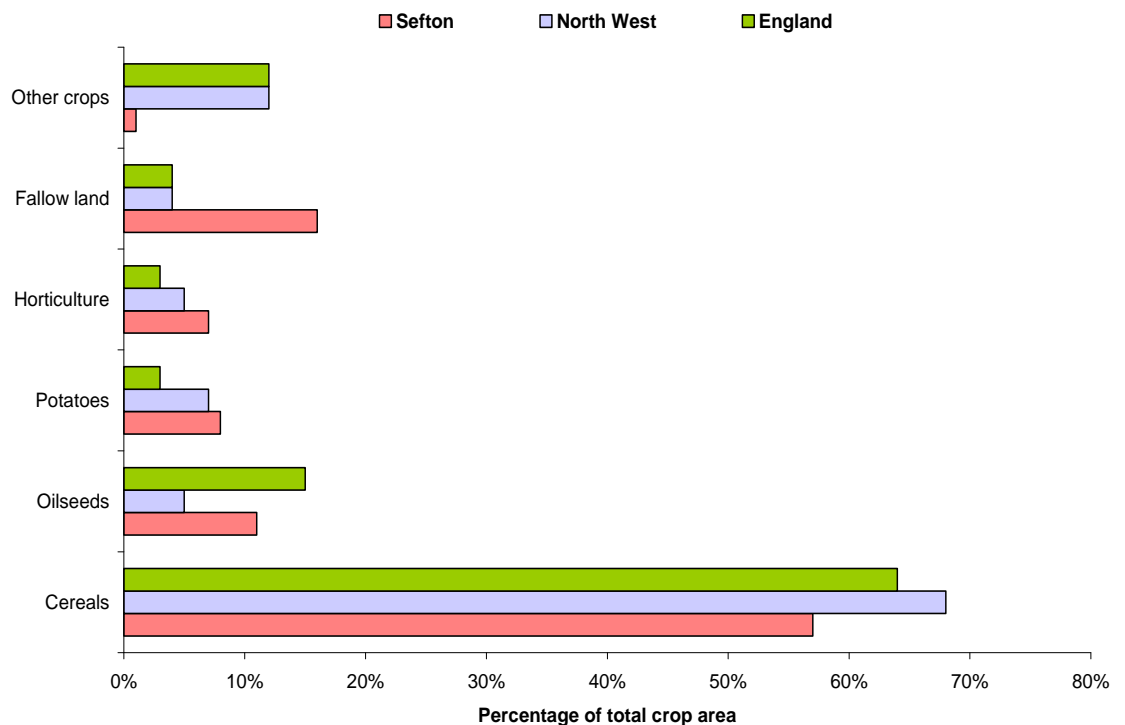
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Source: Source: Defra June Survey of Agriculture and Horticulture³⁶

Cereals and oilseeds

3.18 While cereals were the dominant crop in Sefton in 2010 they are relatively less so than in the North West or England (Figure 8). Part of this difference is accounted for by higher proportion of **horticulture^G** (field-grown vegetables and glasshouse crops) in Sefton at 7% of the cropped area, compared to the regional and national figures of 5% and 3% respectively. This reflects a combination of high quality soils with the capacity to grow salads and field-grown vegetables and the presence of local demand in the Merseyside conurbation.

Figure 8: Crop production in Sefton, North West and England in 2010



Source: Defra June Survey of Agriculture and Horticulture.

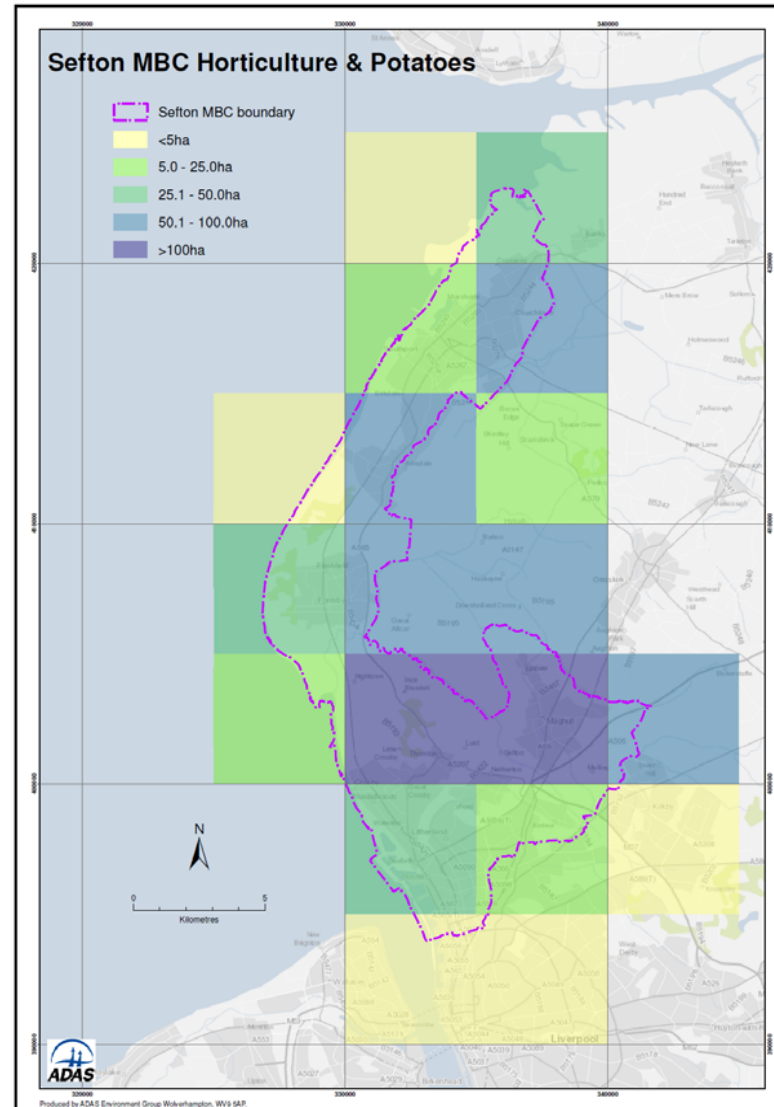
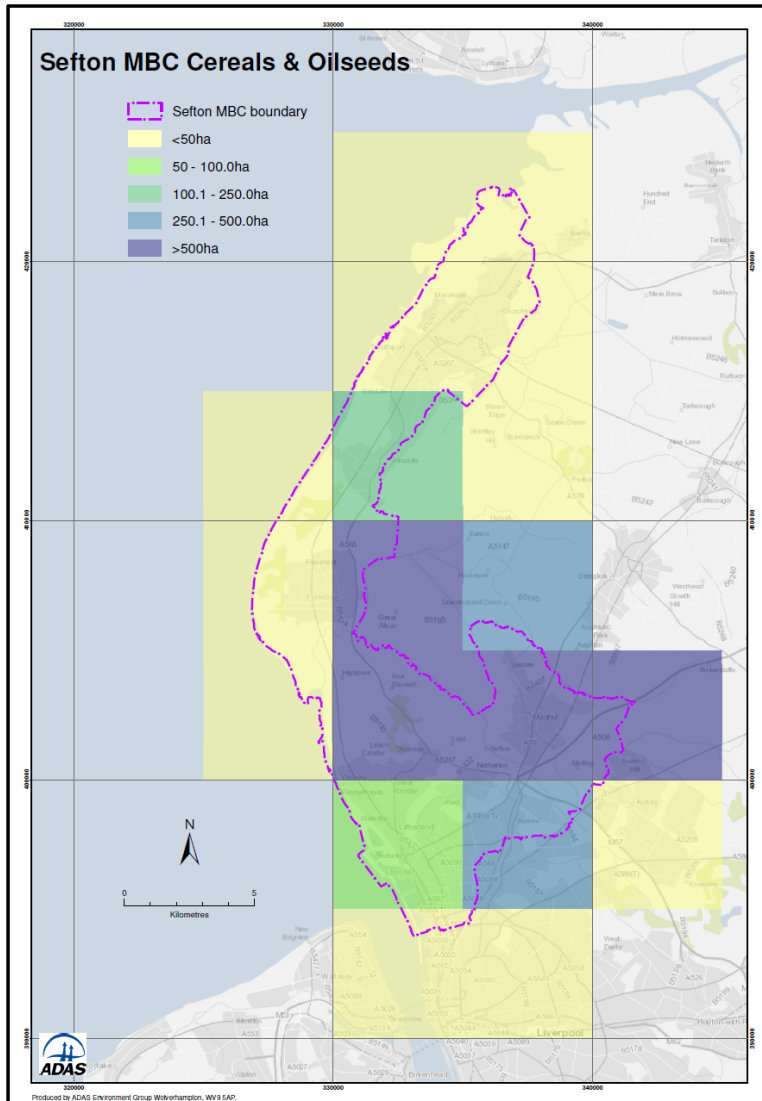
- 3.19 The analysis show the distribution of key crops at the different spatial scales but it is also important to recognise the absolute areas involved for Sefton, the North West and England. This is shown in Table 4 and indicates that cropping in Sefton is only 0.1% of that at England level while cropping in the North West represents 2.9% of the England crop area.

Table 4: Crop areas in Sefton, North West and England in 2010

Crop	Area (ha), 2010			As a proportion of Crops in England (%) 2010	
	Sefton	NW	England	Sefton	NW
Cereals	1,440	76,457	2,496,798	0.1%	3.1%
Oilseeds	271	5,224	599,675	0.0%	0.9%
Potatoes	201	7,722	99,939	0.2%	7.7%
Horticulture	172	5,403	104,529	0.2%	5.2%
Fallow land	409	4,302	149,316	0.3%	2.9%
Other crops	14	14,077	471,810	0.0%	3.0%
Total	2,507	113,185	3,922,067	0.1%	2.9%

- 3.20 Figure 9 shows the distribution of cereals and oilseeds on the first map and the distribution of horticulture and potatoes on the second. These crops have been grouped to reflect the concentration of general arable farming (*Cereals* farms) and those farms which grow high value crops and require good quality soils (*General Cropping* and *Horticulture* farms). While potatoes and vegetables can be grown on light and sandy soils where irrigation is available, they tend to be concentrated on the peat soils; cereals and oilseeds can be grown on a wide range of soils.
- 3.21 The area of wheat and oilseed rape has increased since 1995 whilst the area of barley has declined. This largely reflects a national trend which has seen producers favour wheat and rape as these two most profitable crops for harvesting with a combine. Peas and beans have seen a decline across the Sefton area as well as across the North West as a whole, due to wetter weather conditions and associated highly variable yields.
- 3.22 The area of wheat grown in the North West and in Sefton fluctuates year on year due to the autumn weather conditions and growers ability to sow the crop following the harvesting of potatoes and vegetable crops.

Figure 9: Distribution of cropping in Sefton at 5km² scale (2010)³⁷



Note: This data is mapped by ADAS from detailed June 2010 Census.

Potatoes

- 3.23 Potato production in the Sefton area has declined, as has the number of growers. Potatoes tend to be grown on the peat soils (see paragraph 4.6) which do not dry out quickly in the summer months and can produce a high yield of good quality tubers but this is not exclusively so and the sandier soils around Ince Blundell are also important, especially where irrigation is available from watercourses or on-farm reservoirs., The peat soils are also used to grow high value crops such as iceberg lettuce, celery, potatoes and beetroot.
- 3.24 Table 5 shows that there has been some consolidation with the remaining farmers growing a larger area of potatoes. There are also still a number of farmers in the area who produce small amounts of potatoes for sale to local shops and through the local farm shops. These changes are in line with national trends.

Table 5: Changes in potato production in Sefton

Year	Potato Area (ha)	No. of Growers	Average area (ha) per grower
1995	365	40	9.1
2000	238	27	8.8
2005	216	18	12.0
2010	201	N/A	N/A

- 3.25 The market for potatoes has totally changed over the last 20 years. This reflects a longer term decline in the local wholesale markets at Liverpool, Preston and Manchester as the number of corner shops and specialist greengrocers have reduced. Many potato growers now grow their crop on contract for potato merchants for processing into ready meals, crisps or frozen chips. Some still sell to the local chip shop trade and others to packers who supply the supermarkets.

Vegetables

- 3.26 There has also been a decline the overall area of vegetables grown in Sefton. This is associated with increased specialisation more generally as farms get larger and focus on meeting the demands of key markets. The supermarkets have dominated the vegetable sector like all other fresh produce sectors for a number of years and procurement is contracted to a small number of large suppliers. This presents difficulties in marketing the crop for smaller growers, many of whom have given up growing vegetables and switched to other crops or rented their land out to the more specialist, larger growers who can access the supermarket trade.
- 3.27 Growers in Sefton continue to supply vegetables to supermarkets but are now mainly doing so through third party companies that wash, pack and market produce, often outside the area.
- 3.28 Around Formby there is a small area of very specialist production of asparagus on the sandy soils to which the crop is well suited. This crop is relatively small scale in terms of area, but has a very high value. Most of the produce is now transported to washing plants in West Lancashire.
- 3.29 Horticultural production under glass has remained relatively static over the last 15 years as has the area of glass and the number of businesses. These specialist businesses tend to have specialised or diversified to a garden centre approach,

selling plants direct to the public as well as wholesale to other garden centres and shops, including large retailers such as B&Q.

Livestock production

- 3.30 There are only limited numbers of agricultural livestock in Sefton; the Defra census data for 2010 suggests there are only around 500 beef cattle, 1500 sheep and 1600 pigs. Cattle and sheep are spread across Sefton but concentrated in the areas north and east of Maghull. Commercial pig units are few with numbers limited to the eastern part of Sefton.
- 3.31 An unpublished analysis of Merseyside agriculture in 2008³² reported that for the livestock sector in Merseyside ‘Despite an increase in the proportion of livestock farms ... livestock numbers appear not to have changed substantially over the last fifteen years. The exception being a decline in the pig herd ...’ Table 6 shows changes in livestock numbers in Sefton for the period 1995 to 2010. The data suggests there is an overall reduction in livestock farming, with the exception of sheep which have increased in numbers, albeit from a low base in 2000. The more intensive pig sector which can generate higher levels of employment is present at very low levels in 2010 (higher absolute numbers reflect the intensive nature of pig production).

Table 6: Livestock numbers in Sefton from year 1995 to year 2010

Year	Cattle and Calves	Pigs	Sheep and Lambs
1995	902	2,980	#
2000	#	1,779	346
2005	#	#	297
2010	521	1,627	1,538

#: Information not available.

Source: Defra June Survey of Agriculture and Horticulture

- 3.32 Table 7 shows that livestock production in Sefton represents a very small proportion of regional and country production, largely reflecting the small size of the Sefton land area in comparative terms (Sefton's agricultural land area represents 0.4% of that in the North West and 0.04% of that in England) and the dominance of arable cropping. Grazing livestock (cattle and sheep) are under-represented in the Borough, relative to regional and national data.

3.33 Table 7: Livestock numbers in Sefton relative to NW and England, (2010)

	Sefton livestock total	Sefton livestock as % of North West total	Sefton livestock as % of England total
Cattle and calves	521	0.05%	0.01%
Pigs	1,627	1.18%	0.05%
Sheep and lambs	1,538	0.06%	0.01%

Source: Defra June Survey of Agriculture and Horticulture. Percentages are calculated based on June Survey data (2010) for Sefton, NW and England.

- 3.34 Beef cattle enterprises are mainly located on mixed farms where there is a supply of straw and cereals or waste potatoes etc as stockfeed (paragraph 3.13). Beef cattle on arable farms tend to be housed all year around in buildings, but there are a number of

farmers who graze the marshland on the Marshside RSPB reserve and south of Ainsdale and around Formby.

- 3.35 There are limited numbers of sheep in the Sefton area. Traditionally, sheep would graze land that was required as grassland for a specific purpose. For example, in the past land at Hightown was grazed by sheep each year prior to the Waterloo Cup until hare coursing was banned in Sefton.
- 3.36 Grassland areas in Sefton may also be used for horses and other non-agricultural uses (for example, caravan sites).
- 3.37 The poultry industry in Sefton is very small (593 birds based on the Defra June survey, 2010, having reduced from 48,147 in 2007) in the context of an England flock of 125 million birds. Recent changes in the specifications for cages will see a further reduction in producers as the smaller producers are forced out of the egg industry due to the costs of complying with this regulation.
- 3.38 The number of pig producers has declined significantly over the years as increased welfare requirements (such as the banning of stalls) meant producers were faced with high costs to change their production systems. At the same time, pig prices have been very volatile with strong competition from imports. This sector is generally highly specialised and only the most competitive have survived.

Contribution of agriculture to the wider rural economy

- 3.39 Although roughly half the area of Sefton is Green Belt, not all of this land is in productive agriculture; areas for nature conservation and recreational use are significant. Agriculture contributes £7 to £11 million³⁸ a year to the total economy in Sefton, accounting for only 0.2-0.3% of the Gross Value Added (GVA) generated by the economy in the Borough. This compares to the contribution of GVA from the agricultural sector at 0.6% for the North West region and 0.7% for England and reflects the urban nature of the Borough.
- 3.40 Similarly, employment in agriculture represents a very small percentage of total employment in Sefton in 2010 at 0.2%³⁹, and is in line with the GVA contribution by the agricultural sector nationally. Employment in the agricultural sector in Sefton has declined, from 485 full time employees in 1995 to 244 in 2000, and has remained relatively constant since. This is in line with regional and national trends for agricultural employment, which declined rapidly between 1995 and 2000 and then stabilised.
- 3.41 An indication of the scale of contribution from farming to GVA and employment by those farm types most relevant to Sefton is set out in Table 8. Farm gross margin has been used as a proxy for GVA as this is the protocol for statistics on the economic performance of agricultural; farm **gross margin**⁶ represents the total income from sales of produce less the direct costs associated with its production.

Table 8: Farming GVA and employment by farm type

Farm Type	Associated GVA* £ per ha, 2009	Associated Employment FTE jobs per ha, 2009
Cereals	£792	0.01
General cropping	£829	0.02
Horticulture**	£8,482	0.25
Lowland grazing livestock	£550	0.02

*Using Gross Margin as a proxy.

** Using England level data rather than NW.

Source: Farm Business Survey (FBS) 2009/10 for the North West Region⁴⁰.

- 3.42 Although the direct economic impact of agricultural production is small in Sefton, there is wider evidence that related supplying and processing industries in urban areas make an important contribution⁴¹.

Farm diversification⁶

- 3.43 Diversification is a path chosen by many UK farming families facing economic pressures in agriculture and successive Governments have encouraged farm diversification as a way of addressing declining agricultural markets and improving the viability of individual businesses. This approach received support by the report of the Policy Commission on the Future of Farming and Food (Curry Commission, 2002)⁴² and is supported through the Rural Development Plan for England (RDPE)⁴³.
- 3.44 According to the national statistics, total income from diversification was estimated at £360 million and diversified enterprises generated 15% of the total income of farm businesses in 2009/10⁴⁴. There is no data available for farm diversification in Sefton (at Local Authority level) from the national statistics. However, the North West region has lower levels of diversification compared to other English regions with only 41% of farms having diversified enterprises.
- 3.45 The Mersey Rural Leader Local Action Group, funded under the RDPE, has worked with 9 diversified farm businesses in Sefton ranging from food processing, arboriculture and horticulture to leisure and horsiculture. These businesses generate a turnover of between £20,000 and £2.4 million and employ between 1 and 13 people respectively (equating to £20k and £200k per employee). While this is not representative of all diversified farm businesses in Sefton, it does give an indication of the dynamic nature of the rural economy and the range of scale and performance of rural business.
- 3.46 In terms of tourism opportunities in the rural area, the Economic Strategy for Rural Merseyside - Green Zone 2025⁴⁵, recognises that Sefton has a well developed 'natural tourism' offer: *"It is a key component of "England's Golf Coast" and promotes "Sefton's Natural Coast" alongside the resort of Southport. These natural tourism assets rely upon smaller visitor attractions to provide supporting facilities and infrastructure. There is potential for businesses in the rural area to support the coastal offer through supplying local food, trails and recreational/catering facilities. It will be important however that any development is appropriate in the Green Belt and any impact is suitably mitigated." ... "In the east of Sefton there are also opportunities based around the Leeds Liverpool Canal and the equine sector. This is an important*
- 3.47 *tourism asset and offers potential for the development of small scale rural visitor attractions related to it. Aintree Racecourse is located close to Maghull and Lydiate and there are a number of unrelated equine facilities within Sefton."*

Summary

3.48 Sefton's rural area is essentially the area designated as Green Belt and comprises half of the land of the Borough. Agriculture in Sefton is not typical of NW or of England due to proximity to urban areas. The agricultural sector is characterised as follows:

- Agricultural production is dominated by arable cropping (cereals, oilseeds and potatoes) and horticulture (fruit and vegetables) based on the availability of good quality soils. Sector specialisation combined with changes away from local markets has reduced the number of horticultural units. However, they still represent a higher proportion of cropped land compared to North West and England (as shown in Figure 8).
- Livestock production is relatively limited. There are no dairy farms and cattle production is mainly located on arable farms and with some pastoral cattle and sheep. There are a small number of intensive pig and poultry units (paragraphs 3.30 – 3.38).
- The overall contribution of agriculture to wider economy is modest at 0.2-0.3% of the GVA generated by the economy in Sefton; this is lower than that for the North West region and the national average reflecting the relatively urban nature of the Borough. In 2011, less than then 0.2% of people working in Sefton worked in the Green Belt; approximately half of these were employed in the agricultural sector (paragraphs 3.39 – 3.42).
- There is an important element of farm diversification activities in Sefton, including leisure and horsiculture (paragraphs 3.43 – 3.46).

4 THE SOIL RESOURCE IN SEFTON

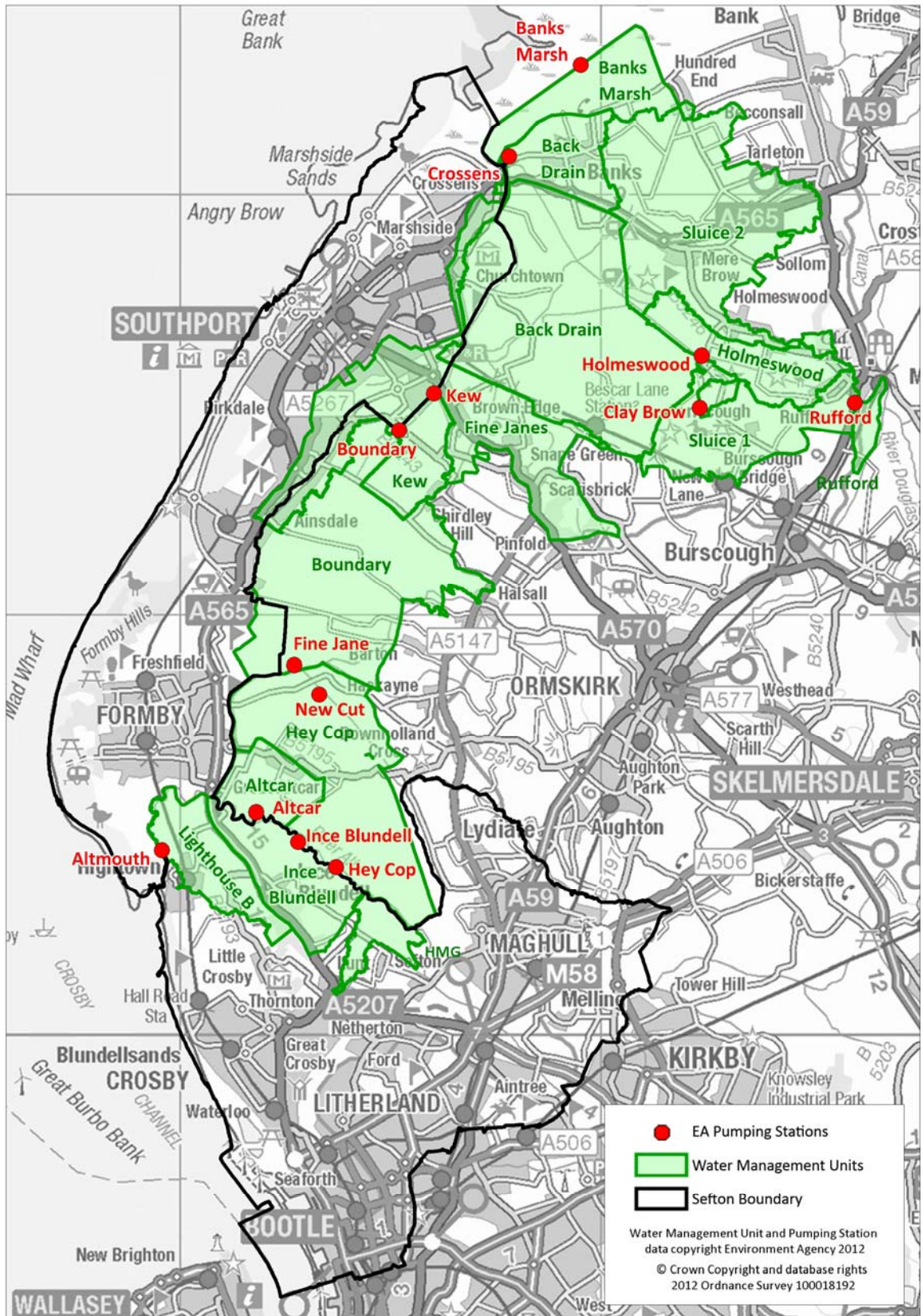
- 4.1 Paragraph 2.28 set out the policy context for soils. Soils are recognised as being an important resource which provides many services. The current position is contained in the national Soil Thematic Strategy⁴⁶, the overall objective of which is the protection and sustainable use of soil, based on the principles of:
- preventing further soil degradation and preserving its services; and
 - remediating degraded soils.
- 4.2 While soils in England have been protected for many years, there has been a growing recognition by Government of the important role soils play in maintaining a healthy environment. In its strategy for soils (Safeguarding our Soils)⁴⁷ the Government recognises that soil cannot be replaced and is an essential growing medium. *'Current policies focus on protecting English soils and the important ecosystem services they provide.*
- 4.3 Further, the most recent guidance on soils (Natural Environment White Paper⁴⁸) states that *'soil is essential for achieving a range of important ecosystem services and functions, including food production, carbon storage and climate regulation, water filtration, flood management and support for biodiversity and wildlife'*.
- 4.4 This chapter details and discusses the soils in Sefton and considers the contribution they make to these major **ecosystem services**⁶.
- 4.5 Sefton forms part of a low lying area on the western edge of the West Lancashire plain, an area of glacial, post glacial and recent geological deposits between the coast and higher ground to the east. The Sefton coast is dominated by mud flats, salt marshes and sand dunes whilst inland, wind blown sands and peats have formed on low lying ground over glacial drift. The resulting soils are very variable and were mapped in 1984 (formerly the Soil Survey of England and Wales) into groups of soils which occur together; these groups are usually named by the most dominant soil type or "Soil Association".
- 4.6 The soil groups are summarised below and in Table 9 where they are described by their Soil Association classification number and name, and by their location and main characteristics. Sefton soils fall into four main groups:
- (i) Sand dunes and sandy soils are found along the coastline and around Maghull, including the Sollom, Blackwood and Sandwich soils;
 - (ii) Deep sandy soils overlying clay within 1m of the surface, including Rufford soils which are found in the south east of Sefton around Maghull;
 - (iii) Fine loamy or clayey topsoils over clay at variable depths, including the productive marine alluviums Downholland soils to the north of Hightown and Wisbech soils north east of Southport, the heavy textures Fladbury and Enborne soils formed on alluvium in the river valleys and the Flint soils formed in glacial deposits north east of Kirkby. These soils show signs of impeded drainage and land quality is reduced by the wetness of the soil;
 - (iv) Peaty soils located away from the coastline, including Turbary Moor, and Altcar soils to the east of Southport, northeast of Formby and north of Crosby.

Table 9: Summary of agricultural soils in Sefton

Soil Type	% of agricultural area	Main locations	Main characteristics
Sandy soils			
641a SOLLOM 1	23.0	Located north of Crosby and around Maghull	Deep sandy soils with a watertable controlled by pump drainage and land drains; some have organic topsoil. Very productive when provided with a good supply of nutrients on intensively farmed areas. Prone to drought, erosion and wind-blow when bare.
821b BLACKWOOD	13.3	Around Southport, Formby and Hightown	Deep sandy soils with a variable depth to the watertable which is controlled by pump drainage. Highly productive if well drained and provided with a good supply of nutrients. The topsoils are often sand which limits land quality. Prone to erosion and wind-blow.
361 SANDWICH	28.6	Located the full length of the coastal margins from Crosby to Southport	Very sandy and prone to drought and erosion. Most areas support non-agricultural uses including golf courses and public open space or low productivity uses such as low input grazing.
Sandy soils over clay			
711o RUFFORD	11.2	Located between Crosby and Maghull	Sandy topsoils over clay within 1m of the surface. Imperfect drainage limits the productivity of this land. Suitable for arable agriculture and grass for cutting, grazing and turf production.
Loam or clay topsoils over clay			
851b DOWNHOL- LAND 2	2.9	Located north of Hightown	Deep, organic medium textured soils formed in marine alluvium. Drainage controlled by a pump drainage system. Good quality soil used for arable agriculture
812b WISBECH	2.1	Located northeast of Southport	Deep, coarse loamy, soils formed in marine alluvium. Drainage controlled by a pump drainage system. Can be prone to reduced water infiltration when used for arable agriculture.
813d FLADBURY 3	5.8	Located on the river Alt floodplain	Deep clayey alluvial soils with poor drainage. Suitable for grass or arable agriculture. Prone to damage by livestock trampling in wet weather.
811a ENBORNE	1.6	Located south of Maghull on the floodplain	Fine loamy alluvial soils affected by seasonal flooding. Moderately to poorly drained. Used for grass or arable agriculture. Prone to damage by livestock trampling in wet weather
572I FLINT	4.1	Located north of Aintree and Waddicar	Loamy soils over clay, moderately to poorly drained. Suitable for arable agriculture.
Peat soils			
1021 TURBARY MOOR	0.70	Located to NE of Southport	Deep peaty soils with a watertable controlled by pump drainage. Prone to erosion when soil is bare. Locally wet.
1022a ALTCAR 1	6.7	Located east of Southport, north east of Formby and north of Crosby	Deep peaty soils with a controlled watertable. Very productive but locally wet and prone to erosion.

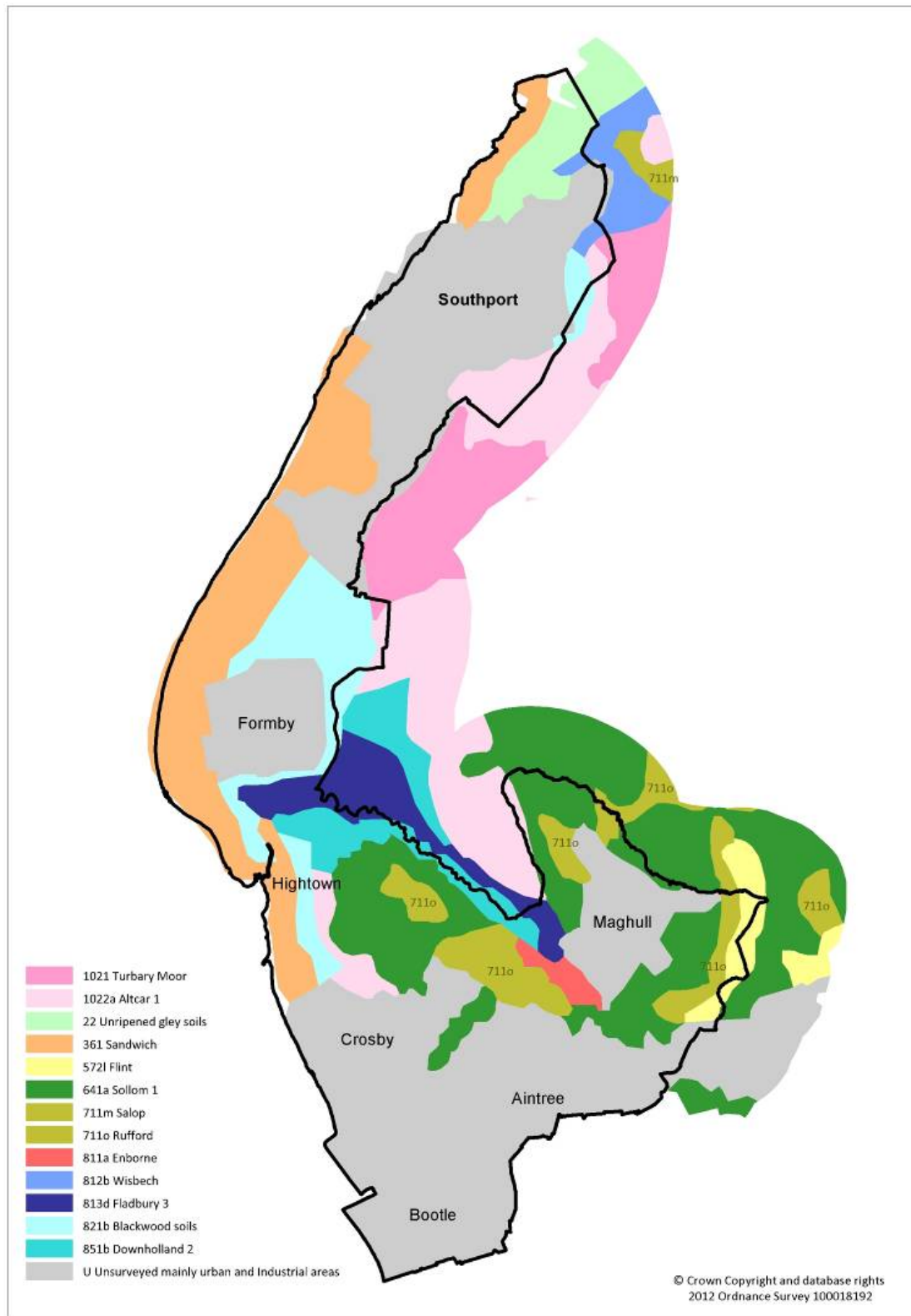
- 4.7 The physical characteristics of soils, such as their texture and drainage coupled with their location and slope determine how they are used, both for agriculture and non-agricultural purposes. In Sefton the very sandy soils along the coast are largely used for non-agricultural purposes such as public open space and golf courses and support habitats such as acid grasslands and heathlands which are protected. Further east, more productive soils support intensive agriculture as well as livestock grazing and horse pasture.
- 4.8 Whilst there is a wide range of soil types within Sefton many require pumped drainage to maintain their agricultural productivity. Much of the drainage network is controlled by the Alt and Crossens pump drainage network (see Figure 10). Before drainage the soils were mainly waterlogged close to ground level and in these conditions peat was laid down over hundreds of years. After drainage, peaty soils have been used intensively for vegetable and arable production but drainage and the continual cultivation of the soils has led to peat shrinkage by drying out and decomposition or by removal through turf cutting. In some areas originally mapped as shallow peat or organic soils the organic matter has now been depleted. The soils are now more prone to drought and reduced water infiltration.

Figure 10: Alt and Crossens pump drainage area



4.9 A summary of the distribution of soil types and their main locations is shown in Figure 11.

Figure 11: Soil Associations within Sefton



Source: Sefton Council 2012 ⁶⁴

- 4.10 The most intensively used soils include Blackwood, Downholland 2, Altcar 1, Sollom 1 and Rufford Soil Associations (see Appendix 2 for more detail). This is reflected by the high prevalence of horticultural crops in Sefton compared with Lancashire and England; typical crops include brassicas, potatoes and carrots, with asparagus grown as a niche crop on sandy soils around Formby and ornamental plants on the Maghull Smallholdings Estate. Chapter 3 (paragraphs 3.9 – 3.29) gives more detail on agricultural crops and horticulture in Sefton.

The essential services that soils provide

- 4.11 All soils provide a range of benefits and functions that are important for human well-being, known as 'ecosystem services'. Farmland is managed largely to produce food, but also has an important role in many other ecosystem services including supporting biodiversity; providing landscapes for leisure and access; regulating water and air quality; and contributing to climate regulation through the production of gases and the deposition and release of carbon.
- 4.12 Ecosystem services were first recognised as being important in the Government's First Soils Action Plan⁴⁹ and more recently in Safeguarding our Soils – A Strategy for England⁵⁰. The Government is now committed to policies (outlined in the Natural Environment White Paper – The Natural Choice⁵¹) that protect English soils and the important ecosystem services they provide. The White Paper highlights the following services:
- nutrient cycling – the recycling of fertilisers and wastes through soil
 - water regulation – the control and storage of water
 - carbon storage – the binding of carbon in the soil as organic matter
 - support for biodiversity and wildlife – i.e. nature conservation
 - providing growing areas for food, wood and biofuel
 - infrastructure support - ground stability for buildings and pipelines.
- 4.13 The UK National Ecosystem Assessment⁵² is the first analysis of the UK's natural environment in terms of the benefits it provides to society and our continuing economic prosperity. It considers, in very broad terms, how farmland management has impacted on major ecosystem services in recent decades. Generally food production is reported to adversely affect the level of ecosystem services found on farmland. The disturbance of soils and use of fertilisers and manures in the process of food production can contribute to water and air pollution and to greenhouse gas emissions. Pesticide use can also displace or destroy biodiversity. Food production also impacts on landscapes by reducing plant and animal species diversity, although much of what we consider as landscape has been shaped by agriculture.
- 4.14 The following paragraphs set out the main ecosystem services for soil in Sefton. Table 10 shows the suitability of each soil type in Sefton for performing each ecosystem service. Soils which are considered important for supporting a function are given more 'stars' whilst those with fewer 'stars' are considered to be less well suited to the function. The overall importance of each soil function should not be determined by adding together the individual scores because not the services are not directly comparable and hence are not evenly weighted.

Table 10: Sefton's Soil – Summary of the Suitability for each ecosystem service

Soil group	Nutrient cycling	Water regulation	Carbon storage	Suitability for Nature Conservation and biodiversity	Growing areas for food wood and fuel	Ground Stability for Building (based on soil texture/wetness)
Sandy soils						
641a SOLLUM 1	++++	+++++	++++	++	+++++	++++
821b BLACKWOOD	++	++++	++	++	+++++	+++
361 SANDWICH	+	+++++	+	+++++	+	+
Sandy soils over clay						
711o RUFFORD	+++	++	+++	++	+++	++++
Loamy or clayey topsoils over clay						
851b DOWNHOLLAND 2 (organic topsoil)	++++	+++	++++	+++	++++	++
812b WISBECH	++++	+++	+++	+++	+++	++
813d FLADBURY 3	++++	++	+++	+++	+++	++
811a ENBORNE	++++	++	+++	+++++	+++	+++
572I FLINT	++++	+++	+++	++	+++	+++
Peat soils						
1021 TURBARY MOOR	+++	+++	+++++	+++++	+++	+
1022a ALTCAR 1	+++	+++	+++++	++++	++++	+

Key

Soils function star rating: + not very suitable, —————▶ +++++ very suitable

Nutrient cycling

- 4.15 Most soils in England require the addition of artificial fertilisers and organic waste materials such as farm yard manures and treated sewage sludge, to ensure there are sufficient nutrients in the soil to support intensive agriculture. In Sefton the deep sandy soils do not hold large natural reserves of nutrients and consequently require high fertiliser or organic waste inputs. As sandy soils are not able to retain some nutrients, especially nitrogen and potassium, any not absorbed by crops can leach into rivers and groundwater. Nitrogen contributes to eutrophication (over enrichment of the water with nutrients) and rapid aquatic plant growth which can choke watercourses and increase flooding. Phosphate can also be transported on soils particles to drains and water courses during intense periods of rain, especially on easily eroded soils such as Sollum and Altcar soils in arable cultivation.

- 4.16 Well-drained, biologically active soils with good levels of organic matter are most able to cycle nutrients efficiently and retain nutrients; these include the medium and heavy textured soils such as Wisbech, found north east of Southport and those with higher levels of organic matter in the topsoil such as the Sollom soils around Maghull.

Water regulation

- 4.17 Rain water infiltrates into the soil and underlying geology where it collects as groundwater, providing a reservoir of water within the soil which accumulates and drains away over time. As a consequence, soils help to reduce river flooding at times when they hold little water but once the groundwater rises to the surface or when the surface layers of the soil are saturated, they can no longer absorb water and the land floods. The water regulation function has been measured as the ability of a soil to store water, as this helps prevent flooding by slowing water movement to water courses.
- 4.18 On some Blackwood soils e.g. to the south of Woodvale and north of Formby the watertable is close to the surface and soils will be saturated for long periods and so will have less potential for infiltration and storage than Table 10 indicates. If changes to the drainage management result in less pumping in the Lower Alt and Crossens catchment area⁵³, this may result in a reduction in the soil's ability to store water as the natural watertable will rise. A higher watertable will have an effect on agricultural production as the soils will be harder to cultivate, reducing the range and yield of crops which can be grown. However the more sandy, drought prone Sollom and Blackwood soils could become more productive if more water is available at depth for growing crops .
- 4.19 Agricultural land quality will be adversely affected if the likelihood of flooding in the area becomes more frequent or severe.

Carbon storage and loss of organic matter

- 4.20 Soils contain a store of carbon in the form of organic matter in the topsoil which is broken down over time to provide nutrients. Good levels of organic matter improve the amount of water a soil can hold, make heavier soils easier to work, help to reduce water erosion on the sandy soils and maintain fertility, all of which make the soils more productive and more resilient to damage and so can improve land quality.
- 4.21 Due to a drying of the soil profile there is estimated to be a net loss of carbon from these soils at a rate of 40 tonnes of carbon dioxide per hectare per year and a reduction in depth of more than 1cm per year⁵⁴ leading to a loss of large quantities of peat over the next 20 years and beyond. Loss of organic matter results in wind erosion and a loss of fertility of the surface layer of topsoil. Crop residues such as straw and leafy brassica crops and bulky wastes including manures and organic industrial wastes are used to increase levels of organic matter to help maintain soil fertility.
- 4.22 Soils are a source of carbon emissions and also a store for carbon depending on how they are managed. For example, cultivating soil decreases organic matter, whilst in waterlogged conditions organic carbon from plant remains are laid down to form peat at a rate of about 1mm/year⁵⁵. In Sefton the Altcar 1 and Turbary Moor soils which are found east of Southport and in a narrow strip north of Crosby were formed on low lying waterlogged ground. These soils have been drained and are gradually shrinking through direct loss of water and by organic decomposition (see paragraph 4.38). Similarly the sandy Sollom soils around Maghull and Downholland soils east of Formby are losing their organic topsoil.

- 4.23 If the watertable in the peat soils rises in the future, peat shrinkage will be reduced and organic matter has the potential to gradually accumulate if the soils become waterlogged to the surface. The Government is encouraging farmers to adopt approaches to conserve carbon including minimum tillage⁵⁶ i.e. reduced cultivations to prepare a seed bed, to reduce fuel and fertiliser use and to improve carbon storage. Such modern farming techniques are helping to reduce the loss of organic matter and can help to build up levels of organic matter gradually over many years, when under grass or when crop residues and other organic wastes are returned to the soils.

Nature conservation and biodiversity

- 4.24 Biodiversity is the interaction between living and non-living organisms and how they relate to one another in their natural habitat. The most important sites within Sefton are protected under European, national or local designations to illustrate their importance for nature conservation. These include Ramsar, SSSI and National Nature Reserves as well as local designations.
- 4.25 Within Sefton the floodplain soils in the Alt Crossens catchment area, with their potential to support permanent pasture, and the very sandy soils along the coast, with their ability to support acid grasslands such as heathlands are considered to be valuable soils for conservation. Most of Sefton's internationally and nationally important wildlife sites are located in the coastal soils (Sandwich soils) and beaches, which are also valued for recreation.

Growing area for food, wood and fuel

- 4.26 An essential role of soils is to provide a medium for growing crops for food and more recently for biofuels⁵⁷ such as oilseed rape and willow. The physical characteristics of soils such as their texture, drainage and stone content determine how well they are able to fulfil this role. Typically Sollom and Altcar soils are high quality whilst the heavy textured or poorly drained Fladbury and Flint soils are of a lower quality. The ability of land to support food production is measured by the Agricultural Land Classification of England and Wales⁵⁸ (see chapter 5).
- 4.27 As discussed in chapters 2 and 3, world markets, Government policies and subsidies have a major influence on the crops grown in England, with a move from supplying local markets with horticultural produce, to national and international trading. As a consequence soils are not always used to grow the full range of crops which they could support and it is common throughout Sefton and elsewhere to find cereals on high quality land which could support horticultural crops and market gardening on heavier, lower quality land e.g. on the northern part of the Maghull Smallholding Estate. In addition turf is grown in Sefton and this can affect the quality of the soil in the long term because a thin layer of topsoil is removed each time it is harvested.
- 4.28 The peat soils including the Turbary Moor and Altcar Association (see Table 10) which occur in the north of Sefton, and sandy glacio fluvial soils such as the Rufford and Sollom Associations, which occur throughout, are very productive in most of Sefton. To the north of Formby and south of Ainsdale the summer watertable lies within 0.5m of the surface making cultivation difficult on Blackwood soils in this area, because wet soils are more easily damaged.
- 4.29 Soils which are easy to cultivate and allow winter harvesting are highly productive so long as they hold good reserves of water to reduce the effects of drought. Examples include the peat soils east of Southport and deep sandy soil with a watertable which is controlled by pump drainage throughout the area. Soils which are heavier textured or which have drainage limitations are less suitable for intensive production, for example

some of the Flint soils north of Aintree and at Waddicar and Fladbury soils on the River Alt floodplain. They can however still produce good yields of summer harvested crops and grass and some are still 'best and most versatile' soils.

- 4.30 Woodland, with appropriate management, has the ability to grow on most soils but the species will be determined by soil type, drainage, climate and altitude. In Sefton tree cover is limited; on the coast conifers prevent soil erosion whilst inland the soils support a wider range of species, some planted as horticultural shelter belts or as managed parklands at Crosby Hall, Ince Blundell Hall, Meols Hall or on golf courses.
- 4.31 The Mersey Forest, which includes land within Sefton, is developing a network of woodland and green spaces to create 'community woodlands' offering environmental, social and economic benefits in the area. Closed landfill sites are often planted and some will be used for coppicing.
- 4.32 Woodland and shelter belts help to reduce wind speed in the lee of the planting and so can be used effectively to reduce wind erosion on the coastal margins and are used to protect crops on horticultural units; woodland can however throw shadow over a significant area on level sites and so affect crop yields.

Stability for buildings and services

- 4.33 To be ideal for building, soils and their underlying geology need to provide firm foundations but in Sefton sands, peats and glacial drift predominate. New development is therefore likely to be located where it is needed rather than based on soil suitability and other factors such as the need to maintain the integrity of the Green Belt. As a result, development may be slightly more expensive than average due to the need for raft or piled foundations on peaty soils, or the need for raised floor levels to help mitigate the risk of flooding.
- 4.34 Soils in Sefton have the following limitations for construction:
- The sands and peats including the Blackwood and Altcar and Turbary Moor soils, which are found along the eastern edge of Southport and Ainsdale where it bounds with West Lancashire, around Crosby and south of Hightown, are more expensive to develop as they are affected by bands of peat which requires the use of specially designed foundations due to their low bearing capacity.
 - High water tables in Blackwood soils, in areas such as Formby and Ainsdale, present specific challenges to construction in terms of foundation design and building / site drainage.
 - Clay soils such as the Flint soils between Aintree and Kirkby are reported by the Council to be generally low shrinkage clays but if there is a likelihood of desiccation of the ground then new buildings in these areas will require specially designed foundations.

Other impacts on soil services in Sefton

- 4.35 Soils in Sefton, in common with the rest of England, continue to be degraded by human actions including intensive agriculture, industrial pollution and urban development⁵⁹. The proximity of the urban area and the spreading of sewage sludge and other organic wastes (which may contain elevated levels of metals) can increase the levels of pollutants in the soil by gradual accumulation but applications are now carefully controlled by the Environment Agency to prevent a build up of pollutants.

Wind erosion

- 4.36 Wind erosion occurs on un-vegetated sandy and peaty soils, due to their coastal position and open landscape. As a consequence it can be difficult to stabilise sand dunes on the coast and to establish spring crops inland. Sand blow leads to costly clean up operations on the roads and the need to re-drill damaged crops. A reduction in topsoil depth can lead to reduced yields and a lower water holding capacity causing the soils to be more prone to drought which in turn affects land quality.

Water erosion

- 4.37 When rivers flood or when the soil can no longer absorb the excess rainfall during heavy rain, water will remove soil particles. In Sefton un-vegetated sandy and peaty soils in the floodplain will be at risk from water erosion leading to an increase in the sediment load of the rivers. Sandy and peaty soils will be at particular risk of erosion during flooding because they have a weak soil structure. Away from the floodplain heavy rain is of less concern because the fields are generally almost level, giving the water more time to infiltrate the soil, making it less prone to erosion. Water erosion can create gullies in fields and remove large volumes of soil onto roads and into streams and ditches. Water erosion will be of most concern on the sandy soils on gently sloping ground around Maghull. Small levels of erosion over many years can reduce land quality.

Peat wastage

- 4.38 Peat wastage occurs due to the shrinkage and decomposition of peat as it dries out after the installation of artificial drainage and due to longer hotter summers resulting from climate change. Work undertaken by the Environment Agency⁶⁰ indicates that mean peat depths in the east of Sefton decreased from 1.5m to 1.2m between 1955 and 1985. Further work is being considered to update this figure because it is anticipated that peat wastage has the potential to lower existing ground levels by up to 1.0m within 100 years. This suggests that peat wastage will increase areas of poor drainage and necessitate a re-design of pumping stations including a lowering of water levels to allow the land drains to work effectively.
- 4.39 Peat wastage has major implications for land quality in the Sefton area and could alter land quality from Grade1 as shown on the Provisional Land Classification Maps to lower quality land, due to poor drainage or the exposure of underlying clay, particularly where the peats are shallow e.g. Downholland soils north of Hightown. Peat wastage also has implications for carbon (see paragraphs 4.20 - 4.21) and water storage (see paragraphs 4.17 - 4.19) across the area because peat stores large amounts of both, and therefore peat wastage can exacerbate the effects of climate change (see paragraphs 4.40 - 4.41).

Climate change

- 4.40 It is predicted that changes in future rainfall patterns will result in farmers having to cultivate their land in less than ideal conditions such as after periods of intense rain or when the soil is very dry. If the soils are worked when they are too wet or have to be worked several times to create a seed bed, degradation (loss of organic matter and soil particles) and structural damage (compaction) to the soil could occur, both of which reduce productivity.
- 4.41 In Sefton the sandy soils will be easily eroded and can become compacted below the topsoil when harvesting occurs in wet conditions. The more clayey soils will be more prone to compaction of the topsoil and at the base of the plough layer. They will be

harder to work in wetter winters and more difficult to cultivate in extreme dry conditions, making it harder and more expensive to create a good seed bed and establish a productive crop. Crop yields could be affected by the problems caused by climate change across the area and land quality may be affected if the soils become more drought prone.

Changes to flood protection

- 4.42 Much of Sefton, including its rural area, is relatively flat and lies at low altitudes less than 5 metres above sea level. Currently about 20% of the rural area is at medium or high risk of river or tidal flooding, and about a third is at risk of surface water flooding. About a quarter of the rural area is at risk of groundwater flooding. There is overlap between these areas; for example some of the area at risk of groundwater flooding coincides with the area at risk of flooding from the River Alt and other rivers and watercourses.
- 4.43 If the current rural land drainage or **fluvial flood risk**⁶ management regimes were to change in the future, as is being considered in the Lower Alt with Crossens Flood Risk Management Strategy, it may be that groundwater levels would rise. This could have impacts on surface water or river flooding, and hence on agricultural land. It is currently too early to say what, if any, changes there would be to rural land drainage or fluvial flood risk, and hence to agricultural land.
- 4.44 If there were to be a change to future rural land drainage or fluvial flood risk management regimes, climate change (notably, more intense rainfall) could make the situation worse. As a worst case this could lead to a reduction in agricultural land quality to the extent that areas currently classified as Grade 1 and 2 would no longer be able to support intensive agriculture or horticulture. Soils could revert to their pre-drained condition where they were waterlogged close to the surface for long periods in winter and could be classified as Sub grade 3b to Grade 5 within the areas of pumped drainage. This worst case scenario would make arable agriculture more difficult, and could lead to soil structure being damaged, if such land has to be cultivated whilst too wet. However, as above, it is currently too early to say what, if any changes there would be to rural land drainage or fluvial flood risk, and hence to agricultural land.

Summary

- 4.45 Within Sefton there are four main soil types which are very diverse, ranging from light sands through medium textured soils to heavy clays and peats. All of these contribute to the character and influence the diversity of the Sefton area. The soils are important for supporting all the main soil services but their suitability varies with soil type (see Table 10 and paragraphs 4.14 - 4.32).
- 4.46 The sandy soils in Sefton vary in their ability to support the full range of ecosystem services. The Sandwich soils which form the sand dunes are protected for nature conservation and biodiversity and include internationally and nationally protected habitats including acid grasslands, and species such as the Natterjack Toad. They also have an important local and regional role for providing areas for recreation and a lesser role for water regulation.
- 4.47 The Sollom soils around Maghull and Blackwood soils east of Formby, are important for growing crops and often include best and most versatile agricultural land. These sandy soils are also good for nutrient cycling and water regulation when the groundwater is controlled.

- 4.48 The medium textured marine alluviums (i.e. Downholland soils, located north of Hightown, and Wisbech soils found northeast of Southport) and the sandy topsoils over clays (e.g. Rufford soils, found between Crosby and Maghull) are moderate to good for agriculture and they are usually classified as 'best and most versatile' agricultural land. These soils are also moderate to good for most ecosystem services.
- 4.49 The fine loamy over clayey soils (e.g. Enborne soils found south of Maghull, and Flint soils located north of Aintree) are of less value for agriculture, of moderate value for most other services and provide a more stable building platform than the alluvial and peat soils in Sefton so long as they do not flood (see Table 10).
- 4.50 The peat soils and Sollom soils with an organic topsoil are good for nutrient cycling and water regulation when drained because they hold large stores of water. However the installation of land drainage changes them from a carbon store to a source of carbon release and many of the Sollom soils found around Crosby, Hightown and Maghull are losing their organic topsoil. All of the peaty soils are good for agriculture if sufficiently drained and ideally should be protected from development as peat soils are a diminishing national resource due to peat wastage/carbon loss.
- 4.51 If organic rich or peaty soils are developed in the future, the peat layer may have to be removed (a process which would lead to carbon release) or specialist building techniques used to ensure stability. The potential development sites identified in the draft Sefton Green Belt Study⁶¹ are mainly on non-peaty soils, the exceptions being parts of Green Belt parcel S004 (adjacent to Churchtown), parts of plot S031 (North of Moss Lane, Ainsdale) and only isolated patches in other sites e.g. parts of S068. In parts of plots S157 (Oriel Drive, Aintree) organic matter appears to be accumulating within the wet hollows but the site is mainly a non peat soil.

Conclusions

- 4.52 In their current condition, soils in Sefton are a valuable local, regional and national asset, contributing to all of the ecosystem services, to a greater or lesser extent (Table 10). They contain nationally and internationally important nature conservation areas along the coast, and inland much of Sefton comprises best and most versatile agricultural land (see chapter 5). They contribute towards the cycling of nutrients, they filter and store water, can retain carbon and grow food and wood.
- 4.53 The loss of some land to development, if required, will have a small effect on most of the services the soils provide, including water regulation, carbon storage and nutrient cycling. There will be a loss of land for food production (see Chapter 6).

5 ASSESSMENT OF AGRICULTURAL LAND QUALITY IN SEFTON

- 5.1 Agricultural land quality in England is measured by the Agricultural Land Classification of England and Wales⁶². This chapter provides an assessment of land quality in Sefton, both at the Borough level and on individual sites. We have:
- Undertaken an assessment of the Provisional Land Classification as determined in the 1970's and a study of existing detailed surveys (paragraphs 5.2–5.14);
 - Considered the factors affecting land quality in Sefton (paragraphs 5.15-5.34);
 - Provided a framework for assessing individual sites in more detail (paragraphs 5.35– 5.40);
 - Provided information on the 23 sites surveyed at a reconnaissance scale (Table 14); and
 - Drawn conclusions on potential grading of land in Sefton (Table 16 and paragraphs 5.53 – 5.78);

Provisional Agricultural Land Classification and Existing Surveys

- 5.2 Many of the soil types discussed in chapter 4 are versatile soils which, with appropriate management, allow a wide range of crops to be grown. Consequently much of Sefton were classified as the best and most versatile land on the original Provisional Land Classification Maps⁶³ produced by the Ministry of Agriculture Fisheries and Food between 1966 and 1974.
- 5.3 Under the Agricultural Land Classification system, agricultural land is graded according to the degree to which its physical characteristics impose long-term limitations on agricultural use. All agricultural land was given a Provisional grade of Grade 1 (very high quality) to Grade 5 (very poor quality) based on climate, soils and site limitations⁶⁴. The Provisional Agricultural Land Classification maps show the agricultural land in Sefton as best and most versatile and with an unusually large proportion of Grades 1 and 2, when compared to the rest of the country, 62.1% of the agricultural area of Sefton, compared with 16% of England. At this time, only agricultural land which was graded Grade 1 or 2 was considered to be the 'best and most versatile' agricultural land.
- 5.4 The Provisional Maps provide a non-detailed classification at one inch to one mile (1:63,360) scale and this information was summarised on 1:250,000 scale plans. These maps give an overall grade for an area but are not sufficiently accurate for use in assessing individual fields or development sites and should not be used other than as general guidance⁶⁵; they are no longer in production but the information is still available on the MAGIC website⁶⁶ at 1:250,000 scale. The Provisional Maps are only accurate to about 80 hectares and are likely to contain land with a different classification within the grade mapped. This also explains why some agricultural areas on the edge of towns and villages were classified as 'urban' on these maps.
- 5.5 The Agricultural Land Classification guidance was updated in 1976⁶⁷ by subdividing Grade 3 land into three subgrades. In 1988, with the release of more technical data, the classification was again updated to provide the current Agricultural Land Classification⁶⁸ which recognises two subdivisions of Grade 3 i.e. Subgrade 3a and 3b. These updates have enabled the identification of the better quality (Subgrade 3a) land within Grade 3, so that it can be included with other '**best and most versatile land**'⁶⁹ i.e. Grades 1-3a.

- 5.6 Since the Provisional mapping there have been no further comprehensive surveys of land quality in Sefton or nationally, only small detailed surveys to support planning applications and the preparation of Development Plans have been carried out. Although the Provisional maps are now 40 years old and the Agricultural Land Classification methodology has evolved and become more technical since it was first released, the Land Classification of an area should not have been significantly affected by these changes.
- 5.7 On the Provisional Agricultural Land Classification maps, the broad distribution of the grades is as follows:
- Grade 1 is located east of Southport and around Maghull over mainly flat to very gently sloping land, on which the **peaty**^G soils of the Altcar Association and organic sandy soils of the Sollom Association have developed. The land is now used mainly for agricultural and horticultural crops.
 - Grade 2 land is located extensively to the north of Crosby and around Maghull where sandy Sollom soils and fine loamy Flint soils occur. The **watertable**^G is controlled by land drains or natural drainage and the area is now used for mixed arable agriculture with some grassland.
 - Grade 3 land is only found to the north east of Formby where soils of the Blackwood and Altcar Soils now support grassland and arable crops.
 - Grade 4 land mainly occurs in narrow bands inland of the sand dunes where soils of the Blackwood or Enborne Soils occur. Land use on these soils is mainly limited by a high groundwater-table or flooding and the area now supports mainly grassland or is used for non-agricultural uses including Formby Hall Golf course, RAF Woodvale and the Altcar Rifle Range.
 - Grade 5 is found along the coast to include Sandwich soils which form the sand dunes and acid grassland; these soils are very prone to drought. Most of this area is in non agricultural uses including golf courses and public open space.
- 5.8 Table 11 shows the MAGIC data for Sefton, which highlights the high proportion of Grades 1 and 2 agricultural land.

Table 11: Sefton's Provisional Land Classification (data from MAGIC)

Agricultural Land Classification	Sq km in Sefton*	% of area in Sefton	% Agricultural area in Sefton	Sq km* in England	Sefton Proportion of England's Total (%)
Grade 1	21.0	14.0	30.5	3,546.4	0.592
Grade 2	21.8	14.4	31.6	18,492.6	0.118
Grade 3	1.8	1.2	2.6	62,917.1	0.003
Grade 4	8.1	5.4	11.8	18,403	0.044
Grade 5	16.2	10.8	23.5	11,007.8	0.147
Non Agricultural	14.1	9.4	-	6,572.1	0.215
Urban	67.6	44.8	-	9,523.2	0.710
Total	150.6	100.0	100.0	130,462.2	0.115

* Cartesian Measurement

Source: Natural England 2011⁶⁹. Measurements by Sefton Council

- 5.9 Where the development of agricultural land is being considered, it is good practice to undertake a more detailed Agricultural Land Classification survey to inform planning

applications for non agricultural use and for the preparation of Development Plans such as the Sefton Unitary Development Plan and the emerging Local Plan.

- 5.10 Government agencies, developers and Sefton Council have commissioned more detailed Agricultural Land Classification surveys of some areas to aid planning decisions over the past 25 years
- 5.11 Some of the detailed surveys carried out in the past (see Table 12) have to be treated with caution for a number of reasons:
- Some of the older maps produced by MAFF or its Agencies either used the pre-1988 Agricultural Land Classification guidance or were produced under the 1988 revised Agricultural Land Classification by reworking pre-1988 survey data, and may not have been rechecked in the field. As a consequence they cannot be relied on because the soil texturing system and the assessment of drainage has altered. However they should still give a good indication of land quality and suggest a reduction in land quality as do the **reconnaissance surveys^G** undertaken as part of this Study (see paragraph 5.43).
 - Surveys undertaken by other organisations are of unknown quality and some contradict surveys undertaken by MAFF / Defra or its Agencies.
 - In some areas, especially those which support organic mineral soils and shallow peat soils, the maps may no longer provide an accurate grading of the land because soils can both improve or deteriorate over time (paragraph.4.19).
 - On sites where two surveys have been undertaken on the same piece of land they provide conflicting data about land quality, e.g. S111 west of Maghull and S129 east of Maghull were both reclassified in 2011. Both surveys show a reduction in land quality when compared with the Provisional maps. Both surveys have been undertaken using the correct methodology and differences in grading appear to be caused by a complex soil pattern or different descriptions of **soil texture^G** or **soil wetness^G**.
- 5.12 The Provisional Agricultural Land Classification maps show large areas of Sefton including most of the potential development sites as '**best and most versatile' agricultural land^G** (see Table 11).
- 5.13 The existing detailed studies undertaken by MAFF/Defra and its agencies all indicate that land quality in Sefton is lower than the Provisional maps suggest, when considered at an individual site level. This is supported by the findings of surveys undertaken to support planning proposals, which in some instances have downgraded land to a greater extent than the surveys undertaken by MAFF/Defra and its agencies. They have been used, along with the reconnaissance surveys as a base, to determine the likely grade of land in Sefton which has not been surveyed.
- 5.14 Table 12 summarises the results of the provisional and detailed surveys which have been undertaken in Sefton and comments on the need for further work.

Table 12 : Comparison of Provisional Classification and Detailed Surveys

Site	Provisional Agricultural Land Classification	Author of detailed survey	Detailed Agricultural Land Classification (Main grade)	Comments	Need for resurvey
Southport					
S007	1	MAFF 1998	3b some 2	Gradings align with expectations of soil type	No
S008	1	MAFF 1998	Non agricultural	Site not in agricultural use	No
Formby					
S044	4 / Urban	ADAS 1992	3b	Gradings align with expectations of soil type	No
S048	Urban extrapolated as 2	ADAS 1992	1-2	Gradings align with expectations of soil type	No
S049	4	ADAS 1992	3b part only	Gradings align with expectations of soil type	No
S053	Urban / 2	ADAS 1992	2 + non agricultural part only	Gradings align with expectations of soil type	No
Thornton					
S092	Urban / 2	MAFF 1998	1-3a	Gradings align with expectations of soil type	No
S093	Urban/2	MAFF 1998	Buildings/3a/ b	Gradings align with expectations of soil type	No
Maghull and Lydiate					
S110	1	RMA Env*. 2011	2	Check as an example of soils in the area	Yes
S111	1	MAFF 1990; RMA Env. 2011	1-3b; 2 -3a	Pre1988 MAFF survey. 1988 revised Land Classification used	More weight given to RMA survey. No
S112	1	MAFF1990	1-3b	Pre1988 survey but results accord with other surveys in the area	No
S122	1/ urban	Stevenson 2011	1- 3a	Gradings align with expectations of soil type	No
S123	1/ urban	ADAS 1992	1-2	1988 revised Land Classification used	No
S129	1/ urban	MAFF 1998 Palmer 2011	2-3a 2 -3b	Gradings align with expectations of soil type. 1988 revised Land Classification used but 3b not anticipated	Yes to confirm presence of 3b
Waddicar					
S144	2	Defra post 1988	3a-b	Gradings align with expectations of soil type	No
S145	1	RAC@ 2011	3a -3b	Gradings align with expectations of soil type	No
Aintree					
S157	1	MAFF 1982	1-3a	Pre1988 survey.	Yes

* RMA Env = RMA Environmental, @ RAC = Reading Agricultural Consultants

Factors which influence land quality

- 5.15 The main factors which influence the quality of land are local climate, site limitations (including flooding and topography) and soil along with the interactions between them. Land quality is determined by considering the most limiting factor.

Climate

- 5.16 Climate has a major influence on land quality by affecting the cost of production and yields and in some part of the country is an overriding limitation. For land classification purposes climate is measured by considering the Annual Average Rainfall and the **Accumulated Temperature**⁶ between January and June. As the rainfall increases so temperatures have to be higher if climate is to remain a neutral factor in land quality. A full description of each climatic variable can be found in the Agricultural Land Classification guidelines⁷⁰.
- 5.17 Sefton Borough occupies a long thin area of land to the north of Liverpool stretching from Bootle in the south to Southport in the north. The climate is affected by the area's proximity to the sea which forms the western boundary of the Borough. The main climatic characteristics used in the determination of land quality have been calculated for the settlements where development may take place in the future i.e. Southport, Ainsdale, Formby, Hightown, Thornton, Maghull and Waddicar (see Appendix 3).
- 5.18 Climatic data for Sefton shows that the area is warm and moist making it good for plant growth. Climate does not limit land quality and all of the agricultural land has the potential to be included in Grade 1 if the land is of a sufficiently high quality.
- 5.19 Soils are at or above **field capacity**⁶ (i.e. fully wet) for 196 days in an average year in the north of Sefton, falling to 183 days around Thornton and rising to 196 days on the higher ground around Maghull; these are high figures for lowland England but typical of the west coast. This information is used in the assessment of soil wetness across the district.

Land Classification and Climate Change

- 5.20 The current Agricultural Land Classification guidelines rely on climatic data which was published in 1989⁷¹ and takes no account of future predicted climate change.
- 5.21 Defra is currently funding work to consider the impact of climate change on soils and Agricultural Land Classification⁷². This work could result in alterations to the current Agricultural Land Classification methodology and would be used to generate projections of the possible future distribution of Agricultural Land Classification grades and to identify the best and most versatile land i.e. Grades 1, 2 and 3a. There is no indication if or when any possible changes will be implemented; or the effect it would have on land quality in Sefton.

Site and Flood Conditions

- 5.22 With the exception of the dunes on the coast, most of Sefton is nearly flat or slopes only very gently, and the gradient does not limit land quality. Occasional old marl pits and hollows give an uneven surface but are too small to map separately and have been included within the general grade for the area as is normal practice.
- 5.23 While surface water is the main source of flood risk in Sefton, many areas are also at risk from fluvial and tidal flooding and have been classified by the Environment Agency as lying within Flood Zones 2 and 3⁷³. However, many of these areas have flood defences.

- 5.24 River flooding does not affect land quality on the areas surveyed because the chance of regular crop damage is extremely low (EA Maps indicate that on average the land will flood at least once every 75 years in the worst affected areas). Grade 1 land can have short floods no more than once every 15 summers and once every 10 years in winter⁵⁰ without affecting its grading.

Interactions between climate, site and soil

- 5.25 The main constraints which affect the cropping potential and the management of the land are soil wetness and drought, climate and site factors such as microrelief (local undulations in levels). See Appendix 3 for more detail.
- 5.26 For Agricultural Land Classification purposes the soil wetness assessment takes account of:
- i. The climatic regime (length of time at **field capacity**^G);
 - ii. The soil water regime (described as wetness class, determined by soil colours and depth to a **slowly permeable layer**^G).
 - iii. The texture of the top 25cm of the soil because this affects **water infiltration**^G and ease of cultivation (see Appendix 3 for more detail).
- 5.27 Depth to a watertable and soil drainage are important considerations in Agricultural Land Classification because it must be possible to harvest crops and cultivate best and most versatile land in winter. In July 2012 after a very wet summer, the watertable was encountered within 0.4m of the surface to the south of Ainsdale and north of Formby and at depths below 0.7m elsewhere. The land was classified by considering soil colours as well as depth to watertable to ensure that they were not under graded because of the unseasonably high watertable.
- 5.28 The heavier soils such as Wisbech soils to the east of Southport and Flint soils between Aintree and Waddicar have impeded drainage and soil wetness can limit land quality. In Whinny Brook and the ditches to the east of Maghull the water level is maintained by land drains at 2.5 – 3 metres below ground level to enable intensive agriculture.
- 5.29 **Drought**^G reduces crop yields and so affects land quality. For Agricultural Land Classification purposes, the drought assessment considers:
- i the available **water capacity**^G of two reference crops (i.e. wheat and potatoes),
 - ii the balance between rainfall and potential **evapotranspiration**^G in spring and early summer.
- 5.30 **Sandy topsoils**^G dry out very rapidly and yields can be reduced even when there is still water in the soil, so **loamy**^G sand topsoils cannot be classified as Grade 1 and sand topsoils cannot be graded higher than Subgrade 3b, examples occur on S056 at Hightown on Blackwood soils.
- 5.31 The soils in Sefton each have a set of physical characteristics such as their texture and drainage which are typical of the soil type (see chapter 4), making it possible to infer the likely Agricultural Land Classification (see table 15 column 6) from a knowledge of the soils, particularly their depth, texture and wetness class, and the local climate.

Conclusions of preliminary assessment

- 5.32 The study indicated that all of Sefton had the potential to be included in Grade 1 and a **climatic limitation**⁶ could not be used to help select sites for further consideration (see data at Appendix 3 and paragraph 5.18).
- 5.33 The risk of flooding on the 43 sites considered is minimal for agricultural purposes and flood risk does not down grade land quality because on average the land will flood at least once every 75 years in the worst affected areas. The depth to a watertable may limit land quality on some of the Blackwood soils around Formby and south of Ainsdale (see paragraphs 5.22-5.24).
- 5.34 **Soil wetness**⁶ is an important consideration in determining agricultural land quality as the land need to be capable of being cultivated and harvested all year round on best and most versatile land (see paragraphs 5.26-5.28).
- 5.35 The sandy soils east of Hightown and around Maghull can be slightly prone to drought and many areas have a **drought limitation**⁶. In addition sandy topsoils cannot be graded higher than Subgrade 3b (see paragraph 5.29)

Framework for considering sites for further study

- 5.36 Sefton Council is legally required to meet the need for new homes and jobs in its area. As the identified need could not be met wholly within the urban area, it carried out a Green Belt Study⁷⁴ in 2011 to assess whether any parts of its Green Belt were potentially suitable for development. The draft Green Belt Study divided Sefton's Green Belt area into a number of distinct 'parcels' based on land use and character (Appendix 4). To enable comparison between areas identified in the Green Belt Study and those referred to in this Study, the same areas and references have been used in both documents.
- 5.37 Sefton Council identified 43 areas of land within the Green Belt which may be suitable for development if required by the emerging Local Plan. The maps in Appendix 5 show the 'Provisional' agricultural land classification for these areas. These areas cover approximately 593 hectares of land adjacent to all the main settlement areas of which 537 hectares (data supplied by Sefton Council) are in agricultural or **mixed land uses**⁶ (7.7% of the agricultural area of Sefton).
- 5.38 Due to the limitations of the Provisional Agricultural Land Classification maps and the limited detailed studies available in the area, ADAS was asked to consider which of the potential development sites selected by the Council should be surveyed, to test the accuracy of existing Agricultural Land Classification data.
- 5.39 To select sites for further consideration ADAS initially undertook the following screening work:
- A study of the agricultural climate (including a measure of **summer temperature**⁶ and rainfall in Sefton) was used to determine if any areas were ineligible for inclusion in Grade 1 (see Appendix 3).
 - The Provisional Agricultural Land Classification grading was compared with existing detailed surveys and with the Soil maps⁷⁵ of the area (see Table 12 and 15). If the two surveys were substantially different they could not be used to

confirm the grading of the soil type. In these cases the soil maps and past experience of the soil type in North West England were used to determine if the soils were likely to have been graded correctly.

5.40 In addition to the comparative studies listed above the following information was also used to determine the need for further survey work:

- If sites were known to be in a productive non-agricultural use they were excluded from further consideration.
- Sites which were unused were considered for re-surveying if there was no obvious reason for this, to see if there was any fundamental reason why they could not be put to a new productive agricultural use.

5.41 Potential changes in flood risk management and rural land drainage regimes were considered. For the purposes of selecting areas for further analysis, it was assumed that water levels would be maintained at their current level, and would not affect land quality.

Results of screening

5.42 Based on the results of the four point sieve above, the list of areas requiring further consideration was determined to be the 23 sites listed in Tables 14 and 15. Each site was assigned an anticipated grade. The 20 sites excluded (i.e. sieved out) are listed in Table 13, together with an explanation of the reason why they were. The maps in Appendix 6 show which sites were re-surveyed and where existing surveys were relied on.

Table 13: Summary of excluded sites

Site	Provisional ALC	Current land use	Reason for exclusion
Southport			
S007	1	Agricultural	Detailed survey exists, using 1988 revised land classification. Gradings align with expectations based on soil type.
S008	1	Non agricultural	Detailed survey exists using 1988 revised land classification + land use (park and ride site)
S009	1	Non agricultural	Restored landfill with limited potential for agricultural reuse
S016		Non-agricultural	Not agricultural. Former school with playing fields. Sandwich soils, likely to be poor quality land,
S017	5	Agricultural	Poor quality land, gradings align with expectations based on soil type.
S027	4	Non agricultural	Not agricultural, small caravan storage area.
Formby			
S044	4	Agricultural	Detailed survey exists for part of site using 1988 revised land classification. Gradings align with expectations based on soil type.
S048	2	Agricultural	Detailed survey exists for part of site using 1988 revised land classification. Gradings align with expectations based on soil type.
S049	4	Agricultural	Detailed survey exists, using 1988 revised land classification. Gradings align with expectations based on soil type.
S052	2	Non - agricultural	Fladbury soils so likely to be less good quality agricultural land
S053	2	Agricultural	Detailed survey exists for part of site using 1988 revised land classification. Gradings align with expectations based on soil type.

Crosby / Thornton			
S066	Urban/2	Non-agricultural	Brownfield site previously used as railway sidings. Small size away from any other agricultural land means this area, economically could not be re-used for agricultural purposes.
S092	Urban/2	Agricultural	Detailed pre 1988 survey exists. Gradings align with expectations based on soil type.
S093	Urban/2	Non agricultural	Garden centre/nursery with many glass houses, polytunnels and car park. Difficult to return to agriculture should current use cease
Maghull and Lydiate			
S111	1	Agricultural	Detailed survey exists, using 1988 revised land classification. Gradings align with expectations based on soil type.
S112	1	Agricultural	Detailed pre 1988 survey exists. Gradings align with expectations based on soil type.
S122	1	Agricultural	Detailed survey exists, using 1988 revised land classification. Gradings align with expectations based on soil type.
S123	1	Agricultural + urban	Detailed 1988 revised land classification survey exists for southern part of site. Gradings align with expectations based on soil type.
Waddicar			
S144	2	Agricultural	Detailed survey exists, using 1988 revised land classification. Gradings align with expectations based on soil type.
S145	1	Agricultural	Detailed survey exists, using 1988 revised land classification. Gradings align with expectations based on soil type.

Methodology for determining the reconnaissance Agricultural Land Classification of sites

- 5.43 Following the screening process, we undertook a Reconnaissance Agricultural Land Classification survey of the 23 remaining sites (see results at 5.64 onwards). A **reconnaissance survey**⁶ is an industry recognised method for undertaking a non detailed survey. It provides information on the general grade of an area but does not delimit small areas of different grades. For this survey, rather than borings being taken at set distances, auger boring locations were determined by topographic changes or visible changes in soil type, an average density of 1boring/1.76ha was achieved. The frequency of auger borings and pit observations is at a level well above the normal reconnaissance survey of 1boring/4ha. This level of survey was considered necessary due to the anticipated 'best and most versatile' nature of the land. Reconnaissance surveys do not replace the need for detailed surveys on individual sites because the grading of a soil can vary over a very short distance. However, these surveys give a good indication of the general land quality in an area and are considered appropriate for this Study as they provide a sufficient level of data to inform the Local Plan about where areas containing the best and most versatile agricultural land are likely to be located.
- 5.44 Fieldwork was carried out over 10 days in July 2012. 23 areas (see Table 14) were assessed and the soils investigated with a hand held 5cm "Dutch" auger to a depth of approximately 100cm. A total of 313.44 hectares was graded based on 146 auger borings and 14 hand-dug soil pits which were used to assess soil structure. In areas where land quality varies significantly over short distances an average grade has been allocated to the land. Table 14 summaries the work undertaken on each site and Appendix 7 provides a location plan of auger borings and pits.
- 5.45 Twenty soil samples were collected across Sefton from each of the main soil types and submitted to NRM Laboratories⁷⁶ for particle size distribution analysis and organic

matter content, to obtain an accurate soil texture; the results are reproduced at Appendix 8.

- 5.46 A wetness class was assigned based on soil colours, **soil mottling**⁶ and the depth to a slowly permeable layer; the depth to a watertable at the time of survey was also considered.
- 5.47 The drought limitation was determined for sandy profiles and all soil pits by calculating the amount of water held in the soil and comparing it with the potential soil moisture deficit for the area.
- 5.48 An Agricultural Land Classification grade was assigned to the sites based on this reconnaissance survey (see results in Table 16).

Table 14: Summary of Data Collected on the 23 Potential Development Sites Studied

Site	Greenbelt parcel number	Soil type from soil map	Land use	No. of auger borings	No of pits	No of lab samples	Comments
Southport	S004 north	Wisbech	Beans/grass	4	1	1	Pit and sample to investigate Wisbech soils.
	S004 south	Blackwood	Potatoes/grass	3	0	0	
	S026	Blackwood	Grass/cattle	9	1	1	Pit and sample to investigate Blackwood soils.
	S030	Blackwood	Grass/horses	3	1	1	Pit and sample to investigate Blackwood soils.
	S031 part	Blackwood	Grass, part brownfield land	3	0	0	Demolished houses covered with thin layer of soil. Field behind is undisturbed.
Formby	S038	Blackwood	Grass/horses	3	0	0	Very wet site.
Hightown	S056	Blackwood	Horses/oats	8	1	1	Sample required to check topsoil texture.
	S058	Blackwood	Oats	8	1	1	Pit and sample required because soils not typical Blackwood, peaty layer below topsoil.
	S068 part	Blackwood	Grass	6	0	1	Sample to confirm topsoil texture
Thornton	S077	Sollom	Wheat	5	1	2	Pit and sample to investigate Sollom soils
	S078	Sollom	Grass/horses	2	0	0	Similar to parcel S077 auger boring to confirm soil type and grade
	S086	Rufford	Oilseed rape	8	0	0	Access limited by oilseed rape crop, but data supports a previous ADAS survey
	S089	Rufford	Grass	3	0	0	Soil not a typical Rufford, auger borings suggest Blackwood and Sollom soils
	S095	Rufford	Beans	5	1	2	Pit and sample to investigate Rufford soils
Maghull	S110 part	Sollom	Wheat/potatoes	4	0	0	Auger borings to confirm soil type and grade
	S125	Sollom	Horticulture/grass	17	1	1	Pit and sample to investigate Sollom soils
	S129	Sollom	Mixed vegetables and beans	23	4	8	Pits and samples to investigate existing conflicting surveys.
	S131	Sollom	Beans	4	1	0	Pit to confirm soil type
	S132	Sollom	Oilseed rape/wheat	8	0	0	Oilseed rape limited access at northern end of site
Waddicar	S152 part	Flint	Grass/ tip	5	1	1	Pit and sample to investigate Flint soils
Aintree	S154 part	Flint	Wheat	4	0	0	Auger borings to confirm soil type and grade
	S155	Flint	Scrub	1	0	0	Auger borings to confirm soil type and grade
Waddicar	S157	Flint	Scrub	3	0	0	Auger borings to confirm soil type and grade
	S158 part	Sollom	Wheat	7	0	0	Auger borings to confirm soil type and grade

Table 15: Agricultural sites for resurvey - anticipated grades based on soil type compared with results of reconnaissance survey

Site	Greenbelt parcel number	Provisional Agricultural Land Classification	Existing Known information	Soil type	Anticipated grade from Soil type	Reason for resurvey	Predominant reconnaissance grade
Southport	S004 north S004 south	2	Agricultural	Wisbech Blackwood	2 to 4 1 – 3b*	Texture/drainage	3a 2-3a
	S026	4	Agricultural	Blackwood	1 to 3b*	Watertable /texture	3b
	S030	4	Agricultural	Blackwood	1 to 3b*	Watertable /texture	3b
	S031 part	4	Part demolished housing	Blackwood	1 to 3b*	Disturbed soils, watertable /texture	4
Formby	S038	4	Agricultural	Blackwood	1 to 3b*	Watertable /texture	4
Hightown	S056	4	Agricultural	Blackwood	1 to 3b*	Watertable /texture	3a in northern half, 3b in south.
	S058	4	Agricultural	Blackwood	1 to 3b*	Watertable /texture	2-3a
	S068 part	4	Agricultural	Blackwood	1 to 3b*	Watertable /texture	3b-4
Thornton	S077	2	Agricultural	Sollom	1 to 2	Potential for Grade1	2
	S078	2	Agricultural	Sollom	1 to 2	Potential for Grade1	2
	S086	1	Agriculture/Part new road route	Rufford	3a to 3b	Over graded? Clay subsoil	2-3a
	S089	1	Agricultural/ Part new road	Rufford	3a to 3b	Over graded? Clay subsoil	2
	S095	2	Agricultural/ Part new road	Rufford	3a to 3b	Over graded? Clay subsoil	2-3a
	Maghull	S110 part	1	Agricultural. Grade 2 in RMA Environmental. 2011 survey	Sollom	1 to 2	Over graded? Loss of organic topsoil?
S125		1	Agricultural	Sollom	1 to 2	Over graded? Loss of organic soil?	Predominantly 2, with 3b in north.
S129		1	Agricultural. Grades 2/3 in MAFF 1998 survey, whilst Palmer 2012 survey shows Grades 2-3b	Sollom	1 to 2	Conflicting surveys and significant areas of Subgrade 3b not anticipated from soil type.	2 -3a
S131		1	Agricultural	Sollom	1 to 2	Loss of organic topsoil?	2
S132		1	Agricultural	Sollom	1 to 2	Loss of organic topsoil?	2-3a
Waddicar	S152 part	1	Agricultural	Flint	3a to 3b	Over graded? Clay subsoil	3b
Aintree	S154 part	1	Unused	Flint	3a to 3b	Over graded? Clay subsoil	Predominantly 2 with 3b in eastern third
	S155	1	Unused	Flint	3a to 3b	Over graded? Clay subsoil Disturbed, flood embankment	3a on level may be -4 on embankment
Waddicar	S157	1	Unused	Flint	3a to 3b	Over graded? Clay subsoil	Mainly 2-3a, 4 in low lying central area
	S158 part	2	Agricultural	Sollom	1 to 2	Potential for Grade1	3a

* Assumes water table is controlled

Anticipated changes to grading arising from survey work

- 5.49 As a result of this survey, some of the sites appear to have different Agricultural Land Classification grades than suggested by the Provisional maps. The reasons for this include:
- Organic layers found in the Sollom topsoil may have broken down over the last 40/50 years.
 - Changes to the pump drainage scheme may have altered the depth to the watertable, making the soils easier to work in winter and therefore eligible for a higher grade if the watertable has been lowered, or a lower grade if the pump drainage scheme is no longer as effective.
- 5.50 The Blackwood soils which are found between Hightown and Southport can be very productive soils if they have a good agricultural drainage system, but are poorly drained in their natural state. Consequently Blackwood soils were studied to determine their drainage and land quality.
- 5.51 Flint and Rufford soils also appear to be over-graded on the Provisional maps because they typically have a **clayey subsoil**^G which makes them difficult to work in winter. Their Provisional grading as Grades 1 and 2 suggest that the soils are either not typical of their type or that they were originally classified by land use rather than soil type. These soils were studied so that their present grading could be ascertained.

Results of the 2012 Land Quality Assessment

Accuracy of the Provisional Agricultural Land Classification maps

- 5.52 The Provisional Agricultural Land Classification maps show that the agricultural land in Sefton has an unusually large proportion of Grades 1 and 2, when compared to the rest of the country.
- 5.53 Work for this study suggests that the Provisional Land Classification Maps may no longer reflect the current land quality of soils in parts of Sefton.

Results of the Reconnaissance Agricultural Land Classification survey

- 5.54 Land use is very varied on the Green Belt parcels surveyed, ranging from permanent pastures supporting cattle or horses e.g. Green Belt parcel S026 and S038, to cereals and vegetables, particularly potatoes and brassicas. Smaller areas of horticultural crops are grown particularly on the Maghull Small holdings Estate Green Belt parcel S125, to the north of Maghull. Large areas of unused land occur south of the motorway at Aintree S155 and S157. A summary of the information is given in Table 16.
- 5.55 The fieldwork work suggests that Sollom soils in the areas surveyed have lost their organic topsoil and are now graded as Grade 2 and Subgrade 3a. Close to the urban edge the Blackwood soils are limited by a high watertable to Subgrade 3b and 4 whilst the more clayey Rufford soils are limited by wetness to Grade 2 and Subgrade 3a. Flint soils are mapped as Subgrade 3a and 3b because they have a wetness limitation. This survey suggests that some of the land, originally mapped as Grade 1 (in line with other areas of organic soils in the country), are now Grades 2 and Subgrade 3a. They are still classed as the 'best and most versatile' agricultural land which should not be developed when poorer quality land is available (see paragraph 2.44).

Table 16: Results of Reconnaissance Agricultural Land Classification

Site	Greenbelt parcel number	Provisional Agricultural Land Classification	Predominant Reconnaissance grade
Southport to Ainsdale	S004 north	2	3a
	S004 south		2-3a
	S026	4	3b
	S030	4	3b
Formby	S031 part	4	4
	S038	4	4
	S056	4	3a-3b
	S058	4	2-3a
Hightown	S068 part	4	3b-4
	S077	2	2
	S078	2	2
	S086	1	2-3a
	S089	1	2
Thornton	S095	2	2-3a
	S110 part	1	1-2
	S125	1	2 and 3b
	S129	1	2 -3a
	S131	1	2
Maghull	S132	1	2-3a
	S152 part	1	3b
	S154 part	1	2 and 3b
	S155	1	potential for 3a and 4
	S157	1	2-3a +4
Aintree to Waddicar	S158 part	2	3a

- 5.56 The fieldwork undertaken on the 23 sites around Sefton has provided an insight into land quality on the different soil types in Sefton (see Table 17). It has not been possible to assign a grade to the whole range of soil types in Sefton because not all occurred within the areas surveyed.
- 5.57 While Table 16 shows that many soils are lower graded than the Provisional maps, as anticipated, some areas were found to have a higher land quality, particularly the Blackwood soils found south of Ainsdale and around Formby.

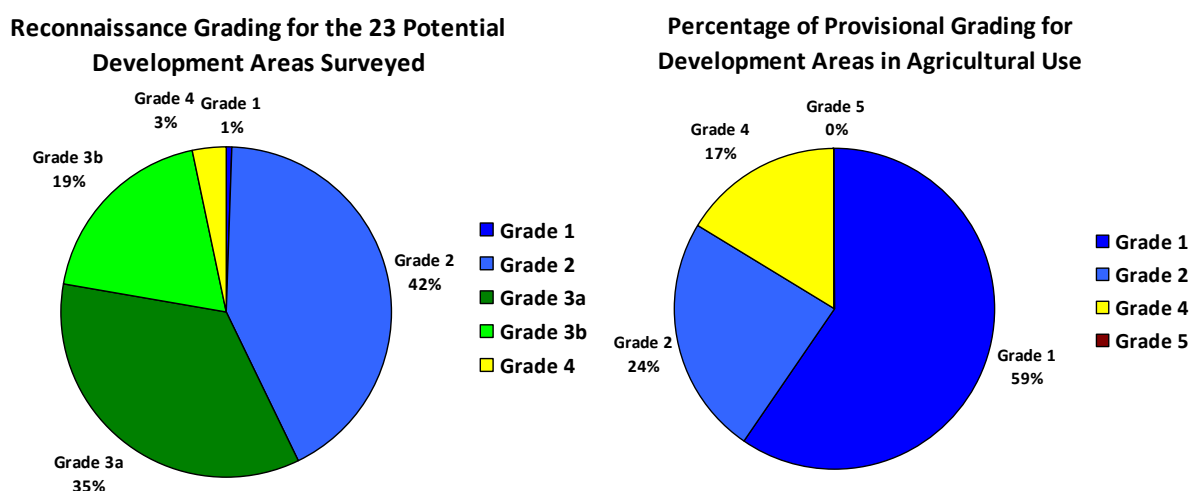
Table 17: Summary of reconnaissance land quality by Soil Association⁶

Soil in Sefton	Provisional Agricultural Land Classification grade	Reconnaissance Agricultural Land Classification grade (2012)	Comments
812b WISBECH	2	2 - 3b	Land quality determined by subsoil texture and structure which affects the drainage
821b BLACKWOOD	2- 5	2 -4	Land quality determined by topsoil texture and depth to watertable.
641a SOLLOM	1 - 2	1-3a mostly 2 and 3a	Very variable and detailed surveys are likely to locate a range of grades, determined by topsoil texture, drainage and

			droughtiness.
711o RUFFORD	1 -2	2 -3a	Land quality determined by depth to clay.
572I FLINT	1 -2	3a -3b	Land quality determined by topsoil texture and depth to clay.

5.58 Figure 12 shows that land quality on the sites surveyed is generally high and falls into the 'best and most versatile' category i.e. Grade 1 – Subgrade 3a. Several sites supporting scrub were considered as part of the study because they had the potential to be returned to agriculture. These have been classed as non-agricultural and do not appear in the figure below.

Figure 12: Comparison of the Provisional and Reconnaissance Grading of the 23 Potential Development Areas - agricultural areas only.



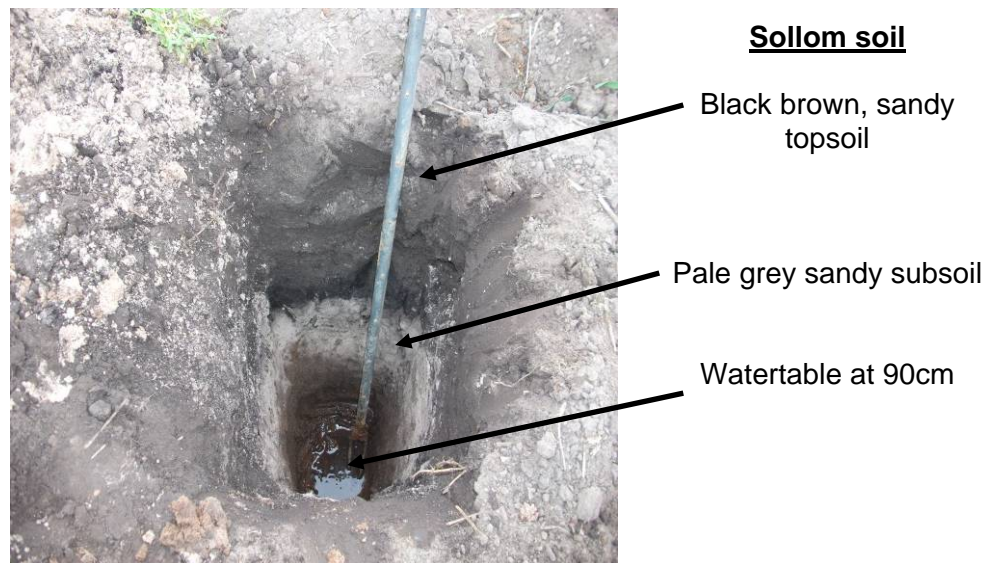
Grade 1

5.59 Of the areas surveyed, only 1.37 hectares (0.4%) was found to comprise Grade 1 agricultural land whereas from the Provisional maps, this percentage would be expected to 59%. Grade 1 is found west of Maghull in Green Belt parcel S110 above the floodplain⁷⁷. It contains deep, well-drained sandy soils where the watertable is controlled by drainage. There are no slowly permeable layers and the soils are not droughty (See maps at Appendix 9).

5.60 This is excellent quality agricultural land capable of supporting a wide range of agricultural and horticultural crops.

Grade 2

5.61 A Grade 2 classification covers 109.06 hectares and 42.4% of the agricultural land surveyed and includes deep, well-drained sandy soils which hold small reserves of water, but groundwater reduces the risk of drought and the soils are not droughty for most crops⁷⁸ including wheat and potatoes.



- 5.62 This grade includes Blackwood soils east of Southport (Green Belt parcel S004) and east of Hightown (Green Belt parcel S058) and Sollom soils north of Thornton and around Maghull (Green Belt parcels S110, S125, S129, S131 and S132)
- 5.63 In areas where topsoil is loamy sand the soils cannot be graded higher than Grade 2. An example occurs in Green Belt parcel S058 which is located to the east of Hightown.
- 5.64 In some areas clay was encountered at depths of 68 - 80cm causing a wetness limitation which limits the soils to Grade 2.
- 5.65 Grade 2 soils with a wetness limitation occur at Thornton on Green Belt parcels S077 and S078, and around Maghull e.g. Green Belt parcel S125 where Sollom soils have layers of clay higher in the profile than is typical for this soil type.

Subgrade 3a

- 5.66 The survey found Subgrade 3a land on 89.49 hectares (34.8%) of the agricultural area surveyed. Typically light and medium textured soils overlie clayey soils at depths below 52cm, making the soils too wet for a higher grade.
- 5.67 This Subgrade includes the Wisbech soils east of Southport (Green Belt parcel S004 north), Blackwood and Downholland soils east of Hightown (Green Belt parcels S056 and 058), Rufford soils north of Thornton (Green Belt parcels S086 and 095) and Sollom soils east of Maghull (Green Belt parcels S129 and 132) and west of Kirkby (Green Belt parcel S158).
- 5.68 This is good quality land capable of supporting a range of agriculture and the less demanding horticultural crops. Isolated areas of Grades 1, 2 and Grade 3b agricultural land are found within the areas of Subgrade 3a agricultural land



Rufford soils

deep sandy loam topsoil

sand

clay loam at depths below 52cm

Subgrade 3b

- 5.69 Subgrade 3b agricultural land accounts for 49.09 hectares (19.1%) of the agricultural area surveyed and coincides with the heavier textured soils and also with sandy soils which have a high watertable.
- 5.70 Typically, medium textured soils overlie a clay layer, which makes them wet in winter. These soils occur to the west of Waddicar (Green Belt parcel S152) and north of Maghull on the northern part of Green Belt parcel S125.
- 5.71 Some Blackwood soils, which have a high watertable, have been graded as Subgrade 3b because they are difficult to cultivate. Typically these soils are also too sandy for a higher grade. Examples occur south of Ainsdale within Green Belt parcels S026 and S030.
- 5.72 Isolated areas of higher and lower quality land may occur within the areas mapped as Subgrade 3b. Subgrade 3b land is moderate quality land capable of supporting moderate yields of a narrow range of crops e.g. cereals and grass.



Grade 4

- 5.73 This Grade accounts for 8.31 hectares and 3.2% of the agricultural area surveyed; it is found to the north of Formby (Green Belt parcel S038) and east of Hightown on part of Green Belt parcel S068. It includes land where water lies close to the soil surface or where the ground has a very irregular surface from previous human activity, making it difficult to cultivate. Low lying peaty soils were located on Green Belt parcel S068.

Grade 5

- 5.74 No land of this quality was located on the sites surveyed.

Non Agricultural and Urban

- 5.75 These classifications include 51.28 hectares of the area surveyed. They include playing fields, unused land, woods and large gardens and isolated buildings.
- 5.76 Although classified as non-agricultural as part of this study, Green Belt parcels S155 and S157 (both north of Aintree) were inspected because they are not being used and support rough grass and scrub. They could therefore potentially be re-used for agricultural.
- 5.77 The central area of plot S157 is waterlogged to the surface and throughout the profile, making it suitable only for extensive rough grazing; it would be classified as Grade 4 or 5 if the land was brought back into production. We have no detailed knowledge of why the land is in this condition but it was reported by a previous tenant that the site had been waterlogged since motorway construction severed the land drains. The higher ground either side of the central depression appears to have the potential to be best and most versatile land - Grade 2 and 3a - if brought back into production.
- 5.78 Green Belt plot S155 is also unused, it supports rough grass and scrub in the field in the south of the plot and a raised flood embankment which is covered in brambles on the eastern boundary. This land could be brought back into agricultural production but it is a small area detached from other agricultural land.

Farm Buildings

- 5.79 This classification covers 4.84 hectares and 1.45% of the area surveyed. It includes farm buildings and hardstanding.

Summary

- 5.80 The Provisional Land Classification maps show Sefton to have a large proportion of the best and most versatile agricultural land, inland of the sand dunes which occur on the coast. Survey work undertaken for this study shows that the majority of land in Sefton is still best and most versatile agricultural land, more than 40 years after the original provisional survey was undertaken. This best and most versatile land is capable of supporting a wide range of crops which can be harvested in winter.

- 5.81 Groundwater in Sefton is sufficiently well controlled to allow the land to be used for the production of high value vegetable crops but regular cultivation has led to a reduction in organic matter levels, to the extent that the Sollom soils such as those found around Maghull are no longer classed as organic and this has affected their land quality by reducing the amount of water they can hold. They are however still considered to be best and most versatile agricultural land.
- 5.82 The Agricultural Land Classification of the 23 resurveyed sites is now mainly Grade 2 and Subgrade 3a, downgraded from the original Provisional Land Classification of Grades 1 and 2 (see Maps in Appendix 10).
- 5.83 Table 16 lists the provisional and current understanding of land quality on the 23 sites surveyed. It illustrates that although the gradings are different to those of the Provisional Classification, most areas potentially identified as being suitable for development in the Draft Green Belt study if required by the **Local Plan**^G are still 'best and most versatile' agricultural land, capable of supporting a wide range of crops.
- 5.84 Areas of Blackwood soils around Formby, mapped as Grade 4 on the Provisional maps, have been upgraded to Subgrade 3b where the watertable appears to be maintained at a depth which allows cultivation of the soils.
- 5.85 The effect of organic loss on land quality on the deep peats south east of Southport and north of Crosby is not certain, due to the few examples encountered during fieldwork. They are likely still to be Grade 1 if the peat is more than 80/100cm deep and the groundwater is controlled to keep it more than 0.7m below ground level.
- 5.86 The Rufford soils around Thornton (e.g. parcels S086 and S095) and Wisbech soils east of (Southport parcel S004) are considered to be mainly Grade 2 and Subgrade 3a due to impeded drainage.
- 5.87 Of the soils occurring on the resurveyed sites only the Flint soils appear to be down graded out of the 'best and most versatile' category on a regular basis, but some are still mapped as Grade 2 and 3a.

6 THE IMPACT OF DEVELOPMENT

- 6.1 The potential impacts of the development on Sefton's Green Belt are examined in this chapter. We consider the socio-economic and employment impacts as well as that on food production and other ecosystem services. The assessment of impacts is based on the results of the land reclassification work from this study (chapter 5) and the wider evidence on soils, agriculture and the agricultural economy from chapters 2-4.
- 6.2 The impact is examined for the two Options for development which included land in the Green Belt. These were consulted on by Sefton Council in 2011 as part of its Core Strategy preparation [now called the Sefton Local Plan]⁷⁹. The land requirement for each has been assumed as follows
- **Option 2** would require land for a new business park (approx. 25 hectares) and for about 4,000 new homes from the Green Belt during the plan period. Assuming 30 homes per hectare (plus 25 hectares for employment), the land needed for the development is approximately 175 hectares. This equates to 2.6% of Sefton's Green Belt. If higher housing densities can be achieved, less land would be required.
 - **Option 3** would require land for a new business park (approx. 25 hectares) and for about 6,600 new homes from the Green Belt during the plan period. Assuming 30 homes per hectare (plus 25 hectares for employment), the land needed for the development is approximately 275 hectares. This equates to 4.2% of Sefton's Green Belt.
- 6.3 The 23 areas surveyed as part of this Study covered an area of approximately 313 hectares. Another 20 areas covering approximately 280 hectares, have been verified by ADAS and did not require a further survey because more detailed information is available than is provided by the Provisional Agricultural Land Classification maps^G (see paragraph 5.13).
- 6.4 The principles applied in making the assessment of the potential impacts are as follows:
- (i) The scale of impact on food production and **Gross Added Value (GVA)**^G / employment is based on the area of agricultural land required for development under Options 2 or 3 (see paragraphs 3.39 onwards).
 - (ii) The proportion of land used for agriculture is based on the 23 Green Belt parcels surveyed in this study (Table 16, page 54,) which indicate that 82% of the area is in agricultural use with the remainder occupied by farm buildings or in non-agricultural use. This is consistent with the proportion of land in agricultural use identified in the Green Belt Study⁸⁰ and has been used as a basis for estimating the impact of agricultural land lost to development under each Option.
 - (iii) It is assumed that the distribution of cropping and stocking on the agricultural land is proportionate to current (2010) agricultural land use across the Green Belt in Sefton (Table 3, page 18). On this basis the area of key agricultural crops lost including grassland, can be estimated.

- (iv) The scale of agricultural land lost is presented in the context of the agriculture land area in the North West and at England level, because yield and stock data is only available at a regional level.
- (v) The analysis of agricultural land area lost to development can be interpreted directly as a loss of food production but this assumes that yields and stocking rates are the same as regional and national averages. Consideration is also given to the effects of different grades of land on crop and livestock productivity, because there is a higher proportion of best and most versatile agricultural land in Sefton compared to the North West and England, and the potential impact on food production.
- (vi) The assessment GVA and employment impacts uses published economic data on financial returns and employment by farm type (Table 8, page 24), based on the balance between arable and grassland, assuming the latter supports livestock systems.
- (vii) The assessment of other ecosystem services is based on the overview of soil function in Chapter 4.

Direct impact on food production

- 6.5 Option 2 requires the development of approximately 175 hectares of land, of which approximately 144 hectares (82%) is assumed will be agricultural land. The consequent loss of crop production is presented in Table 18, assuming the land was cropped according to the 2010 pattern of agricultural land use in Sefton.

Table 18: Loss of crop production (areas) from development (Option 2)

	2010 agricultural area in Sefton (ha)	Distribution of land use by key crops (%)	Area of crops lost under Option 2 (ha)	Area of crops lost as % of crop areas in NW	Area of crops lost as % of crop areas in England
Cereals	1,440	39%	56	0.08%	0.002%
Potatoes	201	5%	7	0.10%	0.010%
Horticulture	172	5%	7	0.13%	0.010%
Grassland	1,151	31%	45	0.01%	0.001%
Other	694	20%	29	-	-
Total	3,658	100%	144	0.02%	0.003%

- 6.6 Results suggest that the sector most affected in Sefton in terms of absolute area would be cereals at 56 ha, representing 0.08% and 0.002% of NW and England cereal area respectively. Land growing potatoes or horticultural crops is small in absolute terms at 7ha, but is more significant than cereals in terms of the proportion of NW and England production (0.1% and 0.01% respectively). If it is assumed that yields and stocking rates of livestock are the same as regional and national averages, land area impacts can be equated to food production impacts.
- 6.7 While the loss of agricultural land due to development under Option 2 would be 144 hectares or 2.1% of Sefton's Green Belt (i.e. 82% of the 2.6% of Sefton's Green Belt that would be developed under this Option), this would represent only 0.02% of agricultural land in the NW and 0.003% in England. Cereals and grassland occupy a greater area, but potatoes and horticulture are more

significant in terms of the proportion of regional and national production that would be lost.

- 6.8 Option 3 requires approximately 226 hectares of agricultural land (i.e. 82% of 275 hectares); the loss of crop production is presented in Table 19, again assuming the current agricultural production pattern in Sefton. Under this Option, some 88 ha of cereals would be lost along with 12 ha of both potatoes and horticulture, 70 ha of grassland and 45 ha of other crops.

Table 19: Loss of crop production (areas) from development (Option 3)

	2010 agricultural area in Sefton (ha)	Distribution of land use by key crops (%)	Area of crops lost under Option 3 (ha)	Area of crops lost as % of crop areas in NW	Area of crops lost as % of crop areas in England
Cereals	1,440	39%	88	0.12%	0.004%
Potatoes	201	5%	12	0.14%	0.010%
Horticulture	172	5%	12	0.21%	0.010%
Grassland	1,151	31%	70	0.01%	0.002%
Other	694	20%	45	-	-
Total	3,658	100%	226	0.03%	0.006%

- 6.9 Results suggest that while the loss of agricultural land due to development under Option 3 would be 3.4% of Sefton's Green Belt, this would represent only 0.03% of agricultural land in the NW and 0.006% in England. Again, cereals and grassland occupy a greater area, but potatoes and horticulture are more significant in terms of the proportion of regional and national production that would be lost.
- 6.10 However, the above analyses do not consider the impact of differential yield between different grades of land. There is a higher percentage of best and most versatile agricultural land in Sefton compared to the North West and England which is likely to produce higher than average yields (see Table 11, page 40).
- 6.11 ADAS has estimated typical yields for the main crops in Sefton by different Agricultural Land Classification grade, based on the common arable crops in Table 20. Regional and national averages are also presented for context. It should be noted that yield information for different Agricultural Land Classification grades is only indicative because land quality is determined by soil flexibility (in terms of its ability to support a range of crops but not the fertility of land) as much as its yield potential.
- 6.12 Table 20 shows that yields for all crops on Grades 1 and 2 agricultural land in Sefton are expected to be generally higher than the regional and national yields. For Grade 3a land yield is higher for all crops apart from wheat because the sandy soils in Sefton are not ideal for wheat production. Yields for Grade 3b land is broadly in line with published average yields for the North West for oilseed rape and higher for wheat and barley.

Table 20: Typical yields for key crops in Sefton by agricultural land classification grading (tonnes per hectare)⁸¹

Agricultural Land Classification	Winter Wheat	Winter Barley	Winter Oilseed Rape	Potatoes
Grade 1	9.3	7.4	4.9	74
Grade 2	8.6	7.4	4.3	62
Grade 3a	7.4	6.2	3.7	49
Grade 3b	6.8	6.2	3.1	49
Grade 4	6.2	5.6	2.5	37
Grade 5	5.6	4.9	2.5	30
<i>England average*</i>	7.8	5.8	3.3	42
<i>NW Average*</i>	5.7	4.8	3.5	<i>Not available</i>

* Figures for wheat, barley and oilseed rape yields are five-year averages (2006-2010); for potatoes, yield data is the five-year average (2005-2009).

- 6.13 Of the farmed land on the Green Belt parcels surveyed for this study (Table 15 page 50), and from pre-existing detailed surveys the main grades of land affected are Grade 1 (8%), Grade 2 (26%), Grade 3a (32%) and Grade 3b including Grade 3c from old surveys (31%); i.e. 66% is best and most versatile land. All other factors being equal, non-agricultural land and land classified as Grade 3b and 4 agricultural land should be considered for development first (in the Local Plan) before looking at the best and most versatile agricultural land.
- 6.14 The scale of difference in yield between best and most versatile land and Grade 3b and 4 agricultural land is in the order of 20-50% across the crops listed. Allowing for this yield premium in Sefton would increase estimates of food production lost. For example, if it was assumed that wheat yields in Sefton were 25% higher than the national yield, the proportion of wheat production lost to development could be in the order of 0.005%.
- 6.15 Potatoes and vegetables may be impacted less by yield variation across the country, as these crops are generally only grown on suitable land, often best and most versatile land. Also, as production of these specialist crops is driven by demand, it is likely that any shortfall would be grown on land elsewhere in the UK, displacing cereals or other crops.
- 6.16 It is important to note that yield is affected by many other factors such as management skill, different levels of agricultural input in crop production (e.g. fertiliser, chemicals etc.), short-term weather factors as well as soil quality, and it is not possible to identify precisely what impact each of these factors will have on yield.
- 6.17 In summary, the scale of agricultural area lost under Option 2 or 3 would be in the order of 2.1 - 3.4% of Sefton's Green Belt, respectively, allowing for non-agricultural use. Assuming average national yields, this equates to a loss of food production of 0.02% at NW level and 0.003% at England level under Option 2 and 0.03% at NW level and 0.006% at England level under Option 3. Allowing for higher yields on Sefton's best and most versatile land would increase these estimates by a factor of 20-50%. This would result in a loss of food production in

the North West of up to 0.03% and 0.005% under Option 2, and of 0.05% and 0.009% under Option 3.

Gross Value Added and employment impacts

- 6.18 The potato and vegetable sector (General Cropping farms) is productive and significant as discussed in Chapter 3 (paragraphs 3.23 - 3.29). It is also associated with relatively high **Gross Value Added (GVA)**⁶ and employment per hectare as well as off-farm activity associated with packing and processing in the local area, including West Lancashire. This sector requires good quality, workable soils and as such is largely located on the best and most versatile soils; in contrast, cereals farms and grazing livestock can utilise most soils.
- 6.19 To estimate the economic and social impacts of land lost to development, we have used published economic and agricultural employment data from the Farm Business Survey (FBS)⁸² for key farm types in the North West. In Sefton, the most common farm types are arable and grazing livestock (see Chapter 3) but in order to capture the impact from horticulture and potatoes, we have used data for *General Cropping* farms which include these crops as well as cereals and oilseeds.
- 6.20 For each of these farm types, we have used per hectare data on GVA and employment from FBS and scaled these up using the area of land used for crops and grassland (livestock production) in Sefton under the two development options. Thus a development of 175 or 275 hectares under Option 2 or 3 would result in the loss of 144 and 226 ha of agricultural land respectively (82% of the area that would be developed in the Green Belt). Within this, approximately 70% of the land is assumed to be farmed as *General Cropping* (99 ha and 156 ha for Options 2 and 3 respectively) and 30% as *Lowland Grazing Livestock* units (45 ha and 70 ha for Options 2 and 3 respectively).
- 6.21 The results are shown in Table 22. **Gross margin**⁶ (sales less direct consumables) is used as a proxy for GVA and employment data is presented as full time equivalent (FTE) jobs. In practice the impact on employment would be felt by all businesses affected by development to a marginal extent; the estimates represent the aggregate effect across all of Sefton.

Table 20: GVA and employment per ha by farm type in the North West

Farm Type	Associated GVA* £ per ha 2009	Associated Employment per ha*, 2010	Impact on GVA		Impact on employment (FTE)	
			Option2 (144ha)	Option3 (226ha)	Option2 (144ha)	Option3 (226ha)
General cropping	£829/ha	0.02 jobs/ha	£82k (99 ha)	£129k (156ha)	2.0 jobs	3.0 jobs
Lowland grazing livestock	£550/ha	0.01 jobs/ha	£25k (45 ha)	£39k (70ha)	0.5 jobs	0.7 jobs
All farms**	-	-	£107k	£168k	2.5 FTE	3.7 FTE

* Using Gross Margin as a proxy

**Assumes no specialist horticulture units.

Source: Farm Business Survey (FBS) 2009/10 for the North West Region

6.22 From Table 21 the direct impacts of Options 2 or 3 on the two key farm types in Sefton are as follows:

- Option 2: A loss of production on 99 ha on *General Cropping* farms and 45 ha on *Lowland Grazing Livestock* farms. This translates to a loss in gross margin (decrease in GVA) of £82,000 and £25,000 respectively, a total of £107,000. In terms of employment, there would be an estimated loss of 2.0 jobs in aggregate from *General Cropping* farms and 0.5 jobs from *Lowland Grazing Livestock* farms, a total of 2.5 jobs across the whole of Sefton. However this must be offset against a compensatory short term increase in GVA in the construction sector and in the longer term where land is developed for employment purposes.
- Option 3: A loss of production on 156 ha on *General Cropping* farms and 70 ha on *Lowland Grazing Livestock* farms. This translates to a loss in gross margin of £129,000 and £39,000 respectively, a total of £168,000. In terms of employment, there would be an estimated loss of 3.0 jobs in aggregate from *General Cropping* farms and 0.7 jobs from *Lowland Grazing Livestock* farms, a total of 3.7 jobs across the whole of Sefton. As above, this must be offset against a compensatory short term increase in GVA in the construction sector and in the longer term where land is developed for employment purposes.

6.23 Farm subsidies and agri-environment payments are linked to land area and any loss of land would impact on this income stream as well as sales of produce. Issues of farm business viability might also depend on the availability of additional land; this is very farm specific and may relate to whether the farm is tenanted, has existing debts etc.

6.24 Where farms have diversified, the impact on GVA and employment depends largely on how critical the land (lost) is to the diversified enterprise and whether development would compromise its viability. This is impossible to gauge in the absence of the particular details of individual sites and businesses. In principle diversified enterprises can generate substantially more GVA and employment than agricultural production alone but many diversified businesses are very small in scale and help support farm family employment rather than generating employment for others.

Other ecosystem service impacts

6.25 Understanding the impacts of development on **ecosystem services**⁶ is a rapidly changing set of knowledge and experience. While there are opportunities to manage or regulate impacts, these opportunities must form part of a wider provision of infrastructure as well as individual parcels of land that provides the same level of, or better, functions. Examples include regulating water flows and providing space and management for biodiversity. The effect of development on each service is considered below.

Nutrient Cycling

6.26 The loss of land to development should not have a significant effect on **nutrient cycling**⁶ (see paragraphs 4.15 – 4.16). As land is taken out of production fertiliser inputs from agriculture will stop. The area that is developed will mostly be covered by roads and buildings which seal the surface of the soil, and reduce biological activity which is important for cycling nutrients. The extent of reduction

of nutrient cycling will also depend on soil type, with the sandy soils least able to retain mobile nutrients. Any effects, either positive or negative, are likely to be small given that a maximum of 4.2% of land in the Green Belt (3.4% of agricultural land) will be lost if Option 3 is selected; less if Option 2 is chosen.

Water Regulation

- 6.27 There is a potential adverse impact on water regulation (see paragraphs 4.17 – 4.19) through developing land that was previously in agricultural use. Surface water run off rates would be both larger and quicker from developed land than from land still in agricultural use and this could be expected to lead to an increase in flooding elsewhere. However developments must be designed to prevent increased surface water run-off, and may be able to address known drainage issues in the vicinity, by the incorporation of sustainable drainage systems.

Carbon Storage

- 6.28 Soils are a source of carbon emissions and also a store for carbon depending on the way they are managed (see paragraphs 4.20 – 4.21).
- 6.29 The removal of existing trees and crops to enable development will release carbon but once land is developed the remaining carbon in the soil will decompose more slowly. The soil will no longer be able to store more carbon in areas of hard development.
- 6.30 Overall, it is considered that development will have a negative effect on storing carbon but the effect will be partially off set by designing in green areas such as gardens and public open space.

Nature Conservation and Biodiversity

- 6.31 If the land to be developed is in intensive agricultural production it is likely that its inherent nature conservation value will be low. However, the impact of the loss of features such as field margins and linear boundaries (hedges and hedgerow trees) would have an adverse impact on a number of different plants and on animal and bird species which rely on field edges for suitable habitat. Species which rely on open arable areas would also be adversely affected by the loss of such land.
- 6.32 The Council's approach to possible development on Green Belt sites, as set out in the draft Green Belt Study⁸³, is that on sites of over 2 hectares only 75% of the site would be available for development and the rest would be available for supporting uses including open space, sustainable drainage and buffer planting if appropriate. For sites under 2 hectares a greater proportion would be developed.
- 6.33 There could be disturbance to protected or sensitive species that do not like human disturbance e.g. Pink-footed Geese, Barn Owls, Corn Buntings etc leading to displacement or a further reduction in their numbers as their habitat declines. The Council has indicated that when it selects sites for development through the preparation of its Local Plan, it will, where possible, choose sites that have the least environmental impact.
- 6.34 Overall it is considered that development will have an adverse impact on biodiversity in the short term but that compensatory planting and the introduction of bird and bat boxes in open spaces and gardens will go some way towards reducing the impact and could lead to a greater diversity of species and habitat, albeit these are likely to be different species to those originally found in the area.

Land for food production

- 6.35 The impact of the loss of agricultural land to development is covered in paragraphs 6.5- 6.17.

Stability for buildings and services

- 6.36 In order to meet future needs, because of ground bearing capacity limitations, development will have to be designed in a way that ensures it is able to withstand some movement on sites containing peat, very sandy soils or clayey soils that are released for development (see paragraph 4.34).
- 6.37 In Sefton, because the area relies heavily on land drainage, it will be particularly important to ensure that land drains upslope of a new development are still connected to the main drains or rivers to prevent waterlogging.

Potential for bringing unused land back into agricultural production

- 6.38 Several of the potential development sites in Sefton are currently unused. A brief inspection of Green Belt parcels S009 (Foul Lane, Southport), S128 (Ashworth South proposed prison site), S155 Bulls Bridge Lane / Wango Lane, Aintree) and S157 (Oriell Lane, Aintree) suggests that the land is unused for a variety of reasons:
- S009 is a closed landfill site adjacent to a waste recycling centre. It is therefore likely to be prone to land settlement depending on the materials tipped, which will lead to an uneven surface making it unsuitable for intensive agriculture, even if a good depth of soil has been used in the restoration.
 - S128 is the former site of the Moss Side Hospital. The site has been cleared and has a cover of un-vegetated rubbly soil at the surface. The site appears unsuitable for intensive agriculture but a detailed investigation would be required to confirm this.
 - S155 is an abandoned area which supports grass and scrub up to 10m high. It appears to have been unused for at least 10/15 years. A brief inspection of the soils indicated that undisturbed medium textured topsoil overlies sand and clay in the south of the sites but the majority of the land appears to form a predominantly manmade flood embankment. This is a small block of land which would be difficult to farm efficiently.
 - S157 is a large block of land to the south of the M57. It currently supports unused grass and small scrub in the field behind Aintree Hall Farm and part was grazed by horses until about 10 years ago. The two fields in the west supports scrub which is reported to be more than 20 years old. The area is very wet with standing water at the surface through the centre of the site. It is understood that the drainage was acceptable before the building of the motorway but construction severed the land drains. The accuracy of this statement is not known but offers a reasonable explanation of the current conditions. This site could not be re-used for intensive agriculture until the drainage issue is resolved.
- 6.39 The potential for bringing land back into agricultural use appears to be limited because there needs to be a desire by the landowner to make this happen. If the land is owned by farmers they must need or want to increase productivity from the land and there must be an economic case for spending money on reinstating land to a productive agricultural use. Government policy contained in the

National Food Strategy⁸⁴ states that the area used for agriculture and food production should not be increased. However, the re-use of such unused areas could compensate for the loss of agricultural land elsewhere.

- 6.40 During development, surplus soils are often available and these should be preserved either on site by increasing the depth of garden soils or exported to brownfield sites. Alternatively they could be exported to similarly textured agricultural land and placed with topsoil overlying subsoil. This would be particularly beneficial in areas where erosion or peat wastage has resulted in the underlying clay coming closer to the surface. The increase in depth to clay could improve land quality. This action will help to mitigate the loss of soil by ensuring that the soils are put to beneficial use.
- 6.41 Overall, based on the selection of sites visited it appears that there is limited opportunity to bring unused land back into agricultural production, either because developers own the site and have no incentive to do so, or because the sites have little or no soil on them. Surplus soils from development sites may provide a source of soils to restore brownfield sites or increase the level of agricultural land. However, this is outside of the Council's control.

Land Banking

- 6.42 Some building companies purchase or take out options on agricultural land which they consider may have potential for future development. So long as the land is still used productively this is not a concern and enables the production of crops to continue until the land is needed for development. However in some cases land purchased for this purpose may be taken out of agricultural production completely or let on a short term basis for livestock grazing or cropping. This reduced management of land can make the area look less attractive and may lead to issues such as fly tipping, unauthorised use by off road vehicles and motor bikes and increased trespass if the land is not adequately secured. It may also lead to less investment in the land and associated farm buildings.
- 6.43 The speculative nature of the purchase and sale of land in this manner also makes land ownership of agricultural land more fragmented and raises land values to the extent where they bear no relation to their value for agricultural use. However, the vast majority of such areas in Sefton are still in active agricultural use, irrespective of whether they are the subject of developer options or not.
- 6.44 Once taken out of agriculture, it is highly unlikely that 'land banked' land will be returned to a productive agricultural use. If the Local Plan allocates land in the Green Belt for future development, this will remove future uncertainty as it will identify those sites that will be required for development at some future date, and those that will not be required.

Summary

- 6.45 Key conclusions are set out below:
- 6.46 The potential loss of land due to development is 175ha under Core Strategy Option 2 and 275ha under Option 3. From the existing detailed surveys and the 23 Green Belt parcels surveyed in this study, the main grades of land affected are Grade 1 (8.5%), Grade 2 (26%), Grade 3a (32%) and Grade 3b(including 3c from old surveys) (31%), of which 66% is best and most versatile land (see paragraph 6.13).

- 6.47 Based on 2010 agriculture production in Sefton, and allowing for non-agricultural land use (18%, based on surveyed sites), the area of crop production that could be lost due to development is estimated at 99 ha and 156 ha for Options 2 and 3 respectively. For both potatoes and horticulture production, the loss would be 7 and 12 ha, respectively. The impact on livestock production would be based on the loss of 45-70ha of grassland (see Tables 18 and 19).
- 6.48 In summary, the impact of losing agricultural land to development is estimated at 2.1% and 3.4% of Sefton food production for Options 2 and 3, respectively. The main crops affected in terms of area are cereals and grassland, the latter supporting grazing livestock. The loss of smaller areas of land growing potatoes and horticultural crops is more significant nationally, as this represents a greater proportion of the national area (see paragraphs 6.7 and 6.9).
- 6.49 The potential impact on food production at regional and national levels is very small in view of the very small amount of land that would be developed under Options 2 or 3, accounting for 0.02-0.03% of agricultural land in the NW region and 0.003-0.006% at England level respectively. These numbers are likely to underestimate the volume of production lost (by up to 50% for some crops), given the higher land quality in Sefton and consequent higher yields of crops grown in the Borough (paragraphs 6.4 – 6.8). However, the loss will still be minute.
- 6.50 The impact on GVA and employment related to the loss of agricultural production for key farm types affected (*General Cropping* and *Lowland Grazing Livestock* farms) is also small. The loss of GVA (using farm gross margin as a proxy) under Option 2 is estimated at £107k while an estimated 2.5 jobs would be lost across Sefton. Under Option 3, there would be an estimated loss of gross margin of £168k and 3.7 jobs across Sefton (paragraph 6.22).
- 6.51 Development can be regulated to ensure that, in the longer term, the loss of agricultural land does not lead to a significant loss of ecosystem services and in some cases the effects could be neutral to positive; sustainable drainage schemes can be designed into development proposals to maintain the water regulation service (paragraph 6.27) while green spaces and gardens will mature to partially mitigate the loss of farmland for storing carbon (paragraph 6.28) and will provide areas for nature conservation/biodiversity (paragraph 6.31).
- 6.52 There appears to be limited opportunity to bring unused land back into agricultural production, either because developers own the site or because the sites have little or no soil on them. Surplus soils from development may provide a source of soils to restore brownfield sites or increase the level of agricultural land (paragraph 6.40). However, this is outside of the Council's control.
- 6.53 Once taken out of agriculture it is highly unlikely that 'land banked' land will be returned to a productive agricultural use (paragraph 6.41). However, if the Local Plan does allocate land in the Green Belt for future development, it will remove future uncertainty as it will identify those sites that will be required for development at some future date, and those that will not be required.

7 CONCLUSIONS

- 7.1 Sefton comprises a coastal Borough situated on the northern edge of the Merseyside conurbation. It contains five main urban areas as well as a number of smaller villages and hamlets set in a rural landscape. The built up area comprises about half the area of the Borough and is where 95% of its residents live. The rural half of the Borough is covered by the Merseyside Green Belt.
- 7.2 In Sefton all land outside of urban areas - that is, Sefton's countryside - is within the Green Belt. The Green Belt covers an area of 7,840 hectares, approximately 51% of the area of the Borough. This includes significant areas of high quality agricultural land and substantial areas of nature conservation value. It also embraces the majority of the undeveloped coast. It includes most of the land to the east of Southport, Formby and Crosby, and all of the agricultural land in Sefton's eastern parishes around Maghull, Aintree and Waddicar.
- 7.3 As part of its Local Plan preparation, Sefton Council consulted on an Options paper⁸⁵ in mid-2011. A key concern raised in the consultation was possible development on the best and most versatile agricultural land. Other related issues raised included the loss of potential to produce food to meet future needs, and the impact of development on agriculture and agricultural employment. This study will contribute to the evidence base to help the Council to decide on the Preferred Option for its Local Plan in accordance with the requirements of the National Planning Policy Framework (NPPF)⁸⁶ (paragraphs 2.43 - 2.46).
- 7.4 Sefton Council therefore commissioned ADAS to undertake the following:
- (i) Review the extent and coverage of agricultural land quality across Sefton and validate agricultural land classification surveys submitted in connection with the Options consultation in 2011;
 - (ii) Update the 1990 analysis of the Sefton rural economy and assess the impact development would have on the loss of agricultural land;
 - (iii) Detail other benefits arising from Sefton's soil resource, including benefits relating to ecosystem services, recreation, amenity, biodiversity, and managing flood risk; and
 - (iv) Consider the effects of land loss on soil functions and the impact on the soil resource from development and potential land-banking.
- 7.5 The updated analysis of the agricultural sector in Sefton highlights that, in common with the industry nationally, there is some degree of restructuring as smaller farms have been lost and larger ones have grown. However, there is still a wide diversity of arable and horticultural units, with small numbers of livestock units. The sector generally remains dependent on subsidies and is being encouraged by Government to both produce more food and improve environmental performance without increasing the amount of land used.
- 7.6 Sefton forms part of a low lying area on the western edge of the West Lancashire plain, with four main soil types which are very diverse, ranging from light sands through medium textured soils to heavy clays and peats. Farmland is managed largely to produce food, but also has an important role in many other ecosystem services that are important for human well-being including supporting biodiversity (Sefton contains nationally and internationally important nature conservation areas); providing landscapes for leisure, access and beauty; regulating water and

air quality; and contributing to climate regulation through the production of gases and the deposition and release of carbon.

- 7.7 A number of sites within the Sefton's Green Belt have been identified as having potential for development – both for new homes and for business parks. Two options were consulted on in 2011 which required Green Belt release; Option 2 required approximately 175 hectares of land (2.6% of Sefton's Green Belt) while Option 3 required approximately 275 hectares of land (4.2% of Sefton's Green Belt). Based on the survey work carried out some 82% of the required area is currently used for agriculture.
- 7.8 The Provisional agricultural land classification maps show that the average quality of agricultural land in Sefton is high – higher than the average in the North West and in England. The Provisional classification gives a general grading and does not claim to be accurate at a detailed level; it needs to be supplemented by further surveys. Detailed surveys (see table 12) have been carried out for specific sites over a number of years; these have generally concluded that the quality of land is lower than that indicated by the Provisional classification.
- 7.9 The land quality findings are generally consistent with what would be expected from the different soil types in Sefton and some sites were excluded from further study (see table 13) either because detailed surveys already existed or because the sites were in a non agricultural use. ADAS also carried out further surveys as part of this Study, on those sites where no detailed survey existed or where previous detailed surveys did not show what would be expected from the soil type. These surveys give a more up-to-date indication of the grading of sites and the agricultural land classification grades also concur with what would be expected from the soil types in the area.
- 7.10 Based on our current knowledge of land quality from the various sources discussed in Chapter 5, it appears that the majority of agricultural sites identified as being suitable for development are still within Grades 1, 2 and 3a i.e. the 'best and most versatile' land in the country.
- 7.11 An assessment of the anticipated loss of production based on the two development options which involve Green Belt shows that the loss of crop produce and livestock would be very small when compared with the North West and England as a whole [0.02-0.03% of the North West's agricultural area and 0.003-0.006% of England's agricultural area for Option 2 and Option 3 respectively]. Given the higher than average quality of agricultural land in Sefton, the figures may be slightly higher. The implications of these Options on food production are very modest at a national scale in view of the land areas concerned.
- 7.12 The analysis also indicates that the loss of economic output and employment would be small [£107k and 2.5 jobs for Option 2 and £168k and 3.7 jobs for Option 3]. The implications of these options on the Sefton agricultural economy are therefore limited and should be seen in the context of new opportunities arising from development.
- 7.13 Sefton Council faces a policy challenge in that it is legally required in the Local Plan to meet its needs for new homes and jobs, but must take into account the economic and other benefits of the 'best and most versatile' agricultural land when it decides which land should be developed in the future through the preparation of its Local Plan. Government advice in the National Planning Policy Framework is that 'where significant development of agricultural land is demonstrated to be necessary, local planning authorities should seek to use areas of poorer quality land in preference to that of a higher quality'.

- 7.14 This means that non-agricultural land or agricultural land of Grades 3b and 4 should be preferred for development where possible. Other site-specific factors, including potential impacts on wider ecosystem services, and other requirements which are beyond the scope of this Study, will need to be considered by the Council in prioritising land for development.
- 7.15 Based on the up-dated knowledge of agricultural land quality in Sefton it appears that planning decisions will have to be made based on factors beyond land quality because most land is classified as best and most versatile. From an agricultural perspective the sites containing the highest value infrastructure such as the modern glass houses on the Maghull Smallholdings Estate (Green Belt parcel S125) should be protected in preference to land which is not intensively used. Ideally, sites which are isolated from other agricultural land should be developed in preference to blocks of land which could lead to further agricultural land loss in the future.
- 7.16 This Study is one of many pieces of evidence which will be used to inform the preparation of Sefton's Local Plan, along with a number of other important studies, key legislative requirements and emerging case law and best practice. This updated assessment of agricultural land quality will therefore be one of several factors in deciding whether any Green Belt sites should be identified for development in the next stage of preparing the Local Plan.

GLOSSARY OF TERMS

Accumulated temperature	The excess of daily air temperature above 0°C, summed between January and June
Agri-environment schemes (AES)	Agri-environment schemes provide financial incentives for farmers to adopt environmentally beneficial land management practices in order to support wildlife conservation; protection of the historic environment; maintenance and enhancement of landscape quality and character; promotion of public access and understanding; and resource protection. Farmers are contracted to undertake a number of management options over a contracted period (5-10 years). AES are funded under the Rural Development Programme (RDP).
Available water capacity	A measure of the amount of water held in the soil which is available for a specific crop to use.
Best and most versatile agricultural land	Land in grades 1, 2 and 3a of the Agricultural Land Classification.
Biofuels	Crops grown for fuel such as oilseed rape and sort rotation willow, also residue straw from cereal harvest.
Brassicas	Plant family containing cabbages, cauliflower, broccoli etc
Clay(ey)	A soil texture containing mineral particles less than 0.002mm
Climatic limitation	An overriding limitation caused by the climate being a combination of too wet or too cold for land to be classified above a specific grade.
Common Agricultural Policy (CAP)	The EU's Common Agricultural Policy (CAP) is the framework under which European farmers operate and receive support. It sets out a range of farming, environmental and rural development activities as well as support arrangements for EU agricultural markets.
Cropping rotation	Planting of different crops in consecutive seasons in the same field. Generally, crop rotation improves or maintains soil fertility, reduces the build up of crop-specific pests and diseases.
Cultivation	The turning of soils to prepare the land for the next crop.
Drought(iness)	A soils susceptibility to running out of available water before the end of the growing season for specific crops. Measured as the difference between what the soil can hold and the potential evapotranspiration rate for the crops.
Drought limitation	A shortage of water sufficiently severe to limit the quality of the land.
Dutch auger	A hand held tool for extracting a core of soil to a depth of 1m.

Ecosystem services	The processes by which soils and the environment interact and affect resources such as clean air, water, food and materials
Erosion	The movement of soil particles from their place of origin by wind or water.
Eutrophication	Over enrichment of water with minerals, particularly caused by phosphorous and to a less extent nitrogen, leading to excessive plant growth.
Evapotranspiration	Water loss from a crop which has an unlimited water supply, affected by crop type and climatic variable such as such as wind speed and sunlight.
Farm diversification	The entrepreneurial use of farm resources for a non-agricultural purpose for commercial gain. Diversification reflects the reduced dependence of farmers on agriculture as a source of income.
Field capacity	A soil moisture state beyond which field drains start to flow. This state is normally reached in autumn and continues until plants start to grow in the spring.
Field grown vegetables	Vegetables can be grown under cover in glasshouses or polytunnels but most are grown on a large scale in fields. Commonly these include brassicas (cabbage, broccoli, cauliflower etc), carrots, beetroot, onions, leeks, asparagus as well as salad crops.
Floodplain	An area of land which is prone to flooding once rivers overflow their banks.
Fluvial flood(ing) (risk)	Flooding with water from rivers.
Gross Margin	Gross margin for a farm business is the total sales less the variable costs incurred in achieving it. Variable costs are those costs directly attributable to an enterprise and which vary in proportion to the size of an enterprise e.g. seed, chemicals and fertilisers etc. A gross margin is not profit because it does not include fixed or overhead costs such as depreciation, interest payments, labour and other costs which have to be met regardless of enterprise size.
Gross Value Added (GVA)	GVA is a measure in economics of the value of goods and services produced in an area, industry or sector of an economy. In national accounts GVA is output minus intermediate consumption (the total monetary value of goods and services consumed or used up as inputs in production by enterprises, including raw materials, services and various other operating expenses)
Glacial drift	Superficial mineral deposits left after the retreat of glaciers.
Horticulture	The intensive cultivation of plants for human use. It is very diverse in its activities, incorporating plants for food and non-food crops such as flowers, trees, shrubs, turf-grass, hops and medicinal herbs.
Infiltration	The movement of water into and through the soil profile.

Less Favoured Area (LFA)	LFA is a term used to describe an area with natural handicaps (lack of water, climate, short crop season and tendencies of depopulation), or that is mountainous or hilly, as defined by its altitude and slope.
Loam(y)	A mix of soil particles made up sand, silt and clay.
Local Plan	Local planning authorities must prepare a local plan which sets planning policies in a local authority area. Local plans must be consistent with national policy and the National Planning Policy Framework.
Microrelief	A description of local undulations in the main slopes.
Minimum cultivation techniques	A range of reduced cultivation methods aimed at reducing the power needed to cultivate the soil, typical techniques involve a reduction in the depth to which the soil is worked such as shallow, cultivation in preference to ploughing or several cultivation operations being carried out in one pass.
Minor holding	The definition of a minor holding has changed over time but from 1980 to 2000 a minor holding had to satisfy all of the following criteria: total land area < 6ha; no regular whole-time farmer or worker on the holding; annual labour requirement <100 standard man days (a standard man day represented 8 hours productive work by an adult worker under average conditions); glasshouse area less than 100 square metres; the occupier does not farm another holding.
Mixed land uses	More than one type of use being made of the land e.g. agriculture plus unused land , horses or golf courses
Moisture Deficits	The balance between rainfall and potential evapotranspiration calculated over the critical part of the growing season, calculated for a specific crop e.g. wheat and potatoes.
Mottle(ing)	Colour variations in the soil which indicate that the soils are not well drained, typical colours include orange and grey colours
Nutrient cycling	The continual cycling of minerals from rock, organic matter and fertilisers to form plant material and their breakdown to release the minerals back to the soil for reuse
Organic matter	Plant residues found in the surface horizon of soils
Particle size distribution	A laboratory measurement of the different sized particles in the soil sample, giving an accurate measurement of the proportions of sand, silt and clay. .
Peat(y)	An organic material build-up from the remains of plants in wet conditions.
Plough layer	The top 20/25cm of soil which is regularly turned by cultivations
Podzol	A soil with a strongly developed leached zone where fine soil and nutrients have been removed down the profile.

Potential evapotranspiration	The amount of water required by a freely growing crop with a full ground cover.
Provisional Agricultural Land Classification maps	A series of maps produced in the 1960/70s at 1:250,000 scale. The classification grades land into 1 of 5 grades according to the degree to which its physical characteristics impose long term limitations on agricultural use. The maps are only accurate to within 80ha.
Reconnaissance survey	A reconnaissance survey is an industry recognised method for undertaking a non detailed survey. It provides information on the general grade of an area but does not delimit small areas of different grades.
Sand(y)	A soil texture containing mineral particles in the size range 0.06-2mm
Set aside land	Land removed from production for environmental or other purposes. It is sometimes required as a condition for farmers to receive support payments.
Sewage sludge	Heat treated solid waste from sewage farms, often referred to as biosolids or compost.
Silt(y)	A soil texture containing mineral particles in the size range 0.002-0.20mm
Single Payment Scheme (SPS)	SPS is part of the Common Agricultural Policy (CAP). It is the principal agricultural subsidy scheme in the EU. Under the scheme farmers have freedom to farm to the demands of the market as payments are not linked to food production. However, payments are linked to meeting environmental, public, animal and plant health and animal welfare standards and the need to keep land in good agricultural and environmental condition (known as 'Cross Compliance').
Slowly permeable layer	A dense or heavy textured layer of soil which reduces water flow through the soil.
Soil Association	A grouping of different soils which regularly occur together in the landscape.
Soil functions	Also referred to as ecosystem services i.e. the processes by which soils and the environment interact and affect resources such as clean air, water, food and materials
Soil structure	An assessment of the way soil particles hold together.
Soil texture	A physical description of the soil's sand silt and clay content, which can be modified by organic matter.
Soil wetness	The average duration of waterlogging at specified depths in the soil profile.
Subsoil	Layers of soil below the topsoil which are modified by weathering but contain less organic matter and microorganisms.

Summer Temperature	The excess of daily air temperature above 0°C between January and June.
Sustainable farming systems	A sustainable agricultural system is one that can indefinitely meet the requirements for food and fibre at socially acceptable, economical and environmental costs.
Topsoil	The surface lay of soil which has been modified by the build up of organic matter and soil flora and fauna.
Water capacity	See available water capacity
Water infiltration	The rate at which water moves through the soil profile.
Watertable	The level at which water sits in the soil, below the watertable the soils are permanently saturated.
Waterlogged soil	Saturated soil where all the air spaces have been filled with water.
(Soil) Wetness (Class) (WC)	A measure of the average duration of waterlogging at specified depths in the soil; WC 1 is well drained and WC 4 -6 are poorly drained.

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