# 3 ENVIRONMENTAL IMPACTS

This section describes the impacts that could result from the construction and operation of the Bantry Sewerage Scheme. Impact amelioration measures are discussed in Section 4.

## 3.1 HUMAN ENVIRONMENT

### 3.1.1 POPULATION

Construction of the proposed sewerage scheme is not expected to significantly affect the current population or future population projections of the Bantry area. Although the extension of sewers to currently unsewered areas could indirectly promote growth and development in these areas, no such expansion is proposed via this sewerage scheme. The sizing of the transmission mains and the treatment works volume capacity have been completed so as to provide adequate capacity to accommodate projected population growth for the next 30 years.

### 3.1.2 LAND USE PATTERNS

The construction of the proposed treatment works will cause long-term impacts to the land use of the 1.01 hectare site, specifically involving the conversion of the land use from an old field/orchard and spruce plantation to a municipal/industrial-type use. This change, however, will not affect land use patterns in the Bantry area. The project will not promote development in the vicinity of project components. The location of the treatment works may limit future potential development of adjacent parcels (particularly residential use), but this area does not currently exhibit high development pressure and would not reasonably be expected to in the future. Although land use patterns on a town-wide basis would not be directly affected, future extension of sewer mains could indirectly promote development of certain uses (residential, industrial) in selected areas.



### 3.1.3 AGRICULTURE

The proposed sewerage scheme would not traverse, or otherwise directly affect any current agricultural uses (i.e. grazing, dairy production) in the Bantry Bay area. In addition, the proposed development will not indirectly affect nearby grazing and agricultural lands.

### 3.1.4 COMMERCIAL FISHERIES

By eliminating the discharge of untreated sewage into Bantry Harbour, the construction and operation of the proposed sewerage scheme will result in positive impacts to the local commercial shellfish industry.

The continued viability of this industry, which supports over 150 full-time, part-time, and seasonal jobs, is critical. It has been determined that the proposed scheme will reduce the current level of total-faecal coliform in the mussel beds to levels within the "approved" category for shellfish harvesting (see Section 3.2.2).

Although construction of the proposed wastewater transmission main could result in short-term impacts due to erosion, sedimentation, increased turbidity, and general disturbances to the intertidal/foreshore area, these potential impacts can be satisfactorily mitigated (see Section 4). Any impacts due to construction in this area will be temporary and occur for the duration of construction only.

Impacts to all types of commercial fisheries will be long-term and positive.

### 3.1.5 TOURISM

Project-related impacts to tourism will not likely be significant, but the projected improvements to the water quality in Bantry Harbour could encourage use and enjoyment of this resource (i.e. swimming, boating, fishing, etc). The project will, however, result in the treatment of sewage generated by the approximately 250,000 tourists who visit the Bantry area on an annual basis, thus resulting in the elimination of these wastes from discharge directly into the harbour without treatment.



### 3.1.6 TRANSPORTATION

Construction of the proposed scheme will result in a short-term temporary increase in traffic due to the movement of construction equipment and machinery, but such a traffic increase will last for the duration of construction only and will not be significant. Operation of the treatment works will result in an insignificant increase in vehicular traffic accessing the facility. Any increase will be attributable to the one full-time employee who will work at the facility and to trucks and service vehicles making deliveries or removing wastes (e.g. sludge). Sludge removal will require one truck trip every three to four days.

This increase in traffic will not cause traffic volume problems along local roads, although the narrow width of the local roads leading to the treatment works site may pose some difficulties in vehicles passing in opposite directions. in general, trucks associated with the treatment works will not be large (5 cubic metres), so traffic-related inconveniences will be

no more severe than current situations experienced with the movement of farm equipment or local truck traffic. Nonetheless, it is recommended that the local roads servicing the proposed treatment works (e.g. from the Cork Road at Westlodge Hotel, past Ardeevin House, to the airstrip) be considered for widening at some point in the future.

## 3.2 FLORA AND FAUNA

This section discusses the potential effects on flora and fauna caused by construction and operation of the proposed Bantry Sewerage Scheme. The discussion addresses the effects on both terrestrial and marine resources.

### 3.2.1 TERRESTRIAL FLORA AND FAUNA

Construction and operation of the proposed facility will result in both long and short-term minor impacts to terrestrial flora and fauna. Construction of the proposed treatment works will require permanent removal of approximately 1 hectare of native vegetation at the proposed treatment works site. This impact will be relatively minor due to the human-influenced nature of the existing vegetation communities (early successional old-field, hedgerow, old orchard, and spruce plantation) and the relative abundance of such habitat in the general vicinity of the treatment works site. The proposed facility will be configured and sited so as to minimise disturbance to large woody vegetation. In addition, woody hedgerows bordering the site will be retained to the degree possible to minimise ecological and aesthetic impacts.



A portion of the proposed wastewater transmission main will traverse a maintained grassy area adjacent to an existing airstrip. Impacts to flora in this area will be insignificant due to the previously altered and maintained condition of the community. In addition, the community will be allowed to revert to its original condition following construction.

Construction of the proposed facilities will have minor short and long-term impacts on fauna habitat, causing localised impacts to fauna populations. During construction, the clearing and grading of the treatment works site and transmission main wayleave will result in a loss of vegetative cover that could cause limited mortality to less-mobile forms of wildlife, such as small rodents, which are unable to escape the construction area. In addition, the general disturbance of the site from construction activities will likely cause the temporary displacement of most fauna from the immediate vicinity of the construction

zone and adjacent areas. Following construction, displaced species are expected to resume their normal habits consistent with the availability of post-construction habitats.

Construction of the treatment works on the 1.01 hectares site will result in the long-term conversion of native vegetation to maintained industrial use. This will preclude the use of this area for most fauna; however, some rodents and songbirds may continue to derive benefit from the early-successional edges likely to be created around the perimeter of the site. Most species currently occupying the site will be able to find suitable undeveloped habitat, generally found in abundance adjacent to the disturbance area.

No known wildlife species of concern or significant wildlife habitats occur in the project area, so no impacts to such resources will occur.

### 3.2.2 MARINE FLORA AND FAUNA

Implementation of the proposed Bantry Sewerage Scheme will have short and long-term minor effects on marine flora and fauna.



The new wastewater transmission main that will convey wastewater from the existing pumphouse to the treatment works will cause short-term minor impacts to littoral and pelagic marine resources. The first approximately 500m of the transmission main will be installed within the existing Route N71 wayleave, thereby avoiding impacts to flora and fauna. The main then diverges from the road into the Bantry Harbour foreshore area.

The relatively protected and low wave-energy environment in this portion of foreshore has allowed for the development of a biologically rich benthic community within the intertidal zone. This rich community promotes utilisation of the foreshore area by a variety of shorebirds and waterfowl that will be precluded from utilising the area during construction. Such impacts will be limited to the construction period.

Operation of heavy equipment for trenching and pipe installation will result in direct and indirect impacts to benthic fauna such as molluscs and crustaceans during construction. Immobile organisms such as mussels, oysters, clams, snails, limpets, and various algae will experience direct mortality and disruption-of-substrate impacts.

Nearby benthic and pelagic communities may be affected by sedimentation resulting from disturbance and suspension of marine sediments in the water column.

Suspended sediment particles may clog the tentacles, fine filters, and gills of suspension feeders and may lead to localised reductions in population of these species (Gay et al 1991). In addition, increased turbidity can cause attenuation of light, thus lowering the rate of photosynthesis by macroalgae and phytoplankton.

However, such effects of suspended solids on benthos are generally restricted to areas that experience extremely high turbidity for a prolonged period of time. Most marine benthic organisms can withstand exposure to high concentrations of suspended solids for short periods (Saila et al 1972).

Sediment plumes resulting from construction will have a minor effect on demersal and pelagic finfish. High concentrations of very fine particles can coat the respiratory epithelium of fishes, thereby interfering with respiration (Sherk et al 1974).

In addition, suspended solids can affect juvenile and larval fish and cause siltation of spawning beds. However, unlike benthos, finfish are highly mobile and can avoid areas they find unsuitable. In general, the zone of potential suspended solids impacts is expected to be minimal due to the generally coarse nature of the sediments (i.e. sand, gravel, and cobbles) along the foreshore and in the Narrows of Bantry Bay.



Depending upon the degree of wind and wave energy, intertidal foreshore areas are subject to frequent natural physical disturbance. For this reason, many of the benthic faunal species occupying the littoral zone have developed adaptations to withstand frequent disturbance. Due to this inherent resiliency, marine benthos are expected to recolonise the foreshore area shortly after cessation of construction activities. Recolonisation by benthos after dredging operations has been shown to be very rapid, on a scale of weeks to about two years, depending upon the magnitude and season of dredging (Wildfish and Thomas 1985; Jones 1986). Studies of the rocky intertidal zone of Bantry Bay were conducted to provide information regarding the sequence and duration of ecological recovery following human disturbance of the intertidal zone. Shores cleared of flora and fauna during the summer of 1978 were found to have nearly full recolonization by August 1979 (Cross and Southgate 1982).

The treated effluent discharge main will convey treated effluent to a discharge point in Bantry Bay. The land-based portion of this main will be routed along an existing roadway and, as such, not affect flora and fauna. The submarine portion will traverse approximately 200 metres across the floor of Bantry Bay

to an effluent outfall point. This portion of the effluent transmission main will be entrenched into the sediments, thus causing localised direct physical impacts to marine benthos and plumes of disturbed sediments. Impacts to benthic organisms resulting from disruption of substrate and sediment plumes are expected to be similar to those described above for the intertidal construction-related disturbance. Of particular concern in the effluent discharge area is the edible sea urchin colony populating the centre of the Narrows in the vicinity of the outfall. Construction of the proposed outfall is likely to cause some limited mortality to sea urchins due to direct physical contact, disruption of substrate, and excessive turbidity interfering with respiratory functions. Impacts to urchin populations will be limited to the extent practicable by minimising the extent and duration of bottom disturbances.

Although the wastewater will be secondary treated to remove the majority of BOD, nutrients, suspended solids, and bacteriological loadings, some localised impact to marine flora and fauna may occur. Increased discharge of plant nutrients in the vicinity of the outfall may result in a shift in normal phytoplankton populations or community structure, which may include minor algal blooms. Such effects are expected to be minimal due to the degree of water flushing in the Narrows and the expected lowering of the overall ambient nutrient levels in the bay caused by the proposed action.



Suspended solids and organic matter contained in the treated effluent will tend to flocculate and precipitate in the effluent/seawater mixing zone. This precipitation may cause localised smothering of sediments and increases in benthic BOD, thereby reducing dissolved oxygen (Gay et al 1991). This effect is expected to be minor due to the proposed diffuser structures that will facilitate dispersion and mixing of the treated effluent. Furthermore, the treated effluent will be generally warmer than the receiving waters, thus forming a buoyant plume carrying the effluent to the surface where wind-driven agitation will occur (Tchobanoglous and Schroeder 1985).

Although the majority of bacteria and viruses in the wastewater will be removed by treatment, all microorganisms cannot be removed economically and, thus, some will be discharged with the effluent. Of greatest concern is the impact of such organisms on maricultural activities in the bay, primarily on the harvesting of cultivated mussels. Mathematical modelling of bacteria concentrations in the vicinity of the mussel-cultivation areas was conducted based on the expected quality of the effluent and the mixing and

circulation patterns of the bay determined through a recent hydrographic survey. This modelling of bacteria concentrations indicated that the levels of bacteria in the vicinity of the mussel beds, resulting from the treated effluent discharge will be at maximum 10.8 fc/100 ml, thereby meeting the criteria for classification of the area as an "approved" shellfish-producing water.

In addition to causing improved water-quality conditions in the vicinity of existing maricultural activities, the proposed discharge of secondary treated wastewater will not affect the quality of water in the zone southwest of Whiddy Island proposed for future shellfish cultivation by the Bantry Fish Farming Cooperative Society Ltd.

## 3.3 AIR QUALITY AND NOISE LEVELS

This section addresses potential impacts to ambient air quality and noise levels caused by construction and operation of the proposed Bantry Sewerage Scheme.

### 3.3.1 AIR QUALITY

The proposed sewerage scheme will have short and long-term minor effects on air quality. Construction activities will result in minor degradation of air quality due to construction vehicle exhaust emissions, generation of fugitive dust, and possible burning of woody debris.



Fuel consumption and resulting emissions during construction will vary depending on the specific construction activity and type of terrain. Vehicular exhaust and crankcase emissions will be kept to a minimum through monitoring vehicles for efficient operation during construction.

Fugitive dust may be produced during all phases of construction, particularly if dry weather conditions prevail. However, due to the generally damp climate in Ireland, this impact is expected to be minimal.

Long-term minor effects on air quality will be realised by operation of the proposed facility. The wastewater treatment process can be a potential source of airborne pollutants, including odours; noxious, toxic, or asphyxiating gases; and aerosols from aeration basins. All of these potential emissions can be minimised and largely controlled by satisfactory design, construction, operation, and maintenance.

Generation of malodorous gases by wastewater treatment systems is caused by incomplete oxidation of sulphur or nitrogen-containing organic matter (Tjochobaneglous and Schroeder 1985). The most common malodorous

inorganic gases produced by wastewater treatment are hydrogen sulphide ($H_2S$), sulphur dioxide ($SO_2$), and ammonia ($NH_3$). A number of organic compounds, including organic acids, aldehydes, ketones, and methylsulfides, as well as algae, fungi, and molds, also produce wastewater-related odours (USEPA 1976).

Odour is best controlled by maximisation of the oxidation-reduction potential (ORP) of the wastewater so as to promote complete oxidation of organic compounds. Since the proposed Bantry Sewerage Scheme treatment works will operate state-of-the-art equipment at levels below capacity, odours generated by the plant are expected to be minimal.

Effective air circulation generated by the prevailing onshore winds will assist in odour dissipation. Odour impacts are expected to be further minimised by the generally rural nature of the landscape surrounding the site and the lack of sensitive receptors. Three occupied residences are located within a 0.5 km radius of the facility, the closest of which is approximately 175 metres to the northwest.

### 3.3.2 NOISE



Construction of the proposed Bantry Sewerage Scheme will cause temporary increases in the ambient noise levels in the immediate vicinity of the construction sites. However, the specific impact of construction activities on sensitive receptor locations, such as residences, will depend on the method of construction and the equipment used. Noise levels during construction may typically be expected to range from 68 to 95 dB(A), measured at 15 metres, with the occasional exception of impact equipment, which can cause noise levels up to 105 dB(A). Blasting, which may be required in areas of near-surface bedrock, will emit high-intensity noise of a few seconds duration. It is unlikely, however, that blasting will be required due to the depth and nature of the glacial till and shale bedrock.

A primary factor in determining noise impacts is the number of receptors exposed to the sound. Due to the generally rural location of the proposed sewerage scheme, this figure should be minimal.

Further, because noise levels diminish at least 6 dB(A) per doubling of distance form the source, noise emissions will be localised. As an example, construction equipment noise of 90 dB(A) (typical for a backacter or grader) measured at 15 metres, would be reduced to 60 dB(A) within 500 metres. Construction noise levels will be reduced to 54 dB(A) within 1 kilometre. Because of the effects of ground and

atmospheric absorption of sound, the actual distances to reach acceptable noise levels will be shorter. Therefore, the impact from the construction noise will be of limited range.

Operation of the facility will create a low-level increase in the ambient noise levels in the immediate vicinity of the plant. However, this noise level will drop off precipitously outside of the immediate environs of the operating plant.

Manufacturers' specifications report approximate maximum noise emissions of 90 dB(A) from each of the two aerators at a distance of 1 metre. The sum total of noise emissions at 1 metre distance will be approximately 94 dB(A). Based on the attenuation equation described above, noise emissions produced by the aerator are not expected to be perceptible above background ambient noise levels - 40 dB(A) - at the nearest noise sensitive area, which is 175 metres distant.

Natural vegetation buffering that will be maintained in place around the proposed treatment works will aid in attenuating noise.



## 3.4 LANDSCAPE AND SCENIC RESOURCES

### 3.4.1 LANDSCAPE

The proposed sewerage scheme will not significantly impact either the landscape of the project area or the character of the Bantry area. Impacts to the foreshore area due to the construction of the transmission main will be temporary, limited generally to the period of construction, and can be mitigated. landscape-related impacts from the construction and operation of the treatment works will generally not be significant for the following reasons: only a relatively small land area will be needed 1.01 hectares; the site is visually screened from nearby roads (and thus is not visible to a large number of people); the site is located on the back side of a drumlin inland from the coastal area (and thus is not visible from Bantry Bay); and the project will not require substnatial site grading (thus, not impacting existing topography or natural land features).

### 3.4.2 SCENIC RESOURCES

The construction and operation of the proposed sewerage scheme will have an insignificant impact on existing scenic resources (i.e. vistas, view sheds, etc.) of Bantry Bay. Because the wastewater transmission main will not be visible after construction, there will be no permanent or long-term impacts to the coastline. The treatment works will cause only slight impacts to visual resources, and these will occur only in the immediately vicinity of the site (i.e. along the

airport road).

Visual impacts from the treatment works facility will not be significant because the site is screened by existing vegetation surrounding it (i.e. hedgerows). Moreover, as the site is located on the back side of a drumlin inland from the coastal area (and, thus, is not visible from Bantry Bay), any visual access to the site from adjacent areas will be limited.

## 3.5 GEOLOGY AND SOILS

This section addresses potential impacts to geological and soil resources caused by implementation of the proposed Bantry Sewerage Scheme.

### 3.5.1 GEOLOGY

The proposed Bantry Sewerage Scheme facilities will be situated on relatively level sites, thereby minimizing the need for grading and topographic alteration. The majority of the project components are underlain by unconsolidated glacial material over shale bedrock, so blasting of bedrock is not expected to be necessary. No known exploitable mineral resources are located in the vicinity of the proposed project, so no impacts to such resources are expected.



### 3.5.2 SOILS

Construction of the proposed sewerage scheme will result in long and short-term minor impacts to soil resources. Long-term loss of soil productivity will occur in the areas directly covered by the wastewater treatment works facility. Adjacent areas disturbed during construction will be recontoured, fertilized, and revegetated, thus minimising long-term impacts to soil productivity.

Since the majority of the wastewater and effluent mains will be aligned along existing roadways or along the foreshore, little soil disturbance will occur. Construction of the segment of wastewater main across the area adjacent to the airstrip will result in temporary disturbance to soil resources. Impacts will be minimised by segregating sopsoil from over the trench and revegetating with a suitable conservation seed mixture. Some soil compaction may occur due to operation of heavy machinery, but this impact is of minor concern because the area is maintained in an idle, grassy state and not utilised for agricultural activities.

## 3.6 HYDROLOGY AND WATER QUALITY

Construction of the land-based components of the scheme may result in some temporary degradation to Bantry Bay water-quality in the immediate vicinity of the construction activities. This impact would be caused primarily by overland storm-water flow transporting disturbed soil particles into adjacent receiving waters. This impact would be minimised by implementation of sedimentation and erosion-control measures and limited to the period of construction. Groundwater resources are not expected to be affected by the proposed action.

Construction of the submarine portions of the wastewater transmission main and the treated effluent outfall main will cause temporary minor impacts to water quality, primarily from the suspension of disturbed sediments into the water column. Impacts resulting from construction-related sediment plumes would have the greatest effect on flora and fauna in the immediate vicinity of the disturbance. Such impacts are discussed in Section 3.3, Flora and Fauna. Overall impacts to water quality will be minor and related primarily to the period of construction and shortly thereafter, until the sediments have stabilised.



The proposed Bantry Sewerage Scheme will involve secondary treatment of urban wastewater to current EC guidelines, thus causing a 95% reduction in BOD, suspended solids, and total phosphorous levels, and an 80% reduction in faecal coliform bacteria and total nitrogen. In addition to achieving significant bacterial reductions, secondary treatment of wastewater has been shown to result in an average 98.8% reduction in human enteric viruses contained in typical municipal sewage (Slade and Ford 1983). Such human enteric viruses are already at levels below detection limits in the raw wastewater from Bantry Town. Since the Bantry Town discharge constitutes the majority of the total anthropogenic pollution input into Bantry Bay, the proposed action will result in a significant reduction in anthropogenic pollutant inputs.

In addition to removing a substantial amount of pollution-loading, the proposed action will also involve discharging the treated effluent in a zone determined through exhaustive hydrographic investigation to have improved water circulation characteristics, thus improving initial dilution, dilution due to dispersion, and the material decay by chemical, biological, and physical means of the remaining wastewater constituents. The combination of reducing waste-loading and improving mixing and dispersion will result in an overall improvement to water quality in the inner harbour and the Bantry Bay ecosystem as a whole.

Areas of special concern, particularly the mussel-cultivation zone northeast of Whiddy Island and Reenrour Beach, will experience improved water quality with regard to faecal coliform and BOD. Mathematical modelling using hydrographic survey data and expected treated effluent concentrations was conducted to predict faecal coliform and BOD concentrations at sensitive areas in the bay, given the two alternative outfall locations. The results of this modelling, using the preferred Narrows outfall site, show worst-cast-scenario concentrations of 10.8 fc/100 ml and 0.0019 mg/l BOD in the active shellfish-cultivation zone, and 2.76 fc/100 ml and 0.0012 mg/l BOD at Reenrour Beach. These values are well below the EC guidelines for bathing water and approved shellfish waters.

Although the predicted values for faecal coliform bacteria concentrations and BOD are quite low, they have been computed for the treated effluent discharge only. The mathematical model does not estimate existing background levels of faecal coliform due to other potential sources, including non-point-source runoff and sewage discharge from watercraft. However, since the majority of waste entering the bay is derived from the Bantry Town discharge, the predicted faecal coliform concentrations from the treated effluent combined with low background levels are expected to equilibrate at a level below the threshold for approved shellfish waters.



Analysis of Bantry municipal wastewater collected at various locations of the municipal sewage collection system, including adjacent to the Bantry Hospital and at the existing pumphouse, revealed concentrations of human enteric viruses below the detection limit in the 5 litre samples taken. The provision of a separate septic tank and soakway system for the two acute intensive care wards at Bantry hospital should ensure that future virus concentrations in the wastewater remain extremely low.

Because viruses are at undetectable levels in the raw wastewater, any viruses remaining in the treated effluent will be at levels so low they are not expected to pose a threat to shellfish areas or bathing beaches. Secondary treatment will remove the majority of viruses and the remainder will be inactivated by natural bacterial marine antiviral activity (MAVA). Although viral sensitivity to MAVA depends on virus type and strain, generally all viruses are inactivated faster in seawater than in freshwater (Block 1983).

## 3.7 CULTURAL HERITAGE

Review of County Cork records for cultural resources has revealed several known significant cultural resources in the general vicinity of the proposed sewerage scheme. However, no known cultural

resources will be directly affected by construction or operation of the facility.

The proposed treatment works will be located adjacent to the ruins of a mid-nineteenth-century farmhouse and associated outbuildings and may result in some disturbance to this historic structure. However, cultural resources of this sort are common in the region and not considered of major cultural importance. No known significant cultural resources will be affected by construction of the proposed sewerage scheme. Unknown cultural resources encountered during the construction phase will be fully evaluated by an archaeological expert.

Aboveground components of the treatment works will have no major negative aesthetic impact on surrounding known cultural resources.

## 3.8 MATERIAL ASSETS

This section addresses the project-related impacts to the recreational and development potential of the Bantry area and the assimilative capacity of Bantry Bay.

### 3.8.1 RECREATIONAL POTENTIAL



Construction and operation of the proposed sewerage scheme will improve the quality of existing recreational resources and the recreational potential of further developing these resources for both local and tourist/seasonal users. Recreational resources that will benefit the most from the proposed development will be water-related activities, particularly those that involve direct water-contact, such as swimming/bathing, wind-surfing, and rowing. Activities that depend on water quality and the health of marine resources, such as angling, will also benefit. land-related recreational activities will not be affected, except for temporary disturbances to the foreshore area due to transmission-main construction that would preclude use of this area (i.e. walking, bird-watching, clamming, angling) for the period of construction (approximately nine months). Without the proposed sewerage scheme, the future development of the area's water-related recreational potential would be adversely affected by worsening water-quality conditions.

### 3.8.2 DEVELOPMENT POTENTIAL

Although the construction and operation of the proposed sewerage scheme will likely not result in direct spin-off development in the Bantry area, it will provide the mechanism to accommodate future

residential, commercial, and, in part, industrial development. By providing the means of treating the wastewater from future development, rather than allowing additional direct sewage discharge into Bantry Harbour, the treatment scheme will allow for future growth without direct environmental impacts to the harbour.

The proposed sewerage scheme may also indirectly promote development in currently undeveloped or under-utilised areas around Bantry Town. By extending sewers into areas that lack them at present, the local authority can encourage residential or industrial development without the need for on-site sewage treatment (unless industrial pretreatment systems are determined necessary). Conversely, the local authority can discourage development in a particular area by choosing not to extend sewers to serve that area.

As such, a sewage collection and treatment system can be used as a development incentive or disincentive. In this aspect, the proposed Bantry Bay Sewerage Scheme will result in indirect beneficial impacts to the development potential of the area.



### 3.8.3 ASSIMILATIVE CAPACITY OF BANTRY BAY

In economic terms, the assimilative capacity of Bantry Bay for wastewater can be assigned a monetary value equivalent to the cost of implementing wastewater treatment to the tertiary level. Using this scenario, the material-asset monetary value of the bay's assimilative capacity to be affected by the action is given by the following equation:

$$Cpst - Cps = Ct$$

where:

Cpst = Cost of conventional preliminary, secondary, and tertiary wastewater treatment (currently being achieved by Bantry Bay waters).

Cps = Cost of preliminary and secondary treatment (to be implemented by the proposed Bantry Sewerage Scheme).

Ct = Cost of conventional tertiary treatment of secondary treated waters (to be accomplished by Bantry Bay waters).

Although no exact monetary values are given for the above variables, it is logical to assume that the cost of Cpst is greater than Cps, which is greater than Ct. Since the Cpst (the monetary value of the assimilative function currently provided by Bantry Bay

waters) is greater than Ct (the monetary value of the tertiary treatment function to be provided by Bantry Bay following implementation of the scheme), a net gain in assimilative-capacity value is predicted. This model, although simplistic, demonstrates that the proposed sewerage scheme will have a net positive effect on the assimilative capacity of Bantry Bay.