

FIGURE 3.8.7 RMP SITES WITHIN THE VICINITY OF THE PROPOSED MARINE CROSSING

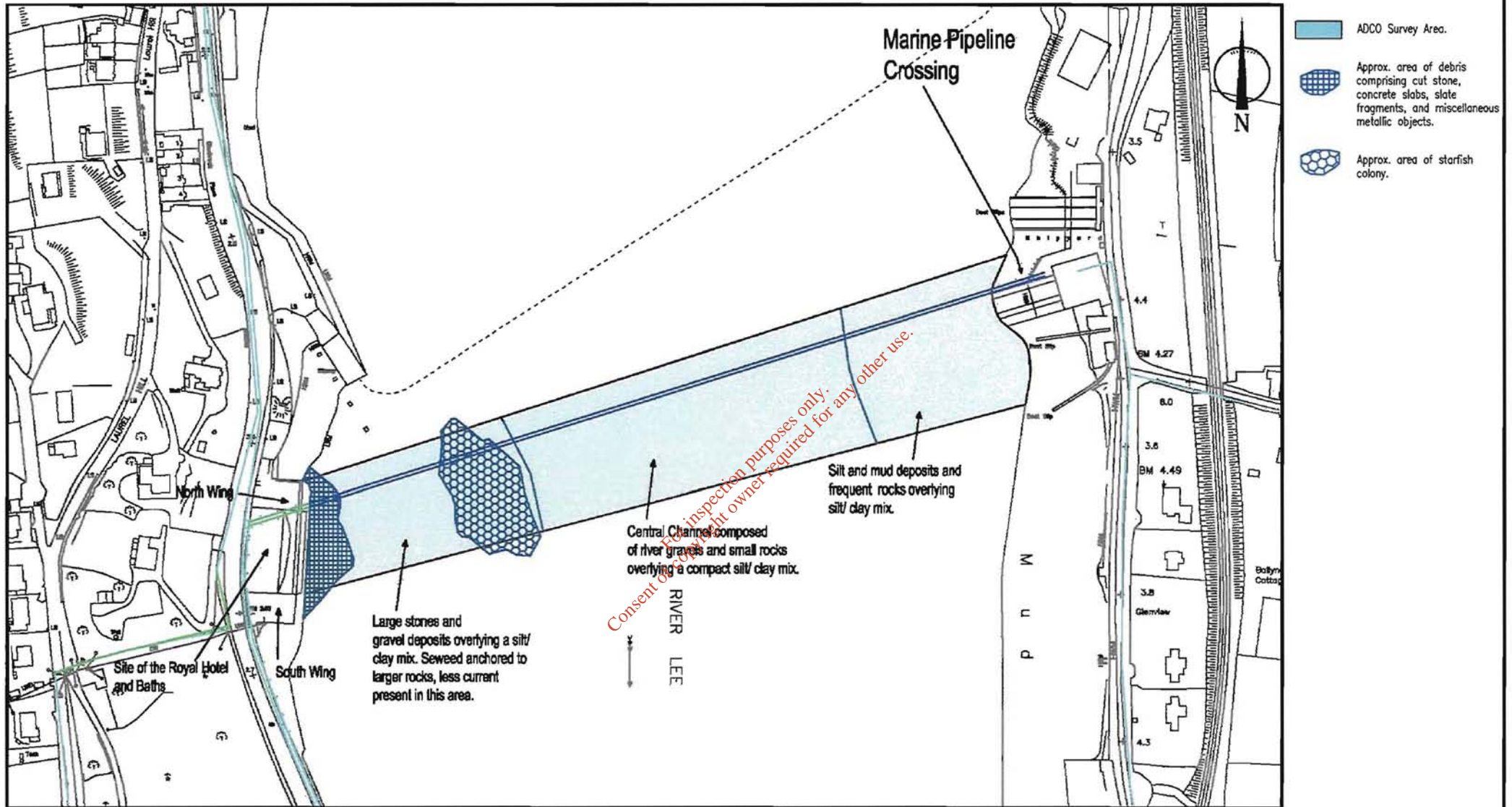


FIGURE 3.8.8 SURVEY AREA AND SEABED OBSERVATIONS AT SITE OF PROPOSED MARINE PIPELINE CROSSING

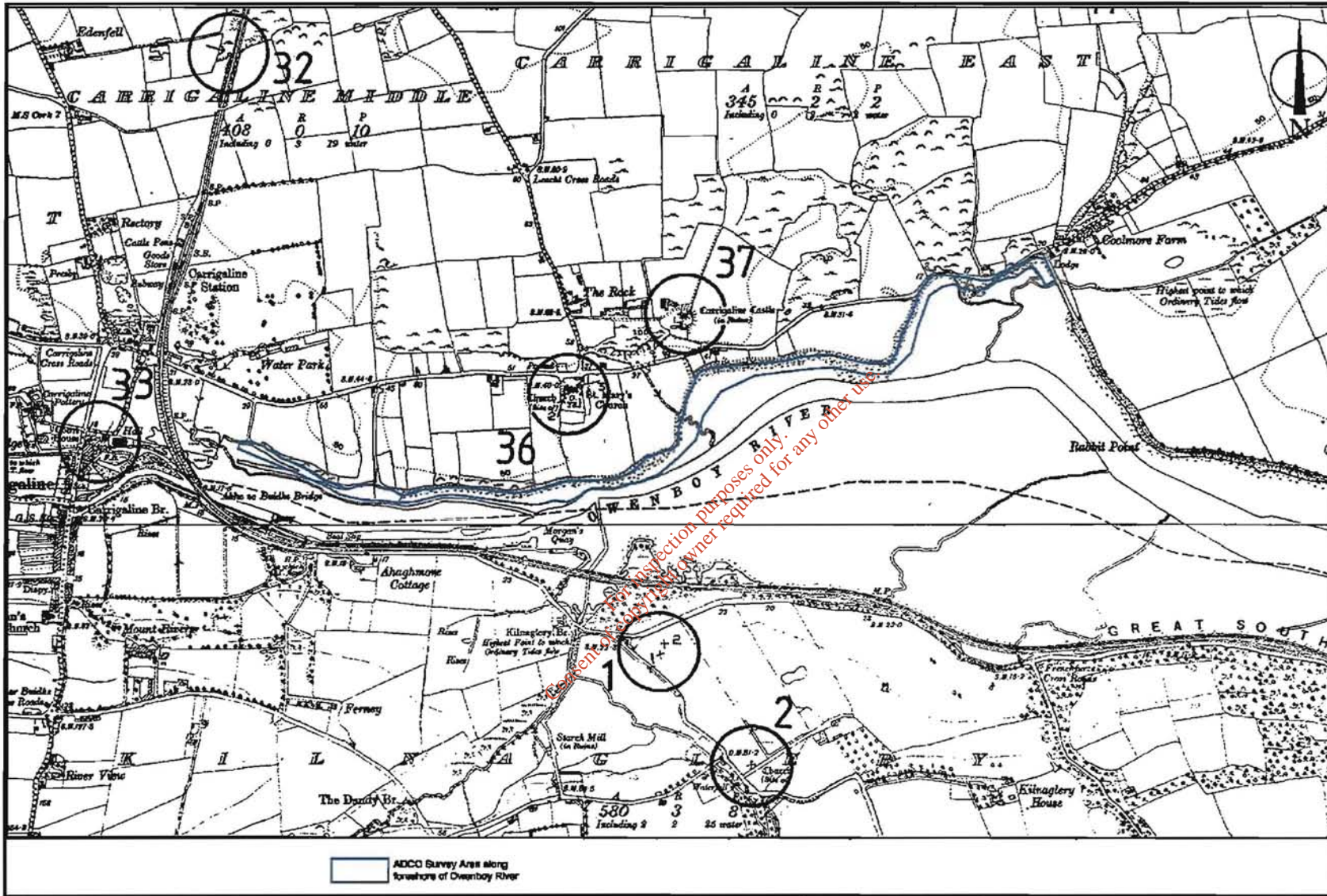


FIGURE 3.8.9 RMP SITES WITHIN THE VICINITY OF THE PROPOSED FORESHORE PIPELINE ROUTE



FIGURE 3.8.10 AERIAL PHOTO SHOWING CH LOCATIONS ALONG PIPELINE ROUTES IN THE MONKSTOWN AREA

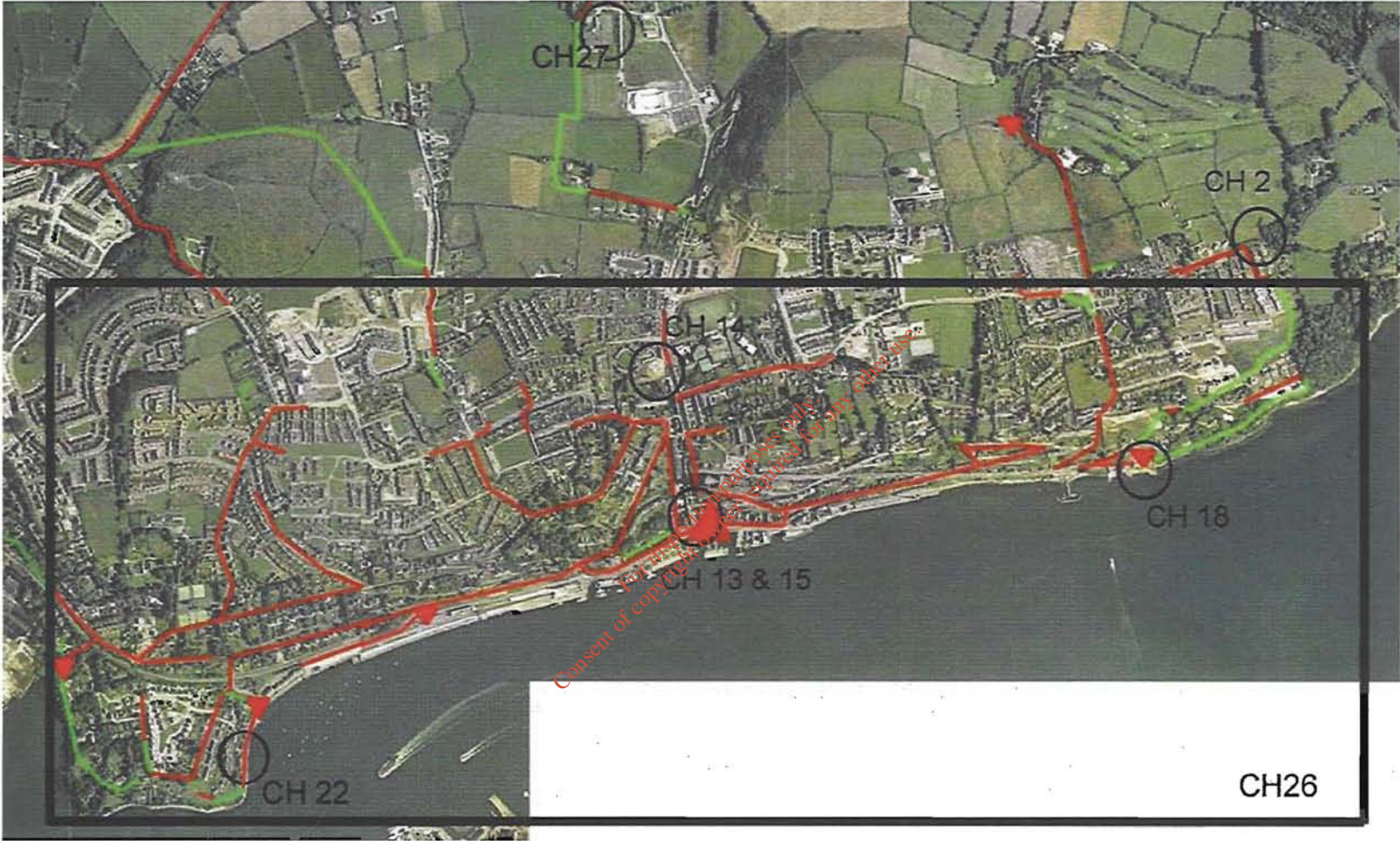


FIGURE 3.8.11 AERIAL PHOTO SHOWING CH LOCATIONS FOR COBH AND ENVIRONS



FIGURE 3.8.12 AERIAL PHOTO SHOWING CH LOCATIONS ALONG PIPELINE ROUTES IN THE PROPOSED WWTP SITE AREA



FIGURE 3.8.13 AERIAL PHOTO SHOWING CH LOCATIONS ALONG PIPELINE ROUTES IN THE RINGASKIDDY AREA



PLATE 3.8.1 NORTH-FACING VIEW OF THE ESTUARY MOUTH, RIVER LEE SURVEY AREA IN DISTANCE

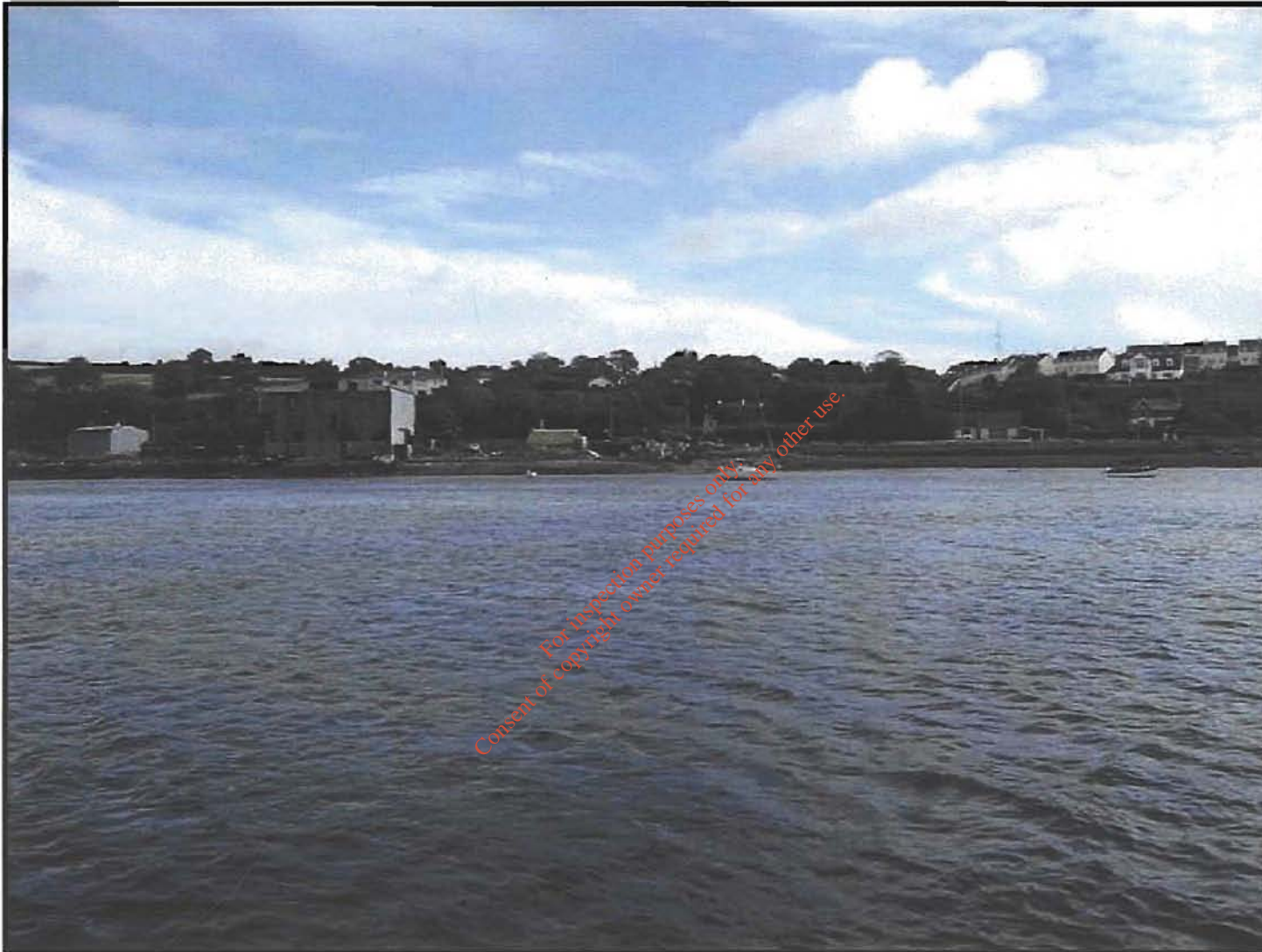


PLATE 3.8.2 EAST-FACING VIEW ACROSS MARINE
PIPELINE SURVEY AREA, RIVER LEE ESTUARY

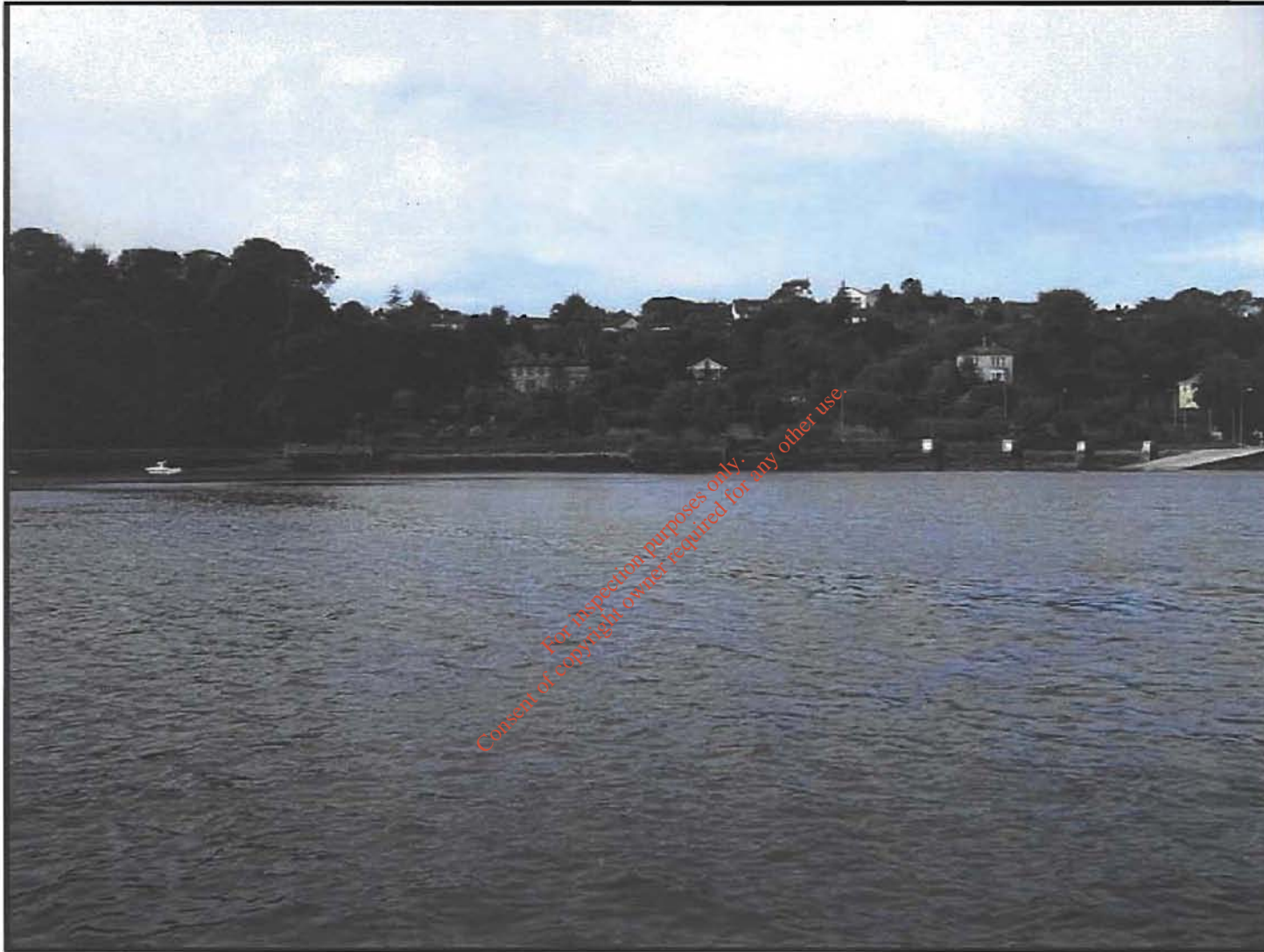


PLATE 3.8.3 WEST-FACING VIEW ACROSS MARINE
PIPELINE SURVEY AREA, RIVER LEE ESTUARY



PLATE 3.8.4 WEST-FACING VIEW OF DOWNSTREAM
(SOUTHERN) MASONRY FACADE FROM THE SOUTH WING
OF THE ROYAL VICTORIA BATHS



PLATE 3.8.5 NORTHWEST-FACING VIEW OF WESTERN SIDE
OF SURVEY AREA, ADJACENT TO THE REMAINS OF THE
SWIMMING AREA OF ROYAL VICTORIA BATHS

3.9 Landscape and Visual Assessment

3.9.1 Introduction

This landscape and visual assessment was completed by Brady Shipman Martin, Landscape Architects on behalf of MMP.

The purpose of this study is to evaluate the landscape and visual impacts associated with the proposed Cork Lower Harbour WWTP (Cork Harbour Main Drainage Scheme) at Shanbally, Co. Cork. In doing so, assessments are made regarding the likely impacts to the landscape and visual character of the development, the appropriate mitigation measure required to complement these impacts and mitigation requirements associated with the future for large scale industrial development.

3.9.2 Methodology

General

The following publications have been referenced in the Landscape and Visual Impact Assessment:

- Cork County Council, Cork County Development Plan, (2003)
- Carrigaline Electoral Area Local Area Plan (Public Consultation Draft), (January 2005)
- Cobh Town Council, *Draft Development Plan*, (2005)
- Environmental Protection Agency, Guidelines on the Information to be contained in Environmental Impact Statements, (March 2002)
- Department of Environment and Local Government, Landscape and Landscape Assessment, Consultation Draft of Guidelines for Planning Authorities, (June 2000)
- The Landscape Institute/Institute of Environmental Management and Assessment, *Guidelines for Landscape and Visual Impact Assessment (2nd Edition)*, Spon Press, (2002)
- National Inventory of Architectural Heritage (www.buildingsofireland.ie)

Visual Assessment

The visual assessment of the site was carried out in July 2007. The methodology used for the landscape assessment entailed:

- A desktop study of the site in relation to its overall context both locally and regionally
- Visiting the site and its environs to assess the following
- Quality and type of views in the area
- The extent of the visual envelope, i.e. the potential area of visibility of the site in the surrounding landscape

The Visual Envelope Map is determined by assessment of the proposed height of the development relative to existing contour levels in the surrounding landscape. A desk top assessment is further refined on site to clarify local visual obstructions from land cover and settlement.

The character and quality of the surrounding landscape was assessed in relation to the proportion of residential and agricultural development, special landscape features, cultural and historical elements and landforms associated with the site.

Character and Visibility

Effects on character and views are considered separately in the impact assessment. Impacts on character relate to changes in the particular identity of coherent landscape areas. Impacts on views are considered where there are particular or noticeable views, which would be affected by the development.

Impacts on the character of the landscape include responses, which are felt towards the combined effects of the new development. The significance of impacts on the perceived landscape character will depend mainly on the visual experience of the landscape and on the number of people affected, but also on judgements about how much the change will matter. Other factors will also affect the experience, including sounds, smells, feelings, etc., experienced by those concerned.

Impact Assessment

The impact assessment for this Section of the report is based on the Guidelines on the Information to be contained in Environmental Impact Statements and the Advice Notes on Current Practice (in the Preparation of Environmental Impact Statements) published by the EPA in March 2002 and September 2003 respectively. The criteria used include the quality, magnitude and duration of impacts.

Criteria for assessing impact quality, magnitude and duration are described in Tables 3.9.1, 3.9.2 and 3.9.3 respectively.

Table 3.9.1: Criteria for assessing the quality of impacts

Impact type	Criteria
Positive impact	A change is likely to improve the quality of the environment.
Neutral	No effect.
Negative impact	The change is likely to adversely affect the quality of the environment.

Table 3.9.2: Criteria for assessing impact magnitude

Impact Magnitude	Definition
No change	No discernible effect on human beings.
Imperceptible Impact	An impact capable of measurement but without noticeable consequences.
Slight Impact	An impact which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate Impact	An impact that alters the character of the environment in a manner that is consistent with existing and emerging trends.
Significant Impact	An impact which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Profound Impact	An impact which obliterates sensitive characteristics.

Table 3.9.3: Criteria for assessing impact duration

Temporary Impact	≤ 1 year
Short-term Impact	1 – 7 years
Medium-term Impact	7 – 15 years
Long-term Impact	15 – 60 years
Permanent Impact	≥ 60 years

Study Limitations

The impact assessment was undertaken in the summer when foliage is in full leaf and therefore provides greater screening than in the winter. However given the density of the local hedgerows there is not likely to be any notable reduction in screening over the winter.

3.9.3 Existing Environment

General

The proposed Cork Lower Harbour WWTP site is located at Shanbally, Co. Cork, approximately 1.06km east of Carrigaline, 2.24km west of Ringaskiddy, and directly east of Barnahely. The village of Shanbally is located 1km to the northeast. The N28 Ringaskiddy Road currently runs east to west approximately 625m to the north, however the proposed route for the N28 Road Improvement Scheme will re-direct the road to run north of the site.

The site covers an area of approximately 7.36ha and is situated on a south facing hillside at approximately 30m high (Malin Head Datum). The site is currently pasture land and is located within two large fields bound by tall hawthorn hedgerows. The north and south boundaries of the site are not contained by the field hedgerows but are defined by the high voltage lines that run overhead north and south of the site that connect to an ESB sub-station immediately to the west of the site.

The topography in the local area is defined by ridgelines that typically run east west to form a rolling landscape. To the north primary visual ridgeline runs through Raheenaring and Monkstown on to Passage West. To the south another ridgeline runs from Crosshaven eastwards through Frenchfurze. Two lower ridgelines further define the visible extents of the local area, one immediately north of the site extending from Carrigaline through Shanbally to the “Golden Rocks” headland at Ringaskiddy, and a second ridge to the southeast along the Currabinny headland with the Owenboy River to the south and Lough Beg to the north. These ridgelines define the extents of the visual envelope and are illustrated on Figure 3.9.1 *Visual Envelope and Photo Locations*.

The local landscape is heavily influenced by the existing pharmaceutical complexes in the Ringaskiddy and Lough Beg area. Of these the newly developed Centacor site and the Novartis site are visible immediately to the east at Barnahely. Immediately west of the site there is a substantial ESB Substation and Bord Gáis pumping station which introduce an industrial element to the very edges of the site. The site is accessed by a gravel lane-way that leads to the Bord Gáis facilities. The lane passes between the ESB sub station to the north and a small industrial complex with two warehouses of approximately 10.0m height to the south. Beyond the warehouses the fringes of Carrigaline are clearly visible.

Historic / Cultural Landscapes

The proposed site is situated in an agricultural landscape, and is not directly associated with any historic landscapes or areas of recreation and amenity. However the surrounding area contains historical references.

Historic Landscapes as designated by the National Inventory of Architectural Heritage (NIAH) are situated at Coolmore in the grounds of Coolmore House, and at Raffeen.

The landscape at Coolmore is largely intact though much of the peripheral landscape is indistinguishable from the surrounding farmland and some modern agricultural buildings have been constructed within the site of the walled garden. The proposed WWTP will not have any direct or indirect impact on the character of Coolmore House and grounds. The historic landscape at Raffeen is associated with Raffeen House and Raffeen House Lower, a large extent of quarrying has been undertaken on the site and all that remains of the historic landscape is Raffeen House and the woodland along the Monkstown Road. The WWTP will have no direct or indirect impact on the landscape at Raffeen. However the mitigation planting will reflect the character of woodland at Raffeen and Monkstown Creek.

Recreation and Amenity Landscapes

The proposed development site has the potential to impact on two areas of amenity or recreation. There are playing pitches at Shanbally within a short distance of the site, but they will not have views of the site. There are also public walks along the Owenboy River and at Currabinny. Currabinny is screened from all views to the site, but there are direct views to the site from the public amenity walk between Carrigaline and Crosshaven for a short distance at Frenchfurze.

Site Significance

The site is contained within a large area Zoned as I-03 on zoning map no. 26 in the *Cork County Development Plan (2003)* and reads as follows in the Zoning Objectives section for Ringaskiddy:

“Suitable for large stand alone industry with suitable provisions for a buffer tree planting, minimum 20 metres wide along the northern boundary to residential areas and provision for Public Open Space and to include three playing pitches.”

There are also a number of scenic routes and scenic landscape designations in close proximity to the site which are discussed below.

Designated Scenic Landscape

There are large areas surrounding the site, particularly to the North, East and South, which are designated as ‘Scenic Landscape’ (refer to Figure 3.9.1 *Visual Envelope and Photo Locations*). Much of the scenic landscape in close proximity to the site is in agricultural usage with no public access. From the local road network in the area, views of the site are largely screened by high hedgerows. There are partial views to the site from within designated scenic landscape along a section of the road out to Coolmore Cross from Carrigaline. The Owenboy valley is designated as scenic landscape but views to the site are restricted by local topography and vegetation. Distant, partial views are possible from the Myrtleville Road and the back road from the Carrigaline Industrial Estate, at Frenchfurze on the opposite side of the Owenboy River, but distance and intervening vegetation restrict the extent of views. The policies relating to these areas (Volume 1, Chapter 7, *Cork County Development Plan* (2003)) read:

‘ENV 3-4 Scenic Landscape

It is a particular objective to preserve the visual and scenic amenities of those areas of natural beauty identified as ‘scenic landscape’ and shown in the scenic amenity maps of Volume 4 of this plan.

‘ENV 3-5 General Views and Prospects

It is a general objective to preserve the character of all important views and prospects, particularly sea views, river or lake views, views of unspoilt mountain, upland or coastal landscapes, views of historical or cultural significance (including buildings and townscapes) and views of natural beauty.’

Zoned lands that also have designations such as ‘scenic’ or ‘heritage’ are considered as follows:

‘9.1.5 As a point of clarification, where particular zoned lands have a scenic landscape designation or adjoin a scenic landscape designation, there is still a presumption in favour of development for the specified land use, but special attention may need to be paid to design, siting and landscaping depending on the individual area and the type of development proposed.’

Designated Scenic Routes

The policy reads: (found on maps 15 and 16 in the *Cork County Development Plan*)

‘ENV 3-5 Scenic Routes

‘It is a particular objective to preserve the character of those views and prospects obtainable from scenic routes identified in this plan. Those routes are shown on the scenic amenity maps in Volume 4 and listed in Volume 4 of this plan.’

Scenic Route A-54 (Road between Passage West and Ringaskiddy): Views from the Ringaskiddy road will not include the proposed site which is on the south side of an intervening ridgeline.

Scenic Route A-56 (Road from Carrigaline and Crosshaven): This route runs from between 2 – 4km to the south of the site. There are long range views along sections the R612. The views across the Owenboy estuary include; Coolmore Estate, Novartis and the proposed site to the west, distinguished by the overhead powerlines (refer to Figure 3.9.1 *Visual Envelope and Photo Locations*).

Visual Envelope

The Visual Envelope is the extent of potential visibility of the site to or from a specific area or feature in the landscape and is defined by topography and vegetation. The visual envelope of this site is indicated on Figure 3.9.1 *Visual Envelope and Photo Locations*.

From the north, the site is visible from elevated lands at Raheenering and also from lands above Strawhall southwest of Monkstown. From the east, views are limited to the local landscape in the area of Barnahely, though there are no views from Novartis car park and grounds due to screening by local topography and vegetation. To the south, the site is visible from the road above Loughbeg past the Coolmore Crossroads, and further south from the Crosshaven and Myrtleville Roads at Frenchfurze. To the west, the site is visible from the eastern fringes of Carrigaline, however there are no clear views from the local roads due to screening from high roadside hedges and housing east of the roads. Views will be achieved from the rear of properties, particularly from upper floor windows on the eastern extents of Carrigaline.

Views from the North

Shanbally: Shanbally is located on the N28 north of the site. The proposed site however is on the opposite side of the low ridge line and is not visible from Shanbally.

Monkstown: There are no views from Monkstown to the site.

Strawhall: Strawhall is a small cluster of housing at a junction on the R610 Monkstown to Raffeen road, from an elevated position on the back road to Monkstown there are views to the site, which is distinguished by the overhead powerlines (refer to View 1 on Plate 3.9.1 *View 1 & View 2*)

Loughbeg: Loughbeg is located approximately 1.5km southeast from the site. This area has been designated as Scenic Landscape in the CCDP. The area sits lower than the site, at approximately 10m high, and there are views looking across the landscape and up towards the site, but it is not possible to look into the site due to existing vegetation. It is possible that the higher elements of the proposed development up to 12m above ground-level would be visible from this location. There are views of Novartis and Buckeye buildings at this point as well.

Currabinny: Currabinny is located approximately 2.5km to the southeast of the site. There are views towards the site from the small road that runs along the ridgeline of the area. The overhead powerlines are visible over the site, although the site itself is screened by existing vegetation it is possible that the higher elements of the proposals up to 120.0m would be visible over existing vegetation. The existing pharmaceutical complexes of Glaxo SmithCline, MOOG, Novartis and Pfizers are all visible in the foreground. There are also Scenic Landscape designations for this area in the *Cork County Development Plan*.

Coolmore: Coolmore is located approximately 2.3km to the southeast of the site and lies below the level of the site at an elevation of approximately 12 to 15m (Malin Head Datum). There is a Scenic Landscape designation to this area also, as laid out by the *Cork County Development Plan*. The intervening topography, vegetation and buildings at Novartis generally limit views to small glimpses of the overhead powerlines in the location of the site.

Barnahely: The power lines over the site are visible from Barnahely but views into the site are screened by the topography and vegetation. The site will also be visible from the upper floors of the Novartis building, but there are no views from the local roads in this area (refer to View 2, Plate 3.9.1 *View 1 & View 2*)

Frenchfurze: Frenchfurze is located approximately 3km to the south of the site, along the R612. It sits at an elevation of approximately 60m OD and overlooks the Owenboy River. There are Scenic Landscape designations placed on this area. The site is partially visible from the Myrtleville Road, and clearly visible from the back road between the Carrigaline Industrial estate and Frenchfurze. The site is also visible from the Carrigaline – Crosshaven Road due south of the site and from the public walk way along the estuary edge between Carrigaline and Frenchfurze (refer to Plate 3.9.2 *View 3*).

Carrigaline: Carrigaline is located approximately 1.06km from the site and is typically at an elevation of 20m OD. There are views of the site and Novartis from the residential area at Bridgemount to the eastern fringes of Carrigaline. A number of roads also go through Carrigaline including, the R611, R612 and R613, but views in the direction of the site from these roads are generally screened by existing vegetation and buildings (refer to View 4, Plate 3.9.3 *View 4, View 5 & View 6*).

Landscape Character

As the site is located near Ringaskiddy in Cork Harbour any description of the landscape character should be cognisant of the strong identity of the harbour. A pilot study of the Landscape Character of Cork Harbour has been undertaken by Mosart on behalf of Cork County Council. The study assesses the landscape thus:

“Notwithstanding the rural character around much of the greater harbour area, the tell-tale signs of urban intensity are evident everywhere through the prevalence of infrastructure such as roads, bridges and electricity power lines and the frequency of urban clusters. Overall, the City and harbour comprise a balance of intensely urban form, rural character and seascape”.

The mixture of industrial development, agricultural land and low density housing areas comprise the overall character of the area. Carrigaline town is a substantial urban settlement, and the eastern fringes of Carrigaline also influence the character of the site. The site therefore remains fundamentally rural in character but heavily influenced by the urban and industrial developments in the surrounding area and the character can therefore be described as a Rural Fringe landscape.

Strawhall is a small cluster of housing at a junction on the R610 Monkstown to Raffeen road, from an elevated position on the back road to Monkstown there are views to the site, which is distinguished by the overhead powerlines (refer to Photograph View 1, Plate 3.9.1)

Character of Development

The proposed development consists principally of the construction of a large sized urban WWTP to serve the population centres of Cork Lower Harbour and its' environs. The proposed WWTP is an essential element of the Cork Harbour Main Drainage Scheme. Associated works, which will be carried out as part of the proposed development, include:

- The widening and upgrading of the site access road
- Marine crossing
- New waste water pumping stations
- The laying of rising mains, surface water sewers and gravity waste water sewers to direct the waste water to the new treatment works
- New waste water treatment works

Treatment Processes

There will be primary, secondary and sludge treatment facilities which will include a series of process and storage tanks, the tanks will have a maximum height of 12.0m above ground, the tanks will be coloured in a neutral dark green colour.

Buildings

The number of buildings and the facilities will depend upon the final process design selection. However a typical arrangement of buildings would include a preliminary treatment building, a main administration building, a secondary treatment building and sludge treatment building. The buildings will have a maximum height above ground of 10.0m.

Pumping Stations

Other elements of the scheme essential to the proposed WWTP include rising mains, pumping stations and gravity sewers.

The proposed locations of the major pumping stations are:

- Carrigaloe, Great Island, adjacent to the ferry terminal
- Monkstown, at the car park off the Glen Road
- Raffeen on the foreshore at Strawhall next to the junctions with the Rochestown Road and the back road to Monkstown
- West Beach Pumping Station, Cobh
- Church Road Pumping Station (existing)

There will also be minor pumping stations at various locations within the serviced area. Minor pumping stations are expected to be submersible type stations with typically only a kiosk located above ground.

The proposed works are discussed in detail in Section 2.5 *Description of the Development*.

3.9.4 Impact Assessment

(i) Construction Phase Impacts

As construction proceeds there will be a requirement to provide for:

- Builder's compound and car-park
- Stockpile mounds of subsoil and topsoil
- Small scale re-grading works
- Upgrading the access road
- Collection Pipelines across the catchment area
- Pumping Stations located in Raffeen, Monkstown, Carrigaloe, Cobh and Church Road

The construction of the WWTP will give rise to an appearance of disruption over the proposed site. The upgrading of the access road will require widening and surfacing. There are wide grass ditches to the access lane so there should be minimal impact on the hedgerow south of the lane and the ESB substation fencing north of the lane. At the eastern end of the lane there are some ornamental trees and shrubs associated with the Bord Gáis sub station, these can be retained. Widening of the local road to provide access may require the loss of some sections of hedgerow, where this is necessary new hedgerows should be planted. The construction of the collection pipelines will result in short term impacts on the landscape due to the preparation the trenches which will leave a visible scar on the land. These impacts will be temporary and will only be visible for a few weeks until the pipes are laid and the ground re-instated. Impacts to hedgerows will be longer in duration as replacement planting of any gaps in the hedgerow may take 3 to 4 years to establish. Short term, slight negative impacts will occur as a result of construction of the pipeline.

Duration of Impact

By their nature construction impacts are short term/temporary and relate only to the building period. On completion of the works there will be long term, permanent operational impacts which are dealt with in the following section.

Table 3.9.4: Summary of Construction Impacts on the Landscape

Landscape Change	Impact Description	Type of impact	Magnitude	Duration
LANDFORM	The site will need to be levelled requiring local earth movement.	Negative	Slight	Permanent
LANDUSE	Introduction of new buildings and structures into the agricultural landscape.	Negative	Moderate	Permanent
LANDCOVER	Loss of some hedgerow and pastureland	Negative	Slight	Permanent
LANDSCAPE CHARACTER	The construction activities will cause disturbance to the pastureland.	Negative	Slight	Temporary
LANDSCAPE QUALITY	Temporary change to the landscape quality of the local	Negative	Slight	Temporary

	area, resulting from construction activities.			
LANDSCAPE FEATURES				
Loss of hedgerow	A central hedgerow will be removed within the site. Small gaps will be lost along the route of the collection pipes.	Negative	Slight	Permanent
Trees	No trees are to be felled	Neutral		
Walls and Features	No walls or man made features of notable quality are to be lost	Neutral		
Historic Landscape	The site is located near to (2-3km) historic landscapes but will not impact on them.	Neutral		
CONSTRUCTION ACTIVITIES				
Excavated material	Temporary mounds of excavated and demolished material stored on site.	Negative	Slight	Temporary
Plant and machinery activity	Views of mobile cranes and plant machinery involved in the building works.	Negative	Slight	Temporary
Working area	The working area will be within the existing site boundary.	Negative	Slight	Temporary
Site compound	The site compound and site parking will be within the existing site area.	Negative	Slight	Temporary
Pipelines	Temporary excavations to lay pipes	Negative	Slight	Temporary
Pumping stations	Construction works on the various pumping stations as listed in detail below	Negative	Moderate to Significant	Temporary

(ii) Operational Phase Impacts

Impact on Landscape Character

Upon the completion of the proposed works, there will be a change in the appearance of the site, from the existing pasture land to the industrial elements of the treatment plant. In order to avoid impact on the surrounding landscape and degrading of the local rural landscape, woodland planting is included in this application to the perimeter of the site to provide increased screening and minimise visual impact. Initial impacts will be moderate negative impact on the local rural landscape reducing to slight negative impacts as planting matures. Impacts on the character of the greater Cork Harbour Area will be slight and negative due to the existing mix of industrial elements and agricultural landscape within the area of the proposed development. Overall the greater surrounding area is deemed capable of absorbing the development without changing the character of the Urban Fringe Landscape.

Designated Scenic Landscape

The impact on areas designated as ‘Scenic Landscape’ will vary depending on their locations in relation to the site, but will generally be affected as follows:

Views from the ‘Scenic Landscape’ surrounding the Owenboy River valley:

The Owenboy River runs approximately 2–3km from the site. Due to its proximity, views will be affected differently throughout this area. In general, the proposed site is set low enough in the landscape that it will not interfere with views of the skyline and will be only partially visible through existing vegetation in adjoining fields and hedgerows. The woodland planting proposed at the boundaries of the site will provide adequate screening. Initial slight negative impacts will be reduced to imperceptible impacts as the planting matures.

Designated Scenic Routes

Scenic Route A-54 (Road between Passage West and Ringaskiddy):

Views from the Ringaskiddy road will not include the proposed site which is on the opposite side of a hill defined by the ridgeline immediately north of the site.

Scenic Route A-56 (Road from Carrigaline and Crosshaven):

Views of the site from the A-56 scenic route are restricted to a short section of the road at Frenchfurze. The site is over 2.0km from this route and partially screened by undulating topography and existing vegetation. The development proposals will result in slight to moderate negative impacts depending on the exact viewing point on the road and the adjacent public footpath. Impacts will reduce to imperceptible on maturity of the mitigation planting in 7-10 years.

Table 3.9.5: Summary of Operational Impacts on the Landscape

Landscape Change	Impact Description	Type of impact	Magnitude	Duration
Landform	The land will be levelled to accommodate the WWTP, the scale of level changes will not be readily apparent within the greater landscape	Negative	Slight	Permanent
Land Use	Introduction of new buildings and structures into the agricultural landscape.	Negative	Moderate	Permanent
Land Cover	Replace pasture land with buildings and structures, in keeping with mixture of industrial development in the Cork Harbour area.	Negative	Slight	Permanent
Landscape Character	The surrounding landscape will remain as urban fringe in character	Neutral		
Landscape Quality	The overall quality of the Cork Harbour area will remain intact	Neutral		
Scenic Landscape	There are limited views to the site Scenic Landscape and Scenic Routes will experience only partial glimpses of the site, until mitigation planting matures.	Negative	Slight	Short Term
Historic Landscape	The WWTP site is located near to (2-3km) historic landscapes but will not impact on them.	Neutral		

Visual Impacts of the WWTP

Shanbally: Shanbally is located on the N28 north of the site. The proposed site however is on the opposite side of the low ridge line and is not visible from Shanbally and will not cause any visual impact.

Playing pitches at Shanbally are adjacent to the site, these are also on the opposite side of the ridgeline to the site but due to their proximity to the site there is potential visual impact from the higher elements of the proposed development. As the proposed screen planting on the northern boundary of the site matures, visual impacts will reduce from slight negative to imperceptible.

Monkstown/Strawhall: The views from elevated lands above Monkstown and Strawhall, towards the site will have an initial slight negative impact. The R610 which runs through Monkstown will not have views into the site. The proposed site will be seen in the context of the pharmaceutical plants in the Ringaskiddy area and in conjunction with the ESB sub station adjacent to the site. The cumulative impacts of the treatment plant with the existing industrial elements and the proposed re-alignment of the N28 are to be off set by the mitigation measures of planting dense woodland screening along the northern boundary of the site. Providing a greater cover of woodland in keeping with the wooded lands over Monkstown Creek, resulting in a long term slight positive impact on the views from the Monkstown and Strawhall area. (refer to View 1, Plate 3.9.1 *View 1 & View 2.*)

Loughbeg: Loughbeg is located approximately 2-3km east from the site. This area has been designated as Scenic Landscape in the *Cork County Development Plan*. Views of the site are partially obscured by existing hedgerows and the topography of the land. There are views of Novartis, Centacor and Buckeye buildings at this point as well. The proposed mitigation measures will provide screening of the treatment plant, which overtime will cause initial slight negative impacts to become imperceptible visual impact.

Currabinny: Currabinny is located approximately 4km to the southeast of the site. There are views of the site from the small road that runs along the ridgeline of the area. The existing pharmaceutical complexes of Glaxo Smith Cline, MOOG, Novartis, Centacor and Pfizers are all visible. There are also Scenic Landscape designations for this area in the CCDP. The site is partially visible in the distance beyond Coolmore Estate for only a short distance from the road leading out to Currabinny. The initial slight negative impacts will be reduced to imperceptible visual impact when the proposed planting matures to provide screening of the site.

Coolmore: Coolmore is located approximately 2.3km to the south of the site and lies at an elevation of approximately 12 to 15m high. There is a Scenic Landscape designation in this area also. The intervening topography, vegetation and buildings at Novartis generally limit views.

Barnahely: Views from the Barnahely area are limited by existing vegetation and existing development. Views from the Novartis grounds will be screened by intervening hedgerows, views would be more likely from the building itself or from elevated lands around the building, the road ways and car parking are too low to experience views of the Treatment Plant. Views from the Centacor site are distant and screened by intervening hedgerows, again views are likely from the upper floors of the buildings but will be distant. The proposed planting on the treatment plant site will, as it matures, provide further screening. Slight Negative Visual Impact will reduce over time to Imperceptible Visual Impact (refer to View 2, Plate 3.9.1 *View 1 & View 2.*)

Frenchfurze: Frenchfurze is located approximately 3km to the south of the site, along the R612. It sits at an elevation of approximately 60m and overlooks the Owenboy River. There are Scenic Landscape designations placed on this area. In general when viewing the area surrounding the site there is a greater sense of the rural landscape as viewed from the south, as opposed to views from the north and east which encompass Ringaskiddy and the various pharmaceutical industries. Therefore views from the south are more sensitive and the impact of the proposed site will be moderate negative as it will be visible in the middle ground with the Novartis building also visible. Impacts will reduce to imperceptible on maturity of the mitigation planting in 7-10 years (refer to Plate 3.9.2 *View 3*).

Carrigaline: Carrigaline is located approximately 1.06km from the site and is typically at an elevation of 20m. There are views of the site from the residential area at Bridgemount on the eastern fringes of Carrigaline. The site is situated on the south facing hill side and will be a dominant feature of the views from the rear of the closest properties, causing moderate negative visual impacts. The mitigation planting will provide a high level of screening to lessen the impact to a slight negative visual impact (refer to View 4, Plate 3.9.3 *View 4, View 5 & View 6*).

Potential Impacts from the Proposed N28 re-alignment

The proposed re-alignment of the N28 will run along the northern boundary of the field in which the site is located. Any views of the site will depend on the elevation of the road at this location. The road will however be on the opposite side of a low ridgeline on the northern boundary of the site. Proposed woodland planting along the northern boundary of the site in conjunction with any planting undertaken as part of the road development will provide adequate screening of the treatment plant and visual impact from the road can be expected to be slight negative to imperceptible.

Potential Impacts from the Proposed Housing east of the site

There is a planning application (PA 06/6928) for new housing directly east of the site. The site of the proposed housing is slightly lower than the proposed WWTP site and is well screened by existing vegetation. It is likely that the higher elements of the proposed WWTP (up to 12.0m in height) would be visible prior to the woodland planting maturing. Impacts could be expected to be slight negative initially reducing to imperceptible.

Cumulative Impacts

Consideration has been given to the impact of the proposed WWTP in conjunction with the proposed re-alignment of the N28, the proposed development of housing and with the existing pharmaceutical complexes. The landscape of the Greater Cork Harbour Area has many designated scenic landscapes and it is necessary to preserve these and maintain a balance between the natural and the man made environment. It is important that the massing and scale of development does not conflict with the rolling topography, views of skylines, coasts and rivers. The setting of the proposed WWTP is well located to avoid impact on the landscape due to the natural screening of the local topography and hedgerows. Taller elements of the WWTP (up to 12.0m) can be screened by the planting of woodland belts. Cumulative impacts will be avoided as the WWTP will not converge with existing or proposed developments, but will remain a small singular element within the urban fringe landscape.

Visual Impacts of the Pumping Stations

Carrigaloe Pumping Station

Carrigaloe pumping station will be required to pump waste water across the River Lee Estuary to Monkstown. The pumping station will be situated on the fore shore in the shipyard area next to the ferry terminal and boat slips. The pumping station will be largely housed below ground level with a small building at ground level. The building will be finished in the style of a boat house in keeping with the ship yard activities in this location.

Construction Impacts: During construction there will be impacts from the works, as the pumping station is largely below ground level there will be significant ground disturbance and removal of materials, this is likely to entail large machinery and the extent of construction works will appear disproportionate to the size of the completed building. The site will be enclosed by hoarding which should limit the extents of visual impact to temporary slight negative visual impact.

Operational Impacts: The building will be visible from the Cobh Road (R624) (scenic route A53), however the single storey building will be in keeping with the marine related industry buildings in the immediate vicinity and will not cause the loss of any views across the estuary. From the estuary and from the Monkstown side of the estuary the building will not protrude above the ridgelines of neighbouring buildings and will be seen as an element of the existing marine related buildings along the shore front. Mitigation measures will include an appropriate architectural treatment to ensure the building is in keeping with the local buildings. On completion visual impact will be neutral, as the building will neither cause a deterioration nor improvement to the local view.

Monkstown Pumping Station

Monkstown pumping station will be located in the centre of Monkstown off the Glen Road. The pumping station will again be largely underground with a small single storey building at ground level. The building will be located in the south eastern corner of the car park at Glen Road. The building will be placed next to rear garden walls backing onto the car park. The pumping house will be overlooked from houses on Glen Road and from the small public park, play area and the car park, there will also be views of the proposed building (particularly the roof) from houses on Castle Terrace. The proposed pumping station will be visible but will not cause the loss of any views, it will be lower than surrounding residential properties and will not break the skyline. Mitigation measures will include a style of architecture in keeping with adjacent buildings and stone walls. The boat house style of the other pumping station buildings would be less appropriate in this location and stone facing of the walls should match existing rear garden walls.

Construction Impacts: During construction there will be impacts from the works, as the pumping station is largely below ground level there will be significant ground disturbance and removal of materials, this is likely to entail large machinery and the extent of construction works will appear disproportionate to the size of the completed building. The site will be enclosed by hoarding which should limit the extents of visual impact to temporary moderate negative visual impact.

Operational Impacts: Visual impacts of the operational building will be neutral from Castle Terrace where only the roof of the building will be visible and will not obscure any views. Slight Negative Visual Impact will be experienced from houses on Glen Road and from the public park and play area as a result of the introduction of a new building to the previously open space. However, the building will not result in the loss of any views and will overtime become an accepted element of the townscape (refer to View 5, Plate 3.9.3 *View 4, View 5 & View 6*).

Raffeen Pumping Station

Raffeen pumping station will be located on the foreshore of Monkstown Creek on reclaimed land at Strawhall south of the junction with the R610 Monkstown Road and the back road to Monkstown. The reclaimed land will be in a small channel between the road and an outer embankment, so the works will not change the existing shore line. The pumping station will be of a similar design to the other pumping stations and will be largely housed underground with a small single storey building at ground level. There are several residential properties located at Strawhall facing onto the R610 with scenic views across Monkstown Creek. To the north of the proposed pumping house there is a boat yard and slip. The design of the pumping station is likely to resemble a boat house in keeping with the boat yard 200m to the north.

Construction Impacts: During construction there will be impacts from the works, as the pumping station is largely below ground level there will be significant ground disturbance, this is likely to entail large machinery and the extent of construction works will appear disproportionate to the size of the completed building. The site will be enclosed by temporary hoarding which will screen the unsightly construction works but increase the extent of visual disturbance resulting in temporary substantial negative visual impact from Strawhall.

Operational Impacts: Visual impact will be experienced from the R610 (scenic route A54), and from properties at Strawhall. The building will not result in the loss of views but will intrude upon previously un-interrupted views across the Creek. There are two properties directly overlooking the pumping station, and several properties will have angled views. Mitigation measures will include an appropriate architectural treatment to ensure the building is in keeping with the local buildings.

On completion, visual impact will be moderate negative, as the building will continue to disrupt views across Monkstown Creek, but will be in keeping with the adjacent boatyard (refer to View 6, Plate 3.9.3 *View 4, View 5 & View 6*).

West Beach, Cobh, Pumping Station

The West Beach pumping station will be located in reclaimed land between the piers along the shorefront at West Beach in Cobh town centre. The location of the proposed pumping station is in close proximity to the Post Office Building (Listed building, Cobh Town Council *Draft Development Plan*, 2005). The pumping station will consist of underground holding tanks and a single storey building at ground level. The surface over the holding tanks will form a paved area with railings to the edge. The single storey building will provide access to the tanks and house generators and administration. The site is located in the town centre, which is an Architectural Heritage Area as designated in the Cobh Town Council *Draft Development Plan* (2005).

Construction Impacts: During construction there will be impacts from the works. As the pumping station is largely in reclaimed land and below the proposed ground level there will be significant ground disturbance, this is likely to entail large machinery and the extent of construction works will appear disproportionate to the size of the completed building. The site will be enclosed by temporary hoarding which will screen the unsightly construction works but increase the extent of visual disturbance resulting in temporary significant negative visual impact from West Beach (refer to View 7, Plate 3.9.4 *View 7 & View 8*).

Operational Impacts: On completion, the proposed pumping station building would be a prominent feature in views from West Beach and from Pearse Square. It would partially obscure views of the harbour and would be dominant in views from West Beach promenade resulting in permanent significant negative visual impact. However, following the implementation of mitigation measures and provision of improved views from the public amenity area, the negative impacts will be reduced to 'slight'.

Mitigation: The impacts are to be mitigated by the appropriate design of the building and the paved open space over the holding tanks which present an opportunity to extend the public amenity along the shore front. The detailed design of the pumping house and associated paved area will be in accordance with the *Draft Development Plan (2005)*, to reflect and respect the scale, massing, proportions, design and materials of existing neighbouring structures in particular the old Post Office, and reflect the character of the shorefront area and historic streetscape. It is proposed that the architectural style of the building should be contemporary and a key feature of the improved streetscape and quay side. The paved area would be public open space inspired by the adjacent promenade but also of a contemporary nature, using local paving materials and metal handrails to tie in with the existing quay side footpaths. There is an opportunity to incorporate existing features of the quayside to improve and upgrade existing facilities. The loss of views from West Beach is to be mitigated by provision of improved views from the new public amenity area. The overall aim of the detail design will be to enhance the West Beach Promenade area and maintain public access to the waterfront.

Details of the pumping stations are at a specimen design stage only and finalised proposals will be subject to planning approval (refer to Plate 3.9.4 *View 7 & View 8*).

(iii) 'Do Nothing' Scenario

In the event of no development occurring, the site will continue as agricultural lands. The lands will none the less be impacted in the future by the proposed re-alignment of the N28. The overall character of the area will remain as rural fringe landscape heavily influenced by the adjacent pharmaceutical plants, infrastructure and residential development.

(iv) 'Worst Case Scenario' Impact

The worst case scenario would be in the event of the mitigation measures failing. In order to guard against this scenario it should be noted that stringent specifications will be employed with regard to all the planting works (refer to Appendix A of *Volume III, Appendix 7A*). The landscape contract will include a 12 month maintenance period during which all plants which fail will be replaced.

In the unlikely event the mitigation measures do fail, the impacts would remain as slight to moderate and would not be reduced over time as described in the impact assessment above.

3.9.5 Mitigation Measures

Project Layout

The primary objectives of the proposed mitigation measures include to:

- Reduce visual impact through minimising negative impacts on the character and views from adjoining residential properties, roads and other public areas.

- Assist a visual integration of future development on the site into the surrounds with an appropriate scale of planting.

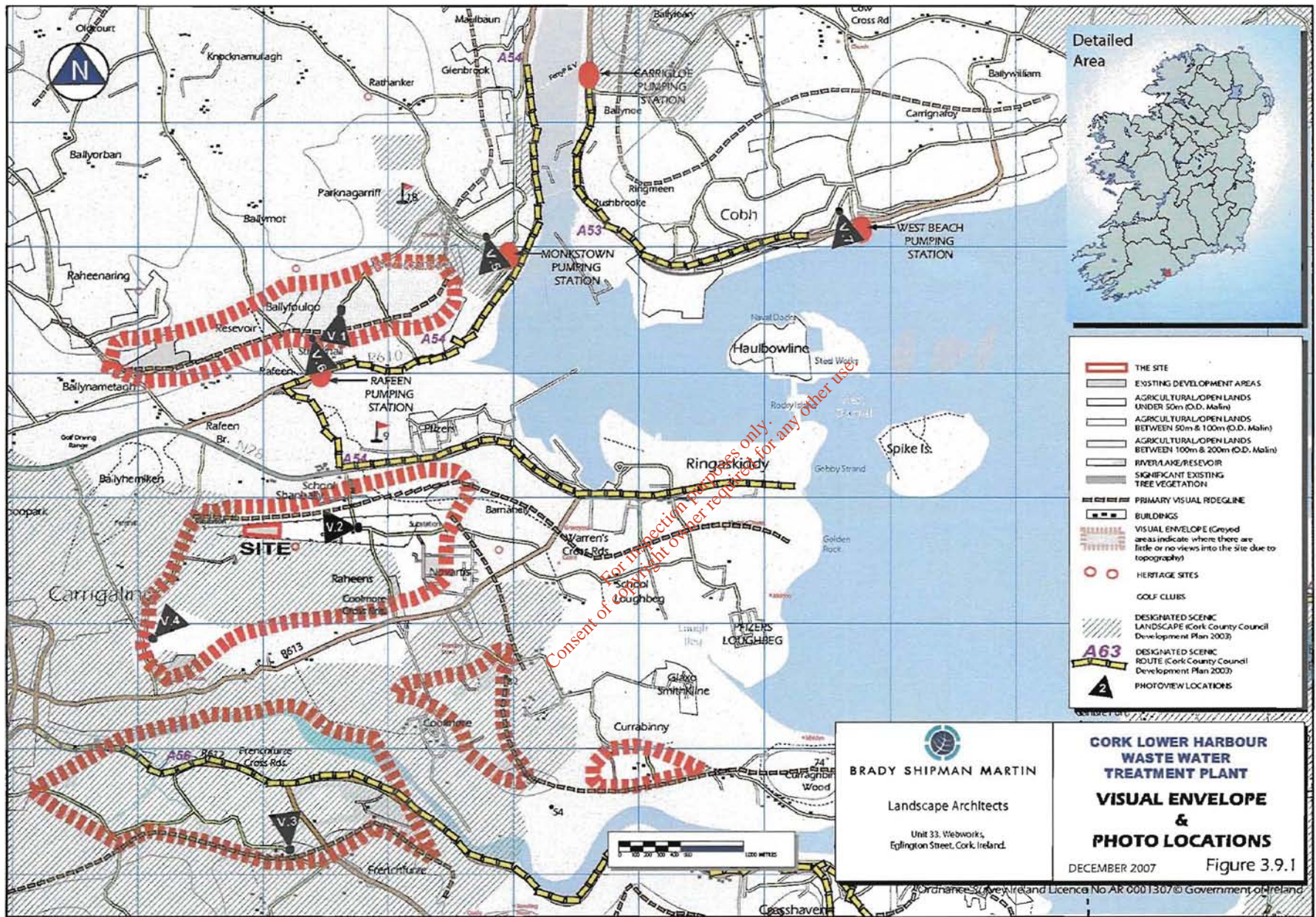
Proposals for this application

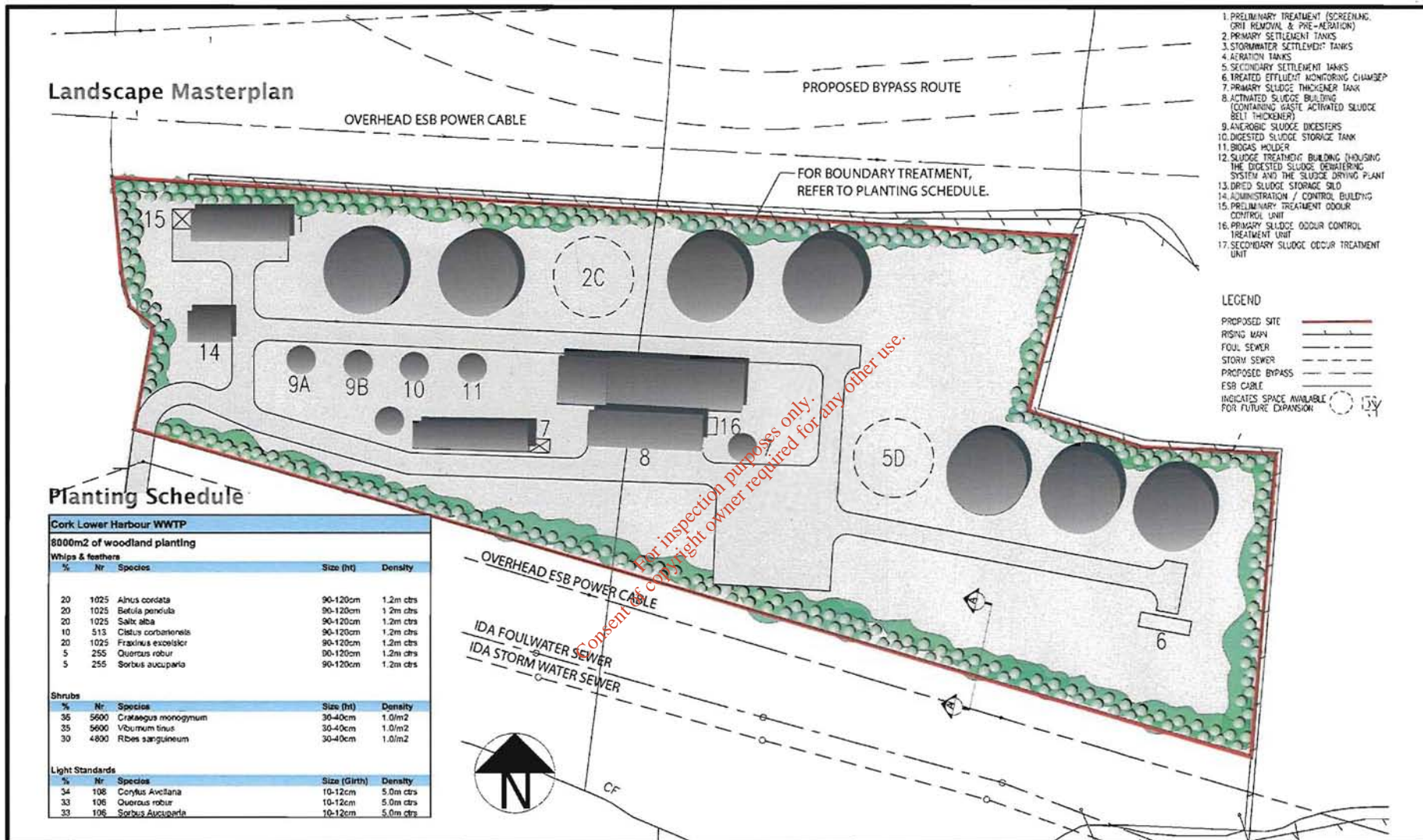
The mitigation measures associated with the current proposals of the WWTP site are to plant a belt of native woodland around the perimeter of the site (refer to Figure 3.9.2 *Planting Schedule* and Figure 3.9.3 *Landscape Proposals Boundary Treatment, Section A-A & Detail 1*). In particular, planting will be required to the north as specified in the *Cork County Development Plan* and to the west to provide screening from the fringes of Carrigaline. This planting will occur during the first planting season (November – March) after all of the construction works have occurred, and will quickly screen the development on site. Within 7-10 years, this planting will form a 10-12m high dense cover, thus screening the majority of the buildings and structures which are to be no greater than 12.0m height. Existing hedgerows/trees are also to be retained to the outer perimeter of the existing fields; however the internal hedgerow currently dividing the site into two fields will be partially removed where it is within the site boundaries.

The mitigation measures include choosing an appropriate low key building colour and additional landscape works associated with the facility administration buildings, roads and car parks. It is recommended that low level lighting is chosen for external lighting around the treatment plant.

3.9.6 Residual Impacts

Residual impacts should be assessed when the proposed planting has reached a level of maturity at 7 – 10 years. At this stage the woodland planting to the boundaries will have reached heights over 10.0 - 12.0m, as the planting will be planted to an earth ditch 2-3m height this will afford a screening of 12.0 – 15.0m height around the site. Therefore there will only be potential views of the tallest elements of the treatment plant at the highest elevation of the site as viewed from the south. As there are no short range views (within 2.0km) from the south then distant views will result in barely noticeable glimpses of the treatment plant. The boundary planting will represent a noticeable change in the landscape, but the selection of native woodland species will be in keeping with woodlands at Monkstown Creek and Currabinny and cause neutral impact to the surrounding rural fringe landscape.





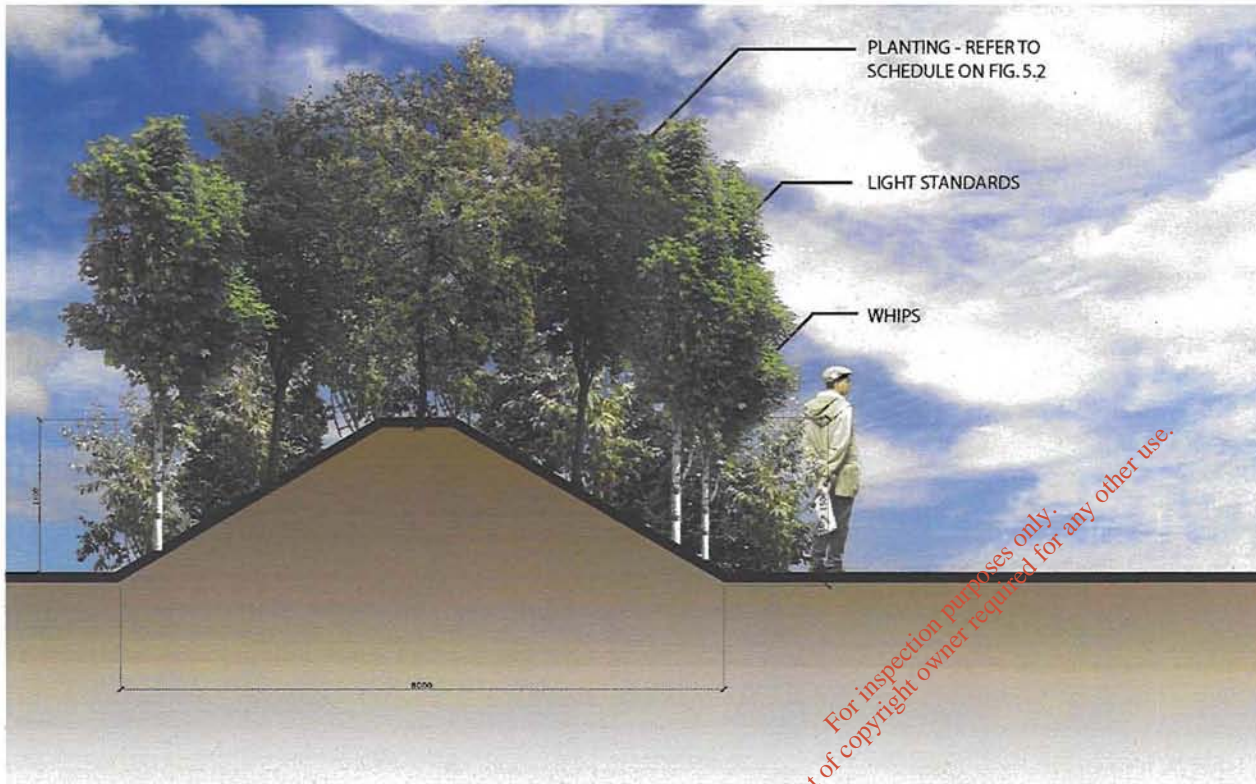
1. PRELIMINARY TREATMENT (SCREENING, GRII REMOVAL & PRE-AERATION)
2. PRIMARY SETTLEMENT TANKS
3. STORMWATER SETTLEMENT TANKS
4. AERATION TANKS
5. SECONDARY SETTLEMENT TANKS
6. TREATED EFFLUENT MONITORING CHAMBER
7. PRIMARY SLUDGE THICKENER TANK
8. ACTIVATED SLUDGE BUILDING (CONTAINING WASTE ACTIVATED SLUDGE (WAS) THICKENERS)
9. ANEROBIC SLUDGE DICESTERS
10. DIGESTED SLUDGE STORAGE TANK
11. BIOGAS HOLDER
12. SLUDGE TREATMENT BUILDING (HOUSING THE DIGESTED SLUDGE DENSIFYING SYSTEM AND THE SLUDGE DRYING PLANT)
13. DRIED SLUDGE STORAGE SILE
14. ADMINISTRATION / CONTROL BUILDING
15. PRELIMINARY TREATMENT ODOUR CONTROL UNIT
16. PRIMARY SLUDGE ODOUR CONTROL TREATMENT UNIT
17. SECONDARY SLUDGE ODOUR TREATMENT UNIT

- LEGEND**
- PROPOSED SITE
 - RISING MAIN
 - FOUL SEWER
 - STORM SEWER
 - PROPOSED BYPASS
 - ESB CABLE
 - INDICATES SPACE AVAILABLE FOR FUTURE EXPANSION

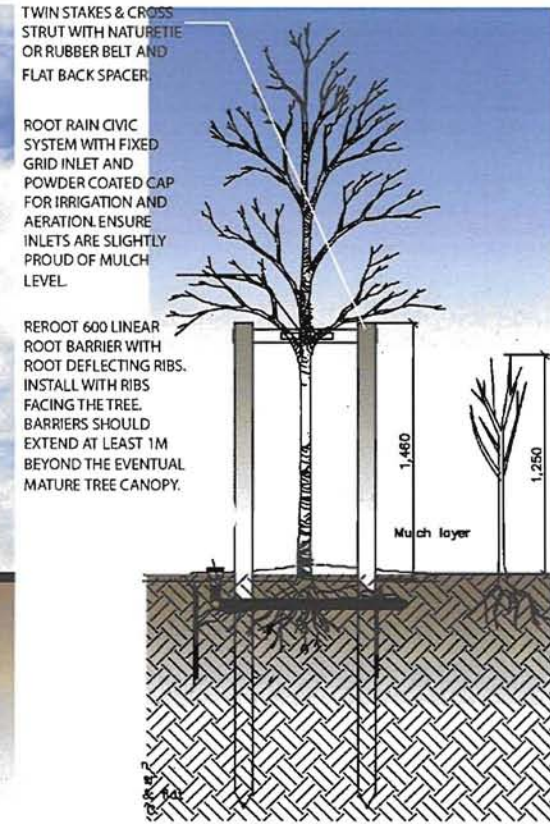
Planting Schedule

Cork Lower Harbour WWTP				
8000m2 of woodland planting				
Whips & feathery				
%	Nr	Species	Size (ht)	Density
20	1025	Alnus cordata	90-120cm	1.2m ctrs
20	1025	Betula pendula	90-120cm	1.2m ctrs
20	1025	Salix alba	90-120cm	1.2m ctrs
10	513	Cistus corbanticola	90-120cm	1.2m ctrs
20	1025	Fraxinus excelsior	90-120cm	1.2m ctrs
5	255	Quercus robur	90-120cm	1.2m ctrs
5	255	Sorbus aucuparia	90-120cm	1.2m ctrs
Shrubs				
%	Nr	Species	Size (ht)	Density
35	5600	Crataegus monogynum	30-40cm	1.0/m2
35	5600	Viburnum tinus	30-40cm	1.0/m2
30	4800	Ribes sanguineum	30-40cm	1.0/m2
Light Standards				
%	Nr	Species	Size (Girth)	Density
34	108	Corylus Avellana	10-12cm	5.0m ctrs
33	106	Quercus robur	10-12cm	5.0m ctrs
33	106	Sorbus Aucuparia	10-12cm	5.0m ctrs

FIGURE 3.9.2 PLANTING SCHEDULE

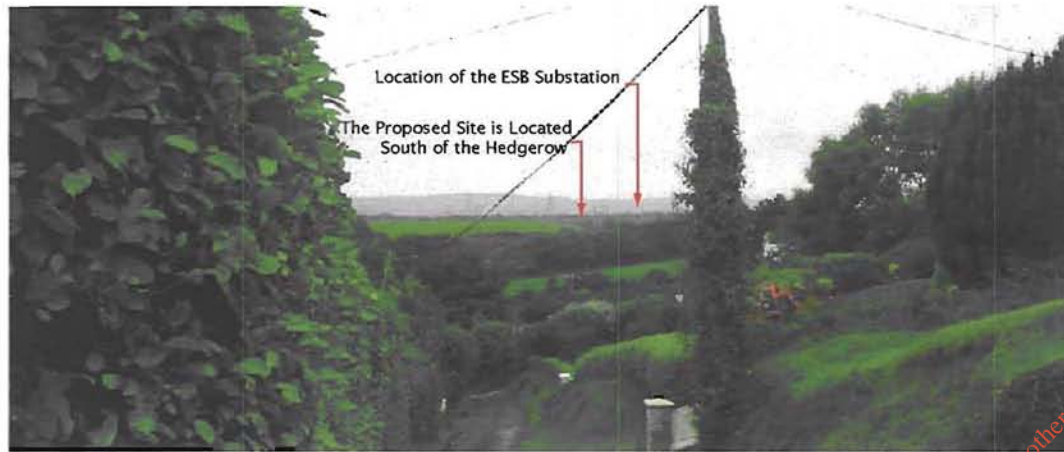


Section A-A'
Proposed Boundary (5-10 years)



Detail 1
Tree & whip planting

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Photograph View 1 - View From the North Towards the Site Which is Barely Visible on the Riddeline.



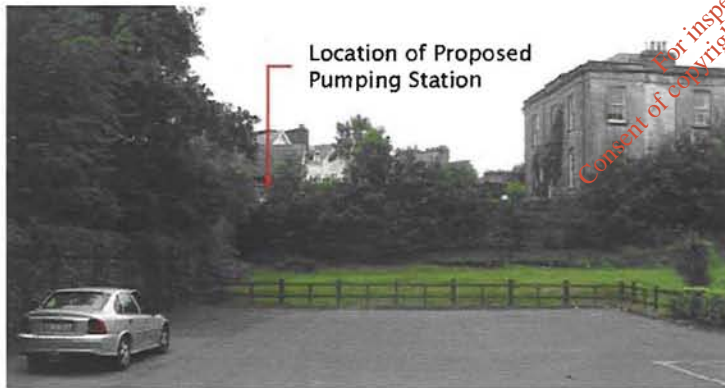
Photograph View 2 - View From the East at Raheens/Barnaheely, Local Hedges Screen the Site.



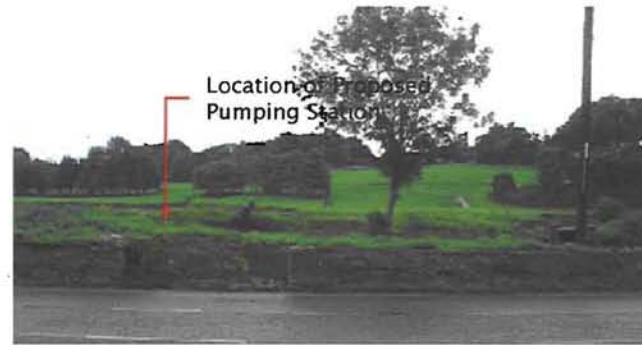
Photograph View 3 - View from the South at Frenchfurze Across the Owenaboy River to the Site
Relevant Local Locations are Highlighted.



Photograph View 4 View from the West at the Eastern Extents of Carrigaline. The Site is Barely Visible Beyond Existing Vegetation



Photograph View 5 - Proposed Location of the Monkstown Pumping Station



Photograph View 6 - Proposed Location of the Rafeen Pumping Station



Photograph View 7 View from the harbour wall at West Beach, Cobh towards the old Post Office Building



Photograph View 8 - View from Pearse Square to the harbour at West Beach, Cobh

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4 Interactions of the Foregoing

This section describes the interactions between the various impacts identified in the previous sections of the present statement during both the construction and operational phases of the proposed development.

While all environmental factors are inter-related to some extent, the significant interactions and inter-dependencies were taken into consideration by the specialist environmental consultants when drafting their technical reports. Consequently these interactions were integrated into the individual sub-sections in Section 3.0 of this EIS.

A simple matrix method has been used (Introduction to Environmental Impact Assessment, Glasson, Therivel and Chadwick, 1999), in which the environmental components addressed in the previous sections of this statement have been placed on both axes of a matrix, and interactions between the various components have then been identified and given a significance rating. It must be noted that each impact is therefore identified twice in the symmetric matrix (refer to the following Table 4.1 Interaction of Impacts during Construction and Operational Phase).

4.1 Human Beings Interactions

Human Beings and Water Quality

It is expected that during the operational phase the development of development there will be a positive impact on human beings due to the improvement in infrastructure and water quality associated with the development.

Human Beings and Material Assets

During the construction phase of the development, there will be short-term, slight negative impact on human beings, due to increased traffic, short-term nuisance impacts to nearby recreational facilities and natural amenities. Human beings will be positively impacted by the improved resource of Cork Lower Harbour during the operational phase of the development, due to improved water quality which will facilitate continued growth and development in the surrounding towns and villages. The improved water quality will also positively impact the recreational value of the waters, fishing and shellfish production.

Human Beings and Air Quality, Odour and Climate

Due to the scale of the proposed development, neither during the construction phase nor operational phases are impacts identified on climate. As such, consequently there are no envisaged interactions between the regional and local climate with human beings.

The primary interaction between air quality and human beings will be the release of odour from the waste water treatment process and traffic emissions from vehicles travelling to and from the facility. However, on effective implementation of the proposed mitigation measures, no residual impacts to the air quality due to the proposed development are envisaged.

Predicted vehicle exhaust emissions as a result of the average vehicle movements to and for the proposed development will be significantly below the relevant limits, as contained in the national Air Quality Standards Regulations 2002 (S.I. No. 271 of 2002) and indicate an imperceptible air pollution impact as a result of increased traffic volumes.

Odour and pollutant emissions have the potential to cause the nuisance to human beings; however, since there are no significant impacts envisaged in relation to odour due to the proposed development, interactions between odour and human beings are considered to be imperceptible.

Human Beings and Noise and Vibrations

During construction and operation of the WWTP noise levels are predicted to have negligible impacts on human beings. During the construction of the major pumping stations, noise impacts will be slight at the nearest houses, however, should not exceed the NRA 70dB(A) criterion. During construction of the pipelines the noise levels will be typically less than 65dB(A), however, occasionally levels of over 70dB(A) may be reached but only for short periods and therefore residences in close proximity may experience short periods of noise levels over 70dB(A). Impacts from vibration at residences in proximity to pumping stations will be mitigated for by incorporation of suitable vibration isolation as appropriate.

Human Beings and Landscape and Visual Assessment

The proposed development is likely to have slightly or moderately negative impacts on visual amenity in the short term during the construction phase, but no significant medium or long term impacts on the landscape or visual amenity of the area are anticipated.

4.2 Terrestrial and Marine Ecology Interactions

Terrestrial and Marine Ecology and Water Quality

During construction of the marine crossing, increased sedimentation will result in temporary slight impacts on water quality. During the operation of the WWTP and collection system, water quality in Cork Lower Harbour is expected to improve, which will affect the type of organisms present in the water. Species diversity in the Lower Harbour is expected to increase with improved water quality resulting in a moderate positive impact in terms of ecology.

Terrestrial and Marine Ecology and Soils, Geology and Hydrogeology

During the construction phase of the development, the removal of soils and overburden for the construction of the WWTP will result in the loss of some hedgerow and improved agricultural grassland. However, these impacts are deemed slight to imperceptible following the implementation of mitigation measures.

Terrestrial and Marine Ecology and Material Assets

During the construction phase, there will be slight negative impacts on ecology and the natural heritage and natural resources adjacent to construction works. However, the proposed development will result in improved water quality in the Lower Harbour, thus positively impacting on the ecology of the harbour environment. This in turn will have a positive effect on fish and shellfish in the harbour waters. Thus the value of this natural resource will increase during the operational phase of the proposed development.

Terrestrial and Marine Ecology and Air Quality, Odour and Climate

During construction of the WWTP and increase in dust may alter soil and water chemistry, which may have impacts on the composition of plant and invertebrate communities. Dust can have direct impacts on insect and other invertebrate populations. Impacts on plant and invertebrate communities may result in knock-on effects further up the food chain. However, upon the implementation of mitigation measures, impacts of dust on ecology will be temporary and slight.

Terrestrial and Marine Ecology and Noise and Vibration

During construction activities, noise and movement created by people and machinery will generate a certain amount of disturbance to local mammals and birds. The disturbance, if any, is likely to be limited to the construction phase of the proposed development. Birds are able to acclimatise to regular patterns of noise disturbance. However, due to the proximity of some of the works to pNHAs and Cork Harbour SPA, method statements for works along the foreshore and for the marine crossing will be developed in consultation with the NPWS, DAFF and SWRFB. The NPWS will be consulted with respect to the protection of the badger sett to the north east of the WWTP site. It is not anticipated that there will be any significant negative impacts on ecology resulting from the operation of the proposed development.

Terrestrial and Marine Ecology and Landscape

The removal of trees, hedgerow and agricultural grassland will alter the landscape at the WWTP site. However, upon implementation of mitigation measures, the amount of hedgerow to be removed will be minimised and as the proposed screen planting on the northern boundary of the site matures visual impacts will reduce from slight negative to imperceptible.

4.3 Water Quality Interactions

Interactions between water quality and human beings and ecology have previously been discussed in Sections 4.1 and 4.2.

Water Quality and Material Assets

During the construction phase there will be temporary slight negative impacts on water quality in Cork Lower Harbour, due to increased sedimentation, thus temporarily affecting this natural amenity and resource. Cork Lower Harbour is a major natural resource and is used extensively for recreational purposes as well as for fishing and shellfish production and the operation of the proposed development will result in improved water quality in the Lower Harbour thus positively impacting on the recreational and economic value of the harbour.

4.4 Soils, Geology and Hydrogeology Interactions

Interactions between Soils, Geology and Hydrogeology and Terrestrial and Marine Ecology have been previously discussed in Section 4.2.

Soils, Geology and Hydrogeology and Material Assets

The permanent removal of soil and overburden for the construction of the WWTP will result in an imperceptible impact in both a local and regional context, for both the construction and operational phases of the development.

Soils, Geology and Hydrogeology and Air Quality, Odour and Climate

Following the implementation of dust suppression mitigation measures the removal of topsoil and stockpiled material will result in a temporary slight to imperceptible negative impact on air quality (particulates) during the construction phase. No impacts are predicted for the operation phase.

Soils, Geology and Hydrogeology and Landscape

There may be a temporary impact on soils arising from the storage of topsoil material for re-use, the view of which will have a slight negative impact on the landscape. The interaction will be temporary only during the construction phase.

4.5 Material Assets Interactions

Interactions between Material Assets and Human Beings, Terrestrial and Marine Ecology and Water Quality have been previously discussed in Sections 4.1, 4.2 and 4.3 respectively.

Material Assets and Air Quality, Odour and Climate

Dust impacts during construction and odour impacts during the operational phase can cause a reduction in amenity value, in the proximity of developments of this nature. With appropriate design and effective management in addition to the implementation of the mitigation measures, odour and air impacts on recreational and amenity assets is predicted to be imperceptible during both construction and operational phases.

4.6 Air Quality, Odour and Climate Interactions

Interactions between Air Quality, Odour and Climate and Human Beings, Terrestrial and Marine Ecology, Soils, Geology and Hydrogeology and Material Assets have been described in Sections 4.1, 4.2, 4.4 and 4.5 respectively.

4.7 Noise and Vibration Interactions

Interactions between Noise and Vibration and Human Beings and Terrestrial and Marine Ecology have been described in Sections 4.1 and 4.2 respectively.

Noise and Vibration and Cultural Heritage

During the construction phase, the potential exists for the vibration of machinery to negatively impact on nearby extant archaeological features. However, following the implementation of mitigation measures the impact is deemed to be imperceptible.

4.8 Cultural Heritage Interactions

As specified in section 3.8 *Cultural Heritage*, there exists the potential for previously un-recorded findings of cultural heritage value to be discovered during the construction phase of the proposed development. In the event of the excavation of a cultural heritage finding being required, this activity could result in environmental impacts on a number of media, e.g. landscape, terrestrial ecology, marine and aquatic ecology. It is inappropriate at this stage to attempt quantification of these impacts due to the lack of specific information. Cultural Heritage and Noise and Vibration interactions have been discussed in Section 4.7.

Cultural Heritage and Landscape and Visual Assessment

The landscape in general is rich in cultural heritage elements with the most important being Cobh Town with its historic past and protected structures. Construction of the collection system and pumping station at West Beach, Cobh will have a significant negative visual impact on this cultural heritage site. This impact will be mitigated by the appropriate design of the building and the loss of views will be mitigated by improved views from the new public amenity area.

4.9 Landscape and Visual Assessment Interactions

Interactions between Landscape and Visual Assessment and Human Beings, Terrestrial and Marine Ecology and Cultural Heritage have been discussed previously in Sections 4.1, 4.2 and 4.8 respectively.

Table 4.1: Interactions of Impacts during Construction and Operation of Proposed Development

	HUMAN BEINGS		TERRESTRIAL AND MARINE ECOLOGY		WATER QUALITY		SOILS, GEOLOGY AND HYDROGEOLOGY		MATERIAL ASSETS		AIR QUALITY, ODOUR AND CLIMATE		NOISE AND VIBRATION		CULTURAL HERITAGE		LANDSCAPE AND VISUAL ASSESSMENT	
	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.
Human Beings			-	-			-	-							-	-		
Terrestrial and Marine Ecology	-	-													-	-		
Water Quality							-	-			-	-	-	-	-	-	-	-
Soils, Geology and Hydrogeology	-	-			-	-							-	-	-	-		
Material Assets													-	-	-	-	-	-
Air Quality, Odour and Climate					-	-							-	-	-	-	-	-
Noise and Vibration					-	-	-	-	-	-	-	-					-	-
Cultural Heritage	-	-	-	-	-	-	-	-	-	-	-	-						
Landscape and Visual Assessment					-	-			-	-	-	-	-	-				

LEGEND	
No Interaction	-
Neutral	
Positive	
Imperceptible Negative	
Slight Negative	
Moderate-Significant Negative	

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