3 SITE OPERATING INFRASTRUCTURE

The site at An Srath Mór (Srahmore), Bangor-Iorras (Bangor-Erris), I gContae Maigh Eo (Co. Mayo) was developed for the purpose of accommodating the deposition of approximately 450,000m^3 of peat, which was transported from the Bellanaboy Bridge terminal site to the Srahmore Peat Deposition site.

In advance of the peat import, the enabling infrastructure required to safely and appropriately accept this material was constructed.

Owing to the existing infrastructure within the site, there is a minor requirement for further enabling construction within the site. A stone access road will be constructed within the deposition bays. Some minor maintenance is proposed to upgrade certain aspects of the site, which includes surface dressing of the access road and the internal haul roads where activity will occur. Some additional temporary contractor buildings will be required for the duration of peat deposition.

3.1 Site Reception Area

The entrance to the site is from the R313, via the existing access road to the reception area, which is suitable for construction traffic. The entrance was constructed in 2005, as part of the previous operation, to be suitable for the turning of long trailer and multi-axle vehicles, according to the National Road Authorities guidelines.

The access to the site is opposite the junction between the R313 and the L1204 and during previous peat import activities this was successfully controlled. Warning signs were installed on the roadside to the east and west of the site entrance on the R313 and on the L1204.

The access road to the peat reception area in Area 5 was constructed using geogrid reinforced road laid directly on top of the peat. A proprietary temporary wheelwash system was installed at the egress from the peat reception area to help mitigate material being deposited on the public roads. This wheelwash was removed at completion of the previous peat deposition activity, but will be reinstalled prior to any future deposition activity occurring.

The peat reception area is shown on Figure 2.1 & 2.8. The reception area consists of a 200mm thick fibre reinforced concrete slab. The slab measures some 120 x 42m and is bounded by a concrete wall of varying height, between 1300-1500mm.

The reception area is laid to falls such that any precipitation/surface water runoff is channelled toward a concrete open drain at the centre of the reception slab. This drain

outfalls to a settlement tank adjacent to the peat reception area, to allow the larger particles to collect. This sump is cleaned out on a regular basis via an access chamber. From here the runoff is piped to an oil interceptor, and then outfalls to a surface water settlement pond. Temporary facilities to be re-imported in Area 5 include a portable wheelwash (108m^2), portable weighbridge (68m^2) and contractor portacabin accommodation buildings (234m^2). A temporary grey water tank was previously provided on site for the collection of wastewater from toilets and wash hand basins. As previously employed and proposed for this operation, it is proposed that the effluent holding tank will be emptied as required by an appropriately permitted and licensed contractor.

A number of skips will also be kept in the accommodation area for the collection of refuse, namely a skip for recyclables and a separate one for non-recyclables.

A temporary bunded oil/lubricant storage facility will also be provided at the site.

3.1.1 Site Deposition Area

The purpose of development proposal is to place up to 75,000m^3 of peat into remaining void space within the Srahmore Peat Deposition site. The necessary infrastructure for such activities largely already exists at the site

It is proposed to import the peat from the on-shore pipeline development to the peat reception area (Area 5) by means of road haulage vehicles. This peat will be transported by Haku trailers to the peat deposition area (Bay 2, Bay 1 & Bay 6 (Bay 7 is available if required) of Area 6).

Internal haul roads exist to facilitate the travel of the tractors and Haku trailers around the site. The roads have been constructed from imported rock material laid on geotextile. The current operation will require the construction of an access road within Bay 2 and Bay 1. This access road will be constructed using rock material onto geotextile and progressively capped with peat as works are completed. Parallel access to the bays will also be provided from temporary and mobile timber platforms. These timber mats will be deployed and removed as required. Owing to ground conditions within Bay 6, internal circulation will be facilitated by means of timber mat placement directly onto the existing ground. (The above will also apply in the event that Bay 7 is required for peat deposition purposes.)

The deposition area is previously infilled with the 448,000m^3 of peat from the terminal site. The remaining void space within the deposition area will be filled as detailed on the site phasing Figure 2.1 & 2.8.

The drainage infrastructure and water management infrastructure already exists within the site. Details of the existing drainage infrastructure are provided in Section 9 herein. A brief

summary of the proposed infrastructure is provided below.

Along the edge of the each peat deposition bay, running adjacent and in parallel to the high fields, surface water drains (toe drains) have been constructed to convey the surface water from the deposition area to a perimeter swale. The precipitation falling on the deposited peat has been drained by creating a fall from the centre of each peat deposition bay, i.e. the centre of each bay where the peat is deposited to the outside of the deposition area, i.e. the edge of the low fields. The precipitation falling on the peat deposition area will, by gravity, find its way into the adjacent toe drains and from there it will be gravity fed to the perimeter swale.

The perimeter swale has been constructed and partially lined as shown on Figure 2.8. The purpose of constructing this perimeter swale is primarily to transmit any surface water runoff falling on the peat deposition area to the settlement ponds constructed in Area 6. The swale will also act as storage capacity for surface water during periods of heavy rainfall.

Existing settlement ponds S5-1 and S5-2 on the site shall take fixed volumes of drained water and the rest will be directly fed into the perimeter swale or diverted into the perimeter swale. At the end of the perimeter swale, as shown on Figure 2.8, a 525mm diameter pipe is laid from the swale to an open drain leading to the settlement ponds. This arrangement restricts the volume flow rate to that which can be effectively treated by the two settlement ponds S1 and S2.

The settlement ponds act in series so that any runoff will be effectively treated by both of the settlement ponds before it is allowed to reach the receiving waters.

No works are proposed in Area 7. This is a cut-over peat land where the drainage channels have been blocked to create a wetland generating habitat in accordance with the Rehabilitation Plan for the Oweninny Works.

3.2 Traffic

The traffic on the public road network associated with the proposed development is detailed in Section 16.3 herein.

4 ALTERNATIVES

4.1 Background

A planning application and accompanying EIS for the Bellanaboy Bridge Gas Terminal was submitted to Mayo County Council in April 2001. Following appeal to An Bord Pleanála the development was refused planning permission due to concerns about the stability of the proposed peat storage on the site. The original terminal proposal had envisaged storing all peat excavated during construction activities on site within bunded areas. Following An Bord Pleanála's decision, the project was re-examined and alternatives, as well as other options for peat management, were considered.

This re-examination resulted in a new planning application to Mayo County Council in December 2003, which proposed the removal of approximately 450,000m^3 of peat from the Bellanaboy Bridge Terminal Site with subsequent deposition of the peat in the Bord na Móna cut over peat land at Srahmore. This proposal was acceptable to Mayo County Council, An Bord Pleanála and the EPA, with Planning Permission granted by An Bord Pleanála in October 2004 and a Waste Licence issued by the EPA in October 2004.

Subsequent to the successful deposition of 448,000m^3 of peat at the Srahmore Peat Deposition site in 2005 and 2007 by Shell E&P Ireland Limited and Bord na Móna a study was commissioned into the remaining void space within Srahmore and the feasibility of transporting excavated peat from the construction of the on-shore pipeline development and transport to, and depositing on, the Bord na Móna cutover peatland at Srahmore.

The Srahmore Peat Deposition Site has proven to be an effective and sustainable solution to the question of peat deposition from the Bellanaboy Bridge Gas Terminal Site.

Peat from Bellanaboy Bridge has been safely transported to Srahmore Peat Deposition and placed there in an orderly manner. The resulting landforms have, as predicted, revegetated successfully and no deleterious matter has been released to the surrounding environment.

Consequently, it is proposed to utilise the unused and available storage capacity at the Srahmore Peat Deposition site to deposit the excess peat from the proposed on-shore pipeline development. This deposition will employ similar operating and management techniques used during the previous peat deposition activities carried out in 2005 and 2007.

4.2 Need for the Scheme and Potential Alternatives

The Corrib Gas Field is in the process of development. An integral aspect of the scheme is the proposed on-shore pipeline link between the Corrib Gas offshore pipeline and the Bellanaboy Bridge Terminal site.

Volume 1 & Volume 2 of this EIS details the environmental impact of the construction of the on-shore pipeline development.

This Volume of the EIS, in respect of the Srahmore Peat Deposition Site element, details the environmental consequences of depositing up to 75,000m^3 of peat. This Volume of the EIS is prepared so that the environmental consequences of the peat transport and deposition at the Srahmore Peat Deposition site can be assessed in the context of the overall proposal.

The Srahmore Peat Deposition Site was designed and was constructed for the deposition of the envisaged 450,000m^3 of peat from the terminal site. Upon final deposition from Bellanaboy Bridge Terminal, 448,000m^3 of peat had been successfully imported and spread within the site.

During the previous operation, peat was deposited within Bay 2 (20-25% of potential area currently occupied), Bay 3 (100% occupied), Bay 4 (100% occupied) and Bay 5 (100% occupied). No peat from the terminal site was deposited in Bay 1, Bay 6 or Bay 7. Therefore, remaining void space exists. A smaller area than predicted in the original infilled bay design was required to accommodate the peat from the terminal site. The reasons for the smaller area is most likely attributable to conservative design assumptions and the fact that the peat was better drained when imported than originally anticipated, resulting in a lower moisture content/higher density, thereby reducing the required infill area.

Under the current development proposal it is proposed to utilise the remaining void space within the permitted activity boundary of the Srahmore Peat Deposition Site to accommodate up to 75,000m^3 of peat from the construction of the Corrib on-shore pipeline.

Ultimately, it will be a decision of An Bord Pleanála to confirm the Approval for the Srahmore Peat Deposition site as part of and in order to facilitate the construction of the on-shore pipeline development. Should Approval for the proposed on-shore pipeline be granted by An Bord Pleanála, an appropriate deposition and storage facility is required for up to 75,000m^3 of peat.

In terms of potential alternative disposal sites to the Srahmore Peat Deposition site, there are two licensed landfill disposal facilities in I gContae Maigh Eo (County Mayo) that could potentially accept the peat from the on-shore pipeline development. These licensed landfills are located at Doire an Iomaire (Derrinumera) (north of Castlebar) and Ráth Ruain (Rathroeen) (north of Ballina). Export of the peat to these facilities, while technically

feasible, would require significantly greater haul distances (40-50km in the case of Ráth Ruain (Rathroeen) and 80-90km in the case of Doire an Iomaire) (Derrinumera) and would also occupy up to 75,000m^3 of landfill capacity, thereby reducing the available capacity for residual municipal waste. The utilisation of municipal waste void space at these facilities is not considered an appropriate solution for peat storage and is not considered an improved alternative solution to the use of the Srahmore Peat Deposition site.

Investigations were undertaken to identify and assess alternative means of utilising the excavated peat from the on-shore pipeline development. These are described below:

Fuel in Power Stations

The use of the excavated peat as a fuel in power stations has been investigated in discussions with Bord na Móna. It was determined that the peat would be too wet to be used directly as fuel and a complex and time consuming procedure of drying the large volumes would be required. In addition, there would be the issue of very large haulage distances from the site to available peat fuelled power stations, e.g. Lough Ree Power, Béal Átha Liag (Lanesborough) (i gContae Ros Comain) (Co. Roscommon), West Offaly Power (Droichead an Sionainne, i gContae Uibh Fhaili) Shannon Bridge, Co. Offaly) Edenderry Power (Éadan Doire, i gContae Uibh Fhaili) (Edenderry, County Offaly). These issues determined that it would not be feasible to use the peat as a fuel.

Gardens / Horticulture

The type of peat used for horticultural purposes is termed Younger Sphagnum Moss Peat. The peat present along the onshore pipeline development is Blanket Bog Peat, which has been humified too much and its structure broken down. It is therefore not suitable as a horticultural material.

There is the possibility that the peat could be used to improve soil texture in agricultural land. However, the very large quantities of peat to be excavated make this alternative impracticable due to the infinite variety of potential locations and the uncertainty over the timescales in which the peat could be removed.

Fuel for Domestic Use

Market demand was deemed too small relative to the quantities of peat involved. Use as domestic fuel would also entail a lengthy process of drying, as well as the difficulty of distributing the peat as discussed above.

Summary

The potential alternatives explored do not provide a compelling argument for alternatives to the proposal of peat deposition at the Srahmore Peat Deposition site. The availability of an EPA Waste Licensed facility for Peat Deposition, which was previously granted planning permission by An Bord Pleanála for deposition of 450,000m^3 of peat, at an approximate

distance of 15-20km from the on-shore pipeline, is considered the most appropriate solution.

4.3 Assessment of Transport Methods

Consideration was given to the method of transporting the peat to determine if any improvements could be made to the previous deposition operation. No improvements or refinements were identified.

4.4 Peat Spreading Method

Two methods of peat transfer were considered:

1. Direct transfer of peat onto the peatland by road haulage vehicles; and
2. Transfer from road haulage vehicles to low ground bearing pressure trailers or rail for dispersal on the peatland.

Direct Transfer

This involves the direct transfer of peat onto the peatland using the road haulage vehicles. This would be used to transport the excess peat from the on-shore pipeline development. These vehicles would be required to travel on a higher standard and significantly stronger internal road infrastructure, which would have to be constructed.

This method has the advantage that there is no requirement for secondary transport equipment, as the road trucks travel into the peat spreading area. However, this option would involve construction of significant length of internal roads of appropriate strength.

This option was deemed inappropriate in that it involved the removal of a significant amount of construction materials and surfacing of roads. This would (a) alter the physical character of the site and (b) prove to be a less environmentally sustainable activity.

Transfer via reception area

This option involves the transport of the peat by road trucks to the existing reception/transfer facility, within Area 5. The peat would then be loaded into low ground bearing pressure trailers (Haku trailers). These trailers would then transport the peat to Area 6 via the existing internal roadways. This method was successfully utilised in the previous operation and no significant problems arose in the on-site transport operation.

Conclusion

It is proposed to adapt this same methodology in the transport and deposition of the peat derived from the on-shore pipeline development as used in the deposition of peat from the terminal.

5 HUMAN BEINGS

5.1 Introduction

This section discusses the key issues affecting human beings, and the potential impacts of the acceptance of up to 75,000m^3 of peat within the existing activity boundary of the Srahmore Peat Deposition site. The issues discussed include population, language and culture, employment and economic climate, tourism and health and safety. A community and socio-economic impact assessment in respect of the Corrib On-Shore Pipeline, and which contains overlapping demographic and other analysis, as contained in this Section, is included in Chapter 6 of Volume 1 of the EIS.

5.2 Study Methodology

A desk study was carried out in order to examine all relevant information pertaining to Human Beings in the area. The Mayo County Development Plan 2008-2014 was examined, along with relevant census data from the Central Statistics Office (CSO).

Fáilte Ireland tourist literature for Mayo, and websites of relevant tourism sites and amenities in the area, were examined. In addition, Ordnance Survey maps were used to identify landuse and possible amenity and tourist sites located in proximity to the existing Peat Deposition site. A site visit was undertaken in August 2008.

5.3 Receiving Environment

5.3.1 Population

The population of the state grew from 3,917,203 persons to 4,239,828 persons between 2002 and 2006, representing an increase of 8.2% in four years. The 2006 population is the highest recorded population in Ireland since 1861, with 16.9% growth over the ten year period (CSO, 2006). The population of I gContae Maigh Eo(County Mayo) experienced an increase of 11.1% between 1996 and 2006.

As shown in Table 5.1, the population of the Béal an Mhuirthead (Belmullet) Rural District has continually decreased, with the decline becoming more marked in recent years. At the local level, the site is located within the District Electoral Division of Guala Mhór (Goolamore). However, given that the Srahmore peat land is immediately adjacent to the boundary of the Baingear (Bangor) DED, the analysis of population in relation to the local community includes both the Guala Mhór (Goolamore) and Baingear (Bangor) DEDs (hereafter referred to as the An Srath Mór 'Srahmore area'). The An Srath Mór Srahmore area experienced a population decrease between 1996 and 2006, followed by a slight population growth in the 2002-2006 period.

In 2006, the local population of the An Srath Mór (Srahmore) area represented almost 8% of the population of the greater Béal an Mhuirthead (Belmullet) rural district, and 0.5% of the population of I gContae Maigh Eo (County Mayo).

The village of Baingear-Iorras (Bangor Erris) (population 295 no. persons in 2006 Census) is situated approximately 1.5km east of the existing peat deposition area.

There are approximately 40 residences located immediately north of the Srahmore Peat Deposition site, distributed linearly along the R313 and the county road heading north along the eastern shores of the Carrowmore lake. South of the existing site, there are approximately 30 dwellings located along a county road, along with a number of agricultural buildings and several derelict houses. The majority of these dwellings are located to the south of the Owenmore River. There are no dwellings located immediately west of the site, between the bog complex and the Munhin River.

This population density would be typical for rural areas in the Iorras (Erris) region outside the main settlements. As a consequence of existing and likely proposed planning policies restricting rural housing, it is not expected that this number will increase significantly in the medium to long term.

Table 5.1: Population Change 1996 – 2006 (CSO)

Year ►	Population			% Population Change		
Area ▼	**1996**	**2002**	**2006**	**1996-2002**	**2002-2006**	**1996-2006**
Ireland	3,626,087	3,917,203	4,239,848	8.0%	8.2%	16.9%
County Mayo	111,524	117,446	123,839	8.0%	5.4%	11.1%
Béal an Mhuirthead **(Belmullet) Rural District**	8,339	7,927	7,923	-4.9	-0.1	-5.0
Guala Mhór **(Goolamore) & Bangor (i.e. including the Srahmore Peat Deposition site)**	658	631	633	-4.1	0.3%	-3.8

(Source: Census of Population, 1996-2006)

5.3.2 Household Numbers & Size

Census of Population trends indicates that the average household size in Ireland is gradually declining over time. Between 1996 and 2006, the national average household size fell from 3.14 to 2.81 persons per household. The average household size for I gContae Maigh Eo (County Mayo) is slightly lower, with a figure of 2.75 persons per household.

As shown in Table 5.2, the average household size in the Srahmore Area has steadily decreased from 3.50 to 2.92 between 1996 and 2006. This is in accordance with trends at national and county level.

Table 5.2: Household Numbers & Size

Households	1996		2002		2006	
	No.	Avg. Size (persons)	No.	Avg. Size (persons)	No.	Avg. Size (persons)
Guala Mhór (Goolamore)	55	3.53	54	3.09	51	2.94
Bangor	134	3.46	141	3.24	160	2.91
Srahmore Area Total	**189**	**3.50**	**195**	**3.16**	**211**	**2.92**

(Source: Small Area Population Statistics, 1996-2002)

The number of households in the Srahmore area remained steady at 189 in 1996, rising by 3.2% in 2002 and by a further 8.2% in 2006 (See Table 5.2). The vast majority of these households are situated in the Baingear (Bangor) DED i.e. the rural area surrounding the village of Baingear-Iorras (Bangor Erris).

5.3.3 Employment

Poor employment growth is a feature of lagging economic development and there is a correlation between this measure and the state of the region's infrastructure, low labour force participation rates and higher rates of outward migration.

The level and growth in employment in the Western Counties (i.e. those west of the Shannon) is shown in Table 5.3 and gives a context within which to view the employment performance of I gContae Maigh Eo (County Mayo). Between 1996 and 2002, while the region experienced employment growth of 22.8%, the level of growth in I gContae Maigh Eo (County Mayo), was below the national average of 28.1%.

In the 2002 to 2006 period, employment growth across the country has continued to increase, with the national average growth being 17.6%. The corresponding figures for the West region and I gContae Maigh Eo (County Mayo) are 19.0% and 16.8% respectively. This rate of employment growth in Maigh Eo (Mayo), while slightly below the regional average, is higher than the rates of growth in Counties Clare and Sligo.

Table 5.3: Employment Growth in the West – Persons aged 15 and over at Work

County/Region	1996	2002	2006	% Change 1996-2002	% Change 2002-2006
Mayo	36,583	44,764	52,277	22.4	16.8
Galway	67,497	85,210	104,495	26.2	22.6
Donegal	39,811	48,379	56,670	21.5	17.1
Sligo	20,204	23,927	27,328	18.4	14.2
Leitrim	8,518	9,990	12,669	17.3	26.8
Roscommon	18,559	21,270	25,829	14.6	21.4
Clare	34,572	43,679	50,607	26.3	15.9
Total 'West'	225,744	277,219	329,875	22.8	19.0
Ireland	1,307,236	1,641,587	1,930,042	25.6	17.6
Leinster	715,137	916,027	1,077,710	28.1	17.6

(Source: Central Statistics Office, 2006)

An examination has been carried out of the recent Live Register figures for the Béal an Mhuirthead (Belmullet) area, which is representative of the population in the vicinity of the Srahmore Area. These figures show an overall decrease in the number of persons claiming unemployment benefit over the eight-year period 2000 to 2008 (See Table 5.4), although figures indicate that there was an increase in 2008 after a low of 474 persons in 2007.

Table 5.4: Average Number of Persons on Live Register in Béal an Mhuirthead (Belmullet)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008
Average No. Of Persons	935	822	778	811	599	554	515	474	677

(Source: Central Statistics Office, 2008)

5.3.4 Agriculture, Forestry and Fishing

Low intensity sheep and livestock farming typify agricultural activity in the area immediately surrounding the existing Peat Deposition Site. There is also a limited amount of silage production, dairy faming and organic farming. Forestry in the area is primarily controlled by Coillte however there are pockets of private plantations. The majority of the plantations are coniferous.

There are five main fishing ports on the coastline close to the proposed development at Portulin, Ballyglass, Rinnroe, French Port and tidally at Béal an Mhuirthead (Belmullet). These ports are used as bases for fishing trawlers and smaller fishing boats. There is also a crab factory at Portulin and there is currently one licensed oyster culturing facility within Sruwaddacon Bay (though it is understood that the facility is not currently in production).

There is also a natural oyster fishery in Blacksod Bay.

5.3.5 Tourism

County Mayo

County Mayo is a largely rural area with rich scenic resources and a distinctive culture. The economy is heavily dependent on the declining sectors of agricultural and fishing. Large proportions of I gContae Maigh Eo (County Mayo) are designated as proposed National Heritage Areas (NHAs) and Special Areas of Conservation (SACs). In addition, the area is also rich in cultural resources through language, history, literature, archaeology and vernacular building traditions. Visitors are attracted to the region for its tranquillity, landscape and traditional community structure.

I gContae Maigh Eo (County Mayo) is also well known for its museums and visitor attractions and has an abundance of festivals throughout the year, mostly during the summer months. Summer schools to learn or improve Irish language skills and schools to study English are hosted throughout the County. In this regard, a major element of the tourism industry in the Gaeltacht areas relates to Irish language schools for school children, students and others.

Tourism has increasingly become an engine for growth in the County. In parallel, the expansion and marketing of tourism resources in the County has been facilitated by improvements in access infrastructure to, from and within the area and wider region, particularly by road and air.

There is still considerable potential to develop the tourism resource of I gContae Maigh Eo (County Mayo) further, particularly in the more remote and sparsely populated areas. The Mayo County Development Plan 2008-2014 states that the,

'Promotion and development of tourism in the County must be underpinned by protection of the natural environment, including appropriate and sensitive development, the provision of infrastructure developments in general, and tourist-related infrastructure and facilities in particular' (Ref; Section 1.2.7).

The Barony of Erris

The site of the existing Peat Deposition Site is located in the Barony of Iorras (Erris), with Broadhaven Bay to the north and the Atlantic to the west. Parts of Erris are classified as Gaeltacht, where Irish survives as a community language. The Barony of Iorras (Erris) stretches from the village of Belderrig and the Céide Fields in the North East to the villages of Baile Chruaich (Ballycroy) and Caorthannán (Castlehill) in the South, and includes Blacksod Bay, The Mullet Peninsula and Broad Haven Bay.

The Céide Fields, situated on the R314 coastal road from Ballina, 8km west of Baile an Chaisil (Ballycastle), is the site of a 5,000-year-old Neolithic farm site discovered beneath

the blanket bog. These fields are the oldest known field systems in the world. The Céide Fields visitor centre explains the stone-age landscape of the North Mayo coast.

Another feature of the landscape is the North Mayo Sculpture Trail (Tir Saile), which begins in Ballina, and follows the coastal route through Cill Ala (Killala), Baile an Chaisil (Ballycastle), Béal Deirg (Belderg), Béal an Mhuirthead (Belmullet) and down to An Fód Dubh (Blacksod). This unique trail of 15 site-specific sculptures encompasses miles of rugged coastline. Seven of these sculptures are to be found in the Barony of Iorras (Erris).

Carrowmore Lake is the largest lake in Iorras (Erris), covering an area of approximately 2000 acres. It is home to a variety of birdlife, especially during winter months when Teal, Mallard, Chelduck, Widgeon and Brent goose are among the species to be spotted.

Tourism in the Area Local to the Existing Peat Deposition Area

The area immediately adjacent to the Peat Deposition Site has a limited amount of tourist attractions. The R313 is a route used by tourists travelling from Baingear (Bangor) to the Mullet Peninsula. Tourist traffic in this area mainly focuses on hill walking, fishing, horse riding and the North Mayo Sculpture Trail. The main centres for tourism nearest the site are Baingear-Iorras (Bangor Erris), Gleann na Muaidhe (Glenamoy), Poll an tSómais (Pollatomish), Ros Dumhach (Rossport), Béal Deirg (Belderg), Béal an Mhuirthead (Belmullet), Gleann an Ghad (Glencad) and An tInbhear (Inbher).

Recreation and Sport

Recreation and sporting activities are varied and well served in the wider area surrounding the existing Peat Deposition Site. There are GAA Clubs in Baingear-Iorras (Bangor Erris), Gleann na Muaidhe (Glenamoy), Ros Dumhach (Rossport), Béal an Mhuirthead (Belmullet) and An Droim (Drum). Baingear-Iorras (Bangor Erris) also has a soccer club. Other past time and sports which are actively pursued in the area include:

- Swimming,
- Watersports,
- Golf,
- Cycling,
- Hill Walking,
- Fishing,
- Snooker,
- Darts,
- Tug-o-war,
- Bingo, and
- Drama and musical groups.

5.3.6 Language and Culture

The existing Peat Deposition Site and surrounding area is located near a Gaeltacht area. The term "Gaeltacht" describes those areas where the Irish language is the community language. Údarás Na Gaeltachta is the Regional Development Agency in Ireland with responsibility for the economic, social and cultural development of the Gaeltacht regions, ensuring the continuation of the Irish language as the spoken language of the community in these regions.

The Irish language is one of the oldest written languages in Europe and has a strong and rich literary tradition. The oral tradition has played a major role in the survival of Irish as a living language.

The Gaeltacht areas were established to encourage an unbroken link with a past that saw Irish as the main language in Ireland. They are seen as a vital lynch-pin for the transmission of Irish as a community language to the next generation.

5.4 Description of the Proposed Development

5.4.1 Introduction

This Volume 3 of the EIS is prepared for a development comprising the transport to and the deposition of up to 75,000m^3 of peat at the Srahmore Peat Deposition Site. Up to 75,000m^3 of peat will be generated during the construction of the On-shore Pipeline development. The Srahmore Peat Deposition Site has previously been successfully utilised for the deposition of approximately 448,000m^3 of peat from the Bellanaboy Bridge Terminal Site. The Srahmore Peat Deposition Site is located to the west of the village of Baingear-Iorras (Bangor Erris), immediately south of the R313 route.

5.4.2 Environmental Emissions

The environmental emissions from the continuation of this development may have the potential to negatively impact on humans include air, noise, water and traffic. The nature and extent of the environmental emissions during its continued operation, together with appropriate mitigation measures, are discussed in detail in the relevant sections of this Volume of the EIS.

5.5 Impacts of the Proposed Development

5.5.1 Operational Impacts

Owing to the existing infrastructure within the site, there is no requirement for significant construction within the site. Some minor maintenance is proposed to upgrade certain aspects of the site.

While the peat is being transferred, a traffic management plan will be implemented in the area, including a temporary signalling/advance warning signage arrangement at the junction of the L1204 county road to the R313 route.

Population, Employment and Economic Impacts

The effects on population and the economy from the development will not be significant in the longer term. However, it is estimated that the manning requirement for the peat deposition activity would be up to 50 people for a period of 3 to 4 months.

Architectural Heritage

With reference to the Mayo County Development Plan, there are no protected structures that will be affected by the continued deposition of peat on the site. The site area has experienced a significant level of disturbance through being worked as an industrial peatland over the past forty years and as a Peat Deposition Site in the last number of years. There will be no further effect on the architectural heritage of the area as a result of the continued development of the site.

Agriculture Forestry and Fishing

It is not expected that there would be any negative impact on agriculture, forestry or fishing during peat deposition with implementation and maintenance of the mitigation measures outlined elsewhere in this Volume 3 of the EIS.

Tourism

A number of tourism centres have been identified in the county. However, most major attractions are sufficiently remote from the existing Peat Deposition Site for their associated visitors to be unaffected by the peat deposition activity. During the deposition period, visitors to the local area who have to pass by the Srahmore Peat Deposition site will notice site activity.

There will be minor traffic delays at the temporary signalling arrangement proposed at the junction of the county road linking Bellanaboy Bridge to the Srahmore Peat Deposition site. There will be increased traffic movements on the haul routes during the deposition period with the movement of heavy goods vehicles to and from the site. These increased traffic levels should not impact significantly on local tourism.

During the deposition phase there will be some disturbance in terms of noise, visual impact, and increased levels of heavy goods vehicles traffic upon the local population.

It is not envisaged that the local fishing industry and angling attractions will be disturbed by the peat deposition operation at the Srahmore Peat Deposition site, with implementation and maintenance of the necessary mitigation measures outlined in this Volume of the EIS.

The operation of this facility will not affect any known recreational routes. The site is visible from local roads and tracks used in the area. However this activity will be restricted to a relatively short timeframe and the rehabilitated site will ultimately blend with the surrounding landscape. Maintaining infrastructure long term and the buildings short term (during the stabilisation process) will not be a significant visual impact within the wider rehabilitated peatland context.

Recreation and Sport

The site is currently not used for any form of recreational activity. In this regard, it is not expected that there will be any significant negative impact on local recreation or sporting facilities, as a result of the proposed peat transfer and deposition activities.

Health and Safety

Peat transfer and deposition activities at the Srahmore Peat Deposition site will be subject to Bord na Móna health and safety procedures, carried out according to best practice guidelines.

Environmental Emissions

The impact of the environmental emissions from the peat deposition site is discussed individually in each of the relevant chapters of this EIS. Each individual section discusses the likely impacts during the operational phase of emissions on humans, flora and fauna and the environment, where relevant.

5.5.2 Long Term Impact of the Proposed Development

Population, Language and Culture

The long term effects of the peat transfer and deposition activities on population, language and culture are negligible.

Employment and Economic Impacts

The transfer and deposition of peat to the Srahmore Peat Deposition site will, in the short term, create and sustain an estimated 50 jobs. However, there will be no significant long-term impact on employment due to the peat deposition activity.

Agriculture Forestry and Fishing

It is not expected that there would be any long-term negative impact on agriculture, forestry or fishing so long as the mitigation measures outlined elsewhere in this Volume of the EIS are implemented.

Tourism

In the long term this development will not negatively impact on the visual amenity in the Srahmore area, as the cutover peatland will revegetate naturally as has been the case previously. This will have an overall positive impact on visual amenity and therefore on tourism. Other than minor traffic delays due to operational traffic, which may occur during the tourist season, there will be no negative impact. There are no significant tourist attractions that will be visually impacted upon directly.

With the appropriate mitigation measures employed as detailed in the other sections of this Volume of the EIS, there will be no impact on fisheries or the natural resources of the area as a result of emissions. In this regard, the important local tourist resources of fishing, hill walking and horse riding will not be negatively impacted.

It is therefore anticipated that the long term impacts on tourism and recreation as a result of the development will be slight in terms of their magnitude.

Recreation and Sport

Given the nature of the development, it is not expected that there will be any significant negative impact on local recreation or sporting activities or facilities as a result of the peat transfer and deposition activities.

5.5.3 Environmental Emissions

The impact of the environmental emissions from the continued deposition of peat is discussed in each of the relevant sections of this Volume of the EIS. Each individual section discusses the likely impacts during the operation phase of emissions on humans, flora and fauna and the environment, where relevant.

5.6 Mitigation Measures

There are no mitigation measures required in relation to the transfer and deposition of peat at the subject site, except for the implementation of a traffic management plan, as part of the traffic impact mitigation measures.

Bord na Móna safety procedures will be implemented during the deposition of peat.

5.7 Monitoring

There will be no need for monitoring over and above that identified elsewhere in this Volume of the EIS. Environmental Monitoring will continue on site in line with the requirements of the Waste Licence Review.

5.8 Do Nothing Scenario

If the continued deposition of peat does not occur the site will remain as is, with remaining void space.

5.9 Reinstatement and Residual Impacts

No reinstatement having regard to human beings is required as a result of this development.

6 TERRESTRIAL ECOLOGY

6.1 Introduction

The aim of the *Terrestrial Ecology* study is to outline the ecological features of the receiving environment and any potential impacts of the proposed activity on habitats and species within the development site and adjacent areas.

The ecological assessment was undertaken by Ecological Advisory and Consultancy Services (EACS) and specialist associates.

The scope of the assessment was:

- to carry out an ecological evaluation of the site in terms of habitats and species present;
- to assess the likely impact of the proposed development on habitats and their constituent plant and animal species;
- to recommend suitable and appropriate mitigation measures to ameliorate any negative impacts;
- to propose any proactive measures to enhance the biodiversity of the site; and
- to propose further assessments and monitoring where appropriate.

The habitats present are described along with their current status and an evaluation of their conservation value. Vegetation and faunal surveys were carried out, subject to the constraints listed below, in order to establish if any sensitive or protected species were present. Potential impacts on adjoining areas are also evaluated. These findings have been used to identify mitigating measures to reduce the impacts and appropriate mitigation or remedial measures are recommended.

6.2 Methodology

The assessment was undertaken by Mrs. J. Neff MSc.FIEEM (Ecological Advisory and Consultancy Services - EACS) in association with the following specialists:

- Vegetation and botanical survey: Dr. John Conaghan
- Non-avian fauna: Dr. Chris Smal MIEEM and Mr. Ger Stanton
- Avian fauna: Dr. Gavin Fennessey and assistants (Fehily Timoney & Co. Ltd)

National Parks and Wildlife Service (NPWS) of Department of Environment, Heritage and Local Government (DoEHLG) were consulted during the scoping process for this EIS and the previous one in 2003. Additional information was sourced from existing reports relating to the site.

The development site is evaluated for its ecological significance based on the outcome of desk and field studies and consultation with statutory bodies to date.

The approach and methodology is in accordance with the EPA Advice Notes on Current Practice (2003); the Guidelines for ecological evaluation and impact assessment ("In Practice" IEEM - Regini, 2000 & 2002 and IEEM, 2006); and with regard to other documents referred to below in the appropriate sections.

6.2.1 Habitats and vegetation

6.2.1.1 Field survey

The Srahmore Peat Deposition site was visited and surveyed on the 16th of July 2008. The primary aim of the survey was to describe and evaluate the habitats occurring within the survey area. Habitats occurring within the survey area were classified according to the scheme outlined in "A Guide to Habitats in Ireland" (Fossitt 2000). A habitat map is presented in Figure 6.1. During the site survey particular attention was paid to the possible occurrence of habitats listed in Annex I of the E.U. Habitats Directive and nationally rare plant species listed in either the 1999 Flora Protection Order or the Irish Red Data Book (Curtis and McGough 1988). Vascular plant species nomenclature in this report follows Stace (1997) and Scannell and Synnott (1987), while the nomenclature of mosses follows Smith (2004).

There were no survey constraints with regard to habitat and vegetation survey.

6.2.1.2 Desk study

Field survey results were supplemented by a desk study which included:

- A review of relevant literature
- A review of reports relating to the site; and
- Consultations with NPWS research section personnel with regard to the rare plant data base.

6.2.2 Non-avian fauna

The field survey was undertaken on the 24th of July 2008 by Dr. Chris Smal and Mr. Ger Staunton in good weather conditions. The study area included the proposed development site area, and also included the area and vicinity of Area 6 as a whole. Locations of interest identified in the pre-deposition fauna survey (Smal, 2004) were revisited also. The course of the major stream that flows through the Srahmore bog area was also searched again.

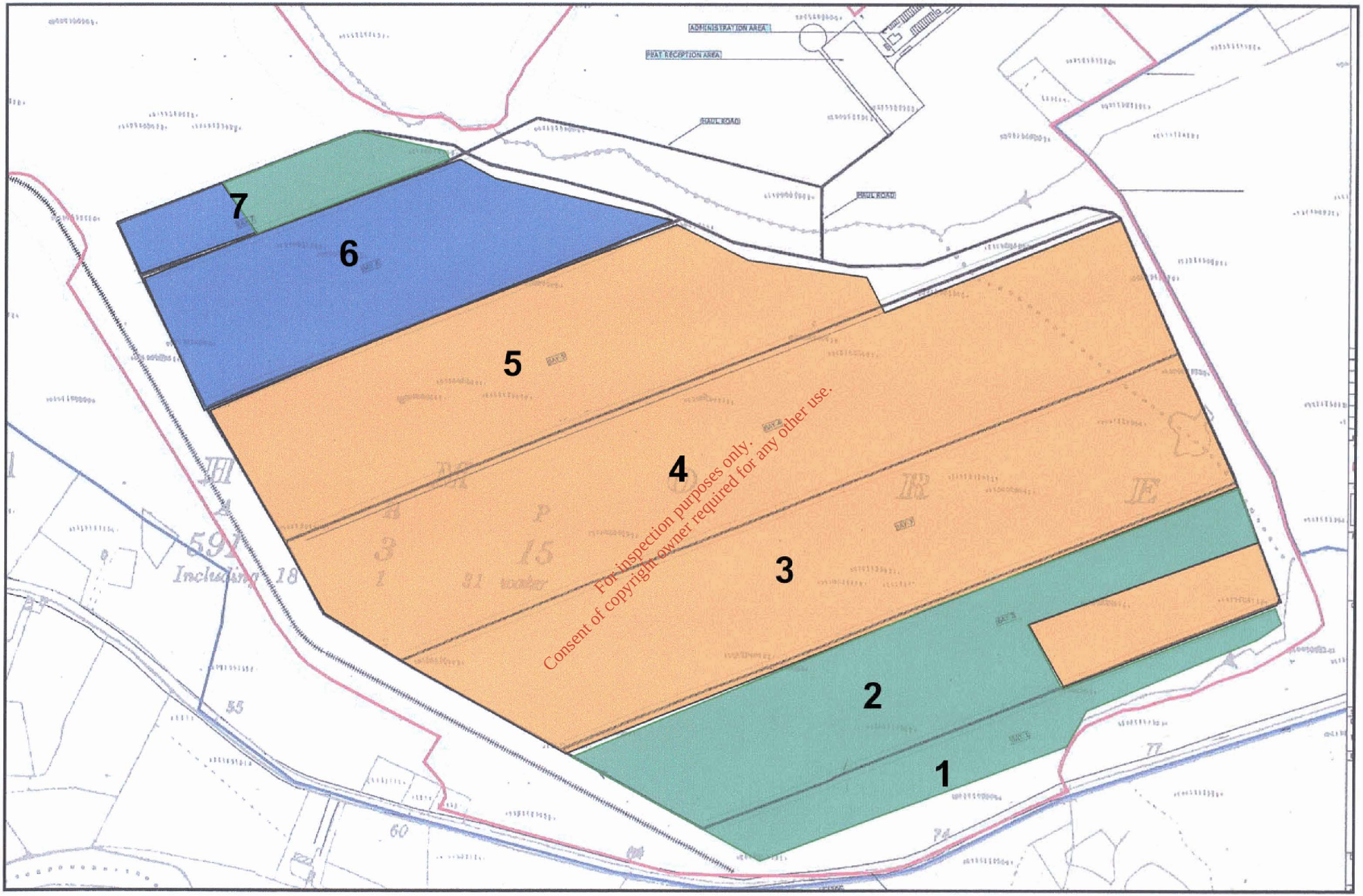

Figure 6.1 Main habitats present at the peat deposition site at Srahmore in Area 6

KEY: Bay numbers 1 to 7
Green - cutover bog (PB4) dominated by bare peat surface; Blue - cutover bog (PB4) dominated by Juncus effusus
Orange - wet grassland (GS4) dominated by Juncus effusus recolonising recently deposited peat

Survey for mammals was carried out by means of a thorough search within the site. Presence of mammals is indicated principally by their signs, such as dwellings, feeding signs or droppings - though direct observations are also occasionally made. Faunal signs are mapped in Figure 6.2. A bat survey was not conducted and was not considered necessary owing to the lack of trees or other potential roosting sites within the development area.

The nature and type of habitats present are also indicative of the species likely to be present; the habitats present were assessed in general accordance with techniques adopted for the Badger & Habitat Survey of Ireland (Smal, 1995); habitats listed by Fossitt (2000) and by JNCC (1990) were referred to.

The field survey was supplemented by evaluation of relevant literature and existing information.

Survey constraints

Survey in summer is outside the optimum season for badger surveying as vegetational cover is high and may conceal setts; other field signs may also be obscured during this season. On site, there was only a limited extent of dense vegetational cover, mostly confined to the vicinity of the main drainage stream.

Frog survey in summer is not productive and active frog breeding sites would not be recorded.

6.2.3 Birds

Field surveys for the current study were conducted during the avian breeding season of 2008 (i.e. from April to July inclusive). In addition to the field surveys a review was undertaken of a previous bird survey conducted at the site by EACS and Arnold (2004). In summary, the aims of the bird survey were:

- To establish the presence and relative abundance of breeding bird species at Srahmore Deposition Site in 2008
- To assess the conservation status of the species found on the site
- To compare bird data from this study with a previous report from this site
- To assess potential impacts of the proposed peat deposition
- To suggest mitigation measures to reduce potential negative impacts on the local bird community
- To describe the residual impacts of the proposed scheme on the local avifauna

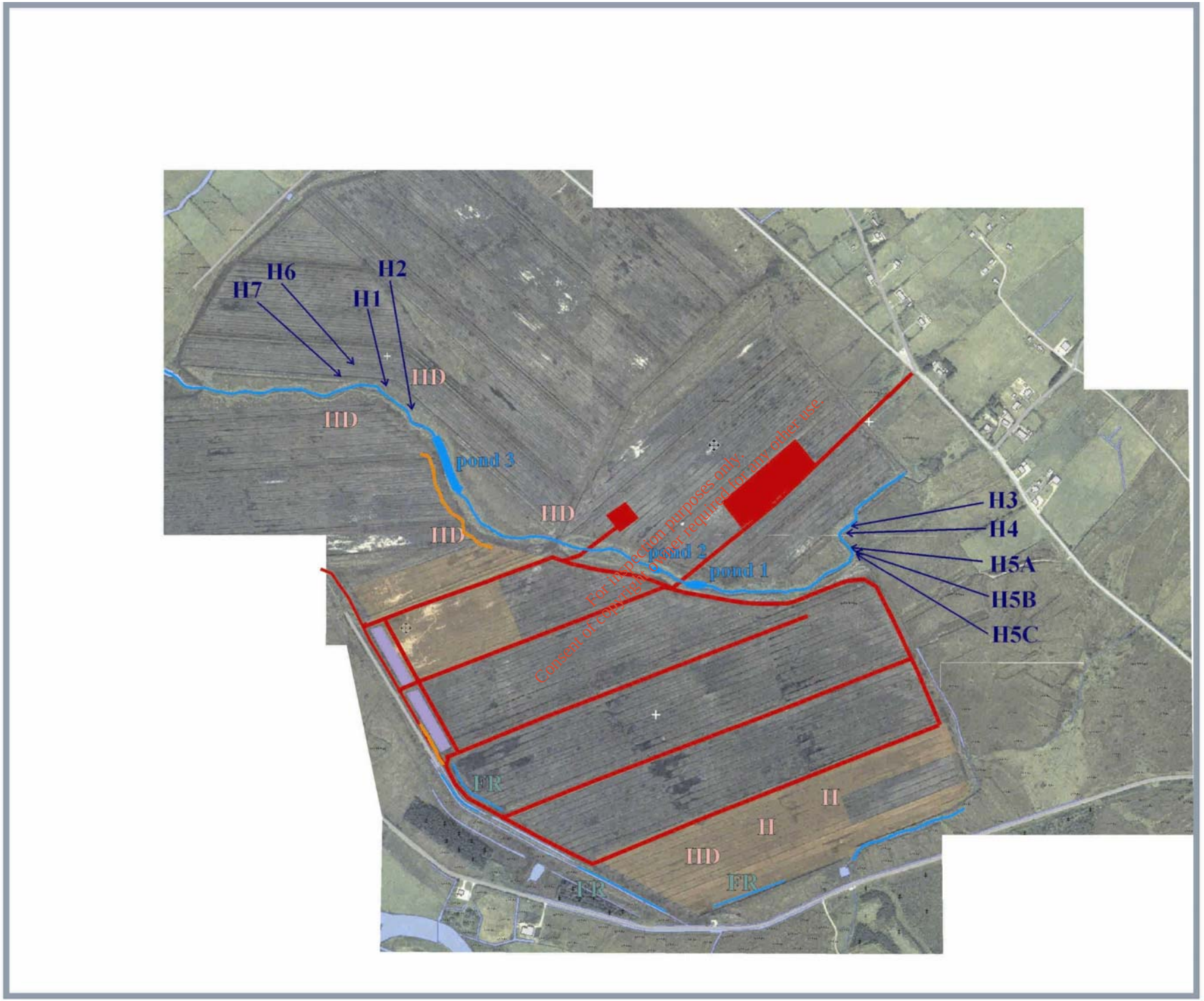

Figure 6.2 Signs of faunal species of interest. Ponds and potential frog breeding sites are also indicated

Bird surveys were undertaken on the 25th of June and the 31th of July 2008 between 05.30 – 10.00 hrs. The weather conditions during both surveys were within the acceptable range for conducting avian surveys (*see* Bibby *et al.*, 2000). The bird surveys were conducted within the site boundary using a series of transects in accordance with Bibby *et al.* (2000). Each of these transects were approximately 250 m in length and a total of six transects were walked. The survey locations are shown in Figure 6.3.

All bird species encountered (seen or heard) during the surveys were recorded, and the abundance of each species was also noted. Birds flying over the site were also included as part of the observations. Birds were recorded as occurring within 50m from the observer or greater than 50m from the observer.

Abundance data collected from these transects (0-50 m distance from the observer) were totalled for each species per month to give a measure of relative abundance. For the purposes of this study, species recorded greater than 50 m from the observer were reviewed separately. In this manner, a taxa list of the birds present in the area, together with an estimate of their relative abundance, was generated.

Desktop Review

A review of relevant studies conducted at the site was undertaken to determine the local breeding bird community that existed at this site previously. Only one full breeding season study was previously undertaken at the site (Arnold 2004) and there was also some additional information in the original Srahmore Peat Deposition EIS, produced by TES Consulting Engineers (2003).

Although the previous study used a different survey methodology to this present study, it was sufficient to allow a general assessment of any important changes that may have occurred in the local breeding bird community over time.

6.3 Receiving Environment

6.3.1 Site Description

The development site forms part of a larger unit (Oweninny Works), of Bord na Móna managed bog located in northwest Maigh Eo (Mayo), on the Erris peninsula. The site is situated approximately 1km to the west of Baingear-Iorras (Bangor Erris), I gContae Maigh Eo (Co. Mayo). The road to Béal an Mhuirthead (Belmullet) (R313) runs adjacent to the site, and the site is accessed from this road. The study area is also skirted, at the south-east, by the local road to Gaoth Sáile (Geesala). The area is covered by Ordnance Survey Discovery Series Maps 22 and 23; and the site is located in 1km squares F8522 and F8523 of the Irish National Grid.

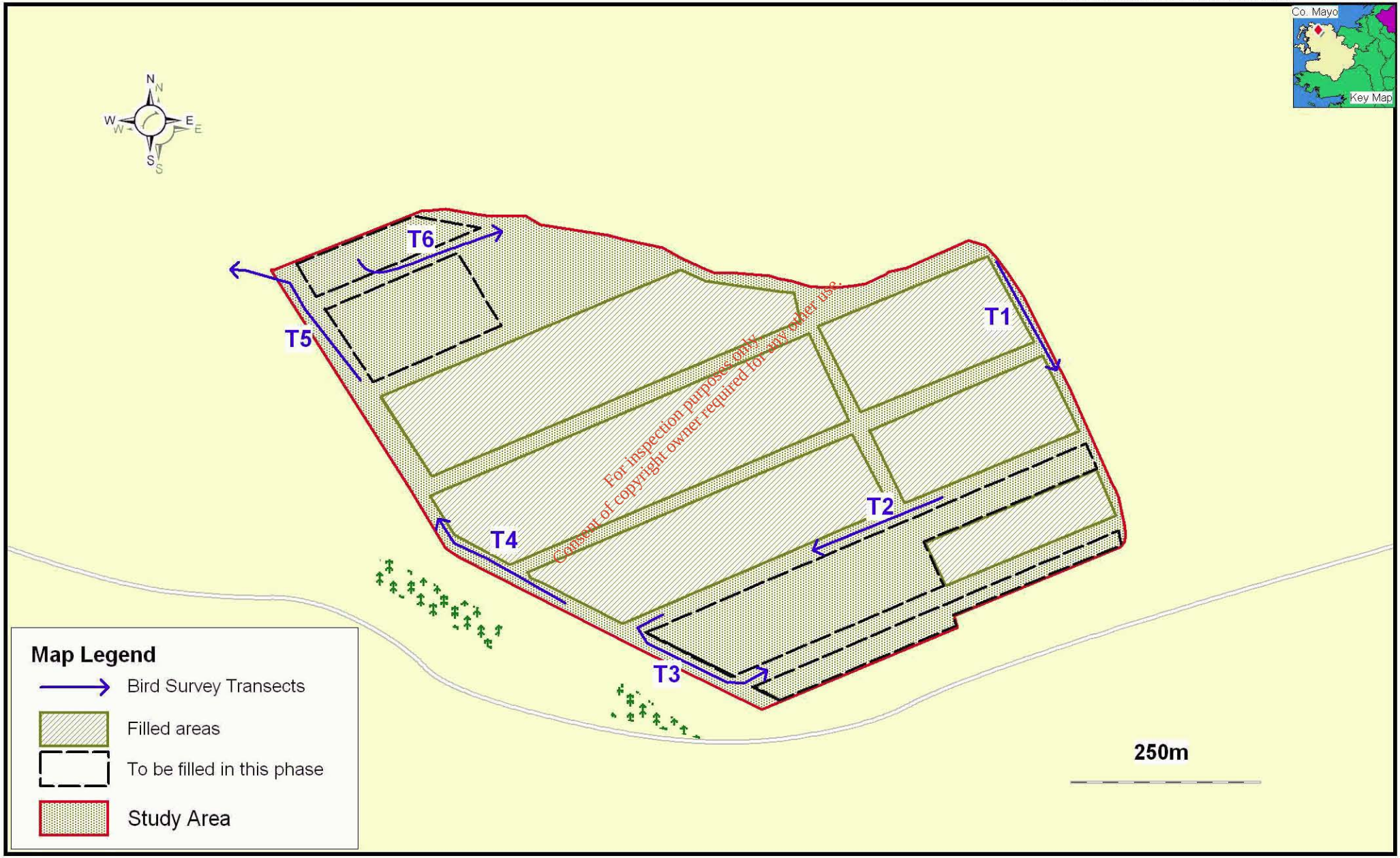

Figure 6.3 Breeding Bird Survey Transects at Srahmore

The main land-use in the area has been:

- industrial peat production over a footprint of up to 1,000ha,
- peat spreading, and
- low intensity agricultural activity along the floodplains of the Munhin and Owenmore Rivers and on the lower slopes of Slieve Fyagh.

Vegetation is generally sparse within the cells which are the primary focus of this study, being mostly composed of bare peat. There is some pioneer vegetation on cutover bogs.

There is wet grassland established along the railway path along with some scrub development. Other high banks, that have not been cutover, have dried somewhat and have a cover of grassland, wet grassland, with scrub in places. The greatest areas of scrub are present along much of the length of the major stream on site. Portions of lowland blanket bog remain at the fringes of the study area (e.g. at the north and north-east in particular).

Apart from the main stream on site, there is a small stream at the south-east. The former feeds to the Munhin River and the latter to the Owenmore River. The confluence of these rivers is approximately 1km to the south west of the site, from whence they flow into the sea at Tullaghan Bay.

There are a number of drainage channels and settlement ponds on site, some dating from earlier periods of peat extraction and some from more recent operations. Several ponds have been created along the main watercourse at the west of Area 6. These have been colonised by native plant species and, whilst small, do add to local biodiversity.

An internal unbound road network has been created on site to allow trucks and vehicles to enter the deposition areas at Area 6.

Lands adjacent to the Bord na Móna bogs comprise a combination of fringes of Atlantic blanket bog and discrete parcels of bog improved for agricultural use. There is some forestry in the vicinity but this is limited to small isolated stands.

6.3.2 History of the site

The landscape that preceded industrial development was a typical mosaic of blanket bog habitats, with peat depths of on average 4m recorded. To develop the site for peat extraction, drains were inserted at 15m intervals within mapped out production units. The drains remained in situ for up to three years until the area was sufficiently dry for Bord na Móna machinery to traverse the site. Once this level of drying was attained, the surface vegetation was removed and the peat was *milled* to harvest a thin layer of peat crumbs, which were then stored on site at Baingear (Bangor) until transported to the ESB station at

Béal Átha Liag (Bellacorick) via road.

Up to forty years of peat production has resulted in significant lowering of the peat level within the peat production footprint area.

Therefore, the landscape and mosaic of blanket bog habitats within the Bord na Móna holdings, has been drastically altered since the 1960s.

6.3.3 Characteristics of the proposed development site

The development site primarily comprises those cells within Area 6 that have not already been filled with peat extracted from the Bellanaboy Bridge Gas Terminal site. These areas are former peat production units that were developed for peat production using the methods outlined previously.

Each of the former production areas which have not already been filled with deposited peat and which are the primary subject of this assessment, are more or less devoid of vegetation except for scattered patches (see below under habitat descriptions). The area is surrounded by (a) a fringe of Atlantic blanket bog[1], (b) Bord na Móna railway lines and (c) deepened drainage channels that were installed for the drainage of the area for peat production. These drainage channels drain into the Owenmore and Munhin Rivers (see Section 7 herein).

6.3.3.1 Legislative context

Irish legislation relevant to an ecological assessment is as follows:

- European Communities (Natural Habitats) Regulations, 1997 (S.I. No. 94 of 1997);
- European Communities (Natural Habitats) (Amendment) Regulations, 1998 (SI 233 of 1998) and 2005 (S.I. 378 of 2005);
- Wildlife Act, 1976;
- Wildlife (Amendment) Act, 2000; and
- Flora Protection Order 1999 (SI No. 94 of 1999).

The Wildlife and Amendment Acts, 1976 and 2000, their associated statutory instruments (including the Flora Protection Order) and Natural Habitat Regulations (for Special Areas of Conservation, SACs) are implemented and controlled by the National Parks and Wildlife Service (NPWS) of the Department of the Environment, Heritage and Local Government (DoEHLG). NPWS is also responsible for the designation of sites.

1 Either degraded or relatively intact Atlantic blanket bog, but generally considered as remnants of the previous Atlantic blanket bog that pre-existed industrial development of the Bangor Bogs by Bord na Móna (*see later*).

6.3.3.2 Designated areas and rare species records

The desk study, including consultations with NPWS confirmed that no rare species of plant, including those on the current Flora Protection Order 1999 (SI No 94 of 1999) are known to occur on the proposed development site. Neither were any FPO species found during the field surveys.

The nearest records for any FPO species are for the Marsh saxifrage (*Saxifraga hirculus*) and for scarce plant records for the Ivy-leaved bellflower (*Wahlenbergia hederacea*) (Neff, 1996-2000). *Saxifraga hirculus* is recorded from springs and flushes within blanket bog complexes located several kilometres to the east and north of the development site. *Wahlenbergia hederacea* is recorded from the banks of the Owenduff River near the confluence with the Tarsaghaunmore River, approximately 10 kms away from the site.

The development site is surrounded by a network of cSACs, SPAs and pNHAs[2]. Those designated sites which occur within 10km or at the 10km from the boundary of the proposed site are listed in Table 6.1. These areas are representative examples of a number of habitats listed in Annex I of the Habitats Directive (92/43/EEC) notably Atlantic Blanket Bog. The designated areas are largely physically and hydrologically isolated from the development site apart from Tullaghan Bay and Blacksod Bay (including the Blacksod Bay/Broadhaven SPA).

2 cSACs, SPAs and pNHAs are *candidate* Special Areas of Conservation, Special Protection Areas and *proposed* Natural Heritage Areas respectively.

Table 6.1: Designated Conservation Sites located within 10km of the Development Site

	Name	Site Code	Designation	Approximate distance from development site
1	Bangor Erris Bog	001473	NHA	4km
2	Blacksod Bay/Broadhaven	04037	SPA	3.5km
3	Broadhaven Bay	000472	cSAC	9.5km
4	Carrowmore Lake Complex	000476	cSAC	1km
5	Carrowmore Lake	04052	SPA	1km
6	Ederglen Bog	002446	NHA	3.5km
7	Glenamoy Bog complex	000500	cSAC	10km
8	Glenturk More Bog	2419	NHA	5.5km
9	Mullet/Blacksod Bay Complex	000470	cSAC	9km
10	Owenduff/Nephin complex	000534	cSAC	1km
11	Pollatomish Bog	001548	NHA	9km
12	Slieve Fyagh Bog	000542	cSAC	6km
13	Tristia Bog	001566	NHA	3.5km
14	Tullaghan Bay and Bog	001567	NHA	3km

These designated areas are host to species listed in Annex II of the Habitats Directive, including: Otter (*Lutra lutra*), salmon (*Salmo salar*), Marsh Saxifrage (*Saxifraga hirculus)* and Ivy-leaved bellflower (*Wahlenbergia hederacea*). Bird species listed in Annex II of the Habitats Directive that utilise these designated areas include Greenland white-fronted geese (*Anser albifrons*), Golden Plover (*Pluvialis apricaria*) and Whooper swan (*Cygnus cygnus*). Annex IV species present in this 10km radius include resident and breeding Merlin (*Falco columbarius*) and Red grouse (*Lagopus lagopus*).

6.4 Habitats and species

6.4.1 Habitats

The habitats recorded from within the development site are outlined below (except for watercourses). The habitats which occur within the actual development site (Area 6) are described and mapped. Because of the confined area of operations being proposed, for the purposes of this study therefore only the habitats in Area 6 are mapped in Figure 6.1. Other habitats, including those located adjacent to and in the vicinity of the site, are also described. A photographic record is presented in Appendix 6.4, Plates 6.1 to 6.18 of Book 3. A list of plant species noted during the field survey is given in Appendix 6.1 of Book 3.

6.4.1.1 Habitat descriptions

The survey area is dominated by cutover bog habitat (PB4). The process of peat extraction at the site has resulted in the formation of large rectangular cells of cutover surface (low fields) which are separated by high (2 to 3 metres) and relatively narrow (5 to 10 metres wide) uncut banks, known as high field areas. As a result of the very dry peat conditions within these high field areas developing dry heath (HH1) vegetation dominates, however bare peat surface is also conspicuous.

More than half of the survey area in Area 6 comprises a dense sward of vigorous wet grassland vegetation (GS4) in which *Juncus effusus* is dominant plant species (Plates 6.1 and 6.2). This vegetation has developed very rapidly on peat which was taken from the Bellanaboy gas terminal site during 2005 and 2007. Apart from *Juncus effusus* other conspicuous plant species in this very species-poor vegetation include *Holcus lanatus, Juncus bulbosus* and *Rumex acetosella*. The remaining ground within the survey area has been designated for the storage of peat in the future. These areas are dominated by cutover blanket bog (PB4) which can be divided into two main types:

- Cutover blanket bog dominated by bare peat surface; and
- Cutover blanket bog dominated by *Juncus effusus* wet grassland (GS4).

A list of plant species recorded from existing cutover bog areas is presented in Table 1 in Appendix 6.1 of Book 3.

In cutover areas where bare peat surface is dominant (Bays 1 and 2) vegetation occurs as relatively small patches scattered throughout extensive bare peat areas (Plates 6.3 and 6.4). The most conspicuous species of these cutover blanket bog areas is generally *Juncus effusus* with *Molinia caerulea, Juncus bulbosus, Calluna vulagris, Erica cinerea, Holcus lanatus, Agrostis* sp. and *Eriophorum angustifolium* also conspicuous.

Bog drains/ditches (FW3) occur within these cutover areas and some are colonized by wetland species such as *Typha latifolia* and *Eriophorum angustifolium* (Plate 6.5).

Cutover blanket bog with development of wet grassland is confined to areas in the north-west of the survey area (Bays 6 and 7). In these areas there has been mixing of peat and subsoil, thus resulting in soil conditions which are conducive to the growth of wet grassland species, most notably *Juncus effusus* and *Holcus lanatus* (Plate 6.6).

Other habitat types present in the general area of the Bord na Móna site and in the vicinity of same include:

Dry siliceous heath, HH1

As mentioned above, this habitat class is found on the edges of high fields and comprises sparse growth of *Calluna vulgaris, Erica cinerea* and *Molinia caerulea*.

Exposed sand, gravel or till, ED1

When these areas do become vegetated, they are generally dominated by *Juncus effusus* and *Juncus bulbosus.*

Scrub, WS1

Scrub vegetation occurs along the main drainage channels and the edges of railway lines. The main feature of the scrub at these locations is dense bramble (*Rubus fruticosus*). There are also dense patches of soft rush growing through the bramble with occasional *Salix* spp. In some areas it grades into fragmentary dry heath with leggy *Calluna* and *Molinia.* Other patches of scrub along railway lines and degraded lowland bog are fragmentary, comprising individuals of gorse (*Ulex europaeus*), willow (*Salix atrocinerea*) and *Rhododendron ponticum*. (Plates 6.12 and 6.15)

Wet grassland, GS4

Wet grassland habitat occurs along railway lines, between sleepers and along the edges of the tracks. The vegetation is relatively diverse including species such as *Juncus effusus*, low-growing *Calluna*, *Holcus lanatus, Molinia, Plantago lanceolata, Bellis perennis, Prunella vulgaris, Rubus,* and *Trifolium pratense*.

Conifer plantation, WD4

Conifer plantations cover less than one hectare to the southern end of the site with the trees planted over 20 years ago. The two stands comprise densely planted lodgepole pine (*Pinus contorta*), fringed by *Rhododendron ponticum*. (Plate 6.17)

Lowland blanket bog, PB3

Lowland blanket bog remnants fringe most of the development site. The condition of the bog is considered to be generally degraded lowland bog remnants, largely being a result of past landuse and drainage associated with peat production at the site.

Degraded Atlantic blanket bog

This habitat represents Atlantic blanket bog that has been heavily impacted upon by drainage and/or former hand-cut peat banks. In the most degraded remnant bog areas, the vegetation is dominated by *Eriophorum* and *Molinia,* with patches of tall (leggy) *Calluna*. Other species present are occasional *Erica tetralix* and *Erica cinerea* with patches of *Rhododendron ponticum*.

Some remnants of intact blanket bog remain on the fringes.

Drainage ditches, FW4

The actual drainage channels are quite variable in vegetation and generally species poor, ranging from isolated stands of pondweed (*Potamogeton polygonifolius*), *Glyceria fluitans*, bottle sedge (*Carex rostrata*), and bog cotton depending on rate of flow and width of the drainage channel. There are occasional patches of *Sphagnum cuspidatum* in shallow drains, generally to the north of the development site. (Plate 6.18)

6.4.1.2 Surrounding area

The land surrounding the Bord na Móna development site largely comprises fringe bog vegetation. This fringe bog is generally included under the lowland blanket bog habitat PB3, as relatively intact and/or degraded lowland blanket bog. It should be noted that recent fire has damaged some of this habitat in recent months (2008) (Plate 6.10).

Two sides of the development site are bordered by roads, beyond which the land-use is largely low-intensity agriculture bordering the Owenmore River and to the north of the Bangor-Belmullet route. To the north and east the land-use has been industrial peat production and displays the vegetative characteristics described here for the development site under the PB4, Cutover blanket bog.

6.4.2 Fauna

The site is characterised by the extensive areas of bare peat, by the recently filled cells which have been colonised by rushes, and a lack of tall scrub or trees. It presents an inhospitable environment for mammals and other vertebrates.

Few signs of fauna were found during survey in July 2008. There had been considerably more mammal activity within the study area during pre-deposition surveys in 2004, whilst those observations amounted to just a few individuals using the area (due to the paucity of vegetation on site).

A list of Irish mammalian, amphibian and reptilian species is included in the Appendix 6.2, Book 3 along with their adjudged status in the area. Observations or signs of the principal protected species within the proposed development site have been mapped on Figure 6.2.

Mammals

Common species

Few signs of mammals were found on site. In contrast to the 2004 survey, no signs of fox *Vulpes vulpes* were found. This species is, nevertheless, expected to occur occasionally on portions of the study area.

As in 2004, signs of Irish hare *Lepus timidus hibernicus* were found regularly, and one individual was seen at the east of the site on the area due for peat deposition. No rabbits *Oryctolagus cuniculus* have been seen in 2004 or 2008 surveys and the habitats on site are poor for them. Nevertheless, some burrows on site have the form of rabbit burrows, whilst presently disused.

Burrows of long-tailed fieldmice *Apodemus sylvaticus* were also observed on site. Other species expected to occur on site – in vegetated areas – include the pygmy shrew *Sorex minutus* and the hedgehog *Erinaceous europaeus.* No squirrels are expected on site because of the lack of vegetation and trees. The grey squirrel *Sciurus carolinensis* is absent in this part of Ireland and the red squirrel *Sciurus vulgaris* is confined to coniferous plantations, in the main, in I gContae Maigh Eo (Co. Mayo) and scarce in the county as a whole.

The pine marten *Martes martes* has increased its range across Ireland and is now known to be present in north Co. Mayo (O'Mahony *et al.*, 2005). Presence of this species has been confirmed (sightings and droppings) in various surveys at the Terminal site. No pine martens are expected on site owing to lack of cover.

American mink *Mustela vison* are known to have spread to I gContae Maigh Eo (Co. Mayo) in recent years and although no signs were found in the area surveyed, one individual was observed (in September 2007; Dr. C. Smal) near to Baingear-Iorras (Bangor Erris) town along the verge of the R313 and not far from the Munkin River. However no signs of mink were found along the watercourses on site.

No deer are expected on site because of the very open nature of the site and the paucity of vegetation. It is known that red deer *Cervus cervus* are present in Iorras (Erris), with observations at the Bellanaboy. From information received from NPWS it is understood that red deer were introduced to the Altnobrockey area of the Nephin range several years ago and have spread into other parts of north I gContae Maigh Eo (Co. Mayo)since their release.

Sheep were observed frequently within the surveyed area.

Badgers

In 2004, the site was utilised, as a foraging area, by badgers: at that time, one active badger latrine, containing fresh badger faeces, was identified south of the main stream to the west of the site area. Also in 2004, badger footprints were also noted in this area along the southern side of the main drainage channel complex at the north of the site.

In 2004 and in 2008, no badger *Meles meles* setts were identified on site and it is certain that there is no active main badger sett on site. No badger signs at all were found in 2008

survey.

The foraging habitat within the site is of very low value for badgers. Presence of badgers on areas of cut-over peat is not entirely surprising as badgers have been noted in such peatland areas previously (Smal, 1995). However, there is a possibility that the disturbance to the area caused by the creation of new roads (Plate 6.7)) and deposition of peat in cells of Area 6 may have led to the decreased use of the area by badgers since 2004.

Badgers are common in Ireland, with an average density nationwide of c. 0.5 social groups per km^2 (Smal, 1995). Their densities are substantially lower in areas of bog, moorland, and upland habitats.

Otters

In 2004, various burrows present along or near to the main drainage channel were identified as otter holts, though all were inactive.

These were revisited in 2008, and except for holt H2, all were found again. Additional burrows were found at locations H6 and H7, and near to H5. Recent burning of some small areas of bog near to some of the burrows was noted. (E.g. H1 and H6 see Plates 6.10 and 6.11). All of the holts/burrows observed within the study area were disused and appeared to have been inactive for some considerable time. The holts/burrow systems on site are detailed in the Appendix 6.3, Book 3. Photographs showed that some of these burrows have remained unchanged since the 2004 survey. (Plate 6.11) Whilst some burrows may be holts disused for some time, some of the burrows identified had smaller entrances and tunnel systems - and appear more akin to old rabbit burrows, although no rabbit presence was identified on site in 2004 or in 2008.

No spraints were identified on site and there was a lack of mammal paths, spraints, or droppings of other mammals, and also lack of prey remains at or nearby these burrow systems.

There is only one significant stream traversing the site and it is possible that otters do continue to visit the site in search of prey during the frog breeding season in spring months and may utilise some of these burrows at this season. Otter presence on the nearby Munkin River is known from the 2004 survey, when spraints were found at Munkin Bridge.

Otters are widespread and common in Ireland. Their presence in known from many localities along the coast in Iorras (Erris) (pers. obs.) and also from studies at the Bellanaboy Gas Terminal, at Sruwaddacon Bay and in the wider locality. They often forage along small streams and drains in search of prey. The common frog *Rana temporaria* is often targeted during the common frog's breeding season in spring. Otters will often travel overland as well, and could well cross wide and open areas such as that at An Srath Mór (Srahmore) in

travel from one stream or river to another.

The presence of what appear to be holts, whilst disused, at the Srahmore area does indicate that they have used the area in the past. The improvement of the main watercourse on site and creation of ponds could well attract the otters in the future. However, the 2004 and this 2008 surveys have not revealed active presence on site. It is evident that the foraging conditions are poor, and few frog breeding sites remain. The large rivers, streams and lakes, as well as the coast must be considered as the principal foraging areas for otters. Their use of the small stream at Srahmore will be occasional and incidental.

However, female otters always seek remote or undisturbed localities for their breeding holts, often well away from larger watercourses. The stream and its banks on site could have provided such refuges in the past, whilst the disturbance in recent years may have discouraged their presence.

Bats

A specialist bat survey was not included within the project brief as no bat roosts would be expected in the very open landscape present. The habitats are poor for foraging bats also. The coniferous plantation nearby (at the south) may provide some shelter and forage for bats on occasion. The invertebrate populations may increase as a result of pond creation in recent years and may now attract foraging bats.

Bat surveys conducted to the north of Baingear- Iorras (Bangor Erris), in the vicinity of Bellanaboy, Sruwaddacon Bay and at Ros Dumhach (Rossport) have revealed bat numbers to be low. The species recorded have included the soprano *Pipistrellus pygmaeus* and common pipistrelle *Pipistrellus pipistrellus*, these two species being the most frequent; these are common and widespread throughout Ireland.

Brown long-eared bat *Plecotus auritus* is also present in Iorras (Erris). Though this species requires broad-leaved woodland for foraging.

Daubenton's bat *Myotis daubentonii* forages over open water and is known to travel over considerable distances along watercourses. It is also found on smaller water bodies such as ponds and pools.

Leisler's bat *Nyctalus leisleri*, which forages over agricultural landscapes, scrub and woodland, has been detected in the Sruwaddacon Bay area. It has also been recorded south of Bellanaboy along the main R314 road.

Natterer's bat *M. nattereri* and whiskered/Brandt's bats *M. mystacinus/M. brandtii* are not expected to be in the area due to the absence of deciduous woodland and scrub.

Likewise, the lesser horseshoe bat *Rhinolophus hipposideros*, is presumed absent as the habitat is not favourable and the nearest known population is in the south of the county in the Castlebar area.

Another scarce bat is Nathusius's pipistrelle *P. nathusii*, which has been detected in the south of the county at Cong but there are no local records.

Amphibians and reptiles

No common frogs *Rana temporaria* were observed on site in 2008, nor any tadpoles (late in season for tadpoles). In 2004, frogs were identified at a number of locations within the study area. This species may breed in some of the drainage channels and bog and heath areas where small pools do occur. Several wet drains that may serve as frog breeding sites in spring are indicated on Figure 6.2. It appears that some pools that had served as frog sites in 2004 have disappeared as a result of development.

Due to the lack of suitable ponds or pools, no smooth newt *Triturus vulgaris* are expected on site.

The common lizard *Lacerta vivipara* is a common species and difficult to observe. It occurs in a range of habitats, especially on moors and rocky places, but also within woodlands and grassland areas. It occurs widely in the Irish countryside but is difficult to observe; it is likely to be present on site or vicinity.

6.4.3 Birds

Observer transect locations are mapped in Figure 6.3.

The species recorded within 50 m of the observer during the 2008 breeding bird surveys are summarised in Table 6.2. A total of 18 species were recorded (combined data) during the 2008 breeding season. Meadow Pipit, *Anthus pratensis* was the more abundant species recorded across the season, followed by Wren, *Troglodytes troglodytes*, Skylark, *Alauda arvensis*, and Goldcrest, *Regulus regulus*.

Eight additional species (*i.e.* recorded greater than 50 m from the observer) were also recorded in the vicinity of Srahmore Peat Deposition Site. These additional species recorded are generally considered nationally common such as Magpie (*Pica pica*), but also included some rarer migrant species, such as Grasshopper Warbler (*Locustella naevia*). A full list of additional species recorded is given in Table 6.3.

6.4.3.1 Desktop Review of Previous Studies at Srahmore Deposition Site

A total of 15 breeding species were recorded by Arnold (2004), (see Table 6.4). The most abundant species in the vicinity of the site in 2004 were found to be Meadow Pipit, Wren, Linnet, *Carduelis cannabina* and Ringed Plover.

Meadow Pipit and Wren were recorded as the two most common species in both surveys. Other common resident species such as Robin, *Erithacus rubecula* and Chaffinch, *Fringilla coelebs*, are also present in each survey. In all 9 of the 15 species recorded by Arnold were also encountered during the 2008 breeding season survey. Some of the discrepancies in the taxa lists produced by the surveys are attributable to records (in both surveys) of single individuals of bird species that may be present on site only sporadically. If these species are extremely infrequent on site there is also the chance of these birds being missed entirely due to the design or timing of the individual survey visits. Arnold's (2004) survey was also based on only one survey visit.

One of the most notable differences occurring between surveys is the abundance of Ringed Plover, with just one adult recorded in the 2008 survey, compared to 5 probable and 1 possible breeding pairs in 2004. Interestingly, a male Sparrowhawk, *Accipiter nisus*, was seen taking a young Ringed Plover from a nest on the June survey visit.

Table 6.2: Summary of Breeding Bird Data Collected (within 50 m of the observer) during the 2008 Breeding Bird Survey at Srahmore Deposition Site

Common Name	Scientific Name	June 2008	July 2008
Blackbird	*Turdus merula*	1	0
Chaffinch	*Fringilla coelebs*	3	2
Coal Tit	*Periparus ater*	3	2
Goldcrest	*Regulus regulus*	6	3
Hooded Crow	*Corvus cornix*	0	1
Mallard	*Anas platyrhynchos*	3	0
Meadow Pipit	*Anthus pratensis*	12	24
Pied Wagtail	*Motacilla alba*	1	0
Ringed Plover	*Charadrius hiaticula*	1	0
Robin	*Erithacus rubecula*	1	6
Sand Martin	*Riparia riparia*	0	1
Skylark	*Alauda arvensis*	7	3
Sparrowhawk (male)	*Accipiter nisus*	1	0
Stonechat	*Saxicola torquata*	1	0
Swallow	*Hirundo rustica*	0	2
Whitethroat	*Sylvia communis*	0	2
Willow Warbler	*Phylloscopus trochilus*	0	1
Wren	*Troglodytes troglodytes*	12	6
Total		**52**	**53**
No. of species		**13**	**12**

Table 6.3: Summary of Bird Species recorded on the site but at a distance of > 50 m from the observer

Common Name	Scientific Name	June	July
Blackbird	*Turdus merula*	0	1
Blue Tit	*Cyanistes caeruleus*	1	0
Grasshopper Warbler	*Locustella naevia*	0	1
Great Tit	*Parus major*	3	0
Greenfinch	*Carduelis chloris*	0	1
Jackdaw	*Corvus monedula*	0	1
Magpie	*Pica pica*	0	2
Meadow Pipit	*Anthus pratensis*	5	1
Mallard	*Anas platyrhynchos*	0	6
Reed Bunting	*Emberiza schoeniclus*	1	0
Robin	*Erithacus rubecula*	0	1
Rook	*Corvus frugilegus*	0	1
Swallow	*Hirundo rustica*	1	1
Wren	*Troglodytes troglodytes*	6	0
Total		**17**	**16**
No. of species		**6**	**10**

Linnet also occurred in high numbers in 2004, but were not recorded in the vicinity of the site this season. Linnet, like most finches, form flocks and as a result they have a clumped distribution – this means that it is likely that in a study with few visits that they are either under- or over-represented in the sample.

In contrast, Skylark and Goldcrest were relatively abundant this season, but were either scarce or absent in 2004. Many of the songbird registrations in the current study were associated with the line of conifers in the southwest of the site and the maturing vegetation along the route of the old internal rail line also towards the southwest of the site.

Table 6.4: Comparison of Species Recorded in the 2004 and 2008 Studies

Common Name	Scientific Name	Species present 2004	Species present 2008
Black-headed gull	*Larus ridibundus*	*	
Blue Tit	*Cyanistes caeruleus*	*	
Chaffinch	*Fringilla coelebs*	*	*
Coal Tit	*Periparusarus ater*		*
Goldcrest	*Regulus regulus*		*
Hooded Crow	*Corvus cornix*	*	*
Linnet	*Carduelis cannabina*	*	
Mallard	*Anas platyrhynchos*		*
Meadow Pipit	*Anthus pratensis*	*	*
Pied Wagtail	*Motacilla alba*		*
Lesser Redpoll	*Carduelis cabaret*	*	
Reed Bunting	*Emberiza schoeniclus*	*	
Ringed Plover	*Charadrius hiaticula*	*	*
Robin	*Erithacus rubecula*	*	*
Sand Martin	*Riparia riparia*		*
Skylark	*Alauda arvensis*	*	*
Sparrowhawk (male)	*Accipiter nisus*		*
Stonechat	*Saxicola torquata*	*	*
Swallow	*Hirundo rustica*		*
Wheatear	*Oenanthe oenanthe*	*	
Whitethroat	*Sylvia communis*		*
Willow Warbler	*Phylloscopus trochilus*	*	*
Wren	*Troglodytes troglodytes*	*	*

6.4.4 Assessment of the scientific interest of the site

6.4.4.1 Habitats

Evaluation has been undertaken with due regard to the revised EPA Advice Notes on Current Practice (2003); EPA Guidelines on the information to be contained in Environmental Impact Statements (2002); and the Institute of Ecology and Environmental Management's Guidelines for Ecological Impact Assessment (IEEM, 2006) and with reference to the National Road's Authority Guidelines for ecological impact assessment (NRA, 2004). (See Table 6.5)

Table 6.5: Ecological Site Evaluation Criteria

Ecological value		Criteria
Internationally important		EU Annex habitat in an internationally designated conservation area (or qualifying site; or site with a proposed designation) A viable area of a habitat type listed in Annex I of the Habitats Directive, or smaller areas of such habitat which are essential to maintain the viability of a larger whole. Non-designated high quality habitat which equates to an EU Annex I priority habitat A regularly occurring, nationally significant population / number of any internationally important species.
Nationally important		EU Annex habitat in a designated (or proposed) NHA. Non-designated good example of Annex I habitat (Under EU habitats Directive) Any habitat which may have been formerly classified as EU Annex I quality, but which has been subsequently highly modified as a result of change in the physical environment or damaged. Such a habitat may be still be classified as an Annex habitat on the basis of the presence of one or more character plant species, but can no longer be considered a good example of that habitat type
Locally important	**High value**	Sites containing semi-natural habitat types with high biodiversity in a local context, with high degree of intrinsic naturalness. Locally rare habitats or species
	Moderate value	Sites containing some semi-natural habitat or locally important for wildlife
	Low value	Highly modified or artificial habitats with low intrinsic ecological value in terms of biodiversity Artificial habitats which provide some secondary wildlife habitat of local value

Habitat evaluation is considered in terms of extent, diversity, naturalness, rarity, fragility, typicalness, recorded history, position, potential value and intrinsic appeal. Field survey data was supplemented by relevant literature and other existing information when carrying out the assessment.

Taking into considered the above evaluation criteria, the site is of Low value, local importance. The habitats which dominate this area are considered to be of low ecological value for the following reasons:

- The cutover blanket bog and wet grassland habitats occurring are generally widespread throughout the west of Ireland;
- The habitats have developed as a direct result of industrial-scale peat extraction in a blanket bog landscape;
- The site does not include nor impinge on any designated conservation site;
- None of the habitats recorded within the site are listed in Annex 1 of the E.U. Habitats Directive;
- Although a relatively species-rich wet grassland/blanket bog flora was recorded none of the constituent species are legally protected or even considered to be locally rare;
- The fringe habitats around the site are fragmentary and considered to be of low ecological value;
- Coniferous plantation is considered to be a habitat of low ecological value, such value being in terms of faunal refuge;
- In the context of the extensive tracts of bog that have been designated as cSACs and/or pNHAs within view of the site, the fringe bog remnants are seen as of significantly low ecological value.
    - The bog fringes are therefore considered to be of local ecological value in terms of biodiversity because they provide remnant areas of vegetation for commuting, refuge and foraging.
    - The most significant ecological aspect is that the area is located within the catchment of the Munhin River that flows into the Owenmore River and ultimately the Tullaghan Bay pNHA. The evaluation of these areas and impacts on salmon and other salmonid species is considered in Section 7 of this Volume of the EIS.

6.4.4.2 Fauna

Overall assessment of scientific interest of area in terms of fauna

The habitats in the area of the proposed scheme may be considered in terms of extent, diversity, naturalness, rarity, fragility, typicalness, recorded history, position, potential value and intrinsic appeal. The potential of these habitats for vertebrate fauna is considered in this framework also. The area may be considered in terms of the essential habitat or land use zones present there.

- *Cutover areas*
  The main habitats on site are the areas of prior peat extraction and the recently filled cells. These are largely devoid of vegetation whilst rushy vegetation has developed on parts of the newly filled cells. These habitats have low value for mammals. Depending on conditions, and development of the rushy vegetation, these could potentially form foraging habitat for frogs in the future.

- *Grassland banks, vegetated tracks*
  The banks between cells (where not used as active road surfaces) and verges of roads, and also the old railway track are often vegetated with grasses and some scrub. These provide habitat and forage for Irish hares, small mammals, frogs, and invertebrates.

- *Watercourses*
  The main area of ecological interest is the principal watercourse at the north and west of the study area. This has banks of varying width on either side; the banks are vegetated with grasses, herbs, occasional ferns, and often substantial bramble *Rubus fruticosus* spp. scrub. The stream provides a wildlife corridor that will be used on occasion by badgers, otters, and other species such as frogs. Small mammals will also be present. Most of the larger mammal burrows found on site are in banks or habitats near to the stream.

- *Ponds, drains*
  There are few ponds on site. Three new ponds have been created along the main watercourse, and these are now showing good diversity of plant and invertebrate life. These ponds may encourage use of the corridor by otters in the future and may also attract foraging bats. The drains on site will harbour frogs during the breeding season where conditions are suitable.

Overview:

The site is very poor for mammalian fauna because of its open landscape and lack of vegetation. Most of the habitats referred to above may be considered as of negligible ecological value for wildlife, with the exception of the main stream and its riparian verges,

which may be considered as of low local value. Frog breeding sites should be considered as of low local value also.

The fringe habitat of blanket bog may be considered as of low local value. It provides foraging areas for frogs and Irish hares.

Species of conservation interest - fauna

A number of mammalian species are protected under the Wildlife Act (1976 and Amendment [2000]), some of which are known to be present on site or may be expected to occur on site occasionally. These include the badger, Irish hare, pygmy shrew, and hedgehog. These species may be considered as common species and ubiquitous through much of the Irish countryside.

The following are considered as species of conservation interest (*Red Data Book*; Whilde, 1993): otter, badger, Irish hare, and hedgehog.

It is an offence to wilfully interfere with or destroy the breeding or resting place of these species (Wildlife Act, 1976; Wildlife [Amendment] Act 2000); there are exemptions for certain kinds of construction developments.

The otter is a protected species under the Wildlife Act (1976 and Wildlife [Amendment] Act, 2000) and is also listed in Annex II and Annex IV of the EU Habitats Directive. It is also listed as requiring strict protection in Appendix II of the Berne Convention. Ireland is a European stronghold for the species, whilst the species is recovering in numbers in Britain after declines believed to have been caused by organochlorine-based insecticides and heavy metals.

All Irish bat species are protected under the Wildlife Act (1976) and Wildlife Amendment Act (2000). Also, the EC Directive on The Conservation of Natural habitats and of Wild Fauna and Flora (Habitats Directive 1992), seeks to protect rare species, including bats, and their habitats and requires that appropriate monitoring of populations be undertaken. Across Europe, they are further protected under the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention 1982), which, in relation to bats, exists to conserve all species and their habitats. The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention 1979, enacted 1983) was instigated to protect migrant species across all European boundaries. The Irish government has ratified both these conventions. All Irish bats are listed in Annex IV of the Habitats Directive.

Reptiles and amphibians

The common lizard, common frog, and the smooth newt are all protected species under the Wildlife Acts. The common frog is a *Red Data Book* species but it is common in most Irish habitats. Common frog was observed on site. But newts are not expected to occur.

The common lizard is expected to occur on site.

It is necessary to ensure protection of breeding sites of reptiles and amphibians and it is good practice to make provision for maintenance of these species if possible.

6.4.4.3 Birds

The conservation status of the species found on the site was also assessed.

BirdWatch Ireland and the Royal Society for the Protection of Birds (RSPB Northern Ireland) have agreed a list of priority bird species for conservation action in the whole of Ireland and this list has recently been updated (Lynas *et al.* 2007, Newton *et al.* 1999). The *Birds of Conservation Concern in Ireland* is published in a list known as the BoCCI List. In this BoCCI List, birds are classified into three separate lists (*Red*, *Amber* and *Green*), based on the conservation status of the bird and hence conservation priority. Conservation designations take into account the dangers faced by bird species that occur in Ireland.

Red-listed species are of highest conservation concern and *Amber-listed* species are of medium conservation concern; 25 species are currently *Red-listed*, while a further 90 are considered *Amber-listed*. Green-listed species are considered of no particular conservation concern (Lynas *et al.* 2007).

Additionally, the EU has published a list of priority bird species. These species are published on a list known as Annex I and are afforded protection throughout the EU Birds (79/409/EEC) and Habitats (92/43/EEC) Directives.

No *Red-listed* or EU Annex I species were recorded during the site survey.

Four *Amber-listed* species were recorded overall, Ringed Plover, *Charadrius hiaticula*, Swallow, Skylark and Sand Martin, *Riparia riparia*. *Amber-listed* species are considered to have an 'unfavourable status' in Europe, due to either small population sizes, moderate population declines, a localised distribution, or are present in internationally important numbers (Lynas *et al* 2007). The Ringed Plover now appears as *Amber-listed* in the revised/updated 2007 BoCCI list. This change from *Green* (Newton *et al.* 1999) to *Amber*-listed has occurred because of the international importance of the current Irish population, with at least 20% of the European population (localised non-breeding population) occurring here. Skylark, Swallow and Sand Martin are all *Amber-listed* as SPEC 3 species, and therefore, considered to be of 'unfavourable status' not concentrated in Europe (Lynas *et al* 2007).

The previous *Amber-listed* status of Stonechat, *Saxicola torquata* (Newton *et al.* 1999) has been revised and the species is now considered *Green-listed*, and therefore, currently of no elevated conservation concern (see Table 6.6).

Table 6.6: Conservation Status of Bird Species Recorded during 2008 Breeding Bird Survey

Common Name	Scientific Name	Conservation Status	
		Revised BoCCI	Previous BoCCI
Blackbird	*Turdus merula*	GREEN	GREEN
Blackcap	*Sylvia atricapilla*	GREEN	GREEN
Blue Tit	*Cyanistes caeruleus*	GREEN	GREEN
Chaffinch	*Fringilla coelebs*	GREEN	GREEN
Chiffchaff	*Phylloscopus collybita*	GREEN	GREEN
Coal Tit	*Periparus ater*	GREEN	GREEN
Goldcrest	*Regulus regulus*	GREEN	GREEN
Hooded Crow	*Corvus cornix*	GREEN	GREEN
Mallard	*Anas platyrhynchos*	GREEN	GREEN
Meadow Pipit	*Anthus pratensis*	GREEN	GREEN
Pied Wagtail	*Motacilla alba*	GREEN	GREEN
Ringed Plover	*Charadrius hiaticula*	**AMBER**	GREEN
Robin	*Erithacus rubecula*	GREEN	GREEN
Sand Martin	*Riparia riparia*	**AMBER**	**AMBER**
Skylark	*Alauda arvensis*	**AMBER**	**AMBER**
Sparrowhawk (male)	*Accipiter nisus*	GREEN	GREEN
Stonechat	*Saxicola torquata*	GREEN	**AMBER**
Swallow	*Hirundo rustica*	**AMBER**	**AMBER**
Whitethroat	*Sylvia communis*	GREEN	GREEN
Willow Warbler	*Phylloscopus trochilus*	GREEN	GREEN
Wren	*Troglodytes troglodytes*	GREEN	GREEN

6.5 Characteristics of the Proposed Development

The Srahmore Peat Deposition Site was granted planning permission by An Bord Pleanála (Ref. PL16.207212) and a waste Licence from the EPA (Ref. W0199-01) for deposition of 450,000m^3 of peat generated in the construction of the Bellanaboy Bridge Terminal Site.

At the planning stage of the original application it was anticipated that the 450,000m^3 would be accommodated within the full extent of Area 6 of the Srahmore Peat Deposition site. The peat excavation and deposition activity was undertaken in 2005 and 2007. Upon completion of the deposition of 448,000m^3 of peat, significant remaining voids exist within the previously permitted site. This is a remaining void area within the previous activity area granted planning permission by An Bord Pleanála and a waste licence by the EPA.

It is proposed that activities within the Srahmore Peat Deposition site will be consistent with activities previously undertaken within the site. It should be noted that the infrastructure necessary for the successful peat deposition activity is largely intact within the site, with some temporary infrastructure requiring re-import or establishment within the site.

The existing drainage systems constructed and successfully utilised under the previous application in Area 5 (Reception Area) and Area 6 (Deposition Area) will continue to operated in order to allow effective drainage of the peat to ensure any run-off from the peat reception hardstand is effectively treated and to ensure the long-term stability of the peat.

The Srahmore Peat Deposition Site is the first cut-over peat land to be successfully used as a Peat Storage Area. It is a unique development in National terms and was recently inspected by an International audience during the International Peat Congress. Appropriate management and stabilisation of peat is a complex and difficult matter. The Srahmore Peat Deposition site represents a unique opportunity for study of the long term stabilisation of peat and the revegetation of deposited peat.

A detailed description of the development can be found in Section 2 of this Volume of the EIS.

6.6 Potential Impact of the Proposed Development

Impact assessment has been undertaken with due regard to the revised EPA Advice Notes on Current Practice (2003); the EPA Guidelines on the information to be contained in Environmental Impact Statements (2003); and with reference to the Institute of Ecology and Environmental Management's Guidelines for Ecological Impact Assessment (2006) and the National Roads Authority's Guidelines (NRA), for ecological impact assessment.

Criteria for assessing impact level have been derived from those set out in Appendix 4 of the NRA Guidelines criteria but expanded in order to be able to address issues such as habitat quality and are shown in Table 6.7. Terminology for impact significance and duration follows that set out by the EPA (2003).

Table 6.7: Impact Magnitude Matrix

Ecological value* ► / Impact magnitude ▼	Internationally important	Nationally important	High value, locally important	Moderate value, locally important	Low value, locally important
Profound negative	Any permanent impacts	Permanent impacts on a large part of a site			
Significant negative	Temporary impacts on a large part of a site	Permanent impacts on a small part of a site	Permanent impacts on a large part of a site		
Moderate Negative	Temporary impacts on a small part of a site	Temporary impacts on a large part of a site	Permanent impacts on a small part of a site	Permanent impacts on a small part of a site	Permanent impact on a site if part of a designated site
Slight Negative		Temporary impacts on a small part of a site	Temporary impacts on a large part of a site	Permanent impacts on a small part of a site	Permanent impacts on a large part of a site
Imperceptible Negative			Temporary impacts on a small part of the site	Temporary impacts on a small part of the site	Permanent impacts on a small part of a site
Neutral	No impacts	No impacts	No impacts	No impacts	No impacts
Slight Positive				Permanent beneficial impacts on a small part of a site	Permanent beneficial impacts on a large part of a site

* For ecological evaluation criteria see Table 6.5 above

6.6.1 Potential impacts on habitat and species

The proposed development is an extension to an existing approved development. The extension will entail infill of several cells within Area 6. The infrastructure required for this is already in place, whilst the scheme will entail the traversing of roads on high banks between some cells, and hence will entail some temporary (for duration of works) loss of natural vegetation currently existing there.

The deposition works will involve the offloading and moving of up to 75,000m^3 of peat, with the potential for increased degradation of the habitat through processes of peat compaction and further disturbance of the present habitat. This degradation could result in an even longer timeframe for habitat succession to commence. However, there is a great amount of experience already gained from the large scale peat spreading works at this site. The rehabilitation plans developed by Bord na Móna and its consultees for the cutover peatlands have been proven to be successful in stabilising the peat and in establishing embryonic peat-forming successional habitats. The plans were applied in the earlier phases of peat deposition at Srahmore and will be applied in the proposed development.

The impacts of this proposal are considered within the framework of existing approved developments on site and observed habitat improvements nearby that have occurred as a result of initial infill phases at Area 6.

6.6.1.1 Overview

There will be a number of temporary impacts on the site during the actual deposition of the peat material onto the cutover bog.

The main habitat present on the site is the cutover bog class, PB4. This habitat type has low local ecological value, particularly when considered within the context of the extensive surrounding cutover bog landscape in Baingear (Bangor). There will be a high magnitude impact on the peat deposition area on all temporary scales (0-25 years). In the short term, the temporary impact will be neutral, in that it will be bare peat covering bare peat. In the medium term, the peat deposition site will have revegetated and the impact will be positive. This will continue into the long-term temporary impact scale, as successional development will allow the area to develop a range of micro-habitats and contribute to biodiversity and habitat value at the local level.

6.6.1.2 Designated conservation areas

Designated conservation areas within 10km of the development are listed in Table 6.1. There will be no impacts, temporary or otherwise, on any designated conservation area, as all are located at some distance from the development and as such are physically isolated.

Neither will there be any impact from development of the site on any of the species listed as rare or scarce above.

6.6.1.3 Loss of habitat

Within the site, the affected habitats may be considered in the context of the principal land use/habitat zones referred to above.

- Loss of areas of bare peat or peat with some colonising vegetation.
- Loss of former bog habitats on banks between cells, often now grassy and with scrub present. (Used by small mammals, frogs and Irish hares).
- Loss of some old drains or more recent drains, some of which could harbour frogs in spring.

6.6.1.4 Habitat fragmentation

The infill of several cells will not lead to additional habitat fragmentation. Indeed, as the area is infilled and becomes re-vegetated, habitat fragmentation may be reduced.

6.6.1.5 Specific impacts on fauna

Mammals

Common species

- Loss of habitat will affect few (and mainly common) mammalian species and there could potentially be some mortality during operation.

- Protected species such as pygmy shrew (possibly hedgehog also) will be directly impacted. There are limited ways to protect such species and they are common in Ireland.

- Other species, such as fox and the protected Irish hare will be affected by loss of foraging habitat. These species move away from disturbance and mortality during construction is not expected or will not be significant.

- Impacts may be considered as Minor Negative on common species in the immediate

locality. However, common species are, of course, widespread and ubiquitous in the Irish countryside and the overall impact on common species may be considered as Negligible.

Badgers

No badger setts were found on site and none are expected to be present. There was no evidence of any foraging activity on site. Loss of foraging habitat will be very small in the context of badger territory sizes.

Impacts on badgers in the locality, regionally and nationally: Negligible.

Otters

Otters do not occur on the site itself, whilst likely to use the main watercourse nearby on occasion and forage for frogs on or near site when frogs are breeding. The recent creation of ponds along the watercourse is considered to have long-term beneficial impacts on otters, whilst disturbance caused by traffic etc. will deter otter use during the construction (i.e. infill phases).

Impacts on otters on site and in the locality: Neutral.

Bats

No bat detector study was conducted but no bat roosts are expected. Occasional use of the watercourses by bats is to be expected and this may have been enhanced by the creation of the ponds along the main watercourse recently.

Impacts on bats on site: Neutral.

Amphibians and reptiles

Frogs are present on site and the rush and grassland habitats, in particular, provide foraging habitat for this species also. No newts were found nor any expected. Common lizard is also protected and there would be loss of foraging and breeding habitat for this species. There could, therefore, be some mortality of frogs and lizards present on site.

Expected impacts on amphibians and reptiles in the locality, region and nationally: Slight Negative.

Potential impacts on fauna in the wider locality

The proposed development is expected to have Negligible or at most Slight Negative impact on the wildlife in adjoining areas.

In this context, the water quality of the stream on or near site, and downstream, is crucial. This has been addressed for earlier phases at Area 6 and the present proposal at Area 6

should not affect the existing measures nor impact further on stream/water quality.

6.6.1.6 Impacts on birds

Given that the habitats at the site are already in a considerably degraded state and the proposed works involve the deposition of more peat (on peat), the potential short-term impacts at the site are relatively insignificant. Although this habitat is already of comparatively low ecological value, there is still the potential for disturbance of the bird species present. This disturbance will result from increased machinery and human activities. The species common in the habitats currently present are relatively abundant locally and nationally. There are large areas of suitable habitat for these species in the hinterland around this site. There is likely to be highly localised short term disturbance and displacement impacts on the birds using the areas where peat is to be deposited. With mitigation, these impacts are likely to be minor and short-term.

6.6.2 Permanent impacts of deposition

6.6.2.1 Designated conservation areas and the wider locality

Designated areas in the locality will not be impacted upon by the proposed development. The proposed peat deposition will result in the creation of additional peatland habitat, to that already being established as a result of the deposition of peat from Bellanaboy. It will benefit species in the area which will have the opportunity to expand into these newly created habitats, thus increasing the overall potential biodiversity of the area.

6.6.2.2 Habitats

The development site will gradually blend with the surrounding landscape over time. This is already in process as a result of the regeneration of vegetation on those areas of peat spread from previous peat deposition. The vegetation succession will lead to a more varied habitat which will contribute to local biodiversity and complement the ecological value of the adjacent rehabilitated cutover areas. Over time the habitats will blend with the existing fringe habitats that currently border the development site. The long term prospect is therefore considered to be positive, with permanent beneficial impacts on the development site.

6.6.2.3 Fauna (non-avian and birds)

There will be no negative permanent impact on faunal activity in the area. The establishment of poor fen or wet grassland will improve the foraging and refuge opportunities for non-avian and avian fauna, aspects within the development site that were previously lacking.

As habitat succession continues at Srahmore, it is probable that the assemblage of faunal species will also continue to change, as different species make use of a changing habitat. In the longer-term, it is hoped that the permanent impact will be the creation of a more ecologically important habitat, with the overall enhancement of the existing area as the area begins to re-vegetate. This impact should lead to a positive increase in the biodiversity of the Srahmore Peat Deposition site area. For this reason long term permanent impacts on non-avian fauna and birds are likely to be positive and additional species are expected to expand into the enhanced and rehabilitated habitats.

6.7 Do Nothing Scenario

The additional cells due for infill (with peat) under this proposal have Low or Negligible ecological value at present. Without any development, they will retain their ecological value as is. A do-nothing approach may result in the establishment of a habitat that is of little ecological value, though this is unlikely because a comprehensive rehabilitation Plan for the site in is place as outlined in the 2003 EIS.

6.8 Mitigation Measures

This proposal is for an extension to the existing development/use of the Srahmore Peat Deposition site at Area 6. Several cells are to be filled under this proposal with infrastructure already largely in place. No mitigation measures are recommended for habitat mitigation per se as there are no habitats of any particular value which will be impacted upon. The method of optimising the revegetation of the peat is an integral part of the proposed peat deposition process which is described elsewhere.

Impacts, as shown above, are in relation to faunal disturbance and loss of foraging during the deposition period, and until the cells support vegetation cover. The following mitigation measures are therefore recommended for faunal species.

6.8.1 Non-avian fauna

6.8.1.1 Protection of protected species

Badgers

- No specific mitigation measures are required for the protection of badgers.
- However, if there is a substantial period of time between this survey and works commencing (e.g. c. 12- 18 months), then a repeat badger/faunal survey should be conducted prior to any work taking place.
- Such survey will ascertain if badgers have created badger setts in the interim period and, if so, appropriate mitigation measures then taken. Badgers do create setts in dry peat banks and such potential must be addressed. Detailed mitigation measures in

such circumstance are not set out here. Any works directly affecting badgers or their resting places must be conducted under licence (from NPWS) by persons qualified to do so.

Otters

- No specific mitigation measures are required for the protection of otters.
- However, if there is a substantial period of time between this survey and works commencing (e.g. c. 12 – 18 months), then a repeat otter/faunal survey should be conducted prior to any work taking place
- Such survey will ascertain if otters have created holts in the interim period and, if so, appropriate mitigation measures then taken. Otters do create setts in dry peat banks and such potential must be addressed. Detailed mitigation measures in such circumstance are not detailed within this report. Any works directly affecting otters or their resting places must be conducted under licence (from NPWS) by persons qualified to do so.
- No works are anticipated in the area of any otter holts found adjacent to the site. If any works close to identified holts are considered, then it is recommended that pre-commencement survey be conducted and mitigation measures taken as appropriate.

Frogs

- Specific mitigation measures are required for the protection of frogs. There are several potential breeding grounds within cells at Area 6 including the cells considered under this proposal.
- Pre-deposition study must be undertaken to ascertain if frogs will be present at breeding sites to be affected/destroyed by any works during the frog breeding season.
- Ideally the period of operation at affected breeding sites should preferably exclude the breeding period (late January/February to July), though this may not be possible for operational reasons. In such circumstances, any amphibians present within the affected portions of the site should be removed prior to operations proceeding and placed into alternative suitable habitats in the locality. These operations need to be conducted by experienced zoologists under licence from NPWS. These operations will allow for frogs and spawn to be translocated from breeding pools to nearby unaffected pools/breeding sites. Frogs and spawn should be moved from any pools affected by sedimentation or pollution caused by construction works. Spawn and tadpoles should be placed in suitable habitat nearby (preferably where frogs are already spawning – indicating good habitat) but in which the additional spawn would not cause overcrowding.
- Artificial breeding pools should be created within unaffected portions of habitats adjacent to the site as part of the landscaping/habitat restoration programme and this option is recommended as mitigation for amphibians. Such ponds could also encourage newt populations potentially present in the locality.

- After peat stabilisation, and vegetation establishments, additional frog breeding sites could be created in some of the existing drains on site or very near site by creating small pools.

6.8.2 Habitat restoration and enhancement

- Rushy habitats and wet grassland will develop in the filled cells and these provide foraging habitat for frogs and then for their predators.
- The main watercourse on site should be further enhanced. It has been noted that the creation of ponds along the channel has enhanced the biodiversity of the stream and will lead to increased use by vertebrate species. Additional ponds are recommended.
- The corridor of the main watercourse should be further enhanced by ensuring protection of the banks and allowing for natural vegetation to colonise these verges. It is recommended that the watercourse be protected to minimum of 5m on either side by adequate fencing or signage. At present, some works have approached close to the stream and there appears to be no provision for permanent protection of the watercourse and wildlife corridor. This provision (i.e. 5m zone) will not be possible where the new roads are already close to the stream but should be adopted where otherwise feasible.
- Any fencing or habitat restoration must avoid holts identified in this study or if found at any required pre-construction surveys.
- Advice should be taken from botanical experts as to habitat restoration or enhancement of this corridor by planting of native species.
- The rehabilitation plan will be reviewed by Bord na Móna, and updated if necessary, based on the early indications of the success of these measures at Srahmore. The aim of rehabilitation is to ensure the rehabilitated area blends in and adds ecological value to the surrounding area.
- Un-managed succession at the site could increase the possibility of the establishment of a habitat of lower ecological value. It is suggested that a management plan for invasive and undesirable species be adopted for this site
- The surrounding area will generally determine what habitat develops –planting around the fringes of the site and perhaps along roadways with appropriate locally sourced (where possible native) species such as willow and alder could increase the rate at which the area are revegetated by supplying an additional seedbank, letting a more diverse and semi-natural habitat develop.
- Regular monitoring should be carried out in order to gauge the progress of habitat succession and the development biodiversity in terms of constituent flora and faunal species.
- Following the peat stabilisation period, the existing site will be reassessed and drainage redesigned to create wetland regeneration, which will also incorporate frog breeding habitat.

6.8.3 Birds

- Ideally, the timing of the deposition should, if at all possible, avoid the peak breeding season for birds. However, it is acknowledged that this may not be practical for operational reasons.
- If the breeding season cannot be avoided, then a pre-deposition survey must be carried out to ensure that no nesting birds are present in the deposition areas.
- Mitigation measures may also be put in place to discourage ground nesting birds from using the areas to be affected by the operations. Such measures might include closely cutting or mowing the vegetation.
- Habitat enhancement measures are expected to lead to an increase of avian diversity as the habitats re-establish over time.

6.8.4 Pollution hazards: during operations

Contamination incidents and run-off of sediments into the local watercourses could affect the stream and river habitats downstream of the construction area. Such would impact on protected species and habitats, for example otters and species using the SPA downstream.

- Construction works should limit entry of sediments, and avoid entry of pollutants, into the drainage system and natural watercourses in the area.
- Any construction works or habitat restoration measures may result in runoff and sedimentation into local watercourses. In view of potential impacts on fisheries, advice should be sought from fisheries experts, and also NPWS in relation to designated conservation areas downstream.
- Strict guidelines for safe use of fuels, lubricants, and disposal of same must be provided and adhered to.
- Disposal facilities must be provided for all other wastes including non-hazardous wastes in order to limit littering and contamination incidents.
- The scheme needs to have in place full treatment facilities for waste water discharges resulting from the proposal, and such must ensure that discharges will not impact on downstream watercourses or designated conservation areas.

6.8.5 Works on site: during operations

Storage areas should be located away from watercourses in order to limit potential impacts and pollution hazards etc. Adequate precautions need to be taken to ensure that any pollution hazards are reduced to negligible hazard. Operations near the main stream should be conducted so as to minimise negative impact on the quality of the stream.

6.8.6 Monitoring:

- The mitigation measures should be monitored by experts at intervals during and post deposition to ensure successful implementation. Good practice also requires that impacts on adjoining areas are also monitored.
- The success of the mitigation measures for frogs should be monitored for a period of at least 2 years after deposition.

See also paragraph 6.10 herein.

6.8.7 Mitigation by avoidance

The proposed development is an extension of use to an existing approved development at this site. The extension will entail infill of remaining low field cells within previously permitted Area 6. Most of the infrastructure required for this is already in place, whilst the scheme will entail the travel of deposition vehicles on high banks between some cells, and hence will entail some temporary loss of natural vegetation currently existing there.

From an ecological viewpoint therefore, the site is appropriately chosen for the deposition. The receptor cells are largely devoid of vegetation. If another Bord na Móna site had been chosen then that would have had implications for the rehabilitation process which has already commenced.

6.8.8 Mitigation by consideration of climatic variability

During the course of peat transfer to Srahmore all activity will be dependent on appropriate weather conditions. The period for transfer of the peat to the site and the spreading of peat in Area 6 will be timed to coincide with the most suitable climatic conditions. This allows for longer daylight periods, favourable drying conditions and optimal conditions for machinery, which in turn will have benefits in providing optimum conditions for vegetation establishment.

6.8.9 Mitigation by remedy

It is proposed that once all the peat has been introduced on site to Area 6 and shaped into the appropriate deposition form (as outlined previously) that there will be no further high level activity within the site. Activity will be restricted to:

- maintaining the integrity of drainage channels,
- excavating material from silt ponds periodically;
- regular site visits (on foot) to ensure there is no subsidence of peat; and
- potential periodic educational/research site visits.

The road infrastructure in Area 6 will allow access for machinery to maintain drainage channels and/or in the event of ameliorative work being required.

It is anticipated that there will be a first flush of seedlings from the seedbank within the peat. However, unlike that taken from Bellanaboy where *Juncus effusus* (soft rush) dominated, the likely first colonisers are *Eriophorum angustifolium*, *Juncus species* (including soft rush) and *Molinia*. The revegetation is likely to be slower than from the Bellanaboy peat, but good cover should be present after 18 months to 2 years. This estimation is based on experience from regeneration of vegetation on the Bord Gáis Mayo to Galway gas pipeline in areas of blanket bog which were subject to conventional spread techniques (i.e. not turving) and where the vegetation was allowed to regenerate naturally on the levelled, bare surface peat.

Initial colonisers would be followed in due course by the natural succession of peatland vegetation, initially by swards of *Juncus effusus* (soft rush) – dominated wet grassland. In this manner, the establishing vegetation will comprise native species and it may be achieved without recourse to fertiliser application or the introduction of alien (i.e. non-native) genotypes which would be the case if seeding was carried out. This will be assessed by the appointed ecologist.

The resulting vegetation will be similar to that commonly occurring on reclaimed agricultural lands in North West Mayo, thus it will also blend into the landscape.

6.9 Predicted Impact of the Proposed Development

The impact of the development will largely depend upon the following:

- the nature of the deposited peat, including the seed bank
- the vegetation successional processes
- reinstatement measures

Based on the above assessment of terrestrial habitats and species above, it is predicted that the overall impact of the development will be slight.

During the deposition process the impact will be higher, especially in terms of faunal disturbance, however in view of the low ecological value of the site and the low numbers of species which are present, this impact is considered to be temporary and moderate, reducing to slight in the short term. Long terms impacts are expected to be positive.

Provided that all measures are implemented as set out in this Volume of the EIS, no negative impact is anticipated as a result of the proposed development.

6.10 Monitoring

Monitoring is a vital part of the process in order to be able to measure the success of the rehabilitation following peat deposition.

Regular monitoring of the site will be undertaken. This is particularly important in the first year following deposition. The Bord na Moná Rehabilitation Plan for the site monitoring programme is included in Appendix 1.2, Book 3 of this Volume of the EIS. In summary:

- An annual assessment of vegetation cover and vegetative successional development across the development site will be conducted. This will document and track changes in vegetation cover, species composition and trends in vegetative condition.
- Site visits will be made at the end of each growing season following introduction of the peat. The survey will cover the following aspects:
  - Vegetation spread and establishment (quantitative and qualitative analysis)
  - Vegetation succession
  - An assessment of peat stability

The fringe habitats may also be included in this study to ensure there are no negative impacts or to assess how their integrity may be improved through alteration of drainage patterns within the development site. This is especially important in the context of faunal species.

The success of recommended mitigation measures for habitat and species should also be monitored.

6.11 Reinstatement and Residual Impacts

6.11.1 Reinstatement

Once the peat is stabilised in Area 6 a number of re-instatement options may be considered:

- *Natural processes*
  This option will involve leaving the former development area to natural processes: leaving the drainage system and peat to naturalise and also to allow the sedimentation ponds to naturalise. Once the peat is stabilised there will be no potential peat run-off and therefore no further requirement for sedimentation ponds. The area would comprise a *Juncus*-dominated landscape.
- *Rewetting*
  There may be potential to alter the drainage within the site to encourage rewetting of the peat deposition facility. Rewetting will only be considered when the area is completely stabilised (100% vegetation cover) and there is no potential for peat

movement within the site.

The most suitable reinstatement option for Area 6 will be selected following consultation with all interested parties.

6.11.2 Residual Impacts

No negative impacts are anticipated from the proposed peat deposition at Srahmore. Residual impacts on habitat and species are considered as follows:

- Habitat and vegetation: residual impacts are considered to be positive.
- Non-avian fauna: the overall impact of the scheme may be considered as Neutral with regard to vertebrate species present on site or in the locality. With habitat improvement as a result of vegetation establishment, the impacts will be Minor Positive for fauna on site.
- Birds: in the medium to longer term the resulting successional habitats will lead to an overall enhancement of the biodiversity at Srahmore resulting in an almost certain increase in local bird diversity.

The residual impacts overall are considered to be significantly positive given that they should result in habitat rehabilitation and increased local biodiversity. However, the importance of ensuring the success of the rehabilitation is such that there should be regular ongoing monitoring at the site to review the progress of the scheme.

7 AQUATIC ECOLOGY

7.1 Introduction

This assessment was conducted in accordance with EPA Guidelines on the Information to be contained in Environmental Impact Statements (EPA, 2002)[1], EPA Advice Notes on Current Practice (in the preparation of Environmental Impact Statements) (EPA, 2003)[2], and also in general accordance with the Guidelines for Ecological Impact Assessment in the United Kingdom (IEEM. 2006)[3].

The aim of the *Aquatic Ecology* study is to (a) outline the current condition of the receiving environment and (b) to assess likely (temporary and permanent, direct and indirect) impacts on aquatic habitats on site and receiving waters. The aquatic habitats include the Munhin River, Owenmore River and Tullaghan Bay, which combined form the lower stretch of the Owenmore Catchment. The Owenmore Catchment covers an area of 340km^2 and stretches from the tributaries entering the Oweninny River at Knockmoyle (cSAC), the Altnabrocky River that flows north through the Bellacorick Bog complex (cSAC) and those entering Lough Carrowmore (cSAC).

The development site is situated within the Bord na Móna Bangor holdings. This area has already being utilised successfully for peat deposition between April 2005 and June 2007. It is proposed to deposit up to 75,000m^3 of peat within the existing activity boundary of the Srahmore Peat Deposition site. The site was, and continues to be, operated, managed and controlled under the requirements of the Waste Licence issued by the Environmental Protection Agency (EPA) in October 2004 (Licence Ref: W0199-01).

Currently terrestrial habitats largely comprise cutover bog (*see section 6*). The information utilised to make the assessment of the development on the aquatic ecology includes baseline water quality samples, existing baseline biological monitoring data from the EPA and literature relating to the Owenmore catchment. On the basis of these studies, potential impacts of the development on the immediate freshwater habitats (on site streams and the Munhin River) and those related to the site (in particular sites designated for their conservation value such as Tullaghan Bay), and appropriate mitigation or remedial measures; are outlined.

[1] Environmental Protection Agency. 2002. Guidelines on the information to be contained in Environmental Impact Statements.
[2] Environmental Protection Agency. 2003. *Advice Notes on Current Practice (in the preparation of Environmental Impact Statements).* Prepared on behalf of the EPA by CAAS Environmental Services Ltd.
[3] IEEM. 2006. *Guidelines for Ecological Impact Assessment in the United Kingdom*. Institute of Ecology and Environmental Management.

Sections 6 and 9 of this Volume of the EIS also present data that are relevant to consideration of the aquatic ecology. Section 6 presents information on the terrestrial ecology, including descriptions of drainage ditches and non-fish vertebrates such as otters and frogs. In addition, Section 6 outlines the areas designated for conservation value within a 10km radius of the site (Table 6.1). Section 9 outlines water quality aspects based on regular monitoring along the Munhin River. These three sections are therefore inter-related and should be read in conjunction.

7.2 Study methodology

7.2.1 Literature Review

Relevant reports such as the Draft *Owenmore River System Report, Fisheries Catchment Plan* (NWRFB 2003) and the *Interim Report on the Biological Survey of River Quality - Results of the 2002 Investigations* (EPA 2002) were reviewed and all relevant information assessed in relation to the development.

7.2.2 Consultation

Consultation letters (18th July 2008) were forwarded to the North Western Regional Fisheries Board (NWRFB) and private fishery owners with interests down river of the development site.

7.2.2.1 Responses

North Western Fisheries Board

A response was received from the NWRFB on 18th August 2008. The board highlighted that they were satisfied with the measures put in place during peat deposition between April 2005 and June 2007 on the site. They requested similar measures for the proposed additional deposition and also provided additional comments listed here;

- Avoid discharge of potential polluting matter during/ after deposition. Design of lagoons should ensure they are effective during extreme rainfall events. Prepare maintenance and monitoring schedule for described settlement lagoons.

- Store and refuel petroleum products in bunded areas away from water courses.

- Works to be carried out during dry weather. Extreme caution should be exercised re potential runoff, during highly sensitive periods regarding salmon and sea trout. This period includes October to May inclusive.

- Investigate soil types to be deposited. Formulate parameters for materials to be

accepted.

- Transport material to site in sealed containers by trained personnel.
- Notify the board prior to works commencing.

Mr Richard Hewitt

A response was received from a fishery owner, Mr Richard Hewitt on 28th July 2008. In this response he expressed concern about the effectiveness of the deposition design to avoid impacts to rivers, from the additional peat proposed. In addition he made a point that to his knowledge, some of the conditions regarding bog rehabilitation, following the initial peat deposition, had not been fully implemented. With respect to his assertion that conditions have not been carried out in accordance with waste licence, this is not factually correct. The operation of the facility has been carried out in accordance with all statutory requirements.

7.2.3 Water Quality and Habitats

The EPA maintains a database of river water quality that is compiled from a series of samples taken from rivers throughout the country. The quality assessment is based on the 'Q Value' rating system. The Q rating ranges from 5 to 1 with 5 being water of the highest quality. This index uses the presence and/or absence of species sensitive to pollution, assigning a score, which can be used to cross-reference with a pollution index that rates the pollution of a site. The evaluation of water quality is based on the relative abundance of groups of indicator species. The key features of the classification system are outlined in Table 7.1

Table 7.1: The biological river quality classification system (McGarrigle *et al*., 2002)

Q Value	Community diversity	Water quality
Q5	High	Good
Q4	Reduced	Fair
Q3	Much reduced	Doubtful
Q2	Low	Poor
Q1	Very low	Bad

Samples for biological analysis are collected using a method called *kick sampling*. Kick sampling is carried out by kicking for a duration of 2 minutes in a stream or riverbed on a suitable gravely substrate in a riffle area[4]. A net is held down stream of the area being disturbed and all macroinvertebrates collected are identified and numbers recorded.

[4] A riffle area is characterised by shallow, turbulent, fast-moving water over rocks or stone. Increased oxygen levels in a riffle area lead to a higher concentration of pollution sensitive invertebrate species.

The Munhin River was surveyed on the 17/09/05 and again on 07/10/2007, by AMGC Environmental Agricultural Consultancy. This assessment was carried out upstream and downstream of the discharge point from the site, to establish a Q index value for both locations and identify any change in water quality.

In addition information on the biological water quality of the Munhin River is available from the EPA (2002) which carries out an extensive programme of kick sampling throughout the country on a regular basis.

Results from these monitoring programmes described, are referred to for the purpose of the impact assessment.

7.2.3.1 Habitats

Habitats including the river bank and river were classified according to The Heritage Council's *A Guide to Habitats in Ireland* (Fossitt, 2000)[5]. Habitats were rated according to the Site Evaluation Scheme contained in the National Roads Authority's Guidelines for Assessment of Ecological Impacts of National Road Schemes (National Roads Authority, 2006[6]). Refer to Appendix 7.1, Book 3 for qualifying criteria for site evaluation.

7.3 Receiving Environment

A description of the general layout of the site, together with the main habitats found, and the historical land management use can be found in Section 6. Also detailed are the areas designated for conservation value that lie within a 10km radius of the development site. A description of the watercourses is presented below, and more detail is given on the ecological significance of the coastal cSACs and pNHAs into which the watercourses flow, particularly Tullaghan Bay and the Mullet/Blacksod Bay complex.

7.3.1 Designated conservation areas and rare and/or protected species

7.3.1.1 Rare and/or protected species

The Annex II species, the Atlantic salmon (*Salmo salar*) is present in the Munhin River. Lamprey species were also recorded from tributaries entering Lough Carrowmore (the tributaries were surveyed as part of the information provided for the Bellanaboy Bridge Terminal EIS). While the development site is downstream of Carrowmore Lake, it is worth noting the presence of lamprey in the area. Both salmon and lamprey species are recognised

[5] Fossitt, J.A. 2000. *A Guide to Habitats in Ireland*. The Heritage Council, Kilkenny, Ireland.
[6] National Roads Authority. 2006. *Guidelines for Assessment of Ecological Impacts of National Road Schemes.* Revision 1, 1st March 2006.

as highly sensitive receptors within the receiving environment and both are listed in Annex II of the EU Habitats Directive.

7.3.1.2 Designated conservation areas

The North West Mayo coastline, and in particular the Erris peninsula and its associated coastal habitats is recognised as being of significant ecological value.

This assessment is based on the presence priority habitats listed under the EU Habitats Directive such as machair, intact blanket bog and extensive sand dune systems and the utilisation of these areas by mammal and bird species listed under the EU habitats and Birds Directive.

Coastal areas, potentially connected to the site include Broadhaven Bay and Blacksod Bay, have therefore warranted a number of designations and these are outlined below. Another aquatic system of significant conservation value is Carrowmore Lake, which is an important salmon fishery. A brief description of these designated areas is provided here to put the development site in context with the surrounding area (Table 7.2).

Table 7.2: Designated ecological conservation areas located within 10km of the development site (Aquatic sites)

Name	Site Code	Designation	Approximate distance from development site
Broadhaven Bay complex	000472	pNHA	9.5 km
Carrowmore lake complex	000476	cSAC	1 km
Mullet/BlacksodBay complex	000470	cSAC	9 km
Tullaghan Bay and Tullaghanashammer Bog	001567	pNHA	3.5 km

Carrowmore Lake is of international importance ecologically. This is mainly due to the significant populations of Annex II listed fish species including Atlantic salmon breeding stocks. In addition it is an important sea and brown trout fishery. A fish counter was installed at the outlet of Carrowmore Lake for the purpose of recording salmon numbers entering and leaving Carrowmore Lake. The counter was installed by the NWRFB recently and results confirm previous assessments that Carrowmore is of major significance in terms of salmon and sea trout productivity within the greater Owenmore River catchment area and environs.

The Munhin River is the outlet for Carrowmore Lake and hence is therefore of key significance for fish travelling from the Atlantic to spawning beds. The Munhin flows into the Owenmore River, which in turn enters Tullaghan Bay.

Tullaghan Bay and Blacksod Bay areas are linked to the freshwater drainage channels from the development site by the Owenmore River flowing into Tullaghan Bay, which is part of the greater Blacksod Bay.

Parts of Tullaghan Bay are designated as (a) a proposed Natural Heritage Area (pNHA), (b) a Special Protection Area (SPA), (c) an Important Bird Area and (d) a *Ramsar* site (see Appendix 7.2, Book 3 for *BirdWatch Ireland* and *Ramsar* descriptions of these sites). The SPA designation is justified mainly due to the presence of nationally significant (>1% population) numbers of wader and waterfowl bird species that winter within Tullaghan Bay and the adjacent Blacksod Bay and Broadhaven Bay.

The development site is therefore located central to a number of areas designated for their ecological significance, as outlined in Section 6. While it has been outlined that there will be a low magnitude impact on terrestrial ecology, the freshwater system draining the development site connects to coastal areas that have significant habitat, fisheries and avian ecological value. Therefore, the aquatic ecology of the site and these designated areas are closely related and potential impacts from the development must be considered with respect to potential indirect effects on the surrounding system.

7.3.2 Habitat Description

7.3.2.1 Depositing/lowland Rivers FW2

Both the main drain from the development site and the Munhin River, fall into this habitat category (Fossitt 2000).

Main drain and two minor drains from the Srahmore Peat Deposition site

The main drain within the development site at Srahmore is approximately 950m in length and drains the greater portion of the development site, and the adjacent former Bord na Móna production areas. Bord na Móna field drains and main outfalls drain Area 5 and 6, each of which either partly or completely drain into the main drain. The southern portion of Area 6 drains to the Owenmore River. Area 7 does not drain to the main drain but to the Munhin River. All drainage from the Srahmore site ultimately drains to the Owenmore catchment and outfalls to the marine environment at Tullaghan Bay. Two other minor drains are present: one drains an area of relatively intact bog and enters the Owenmore at Bord na Móna silt pond S5-1. Another drains the southern corner of the site and enters the Owenmore River at Bord na Móna silt pond S5-2. These drains are Bord na Móna drains and were never significant for salmonid productivity.

The main drain exhibits drain features and has been deepened by Bord na Móna operations.

NWRFB records outline that it is a first order stream[7] with a gradient varying from 0% to 0.6%. The drain-like character and low gradient indicates that the main drain is not significant for salmonid production in the catchment.
The vegetative features of field drains and drainage channels are described in Section 6, with a brief description of the main drainage channel presented here. The eastern end of the main drainage channel is devoid of vegetation. Further down stream, the bank vegetation is dense, comprising impenetrable stands of bramble (*Rubus fruticosus*) with soft rush (*Juncus effusus*). Other species present include purple moor grass (*Molinia caerulea*), *Agrostis* spp and Bracken (*Pteridium aquilinum*) (*see Section 6*). The banks are steep *ca.* 1-2m high with the stream width approximately 0.75m. Water run-off through this stream is generally low.

The main drain from the Srahmore Peat Deposition site flows through a Bord na Móna settlement lagoon (S5-5) before passing underneath the existing railway through low intensity agricultural fields and into the Munhin River.

Munhin River

The Munhin River is the outlet from Carrowmore Lake and stretches from Carrowmore Lake (approx. 1km north of the development site) to the Owenmore River. On leaving Carrowmore Lake, water flows along the Munhin and under the County Road R313. The water continues in a southerly direction west of the development site, joining the Owenmore River approximately 2km south of the site.

The Munhin River is a fourth order river. It is primarily a slow-flowing lowland river, with the gradient varying from 0.1% to 0.5%. Extrapolation from data from the NWRFB GIS system indicates that the section of the Munhin draining the development site does not make a significant contribution to overall salmonid production in the catchment. This is due to the absence of appropriate spawning and nursery habitat for salmonids. The Munhin River is nonetheless utilised for angling, as there are significant numbers of salmon and sea trout utilising the river as a migratory route to and from Carrowmore Lake.

The Munhin River drains the adjacent low intensity agricultural fields, which are characterised by relatively low banks (*ca.* 0.5m) in comparison to the main drainage channel from the Srahmore Peat Deposition site (see above). The stream side vegetation is dominated by bramble (*Rubus fruticosus*) and soft rush (*Juncus effusus*). Other species include *Agrostis* spp, creeping buttercup (*Ranunculus repens*) and red clover (*Trifolium pratense*). Other species may be present but were not in evidence at the time of survey.

The Munhin River to Owenmore to Tullaghan Bay

For completeness, a brief outline of the watercourse until its terminal point in Tullaghan Bay is provided.

[7] The classification system follows that utilised by the NWRFB.

The Munhin enters the lower catchment of the Owenmore River. From this point, the Owenmore stretches for a further 900m before it enters Tullaghan Bay. This is at the highest point to which the ordinary tide flows (marked as salmon weir on O.S. 6 inch maps). There is no discernible gradient along this 900m stretch of the Owenmore River on the NWRFB GIS system. This part of the Owenmore is utilised for angling but once again the lack of spawning habitat and nursery areas indicate that this stretch does not contribute to the overall salmonid productivity. The same applies to Tullaghan Bay.

7.3.3 Water Quality

AMGC

Biological Quality rating carried out upstream and downstream of the main drainage point from the site indicated that there was a slight improvement in water quality downstream of the main outlet from the site between survey findings in 2005 and 2007. The rating went from Class C Moderately Polluted upstream to Class B Slightly Polluted downstream. A new hydrological station was installed at the outlet from Carraghmore Lake as it enters the Munhin River immediately upstream of the activity. This has resulted in a faster flow through this location which made sampling more difficult. However the results indicate that the quality of this stretch of the Munhin has not worsened since 2005, when peat deposition last took place.

EPA

The EPA conducts an ongoing monitoring programme of water quality in the Owenmore catchment. Sampling is conducted in summer months for a number of reasons; (a) the macro-invertebrate fauna of rivers are theoretically under the greatest ecological pressure from pollution, because of reduced flows and higher temperatures (Clabby *et al*. 2002)[8]; and (b) some macro-invertebrate larvae may not be recorded in freshwater systems during winter months[9]. The most recent (2002) biotic indices that they have recorded in the Owenmore Catchment are presented in Table 7.3.

The following two paragraphs detail the EPA Assessments of the Owenmore and Munhin River (*EPA 2002*).

> **"*The Owenmore River*** *was surveyed in early August 2002. Water quality was satisfactory over its length and a good range of pollution-sensitive species present in spite of the ubiquitous presence of silt arising from commercially exploited peat bogs in the catchment. Siltation was especially notable in the upper sections (0050, 0150).*

8 Clabby., Lucey., and McGarrigle Interim Report on the Biological Survey of River Quality. Results of 2002 Investigations. Environmental Protection Agency Ireland (EPA).

9 Macro-invertebrate life cycles often involve an over-wintering strategy

Nonetheless an improvement in quality was noted at Stn 0150, downstream of Béal Átha Liag (*Bellacorick) village and power station, in comparison with 1999. In the middle reaches, as far as Bangor, quality was satisfactory (0270, 0300). A slight deterioration in quality was noted downstream of Bangor (400) in comparison with 1999. Quality was again of a good to high standard at the last station sampled, which is downstream of the Munhin River, which flows from Lough Carrowmore.*

The Munhin *was slightly polluted at the point sampled (0200). The Munhin is located downstream of Carrowmore Lake and an extensive area of Bord na Móna exploited bog. It is notable for its large population of the hemipteran, Aphelocheirus sp., which was still present in August 2002. However, none of the most pollution-sensitive macroinvertebrate species were found at the site in 2002 in contrast to 1999. Turbidity has always been noticeable at this site (0200) due to the peat workings upstream and it is also highly influenced by Lake Carrowmore, which has a surface area of over 900 ha. It is reported that Carrowmore Lake has yielded large numbers of salmon to the rod in recent years".*

Table 7.3: Q-values for the Owenmore Catchment (*Source: EPA 2002*)

Site Name	1981	1986	1990	1994	1997	1999	2002	Current Status
Altnabrocky			5	4-5	4-5	4-5	4-5	Unpolluted
Bellanaboy			4-5	4	4	4-5	4	Unpolluted
Glencullin			4-5	5	5	4-5	-	Unpolluted
Muing			4	3-4	3-4	3-4	3-4	Slightly Polluted
Munhin	4	4-5	4-5	4	4	4	3-4	Slightly Polluted
Owenmore (*at Srahnakilly*)	-	4-5	5	4-5	4	4-5	4	Unpolluted
Site Name	**1981**	**1986**	**1990**	**1994**	**1997**	**1999**	**2002**	**Current Status**
Owenmore (*1.1km below Bellacorick Bridge*)	-	-	4	4-5	4	4	4-5	Unpolluted
Owenmore (*bridge at Bangor–main flow*)		4-5	4	4	4-5	4-5	4-5	Unpolluted
Owenmore (*3km u/s Munhin confluence*)			5	-	-	4-5	4	Unpolluted
Owenmore (*700 metres u/s Munhin confluence*)	-	-	4	4	4-5	4	4-5	Unpolluted
Sheskin Stream			5	4-5	4-5	4-5	4	Unpolluted

7.3.4 Fish

The main drain on site has been heavily impacted by past Bord na Móna peat cutting and associated drainage activities, pre recent peat deposition licensing. It is unlikely that the stream was ever a significant spawning or feeding area and its current status remains as such. The same applies to the other two drains within the development site.

The Munhin River is recognised as an important fishery (NWRFB) [10]. It is also an important link for fish travelling from the Owenmore River upstream to spawning grounds in the tributaries feeding into Carrowmore Lake. Electro fishing was conducted in the streams that enter Carrowmore Lake during preparation of the baseline studies for the Bellanaboy Bridge Terminal Site. Species recorded were brown trout (*Salmo trutta*) and salmon (*Salmo salar*). The salmonid juveniles were considered to be moving towards Carrowmore Lake. They remained there until they became smolts and migrated to sea via the Munhin River.

Stickleback (*Gasterosteus aculeatus*), freshwater European eel (*Anguilla anguilla*) and lamprey (*Lampetra fluviatilis* or *Lampetra planeri*) were also recorded during the surveys and were in abundance in 2003. The introduced species, minnow (*Phoxinus phoxinus*), was also recorded.

7.3.5 Birds

There is no significant usage by birds of the freshwater habitats within the immediate area of the development site but species known to use the Munhin River include heron and cormorant.

7.3.6 Evaluation of ecological significance of the watercourses draining the proposed development site

The ecological value of the drainage channels within the development site are considered to of be of **Low Value, E**. This category includes low grade and widespread habitats. This is justified for the following reasons:

- There are no rare or protected species recorded within the main drain at the Srahmore Peat Deposition site and/or the other minor drain.
- The drain-like character of the drainage channels and peat base suggests the site will

[10] http://www.northwestfisheries.ie

never contribute to salmonid productivity in the Owenmore catchment (first order streams, low gradient, history of Bord na Móna deepening, etc.).
- The drains have no ecological value, except for their value to allow for treatment of the water from the development site before entering other watercourses.

An evaluation is provided for the watercourses into which the Srahmore drains channels will flow. The aquatic ecology of the surrounding area is considered to be of **International value, A.** This category includes internationally designated or proposed sites such as SACs, or sites otherwise meeting criteria for conservation designation at international level. It also includes sites supporting populations of internationally important species. This assignment is justified for the following reasons:

- The presence of listed Annex II species, the Atlantic salmon in the Munhin River and greater Owenmore catchment.
- The presence of lamprey in tributaries entering Carrowmore Lake. Three lamprey species are found in Ireland, all of which are protected under the EU Habitats Directive and two were recorded from tributaries entering Carrowmore Lake (*Lampetra fluviatilis* and/or[11] *Lampetra planeri*).
- The recognised international and national ecological significance of Carrowmore Lake and Tullaghan Bay and the greater Blacksod Bay complex as SPAs, cSACs, pNHAs, IBAs and Ramsar designations. The designations are assigned because of the presence of listed rare and vulnerable bird species, the utilisation of the sites for migratory species and the presence of internationally significant numbers of migratory species each year.
- The significance of the link provided by the Munhin River between Carrowmore Lake (cSAC and habitat for Annex II species such as salmon and brook lamprey) and the Atlantic Ocean for migrating and spawning salmonids.
- While both the Munhin River and the Owenmore River are not presently designated as cSAC, the presence of Atlantic salmon is considered sufficient for these rivers to be treated as cSAC sites under this evaluation of ecological significance.
- There are listed habitats present within the designated areas within Blacksod Bay that are included as priority under the Habitats Directive, and any indirect effects from the development could impact on these areas. While there are no listed rare species of plant recorded from the watercourses, or from the terrestrial habitats, it is the machair and sand dune complexes as a whole in the Mullet/ Blacksod complex that justifies the designation of those areas.

7.4 Characteristics of the Proposed Development

See Sections 2, 6 and 9.

The key features of the development are outlined in Section 2, with reference to the features

11 There is some difficulty in species identification of juvenile forms of lamprey, although it is most likely the species recorded was *L. planeri*.

that will impact on terrestrial ecology detailed in Section 6 of this Volume of the EIS. Those features that are important in consideration of the aquatic ecology are the existing drainage infrastructure and the sedimentation pond design. These are outlined in Section 9 of this Volume of the EIS.

7.5 Potential Impact of the Proposed Development

It is evident from the previous description of the watercourses draining the development site and their link to aquatic habitats of international ecological significance, that any activity within the development site must proceed with due consideration of potential impacts and appropriate mitigation measures will be required. The impacts of the development are considered here in the context of temporary and permanent, and direct and indirect effects.

In contrast to the outline of potential impacts in Section 6, the impacts are considered in the context of the potential effects of elevated suspended solids content of drainage waters and/or a pollution incident. Direct effects are those within the development site and immediately adjacent (the Munhin River), with indirect effects referring to the impacts on designated areas that may be impacted upon by water flowing from the site, including Owenmore River and Carramore lake. Habitats, fauna and designated areas are therefore broadly treated together.

7.5.1 Potential Impacts

The two main potential impacts are (a) excessive suspended solids entering watercourses off-site and (b) pollution incidences resulting in discharges to watercourses. The effects of both of these situations are outlined here for completeness.

7.5.1.1 Excessive suspended solids within watercourses

Suspended solids in relation to the development described in this section refer to peat particles. There is a certain level of naturally occurring peat sediment due to drainage waters flowing through peatland areas however, in the case where a large volume of peat will be deposited onto a cutover peatland, there is an increased potential for peat to go into suspension. The effects are outlined here, with a brief description of the impact:

- *Smothering of fish spawning redds*

Salmon and trout eggs or fry present in spawning redds may be smothered by excessive deposits of silt, or spawning fish may avoid traditional spawning areas if these are covered in silt deposits.

- *Fish health damage*

Fish gills are susceptible to abrasion by excessive exposure to elevated suspended solids levels, which in turn can give rise to health problems in the form of gill disease. Juveniles

tend to be more susceptible than older individuals.

- *Interference with angling*

Excessively turbid waters are likely to reduce angling success (game and coarse angling). It is this impact from suspended solids which is recorded first, before damage to fish health.

- *Smothering of macroinvertebrates*

Aquatic macroinvertebrates including insect larvae, molluscs (snails and bivalves), crustaceans (shrimps and crayfish), leeches and worms, etc., may be smothered by excessive deposits of silt from suspended solids. Moreover, deposits of silt in otherwise stony substrates gives rise to a change in the macroinvertebrate species composition, often favouring less diverse assemblages.

- *Smothering or stunting of aquatic plant communities*

Aquatic plant communities (especially submerged growths) are likely to be eliminated or stunted by excessive deposition of suspended sediment, and effects may also occur through reduction in photosynthesis due to excessive water turbidity.

7.5.1.2 Pollution incidences resulting in discharges to watercourses

- *Pollution from Fuel Oil*

Spillage of fuel, lubrication or hydraulic oils either from bulk storage or from construction vehicles or plant and equipment operating close to watercourses or drainage ditches which connect to watercourses may cause damage to aquatic flora and fauna communities.

7.5.2 Operational Impact Assessment

No additional construction activities are proposed as all infrastructure required for further peat deposition, currently exist on the site. It is in the light of consideration of these potential hazards arising from the development and the mitigation measures that are described in Section 9 herein, that the operational impacts are described.

These impacts relate to those potential impacts from the main operational phase of the development (short-term temporary) to long term temporary impacts (15-25 years following the main development activity). The short-term temporary period is considered in detail here.

7.5.2.1 Temporary short-term impacts (direct)

The greatest level of activity will occur within the short-term temporary period. Once the mitigation measures outlined in Section 9 are implemented, the impact level should be of **very low magnitude**. This is justified in that following the initial introduction and shaping

of the peat, there should be minimal potential for peat run-off and any water leaving the system will be pre-treated to EPA standards. Also, revegetation and stabilisation of the peat is expected to be complete within 5 years following peat deposition. There will therefore be no potential for elevated suspended solids to occur in waters either on-site or leaving the site. Therefore, there will be no loss of habitat through siltation of watercourses and no direct effects on fauna.

The proposed operation should be considered in relation to recent extensive and similar peat deposition activities within the site. These have been successfully implemented and fully monitored under a Waste Licence issued by the Environmental Protection Agency (EPA) in October 2004 (Licence Ref: W0199-01).

7.5.2.2 Indirect effects in the temporary short-term

Implementation of the mitigation measures in Section 9 will result in the indirect effects on designated areas that are hydrologically linked to the development site being of **very low magnitude**. There should be no elevated levels of suspended solids in the water leaving the site once mitigation measures are put in place. There will be no loss of habitat and no effect on faunal activity. This is borne out by biological monitoring implemented in 2005 and 2007 which show no detectable change to river quality in the Munhin River following similar peat deposition activities within the site.

The effect of elevated suspended solids in a high rainfall event could have a negative impact on angling. This would occur through reducing visibility of salmonids through increasing turbidity. Due to the lack of spawning habitat in the Munhin and lower stretches of the Owenmore, there would be no indirect effect on productivity within the Owenmore catchment. However, the mitigation measures outlined should mitigate against potentially elevated suspended solids in watercourses leaving the peat deposition area.

7.5.2.3 Impacts in the medium and long-term temporary period (direct impacts)

It is predicted (*see Section 6*) that the peat deposition area (Area 6) will have revegetated completely within 5 years. Following this period there will be minimal potential for peat to enter suspension, except where peat lies in drainage channels, which is unlikely to be at any significant level.

All other activities will have ceased following completion of the peat deposition. The rehabilitation of the Srahmore Peat Deposition site will be similar to the rehabilitation of the greater Bord na Móna holdings under the *Rehabilitation Plan* prepared by Bord na Móna for IPPC license 505. Sedimentation ponds will continue to be excavated to ensure their efficient operation in accordance with the requirements of the EPA. Therefore, temporary medium and long-term impacts will be of a **very low magnitude**. Following cessation of the need to maintain drainage channels, replacement habitats will form in these channels and

provide freshwater habitats for vertebrates such as frogs, and a range of micro- and macro-invertebrates, leading to an overall increase in biodiversity of the site.

7.5.2.4 Indirect impacts in the temporary medium to long-term

There are no indirect impacts envisaged in the temporary medium to long-term. Revegetation and rewetting of the peat deposition area and rehabilitation of Area 5 may lead to expansion of wetland habitat for wetland bird species. There is no anticipated indirect effect on productivity of salmonids within the Owenmore catchment. Therefore, indirect temporary medium and long-term impacts will be of a **negligible magnitude**.

7.5.3 Permanent impacts of the proposed development (direct and indirect)

Any permanent impacts of the development will be of a **very low magnitude**, following from revegetation of the site and stabilisation of the peat and rehabilitation of the activity areas and maintenance of sedimentation ponds to work at maximum efficiency. Once the peat is stabilised and the site naturalises there should be a **negligible permanent impact**, both direct and indirect. There will be replacement freshwater habitats within drainage channels and sedimentation ponds that naturalise, will revert to sedge and/or reedswamp vegetation that will further contribute to the biodiversity of the site through enhancement of aquatic vegetative complexes. This would contribute to an overall positive impact with respect to aquatic habitats on the development site with negligible impacts off-site.

7.6 Do Nothing Scenario

If the development did not proceed the site would be rehabilitated in accordance with the rehabilitation plan submitted under the existing planning permission.

7.7 Mitigation Measures

A number of mitigation measures have been considered in the course of design of the development.

7.7.1 Mitigation by avoidance

The nature of the site chosen for peat storage is an important element in mitigating against excessive suspended solids in run-off. The site is saucer-shaped and compartmentalised by high fields. This mitigates against any potential lateral movement of peat and any movement within low-lying bays will be towards the low point in the middle of the peat deposition

area. The site has also previously been used for peat deposition and pollution avoidance infrastructure and monitoring programmes are in force.

7.7.2 Mitigation by treatment of water before entering watercourses

The drainage scheme is outlined in detail in Section 9 herein. Water draining the peat deposition area will be controlled through a series of existing sedimentation ponds with the provision of an overflow facility in Area 7 in the case of an extraordinary rainfall event. The drainage scheme has been designed in consultation with the *NWRFB* (*see Section 9*). Sedimentation ponds will be maintained over the course of the development and for a period until such time as outlined by the licensing authority.

Oil traps and oil spillage kits are already installed at the site to mitigate against pollution from fuel spillages and/or other potential pollutants. All wastewater from Area 5 is taken off-site and sewage effluent removed. Fuel oil is stored in double skinned mobile tanks. These tanks are filled while standing on the bunded reception area. The loading shovels are refuelled on this bunded reception area, as will some of the other plant.

The recommendations as set out by North Western Regional Fisheries Board in their consultation response along with the current status of these recommendations are set out below.

- *'Avoid discharge of potential polluting matter during/ after deposition. Design of lagoons should ensure they are effective during extreme rainfall events. Prepare maintenance and monitoring schedule for described settlement lagoons'*. The lagoons have been designed to take into consideration these issues and a maintenance and monitoring schedule have been put in place.

- 'St*ore and refuel petroleum products in bunded areas away from water courses.'* Bunded areas are included on site.

- *'Works to be carried out during dry weather. Extreme caution should be exercised re potential runoff, during highly sensitive periods re salmon and sea trout. This period includes October to May inclusive.'* Works will be undertaken during appropriate climatic conditions.

- *'Investigate soil types to be deposited. Formulate parameters for materials to be accepted.'* Only peat will be imported on site. This will be subject to assessment prior to deposition to ensure suitability.

- *'Transport material to site in sealed containers by trained personnel.'* Yes as previously described.

- *'Notify the board prior to works commencing.'* The board will be notified prior to works commencing.

7.7.3 Mitigation by remedy and re-instatement

Revegetation of the site will stabilise the peat and knit the introduced peat into the former deposited peat and cutaway areas. The vegetation will comprise predominantly *Juncus effusus* with a ground layer of bryophytes. These plants will cover the bare peat, and also filter rainfall passing through.

A number of possible re-instatement options are outlined in Section 6 herein, and the appropriate option will be selected that will allow the system to naturalise and utilise the vegetative features to filter water on site and possibly restore peat-forming conditions.

7.8 Predicted impact of the Proposed Development

7.8.1 Predicted direct impact

The predicted impact of the development is of **negligible impact magnitude**. This is due to the negligible ecological value of the drainage channels on site and the very low impact of the development as outlined previously.

7.8.2 Predicted indirect impact

In consideration of the mitigation measures outlined here and in Section 9, the indirect impact of the development on surrounding areas is expected to be negligible also. Due concern has been given to the fact that the watercourses draining the development site enter watercourses of international significance and strict environmental controls have been designed.

In the worst case scenario, if mitigation measures fail, there would potentially be significant run-off of peat from the site during the peat deposition stage and probably up until the first 12 months following peat deposition, but only in high rainfall events. This is because the peat will be wet and shaped to mitigate against sediment loading of drainage waters. This would have an indirect impact on angling (increased turbidity leading to reduced visibility and therefore reduced catch). There would be no impact on spawning of salmonids as this part of the Owenmore catchment is at its lowest reaches and there is no significant habitat suitable for spawning or nurseries available.

Given that the worst case scenario is unlikely due to existing and proposed new mitigation measures (NWRFB comments), the indirect impact of the development will be of **low to negligible magnitude**.

7.9 Monitoring

The water quality-monitoring regime has been set out by the regulatory bodies. Water quality samples will continue to be taken, as required under Environmental Protection Agency (EPA) Licence Ref: W0199-01, from the locations sampled in October 2007 up until the onset of peat deposition. Following the onset of peat deposition, sampling will continue. Following cessation of activity (including decommissioning and rehabilitation) sampling will continue at intervals as specified by the regulatory authorities.

A composite sampler is installed at the main drainage channel to provide daily information on sediments in the run-off. This is located at the entry point of run-off from the main sedimentation ponds on the main drainage channel. Also grab samples are taken from other settlement lagoons and surrounding watercourses to monitor surface water quality.

7.10 Reinstatement and Residual Impacts

There are no negative residual impacts foreseen at this time.

Re-instatement options are outlined in Section 6. The appropriate option will be selected in view of the best outcome for both the terrestrial and aquatic ecology.