MS51/4/538 Consolidated Observations – Replacement of existing outfall for Swords Waste Water Treatment Scheme

Marine Institute

As part of the expansion and upgrading of the Swords Waste Water Treatment Plant the applicants, Fingal County Council, propose to carry out works on the foreshore involving

- Demolition and removal of existing outfall structures which extend approximately 3m into the Broadmeadow River as shown on Drawing No C007795 DWG 5
- Construction of a temporary dam or sheet piling system of approximately 170m² as shown on Drawing No C007795 DWG 5 for the construction of a new outfall structure
- Construction of a new reinforced concrete outfall structure consisting of a reinforced concrete ground bearing base slab supporting a reinforced concrete wall as shown on Drawing Nos C007795 DWG 1, Drawing Nos C007795 DWG 2, and Drawing Nos C007795 DWG 3.

It is estimated that the duration of the construction works for the entire outfall pipeline will be 3 months.

The proposed new outfall structure is within the Malahide Estuary SAC (Site Code 000205) and adjacent to the Broadmeadow/Swords Estuary SPA (Site Code 004025). An Appropriate Assessment, as required under Article 6 of the Habitats Directive has been carried out and presented in the document entitled “Swords Wastewater Treatment Works Foreshore Licence Application Habitats Directive Assessment, Final September 2010”. It was concluded that subject to the implementation the mitigation measures set out in Section 4.6, no significant negative effects on SAC and SPA are likely to arise as a result of the works on the foreshore.

Given the location, nature and scale of the proposed work the Marine Institute is satisfied that, subject to the full implementation of the mitigation measures set out in Section 4.6 of the Habitats Directive Assessment, they will not have a significant adverse on the marine environment and has no objections to a permit being issued.

Engineering

Re Swords Waste Water Treatment Scheme- Foreshore Licence application to replace an existing outfall (MS51/4/538)-
-Your minute of 25/1/11 and Robert Doyle’s minute of 27/10/10 refers-
In relation to the above Fingal Co Co has made an application for a Foreshore Licence in relation to a proposal to upgrade/replace one of the existing outfalls to the Broadmeadow R (at the top of the Broadmeadow Estuary) in conjunction with the proposed expansion of the Swords WWTP in North Dublin. My report is as follows:

SUBMITTED DOCUMENTATION
The following documentation was submitted by Fingal Co Co in support of this application:

- Completed Foreshore Licence Application Form dated 20/1/11

- Drawings as follows:
  - No DWG1 Rev P1 “Overall Plan”
  - No DWG2 Rev P1 “900 diameter outfall pipe Plan”
  - No DWG3 Rev P1 “Proposed Outfall Structure Plan and Section”
  - No DWG4 Rev P1 “Geographic Co-ordinates of proposed Outfall Structure”.
  - No C007795 DWNG5 Rev P1 “Demolition Plan”

- Appendices (on CD soft copies)
  - Appendix A “Swords WWTP Foreshore Licence Application-Habits Directive Assessment” (for Outfall Structure and Pipeline) dated September 2010
  - Appendix C E.I.S for 90000 PE WWTP (1998)
  - Appendix C Details of land ownership

OVERVIEW
Planning permission was given in 1998 to increase the WWTP to a capacity of 90000 P.E. in two phases. The initial phase of this expansion was completed in 2003 when it reached its current design capacity of 60000PE. Since completion of Phase 1 Expansion Works in 2003, growth in the Swords catchment has outstripped the TP’s current capacity. Having now reached maximum capacity, further development in Swords is now being curtailed at the planning stage and therefore Fingal CC has decided to upgrade the TP to 90000PE in line with the 1998 EIS.
As part of the Detailed Design of the Swords WWTP expansion works to 90000PE, the hydraulic capacity of the final outfall system was assessed using an InfoWorks Hydraulic Model. The model estimated the capacities of the existing 750mm and 375mm diameter final effluent outfalls were 0.85m³/s and 0.13m³/s respectively giving a total combined capacity of 0.98m³/s. Based on the information from a flow and load survey carried out earlier in 2010, the inlet flow for 90000PE expansion at 6DWF has been estimated at 1.35m³/s. The existing final effluent outfall pipes are therefore approximately 0.37m³/s under capacity for the proposed 90000PE upgraded TP. Based on examination of the existing inlet sewer results from the hydraulic modelling, the estimated peak flow that can arrive at the works is of the order of 2.1m³/s. Following a detailed assessment of upgrade alternatives, Fingal CC has decided to replace the existing 375mm with a 900mm pipe which combined with the existing 750mm gravity outfall, will provide a capacity of approximately 2.2m³/s.

DESCRIPTION OF WORKS

There are three specific elements to this Foreshore Licence Application which are as follows:

i. Demolition and removal of existing outfall structures on state owned foreshore

ii. Temporary working area, for the construction of the new outfall, on state owned foreshore

iii. New outfall and outfall structure on non state owned foreshore (for the purposes of the Foreshore Acts this area will effectively become private foreshore once the outfall structures are installed hence it may be considered appropriate to deal with this element of the application under S10)

A more detailed description of the proposed works is set out below:

(i) Demolition of existing outfall structures (see Drawing No C007795 DRG 5 Rev P1)

The works involve the removal of existing structures which project approximately 2m beyond the riverbank of the Broadmeadow R at the top of the Broadmeadow Estuary. The existing outfall structures consist of a 750mm diameter concrete pipe and a 375mm diameter concrete pipe both with concrete surrounds. Both existing outfalls have cast iron hinged flap valves. The existing 375mm outfall pipe also has a manhole access chamber located on the pipe in the estuary beyond the riverbank. This manhole structure will also be removed. All...
demolition wastes associated with this work will be disposed of offsite in accordance with the Waste Management (Collection Permit) Regulations

(ii) Temporary working area on foreshore

In order to keep the area dry and prevent inundation of water from the estuary during the construction phase of the new outfall structure it is envisaged that a temporary dam or sheetpiling system will be required (an area of app 170m² is sought—see Drawing No DRG 4 Rev P1). In order to prevent inundation from the WWTP it is also envisaged that overpumping will be required.

(iii) New outfall and outfall structure
(See also Drawing Nos DRG 1, DRG 2 and DRG 3)

This involves the construction of a new reinforced concrete outfall structure consisting of a reinforced ground bearing slab supporting a reinforced concrete wall. New flap valves will be installed on the existing shortened 750mm concrete outfall pipe and the proposed 900mm concrete outfall pipe. The proposed 900mm outfall pipe will replace the existing 375mm outfall pipe. The proposed outfall structure will be recessed into the riverbank which will involve open excavation works. The existing outfall goes through a wayleave in land owned by a Mr Paul Walls, and Fingal CC is currently liaising this with him under the Water Services Act. Mr Walls does not object to the upgrading of the pipe (ref Q5 in Foreshore Licence Application Form). Due to limited cover over the proposed 900mm pipe a concrete surround will be provided to protect the pipe. A 1.1m high stainless steel handrail will be provided along the top of the reinforced concrete wall of the outfall structure to avoid the risk of falling from a height. The new outfall structure will permit safer access to the flap valves and the outfall pipes than from the existing outfall arrangement.

It is estimated that the duration for the construction works for the entire outfall pipeline will be 3 months.

APPROPRIATE ASSESSMENTS

A Habitats Directive Assessment has been completed to assess the impact of the proposed 900mm pipe and outfall structure on the Malahide Estuary SAC and the Broadmeadow/Swords Estuary SPA in relation specifically to the Foreshore Licence Application elements (see Appendix A). This concludes that due to the scale and location of the new outfall structure there will be no significant impact on the marine environment (e.g. coastal erosion, navigation, pleasure boating or sailing). The proposed outfall structure is being located in the same location as the current outfall structure; however the new structure will be recessed back unto the riverbank and not 2m out from the bank. With appropriate mitigation measures in relation to the timing of the works and water quality no significant impact is anticipated with regard to fisheries interests. Mitigation measures for a range of different environmental issues are presented in Section 4.6 of the Habitats Directive Assessment Report
COMMENT
These appear satisfactory and can be made a condition of the licence when/if granted subject obviously to a definitive view in this regard from the NPWS.

An Appropriate Assessment of the proposed WWTP upgrade in terms of the waste water discharge, on the Malahide Estuary SAC and the Broadmeadow Estuary SPA in relation to the Discharge Licence application to the EPA (under the Waste Water Discharge Authorisation Regulations, 2007 SI No 684 of 2007) has also been undertaken (ref Appendix B) This concludes that the proposed upgrade of the Swords WWTP may result in some impacts on the Malahide Estuary SAC and the Broadmeadow/Swords Estuary SPA and their qualifying interest, however this risk can be significantly reduced through complying with the relevant standards (to be set in the EPA Discharge Licence) and mitigation measures as outlined in Section 4.7 of the Appropriate Assessment Report. (these are in effect the same Mitigation Measures as outlined in Section 4.6 of the Habitats Directive Assessment Report in relation to the Foreshore Licence Application element-ref Appendix A)

COMMENTS/RECOMMENDATIONS
In terms of the Habitats Directive Assessment reports definitive views in this regard can be obtained from NPWS.
In relation to effluent quality standards from the Swords WWTP it is noted that Fingal Co Co have applied for a discharge licence to the EPA under SI No 684 of 2007.

Due to the scale and location of the new outfall structures there will be no significant impact on the marine environment (coastal erosion, pleasure boating, sailing etc). There will be no impact on navigation (pipes will not protrude onto the foreshore). With appropriate mitigation measures in relation to timing of the works and water quality no significant impact is anticipated with regard to fisheries interests.

A site inspection on 4/3/11 confirmed that there is likely to be no impact to navigation or fishing activities (the major noteworthy feature was the presence of numerous birds, swans in particular in the general area)

The mitigation measures as presented in S 4.6 of the Habitats Directive Assessment Report dated September 2010 (ref Appendix A) can be made a condition of the Licence when/if granted (subject to a definitive view from NPWS in this regard).

In conclusion Engineering Inspectorate has no objection to this application proceeding to public notice and subject to no objection arising from that process to the granting of a licence subject to the following conditions:
1(i) A detailed Contractor’s Construction and Method Statement for all pipe laying and construction operations on or adjacent to the foreshore shall be submitted to the Department of Environment Heritage and Local Government prior to the commencement of any works on or adjacent to the foreshore

1(ii) On completion of the works the installation shall be certified by a competent Chartered Engineer as being in accordance with the approved Drawings and good engineering practice.

2(i) Any damage caused to the foreshore in connection with the proposed works shall be made good on completion of the works to the satisfaction of DOEHLG

(ii) The Applicant shall ensure that reinstatement of the adjacent shoreline is undertaken in such a manner that it will not cause any damage or negative environmental impact to the adjacent foreshore.

(iii) The site shall be secured during the course of the works from public access or encroachment by means of suitable barriers and signage and the Applicant shall comply with the relevant Health and Safety legislation.

3 (i) The decommissioning, demolition and removal of the existing outfalls and associated structures from the foreshore shall be undertaken in accordance with the submitted Foreshore Licence Application document

(ii) Further to 3(i) above the disposal of the decommissioned outfall pipelines, associated structures and any excavated unsuitable materials in connection with these works shall conform to the relevant waste disposal legislation and the foreshore shall be made good on completion of these works to the satisfaction of the DOEHLG

4(i) Mitigation measures as set out in Section 4.6 of the Habitats Directive Assessment Report dated September 2010 shall be adopted unless otherwise varied by other condition in this Licence or on direction by NPWS and/ or IFl.(Eastern River Basin District).

4(ii) Further to 4(i) above the Applicant shall adhere to the requirements of NPWS (DOEHLG) and UAU (DOEHLG) in respect of any requirements that they may have during the course of the works.

5(i) Appropriate methods of operation shall be adopted in order to ensure that no spillage of fuel cement or any other pollutant
matter occurs to the Broadmeadow Estuary/Irish Sea during the construction phase (pipes and outfall installation) period.

5(ii) Contractor’s arrangements for the control of pollutants should be notified to both DOEHLG and Inland Fisheries Ireland(Eastern River Basin District) prior to works commencing on or adjacent to the foreshore.

6 The Applicant shall take measures to ensure that the outfall arrangement is maintained in a state of good repair and condition to prevent it becoming a navigational hazard, obstruction to fishing activity, injurious to public health and safety or a source of pollution.

7 The Applicant shall use that part of the foreshore the subject matter of this Licence for the laying, monitoring and use of the outfall pipes for the purposes as outlined in the application and for no other purposes whatsoever.

8(i) This Foreshore Licence is conditional on the Licensee obtaining a valid discharge consent from the EPA in accordance with SI No 264 of 2007 “Wastewater(Authorisation)Discharge Regulations”.

8(ii) A copy of the Consent referred to at 8(i) above shall be forwarded to DOEHLG (Foreshore Unit) once received from the EPA.

9 The Applicant shall notify this Department at least 14 days in advance of the commencement of works on the foreshore.

10(i) Disposal of unsuitable excavated material in connection with the outfall installation shall conform to the relevant Waste Disposal legislation.

10 (ii) Any imported fill material shall be free of any contaminants and sourced from authorised/licensed sources.

Note
Conditions 4(i) and 4(ii) above should be considered as provisional and subject to a definitive view of NPWS as to correct rewording, removal or other amendment as appropriate

Marine Survey Office
No objections subject to the publication of a local marine notice.

**Inland Fisheries Ireland**

In regard to this application, I attach an extract from the then-Eastern Regional Fisheries Board (ERFB), now Inland Fisheries Ireland (Blackrock) in regard to its submission to the EPA re discharge from proposed upgrading of the Swords plant, dated September 2009.

“It is essential to note that sufficient treatment capacity must be available both within the receiving sewerage system locally and downstream at the relevant Waste Water Treatment Plant at all times in order that the ecological integrity of the ultimate receiving water (Broadmeadow Estuary) is protected. The Broadmeadow (Malahide) Estuary is approximately 3.4 km² in size and is considered to be strongly eutrophic. The outer estuary, by comparison, shows generally good quality, and is generally not adversely impacted by the inflow of the poorer quality water from the inner estuary. The Broadmeadow Estuary was considered by the WFD characterisation report to be category 1a “At Risk”, on the basis of multiple pressures. It is “At Risk” from both WwTP’s and CSOs, and “At Risk” on impoundments and “Probably at Risk” on intensive land-use and coastal defences, as well as scoring “At Risk” for OSPAR (dangerous/hazardous substances) and UWWTD sensitive water status.

Part II (5) of the **EUROPEAN COMMUNITIES ENVIRONMENTAL OBJECTIVES (SURFACE WATERS) REGULATIONS, 2009** which states ‘A public authority shall not, in the performance of its functions, undertake those functions in a manner that knowingly causes or allows deterioration in chemical status or ecological status (or ecological potential as the case may be) of a body of surface water. All measures available to the Local Authority should be implemented to seek an improvement in water quality in fresh and transitional waters within its jurisdiction. Design criteria for the Swords plant must be in line with the European Communities Environmental Objectives (Surface Water) Regulations 2009, in achieving ‘good status” ecological / chemical by 2015. The additional objectives of the Sensitive areas under the Urban Waste Water Treatment Directive (Broadmeadow Inner Estuary) and Shellfish Waters Directive should also apply.”

I consider the above to be very pertinent to the current Foreshore application. There are two components to the Fingal Council’s plans in respect of the Swords WWTW. One involves upgrading capacity within the plant and the second relates to upgrade in capacity of the discharge pipe network to take account of the former. The foreshore application being considered here relates to the latter i.e. replacing an existing outfall pipe of 375 mm diameter with one of 900 mm diameter.

The impacts on the SAC and SPA of the proposed engineering works, in regard to laying of new pipeline and of concrete outfall structure set into the riverbank, are clearly dealt with in the Natura 2000 statement. The proposal, in itself, would not have an adverse impact on the fisheries interests i.e.
migratory salmon and trout life stages traversing the Broadmeadow estuary; mullet leisure angling resource etc. However, the proposed works, in the absence of upgrades in the WWTW could facilitate increased volume discharge of material that had not achieved the required level of treatment, as specified in terms of BOD and Suspended Solids.

There is an onus under Water Framework Directive (WFD) to increase the quality of waters to the level of ‘good’ by 2015. This must be borne in mind in granting any Foreshore licence. It should be a condition of licence for this application that the upgrade in quality of treatment of effluents in the Swords WWTW must be developed in tandem with any enlarged pipe work at outfall in order not the prejudice water quality conditions in the inner Broadmeadow estuary.

The inner Broadmeadow estuary is classified for WFD as a lagoon. This is a priority habitat type under Annex I of the Habitats Directive.

The preferred fisheries option would be for effluent outfall to be routed along the inner Broadmeadow for discharge to the fully-tidal waters downstream of the railway embankment i.e. on the marine side of Malahide.

NPWS

The proposed development (Foreshore Ref: MS51/4/358) would seek to demolish and remove an existing outfall structure for Swords Waste Water Treatment Plant, facilitation of temporary working area surrounding the proposed construction, and a new outfall and outfall structure on the foreshore. The existing outfalls consist of 750 mm and 375 mm diameter concrete pipes. As part of the works a temporary dam or sheet piled structure would be constructed. The construction activities associated with the works would involve the replacement of both pipes with a 900 mm diameter structure. These would be covered by means of a steel flap. Finishing and reinstatement works will be undertaken in the vicinity of the development. The existing outfall pipes have insufficient capacity to discharge material from the upgraded sewerage treatment plant.

As part of the application a Natura Impact Statement has been constructed to assess the potential impact to the adjacent designated sites. An ecological assessment was undertaken in the vicinity of the proposed development utilising various techniques including granulometric analysis, benthic biological surveys, and remote survey techniques. The prevailing sediment in the areas surrounding the development was silt/clay with occasional areas of fine sand. The intertidal zone was interspersed with the algae Pelvetia canaliculata, Enteromorpha sp., Ascophyllum nodosum and Fucus spiralis. The most abundant invertebrate species recorded in the intertidal survey included Oligochaeta sp., Enchytraeidae sp., Tharyx sp., Tubificoides benedii, Cerus pedunculatus, Balanus balanus, Mytilus edulis, Hediste diversicolor, Heterochaeta costata, and Tubificoides pseudogaster. The dominant biotope found in the intertidal zone of Broadmeadow Estuary was characterised by oligochaetes. It is considered by the applicant that these species are
opportunistic, pollution tolerant species are often indicative of organically or enriched sediments. The 11 subtidal stations sampled in the Broadmeadow Estuary were for the most part dominated by the oligochaetes *Tubificoides* spp, this is particularly true for the inner estuary in closest proximity to the proposed development. In the outer estuary the overall species list was more diverse with an established *Lanice conchilega/Sabella pavonia* community. The species *Nephtys spp., Glycer*a spp., syllid and cirratulid polychaetes, bivalves such as *Abra* spp. and *Aoridae* and amphipods were also present. The document indicates that the weir at the mouth of the estuary has an important part to play in deciding the species composition of the site. Tidal exchange is reduced towards the inner part of the estuary.

There is a potential for harmful substances to enter Broadmeadow Estuary as a result of the proposed development. These could include in the construction phase, concrete runoff, suspended solids etc and during the operational phase the nutrient load from the outfall could have an interaction with the constituent habitats of the designated site. There will also be some temporary habitat loss associated with the development, mainly surrounding the construction site for the two new outfall pipes. This is likely to be short in duration and confined to a relatively small area (1300m²). It is likely that this habitat would re-establish subsequently. The document concludes that subject to the application of specified mitigation the proposed development would not result in significant alteration of the conservation value of the designated area. This is concluded on the basis that the discharge material would not significantly change from the existing.

**Marine Research Observation for internal use**

- The proposed development would occur within and adjacent to Malahide Estuary cSAC (Site Code: 000205), notified for the marine qualifying interest habitat *mudflat and sand flat not covered by seawater at low tide*.

- The proposed development would also occur within and adjacent to Broadmeadow/Swords Estuary SPA.

- The proposed development would change the outfall diameter of two existing pipes. These would to be used to change the flow capacity of the adjacent waste water treatment plant.

- The impact of the proposed development would result in a direct loss of habitat surrounding the construction works. It is likely that this impact would be temporary in a marine ecological context. There is likely to be a much smaller loss of habitat associated with the direct footprint of the development which is unlikely to be significant.

- There is a potential for some indirect habitat loss as result of potentially increased discharge into the surrounding areas. The applicant notes that the areas immediately adjacent to the existing discharge could be characterised as of poor environmental quality, and have been since prior to the designation of the Natura site. It is anticipated that the near-
field effect of the discharge would not exasperate this condition and it is expected that areas exhibiting what could be termed higher quality habitat are unlikely to be affected.

- There may be issues in relation to wild birds that have not been considered, as they are outside of the remit of Marine Research, and given the importance of the site should be reviewed by the Divisional Ecologist or Birds Unit.

**Marine Research Recommendation for external communication**
The competent authority should attach the following conditions to consent in the interest of maintaining conservation value of marine habitats within Malahide Estuary Special Area of Conservation

1. Any in-river works should be executed so as to minimise the suspension of solids. Disturbance of banks in the channel must be kept to a minimum.

2. Any machines working in the watercourses must be free from leakages and spillages of fuels, oils, greases and hydraulic fluids should be avoided.

3. Any refuelling or maintenance of plant or vehicles must be undertaken in the bunded area.

4. Measures designed to reduce leaching of concrete or other construction material should be implemented to minimise impact to the conservation site.

5. No works should be undertaken outside of the temporary construction compound without the prior notification of the local National Parks & Wildlife Service Conservation Ranger

**SFPA**

No objections due to location of works.

**UAU**

No objections or conditions.

**DAFM**
Having consulted our technical advisors the Department is satisfied that this development will not adversely affect aquaculture or sea fisheries related activities, given its location.

The following observations were made which DECLG may wish to take into consideration:

a) The SFPA should be consulted on the location of any casual pickers of foreshore shellfish and any particular advise to be given to them.

b) DAFF should be consulted by the EPA with respect to the licensing of the effluent. This area has several Habitat Designations and is widely used by mariners as there is a nearby yacht club and marina.