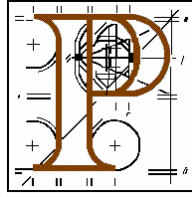


An Bord Pleanála



Inspector's Report

Board Reference:

04.YA0006

Proposed Development:

Proposed Wastewater Treatment Plant at
Carrigtohill, County Cork

Local Authority:

Cork County Council

Inspector:

Daniel O'Connor

**PROPOSED WASTE WATER TREATMENT EXTENSION
CARRIGTOHILL SEWERAGE SCHEME**

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1.0 STATUTORY REQUIREMENTS

Cork County Council, by letter of 4th July 2008, applied to An Bord Pleanála for approval for the construction of a wastewater treatment plant at Carrigtohill and enclosed three copies of the Environmental Impact Statement. The application was made under Section 226 of the Planning and Development Act 2000 and in accordance with Regulation 118 of the Planning and Development Regulations 2001, Part 10. A copy of the notice published in the Irish Examiner of 20th June 2008 was included with the application.

It is stated that copies of the Environmental Impact Statement were sent in accordance with Section 226 of the Planning and Development Act 2000 (as amended) to the following prescribed bodies on the 26th June 2008: -

- Development Applications Unit (DAU) of the DoEHLG.
- Department of Transport.
- Department of Agriculture, Fisheries and Food (DAFF).
- South-Western Regional Fisheries Board.
- HSE.
- Failte Ireland.
- Environmental Protection Agency.
- Minister for Communications, Energy and Natural Resources.
- The Arts Council.
- National Trust for Ireland.
- Heritage Council.

The requirements of Section 121 of the Planning and Development Regulations (SI 600 of 2001) appeared to have been complied with in relation to the notification of the prescribed bodies.

I carried out a site inspection on 22nd September 2008.

1.1 Responses

Responses were received from the following: -

- (a) **Development Applications Unit of the DoEHLG.**

This response was dated 31st July 2008 and deals with nature conservation, archaeological and architectural recommendations.

In relation to nature conservation, the response notes that part of the proposed treatment works, together with most of the proposed outfall pipeline and the diffuser are located within Great Island Channel candidate SAC (cSAC 1058) which was designated for mudflats and sand-flats and Atlantic salt meadow which are habitats listed in Annex I of the Habitats Directive. The response also notes that the area is located within the Cork Harbour SPA which is designated for species listed in Annex I of the Birds Directive. It states that in addition, the proposed WWTW is located within the Great Island Channel proposed National Heritage Area and maintenance of the conservation value of the site is an objective of the Cork County Development Plan.

The response states that the option of discharging into part of Cork Harbour which is not part of the European site has not been specifically addressed in the EIS, and in particular, the option which would result in discharge to undesignated waters, namely Option 1 has not been fully assessed in environment rather than cost terms.

The DEHLG response states that according to the EIS, it was not likely to have a direct adverse affect on the cSAC. It states however that during construction, the development has potential to indirectly adversely affect the adjacent Slatty Pond mudflats. The response states that the NPWS does not have the resources to attend to the post-planning details of pollution control which should be standard best practice for construction works. The submission notes the statement in the EIS on Page 121 that the low-diversity of species might reflect toxic impacts in the past. It states that an assessment of the effects of tidal re-suspension of potentially toxic heavy metals or organic compounds due to the pipeline mudflat excavation is not given.

The response requested further information to be submitted to the DoEHLG in respect of the following: -

- An assessment of alternative no. 1 which was the piping via the Old Youghal to Carrigrennan WWTP in terms of effects on European Sites.
- An assessment of the adverse effects, if any, of the tidal re-suspension of any potentially toxic heavy metals or organic compounds as a result of the excavation and backfill of the pipeline, based on an analysis of mudflat samples.
- Details of construction works, pollution control procedures and the timing of the works, mitigation measures with a reassessment of the likely affects on the cSAC and SPA.

In relation to archaeological recommendations, the submission notes that mitigation has been identified in the cultural heritage section of the EIS.

The submission recommends that the assessment of the application should take impact on architectural heritage into account.

(b) Submission of the South-Western Regional Fisheries Board – letter dated 24th July 2008.

The submission of SWRFB is that all future works should be shown to be compatible with existing legislation and the principal of sustainability. It notes the proposal to culvert and divert existing on-site streams to facilitate the construction of the new wastewater treatment plant. (Reference Page 53 of the EIS). The submission states that no details are provided as to the habitat value of the streams or their flow characteristics or their role as a linkage to upstream watercourses. The submission states that the SWRFB has a no-net loss policy with respect to the loss of aquatic habitat. It states the Board appreciates the importance of the proposed development, but the potential for a substantial and permanent loss of habitat exists. The Board feels that a detailed study of the habitat value of the affected streams is necessary.

The Board submitted that should permission be granted for the proposed development, a condition should apply as follows:

“The total loss to or impact on fisheries resulting from the works will be quantified within a six month period and appropriate counter-balancing measures will be agreed between the applicant and the South-Western Regional Fisheries Board so that a no-net loss to fisheries occurs as a result of the development. The agreement should be finalised within a 18-month period.”

(c) Response of Environmental Protection Agency – reply of 17th December 2008.

The Board sought the observations of the EPA in relation to Regulation 44 of the Wastewater Discharge (Authorisation) Regulations 2007 (No. 7684 of 2007). The EPA response referred to the application on 14th December 2007 by Cork County Council for a discharge Authorisation for Carrigtohill (Ref D0044-01).

Reference to the application on the EPA website does not indicate the Agency views on the application but third party submissions with some quoted responses from the Local Authority would appear to indicate severe difficulties with regular storm overflows and a suggestion that storm overflows quoted in the EIS are seriously understated.

This issue is referred to in the section on Assessment in sections 4.1 and 4.11.

2.0 PROPOSED DEVELOPMENT

- 2.1** The proposal is to extend the wastewater treatment works at Carrigtohill, County Cork. The proposal involves building effectively an entirely new works to the west of the existing construction which was installed in stages and is currently rated at 8,500 p.e.

The existing loading on the plant is given as 12,000 p.e. and the rated capacity of the proposed works is 45,000 for Stage 1 and 62,000 p.e. for Stage 2.

It is proposed to construct a 1,200 millimetre diameter outfall pipe from the works beyond the discharge point of the existing works to a location in Slatty Waters approximately 800 metres into the channel.

2.2 Construction Details

The EIS gives an indicative layout for the works which includes a covered inlet building of 12 metres in height and 4 SBR tanks for the Phase 1 proposal with associated aeration tanks with stormwater tanks and sludge treatment facilities. (Best illustrated on Figure 11.2 of the EIS).

The proposal is to use Carrigtohill WWTW as a sludge satellite centre.

The outfall pipe, which varies between 1,200 and 1,500 millimetres diameter would discharge at North Point in Slatty Water.

2.3 Design Loadings

The Phase 1 capacity is given as 45,000 p.e. and the Phase 2 at 62,000 p.e. The difference is the allowance for AMGEN which was allocated 54 hectares in February 2006. The catchment assigned in total is 638 hectares and the domestic volume is estimated at 18,434 p.e.

The EIS states that the new WWTP standards would be satisfactory for the Phase 1 situation, but that lower values for BOD and nitrogen would be required for the Phase 2 situation.

The EIS calculates the BOD loading and estimates that this would be 253 kgs/day for Phase 1 and that de-watered sludge would be estimated at 5,749 m³ per annum. It states the aeration basins would be approximately 20 metres by 40 metres and would be 4.7 metres deep and that the sludge dewatering building would have an associated sludge holding tank of 500 m³ capacity.

2.4 Alternatives Considered

In relation to alternatives, the EIS notes that a DBO Contract is proposed and therefore the tenderers would be free to offer different processes. However, the indicative layout shows an SBR process. It refers to the Cork Sludge

Management Plan in relation to sludge and notes that the Middleton Works is the hub centre and that provision would be made for accepting and dewatering of imported liquid sludges at Carrigtohill.

The main consideration of alternatives relates to the treatment plant location and this primarily involves whether to treat the effluent at Carrigtohill or to pump it to the larger Carrigrennan WWTW on Little Island.

In relation to the Carrigrennan alternative, three options are outlined for rising mains and these are illustrated in Figure 4.1 of the EIS. The first option would involve using the N25 and would be 6 kilometres in length and would have difficulties in relation to foreshore licence requirements and difficulties with restrictions on using the road corridor as it is a national route. The second option would involve a longer route around the edge of Fota Island and crossing to Carrigrennan from the Marino area. This is stated in the EIS to be the most favoured of the pipeline routes. The third option would involve going along the north of Fota Island and would be 5 kilometres in length. The conclusion in the EIS was that this route was not satisfactory for a pipeline.

The EIS compares the cost estimates to the option of treating at Carrigtohill and concludes that a wastewater treatment plant at Carrigtohill was the most economically advantageous option. It also states that there would be strong strategic reasons for developing a plant at Carrigtohill which would allow the retention of any available capacity at Carrigrennan for Cork City, including areas which have no alternative treatment possibilities.

The conclusion in the EIS is that the alternative of transferring raw sewage to Carrigrennan would offer no significant environmental benefit over the proposed expansion of the plant at Carrigtohill. It also states that the expansion of the plant with the relocation of the outfall to North Point has the least environmental impact of all the alternatives considered and that such expansion could be accommodated at the site without causing undue negative environmental impacts. (It is noted that the EIS does not elaborate on the environmental aspects of the choice and this is commented upon by one of the submissions received).

2.5 Procurement

The proposal is to construct the works using the design, build and operate procedure. However, in the indicative layout, the impacts are evaluated on an SBR process.

2.6 Phasing

The Phase 1 works is given as 45,000 p.e. and the Phase 2 works which would include the major Amgen site would be 62,000 p.e. A comment in the EIS is that if the Amgen site were to require to be developed earlier, that an interim

solution might be required. This is difficult to envisage being capable of being provided as the population equivalent ascribed to Amgen is of a size that would appear to require EIA in its own right as it exceeds 15,000 p.e.

2.7 Development Plan

In Section 5.2.13 of the Development Plan it is included as an objective to carry out a major upgrade of the existing treatment works in a number of locations, including in Carrigtohill. Objectives INF2-5 which refers to sewerage infrastructure needs and INF2-6 which refers to sludge management plan are noted as relevant.

In relation to water quality, Objective ENV1-1 refers to the River Basin Management Plan and states that Cork County Council in partnership with other local authorities would prepare River Basin Management Plans in accordance with the EU Water Framework Directive. Objective ENV2-5 refers to the objective to maintain the conservation value of NHAs and ENV2-6 has the objective to maintain the conservation value of cSAC's, while ENV2-7 has the objective of maintaining the conservation value of SPAs.

Chapter 10 of the Development Plan states that three special local area plans would be completed and one of these includes the Carrigtohill area. Objective LAP 4-2 relates to Carrigtohill where it states it is an objective to carry out a special Local Area Plan to assess the capacity of certain areas in Carrigtohill to accommodate the level of development envisaged by the Cork Area Strategic Plan, having regard in particular to the proximity of the rail line and town centre traffic conditions.

3.0 IMPACTS IDENTIFIED

The impacts as identified in the EIS are follows:

- Water, both surface and groundwater.
- Impacts on air, including noise, odour, aerosols and light.
- Impacts on soils.
- Ecological impacts.
- Socio-economic impacts.
- Material assets.
- Visual impact.
- Cultural heritage.
- Interactions and long-term impacts.

3.1 Impacts relating to Water

The discharge point for the effluent in Slatty Water Estuary (North Point) forms part of SAC No. 1058 known as the Great Island Channel. The existing outfall is at the eastern extremity of Slatty Water, while the proposed outfall at North Point is 800 metres west north-west of that point. The total length of Slatty Water from east to west to the Cobh Railway Line is given as 2,950 metres and is tidal. The EIS states there is a low level of freshwater discharge into Slatty Waters and the main body is saline and tidal. It notes that the dilution and mixing of the water is provided entirely by the ebb and flow of the tides in the vicinity of Harper's Island. The existing discharge to Slatty Water has been in place since 1985 and the indications are that the plant is operating above its capacity and that the effluent does not meet required standards.

Slatty Waters has been designated as sensitive and this indicates a requirement for phosphorous at 2mg/l and for nitrogen at 15mg/l. It is noted that there are no designated bathing areas in the estuary.

The EIS states the model runs indicate an average concentration at the outfall point of 3.13mg/l for 45,000 p.e. It notes that for a Phase 2 development, the concentration of BOD would need to reduce in the effluent from 25 – 20 mg/l. It states that the modelling indicated a peak at Bellevelly Bridge for the combined discharges from Carrigrennan and Carrigtohill of 11 mpn/100mls.

The EIS predicts that the standard of treatment of the wastewater would be substantially improved and that the relocation of the outfall would improve dispersion of the final effluent in Slatty Water. It predicts there would be an elimination of storm water overflows from the WWTW except during exceptionally adverse weather conditions. It is concluded in the EIS that the potential impact of the proposed works on the area is wholly positive.

In relation to groundwater, the karstified nature of the local geology is noted and the importance of preventing sewage entering the groundwater is also noted. The EIS states that in relation to impacts on groundwater, that proper construction and water tightness of pipes would ensure no negative impact on the water quality of the groundwater.

The 2007 Wastewater Discharge (Authorisation) Regulations (SI No.684 of 2007) are relevant to this application and the Local Authority is required to comply with the Regulations with particular reference to Regulation 5, while the Board may not in accordance with Regulation 41(1)(b) subject any permission to conditions which are for the purposes of controlling the wastewater discharge.

However Regulation 42 relates to the transitional period where there is no certificate issued by the EPA. The issues are considered in the Assessment section (4.0) of this report.

3.2 Impacts on Air

In relation to **noise**, it is noted that the nearest residences are 230 metres to the west and 250 metres to the south-west of the plant. It states that the two locations of highest ambient noise were due to the proximity of traffic on the R624. The EIS selects a level of 35 dBA for nighttime and 45 dBA for daytime at any house. It states that the noise levels at the plant are likely not to give rise to noise-related complaints.

The EIS states that no malodours could be detected during a site visit in February 2007 from the existing treatment plant. In relation to predicted **odours**, the EIS states a modelling exercise was carried out and this would have been on an indicative design as the DBO contract would contain performance specifications. The EIS lists the various likely odour generators and states that for Phase 1, the 98 percentile odour concentrations would be less than 0.5 odour units/m³ at 100 metres from the site boundary. It states this compares with an odour concentration of 5 odour units/m³ which is used as a criterion for determining possible nuisance complaints.

In relation to **aerosols**, it states that aerosols would only present a potential health hazards to anybody within 20 metres of the operations. The EIS states the predicted impact of aerosols to be minimal.

With respect to **light**, the proposal is to provide lighting to illuminate all of the treatment units and access roads and states that any negative impact would be minimised by mitigation. The EIS predicts that there are no climatic affects in the region which would require any special measures to be taken during the design of the project.

The European Communities (Waste Water Treatment) (Prevention of Odours and Noise) Regulations (SI No. 787 of 2005) refer to the responsibilities of

operators of wastewater treatment plants to avoid causing nuisance through odours and noise. There is no provision for control and monitoring of these emissions by the EPA so they will be considered in the chapter on Assessment.

3.3 Impact on Soils

The EIS indicates that soft peats and silts overlies sands and gravels with layers of clays and silts in the vicinity of the plant. It states that construction would constitute the main impact and that it was anticipated that ground levels would be raised prior to the construction due to the high water table. It states that the predicted impact of the proposal would be minimal and that no monitoring of the soil on the site would be required.

3.4 Ecological Impacts

The habitat map which is contained in Appendix C of the EIS indicates the following habitats: -

- Riparian Woodland – WN5
- Marsh CM1/immature woodland – WS2
- Reed and large sedge swamp – FS1
- Amenity grassland – GA2
- Drainage ditch – FW4
- Tree line – WL4

The prediction is that the wet-woodland area (WS2) would be affected by the provision of the new plant and would potentially support a variety of relatively common countryside birds. The EIS states the designation of the site is of local value and the impact of its removal is considered to be of high significance.

In relation to mammals, it states there is no evidence to suggest that otters breed within the area. The prediction is that with mitigation in place, the long-term impact of the proposal would be negligible.

In relation to **aquatic habitats**, the SAC status of the Cork Harbour, Great Island Channel is noted as is the SPA designation. The EIS refers to a number of studies that have been previously carried out and that water quality deterioration has been noted. It states that following the commissioning of Carrigrennan Plant, it was expected that water quality would significantly improve.

The EIS states that on the upper shore, there are **small amounts of algae**. It states the mudflats which are exposed at low tide have a black anoxic layer close to the surface and this it is stated could reflect past toxic impacts or high levels of nutrient enrichment.

It notes that the potential impact is to increase the total nutrient loading over time, despite the improved treatment standard. The prediction is that nutrient levels should remain within parameters set by the EPA for sensitive estuarine and coastal waters. The EIS proposes mitigation measures including: -

- Avoidance of the wintering period for the outfall pipeline construction.
- Reuse of dredged sediments within Slatty Water to prevent them from drying out.
- Containment of silt arising from the treatment plant during the development of the site.
- Monitoring of nutrient levels, macro invertebrates and wintering birds.

The EIS states there would be localised disturbance in the mudflats during construction, but the affected area should recolonise relatively quickly.

3.5 Socio-Economic Impacts

A growth rate of approximately 20% per annum between 2002 and 2006 is recorded for Carrigtohill. It states that current planning permissions include a development for 1,600 dwellings. It states the Cork Area Strategic Plan (CASP) considered Carrigtohill to be one of the significant growth potential areas. It states that arising from that, a special Local Area Plan (SLAP) increased the zoning from 584 – 638 hectares. It states this gives the final design population as 18,433 direct residential with 2,787 p.e. for institutional and 24,008 for industrial wastewater p.e. excluding the 17,777 p.e. for Amgen.

The prediction is that the wastewater treatment plant would enable the sustainable development of Carrigtohill Town and its environs. It states that the plant would have a power requirement of less than 500 kW and that a stand-by generator would be provided in the case of power failure.

In relation to **Transport and Communications**, the prediction would be that there would be two one-way trips per working day for sludge. It states also that the long-term impact of the proposal on local traffic would be low.

3.6 Material Assets

The prediction in the EIS is that the final effluent standards would be consistent with the dual targets of complying with the regulations and operating within the assimilative capacity of Slatty Waters. It notes that most of the existing structures and buildings would be expected to be demolished after completion of the new works.

3.7 Visual Impact

The EIS describes the character of the area as being mixed with industrial and commercial developments to the north and east, agriculture and open water to the south and Slatty Waters and the N25 to the west.

The EIS states that the most likely external finish on the works would be a combination of high quality cladding and plaster block work. Three photomontages are given of the plant and Figure 11.1 gives sections through the site based on the indicative design. Embankments varying between 2 and 6 metres in width and between 1.5 and 2.0 metres in height are proposed above the raised ground level. While the perspective views appear to indicate a height of up to 15 metres, the height of the building is given in Chapter 3 of the EIS as being 12 metres. The EIS predicts that given the topography of the site, the impact of the embankment and combination with screening would reduce the visibility of the site from all sides, but that the taller buildings would remain visible from surrounding areas.

3.8 Cultural Heritage

The specialist study in Appendix D of the EIS states there are 52 recorded monuments surrounding the proposed development area and that there would be a direct impact on two recorded archaeological monuments in the vicinity of the development, but this would be minimal due to previous development in those areas. A further specialist report in Appendix D states that the outfall pipeline is not located within a zone of any recorded archaeological sites, but that there are three known sites in the environs including evidence of prehistoric settlement.

The EIS states that as the mudflats are exposed at low tide, it would be possible that formerly unrecorded sites, including archaeological material could be uncovered during disturbance in the vicinity of the pipeline. Mitigation measures are stated to include: -

- Walking of Slatty Water estuary at low tide with non-intrusive inspection of the inter-tidal zone and riverbed.
- Metal detection survey of the area to be undertaken.
- Qualified archaeologist to require a license for work to be issued by the DoEHLG.
- Provision to be made to facilitate excavation or recording of archaeological material that may be uncovered.
- The prediction in the EIS is that subject to the mitigation strategy as proposed, the development would not have any impact on the archaeology of the area.

3.9 Interactions and Long-Term Impacts

In the EIS a brief summary of the impacts are given: -

- Enhanced water quality and reduce public health risk arising from movement of the outfall point.

- Facility would significantly enhance the town's ability to attract industrial and residential developments.
- Noise and odour impacts kept within the works boundary.
- Visual impact would be minimised.
- Natural habitat disruption would be temporary.
- Limited increase in traffic in construction period.

The EIS states that it had demonstrated that the works would have a positive impact on the environment and that mitigation measures would confine impacts to accepted limits and that the mitigated impacts would not produce a cumulative impact of any greater significance.

4.0 ASSESSMENT

The assessment examines the various impacts identified in the EIS. As the proposal is for an expansion of the treatment works, certain impacts would be less significant than for a greenfield location. The issues examined include the following: -

- Impacts on water, with particular reference to the assimilative capacity of Slatty Water.
- Impact on designated areas.
- Cultural heritage impacts.
- Landscape and visual impacts.
- Socio-economic and material assets.
- Odour, noise and climate.
- Soils.
- Traffic.
- Interactions.

4.1 Impacts on Water

The environmental impact statement indicates there would be an improvement in relation to impacts on the receiving water arising from the operation of the new works and the alteration of the discharge point. However, it also acknowledges that the nutrient loading on the receiving waters would increase with an expanded works. It is noted that the current loading on the plant is estimated to be approaching 12,000 p.e. and that the Phase 1 proposal would represent an almost 4-fold increase in loading of the works. It is accepted that the new outfall point, located 800 metres further into the estuary would improve the position regarding impact on receiving waters.

The modelling exercise is noted and also the stated need to reduce nitrogen and BOD concentrations in the Phase 2 effluent in order to achieve satisfactory dilutions. It is considered that the case for any further expansion beyond Phase 1 would need to be made in more detail before being approved. Therefore it is considered that any approval should be restricted to the Phase 1 works or 45,000 p.e.

The tidal nature of the estuary is noted and based on the Environmental Impact Statement and the modelling exercise carried out, it is considered that as far as

assimilative capacity is concerned, the proposed discharge would not result in significant impacts on the water environment.

The consideration of alternatives has a bearing on a number of items and in relation to the impact on Slatty Water Estuary in isolation, the transfer of the raw sewage in operating conditions to Carrigrennan would result in an overall improvement. However the loading arising from the town of Carrigtohill if treated in Carrigrennan would need to be discharged into Cork Harbour so that the loading on the main channel would be increased. Consideration would need to be given to storm conditions where there would be a need to have storm tanks in Carrigtohill and given that the Slatty Water Estuary is designated as sensitive water, it would be probable that provision for pumping flows of 6 times dry weather flow (dwf) or more might require to be provided.

The Wastewater Discharge Regulations (SI 684 of 2007) require the Water Services Authority to obtain a certificate from the EPA. (see Regulation 41) and dates are set out for applications to be made for a licence in the case of existing waste water treatment plants. Cork County Council applied for a discharge licence in respect of the extended works on 14 Dec 2007 and the reference number indicated in the EPA website is D0044-01.

Examination of correspondence on the EPA website relating to licence application D0044-01 suggests that there is considerably more flow passing through the existing works and it is not clear if that is a result of storm flows or an underestimate of the total foul flows to the works. In either event it would appear to reinforce the choice of Tullagreen as the appropriate treatment location as it would be more effective to provide extra storm storage at the site rather than have to provide additional pumping if the Carrigrennan option were chosen.

Regulation 42 refers to a transitional period and this applies in the case of this application. Therefore conditions are recommended relating to the control of waste water discharged. It is noted that the EIS specifies levels for BOD, COD, suspended solids, Nitrogen and Phosphorus and these comply with the UWWT Regulations and the Phosphorus Regulations and are considered appropriate. A condition is also recommended in relation to storm tanks although the appropriate size could only be determined after consideration of the works required in relation to storm overflows on the system which would be addressed as part of the WWDA licence procedure and for which no direct conditions would appear to be applicable under the transition arrangements.

It is considered that the current proposal relating to the Phase 1 proposal is satisfactory and would not give rise to significant adverse affects when compared with the option of pumping to the Carrigrennan Plant. It is considered that the Phase 2 proposals could impact on water quality and a condition is recommended to limit the approval to the phase 1 population equivalent

4.2 Designated Areas

The designated areas include the Great Island Channel SAC Site 001058, NHA and SPA. The current discharge from Carrigtohill WWTW is to the cSAC at a point where dilution would not be considered favourable. (cSAC Sitecode 001058 –Great Island Channel) The proposed extended outfall pipe is considered to be a significant improvement as regards location.

The modelling exercise carried out covers both a stand alone proposal and the combination with the larger Cork City Plant in Carrigrennan and examines parameters including BOD, coliforms, Ammonia, Phosphorus and Nitrogen. It is noted that the Annex I habitats listed in sitecode 001058 for Great Island Channel cSAC are *sheltered tidal sand and mudflats and Atlantic salt meadows*.

Having regard to the improved dilution and mixing available at the proposed outfall at North Point over the existing outfall at Slatty Bridge, the improved quality of effluent and the results of the modelling exercise carried out, it is considered that the effect of the proposed discharge up to 45,000 p.e. to the specified standards in combination with the Carrigrennan discharge would not be likely to have significant environmental effect. Therefore in accordance with Article 6(3) of the habitats Directive there is not a requirement to carry out appropriate assessment in this instance.

The levels of the various discharge parameters would be subject to any condition in a certificate of discharge granted by EPA as noted in para.4.1 above. Regulation 42 applies in this instance.

4.3 Ecological Impacts

The impacts as described include the direct impact of the construction of the wastewater treatment plant on an enlarged site and the potential impacts on the mudflats within Slatty Waters.

It is considered that the impacts on the ecology, both flora and fauna at the extended treatment works would be acceptable and the issue of the closing in of one drainage ditch is referred to later when considering the submission of the SWRFB.

In relation to the mudflats, and noting the comment of the DoEHLG in relation to the disturbance, it is considered that the mitigation measures put forward by the applicants, subject to condition, are satisfactory. (see 4.11 (b) below)

4.4 Impacts on Air including Odour, Climate and Noise

As the proposed procurement method is by DBO, the estimation of impacts in relation to odour and to noise is based on an indicative layout and a presumption that standards can be set which would give rise to acceptable noise and odour levels. The levels specified in the EIS for both odour and

noise are considered satisfactory and if they are achieved, it is considered there would be no significant adverse impacts on the environment arising.

The requirements of SI No. 787 of 2005 are noted and a condition regarding odour is recommended. As the noise levels are clearly specified in the EIS, it is not considered necessary to recommend a condition in that regard.

In relation to climate, it is considered that the works would not contribute significantly to any climatic affect.

4.5 Cultural Heritage Impacts

The report on cultural heritage is concentrated on archaeological impacts and the prediction is that there would be no significant impacts on any recorded monument. Given the mitigation measures proposed for the site in relation to removal of topsoil and also in relation to the walkover survey and metal detection on the pipeline route, it is considered that with mitigation, there would not be significant impacts on the environment. Particular note is taken of the area of the mudflats and a condition is recommended in relation to 1 monitoring which is intended to address issues raised by DEHLG.

4.6 Landscape and Visual Impacts

From an assessment point of view, the use of DBO Contract Procurement makes matters difficult in relation to evaluating landscape and visual impacts. The landscape and visual chapter in the EIS does not refer to the height of buildings as the section through the works is not dimensioned. The only reference in the EIS to building heights is in the project description which states that the height of the intake building would be 12 metres. In view of the fact that the ground level is likely to be increased by a matter of 1 to 2 metres, the effects could therefore be that the inlet building could be as much as 14 – 15 metres height above existing ground level. While not stated specifically in the EIS, it would appear that the inlet building is the highest building proposed and therefore it would appear that the proposal is for buildings not exceeding 15 metres above existing ground level.

At 15 metres, this building would be noticeably higher than the average building in a standard industrial estate and would, as stated in the EIS, be visible above the proposed planting. However the proposed site location, and the potential for screening at the site, together with the proximity of industrial type buildings is considered acceptable. The photomontages given in the EIS indicate an acceptable situation. It is therefore considered that from a landscape and visual aspect, the proposed development would not have significant adverse impacts.

4.7 Socio-Economic Impacts

The EIS prediction is that the expansion of the WWTW would facilitate ongoing industrial, commercial and residential development and would be

beneficial. While the provision of a wastewater treatment works is considered as a necessary requirement for treating sewage effluent, it would not appear to have a positive impact on a socio-economic basis. The economics of the particular plant may be relevant to be considered under this heading.

The examination of alternatives which would involve pumping all of the effluent to Carrigrennan would have a long-term additional pumping cost which would not be incurred with the works in Carrigtohill. It might be possible that economies of scale would indicate that the treatment process could be carried out more expeditiously and efficiently at Carrigrennan, but there would be a need to pump storm flows of 6 times dwf during storm events also. It would appear therefore that the option of locating the treatment plant at Carrigtohill is more economical from an pumping point of view.

It is also noted in the EIS that the allocated capacity for parts of Cork City which could not be catered for otherwise, needs to be reserved at Carrigrennan. Therefore the strategic reason for locating the plant at Carrigtohill is accepted and it is considered that the impacts in relation to the overall sewage disposal regime in the Cork area would be improved by the separate treatment of Carrigtohill from the Carrigrennan catchment.

4.8 Impact on soils

Based on the Environmental Impact Statement and the information supplied, it is considered that there would not be significant adverse impacts on soils.

4.9 Water Framework Directive

The interaction of the proposed discharge and of the existing plant discharge should be considered in the context of the Draft River Basin Management Plan for the South West River Basin District published on 22 December 2008. Other discharges and abstractions, both municipal and industrial are relevant to the Management Plan which is to be finalised following the period of consultation which extends to June 2009. It is considered that while the proposals should ideally be in accordance with an overall plan, that the issues regarding choice of outfall location and choice of location for the extended WWTP have been set out in sufficient detail to be satisfied that the proposals should fit in with the requirements of a River Basin Management Plan and there would be no advantage in awaiting the publication of the Management Plan before assessing the application

4.10 Material Assets including Traffic

The impacts in relation to material assets are considered to be neutral and the traffic impacts are very small. It is considered that neither impact would be regarded as significant.

4.11 Interactions

From the examination of the documents supplied, it is not considered that any interactions would give rise to any cumulative significant impact.

4.12 Submissions

(a) South Western Regional Fisheries Board

The SWRFB notes the proposal to pipe the stream running north-south through site. Consultation with the Fisheries Board is requested to assess the best way to minimise impact. The action recommended by the Fisheries Board is considered reasonable and a condition is recommended in this regard.

(b) Department of Environment, Heritage and Local Government.

The submission from the Development applications Unit states the option of discharging into part of Cork Harbour which is not a European Site had not been specifically addressed in the EIS and the option of discharging to Carrigrenan WWTW had not been fully assessed in environmental, rather than cost terms. It is considered that while the conclusions reached in the EIS mainly refer to cost the environmental aspects are established in the EIS. The fact that an overloaded works currently discharges to an inferior outfall location than that proposed is noted.

While the total loading would be greater, the modelling exercise carried out indicates an acceptable level of impact at the phase 1 or 45,000 p.e level. The energy costs of transferring to Carrigrenan would likely be greater and there would appear to be a need for stormwater tanks on the Carrigtohill sewerage system with a pumping requirement in excess of 3 times dwf if the Carrigrenan option were chosen.

The EIS indicates (p83) that the Fota Bridge area, which is in the SAC, is impacted on a rising tide by the discharge from Carrigrenan although the discharge point is outside the SAC and also that the Carrigtohill proposed discharge would impact on a falling tide and that the impacts were not cumulative.

It is considered that adequate examination of alternatives from an environmental perspective has been carried out.

The submission also raises the question of possible re-suspension of potentially toxic heavy metals or organic compounds as a result of excavation and backfill of the pipeline. The note in the EIS which gives rise to the concern would appear to be a reference to low species diversity and attributing this fact to possible previous toxic influences or high nutrients. It would appear that examination and testing of the excavated material from the mudflats would indicate its suitability for re-use or the need for its removal.

It also states that insufficient details of construction works pollution control are given in the EIS. In this regard it is noted that surface water pipeline construction into Slattery Waters was being carried out in Autumn 2008 and that the laying of a foul sewer effluent pipeline would have the same impact as the construction operation would be similar. Sampling of the mudflats has been carried out and referred to in the EIS. It is considered that a Construction Environmental Impact Plan should be prepared to address the issue and ensure that consultation with the DEHLG is carried out prior to construction.

It is considered that the archaeological comments of DEHLG are adequately addressed in the Mitigation measures in the EIS. While the EIS does not specifically have a reference to architectural issues, this would appear to be covered in the context of Cultural Heritage in chapter 10 of the EIS and also in Appendix D in the references to historical features.

(c) Environmental Protection Agency

While the EPA reply does not comment on the application, it refers to the Discharge Licence application D0044-01. From an examination of the available literature and submissions it would appear that there is a difficulty with overflows in the existing plant. These overflows may arise from normal overloading or from misconnected stormwater flows. The EIS refers to the treatment plant and outfall and does not supply information on overflows in the system, but this aspect of the system is a central part of the WWDA licencing. Accordingly a condition is recommended which seeks to ensure that the necessary storm water works are constructed arising from any approval under this process.

5.0 CONCLUSION

A major issue is the choice of alternatives and it is considered that the examination of alternatives has been appropriately carried out and the chosen scheme, namely expanding the treatment capacity at Carrigtohill and re-locating the outfall point is acceptable and would not give rise to significant impacts on the Environment. It is also considered that the development would be in accordance with the proper planning and sustainable development of the area. Regulation 42 of the Wastewater Discharge Regulations (2007) applies. The quality standards proposed in the EIS are considered appropriate.

The use of DBO procurement means that the estimation of impacts relating to noise and odour must be carried out based on the assumption that chosen emission rates are achievable although the technology has not been determined. Visual impacts are similarly difficult to accurately predict under DBO but in this instance, based on the location of the plant and the information given in the EIS including photomontages, it is considered that the development would not have a significant adverse visual impact.

6.0 RECOMMENDATION

I recommend approval by An Bord Pleanála, subject to the conditions outlined below, of the construction of a wastewater treatment works at Tullagreen, Carrigtohill, Co Cork and the construction of a new outfall pipeline to a location known as North Point in Slatty Water Estuary, Co Cork.

Reasons and Considerations

Having regard to the following :-

- The existing use of portion of the site
- The Cork County Development Plan 2003,
- Cork Area Strategic Plan
- Special Local Area Plan for Carrigtohill (September 2005)
- The requirements of the Urban Wastewater Treatment Directive (91/271/EEC)
- Cork County Sludge Management Plan
- Mitigation Measures proposed in the Environmental Impact Statement

It is considered that the expansion of the wastewater treatment capacity at the Carrigtohill Wastewater Treatment Works will not have significant adverse effects on the environment and would be in accordance with the proper planning and sustainable development of the area.

Conditions

- 1 Phase two of the proposed works shall be excluded from this approval in order to allow for further assessment of the environmental impacts when phase one (45,000 p.e. plant capacity) is in operation.

Reason: To protect the aquatic environment

2. The following effluent discharge standards shall be achieved

Biochemical Oxygen Demand	25 mg / l	on a 95 percentile basis
Chemical Oxygen Demand	125 mg / l	on a 95 percentile basis
Suspended Solids	35 mg / l	
Total Nitrogen	15 mg / l	
Total phosphorus	1 mg / l (as P)	

Reason: To protect the aquatic environment

3. An odour limit of 3.0 Odour Units per cubic metre shall be achieved on a 98 percentile basis at the site boundaries.

Reason: To mitigate odour impacts

4. Storm tanks with a minimum capacity to ensure compliance with the requirements of the DEHLG publication “Procedures and Criteria in relation to Storm Water Overflows” (1995) shall be installed.

Reason: To protect the aquatic environment.

5. A suitably qualified Archaeologist shall be engaged to carry out monitoring on the pipeline route during excavation.

Reason: To ensure that all archaeologically important items are located and evaluated.

6. The treatment of any watercourses running through the development site shall be agreed prior to construction with the South Western Regional Fisheries Board.

Reason: In the interests of protecting aquatic ecology.

7. A comprehensive Construction Environmental Management Plan shall be prepared prior to commencement of construction. The details of reinstatement of excavated materials on the pipeline route shall be agreed with the Department of Environment, Heritage and Local Government (Parks and Wildlife Service).

Reason: In the interests of protecting habitats.

8. The height of the tallest building shall not exceed 15 metres above existing ground level.

Reason: In the interests of visual amenity.

D.G. O’Connor
Engineer Gd I

20th January 2009.

APPENDIX 1

ENVIRONMENTAL IMPACT STATEMENT

The Environmental Impact Statement is in one bound volume and comprises the following: -

- Non-Technical Summary – 25 pages of text.
- Main EIS – 140 pages.
- Appendices.

1.0 Non-Technical Summary

The NTS states that Cork County Council proposes to extend the existing wastewater treatment works at Carrigtohill. It states the existing plant is located at Tullagreen to the south of Carrigtohill and has a design capacity of 8,500 p.e. It states the current load is estimated to be 12,000 p.e. and reflects a doubling of the population of Carrigtohill in the last four years. It states that the plant capacity would need to be increased 45,000 p.e. for Phase 1 and 62,000 p.e. for Phase 2 to cater for the longer term development of the town.

The NTS states the wastewater would be treated to a high standard to meet the requirements of the UWWT Directive, the Phosphorous Regulations (SI No. 254 of 1998) and the requirements arising from the designation as sensitive water in a report from EPA. It states the effluent would be discharged via an outfall pipe at North Point, approximately 800 metres west of the existing outfall point.

The NTS refers to the need for additional wastewater treatment capacity and refers to the Urban Wastewater Treatment Directive which requires populations greater than 10,000 to be subject to secondary treatment by the 31st December 2005. It states the regulations require the total phosphorous concentration in the treated effluent should not exceed to 2mg/l. It notes the current design capacity is 8,500 p.e. and that the medium requirement would be for 45,000 p.e. and a long-term for 62,000 p.e. It states the wastewater treatment plants would treat flows arising to a tertiary standard, including phosphorous removal. It states that a much higher effluent standard is required as part of the upgrading process.

The location of the existing plant is indicated in Figure 1.1a. It notes the existing plant configuration which includes grit removal and a square aeration tank from where the effluent flows to a secondary clarifier. It notes that leachate from a landfill is tankered to the site and pumped into an oxidation ditch. The EIS refers to a picket fence thickener and belt press which are used to de-water sludge before removing it to the Rossmore Landfill.

The NTS outlines a typical design which would include preliminary treatment, secondary treatment involving SBR units which would include nitrogen removal. The indicative layout includes 12 rapid sand filters of 4 metres diameter with a filter bed height of 2 metres. It notes that sludge de-watering would be carried out and equipment would include a 15 x 30 metre building, 500 m³ storage capacity sludge holding tank and a buffer tank of 500 m³ storage.

The NTS states the final works layout could not be specified as the process of procurement is by design build and operate.

On Page 10, the NTS describes the various stages of a typical wastewater treatment plant and states that under the proposed indicative design, the treated wastewater would be discharged to Slatty Waters via an 800 metre long outfall pipe. The NTS repeats that the layout on which the EIS is based is indicative only and that contractor could put forward alternatives based on variations in the secondary or tertiary treatment process. On Page 8 of the NTS, it is noted that the available site is limited in area and that the footprint of SBR tanks are substantially smaller than that of conventional activated sludge system.

The NTS states that alternative designs and layout would be only considered if the impacts were equal to those outlined in the EIS with positive impacts of greater significance and negative impacts of lesser significance.

The NTS refers to alternative treatment processes and includes a number of technologies including the use of reed beds. It notes that the very high space requirement for reed beds means that the process can be discounted as an alternative to the indicative design described.

The NTS states that an alternative considered was to transfer the sewage to Carrigrenan and treat it at that location. It looked at two different sub options which were to use the existing WWTP in Carrigrenan or construct a new Phase at Carrigrenan. It looks at different routes along the N25, the Old Youghal Road and through Fota Island. It states the preferred route is via the Old Youghal Road via Glounthane. It states that based on the whole life costs for both alternatives, the option to construct the WWTP at Carrigtohill offered better value for money.

The impacts are described as follows: -

- **Water:** - The existing treatment works discharges into Slatty Waters which forms the divide between Fota Island and the mainland to the west of Carrigtohill. It states the body of water is approximately 150 – 250 metres in width and 2,950 metres in length from Slatty Bridge to the railway bridge near Harper’s Island. It states the main body of water is saline and tidal and the dilution in mixing of the water is provided entirely by the ebb and flow of the tides.

Table 1.1 gives the design standards for the effluent which for Phase 2 is 20mg/l for BOD with 25mg/l in Phase 1. A lower standard to nitrogen in Phase 2 at 10mg/l is proposed, while suspended solids at 35 and phosphorous at 1mg/l are same for both Phases 1 and 2.

It is stated the new discharge point would result in increased dispersion of the effluent and nutrient levels should remain within the parameters set by the EPA for Estuarine and Coastal Waters.

- **Air:** - The WWTP site is approximately 230 metres from the nearest residential unit and it is stated that any potential impacts on the local community would be mitigated to an acceptable level.
- **Noise:** - The noise study identified the dominant noise in the area as from the N25 and R624 roads. Noise level criteria at the nearest house were set at 50 dBA in daytime and 35 dBA at nighttime.
- **Odour:** - The NTS states that the probable impacts of odour were assessed based on the indicative design. Prediction is that the level could be kept below that which was perceptible provided mitigation measures were put in place.
- **Aerosols:** - Indicated that the requirement would be for fine bubble diffused air systems or surface aerators with additional measures to prevent the production of aerosols.
- **Light:** - Positioning of lighting columns to be carefully chosen and screening with trees and shrubs would be used to minimise over-spill of light outside the site boundary.
- **Climate:** - Predicted that there would be no affects on climate resulting from the new works.
- **Soils:** - Groundwater observations were between 0.2 metres to 2.8 metres below ground level and probably tidal in the area. Ground investigation indicated variable deposits of medium dense sands and gravels. It is anticipated that piled foundations would be required to support certain units. It also states that anchors may be required to hold down tanks against flotation when empty.
- **Land-based Habitats:** - Predicted that the temporary disruption to bird activity during construction could be offset by landscaping.
- **Aquatic Habitats:** - Slatty Water is a small tidal inlet and does not have significant value in terms of larger and more commercial fish species. The NTS states that it supports mullet, bass, flounder, common eel, gobies and blenny species.

- **Socio-Economic Impacts:** - The NTS states the upgrading of the works would be a major part of infrastructure and an essential driver of growth in the region.
- **Transport and Communications:** - Predicted that there would not be a significant traffic effect.
- **Sludge, Screenings and Grit Disposal:** - Provision to be made for accepting and de-watering imported liquid sludges from small wastewater treatment plants to minimise transportation costs to the hub centre in Middleton.
- **Material Assets:** - The site is already owned by Cork County Council.
- **Visual Impacts:** - The general character of the area is stated to be mixed with industrial and commercial developments to the north and the east and agricultural and open water to the south with Slatty Waters and the N25 to the west.

Tanks are expected to be no more than 5.0 metres above existing ground levels with some preliminary treatment buildings up to 15 metres in height. The NTS states that it is expected that the taller buildings would remain visible because of the general topography of the area. It states that with proper care and maintenance that plant, shrubs and trees would become more established and enhances the visual appearance of the area generally.

- **Cultural Heritage:** - The NTS states the impact of the proposed outfall pipeline on the archaeological landscape of the area was assessed and it notes three recorded monuments surrounding the proposed development area. It states the existing WWTP and the proposed area was originally a boggy greenfield site.
- **Recommendations/Summary:** - The NTS states the upgrading of the sewage treatment works at Carrigtohill would improve the standard of treatment and allow greater dispersion of the treated wastewater. It states that failure to provide a suitable treatment facility would restrict growth in the town and in the county as a whole. It recommends that Cork County Council should proceed with the proposal to upgrade the works as outlined and it should be located on land adjacent to the existing WWTP.

2.0 MAIN VOLUME OF EIS – INTRODUCTION

The EIS stresses the principle of sustainability and states that the proposed upgrading of the wastewater treatment works at Carrigtohill is a necessary step in the development of the area and the provision of the infrastructure required to achieve growth on a sustainable basis. It refers to the various statutory

instruments relating to Planning and Development and Environment Impact Assessment. It notes the EIS was prepared by T. J. O'Connor & Associates in conjunction with DHV Water (BV) with input from specialist consultants: -

- Bord na Mona – noise study.
- Envirocon Limited – odour study.
- Dixon – Brosnan Limited – flora and fauna studies.
- Archaeological Services Unit.
- Harbour Modelling – HMRC.

3.0 DESCRIPTION OF THE PROPOSED WORKS

The proposed works is described in Chapter 3 of the EIS from pages 29 – 64.

By way introduction, it is stated that the current resident population in Carrigtohill is given as 2,782 persons in the most recent census. It refers to a commitment to re-open the Cork – Middleton Rail Service and to the zoning of 90 hectares including 60 hectares outside the current development boundary. It states the Carrigtohill catchment serviced area is 554 hectares, but refers to changes made in 2005 and 2006 which added 40 hectares in 2005 and a further 54 hectares in December 2006 to accommodate the AMGEN Development. It shows the development boundary in Figure 3.2.

The history of the wastewater treatment plant is given which commenced with a preliminary report in 1976. The existing design capacity is stated to be 8,500 p.e. It notes that the village and surrounding area are at a low level relative to sea level and that the existing collection system is a partially combined system. It states that using the information available regarding zoning, that the population of a fully developed catchment would be in the region of 18,433 persons, while the population equivalent of the area of the special local area plan would be 45,000. It refers to Amgen, a multinational pharmaceutical company with proposals to construct the facility with a potential for 2,000 new jobs and would have a final process effluent discharge of 4,000 m³/day. It states that this would bring the population equivalent to 62,000 by 2030. Figure 3.1 gives the location of the existing works.

The EIS refers to the options of pumping wastewater to the Carrigrenan WWTP in Little Island or to construct a complete new works at Carrigtohill. It refers to Section 4 of the EIS for further consideration of the options.

Section 3.2 describes the Carrigtohill Main Drainage Scheme with pumping stations referred to as the town pumping station on the Old Cobh Road and the IDA pumping station at the east of the main entrance to the IDA Development. It notes that areas not connected to the existing foul system

include a business park located to the south of the Old Youghal Carpet Site, the area north of the railway line, houses to the south of a junction of Main Street and the road north to Wyse's Bridge. Commercial units to the east of Main Street are also not connected and the areas involved use septic tanks to treat the effluent.

The existing wastewater treatment plant dates back to 1978 and is described as being on a raised site south of the town with access from the Old Cobh Road from Slatty Bridge. It states the plant was originally designed to cater for population equivalent of 5,000 and included an oxidation ditch as the main treatment process. It states that in 1990, it was extended to give a capacity of 8,500 p.e. and the additions included a secondary settlement tank and the conversion a balancing tank to aeration tank. It notes that storage tanks were added on the western side to store leachate from the landfill site and Rossmore. Figure 3.5a indicates the layout of the existing plant with the provisional upgrade indicated.

The EIS describes the operation of the existing plant, including the liquid stream and the sludge stream. It notes that in relation to odour, a low level was present at the inlet works and the sludge de-watering building on a previous study.

The EIS states that dry weather flow is of the order of 725m³/day with storm flow rates recorded up to 4,400 recorded. It states that the large storm flows are due in part to surface water draining from an older section of the Carrigtohill Bypass (N25). It states the typical flow rates from the IDA Industrial Estate are 330m³/day without flows from the plant given as 837m³/day. It states that typical overflows are 53m³/day. The EIS gives details of influent concentrations as measured in Table 3.1.

Section 3.4.1 of the EIS refers to historic of population trends and states that the Carrigtohill DED would be expected to be 4,4000 by the year 2020. Table 3.2 sets out the population of Carrigtohill village and the DED comparing with Cork County and the State from 1971 – 2002.

The EIS comments that when the improvements in transport infrastructure are completed, it was expected that Carrigtohill would have a rapid population growth over the next 20 years. It refers to the Cork Area Strategic Plan (CASP) which considers the Carrigtohill area to be an area with significant growth potential for both residential and industrial/enterprise developments.

Table 3.3 gives details of the breakdown on households and population for the DED and the town and Table 3.4 gives details of commercial discharges. Table 3.5 gives details of institutional wastewater and notes that over 33.9% of the entire development area has been zoned as industrial. The pumping stations are indicated in photographs 3.7 and 3.8. Table 3.6 details industrial wastewater and estimates 5,268m³/day for additional industry outside the development lands with a further 4,000m³ designated to the Amgen site. It

states that the additional hydraulic loading for industry would be an equivalent of 17,778 p.e. and the industrial flow would be 9,270m³/day.

Table 3.7 gives details of effluent concentrations for 2006 and 2007 and this indicates average concentrations for 2007 of 31mg/l for BOD with suspended solids at 187mg/l. It is noted that the maximum concentration of suspended solids is given as 72 for the year 2007 which indicates a typographical error in relation to the average concentration.

Table 3.8 gives the summary of current loadings and Table 3.9 estimates typical effluent characteristics.

Future flows and loads are described in Section 3.5 and reference is made to the CASP which put forward the concept of Metropolitan Cork. It states the design residential figure could be based on the CASP recommendations or the 2003 Cork County Development Plan as amended by the Special Local Area Plan for Carrigtohill of September 2005. It states most of the proposed residential lands zoned in 2003 are being currently developed, so that a large percentage of the projected population of 18,433 could be reached in the short to medium term.

In calculating future commercial loads, the EIS states that a typical ratio would be 1 p.e. commercial to 5 p.e. domestic. It refers to the maximum growth scenario and quotes a domestic population of 4,147 p.e. This would appear to be a typographical error, as Table 3.11 gives the domestic volume as 4,147 m³/day and the p.e. is 18,434. This raises questions about the estimate for commercial wastewater as the figure of 276 m³/day given in Table 3.11 appears to be low in the context of the ratio quoted. (However, in the context of the overall volumes, this potential discrepancy is not considered significant).

The EIS states that there would be no significant increase in institutional load and in relation to industrial loads, it separates the allowance for the additional 54 hectares set aside as part of the Amgen Complex in February 2006.

Table 3.10 gives the estimated wastewater flow rates and Table 3.11 gives the design loadings. This indicates that with the Amgen site included, the population equivalent would be 62,073 of which the Amgen site would account for 17,778. It states that the design p.e. would arise from an area of the catchment of 638 hectares.

Section 3.6 describes the site for the proposed works and refers to the high tension power cables passing over the western side of the existing site. It notes also that a gas main passes adjacent to the eastern boundary of the site. It states that the local authority owns land immediately adjacent to the western boundary of the existing site which could be used for the extension.

The EIS states that it could be concluded that the treatment plant site would be within the floodplain when global warming issues are taken into account. It

states that the increasing of the ground level and the construction of an embankment around the site including the enclosing of one of the streams flowing through the site are possible options.

The EIS states that the proposal is to construct a plant with a capacity of 45,000 p.e. and that additional SBR capacity for a Phase 2 development would be constructed adjacent to the Phase 1 tanks to bring the capacity of 62,000 p.e. It states the reasons for constructing the plant adjacent to the existing one include the ability to use some of the assets on the current site, that wastewater treatment is already an established land use with sewage routed to the site and the strategic reasons for developing a separate wastewater treatment plant. It also notes that Carrigtohill WWTW would be used as a sludge satellite centre and also for treating leachate from the Rossmore Landfill Site. It notes also that long rising mains would be required if an alternative site were to be used.

Table 3.12 sets out the proposed discharge standards which indicate a reduction of BOD and nitrogen for Phase 2 against the Phase 1 values, while values for suspended solids and phosphorous are the same for both Phases. It states that satisfactory dispersion qualities have been demonstrated at North Point by the hydrodynamic model. It notes that the UWWTP sets the standard of 2 mg/l for phosphorous in the final effluent, but that would be excessive in terms of the resulting concentration within the receiving water and a concentration of 1 mg/l was taken for both the neap and spring tide cycles. The EIS states that taking a discharge of 1 mg/l of phosphorous, the average concentration in the receiving water would be 0.031 mg/l at spring tide, but 0.078 at neap tide. It notes that the recommended value is 0.06 mg/l and that as a result of dispersion; the level in the receiving waters would reduce to 0.029 mg/l before the water reached Harper's Island which is approximately 900 metres downstream of the outfall point. The EIS notes that the phosphorous discharge from the proposed works would be less than 3% of the total phosphorous in Lough Mahon. It states that the cost of providing phosphorous removal below 1 mg/l rises disproportionately when compared to the benefits in terms of the usage of resources.

Section 3.7.3 describes the BOD levels and states that at the final design capacity, a discharge standard of 20 mg/l would be required to give a concentration of 2.03 mg/l in the receiving water.

The requirement to achieve standards in excess of those required by the UWWTD is noted and draws attention to the level of dilution available at the outfall.

Section 3.8 refers to the treatment processes and operation and notes that if a DBO contract were used, the contractor could specify which plant was chosen to meet the performance specification. It indicates an indicative layout which would include preliminary treatment, secondary treatment and tertiary treatment. It notes that the construction of SBR's is proposed for the secondary treatment as the footprint is substantially smaller than that of a conventional activated sludge system. It notes however that the successful

tenderer would be free to propose a traditional aeration process as an alternative. The EIS states that the Phase 1 dimensions of the aeration basins would be approximately 20 metres by 40 metres and would be 4.7 metres deep. In relation to tertiary treatment, the EIS states that nitrogen removal is envisaged for the SBR's. It states that phosphorous would be chemically removed in 12 rapid sand filters which would be 8 filters for Phase 1 and 4 for Phase 2. It states that the dimensions to filters would be 4 metres diameter with a filter bed height of 2 metres.

In relation to sludge storage, the EIS envisages a sludge dewatering building, sludge holding tanks and a buffer tank of 500 m³ capacity.

The EIS states that in the event of an inordinate delay in the construction of the treatment plant, it may be necessary to implement interim measures to cater for the discharges from the Amgen site. It gives an indicative detail in Figure 3.5 (a) which is in the EIS immediately after Page 35.

The buildings required would include an administration building, a building to house the air compression units and a storage building. The EIS refers to safety and security and the provisions that would require to be made. It notes that at detailed design stage, a HAZOP analysis should be carried out with all parties including the end user being present.

The EIS describes the outfall in Section 3.8.3 and states it would be between 1,200 and 1,500 millimetres in diameter. It states it would cross the R624 regional road just to the north of Slatty Bridge. It states that as per Figure 3.10, it would follow a direct route along the mudflats of the Slatty Estuary to a discharge point adjacent to North Point. It refers to Tables 3.8 and 3.11 for design loads and these appear earlier in the EIS on Pages 48 and 60 respectively.

Table 3.13 sets out the proposed treatment effluent discharge standards and it is noted that this table is the repeat of Table 3.12. It is also noted that Table 3.16 gives the same data and it is not clear why the same table appears to be reproduced three times.

The EIS states that the BOD loading on Phase 1 would be 253 kg/d and on Phase 2 it would be 279 kg/d. It refers to odours and states that the odour levels of the boundary of the site would not exceed 1.5 odour units on a 98 percentile basis. De-watered sludge for further treatment is estimated at 5,749 m³ for Phase 1 and 7,920 m³ for Phase 2 for one year. It states that screenings and grit removal would involve small quantities and states that it would typically be 1 to 2 domestic wheelie bins per week each.

In relation to construction on Page 62 of the EIS, it notes that the existing WWTP would be demolished when Phase 1 of the new works was completed.

The EIS states that the existing treatment plant is overloaded and that an increase in treatment capacity is required to provide for the sustainable

development of the town. It states that the expansion of the treatment plant is the most appropriate means of providing the necessary increase in treatment and this would include any possible interim upgrade of the treatment plant. It states that in the event of an interim upgrade being required, it would be provided by installation of a package plant at the existing treatment plant. This results from the proposals for the Amgen site.

The EIS states that as a DBO form of procurement may be used, it would not be possible to set out the precise layout of the plant, but the final design would have to comply with the EIS in terms of effluent discharge standards, odour, noise, visual impacts etc.

(It is noted that the p.e. for the Amgen site is 17,778 so that a package plant for the site, if required, would appear to have to comply with the consent requirements for a plant of over 15,000 p.e.).

4.0 ALTERNATIVES CONSIDERED

4.1 Alternative Treatment: -

The EIS refers to secondary and tertiary treatment and states there are variations available depending on particular situations. It lists a number of possibilities and states that under a DBO contract, tenderers would be free to offer different processes. It states that the main alternative to filtration with coagulation as proposed in the indicative design would be membrane treatment or via constructed wetlands. It states that owing to limitations with respect to the size of the site be constructed wetland could not be considered as they would typically require 1 square metres per population equivalent for effluent polishing.

4.2 Sludge De-Watering Processes: -

The EIS draws attention to the Cork Sludge Management Plan which designates the Middleton WWTW as the hub centre for the treatment of wastewater sludges. It states that provision would be made for accepting and de-watering of imported liquid sludges from a number of small wastewater treatment plants near Carrigtohill to minimise transportation costs to the hub centre in Middleton.

4.3 Alternative Treatment Plant Locations: -

The EIS repeats the advantages of the use of the existing site for a WWTW which are set out in Section 3. It also lists the disadvantage which includes the low available dilution at the existing outfall pipe and the requirement to extend the outfall. The alternatives considered included the transfer of sewage from Carrigtohill to the WWTW at Carrigrennan.

The EIS describes the Carrigrennan WWTW and notes that it discharges treated effluent at Marino Point and this is indicated on Figure 4.1. It notes that the design capacity is 413,000 p.e. and is currently treating a load of 313,000 p.e. but is hydraulically overloaded. It notes that the plant configuration includes Sequenced Batch Reactors (SBR) and final sedimentation.

The EIS states that the complete capacity of the Carrigrennan Plant is reserved for domestic and industrial loads within the catchment of the plant. It notes that areas to be served by Carrigrennan have no alternative treatment possibilities and it also notes that the River Basin Management Plan which is currently being drafted and may place limits on the expansion of the plants at Ballincollig and Blarney. It notes also there is a proposed new town to the north of the city at Monard which would have approximately 15,000 p.e. wastewater arising.

The EIS states that two options had been considered namely the treatment of the wastewater from Carrigtohill in the existing plant at Carrigrennan and the construction of a new phase at Carrigrennan to cater for the wastewater from Carrigtohill.

Routes for a pipeline to Carrigrennan were investigated, including along the new route of the N25, the old Youghal Road and through Fota Island.

Route 1 along the N25 would be 6 kilometres in length and approximately 525 millimetres in diameter. It notes the foreshore license might be required from the Department of the Marine and it notes that the NRA have indicated that the route would not be available due to plans to upgrade the N25 to motorway status in the future.

The second route is along the old Youghal Road to Glounthane and this is the one which is most favoured.

The third route through Fota Island would be 5 kilometres in length and would require a 450 millimetre diameter pipeline. Difficulties are envisaged in relation to construction of this route and it is noted that there would still be a difficulty in crossing the channel between Fota Island and Little Island. The EIS concludes that the route through Fota Island is not suitable for a pipeline. It states that the preferred route would be via Glounthane and while it is the longest route, it would cause the least impact.

The EIS states that cost estimates were produced to compare the option of upgrading the WWTP at Carrigtohill to the option of treating at Carrigrennan. It states that based on whole life costs for both alternatives, the option to construct the WWTW at Carrigtohill offered better value for money. (No details are given in relation to the cost estimates). Section 4.3.2 describes alternative outfall locations and states that relocating the outfall beyond North Point would not result in an increase in dispersion of significance to justify the additional costs.

The conclusions of this particular section of the EIS states that there are strong strategic reasons for developing a separate wastewater treatment plant at Carrigtohill. It states that it would allow the retention of any available capacity at Carrigrennan for Cork City and the areas to the north and west of the city where there is no alternative treatment route. It states the development of a wastewater treatment plant at Carrigtohill is the most economically advantageous option. It notes that the proposal to use the plant at Carrigtohill at a sludge satellite centre and this would reduce the cost of transfer to Middleton which is the sludge hub centre.

The EIS states the alternative of transferring raw sewage to Carrigrennan offers no significant environmental benefit over the proposed expansion of the plant at Carrigtohill. It states that relocating the final effluent outfall to North Point offers better dispersal than the existing outfall location, but extending it beyond that would offer limited environmental benefit. It concludes that the expansion of the existing plant with the relocation of the outfall to North Point has the least environmental impact of all the alternatives considered and such expansion could be accommodated at the site without causing undue negative environmental impacts.

5.0 IMPACTS RELATING TO WATER: - (EIS, PAGES 73 – 88)

The EIS refers to Slatty Waters as the name given to the estuary at the eastern side of the upper Cork Harbour. It defines the boundaries of the water body from the sluice gates at Slatty Bridge past Fota Island to the northern channel. It states the waterbody is 150 to 250 metres wide and 2,950 metres long from Slatty Bridge to the railway bridge near Harper's Island. It states there is a low level of freshwater discharge into Slatty Waters with the main body of water being saline and tidal. It states the only exit/entry point for the saline water is at the west end of Slatty Waters adjacent to Harper's Island and the dilution and mixing of the water is provided entirely by the ebb and flow of the tides.

It notes that the Slatty Water Estuary forms part of the SAC No. 1058 known as the Great Island Channel. It states that a description of the SAC is included in Appendix N (Appendices A – D are only included in the documentation).

Shellfish farming is noted in the North Channel east of Belvelly Channel, close to Middleton. It notes that the North Channel is separated from Slatty Waters by Fota Island.

Section 5.1.1 of the EIS refers to the receiving environment and commences with the receiving water quality. It states that since 1985, the wastewater plant at Carrigtohill has discharged treated effluent to the head of the Slatty Water Estuary via the existing outfall and that the loading on the existing plant exceeds the design capacity. It refers to the new treatment plant constructed at Carrigrennan on Little Island.

Previous water quality studies are referred to from 1989 to 1996. It states the reports concluded the water quality particularly in the upper reaches of the harbour had deteriorated over time. It states the areas which suffered most were the Inure Estuary and these had low dissolved oxygen, high BOD, phosphorous, ammonia and nitrate. It states that PSP (paralytic shellfish poisoning) has been recorded in Cork Harbour (Marine Institute 1999).

Section 5.1.1.3 refers to modelling of the harbour. The EIS states that the study involved modelling of the hydrodynamic and water quality conditions prevalent in Cork Harbour and in particular as a result of proposed discharges from the Carrigtohill and Carrigrennan outfalls. It outlines the development of the model including setting up a numerical model with the input of the bathymetry and the land boundaries. This is shown in Figure 5.2. The EIS states the model was calibrated by running the same simulation until it is satisfactorily reproduced field conditions.

The EIS states that in the Cork Main Drainage Preliminary Report, the peak BOD was predicted at the outfall to be 0.33 mg/l. It notes that the overflows from the Carrigtohill plant for collection network have not been modelled. It states that a full description of the model including the bathymetry study is included in Appendix N. *(Only Appendices A – E are included in the EIS).*

Table 5.1 sets out the Urban Wastewater Treatment Directive Discharge Standards and it states that the output of the model should determine whether more stringent removal should be necessary for organic substances and nutrients.

Section 5.1.2 is titled “The Characteristics of the Proposal”. It refers to the Urban Wastewater Treatment Regulations, Bathing Water Regulations and the Dangerous Substances Directive. Table 5.3 sets out the additional standards arising from the designation of Slatty Waters as sensitive and this indicates a requirement for phosphorous at 2 mg/l and nitrogen at 15 mg/l.

In relation to the Bathing Water Regulations, the EIS notes there are no designated bathing areas in the estuary. It notes the problem with sailing due to the emergence of mudflats and it states the proposal is that the Bathing Water Regulations would be met where there was sufficient water over the course of the full tidal cycle for the safe passage of small sailing boats. The location indicated is the channel between Little Island and Fota Island. It notes that this is referred to as the main channel in the output tables. (In Appendix E which gives details of the modelling, there is no reference to a main channel, but there is one to a mid channel).

In relation to Shellfish Waters Regulations, the EIS states the North Channel is separated from Slatty Waters by Fota Island and the indications for Weir Island which is between the shellfish beds and Belvelly is 0 MPN/100 mls. It states the figures indicate that shellfish farmers operating to the east of Belvelly Channel should have no grounds for concern about discharges from Carrigtohill.

The EIS refers to the Local Government Water Pollution Act 1977 and states that only the Phosphorous Regulations of 1998 are relevant. *(There would appear to be a typographical error in this section as the paragraph refers to a “wide ranging directive”, while the heading of the paragraph relates to the Water Pollution Act).*

In relation to the Water Framework Directive, the EIS states the EPA has carried out extensive research on Irish Estuarine and Coastal Waters resulting in the publication of a report entitled “An Assessment of the Trophic Status of Estuaries and Bays in Ireland”. It states that Cork Harbour area was one of the waterbodies investigated and gives the criteria for eutrophication. It notes the Lee Estuary/Lough Mahon area was designated as a sensitive water and it notes the standards for phosphorous at 2 mg/l and of nitrogen at 15 mg/l.

The EIS examines the effects of the discharge and states that the volume of water discharging from the Slatty Waters channel is miniscule compared with the volume within Lough Mahon. It notes the very low level of freshwater discharge into Slatty Waters and the dilution being provided entirely by the ebb and flow of the tides.

In relation to **BOD**, the model runs indicate an average concentration at the outfall point of 3.13 mg/l for 45,000 p.e. At the final design capacity of 62,000 p.e. the EIS states the discharge standard of 25 mg/l for BOD would result in a concentration of 4.46 mg/l in the receiving water and therefore a level of 20 mg/l for BOD was selected for Phase 2. Similarly the standard for discharge for nitrogen is reduced for Phase 2 from 15 to 10 mg/l.

For phosphate, the EIS concludes that a concentration of 1 mg/l would be required, although the UWWTD sets the standard of 2 mg/l for the final effluent. This is because of the requirement to reach a value of 0.06 mg/l when the water reaches Harper’s Island which is approximately 900 metres downstream of the outfall point. It states that the mass of phosphorous to be discharged is small when compared with the mass of water in Lough Mahon and it states that it would contribute less than 3% of the total phosphorous in Lough Mahon. The EIS states that the cost of providing phosphorous removal below 1 mg/l rises disproportionately when compared to the benefits.

The EIS states the model estimates for peak coliform counts at Blackrock is 10 MPN/100 mls, assuming there are no sources at the River Lee and at the nearest source is at Carrigrennan WWTP. The EIS notes that the corresponding figure stated in the Cork main drainage preliminary report was 0 MPN/100 mls. The EIS states that the discharges from Carrigtohill and Carrigrennan are not accumulative to a significant extent at any location at any time. It states the two both affect the water quality at the Fota Bridge region, but at different stages of the tide. It states that the effects of either one is dominant at a time depending on the stage of the tide. It states that when the tide is rising, the effluent from Carrigrennan is dominant and when the tide is falling, the effluent from Carrigtohill is dominant.

The EIS states that modelling indicated in expected peak at Belvelly Bridge of 11 MPN/100 mls for the combined discharges. It states the corresponding figure for Weir Island is 1 MPN/100 mls. The EIS states that when Carrigtohill discharge only is run, the count at Belvelly is 0 MPN/100 mls.

Table 5.4 gives the proposed discharge standards for Phase 1 and Phase 2 and this table is the same as Table 3.12 on Page 54, 3.13 on Page 61 and Table 3.16 on Page 64.

Section 5.1.3 describes the potential impact of the proposal. The EIS states that the standard of treatment of the wastewater would be substantially improved and the relocation of the outfall would improve dispersion of the discharged final effluent in Slatty Waters. It states that there would be elimination of stormwater overflows from the WWTW, except during exceptionally adverse weather conditions and the receiving water would meet the requirements of the EPA “Assessment of the Trophic Status of Estuaries and Bays in Ireland Report”. The EIS also states that the upgraded works would satisfy all the local authority complications under the UWWT Regulations and the Phosphorous Regulations. The EIS concludes that the potential impact of the proposed works on the area is wholly positive.

In Section 5.1.5 the predicted impacts of the proposal are described as being the same as the potential impact.

Section 5.2 refers to groundwater and it states that Carrigtohill is on a relatively low-lying coastal land with elevations between 5 and 15 mOD. It states the catchment to the north of the town rises steeply to approximately 90 mOD. It notes that the karstified nature of the local geology is evident in the large underground fishers and caves which are particularly to the east of the town towards Middleton. The EIS notes that given the karstified nature of the ground, it is important sewage does not enter the groundwater. The EIS states that in relation to impacts on groundwater that proper construction and water-tightness of the pipes would ensure no negative impact on the water quality of groundwater.

6.0 IMPACTS ON AIR: - (EIS PAGES 88 – 111)

The EIS deals with issues relating to noise, odour, aerosols and light.

Section 6.2 deals with noise and notes that road noise dominates the noise environment in the area. It states the nearest residences are 230 metres to the west and 250 metres south-west of the plant. It states the two locations of the highest ambient noise levels due to the proximity to the traffic on the R624. Table 6.1 gives the noise levels recorded by day with the L_{aeq} of the two residences at 80 and 64 respectively, while the L_{aeq} at the treatment plant at Tullagreen range between 57 and 61 dBA.

The EIS describes typical elements of a treatment works and notes that the layout drawings are taken as indicative only, as the proposal is to be a design and build contract. It lists all the requirements for enclosing plant and sets out the potential impact of the proposal. It selects a level of 35 dBA L_{aeq} for nighttime and 45 dBA for daytime at any house. The EIS states that external noise levels of 35 and 50 L_{aeq} at the plant are chosen and that no noise-related complaints are considered likely. The mitigation measures listed in Section 6.2.4 include attenuation, monitoring and screening, all of which are dependent on the chosen design.

The EIS deals with construction noise and states that a daytime limit of 65 – 70 L_{aeq} 12 hour would be considered reasonable for construction work.

The EIS refers to odour in Section 6.3 and states there are no significant industrial emissions within the locality of the treatment plant site. The EIS states that overall the air quality in the locality is good with levels of air pollutants in the area substantially below the national air quality standards. Parameters referred to include nitrogen dioxide, carbon monoxide, benzene and PM_{10} .

The EIS states that **no malodours could be detected** during the site visit in February 2007 near the site boundary of the existing treatment plant. Figure 6.1 gives the hourly wind direction at Cork Airport and Roche's Point and states that the prevailing wind direction is from a south-westerly direction. The EIS refers to the long-term incidence of winds and notes that the greatest potential for odorous emissions is during summer months with dry weather conditions and high temperatures. It states those weather conditions could also be associated with low-flow sewage conditions from the surrounding area.

The EIS describes the characteristics of sewage and the odours arising in Section 6.3.2. It states that under a DBO contract, this would contain performance specifications which would include odour control. It refers to the specialist assessment of odour potential and notes that the indicative design includes an inlet works screening which would be covered or housed and provided with odour control equipment.

The EIS states that stormwater tanks are unlikely to be a significant source of odour due to the infrequent nature of their use. It states that under normal conditions, aeration tanks should not be a significant source of odour and that odours from secondary settlement tanks would not normally be detectable beyond a few metres from the tank. The EIS states the sludge treatment system would be designed to prevent the escape of malodours to the atmosphere.

Section 6.3.3 discusses the potential impact of the proposal and states that the results of the odour impact modelling indicate 99.5 and 98 percentile odour concentrations in the locality which would be between 0.25 and 1 odour unit per m^3 at the adjoining receptors. Figures 6.2 – 6.5 give the predicted

maximum of 98 and 99.5 percentile odour concentrations for the two phases of the works.

The EIS states that an odour concentration greater than 5 ou/m³ is used as a criterion for determining possible nuisance complaints. It states that EPA Publication of 2002 proposed a more stringent condition for pig production units of 3 ou/m³ for 98 percentile of predicted hourly concentrations. It also refers to a target value of 1.5 ou/m³.

The EIS refers to a Phase 2 design scenario and states that the short-term odour concentrations would be 0.25 – 0.6 ou/m³ at the nearest houses as per figure 6.4. It states the analysis of the modelled odour impact due to emissions suggested that the potential for significant malodours to be detected beyond the boundary of the plant would be very low. It states that based on that, the predicted 98 percentile odour value should not exceed 1.5 ou/m³ at the site boundary as 0.25 ou/m³ at the nearest sensitive receptor. It lists mitigation measures relating to the type of plant and equipment to be used and states that under DBO, tenderers would be required to provide performance guarantees with respect to odours from their particular design.

Section 6.3.5 refers to predicted impact of the proposal and states that the predicted 98 percentile odour concentrations are less than 0.50 ou/m³ beyond approximately 100 metres from the site boundary. It states that for Phase 2 or final design stage with all six SBR units in operations the predicted short-term 99.5 percentile odour levels are predicted to be less than 0.5 ou/m³ at the nearest housing.

Section 6.4 refers to aerosols and states that the areas of concern are the potential use of surface aerators. It states that aerosols introduced into the air at the aeration tanks or through the use of effluent as wash water should only present a potential public health hazard to anyone within 20 metres of those operations. It states that even then the risk is very small as there is little evidence that aerosols affect plant operatives at existing treatment works. The EIS states the predicted impact of aerosols at the proposed treatment works is deemed to be minimal due to the rapid evaporation and consequently the inability of the micro organisms to survive.

Section 6.5 refers to light. It states there is no street lighting to the west, south or east of the site. It states it is proposed to provide lighting to illuminate all of the treatment units and access roads and notes that excessive light levels could be a source of nuisance and could cause the treatment works to become a prominent feature in the landscape at night. It states that lighting fixtures should be directed inwards so as to minimise any overspill and at night the full lighting would only be used in operation if the plant is manned or if the alarm system is activated. It states the screening of the works would help shield the light spread outside the site.

It states that any negative impact will be minimised by mitigation as outlined in Section 6.5.4 of the EIS.

Section 6.6 deals with climate and states that there are no climatic effects in the region that will require any special measures to be taken during the design, construction and operation of the project. It states that mitigation measures can be taken to avoid any changes to the climate or contribution to climate change arising from the works.

7.0 SOILS: - (EIS PAGES 112 – 115)

The EIS describes the receiving environment and states that the town is underlain by Waulsortian limestone and the existence of caves in the area demonstrates the karstified nature of the ground. It refers to an abandoned quarry to the north of the Rockland and Castleview estates. The EIS states the groundwater level at the proposed plant site is at the existing ground level during winter and slightly lower during summer months. Drawing No. 7.1 gives indication of the geological formation and Figure 7.2 gives the location of the boreholes which include two on the site of the existing works. Table 7.1 gives a summary of the ground conditions which indicates soft peats and silts which overlie sands and gravels with lairs of clays and silts.

The EIS states the main impact in relation to soils would be the construction of process tanks and foundations for new buildings. It states that it is anticipated that the ground levels of the treatment plant would be raised prior to construction due to the high watertable. It notes that any tanks placed within or below the watertable would be required to have an adequate factor of safety against flotation when empty. The EIS states that the predicted impact of the proposal would be minimal, that no monitoring of the soil on site would be required and that reinstatement of topsoil would be carried out as part of the landscaping of the site.

8.0 ECOLOGICAL IMPACTS: - (EIS PAGES 116 – 122)

The EIS refers to a specialist report which is contained in Appendix C and D. Describing the receiving environment, the EIS notes that the area to the east of the plant has been stripped of its vegetation and is of minimal ecological value at the present time. It states that to the west of the existing plant, the land contains a mixture of wet woodland with reed beds associated with the watercourse / lake along the southern boundary of the site. It notes the minor road which runs along the northern boundary of the site.

The EIS states the **habitats** are listed in Figure 8.1. Figure 8.1 does not appear to be in this part of the EIS, but the habitat types as identified can be found on a table in the specialist report (Dixon, Brosnan) on Page 7. The survey area is divided into the following habitats: -

- Riparian woodland (WN5).
- Marsh (CM1) /immature woodland (WS2).

- Reed and large sedge swamp (FS1).
- Amenity grassland (GA2).
- Drainage ditch (FW4).

It is also noted that the reference to Appendix D on Page 116 of the EIS would appear to refer to the archaeological report in the appendices and it is presumed that the reference should be to Appendix C.

The EIS states that the wet/woodland area would be affected by the provision of the new treatment plant and is unlikely to support rare or uncommon bird species but would potentially support a variety of relatively common countryside birds. It states the lagoon and reed bed fringe and the agricultural land at the edge of the lake are utilised by a number of species. The EIS states that the WWTW would be confined to the proposed site and would result in the complete removal of the habitat located to the west of the existing site. It states there would be no direct impact on the brackish lake (Slatty Pond). It states that it would be expected that Willow/Alder woodland would continue to colonise the area to the west of the existing site. It states the designation of the site is of local value and the impact of its removal is not considered to be of high significance.

The EIS makes reference to noise impacts during construction and states there is no evidence to suggest that otters breed within the area. It states that the removal of vegetation would result in a net loss of habitat within the woodland/scrub/marsh habitat located to the west of the site and it was not expected that the development will significantly impact on reed bed habitats.

Section 8.1.4 refers to mitigation measures and includes the following: -

- Removal of reed beds which fringe the Brackish Lake to a minimum.
- Prevention of incidental damage by machinery by fencing of area earmarked for retention.
- Consultation to be undertaken with National Parks and Wildlife Service with regard to the nature proposed works along on the boundary with the cSAC, SPA and pNHA.
- Essential that all construction staff be notified of the boundaries of the designated areas and be made aware that no construction waste of any kind to be deposited in the protected areas.
- Construction and Demolition Waste Management Plan to be developed.
- Removal of hedgerows during the peak-breeding season should be avoided between March and June.
- Recommended that final landscape plans were designed in consultation with a qualified ecologist.

The EIS states that with mitigation in place, the long-term impact of the proposal would be negligible.

Section 8.2 deals with **aquatic habitats** and reference is again made to Appendix C for further details. The EIS states the area of Cork Harbour into which the treated wastewater would be discharged is a candidate Special Area of Conservation (Great Island Channel, Site 1058) and is part of the Special Protected Area (Cork Harbour 4030). The EIS states that Cork Harbour is an internationally important wetland site supporting in excess of 20,000 wintering waterfowl for which it is amongst the top five sites in the country.

The proposal is stated to discharge to a small creek at the low water mark to the west of Slatty Bridge. The EIS refers to a number of studies that have been previously carried out on water quality in Cork Harbour and deterioration in water quality has been recorded in the past. It states that following the completion of the Cork main drainage scheme, wastewater from Cork City is treated to a high standard and discharged at Carrigrennan on Little Island and the new facility is expected to significantly improve water quality.

The EIS states that estuaries differ from other coastal inlets in that seawater is measurably diluted by inputs of freshwater and the mixing of two very different water masses gives rise to complex sedimentological and biological processes and patterns. It states that on the upper shore, there are small amounts of algae.

The EIS refers to the mudflats which are exposed at low tide and states that these are typically productive environments characterised by high biomass, but relatively low species diversity. The EIS states that observations on the samples indicate the surface of the mud was brown, but a black anoxic layer was recorded close to the surface. It states the only species recorded was king ragworm. It states the low diversity of species may reflect toxic impacts in the past or high levels of nutrient enrichment. It states the nutrient levels may be elevated due to the discharge of effluent from the existing outfall that does not meet the required standard for nitrogen and phosphorous and is discharged at a point of comparatively low dispersal. The EIS states that the Slatty Water does not have significant value in terms of commercial fish species. It states that the only species noted in the absence of dedicated fish surveys were mullet.

Section 8.2.3 refers to the potential impact of the proposal which would be to increase the total nutrient loading over time despite the improved treatment standard. It states that the nutrient levels should remain within parameters set by the EPA for sensitive estuarine and coastal waters. It states that if the proposed extension to the WWTW did not take place, the quality of the final effluent would deteriorate as the region grew. It describes this as a substantial negative affect on the river.

The EIS sets out mitigation measures which include: -

- Avoidance of the wintering period for the installation of the outfall pipeline in the mudflats.

- Reuse of dredged sediments within Slattery Waters to prevent drying out.
- Containment of silt arising from the treatment plant during the development of the site.
- Monitoring of nutrient levels, macro invertebrates and wintering birds should be carried out.

The EIS describes the predicted impact of the proposal and states there would be localised disturbance in the mud flats during construction, but the affected area should recolonise relatively quickly.

9.0 SOCIO-ECONOMIC IMPACTS: - (EIS PAGES 123 – 129)

Section 9.1 deals with industrial and residential development and notes that Carrigtohill grew at a rate of approximately 20% per annum between 2002 and 2006. It refers to current planning permissions which are stated to include development by Gable Holdings Limited for 1,600 dwellings. The Cork Area Strategic Plan (CASP) is stated to consider the Carrigtohill area to be one with significant growth potential for both residential and industrial /enterprise developments. It states that arising from this, the Special Local Area Plan (SLAP) for Carrigtohill increased the zoning to 584 hectares and with the Amgen site included this rises to 638 hectares. The estimated final design population is given as 18,433 direct residential population with 2,787 institutional and commercial p.e. with 24,008 industrial wastewater p.e. and 17,777 p.e. for Amgen.

The EIS states the existing plant is overloaded and would not be able to cope with additional loads and the proposed extension of the plant is essential for the development to take place on a sustainable basis. Figure 9.4 shows the area covered by the SLAP Plan of 2006. The EIS states that the upgrading of the wastewater treatment plant would enable the sustainable development of Carrigtohill Town and its environs.

The EIS considers **power and water supply** in Section 9.2 and states that both the plant and the extension have a power requirement of less than 500 kW and for that reason a low-tension transformer station is installed to supply electricity to the works. It states a stand-by generator is to be provided in case of power failure. The EIS states there would be no impact on the local environment.

Section 9.3 deals with **transport and communications** and Table 9.1 sets out the expected number of vehicle movements which would include transporting of dewatered sludge for treatment or reuse and transfer of screenings and grit to landfill. The estimation is that there would be 548 movements per annum which would average two one-way trips per working day. It states the development would have a very low impact on traffic levels in Carrigtohill generally. Mitigation measures are set to include a temporary wheelwash or

washing facilities and it is stated that the long-term impact of the proposal on the local traffic would be low.

10.0 MATERIAL ASSETS: - (EIS, PAGE 130)

In relation to the assimilative capacity of Slatty Waters, the EIS states that the final effluent standards are consistent with the dual targets of complying with the regulations and operating within the assimilative capacity of Slatty Waters. It notes that the proposed site is owned by Cork County Council and it states that the plant would have the capacity to treat wastewater arising from 45,000 p.e. but the layout of the works would be planned to accommodate a future expansion to 62,000 p.e. It notes that most of the existing structures and buildings would be expected to be demolished after completion of the new works.

11.0 VISUAL IMPACT: - (EIS, PAGES 131 – 135)

The EIS describes the topography and location and gives the boundaries as being Slatty Pond to the south, Slatty Waters to the west and open agricultural land to the east. It states the existing plant is screened by existing hedging on all sides. The character of the area is described as mixed with industrial and commercial developments to the north and east of the site, agricultural and open water to the south and Slatty Waters and the N25 to the west.

The EIS states the layout of the site will be dictated to a large extent by the functional requirements of the treatment works and that the most likely external finish would be a combination of high quality cladding and plaster block work. Figure 11.1 gives sections through the site based on the indicative design. There are three photomontages given of the plant with two from the west and one from the south. The locations of the photographs are given in Figure 11.2. There does not appear to be any indication of the height of the tallest buildings. Mitigation measures are said to include landscaping to the north, west and southern boundaries with embankments varying between 2 and 6 metres in width and between 1.5 and 2 metres in height which are above the raised ground level. (From the perspective views, the height of the building would appear to be approximately 15 metres at the highest point).

Table 11.1 indicates the species to be included in planting on landscaped embankments. It states that given the topography of the site, the impact of the embankment and combination with screening will reduce the visibility of the site from all sides. It states however that the taller building would remain visible from surrounding areas.

12.0 CULTURAL HERITAGE (EIS PAGES 136 – 140)

The EIS refers to Appendix D which is the specialist report on archaeology.

It states the existing WWTW and the proposed area of development was originally a boggy greenfield site. It states the proposed development would not have any visual impact on the known archaeological sites in the environs in the townland of Tullagreen, Carrigtohill, County Cork. It states the proposed outfall pipeline route is not located within the zone of any recorded archaeological sites, but there are three known sites in the environs including evidence for pre-historic settlement. It states that as the mudflats are exposed at low tide, it would be possible that formerly unrecorded sites including archaeological material could be uncovered during disturbance of the environs of the pipeline.

The EIS states that the impact of the proposed outfall pipeline and the archaeological landscape of the area was assessed using all the available documentary and cartographic sources. It states that the area would be subject to an archaeological walkover and metal detection survey at low tide or a dive survey if required.

Section 12.4 refers to mitigation measures: -

- Slatty Water Estuary to be walks at low tide and a non-intrusive inspection carried out of the inter-tidal zone and riverbed.
- Metal detection survey of the area to be undertaken.
- The archaeologist will require a license for the work to be issued by the DoEHLG.
- Provision to be made to facilitate any excavation or recording of archaeological material that may be uncovered during the developmental works.

The EIS states the subject to the mitigation strategy is proposed, the proposed development would not have any impact on the archaeology of the area.

13.0 SUMMARY OF LONG-TERM IMPACTS AND INTERACTIONS: - (EIS PAGES 139 and 140)

This section gives a brief summary of the impacts of the proposal: -

- Movement of the outfall point resulting in enhanced water quality and reduced public health risk.

- Provision of a facility which would significantly enhance the town's ability to attract and cater for industrial, residential and other developments in the town and its environs.
- Works would be designed to modern standards with mitigation measures to reduce noise and light levels and keep discernable odours within the works boundary.
- Landscaping and other measures would minimise visual impact of the works on the local environment.
- Disruption of the natural habitat to be temporary in nature.
- Limited increase in traffic during construction period.

Section 13.2 describes interactions and states that the EIS would have demonstrated that the works would have a positive impact on the environment. It states that the mitigation measures identified would confine impacts to accepted limits and when considered together, it states there are no foreseeable circumstances in which the mitigated impacts can combine to produce accumulative impact of any greater significance.

10.0 APPENDICES

There are four appendices included in the report as follows: -

- Appendix A – Report on potential noise impact.
- Appendix B – Study on air quality impact.
- Appendix C – Report on the flora and fauna (also included within Appendix C is a baseline spring bird survey at Slatty Bridge mudflat, County Cork).
- Appendix D – Archaeological Study.
- Appendix E – Harbour modelling.

14.1 Appendix A – Report on Potential Noise Impact

This report is by Mr. Craig Mallinson and consists of 13 pages of text.

The appendix details the likely location of noise sources and it notes that the plant would be designed to meet the requirements of the Urban Wastewater Directive and would comprise primary, secondary and tertiary treatment, including nutrient removal. It notes the current noise environment and sets out the methodology used for the baseline study. Tables 3.1 and 2 give measurements at five locations for day and nighttime situations. In Section 3.2, the results are discussed and the dominant noise sources are traffic on adjacent roads and the operation of the existing WWTP. The report refers to the construction phase and the operational phase and states that the operational noise levels would not be expected to cause any impact on nearby sensitive receptors and the overall impact was expected to be minimal.

In relation to construction measures, the report lists generic issues such as proper training and maintenance, control of on-site activities, selection of plant and erection of barriers around noisy items. In relation to the operational phase, practical measures are included in the list of mitigation measures.

14.2 Appendix B – Study on Air Quality Impact

This report is prepared by Mr. Michael L. Bailey of Envirocon Limited and the report comprises a total of 20 pages of which 12 pages are text and the remaining consists of graphs and figures.

The report describes the existing environment and notes that the daily concentrations of sulphur dioxide are less than 20% of the limit value specified in the NAQS Regulations. It states no malodours could be detected during the site visit in February 2007 near the site boundary.

The report describes the general climatology and the prevailing winds in the area. It gives a description of odour emissions from wastewater treatment plants in general and notes the low nuisance threshold for some odours.

The report notes that the construction contract is a Design/Build/Operate (BDO). It lists the requirement of the design of a new treatment works with reference to inlet works, stormwater holding tanks, sludge treatment and secondary treatment. It notes that the secondary treatment would be provided by SBR process.

The report states that the inlet buildings would be 17 metres by 10 metres in dimension and it states that the stormwater holding tank would have flows in excess of 3 DWF in an open rectangular tank. The size of this tank is not specified.

In relation to the secondary treatment, the report states that this would be four rectangular tanks with an estimated dimension of 14 x 34 metres. The report states that the SBR tank involves periods of aeration and no aeration and that the aeration equipment supplies air into the tank over a shorter period compared to the subsurface aeration.

The report estimates the dimensions of the sludge treatment building to be approximately 15 metres by 10 metres and states that the odour control units would have a very high removal efficiency rate.

Section 14.0 of the report deals with the odour impact of the works and refers to the prediction modelling carried out. It outlines the assumptions made in relation to the surface area and the height of the treatment units and gives emission rates which would be applied to the odour control units.

The results of the odour dispersion model are described and the 99.5 percentile value which would be exceeded for 0.5% of the time or 45 hours a year is estimated at below 0.25 odour units/m³. The predicted 99.5 percentile concentrations at the Millipore Plant to the north-west of the site are predicted to be between 0.5 and 1 odour unit/m³. It describes the odour unit levels for the 98 percentile and states a target value of 1.5 odour units/m³ is proposed and this is for the Phase 1 development. It states that for Phase 2, the 99.5 percentile level is predicted to be between 0.25 and 0.6 odour unit/m³. The contours of predicted odour levels are given in Tables 4, 5, 6 and 7 of the report.

The report describes odour control measures which include housing of inlet works, covering of skips, venting of odorous emissions to atmosphere and the use of odour control units operating with removal efficiencies of over 95%.

The conclusion of the report is that the design and operation of the upgrading extension of the wastewater treatment plant would minimise the potential for malodours to be detected beyond the site boundary. It states that no significant impact on the ambient air quality of the area is predicted due to odour emissions from the plant.

14.3 Appendix C – Report on Flora and Fauna

This report has 21 pages and it is noted that page 2 is not in either of the copies of the EIS available.

On page 3 of the report surrounding landscape is described and the proposed pipeline route. Paragraph 4 describes the marine ecology and notes that core samples were taken at low tide using a standard corer. It states that the mudflats were typically productive environments and the only species recorded was king ragworm. It states the low diversity may be indicative of habitat deterioration. In relation to fish, it notes that Slatty Water is a small tidal inlet and does not have significant value in terms of the larger and more

commercial fish species. Figure 1 is the habitat map which indicates the designations of amenity grassland, immature woodland and scrub, reed and large sedge swamp, riparian woodland, marsh and drainage ditches. The different designations are described in the following paragraphs and it is noted that in fact the report does not include any even numbered pages.

Mammals are described on page 9 and reference is made to otters, seals and bats. On page 11, Section 8 gives the impact of the proposed development on the flora and fauna and this is described on Table 1 which includes the description of the habitat and species, the relative habitat value, the comments and the impacts.

Mitigation measures are described on page 17. Included in the mitigation, it is recommended that detailed monitoring of nutrient levels, macro invertebrates and wintering birds be carried out. It states that initially accurate baseline winter data should be obtained with surveys repeated every two years until four years after the plant reaches its full capacity. The report states that a feasible, scope should be provided within the design of the treatment plant to upgrade the works and/or move the discharge point should survey results indicate that important bird populations are being adversely affected.

Other mitigation measures include the fencing of habitats earmarked for retention and preparation of a construction and demolition waste management plan.

The report also gives details of the Great Island Channel, Site Code 001058.

14.4 Baseline Spring Bird Surveys at Slatty Bridge Mudflat County Cork

This report is reduced on behalf of T. J. O'Connor's by Mick Mackey. The report consists of pages nos. 23 – 33, but omits the even numbered pages. Page 25 gives a survey of tidal area around the site and Table 2.1 shows the total numbers of wildfowl, waders and gulls recorded at the study site in April 2007. The report on page 27 describes the species and notes that Cork Harbour holds the largest flocks of wintering black-tailed godwits in Ireland and these are the most numerous species observed during the April site assessments. It states that the high tide survey report of 75 roosting in the company of oyster catchers on a rocky bank on the north-western end of the site and the lower number noted during high tides indicated that the black-tailed godwit are using roosting sites outside the study area.

The conclusions on page 29 were that the mudflat may support greater number of birds outside of the April period. It states that most terrestrial species recorded in small numbers and it refers to other reports which detail the detrimental impacts of human activities on estuaries. It states the main potential impacts from the instalment of a wastewater outflow pipeline would be reclamation, disturbance and subsequent pollution and enrichment.

14.5 Appendix D – Archaeological Study

Appendix D contains a report entitled preliminary archaeological impact assessment which is dated July 2004 and this is followed by a further report which is undated, but appears to be the final archaeological report.

In the preliminary report, the study methodology is outlined and the archaeological and historical background of the area is described. It states there are ten fulachta fiadh within the study area and these are listed in the report. It states there are 14 ringforts in the environs of the proposed development with a further six possible examples. It states that the categories of enclosures and earthworks are possible linked to ringforts and there are six of those types of monument within the environs of the study area. It refers to Barry's Court Castle which is located to the south of the Carrigtohill Town.

In relation to impacts, the summary states there are 52 recorded monuments surrounding the proposed development area and it states there would be possibly previously unrecorded monuments uncovered during topsoil stripping. It sets out preliminary mitigation measures which are repeated in the final version of the report. Other than that in the preliminary report, specific mention is made of a shell midden (RMP CO 075 – 068) and a linear earthwork which should specifically be monitored to record any archaeological deposits and to recover any artefacts. In the summary to the preliminary report, it is stated that the direct impact on the two recorded archaeological monuments within the vicinity of the development may be minimal due to previous development in those areas.

The second report within Appendix D also sets out the study methodology, and describes the receiving environment. Section 5 of the report gives the archaeological and historical background of the area and also describes Barry's Court Castle and Fota House.

Section 6 of the report states that the proposed outfall pipeline route is not located within the zone of any recorded archaeological sites, but there are three known sites in the environs including evidence for pre-historic settlement.

Section 7 gives mitigation strategies as follows: -

- Slatty Water Estuary should be walked at low tide and a non-intrusive inspection should be carried out of the inter-tidal zone.
- Metal detection survey of the area must be undertaken.

- Archaeologist would require a licence for the work and the licence to be issued by the DoEHLG. It also states that the archaeologist should be empowered to halt the development if buried archaeological features or finds are uncovered.

(It is noted that the preliminary strategies refer more specifically to the collection system for the drainage works while the second report appears to specifically refer to the outfall pipeline).

Section 8 is titled non-technical summary and it states that while there is no direct impact on the record archaeological monuments within the vicinity of the development area, as yet unknown archaeological monuments in the development zone may be impacted upon. This conclusion is similar to that given in the preliminary archaeological report.

Appendix 1 is an extract from the archaeological inventory of County Cork and refers to an enclosure at Killacloyne, a country house at Tullagreen and an occupation site on Fota Island. Figure 1 shows the site location and Figure 2 is the extract from the RMP Map. Figure 3 is the proposed development area of the outfall pipeline and Figure 4 is the map of RMP site north of the pipeline route.

14.6 Appendix E – Harbour Modelling

This appendix consists of a number of tables which give estimated concentrations for phosphorous, BOD, nitrogen, ammonia, dissolved oxygen, suspended solids and faecal coliforms. The tables indicate the concentrations at neap and spring tide conditions under various tidal conditions.

