3 HUMAN BEINGS – LAND USE

3.1 INTRODUCTION

1 This chapter of the Environmental Impact Statement (EIS) presents an evaluation of the proposed development as set out in Chapter 6, **Volume 3B** of the EIS, in relation to Human Beings – Land Use. The information contained within this chapter considers the land use of the Cavan Monaghan Study Area (CMSA) as defined in Chapter 5, **Volume 3B** of the EIS. In that regard, the evaluation considers the construction, operational and decommissioning aspects of the proposed development in the CMSA.

2 This chapter sets out the methodology followed in this evaluation (refer to **Section 3.2**), describes the characteristics of the proposed development (refer to **Section 3.3**), describes the existing land use environment (refer to **Section 3.4**), evaluates potential impacts, (refer to **Section 3.5**), sets out mitigation measures proposed (refer to **Section 3.6)** and describes anticipated residual impacts (refer to **Section 3.7**). Potential transboundary impacts are addressed in Chapter 9, **Volume 3B** of the EIS. Potential cumulative impacts and potential interrelationships between environmental factors are dealt with in Chapter 10, **Volume 3B** of the EIS.

3.2 METHODOLOGY

3.2.1 Scope of the Evaluation

3 The scope of the evaluation of this chapter of the EIS has been confined to agriculture, forestry and horticulture. The 2012 Corine Land Cover data indicates that, within a 1km corridor of the proposed project alignment, 99.9% of the land is classified as agricultural (including 3.5% pasture land with a mix of semi natural vegetation) and 0.1% is classified as peatland. As detailed in **Chapter 2** of this volume of the EIS and also in Chapter 1, of **Volume 3B** of the EIS, the proposed development has avoided the largest settlements in the CMSA, and is located in an area where the land use is primarily agricultural, with associated secondary land uses including food processing as well as rural settlements, enterprises and tourism.

4 The scoping opinion received from An Bord Pleanála (the Board) (refer to Appendix 1.3, **Volume 3B Appendices** of the EIS) identified the following issues as being relevant to this chapter of the EIS:

- Assess the likely land use impact, including restrictions on existing uses such as agriculture or commercial forestry.

5 The following guidelines were referred to while preparing and writing this appraisal:

- Environmental Protection Agency (EPA) (2002). *Guidelines on the Information to be contained in Environmental Impact Statements*;
- EPA (2003). *Advice Notes on Current Practice (in the preparation of Environmental Impact Statements*); and
- Design Manual for Roads and Bridges (UK) *Vol 11, Section 2 Part 5, Determining Significance of Environmental Effects* (2008), published by the UK Highway Authority.

3.2.2 Information Sources

6 The following data sources were used to inform the appraisal:

- Landowner interviews and discussions;
- Road side surveys in August 2011 and August - September 2013;
- Examination of aerial mapping information;
- Land Registry boundary data;
- Ordnance Survey field mapping;
- Central Statistics Office (CSO) data from the 2010 Census of Agriculture;
- Other sources of information referred to include:
  - *Soils & Subsoils Class* digital data downloaded from the EPA website in September 2013;
  - Corine Land Cover Map of Ireland (2012);
  - Health and Safety Authority Ireland (2013). Farm Safety Action Plan 2013-2015;
  - Health and Safety Authority Ireland (2010). Guidelines for Safe Working near Overhead Electricity Lines in Agriculture, (http://www.hsa.ie/eng/Publications_and_Forms/Publications/Agriculture_and_Forestry);
  - Electricity Supply Board (ESB) and Irish Farmers Association (IFA) (October 1985). *Code of Practice for Survey, Construction and Maintenance of Overhead Lines in Relation to the Rights of Landowners;*
  - ESB and IFA (September 1992). *Agreement on Compensation for Loss of Tree Planting Rights;*

- ESB Networks. *Farm Well, Farm Safely* (http://www.esb.ie/esbnetworks/en/safety-environment/safety_farm.jsp)*;* and
- *National Forestry Inventory* (2007) (Republic of Ireland) published by the Forestry Service, Department of Agriculture, Fisheries and Food.

7 The evaluation methodology involves three stages:

- A baseline appraisal was carried out. The type and size of land parcels[4] and their character is described in **Section 3.4**. The methodology of evaluation of sensitivity is explained in **Section 3.2.3**.
- An appraisal of potential impacts during construction, operation and decommissioning phases was carried out. The magnitude of potential impacts is evaluated based on criteria as set out in **Section 3.2.4**.
- The significance of impact is provided by evaluating the sensitivity of the land parcel and magnitude of impact and is based on the criteria set out in **Section 3.2.5**.

3.2.3 Evaluation of Baseline

8 The land use appraisal for the CMSA includes land parcels along the proposed development and along temporary access routes. The existing agricultural, horticultural and forestry environment is evaluated by interviewing landowners (where possible), roadside surveys and by examination of aerial photography and land registry mapping data. The 2010 *Census of Agriculture* provides comprehensive information on agricultural and horticultural farms in counties Cavan and Monaghan. The character of the agricultural environment is categorised by evaluating the sensitivity of each land parcel along the proposed development.

3.2.3.1 Sensitivity

9 In this evaluation, the main criterion in determining the sensitivity of a land parcel is the enterprise type. Land quality and farming intensity are also considered. The range of sensitivity values range from very low, low, medium, high and very high. The criteria for categorisation of sensitivity are shown in **Table 3.1**.

[4] A land parcel is land owned as determined from the land registry mapping. The land parcel may not be the entire holding of a landowner.

Table 3.1: Criteria for Categorisation of Sensitivity

Sensitivity Category	Enterprise Type	Characteristics
Very High	Experimental Husbandry Farms. Stud Farms (large scale equine, breeding regionally and nationally important horses). Race Horse Training Enterprises.	Rare and important on a regional or national basis. There is limited potential for substitution due to specific facilities and internal farm layout.
	Intensive Livestock enterprises (pigs and poultry), Commercial tree plantations and Mushroom Farms. Intensive Horticultural Enterprises.	Very high potential for change if a tower or overhead line is located on these enterprises. In the case of pig and poultry farms there is a limited potential for substitution due to difficulty in obtaining suitable alternative sites.
	Commercial Forestry Plantations	Very high potential for change within a 74m wide corridor of the overhead line (OHL) in commercial forestry.
High	Dairy Farms.	Any impact that restricts the movement of livestock to and from the farm hub will have a high potential to cause change. These farms generally have a specific grazing paddock layout to allow access to the farm yard – which is difficult to substitute.
	Equine enterprises (significant enterprise on the farm but not including intensive Stud Farms).	
Medium	Beef Farms, Sheep Farms.	The potential for change is lower than dairy farms because livestock generally do not have to be moved on a daily basis and the grazing layout requirement is less rigid than on dairy farms.
	Equine Enterprises (not a significant enterprise on the farm).	Crops and cropping programmes are less sensitive to change in the longer term.
	Tillage and field cropping, grass cropping farms (hay or silage)	There is less restriction on substituting the land in these enterprises.
Low	Rough Grazing and Commonage, Low Stocking rate.	The potential for change is low because the scale or intensity of enterprise is so low that there is a low response to impacts.
Very Low	Little or no agricultural activity e.g. Woodland, Bog.	The potential for change is very low because the scale of enterprise or intensity of enterprise is so low that there is a very low response to impacts.

(Source: Table 3.1 is based on the EPA guidelines 2002 and the Design Manual for Roads and Bridges (DMRB) 2008. The EPA guidelines 2002 define sensitivity as the "*Potential of a receptor to be significantly changed*". The concepts of Importance, Rarity and Potential for Substitution are introduced in Table 2.1 Volume 2, Section 2, and part 5 of DMRB 2008).

10 Sensitivity may vary from indicated values due to professional judgement and depending on site specific factors. Examples of such site specific factors include:

- The presence of specialised facilities on affected land parcels e.g. dog training tracks and horse race / training tracks; and
- Where land parcels have livestock or crops which have a value or importance which is above the normal for this type of farm, the sensitivity value may be increased. Possible examples are experimental sites and rare breeds.

3.2.4 Evaluation of Magnitude of Impacts

11 The elements of the proposed development which will cause potential impacts on the agronomy environment are identified in **Section 3.5**. The magnitude of the impact is the scale of impact due to the proposed development and are assigned values ranging from very low to very high. The probability and duration of occurrence is also considered. The criteria and methodology for evaluation of impact magnitude are set out in **Table 3.2**.

Table 3.2: Criteria and Methodology for Evaluation of Impact Magnitude

Magnitude	Determining Criteria
Very High	A permanent restriction on the operation of a land parcel or site where the location of towers or OHL permanently restricts a vital operational aspect of an enterprise. For example a permanent change in land or forest area of approximately 15% (or more) or the removal of critical buildings or the restriction of access to an intensive enterprise (e.g. pigs, poultry, horticulture).
High	A permanent restriction on the operation of a land parcel or site where the location of towers or OHL permanently restricts an important operational aspect of an enterprise. For example a permanent change in land or forest area of approximately 10-15% or the removal of standard cattle or sheep buildings in a conventional farmyard. Construction phase impacts without mitigation could in rare situations have a high magnitude of impact (e.g. significant damage to land drainage, allowing livestock to stray onto public roads).
Medium	A permanent restriction on the operation of a land parcel or site or where for example a permanent change in land or forest area of approximately 5-10%. Where access to land or farmyard is restricted but there is alternative access. Where the development of, or expansion of, a farmyard is restricted but there is alternative land available for this development. Construction phase impacts without mitigation will generally result in medium magnitude impacts (for example poor re-instatement of fences of land, rutting along access routes not being reinstated or levelled).
Low	A permanent change in land or forest area of approximately 1-5%. The presence of multiple tower sites and a central alignment of the OHL will tend to give a low impact.

Magnitude	Determining Criteria
Very Low	A permanent change in land or forest area of approximately 1% (or less). The presence of one tower site in an average sized land parcel and an alignment of the OHL at the edge of the farm will tend to give a very low impact.

(Source: Based on author's experience in assessing magnitude and significance of impacts.)

12 The criteria in **Table 3.2** are indicative and are subject to a qualitative evaluation of impact based on professional judgement. Consideration is also made as to the likelihood, frequency and probability of an impact occurring.

3.2.5 Evaluation of Significance of Impact

13 The significance of the impact is the importance of the outcome of the impact or the consequences of the change. The EPA *Advice Notes on Current Practice (in the preparation of Environmental Impact Statements)* (September 2003) contain guidelines for describing the significance of impacts. The significance of impact is determined by evaluating the magnitude of the impact and the sensitivity of the affected land parcel. **Figure 3.1** gives a guide for determining the level of significance of impact.

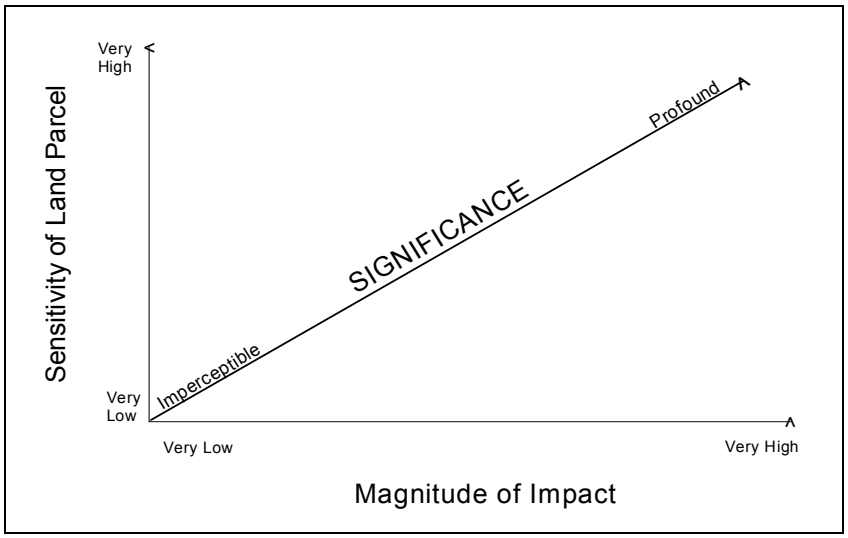

Figure 3.1: Significance of Land Parcel Impacts[5]

[5] Based on Design Manual for Roads and Bridges (UK) Vol 11, Section 2 part 5, Determining Significance of Environmental Effects (2008, published by the UK Highway Authority).

14 The significance of the impacts is described as follows:

- An 'Imperceptible' impact is either an impact so small that it cannot be measured or is capable of measurement but without noticeable consequences;
- A 'Slight Adverse' impact causes noticeable changes in the operation of an enterprise on a land parcel in a minor or slight way;
- A 'Moderate Adverse' impact changes a land parcel causing operational difficulties that require moderate changes in the management and operational resources;
- A 'Major Adverse' impact changes a land parcel so that the enterprise cannot be continued, or if continued will require major changes in management and operational resources; and
- A 'Profound Impact' changes the land parcel in a way that it obliterates the land parcel enterprise.

3.2.6 Consultation

15 The Department of Agriculture, Food and the Marine (DAFM) and ESB were consulted in relation to the proposed development. In addition all landowners along the proposed route alignment were written to and offered an agricultural assessment. (Refer to the *Public and Landowner Consultation Report* in **Volume 2B** of the application documentation and Chapter 3, **Volume 3B** of the EIS for details on scoping and statutory consultation).

3.2.7 Difficulties Encountered

16 These issues are dealt with in **Volume 2B**, *Public and Landowner Consultation Report*, of the application documentation and Chapter 3, **Volume 3B** of the EIS for details on scoping and statutory consultation. The majority of the landowners along the proposed alignment chose not to engage with the agronomist which presents the following difficulties for the assessment.

Difficulty Confirming the Full Extent of Landowner's Farms

17 Land registry mapping is available for all of the proposed alignment and along the proposed temporary access routes. Reliance on land registry mapping as the only source of information on land ownership will lead to both an overestimation of the number of farmers affected and an underestimation of the area farmed (e.g. some of the land farmed may be registered in a spouse's name or in a relative's name). The magnitude of impact in this EIS is partly based on the percentage of the land parcel restricted under the towers, at working sites and along temporary access routes. The consequence of underestimating areas of land farmed is that the

magnitude of impact tends to be overestimated. This is an acceptable consequence in the context of this proposed development where the impacts are generally low.

Difficulty Confirming Enterprise Types

18 The standard practice in land use assessments is to categorise the baseline sensitivity. Farm enterprise is an important criteria in this categorisation. This information is generally obtained from a combination of landowner interviews, roadside surveys and examination of aerial photography. The consequence of incorrectly identifying a high sensitive farm as medium sensitive is that the significance of impact would be underestimated (refer to **Figure 3.1**). However the author is satisfied that the evaluation of land parcel sensitivity is adequate based on the following reasons:

- Roadside surveys and examination of aerial photography have accurately identified very high sensitive land parcels (e.g. commercial forests, stud farms, poultry farms, Teagasc experimental husbandry farms and intensive horticultural enterprises with glass houses & poly tunnels).
- The main difficulty encountered is determining whether grass enterprises were medium sensitivity (beef and or sheep) or high sensitivity (dairy and equine) in situations where livestock were not seen on the land parcel. In order to assess sensitivity in these situations other aspects of the land parcel were examined such as, presence of a farm yard, presence of stables, presence of milking facilities, presence of access suitable for a milk lorry, access into adjoining land parcels (if any) and a well-developed farm paddock system.
- An evaluation was conducted for each land parcel.
- The 2010 National Census of Agriculture is referred to, which provides an accurate description of the baseline environment and therefore the expected enterprise mix along the proposed alignment.

Difficulty in Specifying Land Use Mitigation Measures for Inclusion in the Design, Construction and Operation of the Proposed Development

19 The nature of the proposed development is different from road infrastructural projects because farms are not divided and access is not significantly affected. The land utilisation under the OHLs will not change significantly. The impacts are lower than for road infrastructural projects and there is no requirement for constructed accommodation works for land use purposes. In common with other infrastructural projects, this proposed development reduces overall impact by minimising the overall length, minimising the number of towers and avoiding farm yards. Therefore, although engagement with landowners is desirable, the design of the proposed

alignment is not as reliant on landowner engagement as road projects. For this development if landowners engaged with the project team then additional land use mitigation could have been provided (e.g. placing towers on some field boundaries) and alternative locations for temporary access routes could be specified. While this may result in outcomes that are more satisfactory for landowners, it would result in a lower impact in a very small number of cases. Therefore the consequence due to limited landowner engagement on the design of the proposed development is not significant from a land use point of view. The construction and operation mitigation measures are informed by the author's own experience as an agricultural consultant and reference is made to the ESB / IFA agreement. There is no significant consequence due to limited landowner engagement on construction and operation mitigation measures.

3.3 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

20 The characteristics of the proposed development which have the potential to create impacts on land uses arise from the specific locations of towers and the OHL on lands.

21 During the construction phase, the construction sites around the towers, guarding locations, the stringing sites and the temporary access routes have the potential to cause adverse, albeit largely temporary effects. There will be potential disturbance where trees are located within their falling distance from the OHL infrastructure, and where these need to be felled. Forestry plantations within a maximum 74m wide corridor will be cleared. A detailed description of the proposed development and how it will be constructed is presented in Chapters 6 and 7 of **Volume 3B** of the EIS.

3.4 EXISTING ENVIRONMENT

3.4.1 Land Use Along the Proposed Alignment

22 The CMSA is shown in Figures 3.2 - 3.9, **Volume 3C Figures** of the EIS. **Table 3.3** presents and compares the CSO 2010 Agricultural Census (hereinafter referred to as the 2010 Census) statistics and data from the agricultural evaluation.

Table 3.3: Agricultural and Forestry Statistics for County Cavan, County Monaghan, the State and Land Parcels evaluated along the Proposed Alignment

	Typical Sensitivity	Statistics for County Cavan	Statistics for County Monaghan	State Statistics	Evaluated Land parcels
Average size (ha)	-	26.4	23.3	32.7	10.8
Number of land parcels / farm	-	3.5	3.6	3.8	-
Dairy Farms (% of total number)	High	11.2%	13%	11%	97.5[6]%
Beef, sheep, silage & hay farms, rough grazing (% of total number)	Medium	86.5%	81.5%	83%	
Tillage farms (% of total number)	Medium	0.1%	0.5%	3%	0%
Mixed crops and livestock farms (% of total number)	Medium	0.2%	0.3%	2%	0%
Other enterprises (e.g. pigs, poultry, horticultural cropping, equestrian as the main enterprises) (% of total number)	High	2%	4.7%	1%	2.5%
Forestry (% of total land area)	Very High	8%	5%	10%	0%
Horticultural area (vegetable crops, fruit, nursery, other crops – table 7D of 2010 census) (% of total area)	High - Very high	0.05%	0.02%	0.2%	0%

(Source: The data in the last column is based on the author's evaluation of land parcels along the proposed development. Data in the remaining columns is based on the *National Forestry Inventory* (2007) (Republic of Ireland) published by the Forestry Service, Department of Agriculture, Fisheries and Food and 2010 Census of Agriculture (CSO)).

[6] Excluding forestry and based on visual inspections of land parcels along the proposed development and contact with landowners – 7% are dairy, 53% are beef and / or sheep and 37.5% are unconfirmed grass enterprises (of which 1.5% are scrub and bog land parcels).

23 The 2010 census data for County Monaghan gives a good indication of the agricultural and horticultural holdings along the proposed development within County Monaghan.

- Farms in County Monaghan are smaller than the average farm in the state (23.3ha vs 32.7ha) and, on average, farms in County Monaghan will have 3.6 separate land parcels per farm (Tables 1 and 28 of 2010 census).

- The standardised economic output per farm (Table 3 of 2010 census) is €45,500 in County Monaghan compared to the state average of €30,700 (and €41,953 for surrounding counties). The relatively high output per farm (considering the smaller than average size) can be explained by a higher proportion of other enterprises (pigs, poultry and mushroom).

- There are 1.2 standard work units employed on County Monaghan farms which is the same as the average standard work unit per farm in the state (Table 38 of 2010 census). Farming is the sole or major occupation of two thirds of County Monaghan farmers which is similar to the state (Table 36 of 2010 census).

- Compared to the statistics for the state as a whole, there are a significantly higher proportion of other type enterprises, slightly higher proportion of dairy enterprises, slightly lower proportion of beef, sheep and grass cropping farms and a lower proportion of tillage farms. The percentage of land in forestry is less than the state average. The percentage of total area sown to horticultural crops in County Monaghan is less than the average for the state and the area sown to potatoes is very low (5ha- Table 7D of the 2010 census). Table 8D of the 2010 census indicates that 5% of farms in County Monaghan will have brood mares with an average of approximately three mares per farm (this is similar to the state average).

24 The 2010 census data for County Cavan will give a good indication of the agricultural and horticultural holdings along the proposed development within County Cavan.

- Farms in County Cavan are smaller than the average farm in the state (26.4ha vs 32.7ha) and on average farms in County Cavan will have 3.5 separate land parcels per farm (Tables 1 and 28 of 2010 census).

- The standardised economic output per farm (Table 3 of 2010 census) is €34,500 in County Cavan compared to the state average of €30,700 (€30,636 for surrounding counties).

- There are 1.2 standard work units employed in County Cavan farms which is the same as the average standard work unit per farm in the state (Table 38 of 2010 census). Farming is the sole or major occupation of two thirds of County Cavan farmers which is

similar to the state (Table 36 of 2010 census).

- The farm types in County Cavan are similar to those of the state except for slightly higher proportion of beef, sheep and grass cropping farms and a lower proportion of tillage farms. The percentage of total area sown to horticultural crops in County Cavan is less than the average for the state and the area sown to potatoes is very low (7ha - Table 7D of the 2010 census). Table 8D of the 2010 census indicates that 3% of farms in County Cavan will have brood mares with an average of approximately three mares per farm (this is similar to the state average).

25 The construction material storage yard is a 1.4ha grass field adjoining the N2 south of Carrickmacross. This field will be returned to agricultural production after the construction is completed. A total of 222[7] land parcels are evaluated for impacts along the proposed development. The potential impacts on these land parcels are summarised in **Appendix 3.1, Volume 3C Appendices** of the EIS. The land parcel enterprises evaluated along the proposed alignment are as follows:

- 118 are beef and or sheep enterprises;
- 15 are dairy enterprises;
- 83 are grass land parcels where the farm enterprise is unconfirmed, four of which are bog and scrub plots;
- Five equine enterprises (Ref No LCT- 091, 107, 149, 223A and 232); and
- One intensive agriculture enterprises (LCT- 011, 012 and 013).

3.4.2 Soils Types in Land Parcels along the Proposed Alignment

26 In this section reference is made to *Soils & Subsoils Class* digital data downloaded from the EPA website in September 2013[8]. The main soil types of land parcels along the proposed development in the CMSA are:

- Approximately 50% of soil in land parcels along the proposed alignment in counties Monaghan and Cavan is a mineral soil EPA Code 3. This is categorised as a deep heavy soil which generally has poor drainage characteristics. However this soil can be drained and the drumlin hilly topography can aid drainage. While this soil can be good

[7] One additional farm, LMC-168, is partly within the CSMA and MSA – the appraisal for this farm is included in Chapter 3, **Volume 3D** of the EIS.
[8] Prepared by the Teagasc Spatial Analysis Group at Kinsealy Research Centre (in collaboration with EPA, Department of the Environment, Heritage and Local Government, Forest Service and GSI).

quality from an agricultural point of view it tends to be heavy with restricted drainage. The soil type is evenly distributed in land parcels along the proposed development.

- Approximately 20% of land in affected parcels in the CMSA is a mineral soil EPA Code 1. This is categorised as a deep well drained good quality soil. The soil type is evenly distributed in land parcels along the proposed development.

- Approximately 20% of land in affected parcels in counties Monaghan and Cavan is a mineral soil EPA Code 2. This is categorised as a shallow well drained soil. The quality of this soil is variable with some areas having shallow rocky soils. The distribution of this soil type is widespread but it occurs as the dominant soil in land parcels in Lemgare, Lisdrumgormly and Annaglough.

- Approximately 10% of land in land parcels in the CMSA is bog and wet peaty type soils EPA Code 6 (poor quality from an agricultural point of view). These soils occur mainly in low lying areas adjoining lakes.

27 The visual evaluation of land parcels along the proposed development in counties Monaghan and Cavan suggests that land quality is mixed but the majority is reasonably good quality, heavy land. The topography is hilly (drumlin belt). Artificial land drainage systems are a feature of the land along the line route.

3.4.3 Categorisation of Land Parcels

28 The results of the evaluation and categorisation of agricultural land parcels along the proposed development in the CMSA are shown in **Appendix 3.1, Volume 3C Appendices** of the EIS. These land parcels are categorised based on the criteria described in **Section 3.2.3**. The sensitivity of land parcels along the proposed development is as follows:

- 1% (2 No.) are categorised as very high sensitive with one stud farm (Ref. No. LCT-091) and one intensive agriculture (pigs and / or poultry) enterprises (Ref. No. LCT-011, 012 and 013).

- 9.5% (21 No.) are categorised as high sensitive with 14 dairy enterprises, four equine enterprises (Ref. No. LCT-107, 149, 223A and 232) one beef and forestry enterprise (Ref No. LCT-225 and two unconfirmed grass enterprises (Ref No LCT- 089, 146A and 147A).

- 87% (193 No.) are categorised as medium sensitivity (including the construction material storage yard). These are beef cattle and / or sheep and unconfirmed grass enterprises which are land parcels where livestock were not seen but were evaluated as medium sensitive - in many cases these were meadows.

- 2.5% (6 No.) are categorised as low or very low sensitivity. These are four poor quality land parcels (Ref No LCT- 025, 109 and 235A), and two small land parcels (Ref No LCT-122 and LCT-177A).

3.5 POTENTIAL IMPACTS

3.5.1 Do Nothing

29 In the case of the 'Do Nothing Scenario' there would be no impacts on the environment and there would be no change to the existing environment.

3.5.2 Construction Phase

30 The construction phase impacts are those impacts that may potentially affect land parcels during the projected 36 month period of the construction programme. Chapter 7 of **Volume 3B** of the EIS describes the five stages of the construction programme for the OHL. The stages are summarised here:

- Stage 1 – Preparatory Site Work (1 – 7 days);
- Stage 2 – Tower Foundations; standard installation (3 – 6 days), pilling installation (5 – 10 days);
- Stage 3 – Tower Assembly and Erection and Preliminary Reinstatement (3 – 4 days);
- Stage 4 – Conductor / Insulator Installation (7 days); and
- Stage 5 – Final Reinstatement of Land (1 – 5 days).

31 Taking the maximum duration of works figures for Stages 1 – 5 above, the construction work at one tower should be completed within 32 days or 1 month. However, because the contractor will be working on several tower locations at one time, the construction work will be spread over a six to eight week period at each tower site, up to Stage 3. After Stage 3 there will be a period of inactivity until Stage 4 and Stage 5 works are completed at a later date.

3.5.2.1 Construction Traffic

32 The construction vehicles required for Stages 1 – 3 are described in Chapter 7, **Volume 3B** of the EIS). Typical vehicles accessing agricultural land are; 4x4 jeep, 360˚ tracked excavator (up to 22 tons), wheeled dumper or track dumper (up to 8 tons), transit van, cement lorry (up to 38 tons) or dumper if ground conditions and terrain are not suitable, goods lorries and tractor and trailer.

3.5.2.2 Construction Impacts

33 The potential impacts during the construction phase are:

- Wheel rutting and compaction along temporary access routes and at construction and winching sites, will cause damage to soil at all stages of the construction programme. Rutting will restrict machinery operations, such as fertiliser spreading, spraying and harvesting. The damage will be dependent on ground conditions and weather. Damage would be worst at tower construction sites.

- There is potential for general disturbance to farm enterprises at all stages of the construction programme. Construction activities and traffic could interfere with users of existing and temporary access routes and could generate noise and dust. The movement of construction traffic could disturb livestock. Grazing livestock are generally familiar with the landowner and his machinery and may be disturbed when different machinery and personnel are introduced on to a farm, particularly horses, young cattle and suckler cows. As well as the land lost to arable crops and grassland, temporary access routes and construction sites may cause temporary separation or unavailability of land. For example, access for dairy cows to a milking parlour or access for livestock to water sources could potentially be interfered with. In the unlikely event that rock breaking or piling is required the resulting loud sudden noise could cause a 'fight or flight' response in livestock. There is an increased risk of livestock escaping via new temporary access points or due to gates being left open or failure to make fences stock-proof. Farming operations may be interrupted or take longer to complete as a result of the construction activity. Landowners may have to spend additional time organising their farm enterprise.

- At construction Stage 1, disturbance may occur as a result of the preparation of the tower construction areas and temporary access routes.

- There is an increased risk of spreading animal and crop diseases (soil borne crop diseases) due to personnel and machinery moving between farms at all stages of the construction programme. Construction machinery using existing tracks / roads or accessing land through farm yards increases the risk of spreading farm diseases, because the construction machinery may encounter accumulations of animal manure. Construction machinery may inadvertently spread soil borne diseases particularly in potato and vegetable cropped fields.

- The construction of the proposed development may have direct impacts on Area Based Farm Payments (e.g. Areas of Natural Constraint (ANC) Payment Scheme, 2015 Basic Payment Scheme (BPS) and 2015 Greening Payment Scheme). These payments are dependent on the Utilisable Agricultural Area (UAA) which in certain situations will be

reduced due to temporary access routes and construction sites. The implementation of Nitrates Regulations on farms is sensitive to reductions in UAA. The payments of other farm schemes such as the Agricultural Environmental Options Scheme (AEOS) and Green, Low-carbon Agri-environmental Scheme (GLAS) are also based on the UAA. Certain Agri-Environmental Options may be affected by the location of temporary access routes and construction sites (e.g. Species Rich Grassland Option and Traditional Hay Meadow Option). In the case of Area Based Payment schemes and Nitrates Regulations the reduction in UAA due to the proposed development is generally less than 1-2% of the area farmed and the larger area reductions are generally temporary (e.g. at tower construction sites). In relation to Agri Environmental Schemes, the DAFM will review individual cases on a case by case basis.

- Tree felling in forestry plantations would have a very low to very high impact depending on the proportion of the plantation felled. Opening up the plantation may increase windfalls. Besides the provision of stock proof fencing, the only mitigation is compensation. The cleared land can in certain situations be sown with grass.

- At construction Stages 1 and 3, there is the potential for land drains to be disturbed during excavation.

- At the tower construction sites, any spillages of fuel oil could contaminate soil and surface water.

- In construction Stage 2, spillages of concrete may occur which could contaminate soil and surface water.

- Any potential surface water run-off from soil excavations into water courses could temporarily contaminate drinking sources for cattle.

- There are two line crossings which will require alterations to existing transmission OHL structures. The first is located between Towers 130 and 131 (Drumroosk, Co Monaghan) where the proposed development will cross the existing Lisdrum – Louth 110 kV line. This will require replacing the existing 110 kV poleset IMP 56 with a replacement wood poleset immediately adjacent and erecting two new 110 kV polesets at either side of the 400 kV crossing. Therefore there will be three additional work sites along the existing 110 kV line - similar in scale to guarding locations. The minimum ground clearance for a 110 kV conductor of 7 m will be maintained for the Lisdrum – Louth 110 kV line. The combined impact of the modification to the existing 110 kV line and the construction of the 400 kV Line will result in a moderate adverse impact on LCT-064 and a slight adverse impact on LCT-065.

- The second line crossing is located between Towers 180 and 181 (Corrinenty, Co Monaghan) where the proposed development will cross the existing Louth – Rathrussan 110 kV line. This will require replacing the existing 110 kV poleset IMP 100 and existing 110 kV steel Tower INT 101 with two new wood polesets. At poleset IMP 100, the replacement poleset will be placed in an excavation immediately adjacent to the butt of the old wood poles and the existing structure will be retired. At intermediate Tower INT 101, the existing steel structure will be retired. The replacement wood poleset at position 101 will be erected at the same location as the old intermediate tower. Therefore there will be two additional work sites along the existing 110 kV line - similar in scale to guarding locations. The minimum ground clearance for a 110 kV conductor of 7 m will be maintained for the Louth – Rathrussan 110 kV line. The combined impact of the modification to the existing 110 kV line and the construction of the 400 kV line will result in imperceptible impacts on three land parcels (LCT-146A & 147A, LCT-147B and LCT-147C) and a slight adverse impact on one land parcel (LCT-147).

34 Where the mitigation measures identified in this EIS are implemented, the significance of these construction phase impacts in **Appendix 3.1, Volume 3C Appendices** of the EIS may be summarised as:

- 193 land parcels along the proposed development within the CMSA are predicted to have an imperceptible impact – 87% of total number;
- 28 land parcels along the proposed development within the CMSA are predicted to have a slight adverse impact – 12.7% of total number;
- There is one moderate adverse impact (0.3% of total number) at the construction materials storage yard; and
- There are no major adverse or profound construction impacts.

35 The evaluated significance is relatively low and is dependent on the temporary nature of construction impacts. In line with EPA guidance, temporary impacts have a lower significance than permanent impacts. Without mitigation the impacts would be longer term in nature and therefore the significance would increase dramatically. Construction traffic will have to use existing private farm tracks to access working areas. The impact on land parcels along these tracks is evaluated to be imperceptible.

3.5.2.3 Construction Materials Storage Yard

36 The land use for where the construction materials storage yard is proposed is agricultural. The top soil at the construction compound will be stripped back and replaced with a hard core

surface. There will be long term soil compaction at the site due to machinery and storage of materials. There is the potential for soil and water contamination due to spillages of fuels or materials. These issues will be addressed in the CEMP. Following completion of the construction the site will be re-instated and can be used for agriculture again.

3.5.3 Operational Phase

37 The potential impacts during the operational phase are outlined below.

3.5.3.1 Noise Impacts

38 Noise sources from the OHLs are described in detail in **Chapter 9** of this volume of the EIS. These noise sources include operational noise sources from the OHLs and noise generated during maintenance works.

3.5.3.2 Permanent Disturbance

39 Permanent disturbances as a result of the proposed development are:

- Maintenance works will cause infrequent disturbance during the operational phase (Chapter 7, **Volume 3B** of the EIS). Emergency patrol crews may have to access land, particularly after extreme weather events. Routine maintenance work involves foot patrols to examine OHLs and towers every five years, tower painting at approximately 35 to 40 years and replacement of 25% of shield wire and 5% of insulators at approximately 30 years. Routine maintenance work, as carried out on the existing OHL network, may result in very low levels of disturbance.

- The towers will be a physical obstacle to farm machinery operations. In grassland fields the bases of the towers may be grazed but it will not be possible to reseed or manage them to their full potential. Silage will not be harvested from the area directly under the tower and there will be small inaccessible areas around the tower where silage may not be harvested. In tillage fields there will be uncropped areas under and around the towers.

- The area under the towers may act as reservoir for weeds species, some of which are referred to in the *Noxious Weeds Act* and therefore place an extra responsibility on landowners to control them.

- The construction activity at the tower, guarding and stringing sites and traffic along temporary access routes will cause soil damage which will be evident in the medium term during the operational phase. A higher level of damage can be expected at the

construction materials storage yard where the effects will be longer term due to the intensity of vehicular activity at this site.

- The presence of the towers and OHLs will have direct impacts on the operation of farm schemes during the operational phase. Area Based Payments are dependent on the UAA which in certain situations will be reduced due to the presence of towers. The implementation of Nitrates Regulations on farms is sensitive to reductions in UAA. The payments of other farm schemes such as the AEOS and GLAS are also based on the UAA. Certain Agri Environmental Options may be affected by the location of towers (e.g. Species Rich Grassland Option and Traditional Hay Meadow Option) and tree planting options may be affected under the OHLs. In relation to Agri Environmental Schemes, the DAFM will review individual circumstances on a case by case basis and if possible alternative sites on the farm will be agreed with the landowner (e.g. for tree planting options).

3.5.3.3 Farmyard Development

40 The presence of the OHL may restrict construction of some agricultural and horticultural buildings.

3.5.3.4 Impact on Commercial Forestry

41 There are no impacts on commercial forests along the CMSA alignment.

3.5.3.5 Health and Safety Risks

42 The minimum ground clearance to the proposed 400 kV OHL will be 9m and the minimum ground clearance, following modifications, to the existing 110 kV OHLs will be 7m. In general, most farm machinery activities can take place safely under these electricity lines (e.g. fertilising, low trajectory slurry spreading, spraying, crop harvesting) but there may be unacceptable risks associated with transporting exceptionally high loads (e.g. bales), irrigating crops with rain guns, high trajectory spreading of slurry and using machinery with loader attachments under the electricity lines.

3.5.3.6 Electric and Magnetic Fields

43 Electric and Magnetic Fields (EMF) are described in **Chapter 5** of this volume of the EIS. There are no known adverse effects on livestock or crops as a result of EMF.

3.5.4 Decommissioning

44 The proposed development will become a permanent part of the transmission infrastructure. The expected lifespan of the development is in the region of 50 to 80 years. This will be achieved by routine maintenance and replacement of hardware as required. There are no plans for the decommissioning of the OHL. In the event that part of, or the entire proposed infrastructure is to be decommissioned, all towers, equipment and material to be decommissioned will be removed off site and the land reinstated. Impacts would be expected to be less than during the construction phase and would be of short term duration.

3.6 MITIGATION MEASURES

3.6.1 Construction Phase

45 During the design phase, impacts have been mitigated by minimising the number of towers having regard to requirements imposed by technical and environmental constraints and constructing an OHL development that is structurally sound and safe.

46 Tower sites have been located away from farm yards, where possible and reasonable efforts made to involve landowners in discussions regarding location of towers.

47 Prior to commencement of work, the construction contractors will prepare method statements and work programmes in relation to the detailed phasing of work in line with the phasing outlined in the application documentation. A wayleave agent will be appointed by the contractor to liaise with the landowners along the line route and ensure that their requirements for entry are met, so far as is possible and that landowners are made aware of the schedule of works to be carried out on their land.

48 All employees and contractors involved in the construction phase will receive adequate training in particular in relation to issues relating to livestock safety and bio security on farms.

49 Landowners will be notified in advance of the commencement of construction.

50 The contractor will ensure that landowners have reasonable access to all parts of their farm during the construction phase.

51 Disease protocols will be adhered to. As referenced in the ESB / IFA agreement, the contractor will comply with any DAFM regulation pertaining to crops and livestock diseases.

52 Where required, fencing will be erected to exclude livestock from construction sites.

53 In most situations, mitigation measures for noise will not be required during the construction phase. This is because livestock will quickly adapt to changes in their noise environment. In the unlikely event that rock-breaking or piling are required, owners of livestock in adjoining fields will be notified in advance.

54 It will be construction policy to minimise non tracked vehicular access to sites in wet weather. Temporary aluminium or panel tracks will be used in certain situations to prevent damage to soil (see Chapter 7, **Volume 3B** of the EIS).

55 Excavations will be minimised. The locally excavated material will be reinstated surrounding the tower base following construction. All unused excavated fill will be removed from site and disposed of at a licensed waste facility.

56 Affected land drains will be redirected in a manner that maintains existing land drainage.

57 Where top soil is stripped back it will be replaced. All disturbed field surfaces will be reinstated.

58 Any losses or additional costs incurred by the landowner which are directly attributed to the proposed development, during the construction phase or the operational phase, including additional necessary remedial works and including losses and or additional costs arising from Area Based Payment Schemes, Nitrates Regulations and Agri Environmental Schemes will be paid to the landowner as per the ESB / IFA agreement.

59 Mitigation relating to potential effects on water quality and soil contamination due to fuel or concrete spillages are detailed in **Chapters 7** and **8** of this volume of the EIS.

60 Mitigation measures outlined in the CEMP in relation to land use will be implemented as part of the construction management. A summary of all mitigation measure are detailed in Chapter 11, **Volume 3B** of the EIS.

3.6.2 Operational Phase

61 The OHL infrastructure will be inspected and maintained as set out in Chapter 7, **Volume 3B** of the EIS.

62 Disease protocols will be adhered to during maintenance works.

63 ESB will provide safety information directly to all affected landowners e.g. HSA *Guidelines for Safe Working near Overhead Electricity Lines in Agriculture* and ESB Networks *Code of Practice for Avoiding Danger from Overhead Electricity Lines in Agriculture*. These publications will enable farmers to fulfil their statutory requirements under Health and Safety Regulations.

64 For general operational noise, there is no practical mitigation (refer to **Chapter 9** of this volume of the EIS) but the potential impacts on agricultural activities from noise are negligible. During maintenance works, mitigation will involve notification to landowners in advance of any construction activity.

65 Helicopter inspections will be announced in local newspapers and the Farmer's Journal.

66 Other damage and disturbance impacts which cannot be mitigated directly by the contractor will be addressed in the statutory compensation process. For example the land at construction sites and along temporary access routes may require subsoiling, ploughing and reseeding a few years after the construction period, if crop reestablishment is not satisfactory. Annual payments will be paid to landowners for the interference caused by the towers on their land.

3.7 RESIDUAL IMPACTS

67 Agronomy residual impacts are discussed under three headings:

- Residual impacts at a national and regional level;
- Residual impacts along the alignment in the CMSA; and
- Residual impacts on individual land parcels.

3.7.1 Residual Impacts at a National and Regional Level

68 The area of agricultural land (excluding commonage) in County Cavan is 139,374ha and in County Monaghan is 106,288ha (2010 census data). The combined area of both counties is approximately 5.5% of the national agricultural area.

- The area of land beneath the towers in County Cavan (within the CMSA) will be approximately 0.52ha. There will be short to medium term impacts due to damage to soil on approximately 8ha at construction sites and along temporary access routes. The impact is imperceptible based on the low percentage of total area affected.

- The area of land beneath the towers in County Monaghan will be approximately 2.2ha. There will be short to medium term impacts due to damage to soil on approximately 30.5ha at construction and stringing sites, at guarding locations and along access routes. There will be more long term damage to approximately 2ha of land at the construction compound. The impact is imperceptible based on the low percentage of total area affected.

- There will be no significant change in land use due to the location of the proposed OHL.

69 Overall the significance of residual impact on a regional or national level will be imperceptible.

3.7.2 Residual Impacts along the Proposed Development within the CMSA

70 The impact on the study area (approximately 2,390ha) within the CMSA, which consists of all the land parcels (No. 222) along the proposed development, is evaluated to be imperceptible based on:

- The total area (within CMSA) of land beneath the towers is approximately 2.7ha which is 0.1% of the area of land parcels along the proposed development within the CMSA;

- There will be damage to soil on approximately 40ha (38.5ha short – medium term and 1.4ha long term) which is 1.7% of the area of land parcels along the proposed development within the CMSA; and

- There will be no significant change in land use under the OHLs on land parcels along the proposed development.

3.7.3 Residual Impacts on Individual Land Parcels

71 The land parcel impacts in the operational phase are due to land use restrictions at tower sites, short to medium term damage caused to land during the construction phase, long term inconvenience and additional safety risk caused by presence of the electricity lines and towers and potential impacts caused to farm yards. Disturbance due to maintenance works will also contribute to land parcel impacts. Construction phase disturbance impacts are general short term (1 – 3 years) and with mitigation there should be no residual impact. Impacts due to damage to soil are short to medium term (5 – 15 years; based on author's experience) and with mitigation, lands can be restored to pre-construction condition. Impacts due to loss of land beneath the towers and impacts due to OHLs are permanent (>60 years). Intermittent disturbance due to maintenance works during the operational phase is a permanent impact (>60 years). Helicopter inspections will generally cause a 'fight or flight' reaction in livestock, particularly with sensitive animals such as thoroughbred horses and young livestock. The potential impact could be high. Given the rare occurrence of injury from 'fight or flight' events

the magnitude of impact with mitigation is low. The towers and OHLs will be an additional safety risk on farms, however the magnitude of impact is generally evaluated to be very low based on the existence of similar OHL infrastructure throughout Ireland. Overall magnitude of impacts on individual land parcels tend to be low or very low and the sensitivity of land parcels is medium in the majority of cases (90%). The magnitude and significance of the impact on each land parcel along the proposed development is shown in **Appendix 3.1, Volume 3C Appendices** of the EIS:

- There will be imperceptible impacts on 117 land parcels – 52.5% of total number;
- There will be slight adverse impacts on 91 land parcels – 41% of total number;
- There will be moderate adverse impacts on 14 land parcels – 6.5% of total number; and
- There will be no significant adverse or profound impacts.

72 The moderate adverse impacts on land parcels (reference numbers LCT- 051, 064, 089, 118, 129, 136, 141, 150, 174, 174A, 181, 214, and 226) arise where the OHLs oversail the land parcel in a manner that may impact on potential farm yard development. In addition, there is one moderate adverse impact on the construction materials storage yard due to long term damage caused to soil.

3.8 INTERRELATIONSHIPS BETWEEN ENVIRONMENTAL FACTORS

73 The main interrelationships between environmental factors include the following:

- **Chapter 6** - Flora and Fauna - Many farmers participate in Environmental Schemes funded by the Department of Agriculture, Food and the Marine, for example the Agricultural Environmental Options Scheme (AEOS). Environmental Options such as Species Rich Grass, Traditional Hay Meadows and Tree Planting may be affected by the placement of the OHLs and the towers. Therefore there is a potential impact on biodiversity on farms. In addition, if trees are cleared in the vicinity of OHLs there is a potential impact on shelter. Overall, the impact from the proposed development on the biodiversity on farms and the availability of shelter is imperceptible.
- **Chapter 7** - Soils, Geology and Hydrogeology - Soil quality will be affected by the construction works and there is a potential effect on land drainage. Both of these consequences of construction will have a negative impact on crop growth. With appropriate mitigation the overall impact is assessed to be negligible.

- **Chapter 8** - Water – During construction there is a potential effect on water quality due to surface run-off and this could impact on water sources for livestock. With appropriate mitigation this impact is negligible.

- **Chapter 9** - Air – Noise and Vibration - During the construction and operational periods noise may impact on livestock. Dust may be generated at construction sites and along access routes which may affect quality of crops. Maintenance works and helicopter inspections will cause noise that may have an effect on livestock. With appropriate mitigation this impact is imperceptible.

- **Chapter 10** - Air – Quality and Climate - Construction activity may cause dust to be deposited on agricultural land which can affect grazing livestock.

74 After evaluating these interrelationships there are no significant additional impacts.

3.9 CONCLUSIONS

75 The low level of landowner engagement presented some difficulties for the evaluation of the baseline environment, particularly with the identification of grass based enterprises where livestock were not seen. Despite these difficulties, a detailed evaluation was carried out on land use along the development in the CMSA using roadside surveying and examination of aerial photography. The proposed electricity development within the CMSA will have an imperceptible impact on land use arising from the construction of 134 towers on 2.7ha of land and 40ha of soil damage caused by construction activity. The residual impacts are either imperceptible or slight adverse on 93.5% of the land parcels along the proposed alignment within the CMSA. Thirteen (6%) moderate adverse impacts are due to potential restriction of farm yard development and one (0.5%) moderate adverse impact at the construction materials storage yard is due to damage to soil.