Table 6.4: Existing Noise Levels Measured During EIS Baseline Survey at John Holland's

Date	LAeq	LA90	LA95	LCPeak
29/03/2011	51.08	56.69	45.46	73.07
30/03/2011	51.03	56.6	45.41	74.17
31/03/2011	49.93	55.42	44.43	71.22
01/04/2011	49.23	54.64	43.81	75.35
02/04/2011	50.3	55.83	44.76	83.43
03/04/2011	51.26	56.89	45.62	85.89
04/04/2011	53.13	58.97	47.28	91.14
05/04/2011	51.79	57.48	46.09	86.97
06/04/2011	50.68	56.25	45.10	81.78
07/04/2011	50.32	55.85	44.78	83.15
08/04/2011	49.31	54.73	43.88	83.2
09/04/2011	49.16	54.56	43.75	79.9
10/04/2011	48.53	53.86	43.19	79.96
11/04/2011	48.15	53.44	42.85	80.21
12/04/2011	48.36	53.67	43.04	74.66
13/04/2011	47.86	53.12	42.59	73.9
14/04/2011	51.08	56.69	45.46	73.07
15/04/2011	53.8	59.71	47.88	83.03
16/04/2011	50.9	56.49	45.30	82.38
17/04/2011	49.36	54.78	43.93	85.88
18/04/2011	47.69	52.93	42.44	81.2
19/04/2011	45.61	50.62	40.59	79.35
20/04/2011	53.8	59.71	47.88	83.03

6.4 IMPACTS

During the operational phase of the proposed expansion of the poultry operation, there is a potential for increased site traffic and operational equipment including additional feed and water systems. As the footprint of the development expands, these noise sources have the potential to increase noise levels at these nearby properties. The fact that the proposed extension moves away from the nearest residences the risk of noise complaints is low

The main operational noise sources include:

- Site Traffic and
- Operational Equipment

The local road is currently used by heavy goods vehicles as a short cut to and from Foynes port as traffic congestion in Newcastle West can be a problem at times. As the road surface in place is of poor condition this will lead to increase noise.

6.4.1 Site Traffic and Operation Noise

Operational Noise:

- Transport - of livestock, supplies, wastes, etc.
- Operational activity - ventilation, birds (on stocking and emptying)

Mitigation of operational noise will involve the site operating during normal daytime working hours. Also, poultry house doors will be kept closed when possible.

The impact of noise on the surrounding environment is expected to be minimal, taking into account the remoteness of site location and the fact that no complaints of noise were made in relation to the existing development.

6.5 MITIGATION MEASURES

During the operation of the existing poultry facility measurements determined that noise levels are within the EPA noise limit criteria of 55dB L_{Aeq} and 45dB L_{Aeq} night time at the nearest noise sensitive locations. It is envisaged that the noise levels would not increase due to the fact that the additional two poultry houses on site are at further distance from the nearest noise sensitive locations.

In addition, good working practices will be maintained on site at all times including selection of plant equipment with a low inherent potential for noise emissions, maintenance of equipment and use of exhaust silencer where appropriate.

Mr Kenny has received assurances from suppliers and poultry factories that all delivery and collections will take place between 08:00 hrs and 17:00 hrs. This in turn will minimise the risk of noise complaints. The collection of birds may still take place after 22:00 hours due to bird welfare as the birds are more docile at night.

Likewise during the operational phase good working practices will be used including keeping doors closed, etc.

No mitigation measures are therefore proposed during the operational phase of this development with respect to noise and vibration. In general the distance between the new boundary and properties around the site will ensure noise levels at these locations will not cause any significant impact.

6.6 CONSTRUCTION IMPACTS AND MITIGATION

6.6.1 Impacts

This negative impact for the construction phase of the development will be moderate but will be short-term in nature. During the construction phase of the project, there is potential for a temporary increase in noise levels during site preparation and development. Traffic transporting fill material to and from the site in addition to plant equipment used for developing the additional poultry growing houses are the main potential noise sources during this phase.

The relevant British Standard for guidance on the prediction, assessment and control of construction noise and vibration is BS5228: Part 1: 1997: *'Noise and Vibration Control on Construction and Open Sites'*. While this document is not in force in Ireland, it contains a number of guidelines and recommendations that are considered appropriate and examples of good working practice for all

construction contracts. These guidelines are detailed below and should form the basis of control of any potential impact to noise sensitive locations.

A certain amount of noise will be generated by:

- Transport - of constructional supplies to the site
- Site traffic - vehicles moving around the site during construction
- The construction of the housing

Considering the site levelling and foundation phase will take approximately ten days and then after a few weeks for the installation of housing and associated works should only take approximately two weeks, the construction noise will be temporary in nature. Mitigation measures will involve carrying out construction work during normal working hours, avoiding early morning or late evening work. Neighbouring dwellings are far enough from the site so that noise should not be an issue.

Vibration
During the construction phase of the development, rock breaking may be required within parts of the site. Any vibration impacts during this phase will be imperceptible at the nearest noise sensitive locations to the site.

6.6.2 Mitigation

In order to aid in reducing the noise impact during this phase reference should be made to BS5228: *Noise control on construction and open sites*, which offers detailed guidance on the control of noise from demolition and construction activities. The following mitigation measures, taken from BS5228: *Noise control on construction and open sites*, will apply:

- Machinery with low inherent potential for generation of noise and/or vibration will be used;
- Noisy equipment will be sited as far away from sensitive properties as permitted by site constraints.
- Hours of construction will be limited so that noisy activities will be minimised during unsociable hours

6.7 RESIDUAL IMPACTS

With the application of binding noise limits and hours of operation during the construction phase, along with implementation of appropriate noise control measures as outlined above, the noise impact will be kept to a minimum.

The operational phase of the development is not considered to have a negative noise impact on its surrounding environment. The noise impact resulting from the development is not predicted to contribute to any significant levels of noise at the nearest noise sensitive locations surrounding the Pat Kenny's poultry growing operation.

During the operational phase of the development, noise levels are predicted to remain below the typically IPPC noise level limits at the nearest noise sensitive locations. This phase is envisaged to be of minor impact in terms of noise.

6.8 MONITORING

No monitoring is proposed, however if a complaint is received in relation to noise, an investigation will be commenced following the EPA guidance on noise monitoring.

7 LANDSCAPE AND VISUAL

7.1 INTRODUCTION

An assessment of the likely landscape and visual impacts of the proposed development by Pat Kenny to expand the existing capacity of the poultry growing operation will involve the assessment involved reviewing plans, sections and elevations of the existing, proposed scheme, various publications and reports, including other chapters of the Environmental Impact Statement, together with visits to the site and environs of the subject development.

7.2 METHODOLOGY

The assessment is made with regard to the vulnerability of the landscape to change and to the location of visual receptors relative to the proposed development. The methodology used in the assessment is based on the EPA Guidelines on the information to be contained in Environmental Impact Statements, 2002 and Advice Notes on Current Practice (in the preparation of Environmental Impact Statements), 2003.

7.2.1 Baseline Assessment

The buildings and structures at Pat Kenny poultry operation are constructed in line with planning permissions received from Limerick County Council. The existing poultry house is closer to residential dwelling compared to the proposed poultry house.

Therefore the likely landscape and visual impacts of the proposed development are assessed against a baseline which acknowledges that the existing poultry units are closer to residential dwellings which will continue to elevate in line with the conditions of planning permissions as granted by Limerick County Council.

7.2.2 Landscape

Landscape has two separate but closely related aspects.

The first aspect is **visual impact** that is the extent to which a new structure in the landscape can be seen. Visual impacts may be categorised under 'Visual Intrusion' and 'Visual Obstruction', where:

- **visual intrusion** is impact on a view without blocking, and
- **visual obstruction** is impact on a view involving blocking thereof.

In assessing visual impact, various aspects and stages are considered in detail including, impact during phasing, impact on completion and longer term established impact.

The second aspect is **impact on landscape character**, i.e. responses that are felt towards the landscape and draws on the appearance of the land, including aspect, land-use, topography vegetative cover etc. The character of the existing landscape setting is considered taking account of the various natural and man-made features, such as topography, landform, vegetation, land-use, the built environment.

7.2.3 Significance Assessment Criteria

The significance criteria used in the assessment are based on the impact levels suggested in the EPA Guidelines on the information to be contained in Environmental Impact Statements (2002), which are set out in this volume of the Environmental Impact Statements.

7.3 EXISTING ENVIRONMENT

7.3.1 Coolanoran Landscape Context

The existing poultry growing operation at Pat Kenny, Coolanoran, Newcastle West, is in an area which is relatively flat with existing poultry units well screened by hedgerows. While the buildings and structures associated with the plant are visible close to the entrance the poultry operation is well screened.

7.3.2 Landscape Setting

Pat Kenny's poultry operation is not visually prominent built feature in the locality and in addition there are other poultry units along the local road.

In effect, a number of agriculture and commercial operations exist in the area, including general supplies, Plumbing, poultry and beef farming operations. There is, therefore, amongst the rural surroundings a consistent theme of commercial and agricultural buildings. The Pat Kenny poultry operation is not the most prominent of these facilities and as a consequence it is not a significant influence on the landscape character of the surrounding area.

a. General Low-lying Agricultural Landscape

Rural, agricultural land with little topographic relief leads from the front to the rear of the site. The existing local road from the N21 to the R523. Much of the landscape surrounding the site is flat where levels are commonly below 60 to 120m. Throughout the area the land is farmed with fields enclosed with a varied mix of hawthorn (*Crataegus monogyna*) and blackthorn (*Prunus spinosa*) hedgerow, stone walls and fences. Pasture and grassland for silage predominates as a land use and there is little arable farming in the area. Residential property is generally dispersed along local roads.

b. Developed/Built-up Areas

Development is prominent at the town of Newcastle West with its associated commercial areas. Such development is considered part of the normal limerick landscape setting.

In addition, individual houses and clusters of residential development are dispersed along local roads.

7.3.3 Landscape Planning

The Inventory of Outstanding Landscapes in Ireland, prepared by An Foras Forbatha in 1997, is the only assessment of landscape quality undertaken at a national level. At a county level, Limerick County Development Plan is the statutory development control and forward planning document pertaining to the project area. Relevant landscape and visual references pertaining to the site and its surrounds are referenced in the following description of the landscape planning environment.

7.3.3.1 Inventory of Outstanding Landscapes in Ireland

The Inventory contains no listing within a 2km from Pat Kenny's Poultry Operation, Coolanoran and the proposed site does not fall within a listed Area of Outstanding Landscape.

7.3.3.2 Limerick County Development Plan 2010 - 2016

The Limerick County Development Plan, 2010 - 2016 as amended, contains the following relevant landscape and visual references.

Chapter 7 Environment and Heritage at **Section 7.2 Landscape and Visual Amenity** amongst other aspects considers issues relating to Trees, Tree Preservation Orders and Hedgerows and Landscape and Visual Amenity.

Under Sub-section 7.2.1 on Trees, Tree Preservation Orders and Hedgerows, the Plan sets out policies relating to enhancing tree cover within the county as follows:

[illegible]	It is the policy of the Council to preserve and enhance the general level of tree cover within the county, both in the countryside at large and also in the county's towns. The Council strongly encourages the establishment of native species, in particular broadleaf species.
[illegible]	It is the Policy of the Council to ensure the adequate integration of development into the landscape by the retention of trees and landscape features and/or encouraging suitable planting.

Under Sub-section 7.2.2 on Landscape and Visual Amenity, which the sets out policies relating to Landscape Character, Views and Prospects, Landscape and Amenity Views. Under its Landscape Classification Limerick County Council has identified ten Landscape Character Zones within the county.

7.3.4 "Do-Nothing" Scenario

Should the proposed development not proceed the existing poultry operation will remain and continue to be developed under the conditions of the existing planning permission.

7.3.5 "Do-Nothing" Scenario

Should the proposed development proceed the existing poultry operation will be expanded to 80,000 bird's capacity and will remain and continue to be developed under the conditions of the new planning permission.

7.4 CHARACTERISTICS OF THE PROPOSAL

7.4.1 Introduction

The construction of an additional poultry house with a capacity of 20,000 birds proposes to carry out a series of modifications to the site as set out in detail in **Chapter 2 Site layout and Construction** of the Environmental Impact Statement. In effect the principal landscape and visual aspect of the proposed development entails an expansion of the poultry growing operation.

The following assessment focuses on the proposed extension to the poultry operations.

7.5 IMPACTS

7.5.1 Impact Assessment

This involved examining the location of domestic dwellings and the location of the existing and proposed poultry house.

In assessing the impact the construction, operation and are considered, including construction, operation and restored.

7.5.2 Construction Phase of the Poultry House

The construction phase will have a relatively low landscape and visual impact. Aspects which pertain to the construction phase proper include:

- General site works,
- Vegetation removal,
- Excavations and stockpile of topsoil and subsoil, and
- The construction of the poultry house unit.

By its very nature all this activity will take place at a relatively low level and against the backdrop of the existing poultry houses with its various on-going activities. The final phase of the construction phase will be the erection of the poultry house.

7.5.3 Operational Phase

The nature and process by which the poultry houses will develop is an established and on-going feature of the existing environment. Furthermore given the relatively low lying nature of the landscape, It is considered that, the proposed development will *not have major significant 'landscape' impact.*

The completed additional poultry house will represent a minor feature in an otherwise low lying setting of the area. The additional two houses are behind the existing houses and further away from residential dwellings. Though the feature will remain as a permanent reminder of the activity, the additional impact of the proposed additional poultry house in the longer term is considered to be of *minor impact*, due to the hedgerows, topography and colouring of the sheds, screening by hedgerow, low lying topography and colouring of the proposed sheds.

7.5.4 Landscape Planning Impact

It is considered that the proposed development will have *no significant* landscape planning impacts. The development does not impinge on listed scenic views or prospects or on sensitive, vulnerable or designated landscapes.

7.5.5 Landscape and Visual Impact Summary

Given the nature and impact of the existing facility, it is considered that the proposed extension will not result in *major significant* overall *negative* landscape and visual impact. As a result it is considered that the proposal may be viewed as having an acceptable level of landscape and visual impact, though undoubtedly the proposal is to expand the capacity of the poultry operation

7.6 MITIGATION MEASURES

7.6.1 Landscape Treatments involving the Existing Poultry Operation and its Surrounds

Over the years Pat Kenny has managed and improved the hedgerows around the poultry operation. While the planting is maturing and only has visual presence at proximity, it adds to the diversity of habitat and landscape structure in the immediate surroundings and with continued development will assist in visually enhancing the hedgerow boundary.

In siting and designing the proposal to extend the poultry operation at Coolanoran, it is considered more appropriate in landscape and visual terms to incorporate the existing poultry growing operation feature and its setting rather than consider a new site location.

The existing poultry house have developed gradually over 20 years and is now as much a feature of the local landscape. The topography of the area and the hedgerows around the site results in the existing poultry house being well screened from domestic dwellings in the area around the operation.

7.7 RESIDUAL IMPACTS

Following the construction of the proposed development, there will be no significant impact in an overall landscape context. The continued management of the hedgerows and the maintenance of the poultry house will have no significant impact in terms of landspace and visual impact.

SECTION B – THE NATURAL ENVIRONMENT

This section of the Environmental Impact Statement deals with the potential effects of the proposed scheme on the natural environment. The effects have been grouped as follows:

- **Impacts on the Terrestrial Environment including flora and fauna.**
- **Impacts on the Aquatic Environment**
- **Impacts on Soil, Geology and Hydrogeology**
- **Impacts on Climate**

The various aspects of the natural environment interact to some degree with each other so that assessing one aspect in isolation can be misleading. For example the survival of terrestrial fauna can be dependent on floral composition, which is in turn dependant on soil composition and groundwater levels. Similarly the diversity of aquatic flora and fauna will be impacted by both hydrology and the quality of waters receiving drainage from the proposed scheme.

Human Beings also interact with the natural environment, often by altering landuse and landscape patterns for the purpose of agriculture and settlement.

8 TERRESTRIAL ENVIRONMENT

8.1 INTRODUCTION

This Chapter outlines the flora and fauna currently present in the area of the proposed extension to the existing poultry growing operation and assesses the impact of the proposal on the terrestrial habitats and species identified. Mitigation measures have been proposed where feasible. The ecological assessment involved walking over the site to identify habitats and species of flora and fauna present in order to determining the ecological diversity of this area.

8.2 METHODOLOGY

8.2.1 Flora

The habitats present were recorded and a list of Floravascular plants, lichen and mosses was compiled. Other details noted during the assessment included recording the presence of habitats, species, general abundance, condition of the vegetation, and the degree of disturbance.

Habitats have been classified in accordance to the standard recommended by The Heritage Council (Fossitt 2000). Plant nomenclature in this report follows Rose (2006) for vascular plants, Philips, (1980) for grasses, ferns, mosses and lichens. Attention is given to the possible presence of habitats, plant species that are legally protected under Irish and or European legislation. National Parks and Wildlife Service references to the site including maps of sites of conservation importance in the region and site synopsis were checked.

8.2.2 Birds

During the ecological assessment birds observations were recorded

- All species encountered (seen or heard) were recorded and where possible their abundance noted.
- Areas of Hedgerow within the survey area were surveyed

8.2.3 Mammals, Amphibians and Reptiles

The presence of mammals, amphibians and reptiles was surveyed by searching for direct observations and for signs of their presence such as feeding signs or dropping and dwellings.

8.2.4 Survey Limitations

The weather conditions were warm, wet and windy during the survey. It is not considered that limitations were associated with the survey of habitats and vegetation.

Every effort has been made to provide an accurate assessment of the situation pertaining to the site. However, an ecological survey can only assess a site at a particular time. This study is a snapshot in time and should not be regarded as a complete study.

8.3 DESCRIPTION OF EXISTING ENVIRONMENT

8.3.1.1 Designated Sites

The subject site itself is not designated under any Regional, National or European Environmental Designation. It does not therefore require assessment under the Wildlife (Amendment) Act 2000 (S.I. No. 38 of 2000) or the European Communities (Natural Habitats) Regulations, 1997 (S.I. No. 94 of 1997).

However the following designated areas are located in the Limerick region;

Site Code	Type of Designation	Distance from Site
Stack's to Mullagharirks (004161)	SPA	10 km
Curraghchase Woods (000174)	pNHA	23 km
Askeaton Fen Complex (002279)	SAC	18 km
Ballymorrisheen Marsh (001425)	pNHA	15 km
Lower River Shannon (002165)	SAC	22 km
Inner Shannon Estuary – South Shore (000435)	pNHA	19 km

SAC	Special Area of Conservation
SPA	Special Protection Area
NHA	Nature Heritage Area

8.3.1.2 Flora

GA1 Improved Grassland

The site comprises of improved grassland for silage making with some of the less well drained areas containing *Juncus sp.* The fields comprise improved agricultural grassland with White clover (*Trifolium repens*), Creeping Buttercup (*Ranunculus repens*) Dock species (*Rumex sp.*), Ribwort plantain (*Plantago lanceolata*) and Meadow Buttercup (Ranunculus acris).

WL2 Treelines

The field boundaries around site comprise of the native Ash (Fraxinus excelsior), Hawthorn (*Crataegus monogyna*) also present Sycamore (*Acer pseudoplatanus)*, with an understory of Bracken, Ivy (*Hedera helix*), and Hard Fern (*Blechnum spicant*).

Where boundaries earthen bank with drainage ditch and trees planted into the earthen bank.

Birds

During the walk over birds observations were recorded

- All species encountered (seen or heard) were recorded and where possible their abundance noted.
- Areas of Woodland within the survey area were surveyed by conducting of five-minute point counts.

8.4 IMPACTS

8.4.1 Do-Nothing

Should the expansion not be built there would be no impact on the site at the rear of the existing poultry growing operation.

8.4.2 Do-Something

8.4.2.1 Flora

There will be a loss of plant and animal species from the proposed footprint, particularly with regard to improved grassland. The impact on site boundaries including hedgerows and trees will be negligible. It is expected that only a small section of hedgerow will be removed as part of the construction

The site is of low ecological value with poor species diversity, improved grassland which is mowed from silage twice per year.

8.4.2.2 Designated Sites

The will be no impact on designated sites as the nearest designated site is more the 8 kilometres away.

8.4.2.3 Birds

Whilst no breeding birds of high conservation concern are likely to be impacted by the proposed expansion, the site does not hold of good quality breeding bird habitat which will be lost as a result of the development.

No birds of conservation concern were recorded onsite.

8.4.2.4 Mammals

The proposed development will result in a loss of improved agricultural land and this is considered to be an insignificant Impact.

8.5 MITIGATION MEASURES

The nature of the proposed development is such that the loss of improved agriculture with low ecological value is of insignificant impact and no mitigation is required.

8.6 CONSTRUCTION IMPACTS AND MITIGATION

8.6.1 Impacts

Construction consists of a number of activities which have the potential to affect flora and fauna e.g. site clearance, excavation and infill.

Site clearance has the largest impact on ecology, involving the removal of pre-existing habitats and considerable soil disturbance. It will have least impact on fauna if carried out in the August-November period, avoiding the main bird and mammal breeding time.

Excavation and infill require the use of heavy machinery which has to be stored and maintained on site, but also has to gain access to the working area. This may cause damage to a wider zone of vegetation, particularly in wet weather when compaction and physical damage is likely.

8.6.2 Mitigation

As a minimum, the contractor will comply with all legislative provisions relating to hedgerow/tree removal and the protection of birds and bats and shall have regard to reducing impacts on nesting birds and breeding/roosting bats.

If badger setts are located pre or during construction, they will be dealt with in accordance with advice from the local NPWS wildlife ranger.

8.7 RESIDUAL IMPACTS

There will be a permanent loss of habitat from beneath the footprint of the proposed expansion.

9 AQUATIC ENVIRONMENT

9.1 INTRODUCTION

The abundant supplies of surface and groundwater within Ireland dictate the importance of measures to protect the aquatic environment. The intense nature of agriculture combined with the topography in County Limerick gives importance to the protection of aquatic measures required to protect local watercourses against water pollution.

has in the past presented problems whereby the aquatic environment has suffered the adverse effects of inadequate mitigation measures in the protection of local watercourses against water pollution against agriculture pollution.

However in recent years the combination of factors such as legislation, the REPS programme, catchment management initiatives and increased local authority inspections has led to improvement in the quality of many surface waters through improved agricultural practices in terms of land spreading and waste storage.

This self-regulating approach to water management was incorporated into the planning of the proposed development, and the developer already operates the existing poultry units on site to this principle.

9.2 DESCRIPTION OF EXISTING ENVIRONMENT

The site has no river or water bodies but contains a small drainage ditch which drains the site and surrounding agricultural land.

9.3 IMPACTS

9.3.1 Do-Nothing

Should the extension not be built there would be no loss or changes in the drainage from the site

9.3.2 Do-Something

9.3.2.1 General

The current proposals at Pat Kenny poultry growing operation will increase the flow in the drainage ditch following rainfall as previously the rainfall would have percolated or evaporated within the area of the proposed development. Such potential impacts include loss or alteration of habitats and species, increased suspended solids, alteration of the hydrology and sediment deposition.

9.4 MITIGATION MEASURES

9.4.1 Pollutants and Waste

To prevent chemical pollution during the operation of the poultry operation, all fuels or chemicals kept on site will be stored in bunded containers. All major refuelling and maintenance events will be undertaken away from the site. Equipment will be regularly maintained and leaks repaired

immediately away from the site if possible. Accidental spillages will be contained and cleaned up immediately. Remediation measures will be carried out in the unlikely event of pollution of adjacent watercourses in accordance with the consultant's recommendations.

9.5 CONSTRUCTION IMPACTS AND MITIGATION

9.5.1 Impacts

9.5.1.1 Loss or alteration of habitats and species

There will be a loss of improved grassland habitats and species as a consequence of the expansion of the site. There will be an increase in flow in the drainage ditch, the increase water level may alter the species in the drainage ditch.

9.5.1.2 Increased suspended solids

The construction works associated with expansion of the poultry growing operation has the potential to cause the release of sediments into watercourses notably drainage ditches on site. It is predicted that this will be a short-term as the construction phase is short

9.5.1.3 Pollutants and waste

The likely sources of chemical contamination would be from site machinery and vehicles. Pollution could occur in a number of ways, such as neglected spillages, the storage, handling and transfer of oil and chemicals and refuelling of vehicles. Accidental leakage or discharge of chemicals and pollutants could cause changes in the pH of the water and could have a direct toxic impact on the fauna and flora at the location of the development and further downstream. If waters become polluted, species more tolerant to pollution can extend their distribution, thus altering the species composition of the watercourse.

9.5.2 Mitigation

9.5.2.1 Loss or alteration of habitat and species

To minimise the loss of the habitat and species, the area of construction should be kept to the minimum required. Construction should be approached from the existing poultry operation to avoid disturbing neighbouring habitats. Increased water flow to drainage ditches should be managed and improved if necessary.

However, since it is already a low ecological habitat, the impacts from the loss is not significant

9.5.2.2 Increased suspended solids

To minimise the amount of suspended solids released into the water column during construction, efforts should be made to minimise the area disturbed. Needless clearing and grading should be minimised and phased to limit exposure.

9.5.2.3 Pollutants and Waste

To prevent chemical pollution during the construction of the poultry house, the EPA guidance on storage of materials will be followed.

In addition, should contained chemical portable toilets be used, all sewage will be removed from the site to an authorised treatment works. No sewage will be discharged to watercourses.

9.6 RESIDUAL IMPACTS

Assuming all mitigation measures are put in place and the loss of habitat is of low ecological value, there should be no residual impacts.

9.7 MONITORING

Routine (quarterly) monitoring of the drainage ditch should be conducted

10 SOILS, GEOLOGY AND HYDROGEOLOGY

10.1 INTRODUCTION

This chapter outlines the environment assessment with regard to soils, geology and hydrogeology of the area. This report should be read in conjunction with the site layout plans for the proposed development and the project description sections of the Environmental Impact Statement. In the assessment, particular attention is focused on the likely presence of contaminated soils and groundwater and on sensitive receptors, such as groundwater dependent ecosystems, vulnerable aquifers or water supplies close to the site.

10.2 METHODOLOGY

This report is based on a desk study and a summary of the available and relevant data on the area:

- Geological Survey of Ireland (GSI), 1999. "Geology of the Shannon Estuary", Sheet 17. Scale 1:100,000.
- GSI, 1999. "Geology of the Shannon Estuary. A Geological Description of the Shannon Estuary Region including parts of Clare, Limerick and Kerry, to accompany the Bedrock Geology 1:100,000 Scale Map Series, Sheet 17, Shannon Estuary.
- GSI & Limerick County Council, 1998. County Limerick Groundwater Protection Scheme.
- GSI Groundwater Maps online at www.gsi.ie.
- GSI, well records database.

This environmental impact assessment was prepared in accordance with Guidelines on the information to be contained in Environmental Impact Statements (EPA 2002) and Geology in Environmental Impact Statements, A Guide by the Institute of Geologists in Ireland (IGI, 2002).

10.3 DESCRIPTION OF EXISTING ENVIRONMENT

The natural topography of the site ranges from 92 to 114 meters. The topography of the land is relatively flat with a slight drop to the back of the site towards the proposed poultry house.

10.3.1 Soils and Subsoils

The soils in the area occur on flat and undulating relief at elevations varying from 10 to 130 meters. They are mainly associated on the landscape with the Elton Series and to a lesser degree with the Patrickswell and Rathcannon Series. They occur throughout the limestone plain but mainly north of the terminal moraine of the Weichsel glaciation between Dromcolliher and Newcastle West.

These poorly drained soils, of clay loam to clay texture and of high to very high base status, have been classified as podzolic Gleys. The profile is characterised by a dark-brown surface horizon overlying horizons that are gleyed and that display drab greyish colours and abundant mottling; the mottles increase in size and contrast with depth where they tend to mask the greyish background colours. These horizons overlie a thick strongly gleyed textural B horizon which merges with the parent material at approximately 60 inches deep. Structure is only moderately well developed and weak in the upper horizons and becomes massive with depth; only the upper horizons are friable. Likewise root development is satisfactory in the surface horizons but poor further down. The poor drainage is caused mainly by slow run-off due to the relief, aggravated by the poor permeability of the soils themselves.

The Howardstown soils are devoted mostly to pasture. Grass growth is generally poor. Too well-defined grassland types occur. One has an abundance of the species of the well-drained grasslands growing side by side with moisture-loving rush species such as *Juncus effusus* (soft rush), *Juncus articuiatus* (jointed rush) and *Juncus inflexus* (glaucous rush). **See Figure 8 & 9**

10.3.2 Bedrock Geology

The site is underplayed with Dinantian Pure Unbedded Limestones. The rocks form part of a system of two tight major folds, whose axes are orientated ENE-WSW. Overall, the strata dip north, west and south, roughly at right angles to the edges of the GWB. Measured dip angles are between 10 and 40° meters and reflect the steep mounds of the Waulsortian limestones as well as the folding. N-S, E-W and NE-SW trending faults displace the rock units; they are mapped at the edges of the body, and although no faults or minor folds are mapped in the centre of this area, they will be present. **See Figure 7.**

Transmissivity in the diffusely karstified aquifers is in the range 20–2000 m. In this area of the country, the median value will probably be towards the lower-middle end of the range. At Croom and Fedamore WSs (in the adjacent Fedamore GWB), transmissivities are 120 m

Thickness The Dinantian Pure Unbedded Limestones attain maximum thicknesses of more than 1200 m. However, the effective flowing thickness is likely to be about 30 m, although much deeper inflows can occur if associated with faults or dolomitisation. An epikarstic layer at least a couple of metres thick is likely to exist at the top of the bedrock. In the vicinity of Newcastle West, borehole logs indicate three main production zones: a high permeability karstified band in the upper 10–15 m of bedrock; a middle zone from 35–50 m, where north/south trending fractures, spaced at between 500 m and 800 m apart,

10.3.3 Hydrogeology

10.3.3.1 Aquifer Classification

The Dinantian Pure Unbedded Limestones are reported (GSI, 1998) to be extensively karstified and dolomitised. In the Newcastle West area karstification is reported to occur to depths up of 800 metres. Dolomitisatio*n is a process by which circulating groundwater replaces calcium with magnesium and results in an increased porosity and permeability of the host rock. The Dinantian Pure Unbedded Limestones Formation in the Coolanoran area is classified by the GSI as a low importance important karstified aquifer. **See Figure 10**

10.3.3.2 Groundwater Levels

Water levels in the Dinantian Pure Unbedded Limestones are generally shallow at less than 15metres. Groundwater fluctuations between summer and winter are typical

10.3.3.3 Groundwater Quality

The hydrochemistry of groundwater beneath the site is dominated by the presence of limestone in both the bedrock and subsoils and is hard, calcium bicarbonate type water.

10.3.3.4 Groundwater Usage

The site usage is recorded at a flow meter from the public supply and the site has a poor quality on-site well.

10.4 IMPACTS

10.4.1.1 Soils

The soils around the development hase no intrinsic value.

10.4.1.2 Geology

There is no significant impact on the geology of the area during the operational phase as a result of the proposed development.

10.4.1.3 Hydrogeology

Following construction a significant proportion of subsoils will have been removed. This will potentially increase the aquifer vulnerability resulting in groundwater being more vulnerable to pollution.

There is potential to pollute groundwater as a result of leakage of leachate through the base of the underground storage tanks.

10.5 MITIGATION MEASURES

10.5.1.1 Hydrogeology

The proposed extension of the poultry growing operation will result in the new poultry house. This construction will form a barrier within which potential contaminants will be contained within the poultry house:

10.6 CONSTRUCTION IMPACTS AND MITIGATION

10.6.1 Impacts

10.6.1.1 Soils

The proposed development will require the stripping of topsoils resulting in a loss of soils over the footprint of the poultry house. This is an essential part of the development and is an impact that cannot be mitigated. The construction zone will occur within existing hard standing area, minimising impact on surrounding grassland areas.

10.6.1.2 Geology

It will be necessary to import rockfill as foundation material for the proposed development.

10.6.1.3 Hydrogeology

The removal of subsoils will potentially result in an increase aquifer vulnerability making groundwater more vulnerable to pollution.

10.6.2 Mitigation

10.6.2.1 Soils

Topsoil stripped will be temporarily stockpiled before removal off site reuse.

10.6.2.2 Geology

Rock fill material will be sourced from the local quarry which lies approximately 3 km to the north west.

10.6.2.3 Hydrogeology

Mitigation measures to prevent groundwater pollution during construction will be put in place

Avoidance of contamination of surface water through

- Removal of topsoil off-site preventing soil particles entering surface water
- Bunded areas will be in place for fuels and chemicals