Comhairle Contae Chorcaí
Cork County Council

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

11th February 2011

Re: A0404-01 – Sherkin Island Waste Water Discharge Certificate of Authorisation – Reply to Notice in accordance with Regulation 25(c)(ii) of the Waste Water Discharge (Authorisation) Regulations 2007

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Dear Ms. English,

I refer to your letter of the 31st January 2011 concerning the above. The following is our reply to your request for further information in accordance with Regulation 25(c)(ii) dealing in sequence with the points raised:

Assessment of Effects of the Waste Water Discharges
With reference to Circular L8/08 and the flow diagram in Appendix 1 attached, it can be concluded that the wastewater discharging from the agglomeration will not have significant effects on any relevant European sites.

The discharge point from Sherkin Island Agglomeration is adjacent to Roaringwater Bay & Islands SAC. Roaringwater Bay is a large, well exchanged body of water with high dilution and the pe of the agglomeration is <500pe. A Habitats Directive Assessment (Screening Report) for Sherkin Island Agglomeration has been carried out and is attached. It can be concluded from this that an appropriate assessment is not required for this agglomeration.

Yours sincerely,

Niall O'Mahony,
Senior Engineer,
Cork County Council

Enclosures

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Circular L8/08 2 September 2008
Water Services Investment and Rural Water Programmes – Protection of Natural Heritage and National Monuments

APPENDIX 1
Water Services Schemes - Natural Heritage Checklist for Local Authorities

What projects must be screened?

For new projects and significant changes to any existing operations, if the answer is 'yes' to any of the following, the project (i.e. construction, operation and maintenance) must be screened for its impacts:	
1. Is the development in or on the boundary of a nature conservation site NHA/SAC/SPA?	Yes
2. Will nationally protected species be directly impacted? Wildlife Acts (1976 and 2000), Flora Protection order (S.I. 94 of 1999)?	No
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
4. Is the development a groundwater discharge or abstraction in the ground water catchment or within 5 km of a nature conservation site with water-dependant qualifying habitats/species?	Yes
5. Is the development in the surface water or groundwater catchment of salmonid waters?	No
6. Is the treatment plant in an active or former floodplain or flood zone of a river, lake, etc?	No
7. Is the development a surface discharge or abstraction to or from marine waters and within 3km of a marine nature conservation site?	No
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?	No

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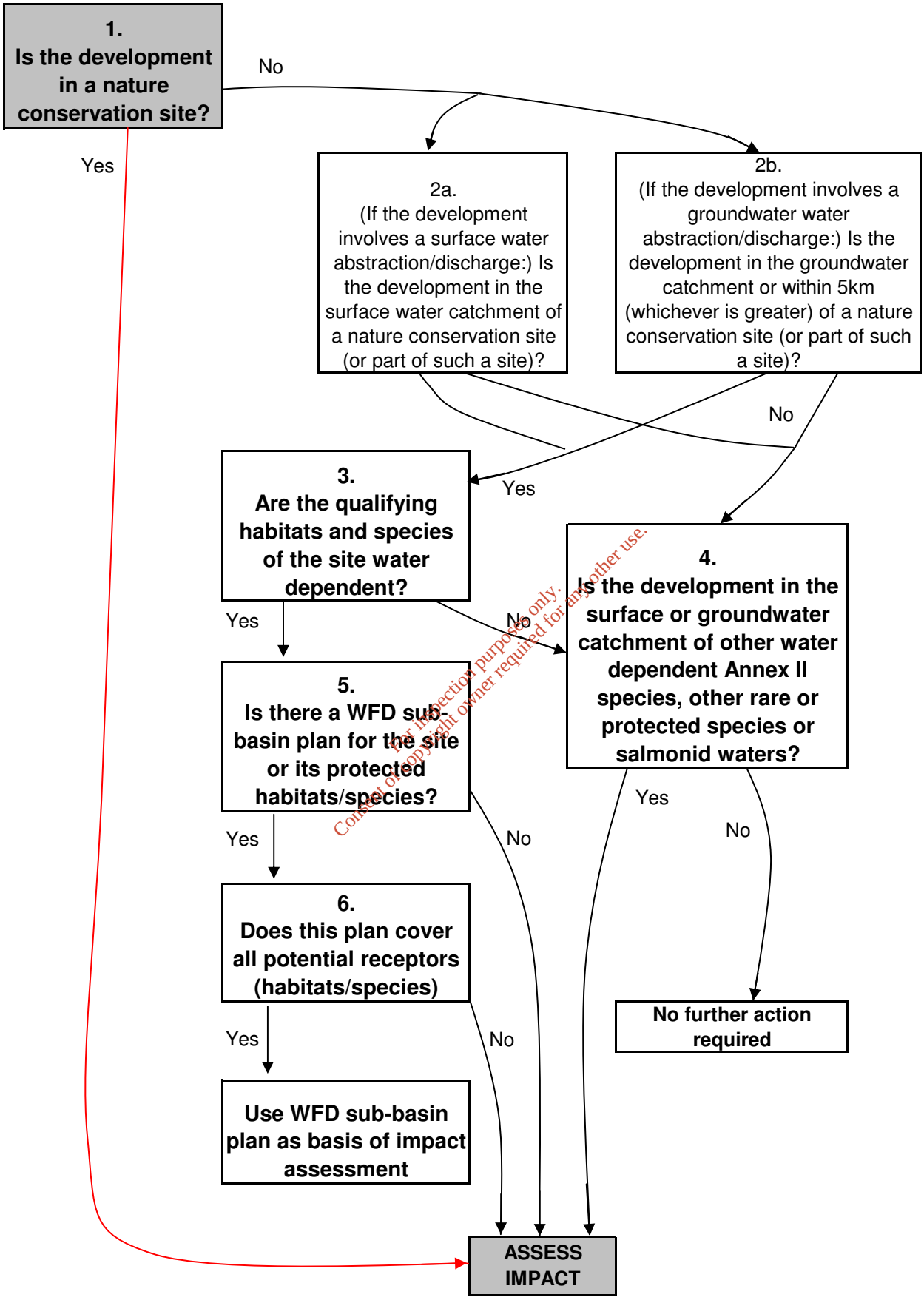
Flow Diagram - Route Highlighted Red & Shaded Grey



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Conclusion: A Screening Report is required for Sherkin Island

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Habitats Directive Assessment (Screening Report) in respect of

Application by Cork County Council to the EPA

for discharge license in respect of the

Sherkin Island Waste Water Treatment Plant

A0404-01

February 2011

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1 Introduction

1.1 Sherkin Island lies southwest of County Cork in Ireland alongside other islands of Roaringwater Bay. The Island has a permanent population of approximately 120 people with a significant number of day visitors during the summer. The existing WwTP was commissioned in 1999, serves 6 no. council houses and discharges to a percolation area and serves a PE of 18. The WwTP, with a volume of 11.25m3 which equates to a design capacity pe of 51, provides tertiary treatment. The treatment process incorporates a wastewater treatment plant and percolation area.

1.2 The treatment plant and percolation area is located adjacent to the Roaringwater Bay & Islands Special Area of Conservation which is designated under the **EU Habitats Directive (92/43/EEC)** as transposed into Irish Law under the European Union (Natural Habitats) Regulations SI 94/1997. As this is the case, and in accordance with requirements under this Directive, the potential impacts of proposed developments that have the potential to impact on Special Areas of Conservation must be assessed. The procedure to do this is called a **Habitats Directive Assessment**. The purpose of such an assessment is to identify whether there may be potential for elements of the project to have a significant impact on nature conservation sites within its impact zone, and if so, to predict the potential for such impacts to affect the overall integrity of such nature conservation sites. The European Union has provided guidance as to how to make a Habitats Directive Assessment which identifies four main stages in the process as follows:

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Stage One: Screening
The process which identifies the likely impacts upon a Natura 2000 site of a project or plan, wither alone or in combination with other projects or plans, and considers whether these impacts are likely to be significant.

Stage Two: 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 or 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 Three: 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 Four: 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, it is deemed that the project or plan should proceed.

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1.3 This document brings together all of the information necessary to make determination as to whether there are likely to be significant impacts arising from the Sherkin Island Waste Water Treatment Plant on the adjacent Roaringwater Bay & Islands Special Area of Conservation and represents the first stage of this process (Screening).

Step 1:
Provide a description of the plan and other plans and projects that, in combination, have the potential to have significant effects on Natura 2000 sites within the potential impact zone;

Step 2:
Identify Natura 2000 sites which may be impacted by the plan, and compile information on their qualifying interests and conservation objectives;

Step 3:
Determine whether the plan needs to be screened for potential impacts on Natura 2000 sites;

Step 4:
Carry out an assessment of likely effects – direct, indirect and cumulative – undertaken on the basis of available information as a desk study or field survey or primary research as necessary;

Step 5:
Assess the significance of any such effects on the Natura 2000 sites within the impact zone.

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1.4 The assessment has been prepared in accordance with the following guidance:

European Commission (2000) Managing Natura 2000 sites: the provisions of Article 6 of the Habitats Directive 92/43/EEC.

European Commission (2001) 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.

Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities. Environment, Heritage and Local Government, 2009.

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2 Appropriate Assessment Screening Matrix

2.1 Description of project	
Location	Sherkin Island, Skibbereen, Co. Cork. See attached Map.
Description of the key components of the project	The treatment system in Sherkin Island provides tertiary treatment (treatment plant & percolation area). Built in 1999 with a capacity of 11.25m3, it was originally designed for a p.e. of 51. Treated effluent from the plant discharges to a percolation area east of the plant.
Distance from designated sites in potential impact zone*	Discharge is adjacent the SAC

2.2 Description of the Natura 2000 sites within the potential impact zone[1]	
Name	Roaringwater Bay & Islands Special Area of Conservation
Site Code	000101
Site Description	Roaringwater Bay, Co. Cork, is a wide shallow bay located on the southwest coast. The site includes the immediate coastline on the mainland from Long Island to Baltimore together with the whole bay and most of the islands. Bedrock is composed of a series of Devonian Old Red Sandstone reefs that run parallel to troughs of Devonian Carboniferous marine clastics in a north east/south west direction. These reefs emerge to form the islands on the south side of the bay and within the bay. Generally the coast is low-lying but the southern edge rises, in line with the hills behind Baltimore, to culminate in a summit of 160m on Cape Clear. The bay itself has a wide variety of reef and sediment habitats, subject to a range of wave exposures and tidal currents, and has been selected for three marine habitats listed under the EU Habitats Directive, i.e. large shallow inlets and bays, marine caves and reefs. The terrestrial habitats are also of conservation interest and include good examples of two habitats listed under the EU Habitats Directive, i.e. dry heath and sea cliffs. Otter and Grey seal, two mammal species listed on Annex II of the EU Habitats Directive, occur within the site. The discharge from the Sherkin Island Wastewater Treatment Plant enters a percolation area.

[1] Natura 2000 sites within the potential impact zone of the proposed development have been identified in accordance with guidance provided in the NPWS circular L8/08.

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	More information on the Roaringwater Bay & Islands SAC is contained appendix 1 of this document.
Qualifying Interests of Roaringwater Bay & Islands SAC.	The site is selected for the following: *Habitats* Large shallow inlets and bays; Reefs; Vegetated sea cliffs of the Atlantic and Baltic coasts; European dry heaths; Submerged or partly submerged sea caves. *Species* Phocoena phocoena; Lutra lutra; Halichoerus grypus
Other Notable Features of Roaringwater Bay & Islands SAC.	The Site Synopsis is contained in appendix 1. The site holds a very important concentration of Choughs (33 pairs in 1992), as well as several pairs of Peregrine Falcons.
Conservation Objectives	Objective 1: To maintain the Annex I habitats for which the SAC has been selected at favourable conservation status: large shallow inlets and bay; Reefs; Vegetated sea cliffs of the Atlantic and Baltic coasts; European dry heaths; Submerged or partly submerged sea caves. Objective 2: To maintain the Annex II species for which the SAC has been selected at favourable conservation status: Phocoena phocoena; Lutra lutra; Halichoerus grypus. Objective 3: To maintain the extent, species richness and biodiversity of the entire site. Objective 4: To establish effective liaison and co-operation with landowners, legal users and relevant authorities. Favourable conservation status of a habitat is achieved when: • Its natural range, and area it covers within that range, is stable or increasing and • The ecological factors that 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 as defined below. The favourable conservation status of a species is achieved when: • Population data on the species concerned indicate that is maintaining itself, and • The natural range of the species is neither being reduced or likely to be reduced for the foreseeable future, and • There is, and will probable continue to be, a sufficiently large habitat to maintain its populations on a long-term basis. *Source - National Parks and Wildlife Service*

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2.3 Assessment Criteria	
Describe the individual elements of the project (either alone or in combination with other plans or projects) likely to give rise to impacts on the Natura 2000 site.	**Discharge from Sherkin Island WWTP:** *Treated wastewater from the Sherkin Island Waste Water Treatment Plant is discharged to a percolation area adjacent to the SAC of Roaringwater Bay & Islands.* *The discharge consists of treated effluent from the Sherkin Island Waste Water Treatment Plant.* **Other Discharges within the SAC:** *Ballydehob WWTP, Baltimore WWTP and Schull WWTP discharge to Roaringwater Bay.* *See Map in Appendix 3 for discharge locations.*
Describe any likely direct, indirect or secondary impacts of the project (either alone or in combination with other plans or projects) on the Natura 2000 site taking into account the following: ○ Size and scale ○ Land-take ○ Distance from the Natura 2000 site or key features of the site: ○ Resource requirements (water abstraction etc.) ○ Emissions (disposal to land, water or air) ○ Excavation Requirements ○ Transportation Requirements ○ Duration of construction, operation, decommissioning ○ Other.	Discharges could give rise to elevated nutrients entering the groundwater on Sherkin Island. Increased nutrient levels may impact on the ecology of an area by changing the composition of floral communities and reducing the ability of less robust plants to survive. Increased nutrient levels may also result in increasing the invertebrate populations in the surrounding waters, thereby increasing bird population levels. However the potential for the treatment plant to result in elevated nutrients in the surrounding waters is reduced by two main factors: 1. The standard of treated effluent is high. 2. The treatment provided is considered as appropriate as set out in the Urban Wastewater Treatment Regulation standards for p.e <2000. 3. The treated effluent enters a percolation area adjacent to Kinish Harbour which forms part of Roaringwater Bay. This Bay is a large and well exchanged body of water with unlimited dilution capacity. ***1. The standard of treated effluent is high*** The wastewater from the Skerkin Island WWTP received tertiary treatment and the effluent discharging is of a high standard (see appendix 2 for effluent testing results). ***2. The treatment provided is appropriate.*** Treated effluent from the Sherkin Island WWTP and receiving water quality were sampled as part of the Certificate of Authorisation application in 2009 (see appendix 2 for effluent testing results). The results of monitoring indicate that the wastewater treatment plant is not having a negative effect on the receiving waters. **Note 1**: See appendix 2 for effluent quality results for 2009. **Note 2**: The samples taken are grab samples. **Note 3**: The effluent sample was taken prior to it entering the percolation area.

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	3. The treated effluent enters a percolation area which is adjacent to Roaringwater Bay & Islands SAC. This is a large and well exchanged body of water with unlimited dilution capacity.
Describe any likely changes to the site arising as a result of: ○ Reduction in habitat area ○ Disturbance to key species ○ Habitat or species fragmentation ○ Reduction in species density ○ Changes in key indicators of conservation value (water quality etc) ○ Climate Change	**Reduction in habitat area:** *Treated effluent is discharging to groundwater and adjacent to Kinish Harbour which forms part of Roaringwater Bay. This Bay is a large well-exchanged body of water where dilution and dispersion potential is high. No significant impacts are evident or predicted on habitats within Sherkin Island or Roaringwater Bay from the operation of this facility.* **Disturbance to key species:** *The operation of the WWTP does not cause any disturbance to habitats & species within the SAC.* **Habitat or species fragmentation:** *No habitat fragmentation has been caused as a result of the operation of this facility.* **Reduction in species density:** *Treated effluent is discharging to a percolation area. No significant impacts are evident or predicted on species for which the SAC is designated.* **Changes in key indicators of conservation value eg water quality:** *While there is no ongoing monitoring of water quality for Kinish Harbour and surrounding waters, some sampling and testing were done and submitted as part of the* Certificate of Authorisation application in 2009. *This testing, while insufficient for a complete analysis indicates that there is no deterioration in water quality associated with the Sherkin Island discharge.*
Describe any likely impacts on the Natura 2000 site as a whole in terms of: ○ Interference with the key relationships that define the structure of the site ○ Interference with key relationships that define the function of the site	**Interference with the key relationships that define the structure of the site:** *The structure of the SAC is not impacted by the operation of this facility.* **Interference with key relationships that define the function of the site:** *The function of the SAC is not impacted by the operation of this facility.*
Describe from the above those elements of the project of plan, or combination of elements, where the above impacts are likely to be significant or where the scale or magnitude of impacts is not known.	No significant impacts are predicted.

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3. Finding of No Significant Effects Report Matrix

Name of project or plan	Sherkin Island WWTP discharge
Name and location of Natura 2000 site	Roaringwater Bay & Islands
Description of the project or plan	The treatment system in Skerkin Island is a treatment plant and percolation area and the wastewater receives tertiary treatment. Built in 1999 with a capacity of 11.25m3, it was originally designed for a p.e. of 51. Treated effluent from the treatment plant discharges to a percolation area adjacent to the plant.
Is the project or plan directly connected with or necessary to the management of the site (provide details)?	No
The assessment of significance of effects	
Describe how the project or plan (alone or in combination) is likely to affect the Natura 2000 Site.	Discharges from the Sherkin Island WWTP either alone or in combination with discharges from other sources could give rise to elevated nutrients entering Kinish Harbour and Roaringwater Bay. Increased nutrient levels may impact on the ecology of an area by changing the composition of floral communities and reducing the ability of less robust plants to survive. Increased nutrient levels may also result in increasing the invertebrate populations in the surrounding waters, thereby increasing bird population levels. The effluent discharged from Sherkin Island is considered as appropriately treated under the Urban Wastewater Treatment Regulations, it is considered that the discharge from Sherkin Island is not contributing negatively on the SAC.
Explain why these effects are not considered significant.	Appropriate treatment is being carried out as laid down in the Urban Waste Water Treatment Regulations. The wastewater is treated to a high standard by receiving tertiary treatment. No significant impacts are evident or predicted on species for which the SAC is designated.
List of agencies consulted: provide contact name and telephone or email address	National Parks and Wildlife Service – Web site
Response to consultation	

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Data collected to carry out the assessment			
Who carried out the assessment	**Sources of data**	**Level of assessment completed**	**Where can the full results of the assessment be accessed and viewed**
Orla O'Brien, Cork County Council	Water Quality Monitoring Data CCC; Waste water Certificate of Authorisation application Report prepared by Cork County Council	Desktop review of cited data.	This report.

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Appendix 1: Ecological Data

1 Roaringwater bay & Islands SAC 000101- Site Synopsis (National Parks and Wildlife Service)

Roaringwater Bay, Co. Cork, is a wide shallow bay located on the southwest coast. The site includes the immediate coastline on the mainland from Long Island to Baltimore together with the whole bay and most of the islands. Bedrock is composed of a series of Devonian Old Red Sandstone reefs that run parallel to troughs of Devonian Carboniferous marine clastics in a north east/south west direction. These reefs emerge to form the islands on the south side of the bay and within the bay. Generally the coast is low-lying but the southern edge rises, in line with the hills behind Baltimore, to culminate in a summit of 160m on Cape Clear.

The bay itself has a wide variety of reef and sediment habitats, subject to a range of wave exposures and tidal currents, and has been selected for three marine habitats listed under the EU Habitats Directive, i.e. large shallow inlets and bays, marine caves and reefs. The shores of the bay range from the exposed, rocky shores of South Sherkin Island, to the sheltered rock, sand and mud communities of the Inner Bay and estuarine communities where the rivers enter the bay. The shallow subtidal reefs have good examples of kelp forest community grazed by the sea urchin *Echinus esculentus*. The animal dominated reefs includes the feather star *Antedon bifida* community, the hydroid *Sertularia argentia* and *Hydralmania falcata* community, and sponge and ascidian communities some of which are species rich and in which two rare species occur; the sponge *Tethyspira spinosa* and the rare red alga *Phyllophora sicula*. The scarce hydroid *Tamarisca tamarisca* occurs at a number of sites within the bay. These communities are typical of very sheltered areas with some current present. The cave community on Sherkin Island is home to the rare filamentous red alga, *Pterosiphonia pennata*. The sedimentary communities in Roaringwater Bay are exceptional. Of particular interest is the extensive bed of the calcareous free living red alga *Lithophyllum dentatum*, (generally termed maerl but may be locally know as 'coral') which is the largest in the country for this species. This bed typically contains specimens that are very large and uniquely flattened in form with the rare filamentous red alga *Spyridia filimentosa*. *Lithophyllum dentatum* is only known from 2 other sites. There are also other maerl communities and several seagrass beds (*Zostera marina*) which may co-occur with a particularly good example in Horseshoe Bay, Sherkin Island.

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The terrestrial habitats are also of conservation interest and include good examples of two habitats listed under the EU Habitats Directive, i.e. dry heath and sea cliffs. The coastal heath vegetation is typified by an abundance of Autumn Gorse (*Ulex gallii*), Heather (*Calluna vulgaris*) and Bell Heather (*Erica cinerea*). This is regularly burnt in most places so that there are clearings where grasses and herbs such as Wood Sage (*Teucrium scorodonia*), Common Violet (*Viola riviniana*) and Tormentil (*Potentilla erecta*) have a temporary rise to prominence before the shrubs grow again. Outcrops of rock bring variety into the heath and are the sites of the more interesting species. These include many southern plants, for example the rare Red Data Book species Hairy Birdsfoot Trefoil (*Lotus subbiflorus*), the Common Birdsfoot itself (*Ornithopus perpusillus*), Spotted Rockrose (*Tuberaria guttata*), Pale Heath Violet (*Viola lactea*) and Lanceolate Spleenwort (*Asplenium billotii*). In addition there is a small amount of Deptford Pink (*Dianthus armeria*), the only place it grows in Ireland though it was likely to have been introduced. Flushes and damp places through this vegetation support some interesting

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liverworts as well as Birdsfoot Clover (*Trifolium ornithopodioides*) and the special annual plants of the south-west, Chaffweed (*Anagallis minima*), Yellow Centaury (*Cicendia filiformis*) and Allseed (*Radiola linoides*). Chamomile (*Chamaemelum nobile*) is also common with Yellow Bartsia (*Parentucellia viscosa*) somewhat less so.

High rocky seacliffs are confined to the southern and south-eastern sides of Clear Island and Sherkin Island. The steep areas of rocky cliffs are generally between 30 and 60 m in height, but more sloping ground with a heath covering extends to 120 m on Clear Island and to 100 m on Sherkin Island. Low, gently sloping cliffs occur elsewhere on some of the islands and on coastal sections of the mainland (mostly less than 30 m). The cliffs have typical maritime vegetation, with Sea Pink (*Armeria maritima*), Scurvy Grass (*Cochlearia* spp.), Red Fescue (*Festuca rubra*), Sea Campion (*Silene maritima*), Plantains (*Plantago maritima*, *P. coronopus*), Sea Samphire (*Crithmum maritimum*), Tree Mallow (*Lavatera arborea*) and, locally, Dotted Sedge (*Carex punctata*) and the Slender Spikerush (*Eleocharis uniglumis*). Two other Red Data Book plants, Little Robin (*Geranium purpureum*) and Sea Pea (*Lathyrus japonicus*) occur rarely on shingle beaches while Ray's Knotgrass (*Polygonum raii*) is more widespread. Several streams have been ponded by such beaches to create marshes of Reed (*Phragmites australis*) where Marsh Pennywort (*Hydrocotyle vulgaris*), Marsh Cinquefoil (*Potentilla palustris*) and Marsh Orchids (*Dactylorhiza majalis*, *D. incarnata*) are frequent together with some Creeping Willow (*Salix repens*) and Gypsywort (*Lycopus europaeus*). On Clear Island a similar marsh has developed into a bog with abundant bog mosses (*Sphagnum* spp.), Bogbean (*Menyanthes trifoliata*) and St John's Wort (*Hypericum elodes*). Sand is a notable feature of Sherkin Island and occurs to a small extent elsewhere. Wild Radish (*Raphanus raphanistrum*), Crested Hairgrass (*Koeleria macrantha*) and Sea Storksbill (*Erodium maritimum*) grow in this habitat with a little Haresfoot Clover (*Trifolium arvense*), Knotted Clover (*T. striatum*) and the Red Data Book Lesser Centaury (*Centaurium pulchellum*).

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Otter and Grey seal, two mammal species listed on Annex II of the EU Habitats Directive, occur within the site. Seabirds breed on some of the islands in the bay. A survey on Clear Island in 1995 reported the following species: Fulmar 716 pairs, Shag 59 pairs, Lesser Black-backed Gull 160 pairs, Herring Gull 51 pairs, Great Black-backed Gull 50 pairs, Guillemot 42 individuals and Razorbill 31 individuals. Cormorants breed on Calf Island, Carrigmore and The Catalogues (c. 100 pairs in mid 1980s), and there is a scattering of gulls on several other islands. Roaringwater Bay has a nationally important population of Black Guillemot, with 198 individuals counted in 1999. Terns (Arctic/Common) bred within the site in the 1980s, with a large colony of 122 pairs on Carrigviglash Rock in 1984. Such large numbers, however, have not been seen since and there have been no records of breeding in the last 10 years. The site holds a very important concentration of Choughs (33 pairs in 1992), as well as several pairs of Peregrine Falcons. Both of these species are listed on Annex I of the EU Birds Directive. Clear Island has Ireland’s only manned bird observatory (established in 1959) and there is a marine research station on Sherkin Island.

In conclusion, Roaringwater Bay and Islands is a site of exceptional conservation importance, supporting diverse marine and terrestrial habitats, five of which are listed under the EU Habitats Directive. The site is also notable for the presence of Otter and Grey Seal plus a number of rare species and also supports important sea bird colonies.

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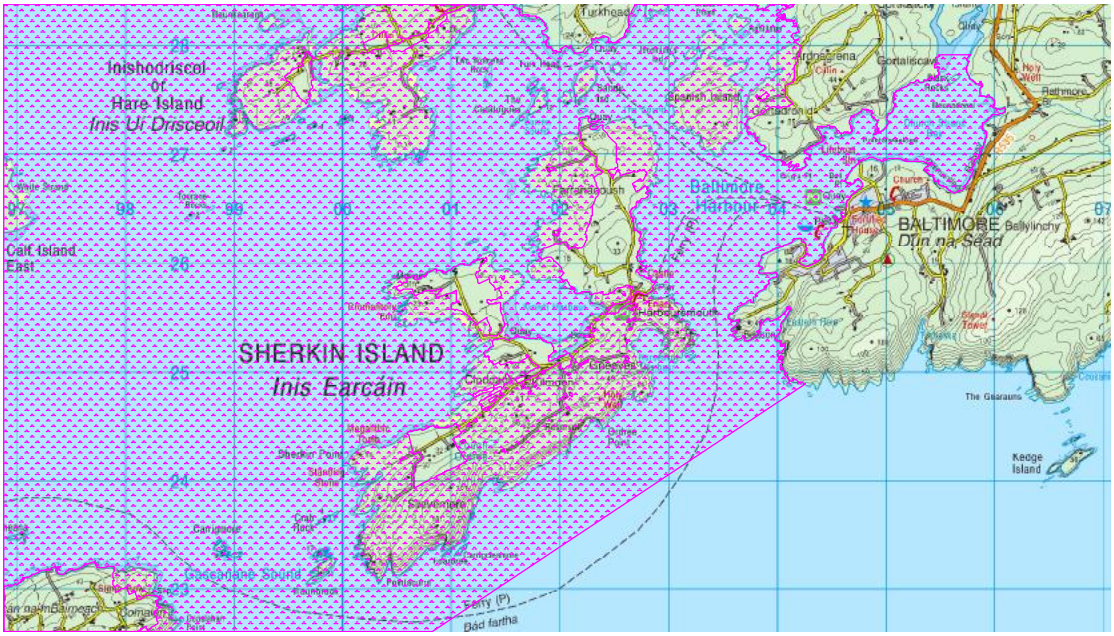
Map of Sherkin Island & Roaringwater Bay & Islands SAC



The treatment system in Sherkin Island is a tertiary treatment plant (treatment plant & percolation area). Built in 1999 with a capacity of 11.25m3, it was originally designed for a p.e. of 51. Treated effluent from the treatment plant discharges to a percolation area adjacent to Kinish Harbour.

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Appendix 2: Treated Effluent Quality Data 2009.

Attachment E4 Sherkin analytical data for certification application				
Sample Date	16/09/2009	16/09/2009	16/09/2009	16/09/2009
Sample	Influent	Effluent	River Upstream	River Downstream
Sample Code	GT1157	GT1158	GT1156	GT1155
Flow M^3/Day	No result	No result	No result	No result
pH	7.5	7.8	7.5	7.8
Temperature °C	No result	No result	No result	No result
Conductivity uS/cm 20°C	1178	1096	460	436
Suspended Solids mg/L	82	34	5	<2.5
Ammonia-N mg/L	82.6	72.3	<0.1	0.2
BOD mg/L	147	51	2	2
COD mg/L	376	180	<21	<21
TN-N mg/L	109.3	93.76	0.476	0.777
Nitrite-N mg/L	<0.1	<0.1	<0.1	0.341
Nitrate-N mg/L	<0.5	<0.5	<0.5	<0.5
TP-P mg/L	12.35	9.67	<0.05	<0.05
O-PO4-P mg/L	9.02	8.55	<0.05	<0.05
SO4 mg/L	52.3	51.4	<30	<30
Phenols µg/L	No result	<0.10	No result	<0.10
Atrazine µg/L	No result	<0.01	No result	<0.01
Dichloromethane µg/L	No result	<1	No result	<1
Simazine µg/L	No result	<0.01	No result	<0.01
Toluene µg/L	No result	<0.28	No result	<0.28
Tributyltin µg/L	No required	No required	No required	No required
Xylenes µg/L	No result	<0.73	No result	<1
Arsenic µg/L	No result	1.1	No result	1
Chromium ug/L	<20	<20	<20	<20
Copper ug/L	<20	<20	<20	<20
Cyanide µg/L	No result	<5	No result	<5
Fluoride µg/L	532	514	42	37
Lead ug/L	<20	<20	<20	<20
Nickel ug/L	<20	<20	<20	<20
Zinc ug/L	39.4	<20	<20	<20
Boron ug/L	137.7	127	<20	<20
Cadmium ug/L	<20	<20	<20	<20
Mercury µg/L	No result	<0.03	No result	<0.03
Selenium µg/L	No result	<0.74	No result	<0.74
Barium ug/L	<20	<20	67.5	<20

Note samples analysed for Dangerous Substances in discharge and downstream of discharge

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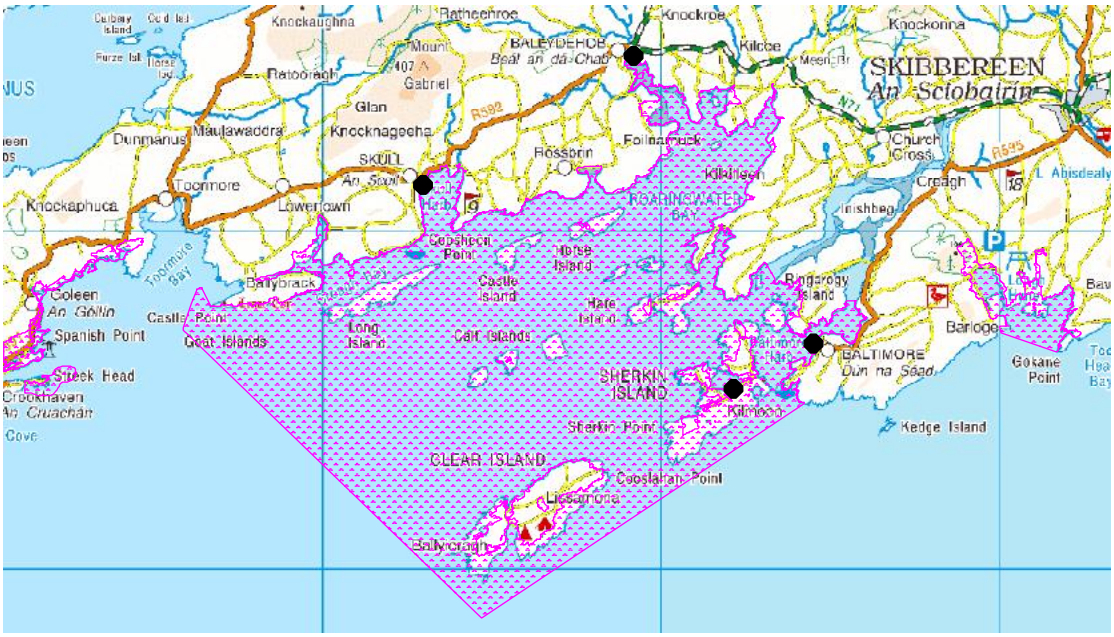
Appendix 3: Map showing locations of all discharges into Roaringwater Bay & Islands SAC.



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