Comhairle Contae Mhaigh Eo

Áras an Chontae, Caisleán an Bharraigh, Contae Mhaigh Eo.
Teileafón: (094) 9024444 Facs: (094) 9023937

Do Thag. / Your Ref. A0025-01 Ár dTag. / Our Ref. WS 512

3rd September 2010.

Administration,
Environmental Licensing Programme,
Office of Climate, Licensing & Resource Use,
Environmental Protection Agency,
Headquarters,
P.O. Box 3000 Johnstown Castle Estate,
County Wexford.

RE: **WASTE WATER DISCHARGE CERTIFICATE APPLICATION**
REGISTRATION NO: A0025-01 – KILMOVEE

Dear Dr. Creed,

Further to your letter of 7th April 2010, I enclose the required response to the query raised in the correspondence.

This documentation includes:

- 1 no. signed copy & 1 no. copy in hardcopy format of the documentation
- 1 no. copies of all files in electronic searchable PDF format on CD-ROM
- 1 copies of digital geo-referenced drawing files on CD ROM

The content of the electronic files on the accompanying CD-ROM is a true copy of the original documentation.

Thank you,

Yours sincerely

Paddy Mahon
DIRECTOR OF SERVICES

www.mayococo.ie

Mayo County Council

Áras an Chontae, Castlebar, Co. Mayo. Tel: (094) 9024444 Fax: (094) 9023937

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Assess the likelihood of significant effects of the waste water discharges from the above agglomerations on the relevant European sites by referring to Circular L8/08 ' Water Services Investment and Rural Water Programmes - Protection of Natural Heritage and National Monuments' issued by the Department of Environment, Heritage and Local Government.

In particular, the flow diagram in Appendix 1 should be completed and the results of each section recorded.

Provide details of the results of this assessment within one month of the date of this notice.

If significant effects are likely then an appropriate assessment must be carried out and a report of this assessment forwarded to the Agency within one month of the date of this notice.

You are advised to provide the requested information in accordance with the 'Note on Appropriate Assessments for the purposes of the Waste Water Discharge (Authorisation) Regulations, 2007 (S.I. 684 of2007)' which is available at www.epa.ie. /downloads/forms/lic/wwda/

Answer No. 1

Attachment F.1 contains a copy of the “A0025-01, Appropriate Assessment Screening for Kilmovee Wastewater Discharge Certificate of Authorisation Application, August 2010”.

The screening indicates that a full Appropriate Assessment will not be required.

MAYO COUNTY COUNCIL

KILMOVEE

WASTE WATER DISCHARGE

Certificate of Authorisation Application

ATTACHMENT F.1

Appropriate Assessment Screening

A0025-01

APPROPRIATE ASSESSMENT SCREENING

For

KILMOVEE WASTEWATER DISCHARGE

Certificate of Authorisation Application

August 2010

In accordance with the Waste Water Discharge (Authorisation) Regulations, 2007 (S.I. No. 684 of 2007)

And

Article 6(3) and 6 (4) of the

Habitats Directive 92/43/EEC

1. INTRODUCTION

Mayo County Council, Aras an Chontae, Castlebar, County Mayo made an application to the Environmental Protection Agency (EPA) for a Waste Water Discharge Certificate of Authorisation, for Kilmovee Agglomeration in compliance with the Waste Water Discharge (Authorisation) Regulations 2007 (S.I. No. 684 of 2007), in November 2009.

Under Part II Schedule 5 (5) of the Wastewater Discharge (Authorisation) Regulations 2007, In considering an application, where it appears to the Agency (i.e. Environmental Protection Agency) that the discharge concerned, or the proposed discharge, as the case may be, is likely to have a significant effect on a European site, either alone or in combination with other operations or activities, the Agency shall cause an assessment to be made of the implications for the site in view of that site's conservation objectives, and the Agency in deciding on the application shall have regard to the conclusions of the assessment.

The Kilmovee Wastewater Treatment Plant discharges into the Kilmovee River. There is only one Natura 2000 site within 5km of the primary discharge point, the Derrinea Bog pNHA / SAC (Site Code 00604) located 4.6km south of the discharge but not downstream from it.

This report includes:

1. Screening of the proposed plan in order to determine whether an Appropriate Assessment is required.

Purpose of Appropriate Assessment

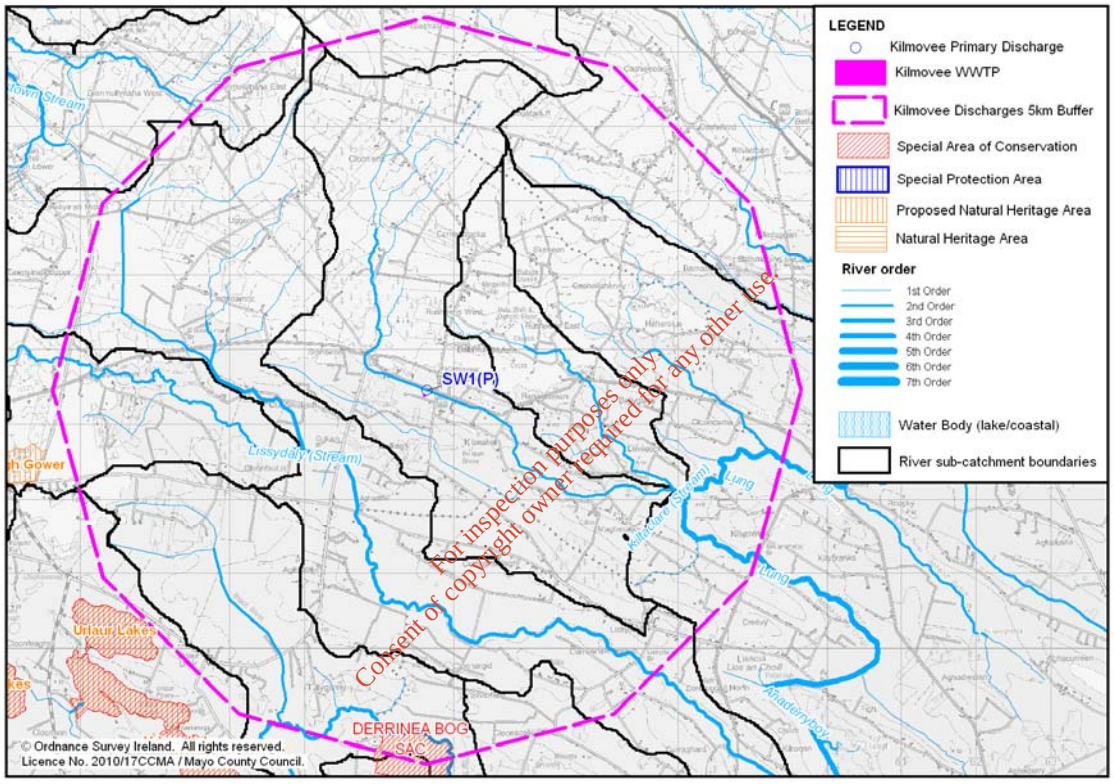
Articles 6(3) and 6(4) of the Habitat Directive 92/43/EEC require an Appropriate Assessment of plans to prevent significant adverse effects on Natura 2000 sites.

> **Article 6(3)** Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect there on either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the 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)** If, in spite of a negative assessment of the implications for the 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 social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of the Nature 2000 site is protected. It shall inform the Commission of the compensatory measures adopted.

The purpose of this Appropriate Assessment (AA) is to address the potential impacts of discharges from the Kilmovee Wastewater Treatment Plant on the conservation objectives of Natura 2000 Site Derrinea Bog pNHA / SAC (Site Code 00604).

The AA must determine whether the project is likely to have significant adverse effects on these sites either along or in conjunction with other plans and projects in the area and whether these effects will adversely affect the integrity of the SACs in terms of their nature conservation objectives.

Figure 1.1 - Location Map – Kilmovee WWTP and associated discharges and adjacent Natura 2000 sites.



2. APPROPRIATE ASSESSMENT - THE PROCESS

According to European Commission Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EC (2001) and MN2000, the assessment requirements of Article 6 establish a stage-by-stage approach as follows:

Stage 1 - Screening for a likely significant effect: An initial assessment of the project or plans effect on a European site(s). If it cannot be concluded that there will be no significant effect upon a European site, an AA is required;

Stage 2 - Appropriate Assessment: The consideration of the impact on the integrity of the Natura 2000 site of the project or plan, either alone or in combination with other projects of plans, with respect to the site's structure and function and its conservation objectives. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts.

Stage 3 – Assessment of alternative solutions: The process which examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the Natura 2000 site:

Stage 4 – Assessment where no alternative solutions exist and 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.

Each stage determines whether a further stage in the process is required. If, for example, the conclusions at the end of Stage One are that there will be no significant impacts on the Natura 2000 site, there is no requirement to proceed further.

The following Assessment has been prepared in consultation with the following documents:

Department of Environment, Heritage and Local Government (2008) Circular L8/08. Water Services Investment and Rural Water Programmes – Protection of Natural Heritage and National Monuments.

EPA (2008) Wastewater Discharge Licensing Appropriate Assessment: Note on Appropriate Assessments for the purposes of the Waste Water Discharge (Authorisation) Regulations, 2007 (S.I. No. 684 of 2007).

EC (2000) Managing Natura 2000 Sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC.

EC (2001) Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC.

Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC.

3. STAGE 1 - SCREENING

Screening is the process of deciding whether or not an AA is required for the project or plan. Screening only requires sufficient information to determine if there is a likely significant effect on a Natura 2000 site and does not require the detailed information needed for the AA.

The following Stage 1 Screening was undertaken according to the Department of Environment, Heritage and Local Government Circular L8/08 and EC Methodological guidance on the provision of Article 6 (3) and (4) of the Habitats Directive 92/443/EEC. This Screening is used below to ascertain if an AA is required.

3.1 – Description of the Project

Kilmovee Wastewater Treatment Plant was commissioned in early 2008 to serve a design population equivalent PE of 300 and is currently operated by Mayo County Council.

The Wastewater Works in Kilmovee consists of a wastewater treatment plant with a collection network of 225mm diameter foul sewers and 2 no. pumping stations. Treated effluent from the plant is discharged to the Kilmovee River (Primary Discharge Point).

The WWTP is based on the attached growth process and designed to treat sewage from a population equivalent of 300 PE.

The Wastewater Treatment process takes place in a package plant consisting of the following :

- Influent sampling point
- Influent chamber
- Primary settlement tank
- Sludge storage in primary settlement tank
- Two attached growth reactors with final settlement tank
- Final effluent sampling points

The treated final effluent from the wastewater treatment plant is discharged to the Kilmovee River through an outfall labelled SW1 (P) (154635E, 293456N). This is the primary discharge point. The Kilmovee River is a tributary of the Lung River which flows into Lough Gara and forms part of the Shannon River Catchment. There are no secondary or storm water discharges.

The wastewater treatment works is designed to treat the wastewater to the standards required by the Urban Wastewater Treatment Regulations i.e. BOD 25mg/l, COD 125mg/l and SS 35mg/l.

The average volume currently discharged from the municipal effluent stream of the treatment plant is estimated at 38.25m^3/day (170 PE @ 0.225L per PE day). This is equivalent to an estimated maximum discharge of 0.96 kg BOD/day and 1.34 kg/day Suspended Solids.

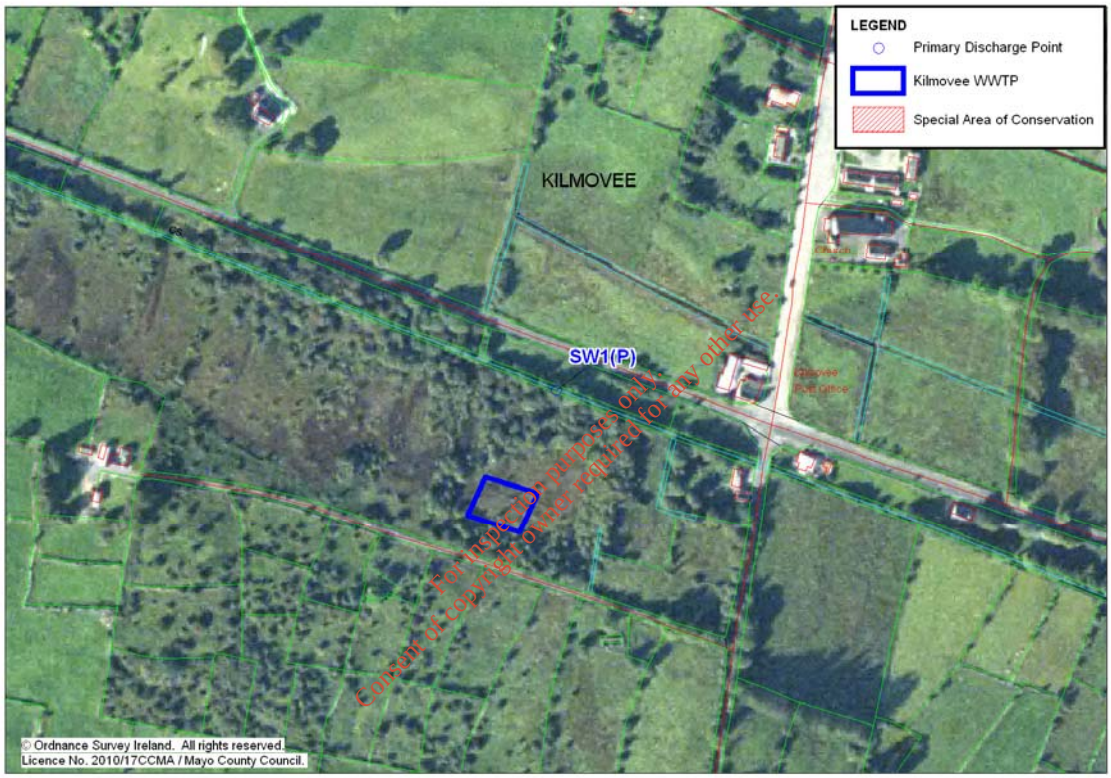
The WWTP has a dry weather flow (DWF) of 38.25m^3/day or 0.000442708m^3/s into the Kilmovee River which has a DWF of 345.6m^3/day or 0.0004m^3/s. The maximum volume emitted per day is 114.75m^3. The period of emission is 60min/hr, 24hr/day, 365 day/yr.

It is expected that the PE being treated by the Kilmovee Wastewater Works will increase to 200 PE in the medium term which would mean an increase in the average discharge from the treatment works to 45m^3/day.

The discharge from the treatment plant is to the Kilmovee River which flows into the Lung River which in turn flows into Lough Gara in Roscommon. The Kilmovee River is not designated Salmonid or Nutrient Sensitive.

Emissions from the WWTP are monitored and the treatment process is adjusted to maximise the efficiency of the plant in removing any pollutants. The process, summarized above, is successful in removing BOD, and suspended solids from the final effluent which results in a reduction of harmful emissions from the treatment works.

Location of Discharge From WWTP



3.2 – Description of Natura 2000 Site

Name: The Derrinea Bog pNHA / SAC (Site Code 00604)

(see Appendix A for site synopses)

The Derrinea Bog pNHA / SAC (Site Code 00604) is located 4.6km south of the discharge but not downstream from it. It has an area of approximately 86.2 ha. The SAC has been designated for the following habitats and species:

- Active Raised Bogs (Habitat Code 7110) – Excellent Representativity.
- Degraded raised bogs still capable of natural regeneration (Habitat Code 7120) – Good Representativity.
- Depressions on peat substrates of the Rhynchosporion (Habitat Code 7150) - Good Representativity.

3.3 – Other projects and plans to be considered 'in combination'.

There are no EPA IPPC licenses or Mayo County Council discharge licenses within 5km of the Kilmovee Waste Water Treatment plant.

There were eight planning permissions granted between 2004 and 2010. Three or these were for dwelling houses to be connected to the public sewer and one for a dwelling house with a septic tank. There was one application for a housing development for 34 houses to be accommodated within the existing WWTP. Two of the applications related to an extension to an existing sports hall and there was one application for the change of use from residential to a family resource centre. None of these planning applications are for significant projects or plans that would impact on sites of nature conservation importance.

Kilmovee is one of seventy two villages identified in the County Settlement Strategy of the Mayo County Development Plan 2008-2014 as a focus for an appropriate level of expansion including small-scale housing development. While supporting the development of these villages, the Council will require that the design and scale of new development respects the intrinsic rural character and ethos of the existing villages.
The full development potential of the villages in partially sustaining and maintaining the rural population will depend on the provision of infrastructure. It is recognized, therefore, that in the short term, the range and scale of development that can be accommodated in some of the villages, will be constrained pending the provision of infrastructure. The Council will actively work, in full cooperation with potential developers, to provide some or all of this infrastructure on an agreed partnership basis in towns and villages where there is a local area plan adopted.

3.4 – Assessment Criteria

3.4.1 – Is the development in or on the boundary of the aforementioned nature conservation sites?

No the Kilmovee WWTP and agglomeration is not on or on the boundary of the Derrinea Bog pNHA / SAC (Site Code 00604).

3.4.2 – Will nationally protected species be directly impacted? Wildlife Acts (1976 and 2000), Flora Protection Order (S.I. 94 of 1999)?

A data search of the National Parks and Wildlife 10km survey grids (Grid Squares M57, M58, M59, M68, M69 and M79) of both the National Parks website and datasets obtained from the NPWS have recorded the presence of Badger (Meles meles) at 7 sites, Common Frog (Rana temporaria) at 8 sites, Freshwater Crayfish (Austropotamobius pallipes) at 8 sites, Irish Hare (Lepus timidus subsp. hibernicus) at 13 sites, Otter (Lutra lutra) at 17 sites and Pine Marten (Martes martes) at 2 sites. The Irish Stoat (Mustela erminea subsp. hibernica), Smooth Newt (Lissotriton vulgaris), Cladonia ciliata (Cladonia ciliata), Cladonia Portentosa (Cladonia Portentosa), Fine Bog moss (Sphagnum angustifolium), Reindeer Moss (Cladina rangifernia), Rigid Bog-moss (Sphagnum teres) and Twisted Bog-moss (Sphagnum contortum) were each recorded at one site within the 10km survey grid squares.

Freshwater pearl mussel prefer rivers flowing over non-calcareous rock that have little calcium and are generally low in nutrients (Moorkens, 1999; Skinner & Hastie, 2003) although this is not supported by available data in Mayo. For NPWS records of the species in County Mayo, 43% of pearl mussel records were located on sandstone bedrock, 42% were located on calcareous bedrock, with 16% located on other non-calcareous bedrock types. It is considered that the distribution of this species here is more influenced by other factors. There are no records of freshwater pearl mussel in the Kilmovee river catchment area.

The species potentially at risk from the WWTP discharges are the Common Frog, the Freshwater Crayfish, the Otter, and the Smooth Newt.

The common frog may have been introduced to Ireland, but, whatever its origins, it is now widespread and common throughout Ireland. In fact it is one of the most common amphibians in Europe. Frogs emerge from hibernation in early spring, returning to the same breeding pond each year in March or April to spawn. The tadpoles can take 4 - 10 weeks to develop, but occasionally tadpoles will overwinter in ponds before metamorphosing the following spring. They feed on slugs, worms, flies and other insects. Amphibians are subject to impacts in both the aquatic and the terrestrial environments. The main threats and pressures for this species relate for the most part to the reduced availability of breeding sites, or the reduced quality of the surrounding terrestrial habitats. The presence of the common frog was recorded at 8 sites within the 10km survey grids between 1979 and 2003. The 3 recordings in 2003 were in the Kilkelly area which is upstream of the WWTP discharge point. The other recordings were in 1994 or earlier.

White-clawed crayfish distribution is strongly determined by bedrock type, and they generally occur in areas with relatively hard, mineral-rich waters on calcareous and rapidly weathering rocks such as limestone and sandstone (Holdich, 2003; Demers et al., 2005). For NPWS/EPA records of white-clawed crayfish in County Mayo, 81% of records were located on calcareous bedrock, 13% on sandstone bedrock types, and 6% located on other non-calcareous bedrock types. The presence of the freshwater crayfish was recorded at 8 sites within the 10km survey grids between 1989 and 2007. 7 of these recordings were in the Sonnagh River which is in the River Moy catchment area. The Kilmovee river is in the Shannon river Catchment area. In 1992 the presence of Crayfish was recorded in the Killaclare stream at Aghadiffin. This stream meets the Kilmovee river downstream of the recorded crayfish point. The Kilmovee WWTP discharge should therefore have no negative impact on the crayfish site.

The presence of the otter was recorded at 17 sites. In 2005 it was recorded at 2 sites, one at Trimoge and one at Carrownlaka both of which are upstream from the discharge point. All other recordings were in 1991 or before. Otter populations have the potential to be indirectly impacted from water quality impacts from the WWTP should these affect fish populations which are an important food source for the otter. However, otter feed on a wide range of food including stickleback, frogs, eels and crayfish all of which can tolerate moderate pollution.

There was only one recording of the smooth newt in the 10km survey grids. This was in Doocastle in 1972. The smooth newt is found throughout Ireland but is an elusive animal not often seen between August and March. In spring and early summer, populations come together to breed in ponds and ditches. Adults may remain in the ponds for several months. Outside the breeding season, the newt is terrestrial and usually nocturnal. They feed on slugs, worms, flies and other insects. Over winter newts hibernate, often in groups, under rotting logs, old tree stumps, in sheds, outhouses, and other locations that are free of frost and safe from predators.

The water quality of the Kilmovee river is considered to be of good status. According to European Communities Environmental Objectives (Surface Water) Regulations 2009 the general definition of good status is :
'The values of the biological quality elements for the surface water body type show low levels of distortion resulting from human activity, but deviate only slightly from those normally associated with the surface water body type under undisturbed conditions'.

The Waste Assimilative Capacity (WAC) calculations were done for BOD, Suspended Solids, Ortho-Phosphorus and Ammonia. See Appendix B.
From these calculations Ortho-Phosphorus and Ammonia exceeded the good water quality requirements which may lead to a deterioration of the river water quality but both BOD and Suspended Solids were within the WAC.

3.4.3 – Is the development a surface water discharge or abstraction in the surface water

catchment or immediately downstream of a nature conservation site with water dependant qualifying habitats/species?

No, there are no designated SACs or SPAs within the catchment or immediately upstream of the Kilmovee WWTP and associated discharges. The Derrinea Bog pNHA / SAC (Site Code 00604) is located 4.6km south of the discharge but not downstream from it.

3.4.4 – Is the development a groundwater discharge or abstraction in the ground water catchment or within 5km of a nature conservation site with water-dependant qualifying habitats/species?

No, the development is a surface water discharge.

3.4.5 - Is the development in the surface water or groundwater catchment of salmonid waters?

The Kilmovee River is not designated as salmonid (under the National Salmonid Regulations). The Kilmovee River flows into the Lung River which in turn flows into Lough Gara in Roscommon. Neither the Lung River nor Lough Gara are designated as salmonid.

3.4.6 – Is the treatment plant in an active or former floodplain or flood zone of a river, lake etc.?

There is no record of flooding in the vicinity of the Kilmovee WWTP (www.floodmaps.ie). The site is located approximately 150m from 'benefiting lands'. These are areas that are subject to flooding and would benefit from land drainage schemes. The plant itself is not located within the 'benefiting lands'.

3.4.7 – Is the development of a surface discharge or abstraction to or from marine waters and within 3km of a marine nature conservation site?

No, the Kilmovee WWTP discharges to the Kilmovee River, which flows into the Lung River which in turn flows into Lough Gara in Roscommon. This is not a marine environment. There is no marine SAC or SPA within 3km downstream of the WWTP.

3.4.8 –Will the project in combination with other projects (existing and proposed) or changes to such projects affect the hydrology or water levels of sites of nature conservation interest or the habitats of protected species?

The WWTP discharge flow as a percentage of the Kilmovee River Dry Weather Flow (DWF) is 11% and of the 95 percentile flow is 5.5%. There are no sites of nature conservation interest or habitats of protected species downstream of the discharge point.

A review of all planning applications in the agglomeration since 2004 (Source: Mayo County Council GIS database), shows no major development has been proposed that would affect the hydrology or water levels of sites of nature conservation interest or the habitats of protected species.

3.4.9 - Conclusion:

It is considered that an Appropriate Assessment is not required.

4. FINDINGS OF SIGNIFICANT EFFECTS REPORT MATRIX

4.1 – Name of project or plan	Kilmovee Wastewater Treatment Plant Discharge Licence Application
4.2 - Name and location of Natura 2000 sites	The Derrinea Bog pNHA / SAC (Site Code 00604)
4.3 - Description of the project or plan	As 3.1 above.
4.4 - Is the project or plan directly connected with or necessary to the management of the site (provide details)?	No
4.5 - Are there other projects or plans that together with the project or plan being assessed could affect the site (provide details)?	No

5. – THE ASSESSMENT OF SIGNIFICANCE OF EFFECTS

5.1 - Describe how the project or plan (alone or in combination) is likely to affect the Natura 2000 site.

Impacts are summarized below based on Figure 1: Screening Matrix of the EC Guidance (2001).

The Kilmovee WWTP and associated discharges will not impact on any Natura site.

5.2 - Explain why these effects are not considered significant.

There are no Natura 2000 sites downstream of the WWTP and associated discharges that would be impacted by the sewerage scheme.

5.3 - List of Agencies Consulted: Provide contact name and telephone or e-mail address:

Any available data was assessed from the following websites;

- WFD Ireland,
- Western RBD,
- National Biodiversity Data Centre,
- Department of Environment Heritage and Local Government, and
- National Parks and Wildlife:

5.4 - Response to Consultation

N/A

DATA COLLECTED TO CARRY OUT THE ASSESSMENT SCREENING

Who carried out the Appropriate Assessment Screening?

Catherine Maughan, Environmental Technician.

Sources of data

Any available data was assessed from the following website;

- WFD Ireland,
- Western RBD,
- National Biodiversity Data Centre,
- Department of Environment Heritage and Local Government, and
- National Parks and Wildlife:

See References/Sources of report.

Level of Assessment

Site Visit and Desk top study.

Where can the full results of the Assessment Screening be accessed and viewed?

Water Services Capital Works Section, Mayo County Council.

References

- Department of Environment, Heritage and Local Government (2008) Circular L8/08. Water Services Investment and Rural Water Programmes – Protection of Natural Heritage and National Monuments.
- EPA (2008) Wastewater Discharge Licensing Appropriate Assessment: Note on Appropriate Assessments for the purposes of the Waste Water Discharge (Authorisation) Regulations, 2007 (S.I. No. 684 of 2007).
- EC (2000) Managing Natura 2000 Sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC.
- EC (2001) Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC.
- Mayo County Development Plan 2008-2014
- Wildlife Act, 1976
- Wildlife (Amendment) Act, 2000
- S.I. No. 94/1999 — Flora (Protection) Order, 1999
-
- Holdich, D. (2003). Ecology of the White-clawed crayfish. Conserving Natura 2000 Rivers Ecology Series No. 1. English Nature, Peterborough.
- Demers, A., Lucey, J., McGarrigle, M.L. & Reynolds, J.D. (2005). The distribution of the white clawed crayfish, Austropotamobius pallipes, in Ireland. Biology and Environment: Proceedings of the Royal Irish Academy, Vol. 105B (2): 65-69
- E. A. Moorkens (1999) Conservation Management of the Freshwater Pearl Mussel Margaritifera margaritifera. Part 1: Biology of the species and its present situation in Ireland. Irish Wildlife Manuals, No. 8.
- Skinner, A., Young, M. & Hastie, L. (2003). Ecology of the Freshwater Pearl Mussel. Conserving Natura 2000 Rivers Ecology Series No. 2. English Nature, Peterborough.
- S.I. No. 293/1988 — European Communities (Quality of Salmonid Waters) Regulations, 1988.
- European Communities Environmental objectives (Surface Waters) Regulations 2009

APPENDIX A – SITE SYNOPSES FOR SACS

SITE NAME: DERRINEA BOG
SITE CODE: 000604

Derrinea Bog is a small raised bog site situated on the northern margin of Cloonagh Lough, just east of the Mayo/Roscommon border and approximately 10 km north-west of Ballyhaunis. A river emanating from Cloonagh Lough forms the eastern and northern boundary of the site, which features an extensive area of pools, quaking flats and well-developed hummocks. The pools are colonized by Bogbean (Menyanthes trifoliata), carpets of Bog-sedge (Carex limosa) and Crowberry (Empetrum nigrum). Surrounding these areas, quaking flats have good Bog Moss (Sphagnum spp.) cover, with White Beak-sedge (Rhynchospora alba), the moss Campylopus atrovirens and Great Sundew (Drosera anglica) also present. The hummock-forming Bog Moss (Sphagnum imbricatum) is found around the pools. The scarce Bog Moss (Sphagnum recurvum var. tenue) has been recorded from the site. A small hillock at the southern end of the bog has an almost complete cover of Heather (Calluna vulgaris), with occasional Sessile Oak (Quercus petraea). Despite drainage and turf cutting in the western part of the site, the more easterly areas are remarkably wet and display an extensive mosaic of bog habitats which contribute to the value of the site.

13.1.1997

Appendix B - WASTE ASSIMILATIVE CAPACITY (WAC) CALCULATIONS

Dilution Rate:
No. Dilutions = Flow in receiving water (m^3/d) / WWTP discharge volume (m^3/d) = 345.6 / 38.25 = 9.04 **(Dilution Rate for WWTP)**

WAC Calculation:
WAC (kg/d) = (Cmax-Cback) * F95 (m^3/s) * 86.4
Where Cmax = max permissible concentration in receiving water
(based on achieving 'good status' under the EC Environmental Objectives (Surface Waters) Regulations 2009).
Cback = background (upstream) concentration (mg/l)

F95 = 95% flow in receiving river (m^3/s)

WAC for BOD = (2.6 – 1) * 0.008 * 86.4 = 1.11kg/day BOD
(Using 'Good Status' for Cmax and results of aSW1u sample for Cback and 95%ile flow in receiving water)

WAC for Suspended Solids = (25 – 2) * 0.008 * 86.4 = 15.9 kg/day SS
(Using Salmonid Regulations for Cmax and results for aSW1u sample for Cback and 95%ile flow in receiving water)

WAC for Ortho-phosphorus = (0.075 – 0.01) * 0.008 * 86.4 = 0.045 kg/day Ortho-phosphorus
(Using 'Good Status' 95%ile for Cmax, results for aSW1u sample for Cback and 95%ile flow in receiving water)

WAC for Ammonia = (0.14 – 0.03) * 0.008 * 86.4 = 0.076 kg/day Ammonia
(Using 'Good Status' for Cmax and results for aSW1u sample for Cback and 95%ile flow in receiving water)

Loadings from WWTP:
Loading (kg/d) = {discharge concentration (mg/l) x discharge flow (m^3/d)} / 1000

Where discharge concentrations are based on maximum concentrations provided in Table D.1(i)(b) of the discharge Certificate of Authorisation application and flows are based on dry weather flow (DWF) included in Table D.1(i)(a) of the discharge license application.

WWTP BOD loading = (10*38.25)/1000 = 0.3825kg/day BOD
(within WAC)

WWTP SS loading = (9*38.25)/1000 = 0.34425kg/day SS
(within WAC)

WWTP Ortho-Phosphorus loading = (2.738*38.25)/1000 = 0.105kg/day Ortho-P
(not within WAC)

WWTP Ammonia loading = (11.667*38.25)/1000 = 0.446 kg/day Ammonia
(not within WAC)

Appendix C – Flow Chart from Appendix 1 of Circular L8/08 from DoEHLG.