

## 6 Agronomy

### 6.1 Introduction

This chapter of the EIS is an assessment of the proposed M7 Osberstown Interchange and R407 Sallins Bypass under the heading of Agriculture. The chapter sets out the methodology to be followed (Section 6.2), describes the existing agricultural environment (Section 6.3), reviews predicted impacts (Section 6.4), sets out mitigation measures proposed (Section 6.5) and describes anticipated residual impacts (Section 6.6).

### 6.2 Methodology

#### 6.2.1 Baseline Assessment

The following legislation and guidelines were referred to while preparing and writing this chapter:

- Section (50) Sub-section 2 and 3 of the Roads Act 1993.
- EPA (Environmental Protection Agency): Guidelines on the Information to be contained in Environmental Impact Statements, 2002.
- EPA: Advice Notes on Current Practice (in the preparation of Environmental Impact Statements) 2003.

#### 6.2.2 Information Sources

The information sources used in this assessment are shown in Table 6.1.

**Table 6.1: Data sources used for the baseline assessment**

Information	Data Source
Agricultural statistics	<ul style="list-style-type: none"> <li>• 2010 National Agricultural Census from the Central Statistics Office (CSO) – used to provide background data on the average size and enterprise mix of farms along the proposed road development.</li> </ul>
Soils	<ul style="list-style-type: none"> <li>• EPA digital soils data sets (available on the EPA website).</li> <li>• The ‘General Soil Map of Ireland’ (1980).</li> <li>• Windshield survey, aerial photography and on farm surveys.</li> </ul>
Land use & farm details	<ul style="list-style-type: none"> <li>• Land registry mapping data.</li> <li>• Land zoning data from 2011 – 2017 Naas Area Development Plan.</li> <li>• Farmer interviews.</li> <li>• Windshield survey.</li> <li>• Aerial photography - used as an aid in examining farm layout and land quality.</li> </ul>

## 6.2.3 Impact Assessment Methodology

A principle objective of the impact assessment methodology is to apply a consistent assessment of impacts to farms affected by the proposed scheme. The assessment of agricultural impacts involves:

- Evaluation of the farm which is impacted.
- Assessment of the magnitude of impacts.
- Assessment of the significance of the impacts.

### 6.2.3.1 Evaluation of farms

Each farm is evaluated to determine the sensitivity and to determine any site specific factors. The main criteria in determining the sensitivity of a farm is the enterprise type and the intensity of the farm enterprise. This information is obtained from farmer interviews and on-site surveying. Table 6.2 sets out the criteria used for the categorisation of sensitivity.

**Table 6.2: Criteria for categorisation of sensitivity**

Farm Enterprise Type	Intensity*	Sensitivity
Stud Farm	High	Very High
	Medium	High
	Low	Medium
Dairy Farm, Intensive equine enterprises.	High	High
	Medium	High
	Low	Medium
Non-dairy grazing livestock enterprises (including beef, sheep and non-intensive equine) and grass cropping enterprise.	High	Medium
	Medium	Low
	Low	Very low
Tillage	High	Medium
	Medium	Low
	Low	Very low
Rough Grazing, Bog, Forestry, Woodland	Low	Very low

*\*The intensity of the farm enterprise is assessed by site evaluation.*

*Site specific factors* such as soil quality, type of access to farm, potential for non-agricultural development, location of farm and presence of other farm enterprises not included in Table 6.2 (e.g. horticulture, poultry, pigs, rare breeds) are assessed on a farm by farm basis. The importance of the farm is considered.

### 6.2.3.2 Assessment of Magnitude of impacts

The magnitude of the impact takes into account the type of impact that will occur as well as the duration over which the impact will occur. The criteria for assessment of impact magnitude are set out in Table 6.3 below.

**Table 6.3: Indicative criteria for assessment of impact magnitude**

Indicative Criteria	Impact Magnitude
<ul style="list-style-type: none"> <li>• A very high proportion of the land lost (e.g. &gt;15% of the farm).</li> <li>• A very high proportion of the affected farm separated by the proposed scheme (e.g. &gt;25% of the farm).</li> <li>• Permanent loss of farm buildings or water sources.</li> <li>• Impact would cause a change in farming enterprise or dramatic reduction.</li> </ul>	Very high
<ul style="list-style-type: none"> <li>• A high proportion of the land lost (e.g. 10-15% of the farm).</li> <li>• A high proportion of land separated (e.g. 15-25% of the farm).</li> <li>• Farm buildings or water sources may be affected but can be replaced.</li> <li>• Impact would not cause a change in farming enterprise but would require high degree of operational changes.</li> </ul>	High
<ul style="list-style-type: none"> <li>• A medium proportion of the land lost (e.g. 5-10% of the farm).</li> <li>• A medium proportion of land separated (e.g. 7-15% of the farm).</li> <li>• Farm buildings or water sources may be affected but can be replaced.</li> <li>• Impact would not cause a change in farming enterprise but would require operational changes.</li> </ul>	Medium
<ul style="list-style-type: none"> <li>• A small proportion of the land lost (e.g. 2.5-5% of the farm).</li> <li>• A small proportion of land separated or no separation (e.g. 3-7% of the farm).</li> <li>• Farm buildings or water sources generally not affected but if affected can be replaced.</li> <li>• Impact would cause a minor change in the day to day operation of farms.</li> </ul>	Low
<ul style="list-style-type: none"> <li>• A very small proportion of the land lost (e.g. &lt;2.5% of the farm).</li> <li>• A very small proportion of land separated or no separation (e.g. &lt;3% of the farm).</li> <li>• No significant impact on operation of farms.</li> </ul>	Very low

The magnitude is not solely dependent on the quantitative measurement of the impact. The quantitative measurement is subject to a qualitative assessment of impact based on agronomist's professional opinion. Temporary and permanent impacts are considered in the agricultural assessment.

The footprint of the proposed scheme will be fenced off permanently at the beginning of the construction period and from this point forward there is a permanent impact (more than sixty years) from the landtake.

Temporary impacts (generally less than 12 months) will occur mainly during the 18 month construction phase prior to accommodation works being constructed and to a lesser extent during the operational period depending on the cropping and location of livestock on the farm.

### **6.2.3.3 Assessing Significance of impacts**

The significance of the impact is determined by evaluating the magnitude and duration of the impact and the sensitivity of the affected farm. Therefore, an impact which affects a farm with a low sensitivity will not be as significant as a similar magnitude of impact which affects a farm with a high sensitivity. A temporary impact will generally be less significant than a permanent or residual impact.

The EPA Advice Notes on Current Practice in the preparation of Environmental Impact Statements (2003) contain guidelines for describing the significance of impacts. These guidelines have been adopted in the main with minor adjustments that are appropriate for agricultural impact assessment. The comparisons between the EPA guidelines and the criteria used in this assessment are shown in Table 6.4.

**Table 6.4: Comparison of significance of impact criteria used in this assessment with the EPA Advice notes (2003)**

<b>Significance of impacts as per EPA Advice Notes</b>	<b>Significance of impacts used in this assessment</b>
<p><b>Imperceptible Impact</b> <i>An impact capable of measurement but without noticeable consequences</i></p>	<p><b>Imperceptible Impact</b> <i>An impact so small it is insignificant or capable of measurement but without noticeable consequences.</i></p>
<p><b>Slight Impact</b> <i>An impact which causes noticeable changes in the character of the environment without affecting its sensitivities.</i></p>	<p><b>Slight Adverse Impact</b> <i>An impact which causes noticeable changes in the character and management of a farm in a minor way. The farm enterprise experiences inconvenience as a result of the proposed scheme.</i></p>
<p><b>Moderate Impact</b> <i>An impact which alters the character of the environment in a manner that is consistent with existing emerging trends.</i></p>	<p><b>Moderate Adverse Impact</b> <i>An impact which alters the character of a farm in a manner that requires moderate changes in the management and operation of the farm. The farm enterprise can be continued as before but with increased management or operational difficulties.</i></p>
<p><b>Significant Impact</b> <i>An impact which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.</i></p>	<p><b>Significant Adverse Impact</b> <i>An impact which by its character, magnitude, duration or intensity alters a sensitive aspect of the farm.</i> <i>The farm enterprise cannot be continued without major changes in management and operation of the farm.</i> <i>This would typically occur where the farm was split in two due to separation but where access between the severed portions and the farm buildings could still be achieved effectively.</i> <i>Where the impact is significant an enterprise change may be necessitated e.g. from dairy to beef.</i></p>
<p><b>Profound Impact</b> <i>An impact which obliterates sensitive characteristics.</i></p>	<p><b>Profound Adverse Impact</b> <i>An impact which obliterates sensitive characteristics of the farm. The farm enterprise cannot be continued as a result of the proposed scheme or a dramatic change is required in the future management and operation of the farm.</i> <i>This would occur where landtake was of such a scale that the remaining land would not form a viable unit or where separation was of such a nature to make the holding unworkable or where important farm buildings and facilities were removed and could not be replaced.</i></p>



- Mixed crops and livestock - various crops and livestock. Medium sensitivity.
- Other (e.g. pigs, poultry, horticultural cropping and equine as the main enterprises). Medium – very high sensitivity.

The National 2010 statistics show that the average size of farms in Co Kildare is 44 hectares. The average size of farms along the proposed route is approximately 42 hectares. This compares to a national average size of 32.7 hectares. The majority of farms along the proposed scheme are non-dairy grazing livestock (beef, cattle and sheep).

**Table 6.6: Land Use Statistics along the Proposed Scheme compared to National and Regional Statistics**

Farm/Enterprise Category	Total Nos. of affected farms within each category	% of farms within each category		
		Farms along proposed scheme	Farms in Co Kildare	Farms nationally
Mainly Dairy	1	9	5	11
Non-dairy grazing livestock and mixed field crops	8	73	73.5	82.5
Mainly Tillage	1	9	15.5	3.5
Mixed Crops & Livestock	0	0	4.5	2
Other	1	9	1.5	1
<b>Total</b>	<b>11</b>	<b>100</b>	<b>100</b>	<b>100</b>

Table 6.6 shows that because of the relatively small sample of farms not all enterprise types are represented along the proposed road development. The main farm type along the proposed road development is beef cattle farming. All of farm 105 and the southern parts of farms 109 and 112 are zoned for housing and industrial development. There is one stud farm along the proposed road development (Ref No 115). Farms 102 and 115 are classified as high and very high sensitivity due to the dairy and stud farm enterprises. Farms 105 and 112, and part of farm 109 south of the M7, are classified as low sensitivity due to a combination of low stocking rates and because all or a very high proportion of the farm is zoned for non-agricultural use. Farm 119 is classified as low sensitivity due to its small size. The remaining farms along the proposed road development are classified as Medium sensitivity. See **Appendix 6.1, V4** for details of each individual farm.

### 6.3.1 Soils along the proposed scheme

In this section, reference is made to the 'General Soil Map of Ireland' (1980) and the EPA Soils Data Sets available on EPA website. The dominant soil is a deep free draining soil (EPA reference code 12). In the north east of the study area a shallow well drained soil dominates (EPA reference code 12).

There are alluvial soils (EPA reference code 51) along the river Liffey and in the north east of the study area along the canal. The topography of the affected farms is flat.

## 6.4 Predicted Impacts on Agronomy

The elements of the proposed scheme which impact on agriculture are the loss of land inside the CPO line, construction activity and the traffic generated during and after construction. The main potential impacts to agricultural enterprises during the construction and operational phases are categorised into landtake impacts, separation (or farm fragmentation) impacts and disturbance impacts.

### 6.4.1 “Do Minimum” Scenario

Farmers as members of the local community regularly use the existing road network to access schools and shops. Tractors travel on the existing road network (excluding motorway) to access farms and herds of cattle. There is a low level of usage of the existing over bridge on the M7. In the “Do Minimum” scenario the existing traffic volumes will continue and this represents an imperceptible impact on agriculture.

### 6.4.2 “Do Something” Scenario

The proposed scheme will reduce the traffic disturbance for farmers who currently use the existing road network.

However, overall there will be a moderately negative impact on agriculture (eleven farms) along the proposed scheme due to landtake, land separation and disturbance impacts from the proposed M7 Osberstown Interchange and R407 Sallins Bypass.

### 6.4.3 Landtake (Construction and Operational Phase)

Agricultural land will be required for the construction of road carriageway and embankments, accommodation roads, footway and cycle tracks, drainage features and planted/landscaped areas. Impacts of these components of the proposed scheme are taken into account in the assessment of impacts. Any reduction in land area can potentially reduce the viability and productivity of farms. The level to which the loss of land affects the viability of an individual farm is not solely dependent on the amount of land removed, but is also dependent on factors such as quality of the land taken, total area of the holding, type of enterprise and whether the landtake results in separation of land or permanent reduction and damage to land access, farm structures or water sources. Approximately 35.9 hectares of land is taken from agricultural holdings for the proposed road development of which 8.7 hectares is zoned for non-agricultural use.

### 6.4.4 Land Separation (Construction and Operational Phase)

Increasing the fragmentation of a farm can potentially increase the long-term fixed and variable costs associated with running the farm and therefore can reduce the viability of farms. Farmers require access to land and if this access is severed the operation of the farm is affected.



Farm fragmentation can result in additional journey times and distances, angulation of fields and change in access arrangements. The dairy enterprise is particularly sensitive to separation impacts. Additional temporary impacts during the construction phase will occur when continuous access to separated land is disrupted. The proposed road development will separate approximately 55 hectares in five of the eleven farms.

#### **6.4.5 Disturbance due to traffic, noise, lighting & dust (Construction and Operational Phase)**

The day-to-day operation of farms will be temporarily disrupted due to increased levels of construction traffic in the local road network. Water and electricity supplies may also be temporarily disrupted during the construction of the proposed scheme.

Access to separated land may be temporarily disrupted. Increased levels of noise and dust will occur as a result of construction traffic and excavation works.

Sudden noise sources are associated with construction excavation and this can cause farm animals to take flight and possibly harm themselves or other farm animals. Land drainage systems can be blocked on a temporary basis during construction. There will be impacts on access to drinking water (River Liffey). Due to the presence of the cycle track and footway there is an increased potential for trespass on to private lands. A combination of these factors contributes to general disturbance.

#### **6.4.6 Summary of Predicted Impacts (pre mitigation)**

The significance of predicted impacts on individual farms, before mitigation measures, from the landtake, land separation and disturbance have been assessed and are presented in Appendix A6.1 V4. The results are summarised in Table 6.7.

**Table 6.7: Summary of Predicted Pre Mitigation Impacts - numbers of affected farms**

Significance of Impact	Numbers of Farms				
	Mainly Dairy	Non-dairy grazing livestock and mixed field crops	Other	Mainly Tillage	Totals
Imperceptible	-	-	-	1	<b>1</b>
Slight	-	-	1	-	<b>1</b>
Moderate	-	2	-	-	<b>2</b>
Significant	-	4	-	-	<b>4</b>
Profound	1	2	-	-	<b>3</b>
<b>Total Nos. of Farms</b>					<b>11</b>
	<i>7 farms are predicted to have impacts which are significant and profound (64% of all affected farms)</i>				

## 6.5 Mitigation Measures

Mitigation of impacts takes place under two headings:

- General mitigation measures – described below.
- Compensation under the Compulsory Purchase System – compensation to farmers for residual damage is part of the statutory process for compensation.

### 6.5.1 Mitigation Measures – Construction Phase

*Landtake impact mitigation:*

- Minimise the landtake requirement so that only lands required for the proposed scheme are taken. In some situations it will be necessary to acquire separated land where access cannot reasonably be provided.

*Land Separation impact mitigation:*

- The landowner will be provided with access to all separated land parcels during the construction of the proposed scheme. Where temporary disruptions to this access occur landowners will be notified in advance.
- Where existing water and electricity supplies are disrupted during the construction phase an alternative water source or electricity supply will be made available e.g. water tanker or electric cable ducting. If permanent access to surface drinking water sources is taken alternative ground water supplies will be provided (or compensation to allow farmer drill his own well).

*Disturbance impact mitigation:*

- Suitable boundary fencing will be erected to delineate the CPO line and prevent disturbance to adjacent land.
- A key contact person will be appointed during the construction phase to facilitate communications between affected landowners and to facilitate the re-organisation of farm enterprises by farmers during critical times.
- The impacts on water quality will be minimised by way of a programme of mitigation measures for surface water sources as described in Chapter 17 - *Hydrology*.
- The spread of dust onto adjoining lands will be minimised by way of mitigation measures set out in Chapter 12 - *Air Quality*. Typically, the impact of dust on agricultural grazing livestock is imperceptible.
- Where drainage outfalls are temporarily altered or land drains blocked or damaged an adequate drainage outfall will be maintained and land drains will be repaired.

### 6.5.2 Mitigation Measures – Operational Phase

*Landtake impact mitigation*

- Minimise the landtake requirements so that only lands required for the proposed road development are taken.

The loss of agricultural land due to the construction of the proposed scheme is a permanent loss which cannot be mitigated.

- Landowners who lose buildings and water sources to the proposed scheme will be compensated. Compensation payments will assist farmers to re-purchase land to replace land lost to the proposed scheme.

*Land Separation impact mitigation:*

- All separated land parcels will be accessible either via the local road network, via accommodation access roads and access tracks or accommodation underpasses.
- Where existing water and electricity supplies to fields or farm yards are severed, the supply will be reinstated by provision of ducting where possible. Alternatively, where ducting is not feasible a permanent alternative water source or electricity supply will be made available. If an alternative water source is not available, the farmer will be compensated to enable him to drill a well on his own land.
- Landowners may have to build additional farm facilities (e.g. cattle holding and testing pens) on their separated land. Field boundaries and paddock systems may have to be re-organised to take into account the altered shape of fields. These matters are allowed for in the compensation settlements.

*Disturbance impact mitigation:*

- Noise mitigation will be provided (see Chapter 11 *Noise and Vibration*).
- Water from the proposed scheme will be diverted to attenuation ponds before discharging to watercourses. The drainage design of the proposed scheme will intersect existing field drains and carry the drainage water to suitable outfalls.
- Other injury impacts such as loss of shelter, removal of field boundaries, disruption of farm roads and field paddock systems and the increased potential for trespass on to private land due to the cycle track and footways are taken into account in this assessment. Statutory compensation will be used to compensate land owners for residual effects and to allow the land owners to execute mitigation measures and re-instatement works on their own land.
- Landscaping along the proposed scheme will minimise the visual impact on farms along the route and will over time improve shelter in affected farms.

## 6.6 Residual Impacts

The agriculture area of Co Kildare is 115,058 hectares (CSO 2010) (including 1293 hectares of commonage). The land required for the proposed scheme will take 0.04% of this area. Five new land segments will be created due to the construction of the proposed scheme. This is 0.06% of the total number of land segments in county Kildare (which is 7,734 – Table 28 of 2010 Census of Agriculture). Therefore the impact on a regional or national level will be imperceptible.

### 6.6.1 Residual Impacts on Agriculture along the Proposed Scheme

The area of all farms directly affected<sup>1</sup> is approximately 464 hectares. Approximately 27.2 hectares of agricultural land and approximately 8.7 hectares of lands zoned for non-agricultural use will be required for the proposed scheme. The permanent landtake will be approximately 10% of the total area of farms directly impacted.

Separation will affect 5 farmers and 55 hectares of land will be separated due to construction of the proposed scheme – approximately 9% of the affected farms. The overall impact on agriculture (eleven affected farms) along the proposed scheme is moderately adverse.

### 6.6.2 Residual Impacts on Individual Farm

The individual farm impact assessment results are presented in Appendix A6.2 V4 and summarised in Table 6.8. The main results are:

- 9% of farms (No 1) affected by the proposed scheme have an imperceptible impact. The farm in this impact category occupies 17% of the area of all farms affected.
- 27% of farms (No 3) affected by the proposed scheme have a slight impact. The farms in this impact category occupy 3% of the area of all farms affected.
- 55% of farms (No 6) affected by the proposed scheme have a moderate impact. These farms occupy 58% of the area of all farms affected.
- 9% of farms (No 1) affected by the proposed scheme have a significant impact. This farm occupies 18% of the area of all farms affected.

---

<sup>1</sup>In many situations the land parcels shown in **Figure 4.12 V3** represent only part of the affected farm i.e. the affected part of the farm. If the information is available the total area of the farm is included in the assessment. However if other lands owned are several kilometres away and if the affected farm is operated relatively independently from these other lands then only the affected area is included. This methodology avoids under estimating impacts.

