

# Irish Water Report

Natura Impact Statement as part of the Clonbur Waste Water  
Discharge Licence Application: D0374-01

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# Introduction

This Natura Impact Statement provides an Appropriate Assessment (AA) of the existing Waste Water Treatment Plant (WwTP), located at Clonbur, County Galway, for the purposes of the Waste Water Discharge (Authorisation) Regulations, 2007 (S.I. No. 684 of 2007), as amended. It assesses whether the on-going operation of the plant, alone or in combination with other plans and projects, is likely to have significant effects on a European Site(s) in view of best scientific knowledge and the conservation objectives of the site(s). European Sites are those identified as sites of European Community importance designated as Special Areas of Conservation under the Habitats Directive or as Special Protection Areas under the Birds Directive.

This report follows the guidance for AA published by the Environmental Protection Agency's (EPA) 'Note on Appropriate Assessments for the purposes of the Waste Water Discharge (Authorisation) Regulations, 2007 (S.I. No. 684 of 2007)' (EPA, 2009); and takes account of the Department of the Environment, Heritage and Local Government's guidelines 'Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities' (DoEHLG, 2009) and Circular L8/08 'Water Services Investment and Rural Water Programmes – Protection of Natural Heritage and National Monuments' (DoEHLG, 2008).

This report was completed by Tobins Consulting Engineers on behalf of Irish Water.

## Legislative Context

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, better known as "The Habitats Directive", provides legal protection for habitats and species of European importance. Articles 3 to 9 provide the legislative means to protect habitats and species of Community interest through the establishment and conservation of an EU-wide network of sites known as Natura 2000. These are Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Conservation of Wild Birds Directive (79/409/ECC) as codified by Directive 2009/147/EC.

Articles 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to affect Natura 2000 sites (Annex 1.1). Article 6(3) establishes the requirement for Appropriate Assessment (AA):

*Any plan or project not directly connected with or necessary to the management of the [Natura 2000] site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subjected to appropriate assessment of its implications for the site in view of the site's conservation objectives. In light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.*

Article 6(4) states:

*If, in spite of a negative assessment of the implications for the [Natura 2000] site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, Member States shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.*

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# Methodology

## Guidance Followed

Both EU and national guidance exists in relation to Member States fulfilling their requirements under the EU Habitats Directive, with particular reference to Article 6(3) and 6(4) of that Directive. The methodology followed in relation to this AA has had regard to the following guidance:

- Note on Appropriate Assessments for the purposes of the Waste Water Discharge (Authorisation) Regulations, 2007 (S.I. No. 684 of 2007). Environmental Protection Agency, (EPA, 2009).
- Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities. Department of Environment, Heritage and Local Government, (DoEHLG, 2010).
- Circular L8/08 – Water Services Investment and Rural Water Programmes – Protection of Natural Heritage and National Monuments. Department of Environment, Heritage and Local Government, (DoEHLG, 2008).
- Communication from the Commission on the Precautionary Principle. Office for Official Publications of the European Communities, Luxembourg, (EC, 2000a).
- Managing Natura 2000 Sites: the provisions of Article 6 of the ‘Habitats’ Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg, (EC, 2000b).
- Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC. Office for Official Publications of the European Communities, Brussels (EC, 2001).
- Guidance document on Article 6(4) of the ‘Habitats Directive’ 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the Commission. Office for Official Publications of the European Communities, Luxembourg, (EC, 2007).
- Nature and biodiversity cases: Ruling of the European Court of Justice. Office for Official Publications of the European Communities, Luxembourg (EC, 2006).
- Marine Natura Impact Statements in Irish Special Areas of Conservation: A working document, National Parks and Wildlife Service, Dublin (NPWS, 2012).
- European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. No.477 of 2011).
- Interpretation Manual of European Union Habitats. Version EUR 28. European Commission (EC, 2013).

## Stages Involved in the Appropriate Assessment Process

### Stage 1: Screening / Test of Significance

This process identifies whether the WwTP discharge is directly connected to or necessary for the management of a European Site(s); and identifies whether the discharge is likely to have significant impacts upon a European Site(s) either alone or in combination with other projects or plans.

The output from this stage is a determination for each European Site(s) of not significant, significant, potentially significant, or uncertain effects. The latter three determinations will cause that site to be brought forward to Stage 2.

### Stage 2: Appropriate Assessment

This stage considers the impact of the WwTP discharge on the integrity of a European Site(s), either alone or in combination with other projects or plans, with respect to (1) the site's conservation objectives; and (2) the site's structure and function and its overall integrity. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts

The output from this stage is a Natura Impact Statement (NIS). This document must include sufficient information for the EPA to carry out the appropriate assessment. If the assessment is negative, i.e. adverse effects on the integrity of a site cannot be excluded, then the process must consider alternatives (Stage 3) or proceed to Stage 4.

### Stage 3: Assessment of Alternatives

This process examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the European Site. This assessment may be carried out concurrently with Stage 2 in order to find the most appropriate solution. If no alternatives exist or all alternatives would result in negative impacts to the integrity of the European sites then the process either moves to Stage 4 or the project is abandoned.

### Stage 4: Assessment Where Adverse Impacts Remain

An assessment of compensatory measures where, in the light of an assessment of Imperative Reasons of Overriding Public Interest (IROPI), it is deemed that the project or plan should proceed.

## Field Walkover Surveys

Field walkover surveys were undertaken during 19<sup>th</sup> of June 2014 to identify the potential for qualifying species and habitats in the surrounding environs of the WwTP discharge.

## Consultation

The EPA, as the competent authority, will seek NPWS advice as may be required in reaching their decision on a WwTP discharge. The NPWS can only communicate with the applicant (i.e. Irish Water) on request from the competent authority, when the formal application process to the competent authority has already commenced.

Inland Fisheries Ireland (IFI) Galway division identified that the Clonbur stream into which the WwTP discharges joins the Rosshill stream, which arises to the southwest of Clonbur and flows

into Lough Mask. The Rosshill stream is classed as one of the most important spawning tributaries of Lough Mask which is supported by data from redd counts (trout spawning beds) and fish counts undertaken since 2009.

## Stage 1: Screening

Screening for Appropriate Assessment was undertaken by the Environmental Protection Agency who determined that an Appropriate Assessment of the existing discharge from the Clonbur WwTP is required due to the potential adverse impact on the qualifying of the Lough Mask/Carra Complex SAC and Lough Mask SPA. This determination was based on the following:

- Clonbur WwTP is located directly south of Lough Mask/Carra Complex SAC and within 1km of Lough Mask SPA
- The WwTP discharges into a minor stream which enters the Rosshill stream ca. 600m from the discharge point, and the Rosshill stream enters Lough Mask ca. 1km from the discharge point; and
- The limited dilution available in the receiving waters for normal waste water discharge.

Therefore, applying the Precautionary Principle and in accordance with Article 6(3) of the Habitats Directive, the current WwTP discharge at Clonbur will be brought forward for a Stage 2 Appropriate Assessment.

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## Stage 2: Appropriate Assessment

Lough Mask/Carra complex SAC and Lough Mask SPA, which have been determined as requiring AA, are described and all the potential impacts resulting from the Clonbur WwTP discharge are discussed in relation to the conservation objectives of these designated sites.

### Description of the Project

The Clonbur agglomeration is located in north County Galway. The wastewater treatment works is situated approximately 300m east of Clonbur Village. In 2009 a new wastewater treatment plant was constructed in Clonbur on the site of the old treatment works.

A letter, referenced IW-ER-LT0055 and dated 3rd June 2014, was submitted by Irish Water to the EPA which proposes a population equivalent for the year 2020 of 235p.e. Based on a loading of 225l/pp/day the dry weather flow for the discharge is calculated at 0.00061m<sup>3</sup>/sec. The 95-percentile flow for the receiving Clonbur stream as obtained from the EPA letter dated 30/04/2013 is 0.002m<sup>3</sup>/sec.

The inlet works consist of two emergency screens (i.e. an automated fine screen and a manually raked screen) and a Grit Trap. The incoming flow then discharges to a primary settlement tank. The effluent then enters a lamella clarifier, flows through a tertiary micro-screen and finally, receives ferric coagulant chemical dosing (i.e. to enhance phosphorus removal). Sludge from the imhoff tank is discharged to two Sludge Drying Reed Beds. These are then utilised to dewater and treat the sludge at the source of origin. Mixed primary and excess sludge is periodically drawn from the Primary Settlement Tank.

There are two interconnected storm water retention tanks (36.0 m<sup>3</sup> each) at Clonbur WWTP. In a storm event, when Tank No.1 is full, it will overflow to Tank No. 2. When Tank No. 2 is full, the water will then flow into the storm overflow pipe and discharge to the Clonbur Stream. The storm tanks are also furnished with emergency overflows so that in event that an overflow should occur, fully screened and de-gritted flow would be discharged to the outfall. There are no storm water overflows on the upstream collection system. A separate surface water system has been constructed in recent years to divert some surface water runoff away from the combined sewer system.

An AA (screening) report was submitted to the EPA on the 15/08/2013 for the proposed development of tertiary treatment. According to the AA, the tertiary treatment will involve phosphate removal on the current site. This would be accomplished by treating with alum or ferric sulphate, or by use of the existing sludge drying reed beds on site. It is noted in the current report that tertiary treatment already takes place at Clonbur WwTP

The treated effluent from the existing WWTP is currently discharged to the Clonbur stream at coordinates 109920E and 256008N which then enters the Rosshill stream. The Rosshill stream is located in a Natura 2000 site, adjacent to the effluent discharge location; namely the Lough Carra/Mask complex SAC (Site Code 1774) and Lough Mask SPA (Site Code 4062). The Rosshill Stream flows directly into Lough Mask approximately 1km away. Lough Mask is

classified as a National Heritage Area, Special Area of Conservation and a Special Protection Area.

Effluent data together with the standards required for the discharge are presented in Table 1.0.

**Table 1.0: Clonbur WwTp Monitoring Data (mg/l)**

Parameter	Effluent (mean values Jan-Jun 2014)	Effluent Standards
BOD	2	25
COD	38	125
SS	10	35

The effluent discharge is in compliance with the Urban Wastewater Treatment regulations (2001) (S.I. No. 254/2001) for all parameters monitored in 2014. Previous years data were not included as it is not certain on which date new plant became fully operational.

#### **Description of the Receiving Environment and Monitoring Results**

The WwTP discharges to the Clonbur stream, a tributary of the Rosshill stream. Monitoring data (latest available from 2010-2011) from both upstream and downstream of the discharge locations demonstrates that the water quality within the Clonbur stream downstream of the WwTP was not in compliance with Schedule 5 of the European Communities Environmental Objectives (Surface Water) Regulations 2009 (S.I. No. 272 of 2009) at that time. Orthophosphate concentrations upstream of the WwTP also exceeded the regulation limits. It is uncertain whether this data reflects the fully operational new plant at Clonbur.

**Table 2.0: Monitoring Data both Upstream and Downstream of WwTP Discharge (Mean Concentrations based on monitoring data from Jan 2010 to May 2011)**

Parameter	EQS*	Upstream	Downstream
BOD	≤2.6	1.2	4.75
Ammonia (as NH <sub>3</sub> – N)	≤0.14	0.056	1.89
Orthophosphate	≤0.075	0.102	0.354

\*European Communities Environmental Objectives (Surface Waters) Regulations 2009, S.I. No. 272 of 2009 (95%ile standards presented).

There is no EPA monitoring data for the Clonbur stream or Rosshill stream. The Rosshill stream rises to the southwest of Lough Mask and joins with several inputs from wetland areas and drains in the vicinity of the Clonbur forest.

A Tobins ecologist sampled three accessible locations for water quality:

- The Clonbur stream into which the WwTP discharges ca 200m downstream of outfall
- The Rosshill stream ca. 400m upstream of the confluence with this drain

- The Rosshill stream ca. 400m downstream of the confluence with this drain (ca. 600m from the outfall)

At the first site, 200m downstream of the outfall, the stream is ca 1.5m wide and 10-20cm deep and flows extremely slowly through shaded woodland with cherry laurel planted on the banksides. The substrate was comprised of organic leaf matter and there was no instream or marginal vegetation. Bankside vegetation included typical woodland species such as ivy (*Hedera helix*), holly (*Ilex aquifolium*), hard shield fern (*Polystichum aculeatum*), herb robert (*Geranium robertianum*), hazel (*Corylus avellana*) and ash (*Fraxinus excelsior*). Based on the sample dominated by group C taxa (*Gammarus duebeni*) with occasional group B and D taxa the site was given a Q3 rating. There was no evidence of toxic effects or sewage pollution (foul smells etc). While the water quality is considered unsatisfactory and moderately polluted based on this rating it is noted that the species composition is typical of this type of habitat (shaded slow flowing drain with abundant leaf litter).

At the second site on the main channel of the Rosshill stream the channel is ca. 2m wide and 20-70cm deep and has a glide-type flow at this location. The sample was dominated by the group C taxa *Gammarus duebeni*, *Baetis rhodani* and chironomid larvae. Group A mayfly *Rhithrogena semicolorata* was also common as was Group D *Asellus aquaticus*. The location was given a Q3-4 rating.

At the third site on the main channel of the Rosshill stream the channel is 3-4m wide and 20-60cm deep and comprises a riffle/pool/glide complex with a clean cobble/stone substrate. Bankside trees includes birch (*Betula pendula*), ash (*Fraxinus excelsior*) and alder (*Alnus glutinosa*) which shade ca. 50% of the channel. Other bankside vegetation includes ivy (*Hedera helix*), meadowsweet (*Filipendula ulmaria*), hard shield fern (*Polystichum aculeatum*) and mosses and liverworts. The sample was very similar to that taken upstream and was dominated by the group C species *Gammarus duebeni* and *Baetis rhodani* with Group A mayfly *Rhithrogena semicolorata* and achieves a Q3-4 rating.

The Water Framework Directive mapping website indicate that the Lough Mask waterbody (IE\_WE\_30\_300) has an overall status of 'moderate' as does the Clonbur stream waterbody (IE\_WE\_30\_2912). Neither waterbodies were noted as being at risk from WwTPs. Also, under the quality of lakes it is classified as Oligotrophic/Mesotrophic<sup>1</sup>. Therefore, the objective under the Water Framework Directive (2000/60/EC) is to raise the lake from 'Moderate Status' to 'Good Status'.

The ecological status of Lough Mask continues to be classed as 'good' in 2012 but it was downgraded from high to good due to the presence of invasive alien species (i.e. zebra mussels) and hydromorphology (EPA, 2013).

### Waste Assimilative Capacity

Table 3.0 summaries the assimilative capacity calculations which are based on the current loading of 235p.e., 95%ile river flow (0.002m<sup>3</sup>/sec) and water quality standards in the European Communities Environmental Objectives (Surface Water) Regulations, 2009 (S.I. No. 272 of 2009). Assimilative capacity calculations use both actual background concentrations and the

<sup>1</sup> EPA envision online mapping (<http://gis.epa.ie/Envision/>)

'notionally clean river' approach. There is no effluent monitoring data for Ammonia or Orthophosphate for the ungraded plant therefore assimilative capacity calculations cannot be carried out for these parameters.

**Table 3.0: Assimilative capacity calculations at estimated loadings of 235p.e. for actual background concentrations and for a notionally clean river.**

Parameter		Background (mg/l)	Predicted downstream quality (mg/l)	EQS* (mg/l)
<b>BOD</b>	Actual Background	1.2	1.387	≤2.6
	Notionally Clean	0.260	0.667	
<b>Ammonia</b>	Actual Background	0.056	-	≤0.14
	Notionally Clean	0.008	-	
<b>Orthophosphate</b>	Actual Background	0.102	-	≤0.075
	Notionally Clean	0.005	-	

\*European Communities Environmental Objectives (Surface Waters) Regulations 2009, S.I. No. 272 of 2009 (95%ile standards presented).

Using both the actual background concentrations and the notional clean river concentrations demonstrates that the Clonbur stream has the capacity to assimilate BOD due to the high effluent quality.

Clonbur WwTP discharges to the Clonbur stream, a tributary of the Rosshill stream which flows into Lough Mask. To determine the possible impacts on the designated sites of Lough Mask, the assimilative capacity of the main channel of the Rosshill stream was determined using the effluent monitoring data, 95%ile flows for Rosshill River (0.04m<sup>3</sup>/sec, 'Rusheen West', EPA HydroTool) and 'notionally clean' surface water concentrations (Table 4.0)

**Table 4.0: Rosshill stream assimilative capacity calculations at estimated loadings of 235 p.e. using notionally clean background river concentrations.**

Parameter		Background (mg/l)	Predicted downstream quality (mg/l)	EQS* (mg/l)
<b>BOD</b>	Notionally Clean	0.260	0.286	≤2.6
<b>Ammonia</b>	Notionally Clean	0.008	-	≤0.14
<b>Orthophosphate</b>	Notionally Clean	0.005	-	≤0.075

As seen in Table 4.0 above the Rosshill stream has the assimilative capacity for BOD based on the 'notionally clean river' approach.

It is noted that the assessment is based on very limited data, particularly with regard to Ammonia and Orthophosphate effluent monitoring data. It is also noted that there is no upstream and downstream monitoring data available after May 2011. There is also no water monitoring data available for the Rosshill stream in the vicinity of the confluence with the Clonbur stream.

In summary, Clonbur WwTP is a new plant and recent effluent monitoring data indicates it is operating well. While dilution capacity in the Clonbur stream is poor, BOD is still assimilated due to the high quality of the discharge. Dilution capacity in the Rosshill stream is also much greater.

### Field Walkover Survey

The Clonbur/Rosshill streams flows through Clonbur woodland to Lough Mask. Field examination, including both upstream and downstream of the discharge location, revealed the presence of the Annex I habitats:

[3110] Oligotrophic Waters containing very few minerals

[3140] Hard Water Lakes

[4030] Dry Heath

[6210] Orchid-rich Calcareous Grassland\*

[7210] Cladium Fens\*

[7230] Alkaline Fens

[8240] Limestone Pavement\*

[91E0] Alluvial Forests\*

And suitable habitats for the Annex II Species (see Table 4.0):

- Otter (*Lutra lutra*) [1355].

Suitable habitat was also present for the SPA features:

- Tufted duck *Aythya fuligula* [wintering]
- Black-headed gull *Chroicocephalus ridibundus* [breeding]
- Common gull *Larus canus* [breeding]
- Lesser black-backed gull *Larus fuscus* [breeding]
- Common tern *Sterna hirundo* [breeding]
- Greenland white-fronted goose *Anser albifrons flavirostris* [wintering]
- Wetlands

Lough Mask is an important brown trout fishery. Trout were observed in the Rosshill stream during the site visit, and suitable nursery and adult habitats were present. IFI have indicated that the Rosshill stream is an excellent trout spawning stream. Otter are widespread in the area. No otter signs (e.g. spraints, feeding remains, paths/slides) were recorded upstream or downstream of the discharge location.

## Description of the Natura 2000 Site Affected

### Lough Mask/Carra Complex SAC

This site is dominated by two large lakes, Lough Mask and Lough Carra, and includes the smaller Cloon Lough. Most of the site is in Co. Mayo, with a small portion in Co. Galway. On the western side, the site is overlooked by the Partry Mountains, while to the east the landscape is largely low-lying agricultural land. The nearest large town is Ballinrobe which is about 4 km east of Lough Mask. The general geological character of the area is Carboniferous limestones, with some shales and sandstones on the western side of Lough Mask. The underlying geology results in a great diversity of habitats, which support many scarce and rare plants and animals.

Lough Mask, at over 8,000 ha, is the sixth largest lake in the country and with a maximum depth of 58 m it is one of the deepest. It is an excellent example of a lowland oligotrophic lake. Aquatic and wetland plant species present which are characteristic of this habitat include several pondweed species (*Potamogeton* spp.), Water Lobelia (*Lobelia dortmanna*) and Shoreweed (*Littorella uniflora*). The eastern part of the lake is shallow and is edged by a lowlying shoreline which is subject to winter flooding. An intricate mixture of plant communities has developed on the limestone, with bare pavement, scrub-dominated pavement, dry grassland and heath. A variety of wetland habitats are also present, along with significant amounts of deciduous woodland along the eastern and southern shores. The western shoreline is less diverse and lacks the limestone communities. However, the fast flowing Owenbrin River has created at its mouth an interesting delta of coarse sandy sediment.

Lough Carra, which is hydrologically linked to Mask, is one of the best examples in Ireland of a hard water marl lake. It is a shallow (mostly less than 2 m), predominantly spring fed, lake with only a few streams flowing into it. Its well-known pellucid green colour is due to calcareous encrustations. It has well developed stonewort communities in the submerged zones, with *Chara curta*, *C. desmacantha*, *C. rudis* and *C. contraria* recorded. Lough Carra, like the eastern and southern shores of Mask, is fringed by a diverse complex of limestone and wetland habitats. The limestone pavement within this site represents the northern limit of the limestones of Clare and Galway. The limestone is variable in character, from open bare pavement to areas covered with dense scrub. Associated with the pavement are areas of dry calcareous grassland and dry heath. Characteristic species of the rocky, limestone formations where soil may only occur in pockets include Bloody Crane's-bill (*Geranium sanguineum*), Yellow-wort (*Blackstonia perfoliata*), Blue Fleabane (*Erigeron acer*), Wild Madder (*Rubia peregrina*) and Rustyback (*Ceterach officinarum*).

Areas of calcareous grassland, often orchid-rich, occur interspersed amongst the limestone. These grasslands support species such as Carlina Thistle (*Carlina vulgaris*), Quaking-grass (*Briza media*), Blue Moor-grass (*Sesleria albicans*), Sweet Vernal-grass (*Anthoxanthum odoratum*), Cowslip (*Primula veris*), Common Knapweed (*Centaurea nigra*), Fairy Flax (*Linum catharticum*), Lady's Bedstraw (*Galium verum*) and Wild Thyme (*Thymus praecox*). A good diversity of orchid species have been recorded from these grasslands, including Pyramidal Orchid (*Anacamptis pyramidalis*), Early-purple Orchid (*Orchis mascula*), Bee Orchid (*Ophrys apifera*), Fragrant Orchid (*Gymnadenia conopsea*) and Dense-flowered Orchid (*Neotinea maculata*). Several of these species, notably Dense-flowered Orchid and Spring Gentian (*Gentiana verna*), are typical Burren species and occur here towards the northern end of their distribution.

The scrub vegetation is variable in character, with extensive areas dominated by Hazel (*Corylus avellana*) and Hawthorn (*Crataegus monogyna*), with Buckthorn (*Rhamnus catharticus*), Alder Buckthorn (*Frangula alnus*), Spindle (*Euonymus europaeus*) and Ash (*Fraxinus excelsior*). The dry heath is well developed in places and is characterised by Gorse (*Ulex europaeus*), Bell Heather (*Erica cinerea*), Heather (*Calluna vulgaris*) and St. Dabeoc's Heath (*Dabeocia cantabrica*). The diminutive orchid Lesser Twayblade (*Listera cordata*) occurs within the heath communities.

A wide range of wetland habitats occur around Lough Carra and along parts of the eastern and southern shores of Lough Mask, including Cladium fen and alkaline fen. Great Fen-sedge (*Cladium mariscus*) occurs as pure stands in places but also grades into areas of alkaline fen, where it is intermixed with Black Bog-rush (*Schoenus nigricans*), Common Club-rush (*Scirpus lacustris*), Common Reed (*Phragmites australis*) and a number of sedge species (*Carex* spp.). The areas of alkaline fen are more extensive than the Cladium fens, and here Black Bog-rush is generally the dominant species. A rich diversity of flowering plant occurs in the fen communities. In addition to the fen habitats, there are sparse but widespread reed swamps, wet grassland and some freshwater marsh communities around the lake shores.

Broadleaved deciduous woodland occurs fairly frequently around much of the shores of the lakes and on some of the islands. This is often scrub-type woodland, which may be either dry (dominated by Hazel, Hawthorn and Ash) or wet. In the case of the latter, dominant species include birches (*Betula* spp.), willows (*Salix* spp.) and Alder (*Alnus glutinosa*). The wet areas of woodland flood seasonally and represent alluvial woodland, a habitat that is listed with priority status on Annex I of the E.U. Habitats Directive. These are particularly well developed in the Ballykine and Clonbur areas of Lough Mask. In some places the woodlands contain Sessile Oak (*Quercus petraea*), Holly (*Ilex aquifolium*) and Rowan (*Sorbus aucuparia*).

A high concentration of rare plants is found at this site. Five species protected under the Flora (Protection) Order, 1999, occur: Irish St. John's-wort (*Hypericum canadense*), Chives (*Allium schoenoprasum*), Pillwort (*Pilularia globulifera*), Irish Lady's-tresses (*Spiranthes romanzoffiana*), and Small Cudweed (*Logfia minima*). Two other Red Data Book plants, Alder Buckthorn and Bird's-nest Orchid (*Neottia nidus-avis*), also occur, along with two Red Data Book stonewort species, *Chara curta* and *C. rudis*.

The Owenbrin area of the site supports a population of the rare bryophyte *Hematocaulis vernicosus*, a species listed on Annex II of the E.U. Habitats Directive. This is the only known lake shore site for the species, which is usually found in upland flushes in association with blanket bog.

A large loft in the stable block of Curramore House provides a summer breeding site of the Lesser Horseshoe Bat, a species listed on Annex II of the E.U. Habitats Directive. The bats gain access to the loft through windows that extend from the ground floor to the loft area. The building is surrounded by mixed woods and is close to the shores of Lough Mask; both of these habitats provide ideal foraging habitat for the bats. In 1993 more than 100 bats were counted at this site, which makes it of international importance. A second internationally important summer roost of Lesser Horseshoe Bats occurs within the site at Ballykyne, near Clonbur. Over 150 bats have been counted at this site in recent years.

The site provide excellent habitat for Otter, also an Annex II species, and the area has Pine Marten (*Martes martes*), a species listed in the Irish Red Data Book. The deep waters of Lough Mask are home to a population of the glacial relict fish species Arctic Char (*Salvelinus alpinus*), and a rare shrimp (*Niphargus* spp.) is also found in these waters. Lough Mask is a very important Brown Trout fishery. White-clawed Crayfish (*Austropotamobius pallipes*), a species listed on Annex II of the E.U. Habitats Directive, has been recorded from Lough Carra.

This site is of considerable conservation importance as it has good examples of eight habitats listed on Annex I of the E.U. Habitats Directive, four of which are listed with priority status. Some of these habitats are amongst the best examples of their kind in the country. It is also selected for two Annex II mammal species and an Annex II liverwort. The site is of ornithological importance for both wintering and breeding birds. A relatively large number of rare or localised plant and animal species occur, including the glacial relict Arctic Char.

## **Description of the Conservation Interests of the SAC**

### **Annex I Habitats**

Lough Carra/Mask Complex SAC supports eight Annex I habitats:

- [3110] Oligotrophic Waters containing very few minerals (conservation status: bad, declining)
- [3140] Hard Water Lakes (conservation status: bad, declining)
- [4030] Dry Heath (conservation status: bad)
- [6210] Orchid-rich Calcareous Grassland\* (conservation status: bad)
- [7210] Cladium Fens\* (conservation status: bad)
- [7230] Alkaline Fens (conservation status: bad)
- [8240] Limestone Pavement\* (conservation status: inadequate)
- [91E0] Alluvial Forests\* (conservation status: bad, improving)

The habitats are all located in the ca. 1km zone from the northern boundary of the WwTP to Lough Mask. This area comprises a mix of grassland, heath, wetland and woodland communities. Terrestrial habitats with no potential to be impacted are dry heath, calcareous grasslands and limestone pavements.

Alluvial forests are water dependant habitats and the problem of pollution finding its way into watercourses is a greater risk than in drier woodland. Key pressures to this habitat noted by NPWS were invasive species and problematic native species. Less critical issues include dumping, grazing, thinning, water abstraction, recreational use and long-term flooding. NPWS also note that nitrate pollution is an additional possibility when overgrazing occurs and also from effluent run-off.

The Clonbur WwTP discharge is assessed as having the potential to impact on Oligotrophic waters, Hard water lakes, Cladium fens and Alkaline fens as these habitats are dependent on water quality and are all associated with the Lough Mask and its shoreline. Alluvial forests are not threatened to the same degree and there is little/no potential for adverse effects and changes to the conservation status of this habitat. The Rosshill stream is approximately 600m from the WwTP discharge, while the marginal wetland fen habitats are approximately 1km from the discharge location.

The lake habitats are highly sensitive to nutrient enrichment from agriculture, municipal and industrial discharges. The lakes are characterised by hard water and support rare plant species such as *Chara* spp. Diffuse and point sources of pollution are considered to be the main pressure on these Annex I habitats (NPWS, 2013). While the wetland habitats away from the main channel of the Clonbur/Rosshill streams are unlikely to be impacted by any potential pollutants, the wetland habitats at the lake margins have the potential to be impacted in a

localised area should high nutrient loads discharge into the lake via the Rosshill stream causing an unfavourable shift in species composition.

## Annex II Species

Lough Carra/Mask Complex SAC is selected for the following Annex II species:

[1303] Lesser Horseshoe Bat (*Rhinolophus hipposideros*) (conservation status: favourable)

[1355] Otter (*Lutra lutra*) (conservation status: favourable)

[1393] Slender Green Feather-moss/Shining sickle moss (*Hematocaulis vernicosus*) (conservation status: favourable)

**Slender Green Feather-moss** *Hematocaulis vernicosus* s is found in the Owenbrin area of the SAC and is not known to be present within the 10K squares M01/M02 where the study area is located. Suitable habitat was not present in the study area and therefore it is not considered further in this assessment. *H. vernicosus* grows in neutral flushes and fens and particularly likes domed springheads, where alkaline water breaks through acidic peat, or areas where alkaline flushes spread onto flushed, acidic ground (Atherton *et al*, 2010).

The nearest **Lesser Horseshoe bat** colony is at Ballykyne in the Clonbur woodland area ca. 1km to the east of Clonbur WwTP. The WwTP discharge has no potential to impact this species and therefore it is not considered further in this assessment.

**Otter** is widespread in the Lough Mask/Carra Complex SAC and is recorded within the 10K squares M05 and M15 where the study area is located. Otters have two basic requirements: aquatic prey and safe refuges where they can rest. This species is dependent on fish stocks which are ultimately dependent on water quality. Otter is likely to occur in the Rosshill stream however, no otter signs (e.g. spraints, feeding remains, paths/slides) were recorded upstream or downstream of the discharge location. The overall assessment of the conservation status of otter is 'Favourable' (NPWS, 2013b).

**Table 5.0: Qualifying Habitats along Surveyed Stretch**

Site	Qualifying Habitats	Present	
		Upstream	Downstream
Lough Carra/Mask SAC	Oligotrophic waters	Upstream	No
		Downstream	Yes
	Hard water lakes	Upstream	No
		Downstream	Yes
	European dry heath	Upstream	No
		Downstream	Yes
	Calcareous grasslands	Upstream	No
		Downstream	Yes
	Caldium fens	Upstream	No
		Downstream	Yes
	Alkaline fens	Upstream	No
		Downstream	Yes
	Limestone pavements	Upstream	No

		Downstream	Yes
	Alluvial forests	Upstream	No
		Downstream	Yes

**Table 6.0: Qualifying Species along Surveyed Stretch**

Site	Qualifying Species	Observed or signs of species presence		Suitable Habitat Present	
		Upstream	No	Upstream	Yes
Lough Carra/Mask SAC	Otter	Upstream	No	Upstream	Yes
		Downstream	No	Downstream	Yes
	Lesser horseshoe bat	Upstream	No	Upstream	No
		Downstream	No	Downstream	No
	Shining sickle moss	Upstream	No	Upstream	No
		Downstream	No	Downstream	No

### Conservation Objectives of the Lough Mask/Carra Complex SAC

Article 6 of the Habitats Directive states that:

*Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications of the site in view of the site's conservation objectives.*

The importance of a site designated under the Habitats Directive is defined by its qualifying features or interests. Qualifying interests for any Natura 2000 site are listed on a *pro forma*, called the Natura 2000 standard data form, which forms the basis of the rationale behind designation, and informs the Conservation Management Plan for targeted management and monitoring of key species and habitats.

Favourable conservation status of a habitat is achieved when:

- Its natural range, and area it covers within that range, are stable or increasing;
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future; and
- The conservation status of its typical species is favourable.

The favourable conservation status of a species is achieved when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; and
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

The generic conservation objective is to maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected:

- [3110] Oligotrophic Waters containing very few minerals
- [3140] Hard Water Lakes
- [4030] Dry Heath
- [6210] Orchid-rich Calcareous Grassland\*
- [7210] Cladium Fens\*
- [7230] Alkaline Fens
- [8240] Limestone Pavement\*
- [91E0] Alluvial Forests\*
- [1303] Lesser Horseshoe Bat (*Rhinolophus hipposideros*)
- [1355] Otter (*Lutra lutra*)
- [1393] Slender Green Feather-moss (*Hematocaulis vernicosus*)

## Lough Mask SPA

Lough Mask, at over 8,000 ha, is the sixth largest lake in the country. It extends for over 14 km along its long axis and is on average about 5 km in width. The underlying geology is of Carboniferous limestones, with some shales and sandstones. The main inflowing rivers are the Cloon and Robe, and the stream from Lough Carra to the north-east. The main outflow is to Lough Corrib to the south. The lake is shallow off the eastern shore but considerably deeper off the western where there is a long narrow trench with a maximum depth of 58 m. The water of the lake is moderately hard.

During the 1990s, the trophic status of Lough Mask has changed from oligotrophic to mesotrophic due to a steady increase in phytoplankton growth. Aquatic and wetland plant species present are characteristic of oligotrophic systems - Water Lobelia (*Lobelia dortmanna*), Shoreweed (*Littorella uniflora*) and various Pondweed (*Potamogeton*) species. The eastern part of the lake is edged by a low-lying shoreline which is subject to winter flooding. An intricate mixture of plant communities has developed on the limestone, with bare pavement, scrub-dominated pavement, dry grassland and heath. The western shoreline is less diverse and lacks the limestone communities. Islands are a feature of the lake, especially in the south-east sector. Lough Mask is one of the most important sites in the country for nesting Black-headed Gull (329 pairs in 1999), Common Gull (124 pairs in 1999) and Lesser Black-backed Gull (286 pairs in 1999). Whilst higher numbers of nesting gulls have been recorded in the recent past, the 1999 populations of the three species still accounted for 8.4%, 1.7% and 10% of the respective national totals. The lake is also a traditional breeding site for Common Tern, with 44 pairs in 1995 and 39 pairs in 1999.

In winter the site has a range of waterfowl, especially diving duck, with the Tufted Duck population (453) being of national importance - all figures are average peaks for 4 of the 5 winters in the period 1995/96-1999/00. It also supports Whooper Swan (54) and is visited at times by part of the Erriff/Derrycraff population of Greenland White-fronted Goose (16). Other species using the site include Wigeon (84), Teal (99), Mallard (101), Pochard (65), Goldeneye (89), Coot (112), Red-breasted Merganser (12), Little Grebe (17), Mute Swan (49) and Cormorant (36).

The lake has a population of Arctic Char, a Red Data book species, and is an important site for Otter, a species that is listed on Annex II of the E.U. Habitats Directive. Lough Mask is an important salmonid fishery.

The lake continues to be vulnerable to enrichment from surrounding agricultural and other commercial/domestic activities. The reasons for the decline in the breeding gull colonies in recent years are unknown, but it is considered that predation by feral American Mink is a problem. Lough Mask is one of the most important inland gull breeding sites in the country, with nationally important populations of three gull species. It also has a nationally important colony of Common Tern, a species that is listed on Annex I of the E.U. Birds Directive. The site supports a good diversity of wintering waterfowl, including a nationally important population of Tufted Duck. The occurrence of Whooper Swan and Greenland White-fronted Goose, albeit in small numbers, is of note as these species are also listed on Annex I of the E.U. Birds Directive.

### Description of the Conservation Interests of the SPA

The SPA is designated for six bird species at the wetlands that support them:

- Tufted duck *Aythya fuligula* [wintering]
- Black-headed gull *Chroicocephalus ridibundus* [breeding]
- Common gull *Larus canus* [breeding]
- Lesser black-backed gull *Larus fuscus* [breeding]
- Common tern *Sterna hirundo* [breeding]
- Greenland white-fronted goose *Anser albifrons flavirostris* [wintering]
- Wetlands

Information on populations (where available) requirements and sensitivities of these species are considered in more details below with information taken from Crowe (2005), NPWS (2011) and the referenced geese census reports.

**Common gull, Black-headed gull and Lesser black-backed gull** feed by direct predation, piracy and scavenging, and have a varied diet composed of animal and vegetable matter. They breed on the coast and on the larger inland lakes in Ireland including Lough Mask. **Tufted duck** feed on animal matter including mussels, crustaceans and insect larvae. Crowe (2005) notes that this species had declined at this time in Lough Mask and no longer occurred in nationally important numbers. **Common tern** is a summer visitor to Ireland and is found on the coasts or large inland lakes. It breeds on the coast with larger colonies in Co. Dublin, Co. Wexford and Co. Galway. It also breeds inland on islets in freshwater lakes including Lough Mask. Its diet comprises mostly of fish. Common gull, lesser black-backed gull and common tern are amber-listed species of conservation concern, while tufted duck and black-headed gull are red-listed (Colhoun & Cummins, 2013).

**Greenland white-fronted geese** historically wintered on bogland, callowland and rough grassland where they fed by uprooting cyperacean species in particular *Eriophorum angustifolium*. In the latter half of the 20th century they have increasingly used grassland habitats and have shown good flexibility in adapting to new food sources including agricultural stubbles and fodder

beet. The decline in the global population continues and is mainly attributed to climate-related changes and increased competition for nest sites with the expanding population of breeding Canada geese. It is an amber-listed species of conservation concern (Colhoun & Cummins, 2013). The most significant population of these geese in Ireland is found in the Wexford slob. Lough Mask is not included in the International Census of Greenland white-fronted geese study (Fox *et al*, 2013) and numbers recorded historically at Lough Mask have been relatively low (Crowe, 2005).

**Wetlands** are also listed as a feature of the SPA. Eutrophication has the potential to alter wetland habitats as certain wetland species would be sensitive to changes in water quality. Influxes in nutrients can result in a shift in species composition toward more tolerant competitive species and a loss of rarer species which typically require lower nutrient inputs. Floristic diversity generally decreases and sensitive invertebrate species may be lost. Some aquatic plants and algae may increase in biomass. Some sensitive wetland habitats are present at the lake margins.

**Table 7.0: Qualifying SPA Features along Surveyed Stretch**

Site	Qualifying Species	Observed or signs of species presence		Suitable Habitat Present	
		Upstream	No	Upstream	No
Middle Shannon Callows SPA	Tufted duck	Upstream	No	Upstream	No
		Downstream	No	Downstream	Yes
	Black-headed gull	Upstream	No	Upstream	No
		Downstream	No	Downstream	Yes
	Common gull	Upstream	No	Upstream	No
		Downstream	No	Downstream	Yes
	Lesser black-backed gull	Upstream	No	Upstream	No
		Downstream	No	Downstream	Yes
	Common tern	Upstream	No	Upstream	No
		Downstream	No	Downstream	Yes
	Greenland white-fronted goose	Upstream	No	Upstream	No
		Downstream	No	Downstream	Yes
	Wetlands			Upstream	Yes
				Downstream	Yes

### Conservation Objectives of Lough Mask SPA

Objective: To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:

- Tufted duck *Aythya fuligula* [wintering]
- Black-headed gull *Chroicocephalus ridibundus* [breeding]
- Common gull *Larus canus* [breeding]
- Lesser black-backed gull *Larus fuscus* [breeding]

- Common tern *Sterna hirundo* [breeding]
- Greenland white-fronted goose *Anser albifrons flavirostris* [wintering]
- Wetlands

## Impact Prediction

### Impacts on Water Quality

The aquatic conservation interests of the Lough Mask/Carra Complex SAC are directly dependant on the aquatic environment and as the Clonbur WwTP discharges into a stream that enters the SAC, there is a connection between this facility and the ecological receptors in Lough Mask.

There are no EPA data available for the Clonbur or Rosshill streams. Biological Water quality samples taken during the site survey indicate that water quality in the Rosshill stream does not deteriorate downstream of the confluence with the Clonbur stream into which the WwTP discharges.

The assimilative capacity study was based on limited data but indicated there is capacity in the Clonbur stream to assimilate BOD from the discharge based on the latest data available, and there is further capacity to assimilate the discharge in the Rosshill stream.

It is also noted that the quality of the effluent being discharged is high and there was no obvious effects of sewage or elevated nutrients (e.g. excessive *Cladophora*) noted. BOD levels in the effluent not only comply with the Urban Waste Water limits but are lower than the surface water standards for receiving waters.

Cumulative impacts in the catchment possibly pose the greatest risk to the conservation objectives. The potential threat(s) of the Clonbur WwTP on water quality (long term or single event) is greatly increased when taken in combination with other water quality concerns in the catchment.

The Mask Water Management Unit Action Plan (WRBD, 2010) indicates that there are no risks from Clonbur WwTP. The largest sources of phosphorus in the catchment are from agriculture and forestry. The Clonbur waterbody (IE\_WE\_30\_2912) is noted as being at risk from quarries and is not listed as being at risk from agriculture or morphology. The Lough mask waterbody is noted as being at risk from abstraction. Water abstraction would particularly impact the sensitive marginal habitats around the lake margins. There are seven Section 4 licensed facilities and four IPPC licensed facilities within the Lough Mask catchment.

Other impacts which are likely to act cumulatively and impact on the SAC result from the following:

- Chemical fertiliser application to agricultural lands (the main fertilisers in use supply nitrogen, phosphorus, potassium and sulphur);

- Agricultural practices such as ploughing leads to greater mineralisation and nitrification, and in the case of old grassland, it can result in an increase in the release of nitrogen over a number of years (OECD, 1986);
- Artificial drainage increases nitrate leaching and reduce the morphological qualities of watercourses, thereby reducing the quality of habitat for flora and fauna;
- Endocrine disruptors in domestic sewage, including the main active component in the oral contraceptive pill, can interfere with the endocrine system of plants and animals which controls a wide range of processes including metabolism, growth and reproduction. Effects include a high degree of intersexuality downstream of sewage works (Routledge *et al.* 1998);
- Forestry may alter water quality indirectly through increased evaporation losses and hence an increase in solute concentrations; and
- On-site wastewater treatment systems, poorly performing septic tank units and other small effluent systems can be significant sources of nutrients to rivers;

While the catchment is being impacted from a number of different sources, it is not considered that the Clonbur WwTP is contributing to these cumulative effects due to the high quality of the discharge.

### **Impacts on Annex I Habitats**

#### *Oligotrophic lakes and hardwater lakes*

Lough Mask is particularly sensitive to eutrophication which can be characterised by an increase in chlorophyll a levels and a shift in trophic status from oligotrophic to mesotrophic. The rare plant and animal species associated with the lake (*Chara* sp, arctic char) require oligotrophic conditions. NPWS (2013) highlights eutrophication as a major pressure/threat to the conservation status of these lake habitats. However the latest water quality information on Lough Mask from the EPA indicates that it has 'good' ecological status.

Clonbur WwTP is a new facility and the quality of the effluent being discharged is very high. The Clonbur stream has the capacity to assimilate BOD based on recent data, and while dilution capacity is low there is further dilution capacity in the Rosshill stream downstream. It is considered that the Clonbur WwTP is not contributing to cumulative impacts on the designated sites.

#### *Cladium fens and Alkaline fens*

Fen habitats with specialised and sensitive flora are be associated with the margins of the lake and there is the potential for localised negative impacts should the WwTP cause deterioration in the water quality of the Clonbur stream. As noted above due to the high quality of the effluent from the new plant it is not considered that the Clonbur WwTP is contributing to cumulative water quality impacts in the catchment.

**Table 8.0: Qualifying Habitats Potentially Impacted by WwTP Discharge**

Qualifying Habitats	Potential Impacts	Brief Explanation	Mitigation required
Oligotrophic waters	No	High quality effluent unlikely to be contributing to cumulative water quality impacts and potential eutrophication of Lough Mask.	No
Hard water lakes	No	High quality effluent unlikely to be contributing to cumulative water quality impacts and potential eutrophication of Lough Mask.	No
Cladium fens	No	High quality effluent unlikely to be contributing to cumulative water quality impacts affecting the structure and functions of this habitat.	No
Alkaline fens	No	High quality effluent unlikely to be contributing to cumulative water quality impacts affecting the structure and functions of this habitat.	No

### Impacts on Annex II Species

#### Otter (1355)

Reduced water quality and ecological status downstream of the discharge of the Clonbur WwTP could potentially have indirect effects on otters: as a result of reduced food supply i.e. reduced macroinvertebrate and fisheries production. The otter is dependent on fish stocks, which are ultimately dependent on water quality. However, there is no indication that the ongoing operation of this plant is having an adverse effect on otters within Lough Mask SAC/SPA as a whole.

**Table 9.0: Qualifying Species Potentially Impacted by WwTP Discharge**

Qualifying Species	Potential Impact	Brief Explanation	Mitigation Required
Otter	No	High quality effluent unlikely to be contributing to cumulative water quality impacts or impacting fish stocks or habitats of Lough Mask on which the otter depends.	No

### Impacts on designated features of the SPA

The Natura 2000 Data form for the SPA notes that the lake is vulnerable to enrichment from surrounding agricultural and other commercial/domestic activities. A decline in breeding gull colonies is thought to be down to mink predation. Tufted duck has also declined historically though reasons for this are not clear.

Eutrophication causing increased phytoplankton growth can and a shift toward a mesotrophic lake environment could increase the amount of food available for bird species, however it can also tend to increase algal blooms which may interfere with terns fishing during their breeding

season. The risk of eutrophication from Clonbur WwTP is considered negligible given the new plant appears to be producing a high quality effluent.

**Table 10.0: Qualifying Features of SPA Potentially Impacted by WwTP Discharge**

Qualifying Features	Potential Impacts	Brief Explanation	Mitigation required
<b>Tufted duck</b>	No	Food source sensitive to eutrophication but high quality effluent unlikely to be contributing to cumulative water quality impacts and potential eutrophication of Lough Mask.	Yes
<b>Black-headed gull</b>	No	Versatile feeders unlikely to be affected by a shift in the nutrient status of the lake. WwTP unlikely to contribute to water quality pressures in catchment due to high quality of effluent	No
<b>Common gull</b>	No	Versatile feeders unlikely to be affected by a shift in the nutrient status of the lake. WwTP unlikely to contribute to water quality pressures in catchment due to high quality of effluent	No
<b>Lesser black-backed gull</b>	No	Versatile feeders unlikely to be affected by a shift in the nutrient status of the lake. WwTP unlikely to contribute to water quality pressures in catchment due to high quality of effluent	No
<b>Common tern</b>	No	Food source sensitive to eutrophication but high quality effluent unlikely to be contributing to cumulative water quality impacts and potential eutrophication of Lough Mask.	No
<b>Greenland white-fronted goose</b>	No	Feed primarily on agricultural lands and unlikely to be affected by the nutrient status of the lake. WwTP unlikely to contribute to water quality pressures in catchment due to high quality of effluent	No
<b>Wetlands</b>	No	High quality effluent unlikely to be contributing to cumulative water quality impacts affecting the structure and functions of these habitats.	No

### Mitigation Measures

Clonbur WwTP is a new facility and is discharging a high quality effluent. The Clonbur stream into which the effluent discharges has a limited dilution capacity however 600m downstream of the discharge this watercourse enters the Rosshill stream which has a greater ability to assimilate the discharge. Q values taken during the current survey indicate that there is no deterioration in water quality in the Rosshill stream upstream and downstream of the confluence with the Clonbur stream.

The WwTP is not identified as being 'at risk' in the WMU Action Plan (WRBD, 2010) and while there are other pressures on water quality in the catchment the Clonbur WwTP is not likely to be contributing to these combined effects.

To ensure continued satisfactory operation of the existing plant mitigation measures recommended for the ongoing operation of the plant are as follows:

- Ensure that the capacity of the WwTP is not exceeded; and
- Continuation of monitoring of the discharge, both upstream and downstream of the plant on a consistent regular basis. Annual biological water quality monitoring should also be undertaken upstream and downstream of the WwTP outfall and upstream and downstream of the confluence with the Clonbur stream. Any biological monitoring should be carried out during the summer / autumn periods.

## Stage 2 Appropriate Assessment Conclusion Statement

The current Appropriate Assessment has been prepared following the EPA (2009) 'Note on Appropriate Assessments for the purposes of the Waste Water Discharge (Authorisation) Regulations, 2007 (S.I. No. 684 of 2007)'. The Department of the Environment, Heritage and Local Government guidance 'Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities' (DoEHLG, 2009a) has also been taken into account. The current assessment for the Waste Water Discharge Licence Application investigates the potential adverse effects on the aquatic qualifying interests of the Natura 2000 network arising from the plant discharge, in combination with other plans / projects affecting the aquatic environment. The assessment considers whether the discharge, alone or in combination with other projects or plans, will have adverse effects on the integrity of a Natura 2000 site, and includes any mitigation measures necessary to avoid, reduce or offset negative effects.

When the above mitigation measures are implemented in full, it is envisaged that there will be no significant adverse effects on the integrity of Lough Carra/Mask Complex SAC and Lough Mask SPA in view of these site's conservation objectives and that the conservation status of the Annex I habitats, Annex II species and protected bird species will not be compromised by WwTP discharge either directly, indirectly or cumulatively.

It is therefore concluded that the Clonbur WwTP discharge, alone or in-combination with other plans and / or projects will not give rise to significant effects on the integrity of the of Lough Carra/Mask Complex SAC and Lough Mask SPA, as long as the mitigation measures as listed above are implemented in full. Stage 2 concludes the Appropriate Assessment process of the Clonbur Waste Water Discharge Licence Application.

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