

ATTACHMENT No F.1-5

DISCHARGE MODELLING & IMPACT ON ENVIRONMENT

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**TIMOLEAGUE AND COURTMACSHERRY
SEWERAGE SCHEME
ASSESSMENT OF ECOLOGICAL
CONSTRAINTS**



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FINAL REPORT



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TIMOLEAGUE AND COURTMACSHERRY SEWERAGE SCHEME ASSESSMENT OF ECOLOGICAL CONSTRAINTS

1. INTRODUCTION

1.1. Background

NATURA Environmental Consultants was commissioned by J.B. Barry and Partners Ltd. to undertake an ecological constraints report of the Timoleague and Courtmacsherry sewerage scheme. The current proposal involves the modernising and extension of the sewerage pipeline infrastructure in these adjacent West Cork villages to facilitate the inclusion of a number of newly developed lands within the area, to upgrade the existing facility where it already exists and to allow for the secondary treatment of sewage. It is proposed that sewage from both villages will be treated in a single waste water treatment plant located in the Courtmacsherry area. Waste water will be subject to primary and secondary treatment and resultant effluent pumped into the bay via an outfall pipe.

The objective of this constraints report is to identify the ecological issues that should be taken into account at the national and local scales when planning and designing the proposed development.

This report focuses on the proposed sewerage pipeline route and the location of the waste water treatment plant and outfall point.

1.2. Methodology

A desk study was carried out to collate the available information on the ecological environment. The National Parks and Wildlife Service (NPWS) database of designated conservation areas and records of rare and protected plant species were checked with regard to the location of the proposed development. BirdWatch Ireland was consulted with regard to the use of the estuary by wetland birds. Data on birds using the estuary was obtained from The Irish Wetlands Birds Survey I-WeBS. The I-WeBS volunteer, Peter Wolstenholm was consulted regarding important bird areas within the estuary.

A field-visit was not conducted for the ecological constraints assessment. Aerial photographs were used to identify potentially sensitive ecological sites such as woodlands, scrub, wetlands and river systems.

For the purpose of this study the proposed waste water treatment plant locations have been referred to numerically as sites 1-5 and are located in west to east direction from Timoleague Village to The Point in Courtmacsherry.

Throughout this report habitats are classified using *A Guide to Habitats in Ireland* (Fossitt, 2000). These habitats were evaluated and given an overall significance rating on the basis of the criteria outlined in NATURA scheme for site evaluation (Appendix I). The scientific and common names are given for plants and follow Webb *et al.* (1996) and Scannell and Synnott (1987) respectively. Only common names are given for mammals and birds (Whilde, 1993).

2. GENERAL DESCRIPTION OF THE ROUTE FOR THE SEWERAGE SCHEME

2.1. General description of study area

The villages of Timoleague and Courtmacsherry are in West Cork, approximately 12 km south of Bandon. Both villages are located along the Courtmacsherry estuary. This sheltered estuary lies in an east-west direction and consists of the drowned valley of the Argideen River, which is now filled with sediments, resulting in extensive mud flats. The Argideen River enters the estuary at Timoleague and the mouth of the estuary opens out towards the east into Courtmacsherry Bay. The surrounding land use is predominantly improved agricultural grassland with some areas of tillage. There is extensive mixed woodland around the village of Courtmacsherry. The woodland includes many exotic trees and was part of the former summer residence of the Earl of Shannon.

The proposed route of the sewerage scheme will follow the R601 road linking Timoleague and Courtmacsherry. The existing separate systems of the villages will be upgraded and amalgamated. The sewerage system of Timoleague will be upgraded and a pumping station built in the village. This will link to sewerage pipes installed along the roadway to Courtmacsherry, where a waste water treatment plant (WWTP) will be installed. Currently, untreated waste is released from 4 point sources in Timoleague and waste is discharged from a holding tank in Courtmacsherry on the falling tide.

2.2. Designated Areas

Courtmacsherry estuary is designated proposed Natural Heritage Area (pNHA) and candidate Special Area of Conservation (cSAC) (site code 001230). The estuary is an important site for the complex of coastal habitats found there, including 10 listed on Annex 1 of the EU Habitats Directive and for the large numbers of birds that use the area (<http://www.npws.ie/>). The pNHA and cSAC cover the entire estuary from the lower reaches of the Argideen River in Timoleague to the mouth of the estuary at Wood Point. The cSAC designation continues along the sea cliffs and includes Broad strand. Along the proposed route, the designated area boundary follows the R601 road. At Wood Point the designation also includes an area of woodland. Three other designated areas occur within a 10km radius of the site and are included in Table 1.

Table 1 Designated conservation areas within 10km of the proposed Timoleague/Courtmacsherry sewerage scheme

Site name	Designation/ Status	Site code	Distance from development
Courtmacsherry Estuary	pNHA/ cSAC	1230	0m
Seven Heads and Dunworley Bay	pNHA	1077	<6 km
Old Head of Kinsale	pNHA/ SPA	100	9 km
Clonakilty Bay	pNHA/ SPA	91	<8 km

Candidate Special Areas of Conservation (cSACs) are sites of international significance, which have been identified by the NPWS and submitted for designation to the EU. An SAC is a statutory designation, which has a legal basis under the EU Habitats Directive (92/43/EEC) as transposed into Irish law through the European

Communities (Natural Habitats) Regulations, 1997. The main implication of this designation is that any project likely to have a significant adverse impact on the integrity of the SAC may only be carried out for “imperative reasons of overriding public interest, including those of a social or economic nature”.

Proposed NHAs (pNHAs) are also habitats or sites of national value for nature conservation which have been identified by the NPWS. These sites become NHAs once they have been formally advertised and land owners have been notified of their designation. NHAs are protected under the Wildlife (Amendment) Act, 2000, from the date they are formally proposed. An NHA is a statutory designation under the Wildlife Amendment Act, 2000. Consultation with the NPWS is required if any development is likely to impact on a pNHA.

A Special Protection Area (SPA) is a statutory designation, which has a legal basis under the EU Birds Directive (79/409/EEC). The primary objective of SPAs is to maintain or enhance the favourable conservation status of the birds for which the SPAs have been designated.

NHAs are considered to be of national importance, while SACs and SPAs are of international importance for nature conservation.

2.3. Rare Plants

There are records of rare plants in the vicinity of the proposed development. The rare Red Data Book plant species, sea kale (*Crambe maritima*) occurs on shingle in the area. Additionally, tor-grass (*Brachypodium pinnatum*), a rarely occurring grass has been recorded on cliffs between Broad strand and Wood Point.

2.4. Fauna

The estuary is of ornithological importance for the many waders and wildfowl that feed on the mud and sandflats. Numbers of wintering birds and their importance in terms of national and international levels are presented in I-WeBS table in the Appendix (PDF). Winter flocks of black-tailed godwits (Figure 1) constitute internationally important numbers. The winter flocks of golden plover (Figure 1) and greenshank constitute nationally important numbers and at least nine other species occur in significant levels for the region. These include; shelduck, wigeon, teal, red-breasted merganser, oystercatcher, lapwing, dunlin, bar-tailed godwit and curlew. Data were supplied by the Irish Wetland Bird Survey (I-WeBS), a joint scheme of BirdWatch Ireland, National Parks and Wildlife Service of the Department of the Environment and Local Development and the Wildfowl and Wetlands Trust. Other bird species of note that occur in the area include little egret, ruff and kingfisher, all of which are included in Annex I of the EU Birds Directive (79/409/EEC).

Otter is likely to use to the estuary and to occur along the riparian areas of the Argideen River.

Due to the considerable woodland cover in the Courtmacsherry area, it is probable that bats of several species feed in the areas and use mature trees as roosting sites.

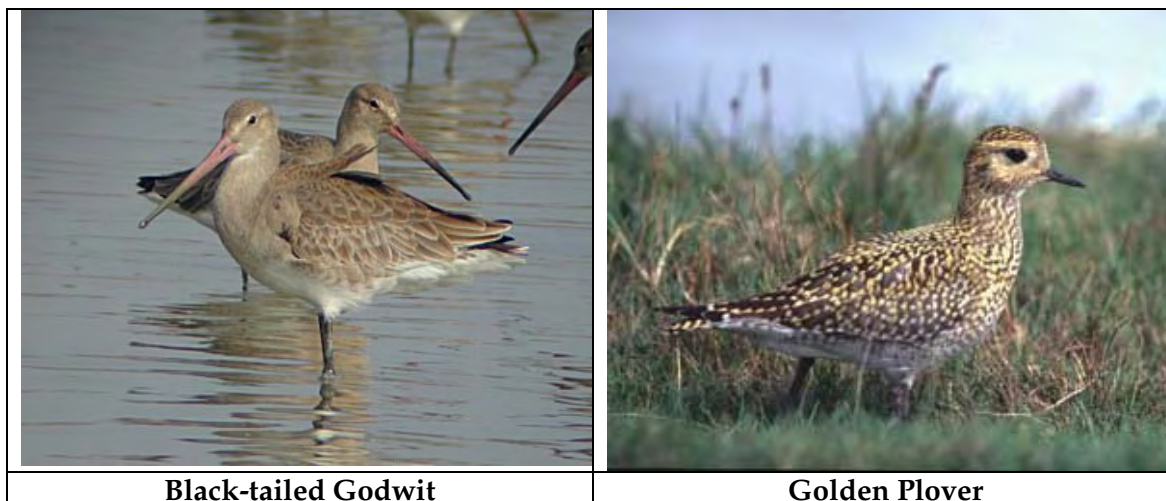


Figure 1. Black-tailed godwit and golden plover occur in significant numbers in Courtmacsherry estuary.

Further off shore, Courtmacsherry Bay is an important area for whales and dolphins with records of harbour porpoise, common and bottle nose dolphin. Humpback whales have been recorded further out in the bay in the past (data from the Irish Whale and Dolphin Group). Harbour porpoise is regularly recorded within the estuary.

2.5. Main waterways and fisheries

The Argideen River that flows into Courtmacsherry estuary is an important sea trout river and also holds good stocks of brown trout (O'Reilly, 2002).

Within the estuary itself water quality can be variable. The growth of algal mats on the mud flats due to nutrient enrichment of the estuary is common during summer months. Shore angling is popular within the estuary and there are angling and bait (lugworm) areas along the proposed route. Fish species caught here include mullet, mackerel and plaice (South Western Regional Fisheries Board).

2.6. Habitats

Aerial photographs were reviewed and the main ecological features noted along the route and adjacent parts of the pipeline are presented in Table 2. Where applicable the main habitats are indicated according to the scheme used in Fossitt (2000). Links with Annex I Habitats (EU Habitats Directive (92/43/EEC) are included where relevant (qualifying interest for SAC). The codes of these are as follows:

Tidal River-CW2 (linked with Annex I habitat 'estuary')

Estuary-MW4 (linked with Annex I habitat 'estuary')

Salt marsh (Upper/lower) –CM1/CM2 (links to Annex 1: Salicornia and other annuals colonizing mud and sand, Atlantic salt meadows (*Glauco-Puccinellietalia maritima*) and Mediterranean salt meadow (*Juncetalia maritimi*))

Shingle and gravel shores -LS1 (links to Annex 1: 'annual vegetation of drift lines')

Sand shores -LS2/ Muddy sand shores- LS3 (links to Annex 1: mudflats and sand flats not covered by sea water at low tide)

Rocky sea cliffs -CS1

Mixed broadleaved woodland -WD1

Hedgerows -WL1

Agricultural land (improved grassland-GA1 and cultivated land –BC1)

3. DESCRIPTION OF MAIN ECOLOGICAL FEATURES AND CONSTRAINTS

Designated areas are a primary constraint and all parts of the proposed sewerage scheme route will impact temporarily on the cSAC during the construction phase. NPWS should be contacted and notified of the development and their views sought regarding impacts and mitigation.

Further constraints in relation to the cSAC of Courtmacsherry estuary will occur in the area of saltmarsh and muddy shore adjacent to Timoleague village and along the bridge of the R601. This area also serves as the most important bird area within the estuary. It is an important feeding site at low tide and the salt march is an important high tide roost for all birds using the area (P. Wolstenholm, *pers comm.*)

A further constraint relating to the cSAC designation is the area of woodland at Wood Point.

It is considered that there will be no direct impacts on the Argideen River. However, the South Western Regional Fisheries Board should be contacted and notified of the development and their views sought regarding indirect impacts and mitigation on the Argideen River and estuary.

3.1. Habitats and flora

The principal ecological constraints, including designation, habitats and important areas for flora and fauna are presented in Table 2. In the absence of a field survey, it is not possible to list non-designated sites that may have some ecological significance.

Table 2. Principal ecological constraints of waste water treatment plant site locations and sewerage pipe line route.

Ecological Constraint	WWTP locations and sewerage pipe route
SAC	Site 1, 2, 3, 4, 5 and sewerage pipe route
Tidal River	Site 1,
Saltmarsh	Site 1, sewerage pipe route
Shingle and gravel shores	Survey required
Sand shore/muddy sand sores	Site 2, 3, 4, sewerage pipe route
Rocky sea cliffs	Site 5
Woodland/ mature trees	site 4, site 5, sewerage pipe route
Rare plant	Survey required of shingle shores (if present)
Feeding site for wintering birds	Site 1, Site 3 (fields)
Roost site for wintering birds	Site 1

3.2. Fauna

The principle constraint relating to fauna is the potential impact on bird feeding sites and high tide roosts. The area of mudflats and saltmarsh adjacent to WWTP site 1 is the most important bird feeding and high tide roost in the estuary. However, this is a seasonal constraint as bird numbers peak in the period September to March inclusive. Construction carried out during summer months would lessen the temporary impact of disturbance to birds.

The agricultural fields that would be impacted on at WWTP site 3 are important feeding sites for birds of the estuary (especially at high tide). There would be a permanent loss of feeding area if the WWTP was built on this site.

There would be no significant impact on otter using the area.

If the development necessitates the removal of mature trees, a bat survey should be conducted to determine if they are used/ suitable bat roosts. This should be carried out in the period of April to September.

4. CONCLUSIONS

- The proposed sewerage scheme passes through the Courtmacsherry estuary which is of international importance due to its SAC designation.
- The proposed WWTP at site 1 (Timoleague village) is the least suitable location in terms of ecological constraints. This area contains important saltmarsh habitat (Annex 1, EU Habitats Directive) and is the most important high tide roost for wintering birds in the estuary.
- Construction of a WWTP in the agricultural fields of proposed site 3 (Peters Point) would impact on an important feeding site for birds.
- Proposed sites 2, 4 and 5 would have least impacts on coastal habitats and important bird feeding and roosting sites.
- Construction should be scheduled outside of months September to March inclusive as this is when birds reach peak numbers.
- The sewerage scheme has the potential to impact on areas where there are stands of mature trees. Mature trees are potential bat roosts and should be subject to survey if likely to be impacted.

5. RECOMMENDATIONS

Further surveys would be required at EIS stage of the proposed development. These would include:

Habitat and flora & fauna survey

Bird survey

Survey of potential bat roosts

In compliance with the Wildlife (Amendment) Act 2000, no vegetation should be cleared during the breeding bird season (Feb-Aug inclusive). Any deviation from this will require prior approval from the NPWS.

There should be consultation with NPWS at all stages of the proposed development and their views sought regarding possible impacts and mitigation measures.

Due to the fisheries value of the Argideen River, instream/shoreline work should be carried out only between May to September. The Requirements issued by the South Western Regional Fisheries Board for construction at river sites should be followed, and no instream/ estuary works should be carried out without prior consultation with the Board.

6. REFERENCES

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O'Reilly, P. (2002), *Rivers of Ireland, a flyfisher's guide.* Merlin Unwin Books, Shropshire, UK.

Scannell, M.J.P. & Synnott, D.M. Census catalogue of the flora of Ireland. The Stationery Office, Dublin.

Webb, D.A., Parnell, J. and Doogue, D. (1996) *An Irish Flora.* Dundalgan Press Ltd., Dundalk.

Whilde, A. (1993). *Threatened Mammals, Birds, Amphibians and Fish in Ireland. Irish Red Data Book 2: Vertebrates.* HMSO, Belfast.

World wide web references:

<http://www.npws.ie>

<http://www.iwdg.ie>

<http://www.swrfb.com>

APPENDIX

(See following page I-WeBS Data from Courtmacsherry Estuary)

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TIMOLEAGUE-COURTMACSHERRY WASTE WATER TREATMENT PLANT, CO. CORK.

Part 1: Environmental Report for Terrestrial WWTP Site

Flora and Fauna

JUNE 2005

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FINAL REPORT



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SUMMARY

NATURA Environmental Consultants Ltd. was commissioned by J.B. Barry and Partners to provide an ecological assessment on Flora and Fauna for the proposed Timoleague-Courtmacsherry Waste Water Treatment Plant (WWTP) Environmental Report. This report details the results of an ecological survey at three proposed sites, reviews impacts and details mitigation measures to be followed. An environmental assessment of the impacts of the outfall from the WWTP into Courtmacsherry Bay is to be presented in a separate report.

The proposed WWTP sites are located in an area comprised of a number of habitat types including improved grassland, drainage ditches and hedgerows. No designated areas are impacted upon by this part of the scheme.

No major negative impact has been identified with regard to the ecology of these sites. Providing that existing hedgerows are retained, there would be no significant negative impact at the proposed site. There will be some loss of foraging area for over-wintering birds at site B.

There will be temporary negative impacts on fauna during the construction stage as a result of disturbance of habitats and from noise, light, use of machinery and presence of people. These impacts will be reduced following construction although there may be some ongoing disturbance during operation.

During the construction phase, the working area around hedgerows and individual trees will be kept to a minimum. The working area will be defined at the outset by the erection of fencing to define the limits of the site works. The fence line will be set at the outer canopy line of trees or shrubs to be retained.

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7. INTRODUCTION

7.1. Background

NATURA Environmental Consultants Ltd. were commissioned by J.B. Barry and Partners to provide an Ecological Report for the proposed Timoleague-Courtmacsherry Waste Water Treatment Plant (WWTP) Environmental Report. This section provides an assessment of the likely impacts of the sewage treatment works on the ecological environment (i.e. the flora, fauna and habitats) at three potential sites located west of Courtmacsherry Village. This report follows from a constraints study prepared by NATURA in January 2005. A separate environmental report examines the impact of the sewage pipelines and outfall location on marine and shoreline ecology.

7.2. Methodology

7.2.1. Desk study

A desk study was carried out to collate the available information on the ecological environment. The National Parks and Wildlife Service (NPWS) database of designated conservation areas and records of rare and protected plant species were checked with regard to the location of the proposed sewage treatment works.

Aerial photographs were examined to make a preliminary assessment of the site and to determine dominant habitat types present in advance of field surveys. The aerial photographs were also used to carry out preliminary evaluations of field boundaries.

7.2.2. Field survey

A field survey was carried out in June 2005 to identify, describe and evaluate ecological habitats. Habitats were classified using *A Guide to Habitats in Ireland* (Fossitt, 2000). While this does not comprise a comprehensive list of plant species, it is sufficient to describe the character of the vegetation and evaluate its ecological significance.

Mammals and birds were assessed in the course of the main habitat surveys using a combination of direct sightings and observations of signs, tracks and droppings. Such an assessment of mammals and birds is not exhaustive, but together with information on the location of suitable habitat for key species, is sufficient for the purposes of the environmental report. A comprehensive bat survey was not undertaken at the site however, existing trees were evaluated in terms of their suitability for bats.

In this report, scientific and common names for plants follow Webb *et al.* (1996) and Scannell and Synnott (1987) respectively. Scientific and common names of mammals and birds follow Whilde (1993).

7.2.3. Consultations

The National Parks and Wildlife Service (NPWS) of the Department of Environment, Heritage and Local Government was consulted in relation to records of rare plants in the vicinity of the proposed site. Information on species of fauna and flora listed for

protection under Annex II of the EU Habitats Directive (92/43/EEC), Annex I of the Birds Directive (79/409/EEC), Flora Protection Order (1999) and the Wildlife (Amendment) Act (2000) was also sought from NPWS.

7.2.4. Evaluation and impact assessment criteria

Ecological sites were evaluated and given an overall significance rating on the basis of the criteria outlined in Appendix 1. The criteria within Appendix 2 were used for assessing the significance of the impacts of the development on terrestrial sites. The scale of the likely impacts was assessed on the basis of the area/length of the particular site or habitat that would be impacted, and the ecological value of that site or habitat.

8. EXISTING ENVIRONMENT

8.1. General description of study area

Three potential sites for the waste water treatment plant have been selected in an area of agricultural land on the western edge of Courtmacsherry Village. Each site comprises of an area of 50m x 50m within a larger agricultural field. The sites are 100-200m from the R601 road and shoreline of Courtmacsherry Estuary. The habitats associated with each site are described in Section 2.4 and presented as a habitat map in Figure 1.

Site A: located within an improved grassland field and bounded to the south and west by hedgerow. The sewage pipeline and site access would follow the western field boundary north to the R601 road. This site is particularly wet with a small stream/ spring flowing over-ground at the southern part of the site.

Site B: located within an improved grassland field and bounded to the east and south by hedgerow. The sewage pipeline and site access would follow the eastern field boundary north to the R601 road.

Site C: located within an improved grassland field and bounded to the west by a hedgerow. This site lies furthest away from the R601 road (200m). The sewage pipeline and site access would follow the western field boundary and cross a hedgerow into another field before emerging at the road.

8.2. Designated areas

The proposed locations for the waste water treatment plant are approximately 200m from the shoreline of Courtmacsherry estuary. This is proposed Natural Heritage Area (pNHA) and candidate Special Area of Conservation (cSAC) (site code 001230). The estuary is an important site for the complex of coastal habitats found there, including 10 listed on Annex 1 of the EU Habitats Directive and for the large numbers of birds that use the area. The pNHA and cSAC cover the entire estuary from the lower reaches of the Argideen River in Timoleague to the mouth of the estuary at Wood Point. The cSAC designation continues along the sea cliffs and includes Broad strand. The pNHA/ cSAC boundary follows the high tide water mark which is alongside the R601 road. The sewage pipeline from Timoleague to Courtmacsherry will follow the road and thus the pNHA /cSAC boundary.

Table 1 Designated conservation areas within 10km of the proposed Timoleague/Courtmacsherry sewerage scheme

Site name	Designation/ Status	Site code	Distance from development
Courtmacsherry Estuary	pNHA/ cSAC	1230	0-200m
Seven Heads and Dunworley Bay	pNHA	1077	<6 km
Old Head of Kinsale	pNHA/ SPA	100	9 km
Clonakilty Bay	pNHA/ SPA	91	<8 km

Candidate Special Areas of Conservation (cSACs) are sites of international significance, which have been identified by the NPWS and submitted for designation to the EU. An SAC is a statutory designation, which has a legal basis under the EU Habitats Directive (92/43/EEC) as transposed into Irish law through the European Communities (Natural Habitats) Regulations, 1997. The main implication of this designation is that any project likely to have a significant adverse impact on the integrity of the SAC may only be carried out for “imperative reasons of overriding public interest, including those of a social or economic nature”.

Proposed NHAs (pNHAs) are also habitats or sites of national value for nature conservation which have been identified by the NPWS. These sites become NHAs once they have been formally advertised and land owners have been notified of their designation. NHAs are protected under the Wildlife (Amendment) Act, 2000, from the date they are formally proposed. An NHA is a statutory designation under the Wildlife Amendment Act, 2000. Consultation with the NPWS is required if any development is likely to impact on a pNHA.

8.3. Rare plants

There are records of rare plants in the vicinity of the proposed development. However, they are not associated with the agricultural habitats of the proposed WWTP sites. The rare Red Data Book plant species, sea kale (*Crambe maritima*) occurs on shingle beaches in the area. Additionally, tor-grass (*Brachypodium pinnatum*), a rarely occurring grass has been recorded on cliffs between Broad strand and Wood Point.

8.4. Terrestrial habitats

A general description of the principal terrestrial habitats occurring at the proposed WWTP sites is given below. Figure 1 details the main habitats identified at each site. The three potential WWTP sites are of similar habitat composition with the main habitats being: Improved agricultural grassland (GA1), Hedgerow (WL1), Drainage ditch (FW4) and stone wall (BL1).

8.4.1. Improved agricultural grassland (GA1)

The proposed WWTP sites are all located within larger agricultural fields. All three fields are improved agricultural grassland with a sward containing rye grass (*Lolium* spp.) and white clover (*Trifolium repens*).

Site A: This field has been heavily grazed by cattle and there is extensive poaching throughout. Grass species include perennial rye grass (*Lolium perenne*), creeping bent (*Agrostis stolonifera*) and marsh fox tail (*Alopecurus geniculatus*). Ruderal species including common ragwort (*Senecio jacobia*) and thistle (*Cirsium arvense*, *C. vulgare*) occur occasionally throughout the field. The short sward has allowed for daisy (*Bellis perrennis*) to proliferate in parts of the field. Creeping buttercup (*Ranunculus repens*) is also frequent. A large section of the proposed site is very wet and dominated by aquatic plants brooklime (*Veronica beccabunga*) and water cress (*Rorippa nasturtium-aquaticum*) (See section 2.5.1).

Site B: This field was recently cut for silage. Grasses along the uncut verge included, perennial rye grass, creeping bent, cocks-foot (*Dactylis glomerata*) and wild oat (*Avena fatua*).

Site C: This field has also been heavily grazed by cattle resulting in a cropped sward and heavily poached surface. There were occasional clumps of common ragwort and thistle. Common mouse ear (*Cerastium holosteoides*) occurs frequently throughout the site.

8.4.2. Hedgerows (WL1)

Each of the proposed potential WWTP sites is bounded by unmanaged hedgerows.

Site A: bounded to south and west by hedgerow, the sewage pipeline and site access will run along the western hedge. There is a shallow drainage ditch associated with the western hedgerow.

Site B: bounded to the east by a hedgerow and associated drainage ditch and to the south by hedgerow. The sewage pipeline and site access will run along the eastern hedgerow.

Site C: bounded to the west only by a gappy unmanaged hedgerow. The sewage pipeline and site access will run along the western hedgerow and pass through a second hedge to the north before emerging through the roadside hedge.

Hedgerow species composition is similar on all sites. The woody component of the hedge is on an earthen and stone bank and the principal species present include blackthorn (*Prunus spinosa*), hawthorn (*Crataegus monogyna*), holly (*Ilex aquifolium*), elder (*Sambucus nigra*), gorse (*Ulex europeaus*) and occasional willow (*Salix sp.*). There are infrequent hedgerow trees on most of the hedgerows, the exception being the northern end of the eastern hedge at site B. Tree species include ash (*Fraxinus excelsior*) and sycamore (*Acer pseudoplatanus*). Other hedgerow species present include abundant bramble (*Rubus fruticosus agg.*), honeysuckle (*Lonicera periclymenum*), dog rose (*Rosa canina*) and ivy (*Hedera helix*). The ground flora associated with the hedgerows includes nettle (*Urtica dioica*), thistle, dock (*Rumex spp.*), foxglove (*Digitalis purpurea*), herb Robert (*Geranium robertianum*), cleavers (*Galium aparine*) and ferns.

8.4.3. Stone walls (BC1)

The northern boundary of the larger field within which the proposed WWTP of site B is located is composed of a stone wall. The wall is tallest at the eastern end of the field boundary and has fallen away in locations further west along the boundary.

8.5. Aquatic Habitats

8.5.1. Drainage ditches (FW4)

A number of hedgerows have drainage ditches associated with them (See Section 2.5.2). These are wet ditches that contain some aquatic vegetation including brooklime, water cress, common figwort (*Scrophularia nodosa*) and rushes (*Juncus* spp.). At site A a considerable area of the field is very wet with water flowing over-ground. This may be as a result of a blocked drainage ditch or a spring close to the surface. The area is easily identified by the large patch of brooklime and water cress. The drainage ditch bordering site B has been filled with rubble in places.

8.6. Fauna

Mammals

Few substantial trees were present in the hedgerows of the proposed sites thus lowering the potential for bat roosts in the immediate vicinity of the proposed WWTP sites. However, due to the considerable woodland cover in the greater Courtmacsherry area, it is probable that bats of several species feed in the area. Bats are also known to use stone walls as roost sites. The stone wall at the northern boundary of Site B is substantial in places and has many crevices and thus is considered a potential bat roost.

No evidence of badger setts or tracks were noted at any of the three sites. However, the sites may support foraging areas for badgers. Other mammals likely to be present or use the sites for foraging include, rabbit, fox, stoat, hedgehog, pygmy shrew and mink.

Birds

The estuary is of ornithological importance for the many winter waders and wildfowl that feed on the mud and sandflats. Many of these birds (e.g. lapwing, dunlin, bar-tailed godwit, golden plover and curlew) will roost and feed on agricultural grass fields at high tide. The Constraints Report (January 2005) detailed that fields close to Peters Point were important winter feeding grounds (especially at high tide). This feeding area coincides with the field within which Site B is located. Confirmation of use of the site by waders would be possible only during the period of September to March inclusive.

Birds recorded during the survey included species that nest and feed in hedgerows including, wren, robin, dunnock, blackbird, song thrush, chaffinch and willow warbler. A flock of approximately 25 starlings were observed flying around and feeding at Site A. Rooks, black headed gull and lesser black-backed gull were observed foraging around Site 2 as the area had recently been cut for silage.

8.7. Evaluation of terrestrial habitats

The improved agricultural grassland which constitutes almost the entire area of the sites is of low ecological value.

The hedgerows recorded at the sites may be regarded as being of moderate local ecological importance. They provide suitable breeding habitat for a number of bird species and act as a corridor for faunal movement between other hedgerows and habitats. The stone wall located at the roadside boundary of site B may be regarded of moderate as it is a potential bat roost.

8.8. Evaluation of aquatic habitats

There is no significant water course impacted at any of the three proposed sites.

9. DESCRIPTION OF LIKELY SIGNIFICANT IMPACTS

9.1. General Impacts

As the proposed sites for the WWTP do not overlap with any designated area there will be no impact on such areas.

Impacts on the various habitat types identified at the proposed WWTP sites are summarised in Table 2. Providing that existing hedgerows are retained, there would be no significant negative impact at any of the proposed WWTP sites.

Table 2. Summary of habitats present, their evaluation (see Appendix 1 & 2), impacts and any proposed mitigation required.

Habitat	Evaluation	Impact	Mitigation
Improved grassland (GA1) Site, A, B, C	E (Low value)	Minor negative	None required
Hedgerow (WL1) Site A, B, C	D (Moderate value)	Moderate negative / Neutral (if not removed)	Retain hedgerows bounding the site
Stone wall (BC1) Possible bat roost Site B	D (moderate value)	Moderate negative / Neutral (if not removed)	None required if retained. Survey of suitability for bats. Removal supervised by qualified ecologist.
Drainage ditch (FW4) Site A, B	E (Low value)	Minor negative	Fence off during construction.

Habitats

The main ecological impacts would be associated with site clearance during the construction phase. As the sites are currently dominated by improved grassland the impact of site clearance and the grassland is considered a minor negative impact. However, at Site A, the ground conditions are very wet and there is potential for run off and siltation through the drainage ditch into the estuary.

If hedgerow removal were to occur at the sites it would constitute a moderate negative impact.

Fauna

There will be temporary negative impacts on fauna during the construction stage as a result of disturbance of habitats and from noise, light, use of machinery and presence of people. These impacts will be reduced following construction although there may be some ongoing disturbance during operation.

There may be temporary disturbance to birds during the construction phase. If hedgerows are retained, there should be no significant loss of feeding and nesting habitat.

The agricultural fields that would be impacted on at WWTP Site B are known to be important feeding sites for birds of the estuary (especially at high tide). There would be a permanent loss of feeding area in the footprint of the development if the WWTP was built on this site. However, the area in question is small in comparison to the field as a whole and due to the presence of adjacent grass fields this impact is not considered significant. There may be some loss of foraging area for mammals also.

Once constructed the WWTP should not pose a significant operational impact on the ecology of the site. Impacts on the Marine environment of Courtmacsherry estuary will be assessed and mitigation prescribed in a separate report.

If the development necessitates the removal of mature trees or the stone wall a bat survey should be conducted to determine if they are used/ suitable bat roosts. This should be carried out in the period of April to September.

9.2. Individual sites

The three sites selected for assessment for the building of the proposed WWTP are broadly similar in terms of ecological impact (Section 3.1). However, there are a number of factors that would favour one site over another.

Site A: Due to the wet ground conditions this site there may be a temporary negative impact (moderate) due to run off into the estuary.

Site B: There could be some loss of foraging area for winter birds. Removal of the stone wall at the northern boundary would constitute a moderate negative impact (if suitable for bats).

Site C: This site is located furthest from the road and thus would involve more disturbance during construction phase as two fields and two hedgerows would be crossed. However this site is more favourable for the WWTP as bird feeding areas are not impacted and ground conditions are more stable.

10. MITIGATION

If hedgerows were to be removed from the site, seasonal restrictions for construction activity would be related to breeding birds under the Wildlife Act (1976) and Wildlife (Amendment) Act (2000). Under the legislation, *there will be no removal of hedgerows, trees or scrub during the bird breeding season 1st March to 31st August.*

If Site B is selected as the preferred option, the stone wall at the northern boundary should be assessed for suitability as a bat roost and any removal of part or all of the wall should be conducted in the presence of a qualified ecologist to avoid damage to any bats that may be present.

Where hedgerows are to be retained; the working area around hedgerows will be kept to a minimum to reduce the area of habitat impacted. The working area will be defined at the outset by the erection of fencing to define the limits of site works. Any trees or hedgerows that are to be retained within the site works will be fenced at the outer canopy line of trees or shrubs.

No special mitigation measures are required for improved grassland. Where a hedgerow or section of a hedgerow cannot be avoided, direct mitigation is not feasible. Planting within the site should utilize predominantly native species and aim to re-instate the hedgerows which may serve as corridors for animal movement.

11. REFERENCES

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12. APPENDICES

APPENDIX 1: ECOLOGICAL SITE EVALUATION CRITERIA

Rating	Qualifying Criteria
A	<p>Internationally important Sites designated (or qualifying for designation) as SAC* or SPA* under the EU Habitats or Birds Directives.</p> <p>Undesignated sites containing good examples of Annex I <u>priority</u> habitats under the EU Habitats Directive.</p> <p>Major salmon river fisheries.</p> <p>Major salmonid (salmon, trout or char) lake fisheries.</p>
B	<p>Nationally important Sites or waters designated or proposed as an NHA* or statutory Nature Reserves.</p> <p>Undesignated sites containing good examples of Annex I habitats (under EU Habitats Directive).</p> <p>Undesignated sites containing <u>significant numbers</u> of resident or regularly occurring populations of Annex II species under the EU Habitats Directive or Annex I species under the EU Birds Directive or species protected under the Wildlife (Amendment) Act 2000.</p> <p>Major trout river fisheries.</p> <p>Water bodies with major amenity fishery value.</p> <p>Commercially important coarse fisheries.</p>
C	<p>High value, locally important Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or significant populations of locally rare species.</p> <p>Small water bodies with known salmonid populations or with good potential salmonid habitat.</p> <p>Sites containing <u>any</u> resident or regularly occurring populations of Annex II species under the EU Habitats Directive or Annex I species under the EU Birds Directive.</p> <p>Large water bodies with some coarse fisheries value.</p>
D	<p>Moderate value, locally important Sites containing some semi-natural habitat or locally important for wildlife.</p> <p>Small water bodies with some coarse fisheries value or some potential salmonid habitat.</p> <p>Any water body with unpolluted water (Q-value rating 4-5).</p>
E	<p>Low value, locally important Artificial or highly modified habitats with low species diversity and low wildlife value.</p> <p>Water bodies with no current fisheries value and no significant potential fisheries value.</p>

*SAC = *Special Area of Conservation*

SPA= *Special Protection Area*

NHA= *Natural Heritage Area*

APPENDIX 2: CRITERIA FOR ASSESSING IMPACT SIGNIFICANCE ON TERRESTRIAL SITES.

Site category* ► Impact level ▼	A sites Internationally important	B sites Nationally important	C Sites High value, locally important	D sites Moderate value, locally important	E sites Low value, locally important
Severe negative	Any permanent impacts	Permanent impacts on a large part of a site			
Major negative	Temporary impacts on a large part of a site	Permanent impacts on a small part of a site	Permanent impacts on a large part of a site		
Moderate negative	Temporary impacts on a small part of a site	Temporary impacts on a large part of a site	Permanent impacts on a small part of a site	Permanent impacts on a large part of a site	
Minor negative		Temporary impacts on a small part of a site	Temporary impacts on a large part of a site	Permanent impacts on a small part of a site	Permanent impacts on a large part of a site
Neutral	No impacts	No impacts	No impacts	No impacts	Permanent impacts on a small part of a site
Minor positive				Permanent beneficial impacts on a small part of a site	Permanent beneficial impacts on a large part of a site
Moderate positive			Permanent beneficial impacts on a small part of a site	Permanent beneficial impacts on a large part of a site	
Major positive		Permanent beneficial impacts on a small part of a site	Permanent beneficial impacts on a large part of a site		

* Site categories A to E are defined in Table 2a.

APPENDIX 5: CRITERIA FOR ASSESSING IMPACT SIGNIFICANCE ON AQUATIC SITES.

A Sites

	Temporary	Short-term	Medium-term	Long-term
Extensive	Major	Severe	Severe	Severe
Localised	Major	Major	Severe	Severe

B Sites

	Temporary	Short-term	Medium-term	Long-term
Extensive	Major	Major	Severe	Severe
Localised	Moderate	Moderate	Major	Major

C Sites

	Temporary	Short-term	Medium-term	Long-term
Extensive	Moderate	Moderate	Major	Major
Localised	Minor	Moderate	Moderate	Moderate

D Sites

	Temporary	Short-term	Medium-term	Long-term
Extensive	Minor	Minor	Moderate	Moderate
Localised	Not significant	Minor	Minor	Minor

E Sites

	Temporary	Short-term	Medium-term	Long-term
Extensive	Not significant	Not significant	Minor	Minor
Localised	Not significant	Not significant	Not significant	Not significant

In line with the EPA guidelines (EPA 2002), the following terms are defined when quantifying duration:

- Temporary: up to 1 year,
- Short-term: from 1-7 years,
- Medium-term: 7-15 years,
- Long-term: 15-60 years,
- Permanent: over 60 years.

Localised impacts on rivers are loosely defined as impacts measurable no more than 250m from the impact source. Extensive impacts on rivers are defined as impacts measurable more than 250m from the impact source. Any impact on salmonid spawning habitat, or nursery habitat where it is in short supply, would be regarded as an extensive impact as it is likely to have an impact on the salmonid population beyond the immediate vicinity of the impact source.

* Site categories A to E are defined in Table 2a.

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TIMOLEAGUE-COURTMACSHERRY WASTE WATER TREATMENT PLANT, CO. CORK.

Part 2: Environmental Report

SEWAGE PIPELINE ROUTE AND MARINE OUTFALL

August 2005

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FINAL REPORT



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13. INTRODUCTION

13.1. Background

NATURA Environmental Consultants Ltd. were commissioned by J.B. Barry and Partners to provide an Ecological Report for the proposed Timoleague-Courtmacsherry Waste Water Treatment Plant (WWTP) Environmental Report. This section provides an assessment of the likely impacts of the sewage treatment works outfall on the marine biological environment. This report does not deal with the water quality aspects. This report follows from a constraints study prepared by NATURA in January 2005, and an environmental report dealing with the terrestrial environment (Waste Water Treatment Plant) in June 2005.

Two outfall options were examined; the inner outfall option is located at the existing outfall location from the Septic Tank in Courtmacsherry while the outer outfall option is located to the north-east of Wood Point (see Figure 1). In addition, the site selected for a sewage pumping station at Timoleague Village and the sewage pipeline route from Timoleague to Courtmacsherry is also assessed.

13.2. Methodology

13.2.1. Desk study

A desk study was carried out to collate the available information on the terrestrial and marine environment. The National Parks and Wildlife Service (NPWS) database of designated conservation areas and records of rare and protected plant species were checked with regard to the location of the proposed outfall.

The National Parks and Wildlife Service (NPWS) of the Department of Environment, Heritage and Local Government was consulted in relation to records of rare plants in the vicinity of the proposed site. The South Western Regional Fisheries Board (SWRFB) was consulted regarding the fisheries value of Courtmacsherry Estuary. Information on species of fauna and flora listed for protection under Annex II of the EU Habitats Directive (92/43/EEC), Annex I of the Birds Directive (79/409/EEC), Flora Protection Order (1999) and the Wildlife (Amendment) Act (2000) was also sought from both the NRFB and NPWS.

BirdWatch Ireland was consulted regarding previous data on bird activity (wintering waders and wildfowl) around the Courtmacsherry Estuary area. Data were supplied by the Irish Wetland Bird Survey (I-WeBS), a joint scheme of BirdWatch Ireland, National Parks and Wildlife Service and The Wildfowl and Wetlands Trust.

Aerial photographs were examined to make a preliminary assessment of the terrestrial and marine environment and to determine dominant habitat types present in advance of the field visit and dive survey.

13.2.2. Field survey

A dive survey was carried out in August 2005 to identify, describe and evaluate the marine habitats. Terrestrial habitats impacted by the scheme were also examined. Habitats classification follows *A Guide to Habitats in Ireland* (Fossitt, 2000). While this

does not comprise a comprehensive list of plant species, it is sufficient to describe the character of the habitat and evaluate its ecological significance.

The pipeline route options to the shore were also assessed in terms of habitat and sensitivity to construction.

In this report, scientific and common names for plants follow Webb *et al.* (1996) and Scannell and Synnott (1987) respectively. Scientific and common names of mammals and birds follow Whilde (1993).

13.2.3. Evaluation and impact assessment criteria

The terrestrial and marine habitats were evaluated and given an overall significance rating on the basis of the criteria outlined in Appendix 1. The criteria within Appendix 2 were used for assessing the significance of the impacts of the development on the habitat.

14. EXISTING ENVIRONMENT

14.1. General description of study area

The proposed pump station is in an improved grassland field adjacent to Timoleague Village. The route of the untreated sewage pipeline is along the R601 road.

The proposed discharge point for Courtmacsherry and Timoleague Waste Water Treatment Plant is into the estuary of the Argideen River which empties into Coolmain Bay, West Cork. Coolmain Bay is a small sub-bay of Courtmacsherry Bay which extends from Seven Heads in the west to the Old Head of Kinsale in the east. The bay is comprised of extensive intertidal sand and mud flats with coarser sediments to the seaward end and finer and softer sediments to the west towards Timoleague. Wood Point extends into Coolmain Bay for a distance of approximately 1km east of Courtmacsherry forming a low rocky headland with extensive woodland cover on its north side extending to the shore.

The entire Courtmacsherry estuary has very extensive green algae cover which is particularly notable during low water when it can be seen covering virtually all intertidal sand and mud flats. During the dive survey, massive amounts of algae were observed drifting on the current. The abundance of algae appears to be at least partially a result of currently inadequate treatment of waste water discharge into the bay.

14.2. Designated areas

The proposed location options for the waste water treatment outfall are both within the Courtmacsherry Estuary proposed Natural Heritage Area (pNHA) and candidate Special Area of Conservation (cSAC) (site code 001230). The estuary is an important site for the complex of coastal habitats found there, including 10 listed on Annex 1 of the EU Habitats Directive and for the large numbers of birds that use the area. The pNHA and cSAC cover the entire estuary from the lower reaches of the Argideen River in Timoleague to the mouth of the estuary at Wood Point. The cSAC designation continues along the sea cliffs and includes Broad strand. The pNHA/cSAC boundary follows the high tide water mark which is alongside the R601 road.

The sewage pipeline from Timoleague to Courtmacsherry will follow the road and thus the pNHA /cSAC boundary to the point where it enters the shoreline.

Candidate Special Areas of Conservation (cSACs) are sites of international significance, which have been identified by the NPWS and submitted for designation to the EU. An SAC is a statutory designation, which has a legal basis under the EU Habitats Directive (92/43/EEC) as transposed into Irish law through the European Communities (Natural Habitats) Regulations, 1997. The main implication of this designation is that any project likely to have a significant adverse impact on the integrity of the SAC may only be carried out for "imperative reasons of overriding public interest, including those of a social or economic nature".

Proposed NHAs (pNHAs) are also habitats or sites of national value for nature conservation which have been identified by the NPWS. These sites become NHAs once they have been formally advertised and land owners have been notified of their designation. NHAs are protected under the Wildlife (Amendment) Act, 2000, from the date they are formally proposed. An NHA is a statutory designation under the Wildlife Amendment Act, 2000.

14.3. Rare plants

There are records of two rare plants from the area, notably the Red Data Book listed species, sea kale (*Crambe maritime*) which occurs on shingle beaches in the area, and the nationally rare tor-grass (*Brachypodium pinnatum*), which has been recorded on cliffs between Broad strand and Wood Point.

14.4. Fauna

Mammals

Due to the considerable woodland cover in the greater Courtmacsherry area, it is probable that bats of several species feed in the area.

Otter tracks were noted along the coast at the outer outfall location. Other mammals likely to be present or use the sites for foraging include, badger, rabbit, fox, stoat, hedgehog, pygmy shrew and mink.

Birds

The estuary is of ornithological importance for the many winter waders and wildfowl that feed on the mud and sandflats. Many of these birds (e.g. lapwing, dunlin, bar-tailed godwit, golden plover and curlew) will roost and feed on agricultural grass fields at high tide. The Constraints Report (January 2005) detailed important areas for winter waders as recorded by IWeBS surveyor P. Wolstenholm (*Pers. com.*). The location adjacent to Timoleague Bridge is the most important area for birds in the estuary as it is the most extensive high tide roost for winter waders. The inner outfall option location is not an important feeding area for over-wintering birds with occasional occurrences of red shank, turnstone and wigeon. The outer outfall option at toward Wood Point is not an important area for feeding birds as it is consistently inundated by the tide. Confirmation of use of the site by waders would be possible only during the period of September to March inclusive.

Fisheries

The Argideen River that flows into Courtmacsherry estuary is an important sea trout river and also holds good stocks of brown trout (O'Reilly, 2002).

Within the estuary itself water quality can be variable. The growth of algal mats on the mud flats due to nutrient enrichment of the estuary is common during summer months. Shore angling is popular within the estuary and there are angling and bait (lugworm) areas along the proposed route. Fish species caught here include mullet, mackerel and plaice (South Western Regional Fisheries Board - SWRFB).

The area in the vicinity of the proposed outer outfall is an angling area for species such as bass, mackerel and Pollock (SWRFB).

14.5. Description of the outfall route options

A general description of the principal intertidal and marine habitats and associated fauna occurring along the outfall route options is given below. Figure 1 details the main habitats identified along each option.

14.5.1. Inner outfall option (A)

The inner outfall option runs to sea at a point opposite Anchor Bay Cottages where the shore is defined by a stone retaining wall. The pipeline route runs in an oblique line for a distance of approximately 170m to the discharge point which is at the lower end of extensive inter-tidal flats within a narrow channel extending just west of the harbour.

The upper shore is comprised of sand, gravel and cobble with occasional boulders. Some shale bedrock is exposed on the upper shore. Bladder wrack (*Fucus vesiculosus*) is frequent on the cobbles and boulders, while the green alga *Enteromorpha sp.* is abundant and forms large bleached and decaying mats along the tide line. The lower shore is predominantly sand and silts with some gravel. The shore is covered in extensive mats of *Enteromorpha* with occasional clumps of bladder wrack on isolated rocks. Lugworm (*Arenicola marina*) casts are occasional on the sediment surface.

The sub-tidal habitat does not differ significantly from the lower shore and the sediment type remains constant to the discharge point which is located in water approximately 3m below chart datum. The outfall point is approximately 60m off shore. Mullet (*Chelon labrosus*) are common in the vicinity of the proposed outfall location.

14.5.2. Outer outfall option

From the shoreline, outer outfall option pipeline runs in a gently oblique line for a distance of approximately 450m to the discharge point which is approximately 120 north of Wood Point. The pipeline passes through a tarmacadam car park and along the upper shore below low cliffs of glacial till with established scrub dominated by willow, gorse and briar. This cliff line rises gently from Broadstrand in the west to a height of up to approximately 15m at the point at which the proposed outfall pipeline joins the shore. The cliff shows signs of recent collapse in places, though the

extensive shrub and vegetation cover appear to provide considerable stability. Where Wood Point Wood meets the shore, the shale bedrock is exposed and is overlain by a shallow band of till typically 2-3m in height. Opposite the discharge point, the rock forms extensive platforms extending into the intertidal zone.

Serrated wrack (*Fucus serratus*) is locally abundant on the upper shore where outcropping rock occurs, along with channelled wrack (*Pelvetia canaliculata*) and some bladder wrack. Within the splash zone, sea pink and sea plantain occur alongside the lichens *Lecanora atra*, *Verrucaria maura* and *Xanthoria parietina*.

The entire pipeline route from the intertidal zone to the outfall location has a uniform substrate which is comprised of coarse to fine sands. There is extensive cover by both *Enteromorpha* and sea-lettuce (*Ulva lactuca*). During the dive survey which was undertaken during the last hour of the flood tide, vast amounts of both green algae were being carried on the current.

The sand mason worm (*Lanice conchilega*) is very abundant along the pipeline route and in some places forms extensive beds. Many of the tubes of the worms were heavily coated with *Enteromorpha*. The crustaceans brown shrimp (Crangon crangon), shore crab (*Carcinus maenas*) and hermit crab (*Pagurus bernhardus*) are all frequent along the route, and juvenile plaice (*Pleuronectes platessa*) and sand eels (*Ammodytes sp.*) were observed occasionally.

14.6. Evaluation of outfall route options

Both outfall options are located within the pNHA and cSAC Courtmacsherry Estuary and resultantly are rated as being part of a site of international importance. The inner outfall option is located in an area of confined tidal movement within close proximity to extensive intertidal mud and sand flats. The area is dominated by extensive growth of the green alga *Enteromorpha*. Tidal flushing is unlikely to be as effective at this location as at the outer site and there is resultantly a heightened risk of continued eutrophication within the estuary.

The outer outfall option is located in an area of considerable tidal movement with a uniform sand substrate extending along the entire pipeline to the discharge point. However, as the pipeline route enters the shore, it crosses below a low glacial till cliff which has established scrub vegetation and may support the rare plant tor-grass. The main sensitivity of this outfall option relates to the point at which the pipeline enters the shore.

15. DESCRIPTION OF LIKELY SIGNIFICANT IMPACTS

The main impacts associated with this development are related to the construction phase and impacts of discharged treated effluent into the estuary. The installation of the treated effluent outfall pipeline will be by open trenching overland (including the intertidal area).

15.1. General Impacts

The main ecological impacts would be associated with site clearance and excavation during the construction phase. There will be minor temporary negative impacts on terrestrial habitats (grasslands) impacted by the installation of the sewage pipeline. There will be no impact on the area of mixed woodland at Wood Point as the pipeline will be routed away from the woodland edge.

There will be temporary moderate to minor impacts on the littoral zone (rocky shore and sandy shore) depending on the method of construction. The shifting sediment of the sandy shore will reinstate rapidly after installation of the outfall pipeline. There may be permanent impacts on exposed rock if excavation (or blasting) is required for installation, however, these impacts would be more visual than ecological in nature.

There will be temporary moderate negative impacts on the sublittoral habitats. However, the shifting sediments of these habitats will reinstate rapidly after installation of the outfall pipeline.

Operational impacts at the outfall location include a possible decrease in water quality leading to eutrophication. There is potential for faecal contaminants from the outfall to contribute to algal bloom within the estuary. However, the potential of this occurring would not exceed the current risk associated with untreated waste entering from Timoleague and Courtmacsherry villages.

15.2. Fauna

There will be temporary negative impacts on fauna during the construction stage as a result of disturbance of habitats and from noise, light, use of machinery and presence of people. These impacts will be reduced following construction.

There may be temporary disturbance to birds during the construction phase. Impacts on any birds present will depend on the time of Year construction is due to take place. Disturbance would be greatest during winter months.

As the proposed sewage pipeline avoids the mixed woodland area, there should be no significant impact on bats in the area.

Recovery of the marine sediment habitat is likely to be swift following installation of the pipeline due to the mobility of organisms. Once constructed the outfall pipeline should not pose a significant operational impact on the ecology of the immediate area.

The fishing industry within Courtmacsherry Bay demands good water quality. As stated in section 3.1 there is potential for faecal contaminants from the outfall to contribute to algal bloom within the area. However, the potential of this occurring would not exceed the current risk associated with untreated waste entering the estuary.

15.3. Inner outfall option

Data relating Bathymetric modelling of the outfall locations was not available at the time of preparing this report. However, J. B. Barry & Partners Ltd confirmed that the Bathymetric modelling demonstrated that there would be sufficient tidal movement and flushing at this location to prevent build up of effluent concentrations during flood tide. No significant impact on marine fauna would be expected at this location.

15.4. Outer outfall option

This is considered the more suitable outfall location, as there is greater tidal movement at this location. The current proposed route may impact on the cliff along the shoreline. This cliff is composed of friable soils and there is already evidence of erosion. Passing too close to this area would risk further erosion and deterioration of the cliff face. However, by ensuring that works do not disrupt the cliff and fencing an area below the cliff base will overcome this impact. There would be no significant impact on marine fauna as the sublittoral zone is homogenous along the proposed route.

16. MITIGATION

16.1. Terrestrial habitats

The working area will be defined at the outset by the erection of fencing to define the limits of site works. Any trees or hedgerows that are to be retained within the site works will be fenced at the outer canopy line of trees or shrubs.

If any shrubs or trees were to be removed from the site, seasonal restrictions for construction activity would be related to breeding birds under the Wildlife Act (1977) and Wildlife (Amendment) Act (2000). Under the legislation, *there will be no removal of hedgerows, trees or scrub during the bird breeding season 1st March to 31st August.*

No special mitigation measures are required for improved grassland at the pumping station. Planting within the site should utilize predominantly native species and aim to re-instate the hedgerows which may serve as corridors for animal movement.

16.2. Fauna and Fisheries

To avoid disturbance to winter migrants and waders: construction in the estuary should be carried out between months April to Sept.

The SWRFB recommends that a hydraulic study or model be carried out to ascertain the dispersion potential for effluent discharge.

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Rating	Qualifying Criteria
A	<p>Internationally important Sites designated (or qualifying for designation) as SAC* or SPA* under the EU Habitats or Birds Directives.</p> <p>Undesignated sites containing good examples of Annex I <u>priority</u> habitats under the EU Habitats Directive.</p> <p>Major salmon river fisheries.</p> <p>Major salmonid (salmon, trout or char) lake fisheries.</p>
B	<p>Nationally important Sites or waters designated or proposed as an NHA* or statutory Nature Reserves.</p> <p>Undesignated sites containing good examples of Annex I habitats (under EU Habitats Directive).</p> <p>Undesignated sites containing <u>significant numbers</u> of resident or regularly occurring populations of Annex II species under the EU Habitats Directive or Annex I species under the EU Birds Directive or species protected under the Wildlife (Amendment) Act 2000.</p> <p>Major trout river fisheries.</p> <p>Water bodies with major amenity fishery value.</p> <p>Commercially important coarse fisheries.</p>
C	<p>High value, locally important Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or significant populations of locally rare species.</p> <p>Small water bodies with known salmonid populations or with good potential salmonid habitat.</p> <p>Sites containing <u>any</u> resident or regularly occurring populations of Annex II species under the EU Habitats Directive or Annex I species under the EU Birds Directive.</p> <p>Large water bodies with some coarse fisheries value.</p>
D	<p>Moderate value, locally important Sites containing some semi-natural habitat or locally important for wildlife.</p> <p>Small water bodies with some coarse fisheries value or some potential salmonid habitat.</p> <p>Any water body with unpolluted water (Q-value rating 4-5).</p>
E	<p>Low value, locally important Artificial or highly modified habitats with low species diversity and low wildlife value.</p> <p>Water bodies with no current fisheries value and no significant potential fisheries value.</p>

*SAC = *Special Area of Conservation*

SPA= *Special Protection Area*

NHA= *Natural Heritage Area*

APPENDIX 2: CRITERIA FOR ASSESSING IMPACT SIGNIFICANCE ON TERRESTRIAL SITES.

Site category* ► Impact level ▼	A sites Internationally important	B sites Nationally important	C Sites High value, locally important	D sites Moderate value, locally important	E sites Low value, locally important
Severe negative	Any permanent impacts	Permanent impacts on a large part of a site			
Major negative	Temporary impacts on a large part of a site	Permanent impacts on a small part of a site	Permanent impacts on a large part of a site		
Moderate negative	Temporary impacts on a small part of a site	Temporary impacts on a large part of a site	Permanent impacts on a small part of a site	Permanent impacts on a large part of a site	
Minor negative		Temporary impacts on a small part of a site	Temporary impacts on a large part of a site	Permanent impacts on a small part of a site	Permanent impacts on a large part of a site
Neutral	No impacts	No impacts	No impacts	No impacts	Permanent impacts on a small part of a site
Minor positive				Permanent beneficial impacts on a small part of a site	Permanent beneficial impacts on a large part of a site
Moderate positive			Permanent beneficial impacts on a small part of a site	Permanent beneficial impacts on a large part of a site	
Major positive		Permanent beneficial impacts on a small part of a site	Permanent beneficial impacts on a large part of a site		

* Site categories A to E are defined in Table 2a.

APPENDIX 5: CRITERIA FOR ASSESSING IMPACT SIGNIFICANCE ON AQUATIC SITES.

A Sites

	Temporary	Short-term	Medium-term	Long-term
Extensive	Major	Severe	Severe	Severe
Localised	Major	Major	Severe	Severe

B Sites

	Temporary	Short-term	Medium-term	Long-term
Extensive	Major	Major	Severe	Severe
Localised	Moderate	Moderate	Major	Major

C Sites

	Temporary	Short-term	Medium-term	Long-term
Extensive	Moderate	Moderate	Major	Major
Localised	Minor	Moderate	Moderate	Moderate

D Sites

	Temporary	Short-term	Medium-term	Long-term
Extensive	Minor	Minor	Moderate	Moderate
Localised	Not significant	Minor	Minor	Minor

E Sites

	Temporary	Short-term	Medium-term	Long-term
Extensive	Not significant	Not significant	Minor	Minor
Localised	Not significant	Not significant	Not significant	Not significant

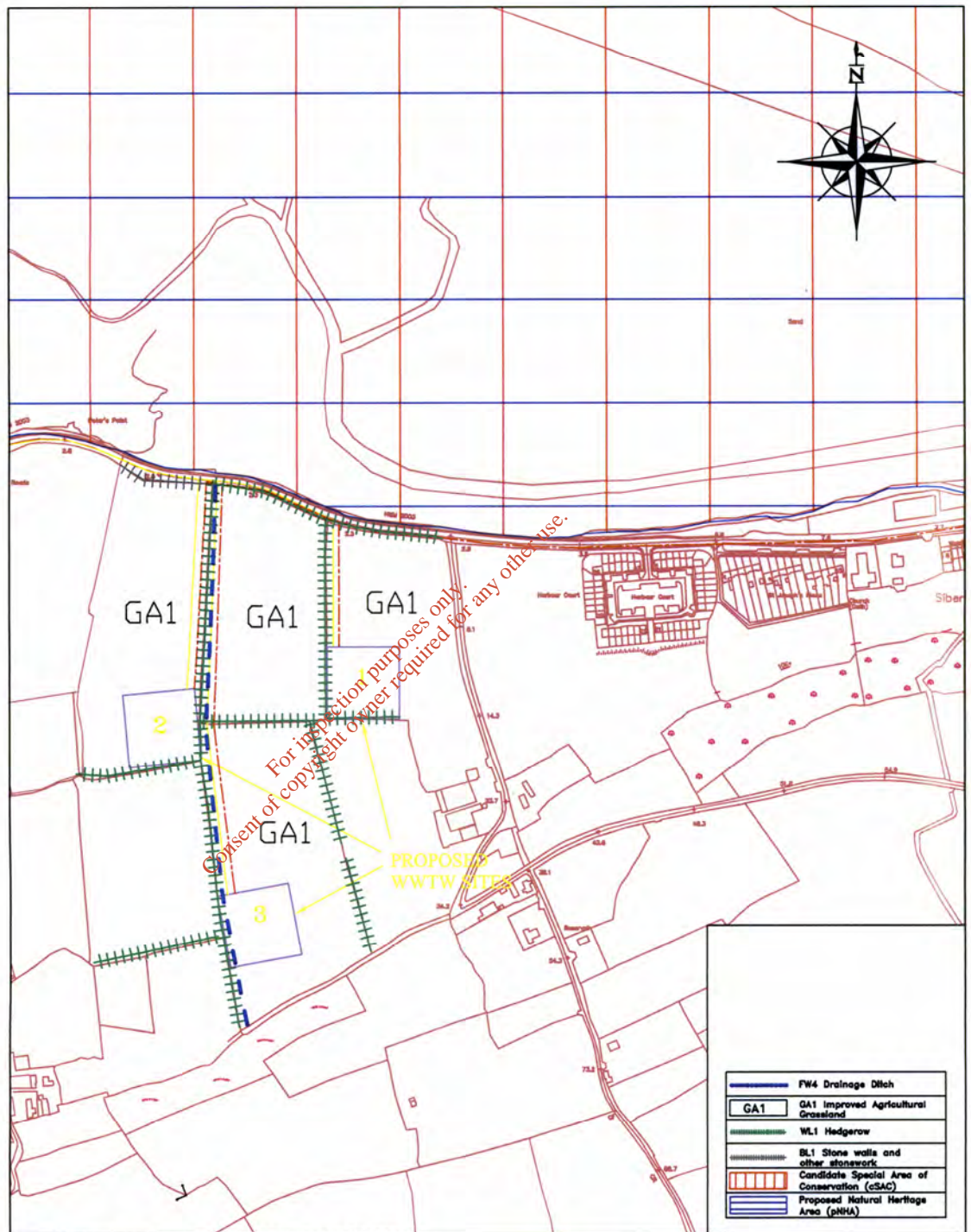
In line with the EPA guidelines (EPA 2002), the following terms are defined when quantifying duration:

- Temporary: up to 1 year,
- Short-term: from 1-7 years,
- Medium-term: 7-15 years,
- Long-term: 15-60 years,
- Permanent: over 60 years.

Localised impacts on rivers are loosely defined as impacts measurable no more than 250m from the impact source. Extensive impacts on rivers are defined as impacts measurable more than 250m from the impact source. Any impact on salmonid spawning habitat, or nursery habitat where it is in short supply, would be regarded as an extensive impact as it is likely to have an impact on the salmonid population beyond the immediate vicinity of the impact source.

* Site categories A to E are defined in Table 2a.

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Courtmacsherry - Timoleague WWTP

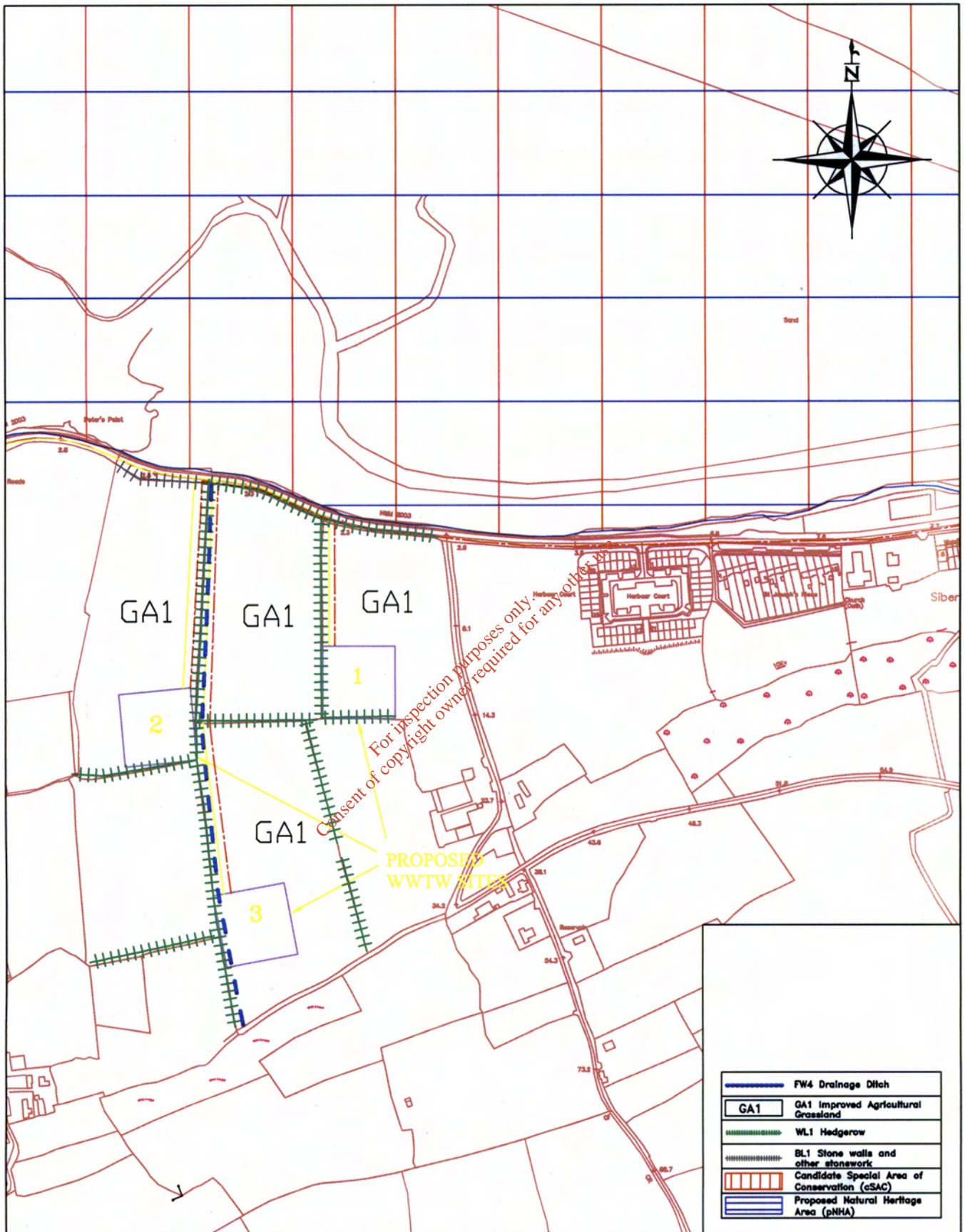


Enterprise Centre,
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Wicklow, Ireland
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Fax: 353 (0)404 64022

Figure 1: Habitat Map

Drawn by: FB	Project no: 1201
Checked: MF	Scale: 1:5000
Sheet no: 1 of 1	Date: 20.06.2005

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Courtmacsherry - Timoleague WWTP

	FW4 Drainage Ditch
	GA1 Improved Agricultural Grassland
	WL1 Hedgerow
	BL1 Stone walls and other stonework
	Candidate Special Area of Conservation (cSAC)
	Proposed Natural Heritage Area (pNHA)



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Wicklow, Ireland
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Fax: 353 (0)404 64022

Figure 1: Habitat Map

Drawn by: FB	Project no: 1201
Checked: MF	Scale: 1:5000
Sheet no: 1 of 1	Date: 20.06.2005



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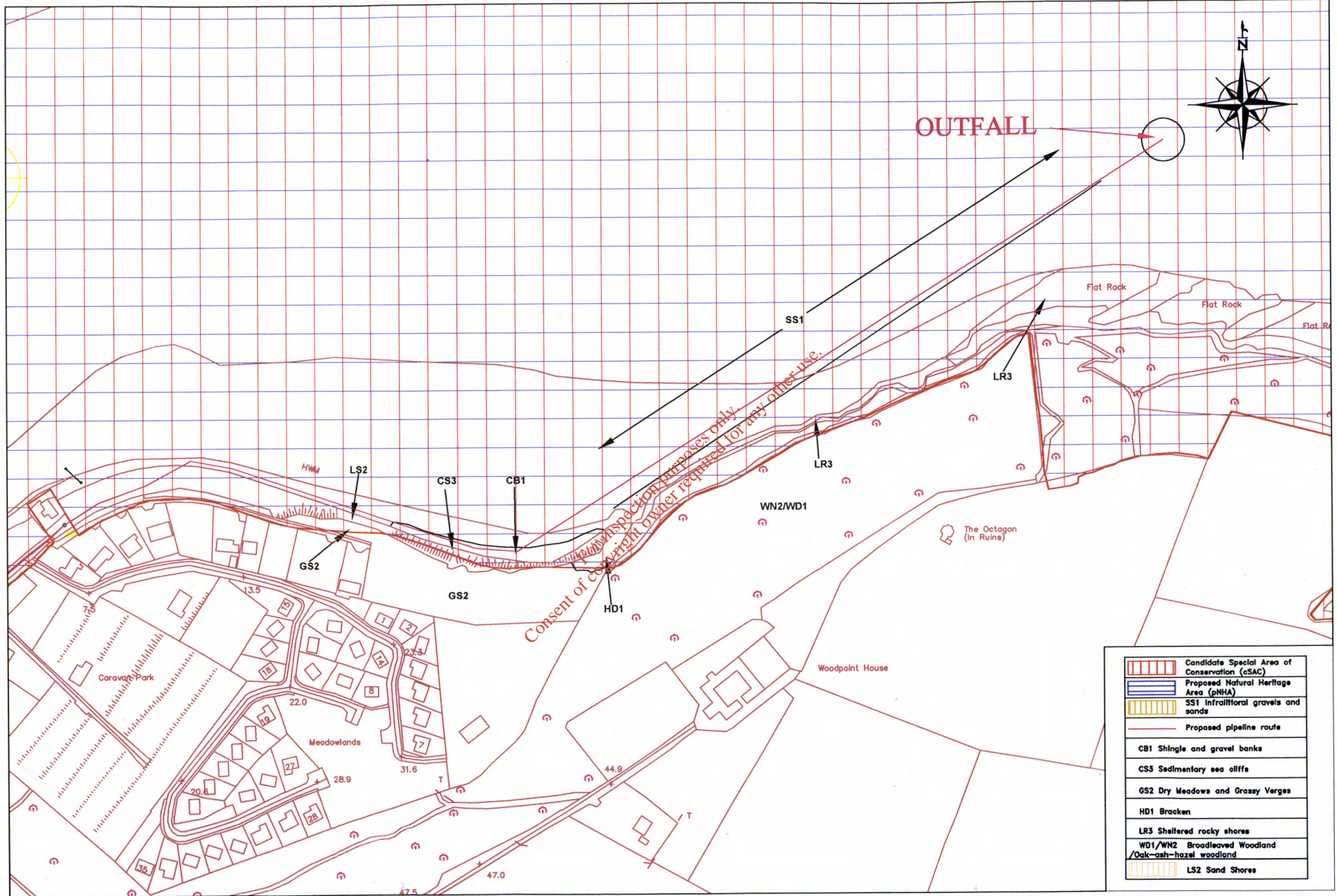


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Courtmacsherry Timoleague Marine Element

Figure 1: Courtmacsherry Timoleague Outfall Option A

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Sheet no: 1 of 2	Date: 05.09.2005



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Courtmacsherry Timoleague Marine Element

Figure 1: Courtmacsherry Timoleague Outfall Option B

Drawn by: FB
Checked: MF
Sheet no: 2 of 2

Project no: 1201
Scale: 1:2500
Date: 05.09.2005

ATTACHMENT No G.1

COMPLIANCE WITH COUNCIL DIRECTIVES

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APPLICATION FOR A WASTEWATER DISCHARGE LICENCE

TIMOLEAGUE

Attachment G.1 – Compliance with Council Directives

Capital Investment Programme

It is proposed to construct a new waste water treatment plant on a greenfield site 0.25 km to the west of Courtmacsherry village and 0.5 km to the east of Ballynamona House serving the villages of Timoleague and Courtmacsherry. The waste water treatment plant will be phased to cater for a load from Timoleague of 1,300 for the year 2015 (Phase 1) and 2,020 pe for horizon year 2030 (Phase 2) with sewer network designed for 2,620 pe for horizon year 2055.

The combined sewer system displays surcharging when subjected to 1 year, 5 year and 20 year storm and the design future loading. Consideration was given to the option of constructing a new foul sewer alongside the stone culvert in Abbey Street in order that the culvert would be used as a storm (only) culvert. The depth of the existing culvert varies from 1.5 metres to 2.4 metres. Allied to this the alignment of the stone culvert cannot be definitely mapped. A new foul sewer could be required to be constructed at a depth of circa 3 metres to permit reconnection of house connections under the existing stone culvert. This option could involve complicated construction issues, including protection of the existing culvert against possible collapses.

The areas that experience surcharging in Timoleague are along the laneway off Abbey Street and to the rear of the School and it is recommended that these sewers are upgraded from 150 mm and 100 mm diameter to 225 mm diameter.

It is proposed to lay a header sewer along the Main Road in Timoleague that will intercept the five existing outfalls. Due to the topography of the ground and existing invert levels of the outfalls the proposed new sewer will run from the north of the village at Church Bridge to the south of the village (School Road / Barryroe Road). The new sewer will terminate at a new proposed Pumping Station which will pump the waste water to the proposed waste water treatment plant at Courtmacsherry.

The proposed pumping station site is a green field that lies due south of Timoleague Village. The site is approximately 0.77ha and the topography of the site is a steep slope from west to east. Access to the site would be via the Main Road.

Waste Water Treatment Plant

A preliminary report has been carried out for the joint upgrading of Courtmacsherry and Timoleague Sewerage Schemes and is currently awaiting DOEHLG approval. It is proposed that the waste water treatment plant will be constructed as part of a DBO bundle of schemes. The chosen contractor will then design, build and operate the plant for a set period of years.

Under Phase 1 the proposed Waste Water Treatment Plant will be designed and constructed in a modular form for a population equivalent of 4,000 pe to cater for Courtmacsherry and Timoleague.

Phase 2 which is expected to be constructed by 2015 is to include for the modular expansion of the Waste Water Treatment Plant to serve the ultimate design population of 5,000 pe.

It is considered that the appropriate treatment for the villages would be to adopt the treatment systems, which as a minimum result in compliance with the treatment standards outlined below.

The minimum treatment standards adopted as per the Second Schedule of the Urban Wastewater Treatment Directive for the village are as follows:

Biochemical Oxygen Demand (BOD)	25 mg/l
Chemical Oxygen Demand (COD)	125 mg/l
Total Suspended Solids (TSS)	35 mg/l

All wastewater treatment processes for use with municipal waste involve the use of biological processes to eliminate organic pollution in the receiving waters. The primary objective of biological wastewater treatment processes is the conversion of biodegradable organic materials into microbial biomass, which can be separated by appropriate solids/liquid separation processes, such as sedimentation, flotation etc.

A typical plant would consist in this case of screening, aeration, settlement with return of sludge and sludge treatment and removal. It is proposed that UV disinfection be installed at the WWTP due to the fact that Courtmacsherry Bay is used as an amenity area for fishing and water sports.

The WWTP will include storm water storage and will be designed so that the treated effluent can gravitate down to the existing Courtmacsherry septic tank and discharge through the existing outfall pipe.

The preferred option for the outfall is to be located at the existing Courtmacsherry outfall point.

The likely timeframe for the carrying out of these works is as follows:

1. **Preparation of Brief** for the Appointment of Consulting Engineer for Scheme to go forward as Design, Build, Operate (DBO) Scheme by **June 2009**
2. **Approval of Brief** by DOEHLG – **Jan 2010**
3. **Appoint Consultant** – **June 2010**
4. **Design period + Receipt of Tenders** – **December 2012**
5. **Start construction** – **June 2013**
6. **Completion of Works** – **June 2014**

ATTACHMENT No G.3

IMPACT MITIGATION

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APPLICATION FOR A WASTEWATER DISCHARGE LICENCE

TIMOLEAGUE

Attachment G.3 – Impact Mitigation

Capital Investment Programme

It is proposed to construct a new waste water treatment plant on a greenfield site 0.25 km to the west of the Courtmacsherry and 0.5 km to the east of Ballynamona House. The waste water treatment plant will be phased to cater for a load from Timoleague of 1,300 for the year 2015 (Phase 1) and 1,907 pe for horizon year 2030 (Phase 2) with sewer network designed for 2,620 pe for horizon year 2055.

It is proposed to lay a header sewer along the Main Road in Timoleague adjacent to the Abbey and School that will intercept the five existing outfalls. Due to the topography of the ground and existing invert levels of the outfalls the proposed new sewer will run from the north of the village at Church Bridge to the south of the village (School Road / Barryroe Road). The new sewer will terminate at a new proposed Pumping Station.

The proposed pumping station site is a green field that lies due south of Timoleague Village near road junction R601 and School Road. The design capacity of the Timoleague PS is 40 l/s (greater than Formula A allowing storm overflows under a 1 in 1 year storm). Flows from Timoleague will be pumped to the WWTP via a 3.3km rising main.

Strengthening and augmentation of the existing foul/combined system will be required to address lack of capacity (under future loading conditions) and isolated instances of poor sewer condition.

Foul sewers will be required to provide for future development areas in the villages and the environs. Storm sewers will be required to convey surface water run-off from future development areas. It is envisaged that these sewers will be undertaken in Phase 2.

Waste Water Treatment Plant

A preliminary report has been carried out for the joint upgrading of Courtmacsherry and Timoleague Sewerage Schemes and is currently awaiting DOEHLG approval. It is proposed that the waste water treatment plant will be constructed as part of a DBO bundle of schemes. The chosen contractor will then design, build and operate the plant for a set period of years.

Under Phase 1 the proposed Waste Water Treatment Plant will be designed and constructed in a modular form for a population equivalent of 4,000 pe to cater for Courtmacsherry and Timoleague. The sewer network will be upgraded and expanded to service existing catchment area.

Phase 2 which is expected to be constructed by 2015 is to include for the modular expansion of the Waste Water Treatment Plant to serve the ultimate design population of 5,000 pe. The sewer network will then be expanded to service future development outside the existing catchment area.

It is considered that the appropriate treatment for the villages would be to adopt the treatment systems, which as a minimum result in compliance with the treatment standards outlined below.

The minimum treatment standards adopted as per the Second Schedule of the Urban Wastewater Treatment Directive for the village are as follows:

Biochemical Oxygen Demand (BOD)	25 mg/l
Chemical Oxygen Demand (COD)	125 mg/l
Total Suspended Solids (TSS)	35 mg/l

All wastewater treatment processes for use with municipal waste involve the use of biological processes to eliminate organic pollution in the receiving waters. The primary objective of biological wastewater treatment processes is the conversion of biodegradable organic materials into microbial biomass, which can be separated by appropriate solids/liquid separation processes, such as sedimentation, flotation etc.

A typical plant would consist in this case of screening, aeration, settlement with return of sludge and sludge treatment and removal. It is proposed that UV disinfection be installed at the WWTP due to the fact that Courtmacsherry Bay is used as an amenity area for fishing and water sports.

The WWTP will include storm water storage and will be designed so that the treated effluent can gravitate down to the existing septic tank and discharge through the existing outfall pipe.

The preferred option for the outfall is to be located at the existing outfall point.

The likely timeframe for the carrying out of these works is as follows:

1. **Preparation of Brief** for the Appointment of Consulting Engineer for Scheme to go forward as Design, Build, Operate (DBO) Scheme by **June 2009**
2. **Approval of Brief** by DOEHLG – **Jan 2010**
3. **Appoint Consultant** – **June 2010**
4. **Design period + Receipt of Tenders** – **December 2012**
5. **Start construction** – **June 2013**
6. **Completion of Works** – **June 2014**

ATTACHMENT No G.4

STORM WATER OVERFLOWS

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APPLICATION FOR A WASTEWATER DISCHARGE LICENCE

TIMOLEAGUE

Attachment G.4 – Storm Water Overflow

Capital Investment Programme

The following is an extract from the Preliminary Report carried out by J. B. Barry & Partners Consulting Engineers for the proposed Courtmacsherry & Timoleague Sewerage Schemes with regard to storm overflow at Timoleague Pumping Station:

A number of regulations and guidelines govern the frequency and quality of stormwater discharges from combined sewer systems into river and estuarial waters. These principally include the Urban Waste Water Treatment Directive (UWWTD) and the Procedures and Criteria in relation to Storm Water Overflows (1995). Applying the relevant standards, spills from new pumping stations storm overflow are limited to one in seven per annum.

In Timoleague, a new Pumping Station, located to the south of the village centre, is recommended. Timoleague PS will deliver flows to the new WWTP.

The Timoleague PS should only overflow under the 1 in 1 year storm. Storage of 485m³ is required at the WWTP to store the difference between Formula A and full flow to treatment (43l/s) for 2 hours.

Proposal for Transfer of Flow from Timoleague to the Waste Water Treatment Plant

The following hydraulic modelling methodology is used in order to calculate the volume of storage required and the pump rate at each pump station to meet criteria discussed in detail in Section 7.

Rainfall event data (RED) files with a return probability of 1 in 7 times per annum, summer and winter storms were produced in *InfoWorks*;

- The Formula A pumping rate was calculated adding the dry weather flow, a population multiplier and twice the existing industrial trade effluent. This resulted in a pump rate capacity of 70 l/s and 30 l/s at Harbour PS, Courtmacsherry and Timoleague PS respectively, (25 Year design horizon).
- The pumping rate required to only overflow 7 times in 1 bathing season was determined by adding all loading to the pumping station for the 1 in 7 times per annum synthetic storm. This resulted in a pump rate of 54 l/s and 59 l/s at Harbour PS and Timoleague PS respectively.

The UWWTD guidelines referred to above, stipulate Formula A as the minimum outflow setting and therefore the Formula A flows were adopted for the design pump capacity of Timoleague PS. The models were tested to ensure that spills did not exceed the 7 times in 1 year storm.

It should be noted that the design capacity adopted for Timoleague PS is 40 l/s, which although less than the 7 in 1 year flow (59 l/s), it is greater than the Formula A flow (30 l/s). The hydraulic model demonstrated that with pump capacity of 40 l/s, the 7 times a year spill regime was not exceeded. There is adequate storage in the way of 'on-line' storage in the 525mm diameter Collector Sewer and within the pump sump chamber. The model demonstrated that overflow incidences at the Timoleague PS should only occur under the 1 in 1 Year storm.

The likely timeframe for the carrying out of these works is as follows:

7. **Preparation of Brief** for the Appointment of Consulting Engineer for Scheme to go forward as Design, Build, Operate (DBO) Scheme by **June 2009**
8. **Approval of Brief** by DOEHLG – **Jan 2010**
9. **Appoint Consultant** – **June 2010**
10. **Design period + Receipt of Tenders** – **December 2012**
11. **Start construction** – **June 2013**
12. **Completion of Works** – **June 2014**

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Agglomeration details

Leading Local Authority	Cork County Council
Co-Applicants	
Agglomeration	Timoleague
Population Equivalent	1000
Level of Treatment	None
Treatment plant address	Not applicable
Grid Ref (12 digits, 6E, 6N)	147200 / 043523
EPA Reference No:	

Contact details

Contact Name:	Declan Groarke
Contact Address:	Water Services Section Cork County Council Western Division The Courthouse Skibbereen Co Cork
Contact Number:	028-21299
Contact Fax:	028-21995
Contact Email:	declan.groarke@corkcoco.ie

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Table D.1(i)(a): EMISSIONS TO SURFACE/GROUND WATERS (Primary Discharge Point)

Discharge Point Code: SW-1

Local Authority Ref No:	SW01 TIMO	
Source of Emission:	Primary Discharge	
Location:	Abbey Bridge, Timoleague	
Grid Ref (12 digits, 6E, 6N)	147200 / 043523	
Name of Receiving waters:	Courmacsherry Estuary	
Water Body:	Transitional Body	
River Basin District	South Western RBD	
Designation of Receiving Waters:	pNHA, SAC	
Flow Rate in Receiving Waters:	0	m ³ .sec ⁻¹ Dry Weather Flow
	0	m ³ .sec ⁻¹ 95% Weather Flow
Additional Comments (e.g. commentary on zero flow or other information deemed of value)	Receiving water zero flow due to transitional waters	

Emission Details:

(i) Volume emitted			
Normal/day	171.2 m ³	Maximum/day	513.6 m ³
Maximum rate/hour	21.4 m ³	Period of emission (avg)	60 min/hr 24 hr/day 365 day/yr
Dry Weather Flow	0.004 m ³ /sec		

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Table D.1(i)(b): EMISSIONS TO SURFACE/GROUND WATERS - Characteristics of The Emission (Primary Discharge Point)

Discharge Point Code: SW-1

Substance	As discharged			
	Unit of Measurement	Sampling Method	Max Daily Avg.	kg/day
pH	pH	Grab	= 9	
Temperature	°C	Grab	= 0	
Electrical Conductivity (@ 25°C)	µS/cm	Grab	= 0	
Suspended Solids	mg/l	Grab	= 500	85.6
Ammonia (as N)	mg/l	Grab	= 0	0
Biochemical Oxygen Demand	mg/l	Grab	= 350	59.9
Chemical Oxygen Demand	mg/l	Grab	= 700	119.8
Total Nitrogen (as N)	mg/l	Grab	= 50	8.6
Nitrite (as N)	mg/l	Grab	= 0	0
Nitrate (as N)	mg/l	Grab	= 0	0
Total Phosphorous (as P)	mg/l	Grab	= 12	2.05
OrthoPhosphate (as P)	mg/l	Grab	= 10	1.7
Sulphate (SO ₄)	mg/l	Grab	= 0	0
Phenols (Sum)	µg/l	Grab	= 0	0

For Orthophosphate: this monitoring should be undertaken on a sample filtered on 0.45µm filter paper
 For Phenols: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

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Table D.1(i)(c): DANGEROUS SUBSTANCE EMISSIONS TO SURFACE/GROUND WATERS - Characteristics of The Emission (Primary Discharge Point)

Discharge Point Code: SW-1

Substance	As discharged			
	Unit of Measurement	Sampling Method	Max Daily Avg.	kg/day
Atrazine	µg/l	Grab	= 0	0
Dichloromethane	µg/l	Grab	= 0	0
Simazine	µg/l	Grab	= 0	0
Toluene	µg/l	Grab	= 0	0
Tributyltin	µg/l	Grab	= 0	0
Xylenes	µg/l	Grab	= 0	0
Arsenic	µg/l	Grab	= 0	0
Chromium	µg/l	Grab	= 0	0
Copper	µg/l	Grab	= 0	0
Cyanide	µg/l	Grab	= 0	0
Flouride	µg/l	Grab	= 0	0
Lead	µg/l	Grab	= 0	0
Nickel	µg/l	Grab	= 0	0
Zinc	µg/l	Grab	= 0	0
Boron	µg/l	Grab	= 0	0
Cadmium	µg/l	Grab	= 0	0
Mercury	µg/l	Grab	= 0	0
Selenium	µg/l	Grab	= 0	0
Barium	µg/l	Grab	= 0	0

For Orthophosphate: this monitoring should be undertaken on a sample filtered on 0.45µm filter paper

For Phenols: USEPA Method 604, AWWA Standard Method 6246, or equivalent.

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Table D.1(ii)(a): EMISSIONS TO SURFACE/GROUND WATERS (Secondary Discharge Point)

Discharge Point Code: SW-2

Local Authority Ref No:	SW02 TIMO	
Source of Emission:	Secondary Discharge	
Location:	School Road, Timoleague	
Grid Ref (12 digits, 6E, 6N)	147131 / 043496	
Name of Receiving waters:	Courmacsherry Estuary	
Water Body:	Transitional Body	
River Basin District	South Western RBD	
Designation of Receiving Waters:	pNHA, SAC	
Flow Rate in Receiving Waters:	0	m ³ .sec ⁻¹ Dry Weather Flow
	0	m ³ .sec ⁻¹ 95% Weather Flow
Additional Comments (e.g. commentary on zero flow or other information deemed of value)	Receiving Waters flow zero as waters are transitional	

Emission Details:

(i) Volume emitted			
Normal/day	36.7 m ³	Maximum/day	110.1 m ³
Maximum rate/hour	4.6 m ³	Period of emission (avg)	60 min/hr 24 hr/day 365 day/yr
Dry Weather Flow	0.00085 m ³ /sec		

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Table D.1(ii)(b): EMISSIONS TO SURFACE/GROUND WATERS - Characteristics of The Emission (Secondary Discharge Point)

Discharge Point Code: SW-2

Substance	As discharged			
	Unit of Measurement	Sampling Method	Max Daily Avg.	kg/day
pH	pH	Grab	= 9	
Temperature	°C	Grab	= 0	
Electrical Conductivity (@ 25°C)	µS/cm	Grab	= 0	
Suspended Solids	mg/l	Grab	= 500	18.35
Ammonia (as N)	mg/l	Grab	= 0	0
Biochemical Oxygen Demand	mg/l	Grab	= 350	12.85
Chemical Oxygen Demand	mg/l	Grab	= 700	25.69
Total Nitrogen (as N)	mg/l	Grab	= 50	1.84
Nitrite (as N)	mg/l	Grab	= 0	0
Nitrate (as N)	mg/l	Grab	= 0	0
Total Phosphorous (as P)	mg/l	Grab	= 12	0.44
OrthoPhosphate (as P)	mg/l	Grab	= 10	0.37
Sulphate (SO ₄)	mg/l	Grab	= 0	0
Phenols (Sum)	µg/l	Grab	= 0	0

For Orthophosphate: this monitoring should be undertaken on a sample filtered on 0.45µm filter paper

For Phenols: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

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Table D.1(ii)(c): DANGEROUS SUBSTANCE EMISSIONS TO SURFACE/GROUND WATERS - Characteristics of The Emission (Secondary Discharge Point)

Discharge Point Code: SW-2

Substance	As discharged			
	Unit of Measurement	Sampling Method	Max Daily Avg.	kg/day
Atrazine	µg/l	Grab	= 0	0
Dichloromethane	µg/l	Grab	= 0	0
Simazine	µg/l	Grab	= 0	0
Toluene	µg/l	Grab	= 0	0
Tributyltin	µg/l	Grab	= 0	0
Xylenes	µg/l	Grab	= 0	0
Arsenic	µg/l	Grab	= 0	0
Chromium	µg/l	Grab	= 0	0
Copper	µg/l	Grab	= 0	0
Cyanide	µg/l	Grab	= 0	0
Flouride	µg/l	Grab	= 0	0
Lead	µg/l	Grab	= 0	0
Nickel	µg/l	Grab	= 0	0
Zinc	µg/l	Grab	= 0	0
Boron	µg/l	Grab	= 0	0
Cadmium	µg/l	Grab	= 0	0
Mercury	µg/l	Grab	= 0	0
Selenium	µg/l	Grab	= 0	0
Barium	µg/l	Grab	= 0	0

For Orthophosphate: this monitoring should be undertaken on a sample filtered on 0.45µm filter paper
 For Phenols: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

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Table D.1(ii)(a): EMISSIONS TO SURFACE/GROUND WATERS (Secondary Discharge Point)

Discharge Point Code: SW-3

Local Authority Ref No:	SW03 TIMO	
Source of Emission:	Secondary Discharge	
Location:	School Road, Timoleague	
Grid Ref (12 digits, 6E, 6N)	147142 / 043507	
Name of Receiving waters:	Courmacsherry Estuary	
Water Body:	Transitional Body	
River Basin District	South Western RBD	
Designation of Receiving Waters:	pNHA, SAC	
Flow Rate in Receiving Waters:	0	m ³ .sec ⁻¹ Dry Weather Flow
	0	m ³ .sec ⁻¹ 95% Weather Flow
Additional Comments (e.g. commentary on zero flow or other information deemed of value)	Receiving Waters flow zero as waters are transitional	

Emission Details:

(i) Volume emitted			
Normal/day	7.4 m ³	Maximum/day	22.2 m ³
Maximum rate/hour	0.93 m ³	Period of emission (avg)	60 min/hr 24 hr/day 365 day/yr
Dry Weather Flow	0.00017 m ³ /sec		

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Table D.1(ii)(b): EMISSIONS TO SURFACE/GROUND WATERS - Characteristics of The Emission (Secondary Discharge Point)

Discharge Point Code: SW-3

Substance	As discharged			
	Unit of Measurement	Sampling Method	Max Daily Avg.	kg/day
pH	pH	Grab	= 9	
Temperature	°C	Grab	= 0	
Electrical Conductivity (@ 25°C)	µS/cm	Grab	= 0	
Suspended Solids	mg/l	Grab	= 500	3.7
Ammonia (as N)	mg/l	Grab	= 0	0
Biochemical Oxygen Demand	mg/l	Grab	= 350	2.59
Chemical Oxygen Demand	mg/l	Grab	= 700	5.18
Total Nitrogen (as N)	mg/l	Grab	= 50	0.37
Nitrite (as N)	mg/l	Grab	= 0	0
Nitrate (as N)	mg/l	Grab	= 0	0
Total Phosphorous (as P)	mg/l	Grab	= 12	0.09
OrthoPhosphate (as P)	mg/l	Grab	= 10	0.07
Sulphate (SO ₄)	mg/l	Grab	= 0	0
Phenols (Sum)	µg/l	Grab	= 0	0

For Orthophosphate: this monitoring should be undertaken on a sample filtered on 0.45µm filter paper

For Phenols: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

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Table D.1(ii)(c): DANGEROUS SUBSTANCE EMISSIONS TO SURFACE/GROUND WATERS - Characteristics of The Emission (Secondary Discharge Point)

Discharge Point Code: SW-3

Substance	As discharged			
	Unit of Measurement	Sampling Method	Max Daily Avg.	kg/day
Atrazine	µg/l	Grab	= 0	0
Dichloromethane	µg/l	Grab	= 0	0
Simazine	µg/l	Grab	= 0	0
Toluene	µg/l	Grab	= 0	0
Tributyltin	µg/l	Grab	= 0	0
Xylenes	µg/l	Grab	= 0	0
Arsenic	µg/l	Grab	= 0	0
Chromium	µg/l	Grab	= 0	0
Copper	µg/l	Grab	= 0	0
Cyanide	µg/l	Grab	= 0	0
Flouride	µg/l	Grab	= 0	0
Lead	µg/l	Grab	= 0	0
Nickel	µg/l	Grab	= 0	0
Zinc	µg/l	Grab	= 0	0
Boron	µg/l	Grab	= 0	0
Cadmium	µg/l	Grab	= 0	0
Mercury	µg/l	Grab	= 0	0
Selenium	µg/l	Grab	= 0	0
Barium	µg/l	Grab	= 0	0

For Orthophosphate: this monitoring should be undertaken on a sample filtered on 0.45µm filter paper

For Phenols: USEPA Method 604, AWWA Standard Method 6246, or equivalent.

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Table D.1(ii)(a): EMISSIONS TO SURFACE/GROUND WATERS (Secondary Discharge Point)

Discharge Point Code: SW-4

Local Authority Ref No:	SW04 TIMO
Source of Emission:	Secondary Discharge
Location:	North of Timoleague Abbey, Timoleague
Grid Ref (12 digits, 6E, 6N)	147207 / 043704
Name of Receiving waters:	Courmacsherry Estuary
Water Body:	Transitional Body
River Basin District	South Western RBD
Designation of Receiving Waters:	pNHA, SAC
Flow Rate in Receiving Waters:	0 m ³ .sec ⁻¹ Dry Weather Flow 0 m ³ .sec ⁻¹ 95% Weather Flow
Additional Comments (e.g. commentary on zero flow or other information deemed of value)	Receiving Waters flow zero as waters are transitional

Emission Details:

(i) Volume emitted			
Normal/day	12.2 m ³	Maximum/day	36.6 m ³
Maximum rate/hour	1.53 m ³	Period of emission (avg)	60 min/hr 24 hr/day 365 day/yr
Dry Weather Flow	0.00028 m ³ /sec		

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Table D.1(ii)(b): EMISSIONS TO SURFACE/GROUND WATERS - Characteristics of The Emission (Secondary Discharge Point)

Discharge Point Code: SW-4

Substance	As discharged			
	Unit of Measurement	Sampling Method	Max Daily Avg.	kg/day
pH	pH	Grab	= 9	
Temperature	°C	Grab	= 0	
Electrical Conductivity (@ 25°C)	µS/cm	Grab	= 0	
Suspended Solids	mg/l	Grab	= 500	6.1
Ammonia (as N)	mg/l	Grab	= 0	0
Biochemical Oxygen Demand	mg/l	Grab	= 350	4.27
Chemical Oxygen Demand	mg/l	Grab	= 700	8.54
Total Nitrogen (as N)	mg/l	Grab	= 50	0.61
Nitrite (as N)	mg/l	Grab	= 0	0
Nitrate (as N)	mg/l	Grab	= 0	0
Total Phosphorous (as P)	mg/l	Grab	= 12	0.15
OrthoPhosphate (as P)	mg/l	Grab	= 10	0.12
Sulphate (SO ₄)	mg/l	Grab	= 0	0
Phenols (Sum)	µg/l	Grab	= 0	0

For Orthophosphate: this monitoring should be undertaken on a sample filtered on 0.45µm filter paper

For Phenols: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

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Table D.1(ii)(c): DANGEROUS SUBSTANCE EMISSIONS TO SURFACE/GROUND WATERS - Characteristics of The Emission (Secondary Discharge Point)

Discharge Point Code: SW-4

Substance	As discharged			
	Unit of Measurement	Sampling Method	Max Daily Avg.	kg/day
Atrazine	µg/l	Grab	= 0	0
Dichloromethane	µg/l	Grab	= 0	0
Simazine	µg/l	Grab	= 0	0
Toluene	µg/l	Grab	= 0	0
Tributyltin	µg/l	Grab	= 0	0
Xylenes	µg/l	Grab	= 0	0
Arsenic	µg/l	Grab	= 0	0
Chromium	µg/l	Grab	= 0	0
Copper	µg/l	Grab	= 0	0
Cyanide	µg/l	Grab	= 0	0
Flouride	µg/l	Grab	= 0	0
Lead	µg/l	Grab	= 0	0
Nickel	µg/l	Grab	= 0	0
Zinc	µg/l	Grab	= 0	0
Boron	µg/l	Grab	= 0	0
Cadmium	µg/l	Grab	= 0	0
Mercury	µg/l	Grab	= 0	0
Selenium	µg/l	Grab	= 0	0
Barium	µg/l	Grab	= 0	0

For Orthophosphate: this monitoring should be undertaken on a sample filtered on 0.45µm filter paper

For Phenols: USEPA Method 604, AWWA Standard Method 6246, or equivalent.

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Table D.1(ii)(a): EMISSIONS TO SURFACE/GROUND WATERS (Secondary Discharge Point)

Discharge Point Code: SW-5

Local Authority Ref No:	SW05 TIMO	
Source of Emission:	Secondary Discharge	
Location:	South of Church Bridge, Timoleague	
Grid Ref (12 digits, 6E, 6N)	147173 / 043780	
Name of Receiving waters:	Courmacsherry Estuary	
Water Body:	Transitional Body	
River Basin District	South Western RBD	
Designation of Receiving Waters:	pNHA, SAC	
Flow Rate in Receiving Waters:	0	m ³ .sec ⁻¹ Dry Weather Flow
	0	m ³ .sec ⁻¹ 95% Weather Flow
Additional Comments (e.g. commentary on zero flow or other information deemed of value)	Receiving Waters flow zero as waters are transitional	

Emission Details:

(i) Volume emitted			
Normal/day	24.5 m ³	Maximum/day	73.5 m ³
Maximum rate/hour	3.06 m ³	Period of emission (avg)	60 min/hr 24 hr/day 365 day/yr
Dry Weather Flow	0.00057 m ³ /sec		

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Table D.1(ii)(b): EMISSIONS TO SURFACE/GROUND WATERS - Characteristics of The Emission (Secondary Discharge Point)

Discharge Point Code: SW-5

Substance	As discharged			
	Unit of Measurement	Sampling Method	Max Daily Avg.	kg/day
pH	pH	Grab	= 9	
Temperature	°C	Grab	= 0	
Electrical Conductivity (@ 25°C)	µS/cm	Grab	= 0	
Suspended Solids	mg/l	Grab	= 500	12.25
Ammonia (as N)	mg/l	Grab	= 0	0
Biochemical Oxygen Demand	mg/l	Grab	= 350	8.58
Chemical Oxygen Demand	mg/l	Grab	= 700	17.15
Total Nitrogen (as N)	mg/l	Grab	= 50	1.23
Nitrite (as N)	mg/l	Grab	= 0	0
Nitrate (as N)	mg/l	Grab	= 0	0
Total Phosphorous (as P)	mg/l	Grab	= 12	0.294
OrthoPhosphate (as P)	mg/l	Grab	= 10	0.245
Sulphate (SO ₄)	mg/l	Grab	= 0	0
Phenols (Sum)	µg/l	Grab	= 0	0

For Orthophosphate: this monitoring should be undertaken on a sample filtered on 0.45µm filter paper

For Phenols: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

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Table D.1(ii)(c): DANGEROUS SUBSTANCE EMISSIONS TO SURFACE/GROUND WATERS - Characteristics of The Emission (Secondary Discharge Point)

Discharge Point Code: SW-5

Substance	As discharged			
	Unit of Measurement	Sampling Method	Max Daily Avg.	kg/day
Atrazine	µg/l	Grab	= 0	0
Dichloromethane	µg/l	Grab	= 0	0
Simazine	µg/l	Grab	= 0	0
Toluene	µg/l	Grab	= 0	0
Tributyltin	µg/l	Grab	= 0	0
Xylenes	µg/l	Grab	= 0	0
Arsenic	µg/l	Grab	= 0	0
Chromium	µg/l	Grab	= 0	0
Copper	µg/l	Grab	= 0	0
Cyanide	µg/l	Grab	= 0	0
Flouride	µg/l	Grab	= 0	0
Lead	µg/l	Grab	= 0	0
Nickel	µg/l	Grab	= 0	0
Zinc	µg/l	Grab	= 0	0
Boron	µg/l	Grab	= 0	0
Cadmium	µg/l	Grab	= 0	0
Mercury	µg/l	Grab	= 0	0
Selenium	µg/l	Grab	= 0	0
Barium	µg/l	Grab	= 0	0

For Orthophosphate: this monitoring should be undertaken on a sample filtered on 0.45µm filter paper

For Phenols: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

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TABLE E.1(i): WASTE WATER FREQUENCY AND QUANTITY OF DISCHARGE – Primary and Secondary Discharge Points

Identification Code for Discharge point	Frequency of discharge (days/annum)	Quantity of Waste Water Discharged (m ³ /annum)
SW-1	365	62487.999999999
SW-2	365	13395.5
SW-3	365	2701
SW-4	365	4453
SW-5	365	8942.5

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TABLE E.1(ii): WASTE WATER FREQUENCY AND QUANTITY OF DISCHARGE – Storm Water Overflows

Identification Code for Discharge point	Frequency of discharge (days/annum)	Quantity of Waste Water Discharged (m ³ /annum)	Complies with Definition of Storm Water Overflow
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TABLE F.1(i)(a): SURFACE/GROUND WATER MONITORING

Primary Discharge Point

Discharge Point Code:	SW-1
MONITORING POINT CODE:	aSW-1d
Grid Ref (12 digits, 6E, 6N)	150426 / 043277

Parameter	Results (mg/l)				Sampling method	Limit of Quantitation	Analysis method / technique
	01/01/09	21/05/09					
pH		= 8.3			Grab	2	Electrochemical
Temperature	= 0				Grab	0.5	electrochemical
Electrical Conductivity (@ 25°C)		= 35700			Grab	0.5	Electrochemical
Suspended Solids		= 10			Grab	0.5	Gravimetric
Ammonia (as N)		= 0.5			Grab	0.02	Colorimetric
Biochemical Oxygen Demand		= 3			Grab	0.06	Electrochemical
Chemical Oxygen Demand		= 22			Grab	8	Digestion & Colorimetric
Dissolved Oxygen	= 0				Grab	0	ISE
Hardness (as CaCO ₃)	= 0				Grab	0	titrimetric
Total Nitrogen (as N)		= 1.21			Grab	0.5	Digestion & Colorimetric
Nitrite (as N)		< 0.1			Grab	0.013	colorimetric
Nitrate (as N)		< 0.5			Grab	0.04	Colorimetric
Total Phosphorous (as P)		< 0.05			Grab	0.2	Digestion & Colorimetric
OrthoPhosphate (as P)		< 0.05			Grab	0.02	Colorimetric
Sulphate (SO ₄)		= 0			Grab	30	Turbidimetric
Phenols (Sum)		< 0.1			Grab	0.1	GC-MS2

For Orthophosphate: this monitoring should be undertaken on a sample filtered on 0.45µm filter paper

For Phenols: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

Additional Comments:	Default value of 01/01/09 and 0 where results not available. Ammonia result contains a saline interference. No sulphate result available.
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TABLE F.1(i)(b): SURFACE/GROUND WATER MONITORING (Dangerous Substances)

Primary Discharge Point

Discharge Point Code:	SW-1
MONITORING POINT CODE:	aSW-1d
Grid Ref (12 digits, 6E, 6N)	150426 / 043277

Parameter	Results (µg/l)				Sampling method	Limit of Quantitation	Analysis method / technique
	21/05/09						
Atrazine	< 0.01				Grab	0.96	HPLC
Dichloromethane	< 1				Grab	1	GC-MS1
Simazine	< 0.01				Grab	0.01	HPLC
Toluene	< 0.28				Grab	0.02	GC-MS1
Tributyltin	= 0				Grab	0.02	GC-MS1
Xylenes	< 1				Grab	1	GC-MS1
Arsenic	= 1.7				Grab	0.96	ICP-MS
Chromium	< 20				Grab	20	ICP-OES
Copper	< 20				Grab	20	ICP-OES
Cyanide	= 5				Grab	5	Colorimetric
Flouride	= 603				Grab	100	ISE
Lead	< 20				Grab	20	ICP-OES
Nickel	< 20				Grab	20	ICP-OES
Zinc	< 20				Grab	20	ICP-OES
Boron	= 2242				Grab	20	ICP-OES
Cadmium	< 20				Grab	20	ICP-OES
Mercury	< 0.2				Grab	0.2	ICP-MS
Selenium	= 14.7				Grab	0.74	ICP-MS
Barium	< 20				Grab	20	ICP-OES

Additional Comments:	TBT value is 0.02ug/l as Sn Tributyltin result to follow at a later stage. Flouride result contains a saline interference. Boron result contains a possible interference.
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TABLE F.1(i)(a): SURFACE/GROUND WATER MONITORING

Primary Discharge Point

Discharge Point Code:	SW-1
MONITORING POINT CODE:	aSW-1u
Grid Ref (12 digits, 6E, 6N)	146486 / 045753

Parameter	Results (mg/l)				Sampling method	Limit of Quantitation	Analysis method / technique
	01/01/09	21/05/09					
pH		= 7.8			Grab	2	Electrochemical
Temperature	= 0				Grab	0.5	electrochemical
Electrical Conductivity (@ 25°C)		= 207			Grab	0.5	Electrochemical
Suspended Solids		< 2.5			Grab	0.5	Gravimetric
Ammonia (as N)		< 0.1			Grab	0.02	Colorimetric
Biochemical Oxygen Demand		= 1			Grab	0.06	Electrochemical
Chemical Oxygen Demand		< 21			Grab	8	Digestion & Colorimetric
Dissolved Oxygen	= 0				Grab	0	ISE
Hardness (as CaCO ₃)	= 0				Grab	0	titrimetric
Total Nitrogen (as N)		= 4.51			Grab	0.5	Digestion & Colorimetric
Nitrite (as N)		< 0.1			Grab	0.013	colorimetric
Nitrate (as N)		= 3.46			Grab	0.04	Colorimetric
Total Phosphorous (as P)		< 0.05			Grab	0.2	Digestion & Colorimetric
OrthoPhosphate (as P)		= 0			Grab	0.02	Colorimetric
Sulphate (SO ₄)		< 30			Grab	30	Turbidimetric
Phenols (Sum)		= 0.1			Grab	0.1	GC-MS2

For Orthophosphate: this monitoring should be undertaken on a sample filtered on 0.45µm filter paper

For Phenols: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

Additional Comments:	default values of 01/01/09 and 0 where results are not available. No result for Orthophosphate available.
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TABLE F.1(i)(b): SURFACE/GROUND WATER MONITORING (Dangerous Substances)

Primary Discharge Point

Discharge Point Code:	SW-1
MONITORING POINT CODE:	aSW-1u
Grid Ref (12 digits, 6E, 6N)	146486 / 045753

Parameter	Results (µg/l)			Sampling method	Limit of Quantitation	Analysis method / technique
	20/05/09	21/05/09				
Atrazine		< 0.01		Grab	0.96	HPLC
Dichloromethane		< 1		Grab	1	GC-MS1
Simazine		< 0.01		Grab	0.01	HPLC
Toluene		< 0.28		Grab	0.02	GC-MS1
Tributyltin		= 0		Grab	0.02	GC-MS1
Xylenes		< 1		Grab	1	GC-MS1
Arsenic		< 0.96		Grab	0.96	ICP-MS
Chromium		< 20		Grab	20	ICP-OES
Copper		< 20		Grab	20	ICP-OES
Cyanide		< 5		Grab	5	Colorimetric
Flouride		< 100		Grab	100	ISE
Lead		< 20		Grab	20	ICP-OES
Nickel		< 20		Grab	20	ICP-OES
Zinc		< 20		Grab	20	ICP-OES
Boron	= 30.805			Grab	20	ICP-OES
Cadmium		< 20		Grab	20	ICP-OES
Mercury		< 0.2		Grab	0.2	ICP-MS
Selenium		= 4.6		Grab	0.74	ICP-MS
Barium		< 20		Grab	20	ICP-OES

Additional Comments:	TBT value is 0.02ug/l as Sn Tributyltin result not required
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TABLE F.1(ii)(a): SURFACE/GROUND WATER MONITORING

Secondary Discharge Point

Discharge Point Code:	SW-2
MONITORING POINT CODE:	aSW-2d
Grid Ref (12 digits, 6E, 6N)	150426 / 043277

Parameter	Results (mg/l)				Sampling method	Limit of Quantitation	Analysis method / technique
	01/01/09	21/05/09					
pH		= 8.3			Grab	2	Electrochemical
Temperature	= 0				Grab	0.5	electrochemical
Electrical Conductivity (@ 25°C)		= 35700			Grab	0.5	Electrochemical
Suspended Solids		= 10			Grab	0.5	Gravimetric
Ammonia (as N)		= 0.5			Grab	0.02	Colorimetric
Biochemical Oxygen Demand		= 3			Grab	0.06	Electrochemical
Chemical Oxygen Demand		= 22			Grab	8	Digestion & Colorimetric
Dissolved Oxygen	= 0				Grab	0	ISE
Hardness (as CaCO ₃)	= 0				Grab	0	titrimetric
Total Nitrogen (as N)		= 1.21			Grab	0.5	Digestion & Colorimetric
Nitrite (as N)		< 0.1			Grab	0.013	colorimetric
Nitrate (as N)		< 0.5			Grab	0.04	Colorimetric
Total Phosphorous (as P)		< 0.05			Grab	0.2	Digestion & Colorimetric
OrthoPhosphate (as P)		< 0.05			Grab	0.02	Colorimetric
Sulphate (SO ₄)		= 0			Grab	30	Turbidimetric
Phenols (Sum)		< 0.1			Grab	0.1	GC-MS2

For Orthophosphate: this monitoring should be undertaken on a sample filtered on 0.45µm filter paper

For Phenols: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

Additional Comments:	Default value of 01/01/09 and 0 where results not available. Ammonia result contains a saline interference. No sulphate result available.
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TABLE F.1(ii)(b): SURFACE/GROUND WATER MONITORING (Dangerous Substances)

Secondary Discharge Point

Discharge Point Code:	SW-2
MONITORING POINT CODE:	aSW-2d
Grid Ref (12 digits, 6E, 6N)	150426 / 043277

Parameter	Results (µg/l)				Sampling method	Limit of Quantitation	Analysis method / technique
	21/05/09						
Atrazine	< 0.01				Grab	0.96	HPLC
Dichloromethane	< 1				Grab	1	GC-MS1
Simazine	< 0.01				Grab	0.01	HPLC
Toluene	< 0.28				Grab	0.02	GC-MS1
Tributyltin	= 0				Grab	0.02	GC-MS1
Xylenes	< 1				Grab	1	GC-MS1
Arsenic	= 1.7				Grab	0.96	ICP-MS
Chromium	< 20				Grab	20	ICP-OES
Copper	< 20				Grab	20	ICP-OES
Cyanide	= 5				Grab	5	Colorimetric
Flouride	= 603				Grab	100	ISE
Lead	< 20				Grab	20	ICP-OES
Nickel	< 20				Grab	20	ICP-OES
Zinc	< 20				Grab	20	ICP-OES
Boron	= 2242				Grab	20	ICP-OES
Cadmium	< 20				Grab	20	ICP-OES
Mercury	< 0.2				Grab	0.2	ICP-MS
Selenium	= 14.7				Grab	0.74	ICP-MS
Barium	< 20				Grab	20	ICP-OES

Additional Comments:	TBT value is 0.02ug/l as Sn Tributyltin result to follow at a later stage. Flouride result contains a saline interference. Boron result contains a possible interference.
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TABLE F.1(ii)(a): SURFACE/GROUND WATER MONITORING

Secondary Discharge Point

Discharge Point Code:	SW-3
MONITORING POINT CODE:	aSW-3d
Grid Ref (12 digits, 6E, 6N)	150426 / 043277

Parameter	Results (mg/l)				Sampling method	Limit of Quantitation	Analysis method / technique
	01/01/09	21/05/09					
pH		= 8.3			Grab	2	Electrochemical
Temperature	= 0				Grab	0.5	electrochemical
Electrical Conductivity (@ 25°C)		= 35700			Grab	0.5	Electrochemical
Suspended Solids		= 10			Grab	0.5	Gravimetric
Ammonia (as N)		= 0.5			Grab	0.02	Colorimetric
Biochemical Oxygen Demand		= 3			Grab	0.06	Electrochemical
Chemical Oxygen Demand		= 22			Grab	8	Digestion & Colorimetric
Dissolved Oxygen	= 0				Grab	0	ISE
Hardness (as CaCO ₃)	= 0				Grab	0	titrimetric
Total Nitrogen (as N)		= 1.21			Grab	0.5	Digestion & Colorimetric
Nitrite (as N)		< 0.1			Grab	0.013	colorimetric
Nitrate (as N)		< 0.5			Grab	0.04	Colorimetric
Total Phosphorous (as P)		< 0.05			Grab	0.2	Digestion & Colorimetric
OrthoPhosphate (as P)		< 0.05			Grab	0.02	Colorimetric
Sulphate (SO ₄)		= 0			Grab	30	Turbidimetric
Phenols (Sum)		< 0.1			Grab	0.1	GC-MS2

For Orthophosphate: this monitoring should be undertaken on a sample filtered on 0.45µm filter paper

For Phenols: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

Additional Comments:	Default value of 01/01/09 and 0 where results not available. Ammonia result contains a saline interference. No sulphate result available.
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TABLE F.1(ii)(b): SURFACE/GROUND WATER MONITORING (Dangerous Substances)

Secondary Discharge Point

Discharge Point Code:	SW-3
MONITORING POINT CODE:	aSW-3d
Grid Ref (12 digits, 6E, 6N)	150426 / 043277

Parameter	Results (µg/l)				Sampling method	Limit of Quantitation	Analysis method / technique
	21/05/09						
Atrazine	< 0.01				Grab	0.96	HPLC
Dichloromethane	< 1				Grab	1	GC-MS1
Simazine	< 0.01				Grab	0.01	HPLC
Toluene	< 0.28				Grab	0.02	GC-MS1
Tributyltin	= 0				Grab	0.02	GC-MS1
Xylenes	< 1				Grab	1	GC-MS1
Arsenic	= 1.7				Grab	0.96	ICP-MS
Chromium	< 20				Grab	20	ICP-OES
Copper	< 20				Grab	20	ICP-OES
Cyanide	= 5				Grab	5	Colorimetric
Flouride	= 603				Grab	100	ISE
Lead	< 20				Grab	20	ICP-OES
Nickel	< 20				Grab	20	ICP-OES
Zinc	< 20				Grab	20	ICP-OES
Boron	= 2242				Grab	20	ICP-OES
Cadmium	< 20				Grab	20	ICP-OES
Mercury	< 0.2				Grab	0.2	ICP-MS
Selenium	= 14.7				Grab	0.74	ICP-MS
Barium	< 20				Grab	20	ICP-OES

Additional Comments:	TBT value is 0.02ug/l as Sn Tributyltin result to follow at a later stage. Flouride result contains a saline interference. Boron result contains a possible interference.
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TABLE F.1(ii)(a): SURFACE/GROUND WATER MONITORING

Secondary Discharge Point

Discharge Point Code:	SW-4
MONITORING POINT CODE:	aSW-4d
Grid Ref (12 digits, 6E, 6N)	150426 / 043277

Parameter	Results (mg/l)				Sampling method	Limit of Quantitation	Analysis method / technique
	01/01/09	21/05/09					
pH		= 8.3			Grab	2	Electrochemical
Temperature	= 0				Grab	0.5	electrochemical
Electrical Conductivity (@ 25°C)		= 35700			Grab	0.5	Electrochemical
Suspended Solids		= 10			Grab	0.5	Gravimetric
Ammonia (as N)		= 0.5			Grab	0.02	Colorimetric
Biochemical Oxygen Demand		= 3			Grab	0.06	Electrochemical
Chemical Oxygen Demand		= 22			Grab	8	Digestion & Colorimetric
Dissolved Oxygen	= 0				Grab	0	ISE
Hardness (as CaCO ₃)	= 0				Grab	0	titrimetric
Total Nitrogen (as N)		= 1.21			Grab	0.5	Digestion & Colorimetric
Nitrite (as N)		< 0.1			Grab	0.013	colorimetric
Nitrate (as N)		< 0.5			Grab	0.04	Colorimetric
Total Phosphorous (as P)		< 0.05			Grab	0.2	Digestion & Colorimetric
OrthoPhosphate (as P)		< 0.05			Grab	0.02	Colorimetric
Sulphate (SO ₄)		= 0			Grab	30	Turbidimetric
Phenols (Sum)		< 0.1			Grab	0.1	GC-MS2

For Orthophosphate: this monitoring should be undertaken on a sample filtered on 0.45µm filter paper

For Phenols: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

Additional Comments:	Default value of 01/01/09 and 0 where results not available. Ammonia result contains a saline interference. No sulphate result available.
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TABLE F.1(ii)(b): SURFACE/GROUND WATER MONITORING (Dangerous Substances)

Secondary Discharge Point

Discharge Point Code:	SW-4
MONITORING POINT CODE:	aSW-4d
Grid Ref (12 digits, 6E, 6N)	150426 / 043277

Parameter	Results (µg/l)				Sampling method	Limit of Quantitation	Analysis method / technique
	21/05/09						
Atrazine	< 0.01				Grab	0.96	HPLC
Dichloromethane	< 1				Grab	1	GC-MS1
Simazine	< 0.01				Grab	0.01	HPLC
Toluene	< 0.28				Grab	0.02	GC-MS1
Tributyltin	= 0				Grab	0.02	GC-MS1
Xylenes	< 1				Grab	1	GC-MS1
Arsenic	= 1.7				Grab	0.96	ICP-MS
Chromium	< 20				Grab	20	ICP-OES
Copper	< 20				Grab	20	ICP-OES
Cyanide	= 5				Grab	5	Colorimetric
Flouride	= 603				Grab	100	ISE
Lead	< 20				Grab	20	ICP-OES
Nickel	< 20				Grab	20	ICP-OES
Zinc	< 20				Grab	20	ICP-OES
Boron	= 2242				Grab	20	ICP-OES
Cadmium	< 20				Grab	20	ICP-OES
Mercury	< 0.2				Grab	0.2	ICP-MS
Selenium	= 14.7				Grab	0.74	ICP-MS
Barium	< 20				Grab	20	ICP-OES

Additional Comments:	TBT value is 0.02ug/l as Sn Tributyltin result to follow at a later stage. Flouride result contains a saline interference. Boron result contains a possible interference.
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TABLE F.1(ii)(a): SURFACE/GROUND WATER MONITORING

Secondary Discharge Point

Discharge Point Code:	SW-5
MONITORING POINT CODE:	aSW-5d
Grid Ref (12 digits, 6E, 6N)	150426 / 043277

Parameter	Results (mg/l)				Sampling method	Limit of Quantitation	Analysis method / technique
	01/01/09	21/05/09					
pH		= 8.3			Grab	2	Electrochemical
Temperature	= 0				Grab	0.5	electrochemical
Electrical Conductivity (@ 25°C)		= 35700			Grab	0.5	Electrochemical
Suspended Solids		= 10			Grab	0.5	Gravimetric
Ammonia (as N)		= 0.5			Grab	0.02	Colorimetric
Biochemical Oxygen Demand		= 3			Grab	0.06	Electrochemical
Chemical Oxygen Demand		= 22			Grab	8	Digestion & Colorimetric
Dissolved Oxygen	= 0				Grab	0	ISE
Hardness (as CaCO ₃)	= 0				Grab	0	titrimetric
Total Nitrogen (as N)		= 1.21			Grab	0.5	Digestion & Colorimetric
Nitrite (as N)		< 0.1			Grab	0.013	colorimetric
Nitrate (as N)		< 0.5			Grab	0.04	Colorimetric
Total Phosphorous (as P)		< 0.05			Grab	0.2	Digestion & Colorimetric
OrthoPhosphate (as P)		< 0.05			Grab	0.02	Colorimetric
Sulphate (SO ₄)		= 0			Grab	30	Turbidimetric
Phenols (Sum)		< 0.1			Grab	0.1	GC-MS2

For Orthophosphate: this monitoring should be undertaken on a sample filtered on 0.45µm filter paper

For Phenols: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

Additional Comments:	Default value of 01/01/09 and 0 where results not available. Ammonia result contains a saline interference. No sulphate result available.
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TABLE F.1(ii)(b): SURFACE/GROUND WATER MONITORING (Dangerous Substances)

Secondary Discharge Point

Discharge Point Code:	SW-5
MONITORING POINT CODE:	aSW-5d
Grid Ref (12 digits, 6E, 6N)	150426 / 043277

Parameter	Results (µg/l)				Sampling method	Limit of Quantitation	Analysis method / technique
	21/05/09						
Atrazine	< 0.01				Grab	0.96	HPLC
Dichloromethane	< 1				Grab	1	GC-MS1
Simazine	< 0.01				Grab	0.01	HPLC
Toluene	< 0.28				Grab	0.02	GC-MS1
Tributyltin	= 0				Grab	0.02	GC-MS1
Xylenes	< 1				Grab	1	GC-MS1
Arsenic	= 1.7				Grab	0.96	ICP-MS
Chromium	< 20				Grab	20	ICP-OES
Copper	< 20				Grab	20	ICP-OES
Cyanide	= 5				Grab	5	Colorimetric
Flouride	= 603				Grab	100	ISE
Lead	< 20				Grab	20	ICP-OES
Nickel	< 20				Grab	20	ICP-OES
Zinc	< 20				Grab	20	ICP-OES
Boron	= 2242				Grab	20	ICP-OES
Cadmium	< 20				Grab	20	ICP-OES
Mercury	< 0.2				Grab	0.2	ICP-MS
Selenium	= 14.7				Grab	0.74	ICP-MS
Barium	< 20				Grab	20	ICP-OES

Additional Comments:	TBT value is 0.02ug/l as Sn Tributyltin result to follow at a later stage. Flouride result contains a saline interference. Boron result contains a possible interference.
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Annex 2: Check List For Regulation 16 Compliance

Regulation 16 of the waste water discharge (Authorisation) Regulations 2007 (S.I. No. 684 of 2007) sets out the information which must, in all cases, accompany a discharge licence application. In order to ensure that the application fully complies with the legal requirements of regulation 16 of the 2007 Regulations, all applicants should complete the following.

In each case, refer to the attachment number(s), of your application which contains(s) the information requested in the appropriate sub-article.

Regulation 16(1) In the case of an application for a waste water discharge licence, the application shall -		Attachment Number	Checked by Applicant
(a)	give the name, address, telefax number (if any) and telephone number of the applicant (and, if different, of the operator of any treatment plant concerned) and the address to which correspondence relating to the application should be sent and, if the operator is a body corporate, the address of its registered office or principal office,	B.1	Yes
(b)	give the name of the water services authority in whose functional area the relevant waste water discharge takes place or is to take place, if different from that of the applicant,	Not Applicable	Yes
(c)	give the location or postal address (including where appropriate, the name of the townland or townlands) and the National Grid reference of the location of the waste water treatment plant and/or the waste water discharge point or points to which the application relates,	B.2	Yes
(d)	state the population equivalent of the agglomeration to which the application relates,	B.9(i)	Yes
(e)	specify the content and extent of the waste water discharge, the level of treatment provided, if any, and the flow and type of discharge,	C,D	No
(f)	give details of the receiving water body, including its protected area status, if any, and details of any sensitive areas or protected areas or both in the vicinity of the discharge point or points likely to be affected by the discharge concerned, and for discharges to ground provide details of groundwater protection schemes in place for the receiving water body and all associated hydrogeological and geological assessments related to the receiving water environment in the vicinity of the discharge.	F.1	No
(g)	identify monitoring and sampling points and indicate proposed arrangements for the monitoring of discharges and, if Regulation 17 does not apply, provide details of the likely environmental consequences of any such discharges,	E.3	No
(h)	in the case of an existing waste water treatment plant, specify the sampling data pertaining to the discharge based on the samples taken in the 12 months preceding the making of the application,	E.4	No
(i)	describe the existing or proposed measures, including emergency procedures, to prevent unintended waste water discharges and to minimise the impact on the environment of any such discharges,	G.3	No
(j)	give particulars of the nearest downstream drinking water abstraction point or points to the discharge point or points,	Not Applicable	No
(k)	give details, and an assessment of the effects, of any existing or proposed emissions on the environment, including any environmental medium other than those into which the emissions are, or are to be made, and of proposed measures to prevent or eliminate or, where that is not practicable, to limit any pollution caused in such discharges,	F.1	No
(l)	give detail of compliance with relevant monitoring requirements and treatment standards contained in any applicable Council Directives of Regulations,	E.1,E.4	No
(m)	give details of any work necessary to meet relevant effluent discharge standards and a timeframe and schedule for such work.	G.1	No
(n)	Any other information as may be stipulated by the Agency.	Not Applicable	Yes
Regulation 16(3) Without prejudice to Regulation 16 (1) and (2), an application for a licence shall be accompanied by -		Attachment Number	Checked by Applicant
(a)	a copy of the notice of intention to make an application given pursuant to Regulation 9,	B.8	Yes
(b)	where appropriate, a copy of the notice given to a relevant water services authority under Regulation 13,	Not Applicable	Yes
(c)	Such other particulars, drawings, maps, reports and supporting documentation as are necessary to identify and describe, as appropriate -	B	Yes
(c) (i)	the point or points, including storm water overflows, from which a discharge or discharges take place or are to take place, and	B.3, B.4, B.5	Yes
(c) (ii)	the point or points at which monitoring and sampling are undertaken or are to be undertaken,	E.3	Yes
(d)	such fee as is appropriate having regard to the provisions of Regulations 38 and 39.	B.9(iii)	Yes

Regulation 16(4) An original application shall be accompanied by 2 copies of it and of all accompanying documents and particulars as required under Regulation 16(3) in hardcopy or in an electronic or other format as specified by the Agency.		Attachment Number	Checked by Applicant
1	An Original Application shall be accompanied by 2 copies of it and of all accompanying documents and particulars as required under regulation 16(3) in hardcopy or in electronic or other format as specified by the agency.		Yes
Regulation 16(5) For the purpose of paragraph (4), all or part of the 2 copies of the said application and associated documents and particulars may, with the agreement of the Agency, be submitted in an electronic or other format specified by the Agency.		Attachment Number	Checked by Applicant
1	Signed original.		Yes
2	2 hardcopies of application provided or 2 CD versions of application (PDF files) provided.		Yes
3	1 CD of geo-referenced digital files provided.		Yes
Regulation 17 Where a treatment plant associated with the relevant waste water works is or has been subject to the European Communities (Environmental Impact Assessment) Regulations 1989 to 2001, in addition to compliance with the requirements of Regulation 16, an application in respect of the relevant discharge shall be accompanied by a copy of an environmental impact statement and approval in accordance with the Act of 2000 in respect of the said development and may be submitted in an electronic or other format specified by the Agency		Attachment Number	Checked by Applicant
1	EIA provided if applicable	F.1	Yes
2	2 hardcopies of EIS provided if applicable.	Not Applicable	Yes
3	2 CD versions of EIS, as PDF files, provided.	Not Applicable	Yes

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