



Environmental Impact Assessment Report

Volume 1: Non-Technical Summary

Final Report

July 2024

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COMHAIRLE CONTAE AN CHLÁIR
CLARE COUNTY COUNCIL



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Contract

This report relates to the Kilkee FRS commissioned by Clare County Council, on behalf of the Office of Public Works. Conor O'Neill, Christos Papachristou and Bernadette O'Connell of JBA Consulting carried out this work.

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Purpose

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Abbreviations

AA	Appropriate Assessment
ACA	Architectural Conservation Area
CCC	Clare County Council
CFRAM	Catchment Flood Risk Assessment and Management
DEHLG	Department of Environment, Heritage and Local Government
EIAR	Environmental Impact Assessment Report
EPA	Environmental Protection Agency
FRS	Flood Relief Scheme
GHS	Geological Heritage Site
GIS	Geographic Information System
GSI	Geological Survey Ireland
IAQM	Institute of Air Quality Management
NHA	Natural Heritage Area
NIAH	National Inventory of Architectural Heritage
NPF	National Policy Framework
NNPWS	National Parks and Wildlife Service
OPW	Office of Public Works
PCD	Public Consultation Day
pNHA	proposed Natural Heritage Area
RRPS	Record of Protected Structures
SAC	Special Areas of Conservation
SPA	Special Protection Areas
UWWTP	Urban Wastewater Treatment Plant
WFD	Water Framework Directive
WWTP	Wastewater Treatment Plant
ZoI	Zone of Influence

Non-Technical Summary

Introduction

This document provides a non-technical summary for the Environmental Impact Assessment Report (EIAR) which was prepared for the proposed Flood Relief Scheme (FRS), in Kilkee, Co. Clare.

There are five stages in the project:

- Stage I – Development of a number of flood defence options and the identification of a preferred Scheme;
- Stage II – Planning & Detailed Design;
- Stage III & IV – Tender & Construction; and
- Stage V – Project Close-Out (Handover to Client).

This Non- Technical Summary is produced as part of Stage II of the project. It follows on from work carried out to date including the Options Assessment Report¹ and the EIAR Scoping Report².

The EIAR comprises three volumes as follows:

- Volume 1, Non-Technical Summary;
- Volume 2, Environmental Impact Assessment Report; and
- Volume 3, Environmental Impact Assessment Report Appendices.

Need for the Proposed Development

There are two main streams that run through Kilkee. These streams are the Victoria and the Atlantic stream. There have been several recent instances of flooding in Kilkee. The Victoria Stream is noted to overflow its banks annually causing flooding and putting a number of residencies and businesses at risk. Kilkee severely flooded in April of 2015 and previously in 2014, and most recently in 2019 and 2024.

As Kilkee is highly susceptible to flood events, improvements to the existing infrastructure and provision of additional measures are required to reduce impacts and frequency of extreme events which inundate the town. JBA Consulting and JB Barry have been commissioned by Clare County Council (CCC) to provide the engineering and environmental services subject of this EIAR and deliver the Kilkee FRS.

In the absence of the proposed development works, flooding will persist and possibly worsen over time. The residual impacts of continuous flooding will damage and devalue properties in the area and affect long term regeneration plans and tourism for Kilkee and its environs.

It is intended the works will enhance and fortify the infrastructure and introduce new measures that will be able to withstand the likely increased frequency and severity of future flooding events. The works have been designed and developed with a primary focus to protect the affected areas against fluvial and tidal flooding. The scheme proposed herein is designed to provide protection to properties in the study area from the 1 in 200-year tidal flood event.

Support for enhanced flood protect is encouraged under the National Planning Framework, regional and local objectives, and further supported under European Union Policy for flood risk assessment and management. These objectives and goals are set out below.

Site description

The scheme area is approximately 3.6km² (Figure 1) and includes Kilkee town centre and adjacent rural lands. The Victoria and the Atlantic Stream are the two main streams considered in this FRS. Both streams flow into Moore Bay. The two streams have a number of tributaries and drainage channels which contribute to the flow through the area.

¹ JBA Consulting (March 2024) Kilkee Flood Relief Scheme - Options Report. Clare County Council and Office of Public Works

² JBA Consulting (August 2023) Kilkee Flood Relief Scheme - EIA Screening and Scoping for Fluvial Works - Clare County Council and Office of Public Works

Historically, the town has been subject to fluvial flooding and as such, Kilkee was part of the OPW CFRAM study programme. This study's Preliminary Options Report concluded that a flood relief program for the local community would be feasible and effective. According to the CFRAM Options Report, the viable scheme option for Kilkee consisted of a series of flood embankments and flood walls.

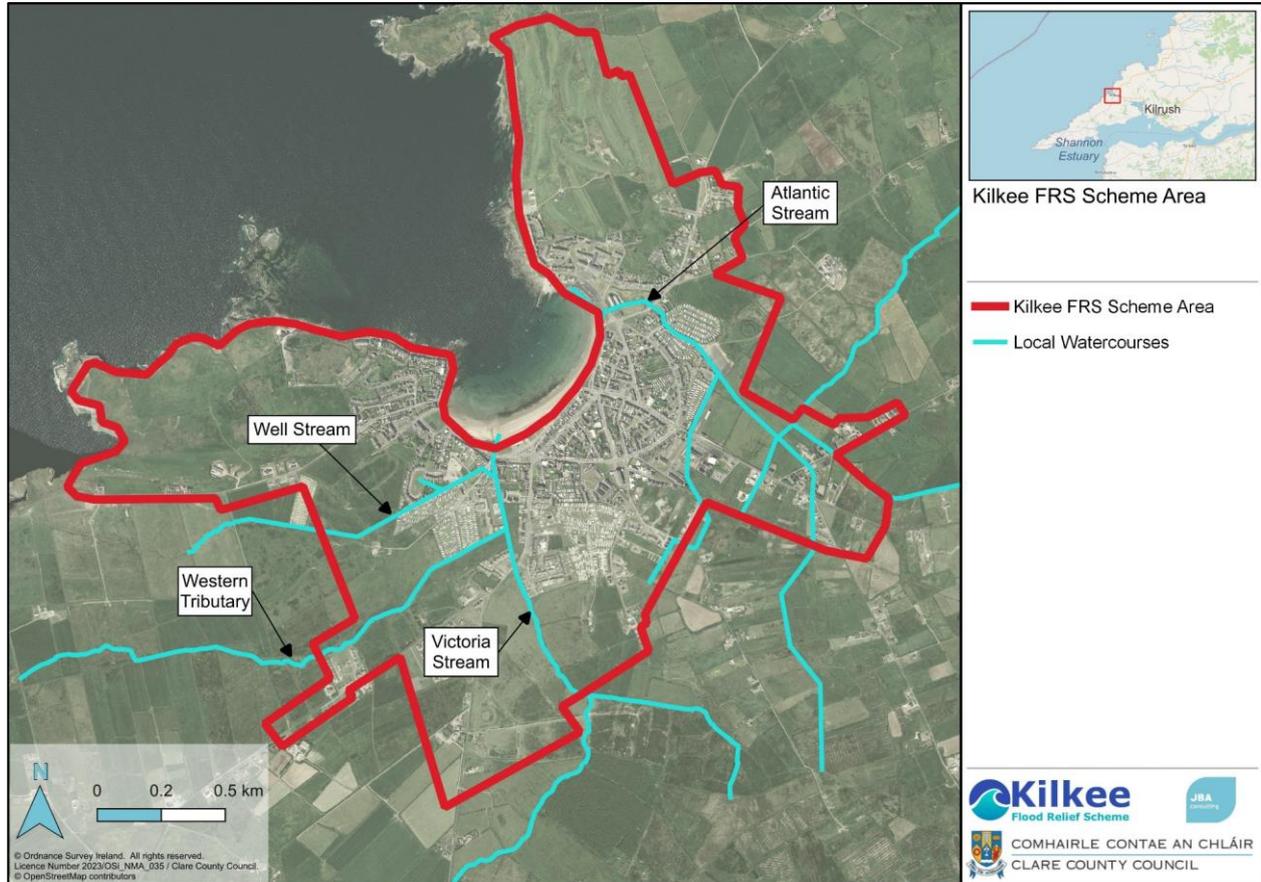


Figure 1: Kilkee FRS Scheme Area

Legislation and Planning Policy

The requirement for flood protection is driven largely by the EU 'Floods' Directive (2007). The design of the Kilkee FRS in response to this law, has triggered the need for an EIAR as part of the planning requirements set out by An Bord Pleanála and the Planning and Development Act 2000 (as amended), and the Planning and Development Regulations 2001, as amended. These key pieces of policy are described further below.

The scheme has been designed in accordance with the following legislation and policy documents:

- EU 'Floods' Directive;
- The National Planning Framework NPF;
- The Planning System and Flood Risk Management 2009;
- Climate Change Sectoral Adaptation Plan for Flood Risk Management, 2015;
- Our Sustainable Future: Framework for Sustainable Development;
- Climate Action Plan 2023;
- Mid-West Area Strategic Plan (MWASP) 2012-2030;
- Regional Spatial and Economic Strategy, Southern Region;
- Shannon Estuary North & Mal Bay Flood Risk Management Plan; and
- Clare County Development Plan 2023-2029.

It is concluded that the proposed development would be in compliance with national, regional and local planning policy provisions and would not seriously injure the amenities of the area or significantly impact the current land use objectives in Kilkee and would, therefore, be in accordance with the proper planning and sustainable development of the area.

EU 'Floods' Directive 2007

The EU 'Floods' Directive came into force in 2007 and works with the Water Framework Directive (WFD) for the protection of water quality. Under this Directive, each Member State is required to produce policies and plans that set out measures to reduce flood risk and protect the most at-risk communities from flooding.

Kilkee is part of the Flood Risk Management Plan for the Shannon Upper and Lower River Basin. The plan manages flooding for the southwest region to meet Ireland's obligations under the 2007 EU 'Floods' Directive.

The Planning and Development Act 2000 (as amended), and the Planning and Development Regulations 2001, (as amended)

The Planning and Development Act 2000 (as amended) forms the basis of the Irish planning system, setting out the detail of for planning guidelines, obtaining planning permission and the process for Environmental Impact Assessment.

CCC wishes to prepare a Planning Application to An Bord Pleanála (ABP), under Section 175 of the Planning Act. Due to the scale and nature of the Scheme, the requirement for an Environmental Impact Assessment Report has been triggered, as listed under Section 5 Part 2.

The requirements for the preparation of an Environmental Impact Assessment are contained within the Planning Act and have been followed closely in the preparation of the 3 Volumes of this EIAR.

Constraints, Alternatives Considered, Options, and Scoping Stages

Prior to the preparation of this EIAR, several studies were undertaken to inform the options, design, and scoping of this EIAR.

The Constraints Study was the first step in the determining the key environmental constraints and drivers which would inform the development of potential flood relief options and ultimately informed the preparation of this EIAR.

Alternative options were considered in the early phases of the development. This was completed as part of Stage I - Options Development, and the results are presented in the Options Assessment Report³. The Options Assessment included the following options, which were assessed for their applicability, economic feasibility, and their environmental, social, and cultural impact.

Structural Measures

- Flood storage/ Direct flood defences;
- Flood flow bypass channel;
- Increase channel conveyance/ Channel widening and pipe removal;
- Walls and embankments;
- Natural Water Retention Measures (NWRM).

The Options Assessment Report presented the various structural through screening all available alternatives considered, and from the screening process developed options specific to each intervention area, of which there were three in Kilkee each of which had sub-areas identified:

- The Atlantic Stream
 - Kilkee Bay Hotel
 - Dún an Óir estate
 - Sandpark Mobile Park
 - Waterworld
 - Meadow View Court;
- The Atlantic Stream Outfall; and
- The Victoria Stream
 - Well Stream

³ JBA Consulting (March 2024) *Kilkee Flood Relief Scheme - Options Report*. Clare County Council and Office of Public Works

- Victoria Court
- Victoria Stream
- Western Tributary.

The outcome included three options for the Atlantic Stream, two options for the Atlantic Stream Outfall and four options for the Victoria Stream.

The merits of the alternative options were summarised on the basis of cost, Multi-Criteria Analysis (MCA) score, environmental and ecological impact, process and programme, and climate change adaptability.

The emerging preferred options are:

- Option 1 for the Atlantic Stream
- Option 2 for the Atlantic Stream Outfall and
- Option 1A for the Victoria Stream.

Following selection of an Emerging Preferred Option, a Scoping Report was developed, which was the first stage in the preparation of the EIAR. The Scoping Report introduced the proposed development, defined the location and extent of works, identified the key environmental issues and receptors in the vicinity, the potential impacts of the proposal, and identifies the likely environmental studies that are required to inform the full EIAR. The Scoping Report was distributed to statutory consultees as part of the consultation phase.

Description of the Proposed Development

The proposed development includes defences that comprise: either repairs to existing walls and increase of their height, new reinforced concrete flood walls, earth embankments, improvement of existing outfall and debris screen and road reprofiling (shown in Figure 2, Figure 3, and Figure 4 overleaf), depending on the location and local constraints. Apart from the measures that relate directly to the risk of flooding from the river, the proposals include measures to prevent increasing the risk of flooding from waves heavy rainfall and water coming from overcapping existing walls along Marine Parade (Figure 5). A description of the works at location are described further in Table 1.

Table 1: Summary of the proposed measures

Measures location	Proposed measures
Atlantic Stream	Kilkee Bay Hotel Construction of embankment, diversion of open channel into centre of floodplain, Installation of new headwall and inlet culvert under embankment to link with existing culvert.
	Dún an Óir estate Boundary wall height increased.
	Sandpark Mobile Park Construction of embankment.
	Waterworld New debris screen at upstream culvert headwall.
	Meadow View Court Construction of manholes with grated covers on existing culvert.
Atlantic Stream Outfall	Upgrade existing overflow chamber with raised cover with flap valves, reconstruct outfall manhole and install non-return valve on upstream culvert, install non-return valve on existing overflow outfall culvert, seal existing cover of manhole downstream of overflow chamber on main outfall culvert.
Victoria Stream	Well stream Construction of embankment with inclusion of new headwall and inlet culvert to existing culvert downstream, installation of overflow and non-return valve, decommissioning of existing Well Stream box culvert and circular overflow culverts, installation of new box culvert, resurfacing and regrading of Well Road, installation of precast reinforced concrete u-channel along the existing Well Stream alignment.
	Victoria court Reconstruction of Victoria Court boundary wall.
	Victoria Stream Local repointing and thickening of existing property wall, construction of embankment and flood defence wall, diversion of open channel, existing open channel to be filled in, reconstruction of boundary wall, construction of embankment.
	Western Tributary Construction of embankment, diversion of open channel and backfill of existing channel, regrading of floodplain in field, installation of culvert, inclusion of headwalls on inlet and outlet of culvert.
Pluvial Flod Risk	Installation of pump stations, sub-surface storage and rising mains, construction of carrier sewers and associated manholes, upgrade of Carrigaholt Road surface water drainage network.
Coastal Flood Risk Baseline Retention Measures	Inclusion of sluice gates at proposed flood defences and road profile raising.

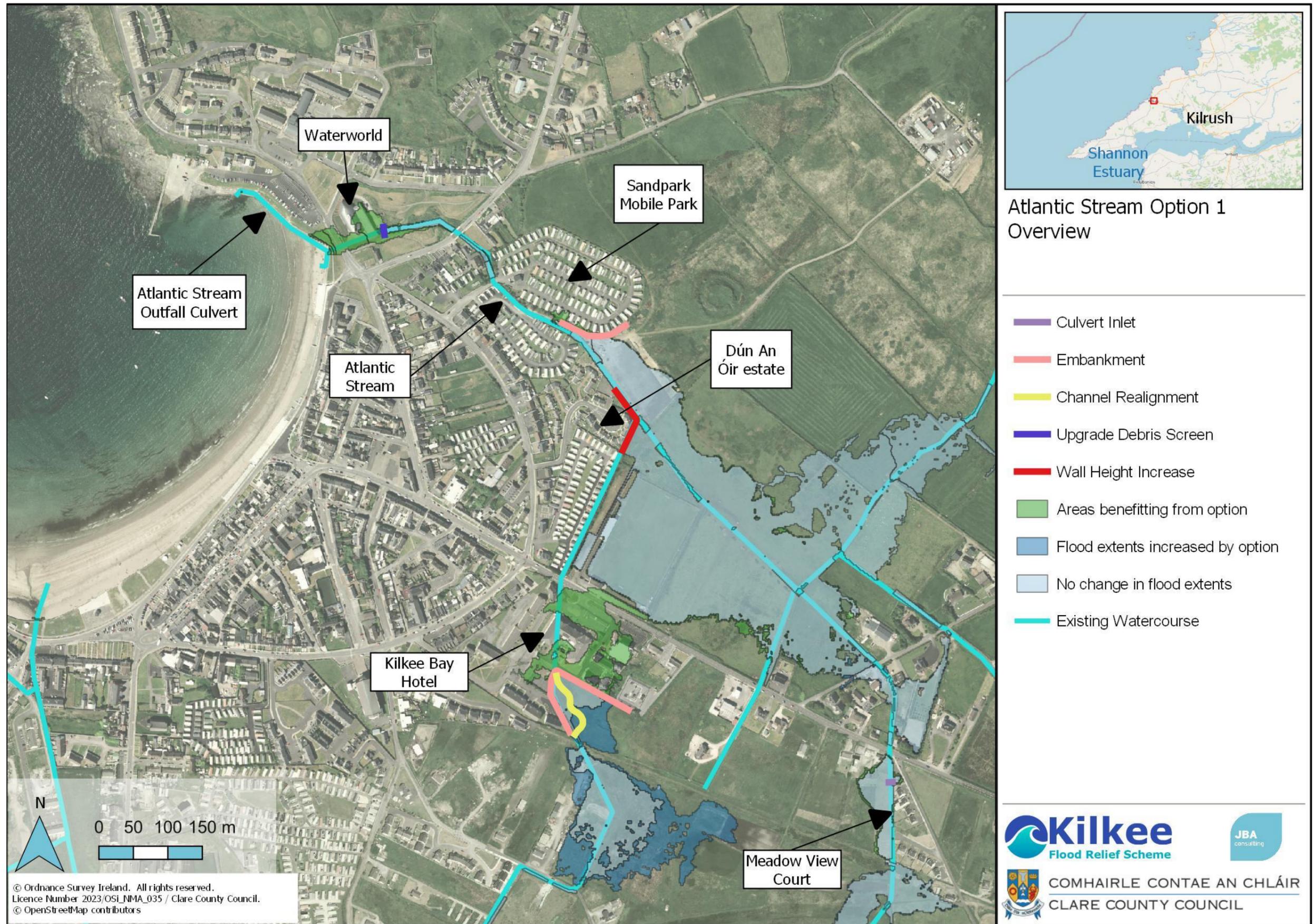


Figure 2: Overview for the Atlantic Stream area

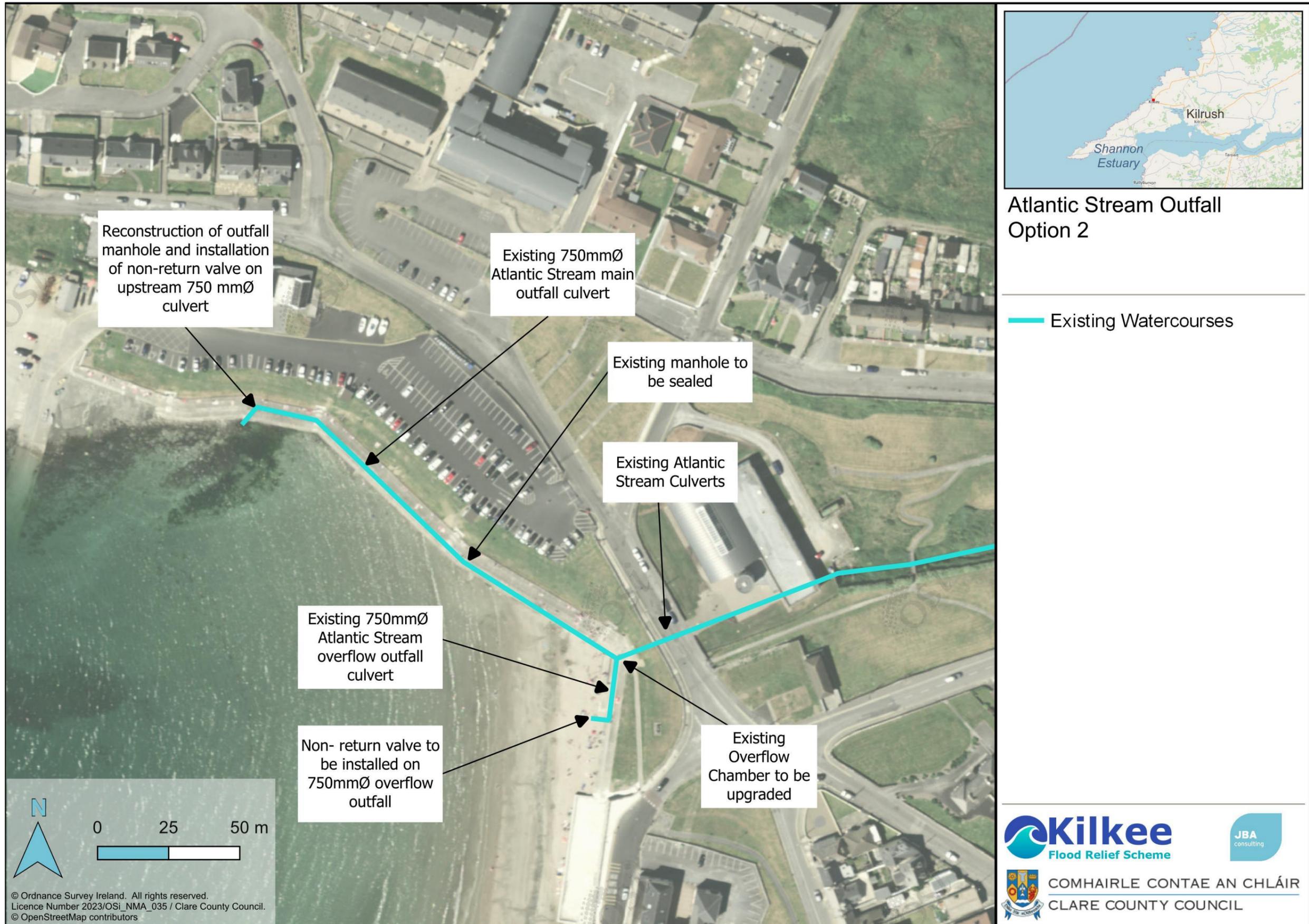


Figure 3: Overview for the Atlantic Stream outfall

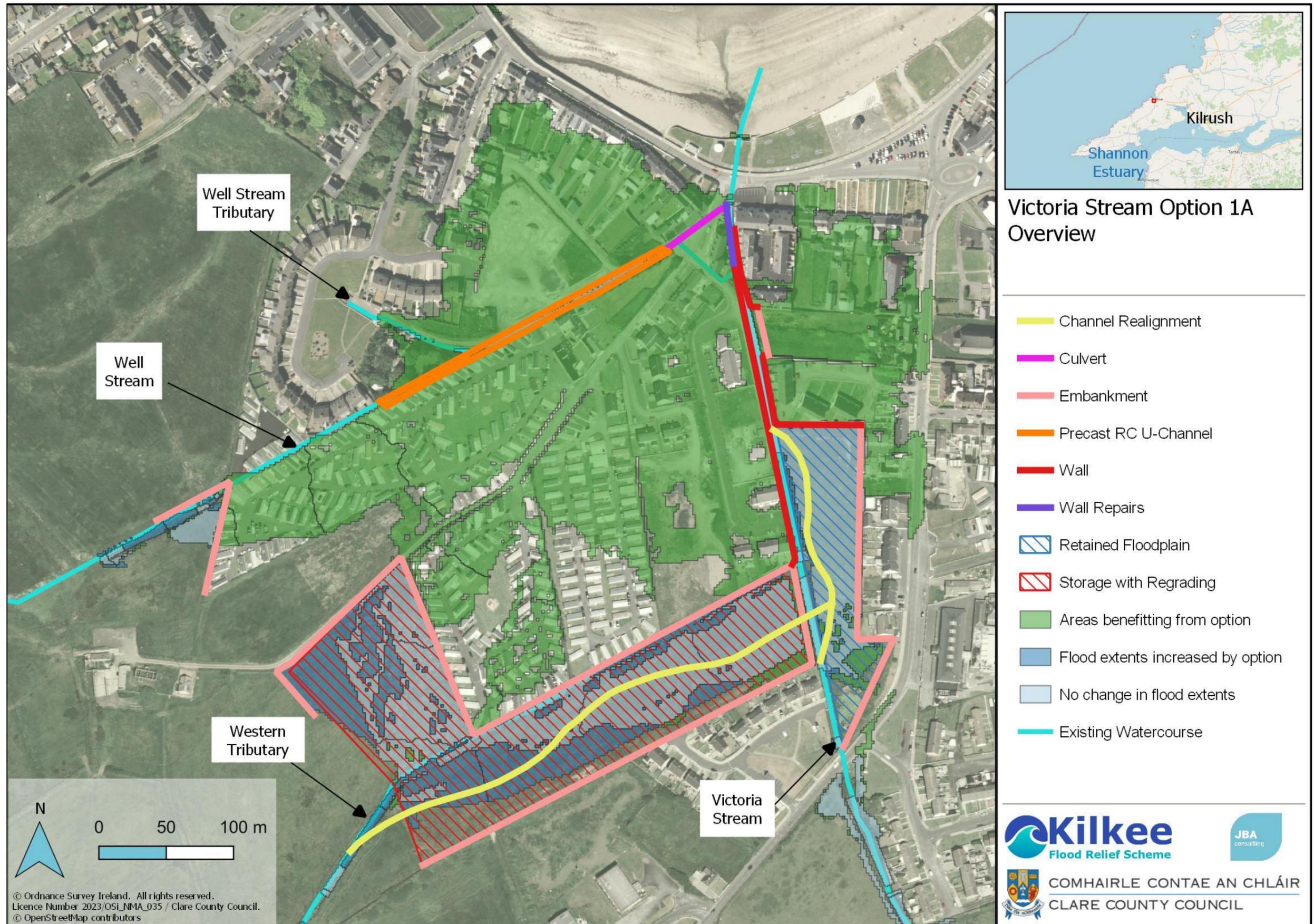


Figure 4: Overview for the Victoria Stream

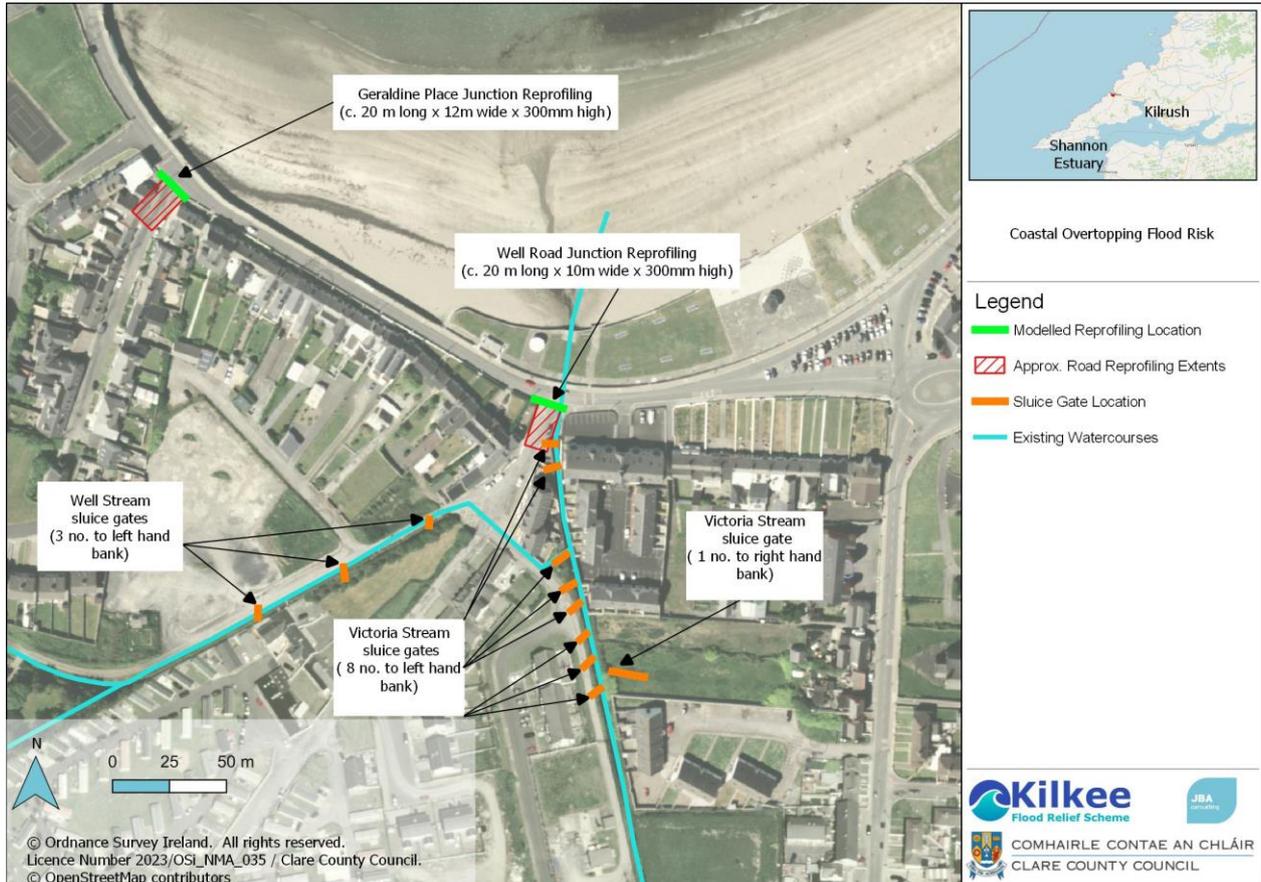


Figure 5: Coastal overtopping flood risk measures

Consultation

Public and statutory consultation are a requirement of projects undergoing EIAR. Statutory consultees include government bodies, regulatory bodies, non-governmental organisations and other who have an interest or responsibility in some respect to a part of the development. These consultees were identified in the Scoping stage of the EIAR. The second avenue is to consult with the public including local residents and business owners who may be impacted by the development or any member of the public who wants to provide input.

Statutory Consultation

Statutory Consultees were issued a letter and a copy of the Scoping Report by email on 11th of July 2023 requesting that any comments, observations or submissions in relation to the scope and level of information to be included in the EIAR be made prior to submission. Non-statutory consultees, including NGOs, Local Authority, and local interest groups were also issued the report and were asked for feedback. Responses were received from the following:

- Department of Environment, Climate and Communications
- Department of Housing, Local Government and Heritage – Development Applications Unit (DAU)
- Department of Transport, Tourism, and Sport
- Geological Survey Ireland (GSI)
- Fáilte Ireland
- Health Service Executive (HSE)
- Irish Water/Uisce Éireann
- Transport Infrastructure Ireland (TII)

Responses were considered in the preparation of the EIAR and were passed onto the design team where amendments to the design were required.

Additional consultation was carried out on the 15th of January 2024 between members of the Design Team, EIAR Team, the Department of Housing, Local Government and Heritage Ecological Guidance and Advisory Unit, and the National Parks and Wildlife Service to ensure that any biodiversity impacts and recommendations are in line with the department's policies.

Public Consultation

To date there have been four public participation events on the Kilkee FRS:

The first public participation event was held during August 2020, during the Covid-19 pandemic. Due to the pandemic restrictions, the event took place online, with an information video on the scheme shared.

The second public participation day was held on the 18th of August 2022, in Kilkee Community Centre. Nine representatives from the project team were present throughout the day, and 33 attendees were recorded.

The third public consultation day on the preferred option was held on Thursday 13th of April 2023.

The fourth public consultation day was held between the 26th of February to 6th of March 2024 when a draft set of planning documents were put on public display. On the 6th of March members of the design team and steering group were available to take questions relating to the planning documents.

The feeling from most attendees was that a solution was needed.

Landowner liaison

Before submitting the scheme for planning, the landowners that are directly impacted by the scheme (both in a temporary or permanent capacity) were contacted directly by the local authority. This provided a direct contact line for those affected properties and the local authority. This liaison will continue through the planning and detailed design processes.

Assessment of Effects

Construction: Air Quality and Dust, Climate, Noise and Vibration. and Population and Human Health

Air Quality and Dust

The background air quality in Kilkee is of very good quality and the site is located in an area classed as 'Zone D' and has a reading of 1 out of 10 (with 10 being the worst quality) on the Air Quality Index for Health on the as denoted by the EPA; relative to the location and relative air quality challenges.

A construction dust assessment was undertaken to determine whether air quality impacts are likely to arise from the construction of the proposed development. The risk of impacts from earthworks associated with the construction process was determined. Subsequently, appropriate mitigation measures have been outlined to reduce the risk of dust soiling, and impact on human health and ecological receptors.

The suggested mitigation measures include the development of a Dust Management Plan (DMP). The DMP may include monitoring of dust deposition, dust flux, real-time PM10, continuous monitoring and/or visual inspections.

Appropriate dust deposition limits during the Construction Phase have been recommended.

No baseline air quality or dust deposition survey has been undertaken. Reference has been made to EPA data to quantify the existing air quality in proximity to the proposed development site.

No significant impacts to the quality of the air in Kilkee are expected to arise from the construction of the proposed flood defences. The operation of the defences does not generate airborne particles and will have no negative impact.

Climate

The baseline for the greenhouse emission was established by the 'Ireland, National Inventory Report 2023' as published by the EPA in March 2023 and the greenhouse gas allowance by the Government's Climate Action Plan 2023. During the construction phase of the proposed development, GHG emissions will potentially be generated by site preparation works, excavation, infilling works, construction activities, energy usage, etc.

Based on the volume of excavated, backfilled and imported material and HGV movements, the total volume of gas emissions for the construction of the proposed development was assessed as negligible. The operation of the defences does not generation of airborne particles and will have no negative impact.

During the operational phase for the proposed development, no further emissions will be generated so there will be no further impacts.

Noise and Vibration

An assessment was carried out of the noise and vibration effects arising from the construction of the proposed scheme. The baseline noise environment was determined by conducting surveys at sensitive locations in the vicinity of the proposed scheme. The results of these surveys indicate that the current noise levels are dominated by traffic, pedestrians and the ocean.

The noise and vibration assessment examined multiple phases during construction including embankment construction, concrete wall / barrier construction, and associated construction traffic. This assessment showed that appropriate noise levels will be achieved if mitigation measures are closely followed. The traffic data indicates that there will be no significant noise impacts generated during the construction or operational phases.

There are no operational noise sources as part of the proposed scheme, therefore, no impact assessment was required.

During construction, the contractor will take specific noise abatement measures and comply with the recommendations set out in appropriate codes of practice. Specific measures which will be prescribed in the site-specific Construction Environmental Management Plan (CEMP) will be implemented during construction include the following:

- Working hours during site construction operations will be restricted to daytime hours from 07:30 hours to 16:30 hours (Monday to Friday) and as may be required, from 08.00 hours to 13.00 hours (Saturdays). Evening and night-time work is not expected to take place although it is possible that limited 24-hour working may be required to take place on occasion. This will only take place with the prior agreement of CCC.
- An on-site speed limit will be enforced for all traffic. Drivers of vehicles will be advised of the speed limits through the erection of signs *i.e.* a typically recommended on-site speed limit is 10 km/hr.
- Where practicable, the use of quiet working methods and the most suitable plant will be selected for each activity having due regard to the need for noise control.
- Best practicable means will be employed to minimise noise emissions and will comply with the general recommendations of BS 5228. To this end operators will use “*noise reduced*” plant and/or will modify their construction methods so that noisy plant is unnecessary.
- By positioning potentially noisy plant as far as possible from noise sensitive receivers the transmission of sound can be minimized. Earth mounds and/or stockpiles of material or perimeter hoarding on site can be used as a physical barrier between the source and the receiver.
- Mechanical plant used on site will be fitted with effective exhaust silencers. Vehicle reverse alarms will be silenced appropriately to minimise noise breakout from the site while still maintaining their effectiveness.
- All plant will be maintained in good working order. Where practicable, machines will be operated at low speeds and will be shut down when not in use.
- Compressors will be of the “noise reduced” variety and fitted with properly lined and sealed acoustic covers.
- In all cases engine and/or machinery covers will be closed whenever the machines or engines are in use.
- All pneumatic percussive tools will be fitted with mufflers or silencers as recommended by the equipment manufacturers. Where practicable, all mechanical static plant will be enclosed by acoustic sheds or screens.
- Employees working on the site will be informed about the requirement to minimise noise and will undergo training on the following aspects:
 - The proper use and maintenance of tools and equipment.
 - The positioning of machinery on-site to reduce the emission of noise to the noise sensitive receivers.

- Avoidance of unnecessary noise when carrying out manual operations and when operating plant and equipment.
 - The use and maintenance of sound reduction equipment fitted to power pressure tools and machines.
- Cognisance will also be taken of the *Environmental good practice site guide* 2005 compiled by CIRIA and the UK Environment Agency. This guide provides useful and practical information regarding the control of noise at construction sites.
 - Where excessive noise levels are recorded, further mitigation measures will be employed which may include temporary wooden hoarding / acoustic screening to be installed to a height of no less than 2m around areas of construction where loud noise levels occur.
 - The contractor will ensure that the TII Guidelines, which identify limits for protection against cosmetic damage as a function of vibration frequency, are not exceeded by the selected low vibration piling method.
 - Responsible Person –The Contractor will appoint a responsible and trained person who will be present on site and who will be willing to answer and act upon complaints and queries from the local public.
 - Night-time Working - If there are items of plant (e.g. dewatering pumps and similar) in use during night-time hours they will be chosen, sited and enclosed such that levels at the nearest properties do not exceed the measured background noise levels.

In addition to mitigation measures, monitoring will be undertaken during the construction phase to ensure that noise is in compliance with agreed upon limits.

Population and Human Health

This chapter assessed impacts to population and human health including dwellings and people living Kilkee, as well as a number of businesses, schools, childcare facility, medical facility, church, community and recreational facilities.

The proposed development is expected to have the greatest impact to population and human health during the construction phase of the project. These impacts are predicted to be secondary as a result of disruptions to traffic, noise, air quality, water quality, and landscape/visual amenity. There will be temporary minor impact to residential and visual amenity lasting only the duration of the construction phase (18-24 months approximately). There will be a positive impact to population and economy through the employment of construction personnel. There is also a risk to personnel employed on the site, as with any construction site, however procedures will be put in place by the contractor to mitigate for this. Mitigation measures will include a CEMP (Construction and Environmental Management Plan), which will limit the effects on human beings with regards to traffic, noise, air, dust, access, landscape and visual impact, and amenity.

When the site is operational, the land use and zoning will be consistent with the existing land use, as these works are considered an upgrade to the existing infrastructure and modification of existing features. The upgrade will, however, improve the recreational and tourism opportunities in Kilkee through the improvement of the quality of the water spilling into Moore Bay. Overall, the proposed development has the potential to make Kilkee more desirable as a residential and business area due to the reduced risk of flooding. The development will also protect important tourist destinations from flooding, which are culturally and economically significant to Kilkee. No significant negative impacts are predicted during the operation phase.

Biodiversity

This chapter assessed the impact of the proposed development on biodiversity during the construction and operation phases.

The assessment of Annex 1 habitats which are of International value i.e. Kilkee Reefs SAC is considered within the NIS (Natura Impact Statement) which forms part of this planning application.

Impacts during construction will result from habitat loss/disturbance, habitat degradation, disturbance to faunal species, reduction in water quality, release of dust (impacting habitats and water quality) and spread of invasive species for the following species which were recorded on site:

Mammals

- Bats - Common and Soprano Pipistrelle were recorded in the area. There will be no loss of roosts associated with the project no permanent loss of foraging habitat due to the inherent design level mitigation of the project and the increased wetland area may provide higher quality habitat and further opportunities for bats.
- Badger - Evidence of badger using the land around Kilkee was recorded; potential sett locations were also noted and monitored. No active sett was recorded within the footprint of the scheme works. Badgers are unlikely to be disturbed by the works.
- Otter - Otter were recorded using the area around Kilkee; no evidence of Otter activity was recorded on the Atlantic, Victoria, Western Tributary or Well streams. No loss of overall foraging habitat is anticipated, due to the inherent design of the project.

Birds

- Marine birds – these are mainly found along the coast and the beach area. These will be most likely affected by works along the waterfront i.e. works on the Atlantic culvert and debris screen replacement. Noise disturbance may occur if there is exposure to loud noise.
- Wetland and Waterbirds - Habitat, and noise and visual disturbance is likely to occur in areas of work where stream realignment occurs, especially on the Victoria stream in the Carrigaholt Road Field. This work has the potential to cause physical disturbance for wintering Snipe (Flushing if approached to within 20m), and result in changes in habitat function.
- Passerines: These will most likely be affected by removal of vegetation, leading to a loss of breeding, roosting and foraging habitat. There is potential for impacts on breeding Sedge Warbler.

Fish and Aquatic species

- The Atlantic Hotel realignment has the potential to lead to the loss of fish and aquatic species. Installation of the culvert headwall and debris screen has the potential to introduce uncured concrete, cement, and particles into the water ways. There is a potential for the loss of the eel nursery in the Victoria stream during the works on the Victoria Stream Wall, as suitable habitat for elvers was noted to be present within the cracks/crumbling areas of the walls along the Victoria stream.
- For Well steam, over pumping and water storage in an underground retention tank has the potential to trap fish during the construction phases. Utilisation of underground storage tanks during flood events also has the potential to divert fish into attenuation features. The removal of the culvert has the potential to trap and destroy fish. Changing of the nature of the habitat i.e. instalment of the U channel has the potential to result in loss of habitat for eel (presence confirmed in Well stream by e-DNA).
- Amphibians- Work in or adjacent to waterways and wetlands has the potential to impact amphibian species by disturbing or destroying breeding and foraging habitat. There is potential for temporary effect on amphibians during the construction phase, but long-term habitat creation.

Invasive Non-Native Species

- Japanese Knotweed is recorded in Kilkee. There are currently active eradication measures in place by Clare County Council. Additionally, there are Three-cornered Leek, Japanese Rose *Rosa rugosa* and Cherry Laurel were also recorded within the footprint of the scheme. The works have the potential to spread Japanese Knotweed through the movement of vehicles, the excavation and removal of materials and the introduction of inert materials.

Lighting

Due to the limited timing of the works, and temporary nature of the lighting, this aspect will not have a significant effect on any species.

Maintenance

The scheme maintenance may have an impact through physical disturbance of habitats, release of suspended solids, hydrocarbon and other spillage, release of nutrient, change in water levels, noise and visual disturbance, through the mowing regime of the embankments, infrastructure repair and maintenance, riverbed and aquatic vegetation maintenance.

Habitats

- Approximately 370 m² of reed and large sedge swamp (FS1) will be lost for the realignment of the Victoria stream. In total ~870 m² will be lost out of the overall ~10,000 m².
- There will be a loss of approximately 600m² of Dry meadows and grassy verges, wet grassland (GS2 and GS4) with the stream realignment and creation of scrapes in the Long Field.
- Depositing/lowland rivers FW2; Eroding/upland rivers FW1 There will be a loss of the original streams, with potential loss of aquatic habitats, removal and loss of bed material and associated fauna and flora. Overall, there will be no net loss of river length, but habitat may be affected without mitigation measures.
- Marsh GM1 Marsh GM1 Approximately 200m² of marsh area will be lost to the creation of the embankment across the Well Stream, and approximately 330m² of marsh area along Cunningham's caravan park. This corresponds to approximately 8.7% and 23% of each area respectively.

Flora of interest: orchids

Orchids *Dactylorhiza spp* were recorded in the Long Field. This field will be modified to accommodate scrapes and realignment of the Western Tributary. There is likely to be some loss of habitat and some loss of plants as part of the field will become the new stream section. There is potential for permanent effects on the orchids through accidental habitat loss and destruction of plants.

Mitigation and Monitoring

The project has been assessed including some designed-in mitigation. This was done where mitigation is proven to be effective and will be implemented effectively with a high certainty. Where significant residual impacts are still identified, further mitigation measures will be proposed as part of the EIA process to avoid, reduce or minimise them. Residual ecological impacts are those that remain once the development proposals have been implemented. The main aim of ecological mitigation is to minimise or eliminate residual impacts. A post-mitigation or final significance level is assigned to the impact described, which considers and includes the implementation of any stated mitigation measures; these are the residual impacts.

General mitigation in the form of Standard construction practices have been outlined, along with use of precautionary principles to avoid detrimental effects to the environment. The principal contractor will be required to ensure good environmental management within the site compounds. To determine the effectiveness of proposed measures, the site terrestrial and aquatic habitats will be monitored prior to, during and for at least 5 years post construction.

Specific mitigation is specified where significant impacts are predicted for wetland and waterbirds, Passerines, Fish and Aquatic species including amphibians and flora of interest: orchids.

A summary of the project impacts on the different ecological features, with reference to a summary of mitigation measures is provided in the Table 2 overleaf.

Table 2: Summary of scheme impacts on ecological receptors

Ecological feature	Value	Construction Impact	Operational Impacts	Effect without mitigation	Mitigation	Residual effect significance
Habitats						
Reed and large sedge swamp	Local Importance (Lower Higher).	Loss of habitat, habitat degradation (soil compaction, tracking and disturbance by machinery).	-	Loss of habitat	Preserve excavated turves and reinstate, fence areas to remain intact. Enhanced post construction management of reeds.	Slight negative effect. Loss of habitat to the footprint of the embankment and stream re-alignment will be offset by enhanced management and wetland creation.
Wet grassland	Local Importance (Higher Value).	Loss of habitat, habitat degradation (soil compaction, tracking and disturbance by machinery).	-	Loss of habitat. Temporary disturbance of habitat from machinery working.	Preserve excavated turves and reinstate. Work in dry ground conditions. Use mats to protect sensitive areas. Only small areas of local important habitat to be lost in footprint of embankment, or to stream re-alignment.	Long term loss of small area of locally important wet grassland.
6510 Annex I habitat	Regional Importance	Loss of habitat, habitat degradation (soil compaction, tracking and disturbance by machinery).	Change in hydrological regime causing changes in species composition	Habitat degradation, change in species composition, loss of habitat	Mowing/ grazing regime. Avoid machinery working in species rich areas. Position ponds and regrading in areas of low diversity. Where machinery must work from within species rich areas use of mats to avoid soil compaction and to protect vegetation. Work in dry ground conditions only to minimise cutting up/disturbance.	Slight negative. Enhanced management (e.g. formalised hay meadow management with no fertiliser input) will secure management of field in long term for biodiversity.
Marsh	Local Importance (Higher Value).	Loss of habitat	-	Loss of habitat to embankment behind Cunninghams caravan park.	Wetland creation	Neutral effect
Sand shores	Local Importance (Higher Value).	Sedimentation	Storm runoff causing erosion of sand shores (normally replaced within incoming tides over time).	Sedimentation	Dry working. Operation of the FRS will mean less storm runoff events	Neutral effect
Rivers						
Atlantic Stream	Lower local importance	Water quality – release of sediments and pollution during construction.	Improved water quality; Annual vegetation cutting on banks is not expected to have any	Sedimentation, nutrient loading, loss of habitat, loss of aquatic species	Water quality protection measures	Temporary slight negative impact in localised areas of stream. Operational: neutral.

			negative impact			
Well Stream	Lower local importance	Water quality – release of sediments and pollution during construction. Temporary loss of habitat during over pumping / diversion.	Loss of naturalness (replacement of natural bed with U channel). .	Loss of instream habitat. Dry bed during over pumping / diversion	Water quality protection measures. Naturalised features to be re-instated. Similar connectivity (culvert replacement). Translocation of bed material to new U channel. Translocation of any eel to suitable habitat. ECoW monitoring.	Long-term slight negative in a localised extent approximately 100m of locally important stream. Reversible. Offset by overall gain in higher quality stream habitat at a scheme level.
Western Tributary	Local Importance (Higher Value).	Water quality – release of sediments and pollution during construction. Loss of habitat	-	Sedimentation, nutrient loading, loss of habitat, loss of aquatic species	Water quality protection measures during construction. Stream realignment to include natural features. Habitat, fauna and flora translocation. ECoW monitoring. Water quality improvements from ponds and flooding.	Slight positive residual impact. Improved water quality and aquatic/fish habitat
Victoria Stream	Local Importance (Higher Value).	Water quality – release of sediments and pollution during construction. Loss of habitat	-	Sedimentation, nutrient loading, loss of habitat, loss of aquatic species	Water quality protection measures during construction. Stream realignment to include natural features. Habitat, fauna and flora translocation. ECoW monitoring. Water quality improvements from ponds and flooding.	Slight positive residual impact. Improved water quality and aquatic/fish habitat
Flora						
Dactylorhiza sp.	Regional	Loss of habitat, loss of plants	Permanent loss of habitat	Loss of habitat, loss of plants	Avoidance of orchid areas. Use of protective mats to protect vegetation. Work during dry periods in prevent compaction. Translocation of plants if needed by specialist.	Small loss of habitat to embankment. Slight negative.
Invasives species – Japanese Knotweed	None	Spread of invasive species	Spread of invasive species	Spread of INNS	Biosecurity measures	No residual effects anticipated
Mammals						
Badger	Regional Importance.	Loss of foraging habitat; trapping in trenches	No impact anticipated	Trapping of individuals	Excavation protection measures.	No residual effects anticipated
Otter	Regional Importance.	Loss of foraging opportunities; trapping	Improved water quality; increased foraging opportunities	Trapping of individuals; reduced foraging	Excavation protection measures; Water quality protection measures Otter passability ledges	No residual effects anticipated / slight positive
Bats	Local Importance (Higher)	Loss of linear features	Increased foraging habitat	Temporary displacement	Lighting control during construction. Retention of linear features.	No residual effects anticipated
Birds						

Marine birds / Waders & Waterbirds	Local Importance (Higher Value).	Temporary disturbance	None anticipated	Temporary displacement	Noise avoidance measures	Potentially improved habitat for waders and waterbirds
Passerines all	Local Importance (Higher Value).	Temporary disturbance	None anticipated	Temporary displacement	Vegetation management outside of bird nesting season	No residual effects anticipated
Sedge Warbler	Local Importance (Higher Value).	Loss of habitat; temporary disturbance	None anticipated	Temporary displacement	Vegetation management outside of bird nesting season	No residual effects anticipated
Snipe	National / Regional	Loss of wintering habitat; temporary disturbance	None anticipated	Short-term displacement	Vegetation management outside of bird nesting season and prior to arrival of winter migrants. Preservation of intact areas of reed habitat.	Potentially improved habitat for Snipe
Fish & Amphibians						
Flounder	Local Importance (Higher Value).	Temporary loss of habitat	Increased water quality; increased connectivity	Loss of habitat; loss of individuals	Water quality protection measures; fish translocation measures during construction.	Potentially improved water quality; improved habitat
Eel	National	Temporary loss of instream habitat	Increased water quality; increased connectivity	Loss of habitat; loss of individuals; loss of nursery	Water quality protection measures; fish translocation measures; Nursery protection measures; increased nursery habitat Eel passability measures	Potentially improved water quality; improved habitat; improved connectivity
Amphibians	Local Importance (Higher)	Temporary loss of habitat	Increased water quality; increased habitat potential	Loss of habitat; loss of individuals	Water quality protection measures; translocation as required.	Temporary Slight negative during construction. Long term Slight positive during operation. Potentially improved water quality; improved quality and quantity of habitat, improved connectivity.
Features of local interest identified in the Local Area Plan	Allender's Field	n/a outside area of works	Enhancement of biodiversity wider area	n/a	n/a	Slight positive.

Land and Soil

This chapter comprised an assessment of the likely significant effects of the proposed development with respect to land, geology, and soil.

Bedrock Geology

Bedrock geology of the site is composed of Upper Carboniferous (Namurian) sandstone, siltstone, and mudstone, with grey siltstone and sandstone present in sections along the coastline and inland towards the east. The Carboniferous bedrock transitionally overlies the progradation slope system (Gull Island Formation) which forms part of the Clare Basin.

Quaternary Sediments

Quaternary sediments within the study area are dominated by Namurian sandstone and shale till, blanket peat and made ground. Marine sediments underlie Kilkee Beach and tidal marsh silts and clays are present around parts of the Shannon Estuary southeast of Kilkee. There is significant surface bedrock along the northern and western coastline. In general, subsoil permeability is low across the site and study area.

Soils

Soils across the study area belong to the Surface water Gleys, Groundwater Gleys, Brown Earths, Brown Podzolics, or Luvisols Great Group listed in decreasing frequency.

Karst Features

No karst features were identified within the 2km study area during the desktop study. No geohazards were recorded during the desktop study. Kilkee is an area of relatively low radon risk and the majority of the works will take place in areas of low radon risk (1 in 20 homes is likely to have radon) with some areas of medium risk (1 in 10 homes is likely to have radon).

Site Investigation

A site investigation was undertaken by OCB Geotechnical between 17th of November 2021 and 3rd of June 2022 to provide geotechnical and environmental information that would inform the design and construction of a proposed flood relief scheme. Typical ground strata observed across trial pits in the locations of proposed flood measures was highly variable. Groundwater was struck at a depth ranging between 0 – 2.10m with an average of 1.38m. Grey and orange mottling was evident across the majority of trial pits indicating waterlogging and anaerobic conditions for significant parts of the year. Soils textures varied and a high clay content is reflected in this range which was recorded over 6 samples. Flood relief measures are proposed in soils that range from dry to very wet, neutral to slightly basic pH, and high clay content with low volumes of silt, sand, and small gravels, which increase with depth. The site investigation found no evidence of contamination across the area of study. Made ground was encountered in eleven of the trial pits.

Land fill and Quarries

The Lisdeen Waste Recovery facility (Registration number W0170-01) is located southeast of Kilkee. The site is a former landfill that now accommodates a domestic waste bring facility. During the desktop survey, what appears to be a sand and gravel quarry southwest of Kilkee and south of Fohagh Point was identified using Google Maps. However, there is no record of a quarry in this location in the GSI database or on the historical 6-inch map.

Geological Heritage

Fohagh Point is a geological heritage site of National Importance and may be proposed as a Natural Heritage Area (NHA) by the Geological Survey Ireland (GSI). The proposed development area does not fall within the site and proposed works are not anticipated to have an impact on the integrity or visual amenity of the site's geology.

Predicted impacts from the proposed development will be from the import and export of soil, contamination, soil exposure, erosion, instability, and soil compaction. Temporary access roads will accompany the site compounds and will require the import of stone or gravel material (4987m³). Due to the temporary nature of the site compounds, impacts on soil and geology are expected

Changes to the soil and geological environment as a result of the scheme will arise predominantly through the excavation and subsequent infilling (12,714m³). Due to the shallow excavation depths, effects on subsoils are not anticipated to be significant.

It is estimated that 20,007m³ of engineered clay material will be required across the Atlantic Stream and Victoria/Well Stream systems for the construction of the embankments and regrading of storage areas.

Accidental spillages may result in localised contamination of soils, geology, and groundwater underlying the site, should contaminants migrate through the subsoils.

The construction of embankments will require the use of impermeable clay and a reinforced geogrid for stability. This will ultimately change the soil environment in these areas to a hard-standing area, with the consequential change in rainwater soakage and storage. There will be an initial flush of loose material during the next heavy rainfall event following construction of the earthen embankments. This will cause an increase in suspended solids in the surface water run-off from the embankment sites.

There will be several permanent diversions and realignments of watercourses. A tributary of the Atlantic Stream will be diverted into a storage area bounded by a new embankment, south of Kilkee Bay Hotel. The morphology of the stream will be changed from a straight channel to a meandering one. A western tributary of the Victoria Stream will be diverted through a flood storage area and the Victoria Stream will be diverted through an open space within a residential area.

The Atlantic Stream will be diverted into a storage area bordered by an embankment. During a flood event, the stream will burst from the open channel and flood waters will be retained by the embankment. This mechanism has also been employed on the Victoria Stream and its western tributary.

A Construction Environmental Management Plan (CEMP) will be prepared for the proposed development, it outlined the site-specific mitigation measures. These include a Soil Management Programme for the operations at the site, the routes of temporary pathways and roads to minimise soils compaction, and temporary storage and refuelling areas and designated areas for pouring concrete.

Following the implementation of the proposed mitigation measures, the residual effects of the proposed development on land and soil will be minimised. Therefore, the effects during the construction phase will be short-term, imperceptible, neutral.

During operation period mitigation measures include retention of silt fences until the soil on the banks has stabilised and grass has rooted. The ECoW and IFI will determine when silt fences can be removed. The design of the scheme has been such that there are no predicted effects on land and soil during the operational phase of the development. Overall, the effects of the proposed development during operation will be permanent, imperceptible, neutral.

Following the implementation of the proposed mitigation measures, the residual effects of the proposed development on land and soil will be minimised. Therefore, the effects during the construction phase will be short-term, imperceptible, neutral.

The design of the scheme has been such that there are no predicted effects on land and soils during the operational phase of the development. Overall, the effects of the proposed development during operation will be permanent, imperceptible, neutral.

Water – Surface and Groundwater

This chapter comprised an assessment of the likely significant effects of the proposed development with respect to surface and ground water.

Surface Water

The proposed site is adjacent to Kilkee Bay, with two watercourses, the Atlantic and Victoria Streams, flowing through the town and into the bay. Both streams flow roughly from a southeast to northwest direction and have a number of tributaries and drainage channels which contribute to the flow through the area. The proposed flood defences are in close proximity to the Kilkee Reefs SAC. The reefs are subjected to the great strength of Atlantic breaking waves from the west. Moore Bay provides some protection from tidal currents

The Atlantic Stream is located on the northern side of Kilkee. The river flows for approx. 2.4km before discharging into Kilkee Bay and is heavily urbanised throughout much of the scheme area. The stream is

approx. 2.5m wide and 0.2-0.3m deep, comprising slow-flowing glide and occasional pool with no riffle areas.

The Victoria Stream rises south of Kilkee and flows for approximately 1.9 km north before draining into Kilkee Bay. The Victoria Stream is heavily urbanised throughout much of the study area. As with the Atlantic Stream, historically the watercourse has been extensively straightened and deepened. The channel is on average approx. 1.5m wide and 0.1-0.2m water depth (from bottom of channel to top of the water) with a profile comprising very slow-flowing glide and pool.

Groundwater

The Kilrush groundwater body (IE_SH_G_123) underlies the site. The Kilrush groundwater body has been characterised as Good status for 2016-2021 and is Not at Risk. The Miltown Malbay groundwater body (IE_SH_G_167) is north of Kilkee, and its southern extremity is immediately adjacent to the Atlantic Stream Outfall. It is also at Good status and Not at Risk. Four wells mapped by GSI fall within 1km of the site. To the west adjacent to the site are two wells used for agricultural and domestic purposes, of poor yield. To the south approximately 500m away is another agricultural/domestic use well with an average yield of 6.5 m³/day. To the east adjacent to the site is well with no specified use and an average yield of 6.5 m³/day

The surface water bodies around Kilkee are of Medium Importance, due to nationally important amenity sites for a wide range of leisure activities. Regarding hydrogeology, the rating is also medium, mainly due to [the Locally Important Aquifer](#).

The Atlantic and Victoria Streams as specified above are both within the KILKEE_LOWER_010 WFD sub-basin. According to the WFD 2016-2021 assessment, the waterbody has a Moderate status. This means that overall biological, physico-chemical, hydromorphological and pollutants do not support a good ecological status. The risk status of the waterbody is under review. Additionally Kilkee has been recognised as a Blue Flag beach.

During construction the water environment is at risk from contaminated water entering the waterbody (either surface or groundwater), or likely changes to watercourse morphology and flow patterns, impacts will result from:

- excavation of material and import of fill material will increase the potential for suspended solids entering surface water runoff from the site.
- localised accidental pollution incidences from spillages or leakages and run off from concrete.
- Surface water run-off during the construction phase could contain increased silt levels because of the exposure of bare ground and presence of imported and excavated soil stockpile.
- Groundwater pumping (dewatering) in construction serves to regulate groundwater levels in order to facilitate safe and dry working conditions during excavation and to alleviate groundwater pressures on subterranean structures. This has the potential to temporarily alter the groundwater level locally and affect water quality.
- Instream works from installation of culverts concrete u-channel, defence walls, manholes and embankments.
- Modifications to surface water drainage network including the installation of two pump stations and sub-surface storage, 450mm carrier drain under Well Road to intercept existing surface water outfall, 200 m of 225 Ø sewer to deal with spills from existing networks during flood events.
- Changes to the hydromorphology of Atlantic stream from wall and embankment construction and increase in sedimentation and run off entering the watercourse.

Mitigation measures included in the preliminary Construction Environmental Management Plan (CEMP), include proper planning of works, site compound construction, storage management and excavation plans plus the measure to avoid and manage accidental spills and leaks.

Measures are also specified to reduce the potential impacts from instream works impacting on water quality. Additionally, monitoring is required ensure that Kilkee does not become vulnerable to floods during construction and by the implementation of temporary flood barriers at exposed excavations use of protective and biodegradable matting or geotextiles on the banks and the sowing of grass seed on bare soil.

Other measures include chisel ploughing to loosen the soil that will be compacted during construction and promote seed growth; this will increase infiltration rates, reducing runoff rates from the site. Natural bed material will be used to cover the base of the proposed precast u-channel. Where possible, this material will come from the existing Well Stream bed material, which will be retained and stored for this purpose. It will be crucial to maintain the same gradient of the Well Stream, to allow deposition of natural material in the new stream bed.

Provided that mitigation measures are followed closely during the construction phase of the scheme, the residual impact to surface water and groundwater bodies will be reduced to temporary, slight negative to imperceptible.

During the operation phase of the project, considering the design considerations benefitting surface and groundwater bodies, the residual impact will be long-term and slight, with a neutral impact on quality, i.e., an effect which causes noticeable changes to the character of the environment without affecting its sensitivities.

Material Assets

Material assets, as described in the EPA Guidelines, covers three separate aspects: roads, traffic, and transport, built services or utilities, and waste management. These three aspects were assessed in this chapter.

Roads, traffic, and transport

The N67 is the main road in the area and passes through the town and connects Killimer Ferry Terminal with Galway. The R487 feeds into the town from the south at Carrigaholt Road, running to the southwest tip of County Clare at Loophead Lighthouse. The N68 connects Ennis to Kilrush and the N67.

Within Kilkee, the Strand Line on the beach front is the terminus of the R487, with O'Curry Street running parallel to the rear in a northeast/southwest direction. Kilkee town centre is semicircular in shape. Moore Bay is to the East with roads such as Chapel Street, Corry Lane, Railway Road and Erin Street. Circular Road encloses the town centre and is bisected by the N67. Other minor roads in the town radiate outwards from Circular Road and contain residential housing estates. During the summer months, the tourist population in Kilkee is much larger than the local population, putting significant pressure on the town's road infrastructure. Throughout Kilkee, traffic congestion and parking issues are caused by the high volume of cars. However, it is essential to remember that during most of the year, the majority of the traffic is local. The town's Traffic Management Plan addresses both seasonal and daily traffic management needs, by implementing alternative traffic routes.

Local traffic will be impacted by the construction traffic travelling to and from the site. Temporary road closures and diversions will also likely be required during construction. Communication of these measures will be developed for the scheme.

For works to Victoria Stream there will be an estimated total of 2,674 truck movements during the construction phase. These are required for; all material to be removed for construction, concrete deliveries, incoming engineering fill for embankment construction, and stone deliveries and removal. These truck movements will take place across the construction phase, working out at approximately 7 truck movements per day. This will require temporary road closures and temporary restrictions or disruptions to access for these properties. A temporary traffic management system will be put into place.

There will be an estimated 631 truck movements associated with the Atlantic Stream construction phase. This includes incoming engineering fill and material removed for construction of the embankments, upgrades to the ESB access road, and stone deliveries and removal, working out at approximately 2 truck movements per day. The works will require a road diversion for the duration of the works and closure of part of the promenade. This should extend to ensure that all seating areas immediately below and beside the works area are temporarily closed off for the duration of the works.

The construction management plan will take into account construction vehicles and mitigate any issues with vehicles on public roads, minimising the impacts to the public road network during construction stage. Appropriate phasing of construction works will enable access to the properties in a safe and controlled manner. Once the proposed mitigation measures are put in place, the residual impact to roads, traffic and transport during construction would be temporary, negligible.

Built services or utilities,

Underground utilities will be found in multiple locations around the site, and already serve the existing town of Kilkee. While deep excavations are generally not required, impacts to utilities will occur during the construction stage. Both the UE Pumping Station and the ESB sub-station are at risk of flooding in the 1% AEP.

For works to Victoria Stream there will be periodic shutoffs of water services and foul services at Crescent Place. The sequencing of these works will be agreed between Uisce Éireann, Clare County Council and the property owners. During construction, foul water will be redirected to the pumping station to the rear of Victoria Park.

Existing overflow culverts from the Well Stream flow into the Victoria Stream at Victoria Park and pass directly under the ESB sub-station. These will be decommissioned as part of the scheme.

Part demolition of the existing outfall manhole on the Atlantic Stream Outfall will occur and elevation of the manhole so that it sits above the existing promenade structure. The existing Atlantic Stream culvert will remain in place where a flap valve will be installed above the high-water mark. No foreshore licence is needed as no new culvert will be installed.

Mitigation measures discussed in the previous section will reduce the environmental impact of the proposed development however, there are some impacts that cannot be avoided in the short term, such as short-term disruptions to water main, foul sewer, or ESB stoppages for several hours during the connection of services. Residents will receive notices if stoppages are foreseen. There are no additional impacts expected once services are introduced. The overall residual impact during the construction phase from disruption of services has been assessed as temporary, negligible.

Waste management

There is a Bring Bank located in Kilkee Town Centre Car Park, which receives small household recyclables, e.g., plastic bottles, aluminium cans, glass bottles/jars, and textiles. This facility is not located within the Flood Zone A or B extents. The nearest recycling centre and transfer station is in Lisdeen on the N67 between Kilkee and Kilrush.

There will be excavations and construction waste as a result of excavation for the proposed development.

For works to Victoria Stream there will be 7474m³ of construction waste and for the Atlantic Stream there will be 1225m³ of construction waste. The waste will be removed to an approved waste soil recovery facility. A portion of the material will be reused as fill where required. Alternatively, the contractor can reuse this material on another site as a by-product while adhering to Article 27 of the EC (Waste Directive) Regulations (2011). This would further reduce the volume of waste generated during excavation.

A Resource Waste Management Plan (RWMP) will be produced by the appointed contractor to help manage, reduce, and dispose of waste arising during the construction phase. The RWMP will outline waste reduction techniques, guidelines to be followed, and the waste disposal streams to be used during the development. All construction waste will be segregated and removed to an approved location.

Once the proposed development is operational, waste will collect at the debris screen upstream of the culvert headwall at Waterworld. This will relieve pressure on the culvert and reduce blockage, therefore benefiting the wider area in times of flooding. The debris screen is designed to do this, with waste to be removed upon each inspection. The operational impact on waste will therefore be long-term, slight, positive.

Cultural Heritage

The cultural heritage chapter has assessed terrestrial and underwater archaeological impact assessment of the proposed scheme. The assessment combined desk-based research and the results of a site survey. The survey included a visual inspection, walk over survey along with a wading, metal detection survey. This research identified areas of cultural significance including both archaeology and architectural heritage which may be impacted by the proposed development.

Recorded Archaeological Sites

Record of Monuments and Places (RMPs) - Section 12 (1) of the National Monuments Act 1994 made provision for the establishment and maintenance of a Record of Monuments & Places (RMP). Under this

Act, each site recorded in the Record of Monuments and Places is granted statutory protection. When the owner or occupier of a property, or any other person proposes to carry out, or to cause, or to permit the carrying out of any work at or in relation to a recorded archaeological monument they are required to give notice in writing to the Minister for Housing, Local Government and Heritage 2 months before commencing that work.

There are 17 monuments listed in the Record of Monuments and Places within the Scheme Area. The sites within the boundary primarily date to the Early and Late Medieval, though standing stones (CL056-102) are commonly believed to be Bronze Age in date and the megalithic structure (CL056-041001) may be Neolithic.

A holy well (CL056-142) is located adjacent to Well Stream Tributary, though no works are to take place within the Zone of Notification (ZON) for this site.

National Monuments - No National Monuments are located within the Scheme Area

Sites with Preservation Orders - There are no sites with preservation orders located within the Scheme Area.

Architectural Heritage

Record of Protected Structures -The County Development Plan 2023-2029 lists 26 protected structures within the study area for the scheme None of these structures are within the footprint of the proposed works, though the embankment behind Kilkee Bay Hotel will sit adjacent to the railway line associated with the Kilkee Railway Station (RPS 403; NIAH 20301006). The West Clare Railway Structures Survey (2005) describes the Kilkee Station as in 'good condition much original features remain such as awning etc'.

Architectural Conservation Area (ACA) -Clare County Council have designated a significant portion of Kilkee town as an ACA. The County Development Plan notes that Kilkee has retained its unique character as a 19th century bathing place. The town contained several protected structures and many fine buildings. A large area of the town centre is designated as an ACA, recognising the historical and architectural importance of the townscape and layout of the core area.

Undesignated Elements of Built Heritage -The Clare Coastal Architectural Heritage Survey (2008) discusses the bathing places in Kilkee related to the 19th-century development of the coastline. There are, however, no such structures recorded as remaining in the town. Other features noted included the protected structures of the East End Boathouse (RPS 511), the Band Stand (RPS 062), the Seawall and Promenade at Strandline (RPS 060), the Marine Parade slipway (RPS 578), and the Sea Baths (RPS 579). Added to this list are a pier and slipway, a lifeguard hut, sea baths on the western side of the strand, and a fishpond, also located on the northwest side of Moore Bay. None of these are located within areas of proposed works. A bath house is noted on the 1st edition OSi map but this seems to have been incorporated into 'Cliff Cottage' on the 2nd edition OSi map.

The Clare Town & Village Photographic Survey (2009) included 317 photographs of buildings throughout the town of Kilkee. These formed the streetscapes of the Promenade, 'Jimmy's Hill', O'Curry Street, Chapel Street, O'Connell Street, Erin Street, Market Square, Atlantic View, and Gratten Street.

Survey result - Fifteen features of cultural heritage significance were identified during the survey, including revetment walls, culverts and a bridge. There are no recorded archaeological monuments or protected architectural structures within the proposed works areas, though two lie in close proximity: St. Senan's Well (CL056-042) and Lisnaleagaun Ringfort (CL056-044). A portion of the scheme lies within the Architecture Conservation Area for Kilkee town. However, there are no NIAH or protected structures in the immediate vicinity of the proposed works.

Archaeology

The proposed works will not directly or indirectly impact archaeological features included in the RMP or SMR. The possible earthworks (CHS14) identified in Area 5, along the Western Tributary, are not confirmed archaeological monuments and may represent modern-historic or indeed modern interventions. However, if these features are archaeological, then the proposed excavation works could, without the implementation of mitigation measures, result in a negative significant and permanent impact.

Ground disturbance works at the Western Tributary, Carrigaholt Road field, the Kilkee Bay Hotel and the Sandpark Mobile Park have the potential to uncover and directly impact on unrecorded subsurface features, deposits, structures and objects of archaeological potential. The significance of such impacts

cannot be accurately assessed based on existing information because these areas comprise greenfield sites with no indication of archaeological remains.

Excavation works in-stream and along stream banks including, but not limited to, watercourse widening and deepening and foundation preparations for embankments and walls, have the potential to directly impact unrecorded buried archaeological material. The significance of such impacts cannot be accurately assessed based on existing information because these areas comprise streambeds with no indication of archaeological remains.

Architectural Heritage

The proposed scheme will not impact directly on architectural heritage features within the Architectural Conservation Area or features included in the Record of Protected Structures and the National Inventory of Architectural Heritage.

Direct impacts are anticipated on one non-designated architectural heritage site (CHS15) identified during the survey. Although very poorly preserved the stone revetment walls along Well Stream contribute to the historic character of the waterway. Their removal, along c. 240m of the stream to facilitate the installation of a precast u-channel,

Potential indirect impacts are anticipated at the unnamed stone bridge (CHS2) in Atlantic Stream, stone culverts in Well Stream and the West Clare Railway Line (CHS8). There may be a potential for accidental damage to these features during the construction phase due to the close proximity of the construction works. The replacement of the existing debris screen behind Waterworld is located c. 100m west of the unnamed stone bridge (CHS2) and the primary national road through Kilkee, N67, traverses the bridge, likely necessitating travel of site equipment across the structure. The closest stone culvert in West Stream is located c. 40m northwest to the installation of the precast u-channel. The embankment and excavation works in the area of Kilkee Bay Hotel (Area 9) is directly adjacent to and beneath the West Clare Railway line (CHS8), an area of concentrated activity between its opening in 1892 and its closing in 1960.

A number of mitigation measures are proposed in advance of the Construction Phase. Construction shall not begin until these mitigation measures have been fully implemented and adhered to.

Where terrain proves suitable, a programme of archaeological geophysics shall be undertaken under licence from the National Monuments Service focusing on greenfield areas. Based on the results of the geophysical survey, a programme of licenced archaeological testing shall be undertaken in advance of the Construction Phase. The results of archaeological testing will inform on the requirement for additional archaeological mitigation measures which may include avoidance, archaeological excavation, or archaeological monitoring.

A programme of licenced archaeological monitoring shall be carried out at Construction Stage. The programme shall include archaeological monitoring of all vegetation clearance along the watercourses and greenfields. Any additional unrecorded cultural heritage features such as stone revetments or culverts currently obscured by overgrowth shall be fully recorded. Any ground disturbance works in streambeds and along banks shall be archaeologically monitored. The level of archaeological monitoring of excavation works within greenfields will be determined based on the results of the geophysical surveys and archaeological testing.

Following the vegetation clearance at Well Stream, the stone revetment walls (CHS15) shall be fully recorded with photography, measurements and drawings where appropriate along with any other features revealed by the clearance works in the streams.

Toolbox talks shall be given to make workers aware of features within the streams and along the stream banks as well as the West Clare Railway line (CHS8) which are located close to proposed works.

Table 3: Summary of Impacts on Cultural Heritage Sites

Location	Townland	CHS	Potential Cultural Heritage Site	Description of Potential Impact	Potential Impact Type	Potential Impact level	Proposed Mitigation	Residual Impact
Area 1 Well Stream	Kilkee Lower and Kilkee Upper	CHS15	Stone revetment walls	Removal of stone wall	Direct Negative	Slight Permanent	Archaeological monitoring of and full detailed recording after vegetation clearance	Slight
Area 1 Well Stream	Kilkee Lower and Kilkee Upper	-	Streambed: possible sub-sediment artefacts or unlocated/unrecorded wrecks	Excavation of streambed and banks	Direct Negative	Moderate to Profound Permanent	Archaeological monitoring	Slight
Area 1 Well Stream	Kilkee Lower and Kilkee Upper	-	Stone culverts to the northwest of works are located in close proximity to construction work	Installation of precast u-channel	Indirect Negative	Moderate Permanent	Archaeological monitoring and Toolbox talk	Imperceptible
Area 2 Victoria Stream	Kilkee Lower, Dough, and Ballyonan or Doonaghboy	-	Streambed: possible sub-sediment artefacts or unlocated/unrecorded wrecks	Excavation of streambed and banks	Direct Negative	Moderate to profound Permanent	Archaeological monitoring of vegetation clearance and excavation works	Slight
Areas 3–5 Greenfield Areas adjacent to Western Tributary	Kilkee Lower and Ballyonan or Doonaghboy	-	Possible unrecorded subsurface archaeological features	Excavation including topsoil removal	Direct Negative	Moderate to Profound Permanent	Archaeological monitoring of vegetation clearance; Geophysical survey and pending results follow up testing or monitoring	Slight
Area 5 Western Tributary	Ballyonan or Doonaghboy	CHS14	Possible earthworks	Excavation including topsoil removal	Direct Negative	Significant Permanent	Archaeological monitoring of vegetation clearance; Geophysical survey and pending results follow up testing or monitoring	Slight
Areas 6 & 7 Greenfield Area adjacent to Church Road	Dough and Ballyonan or Doonaghboy	-	Possible unrecorded subsurface archaeological features	Excavation including topsoil removal	Direct Negative	Moderate to Profound Permanent	Archaeological monitoring of vegetation clearance; Geophysical survey and pending results follow up testing or monitoring	Slight

Area 9 Kilkee Bay Hotel	Dough	CHS8	West Clare Railway line	Excavation including topsoil removal	Indirect Negative	Slight Permanent	Archaeological monitoring and Toolbox talk	Imperceptible
Area 9 Kilkee Bay Hotel	Dough	CHS8	Possible unrecorded subsurface archaeological features related to the West Clare Railway line	Excavation including topsoil removal	Direct Negative	Significant Direct Permanent	Archaeological monitoring of vegetation clearance; Geophysical survey and pending results follow up testing or monitoring	Slight
Area 10 Greenfield Area adjacent to Sandpark Mobile Park	Dough	N/A	Possible unrecorded subsurface archaeological features	Excavation including topsoil removal	Direct Negative	Moderate to profound Permanent	Archaeological monitoring of vegetation clearance; Geophysical survey and pending results follow up testing or monitoring	Slight
Areas 10 & 11 Atlantic Stream	Dough	-	Streambed: possible sub-sediment artefacts or unlocated/unrecorded wrecks	Excavation including topsoil removal and replacement of debris screen	Direct Negative	Moderate to profound Permanent	Archaeological monitoring of vegetation clearance and excavation works	Slight
Areas 10 & 11 Atlantic Stream	Dough	CHS2	The stone bridge is located in close proximity to construction work	Replacement of debris screen	Indirect Negative	Moderate Indirect Permanent	Archaeological monitoring and Toolbox talk	Imperceptible
Do Nothing Scenario	-	-	<i>Potential unrecorded archaeological heritage near streams</i>	<i>Flooding creating hydrological impacts such as scouring and undercutting</i>	<i>Indirect Negative</i>	<i>Slight Permanent</i>	<i>Overtime, impacts can build creating more long-term and intensive damage</i>	<i>Moderate</i>

Landscape and Visual

The potential significant effects of the proposed development on landscape and visual amenity as assessed. Kilkee is a gently sloping coastal town and a main settlement of North Loop Head Peninsula LCA. Kilkee includes a concentration of holiday developments in the area, surrounded by extensive farmland characterized by extremely distinctive ladder fields, with a sense of a rural detached atmosphere of unspoiled qualities.

The town, with its retained unique character as a 19th Century bathing attraction, contains several protected structures, relatively grouped in proximity to Moore Bay. Where the settlement character is substituted by farmland in Kilkee's environs, several National Monuments are present, such as structures, ringforts and standing stones.

The proposed development is generally sited away from protected structures (RPS) and national monuments (NMS), separated by at least 100 metres. Five structures north of the Well Stream and north of the reprofiling works of the road junctions at Marine Parade are located under 100 metres, at a range from approximately 35m to 95m, RPS no. 481 (Church at Geraldine Place), NMS no. CL056-042 (St Senan's Well), RPS no. 397 (8 Marine Parade), RPS no. 578 (Slipway) and RPS no. 572 (Bandstand).

The Kilkee Reefs Special Area of Conservation (SAC) is an important element in the landscape and seascape. The proposed development is centred on the existing streams of Kilkee but has the potential to impact this SAC and water quality. Potential impacts on this SAC are described in Chapter 7 of the EIAR.

The receiving landscape of the existing Atlantic and the Victoria Stream at Kilkee is urban and includes different stream defences according to location and land use. The existing streams flow through ditches, channels, and culverts.

There are two designated scenic routes in the CDP within Kilkee. The closest is Scenic Route 30, which runs along the coast road into Kilkee from the west, just north of where the Victoria Stream enters Moore Bay. The second is Scenic Route 33 to the northeast of Kilkee, approx. 2.5km from the centre of the town. Due to the distance and intervening topography, the proposed development is unlikely to be visible from Scenic Route 33. Neither of these scenic routes are likely to be impacted by the proposed development. The seascapes of County Clare are a crucial element of the County's history, identity, and culture. Kilkee seascape is identified as 'North Loop Head Peninsula' Seascape Character Area (SCA). Residences in the area enjoy views over the seascape, Moore Bay, and surrounding countryside. It is an objective of Clare County Council that it be demonstrated that every effort has been made to visually integrate any proposed development within the SCA.

Eight (8 No.) verified photomontages have been produced showing the expected visual change to specific views as a result of the proposed development. In photomontages where the proposed development is not clearly discernible, an additional image is included where a wireline represents the outline of the extent of proposed defences. This provides a sense of the degree of screening and magnitude of change to these views as a result of the proposed development. The compendium of photomontages is presented in Appendix G as a series of images under the title Verified Photomontages and CGI's.

Landscape character

The landscape of the environs around the Atlantic Stream is not deemed sensitive, with no designated or protected landscapes located near the existing watercourse. The nearest designated monuments (Souterrain – NMS no. CL056-044002 and Ringfort – NMS no. CL056-044-) are located approximately 138m from the proposed development at its closest point. The proposed works are very localised and therefore, it is unlikely that the proposed development will have any impacts on these monuments due to distance. The landscape sensitivity is deemed Low. The predicted landscape impact of the proposed development at the Atlantic Stream are not significant during both construction and operational phase, due to the small scale and strategic siting of the proposed works.

Proposals to the Victoria Stream are divided between the Well Stream and Tributary, Victoria Court, the Victoria Stream, and Western Tributary. The receiving landscape is relatively urban, with sections located in greenfield sites and town edges. The landscape of the environs around Victoria Stream is also of Low sensitivity, with few designated monuments in a landscape character that exhibits the capacity for change. The proposals in this area include new embankments, diverted open channels, new marginal, wildflower meadow and native tree planting, leaky dams, new culvert, and reconstructed boundary walls. The

existing open channel at the Victoria Stream and Western Tributary will become obsolete and will be backfilled in its current location. The soft proposals in these fields will enhance the landscape and provide flood defences to the built environs. The predicted landscape impact of the proposed development at the Victoria Stream are also not significant during both construction and operational phase, due to the small scale and strategic localised siting of the proposed works.

Visual Amenity

The visual impact assessment has considered the entire proposal development for visual receptors in scenic routes and SCA, due to views changing along each route or area. However, the closest proposed development area has been considered for residential, town centre, tourism, and community receptor groups, as the proposed development is likely to not be perceived in distances higher than 300m due to scale and the intervening buildings and vegetation.

Overall no significant impacts to the landscape and visual amenity were identified, therefore no mitigation measures are proposed for the proposed development. The residual impacts remain as per the initial assessment.

Interactions

Interactions occur when a predicted impact causes interaction or dependency with other environmental aspects. This section assessed the interactions as positive, negative, or neutral. The interactions of environmental effects were considered throughout the [EIA process](#) for the proposed [development](#). Where an interaction was identified it was marked with a 'Y' (i.e. Yes) as shown in Table 3 below and was considered further. Where necessary adjustments were made to the design of the layout to mitigate impacts arising from these interactions.

Table 4: Summary of scheme interactions

	Air Quality and Dust	Climate	Noise and Vibration	Population and Human Health	Biodiversity	Land and Soil	Water	Cultural Heritage
Population and Human Health	Y		Y					
Biodiversity	Y							
Land and Soil	Y	Y			Y			
Water	Y			Y	Y	Y		
Material Assets	Y			Y		Y	Y	
Cultural Heritage	Y							
LVIA	Y			Y	Y			Y

In terms of residual impact resulting from interactions, on implementation of mitigation measure these are likely to be:

- Slight and temporary during the construction phase and
- Negligible during operational phase.

Cumulative Impacts and Human Health

The cumulative effects of the proposed development in combination with other relevant existing, planned and permitted projects were assessed to determine whether these would give rise to significant effects on the environment.

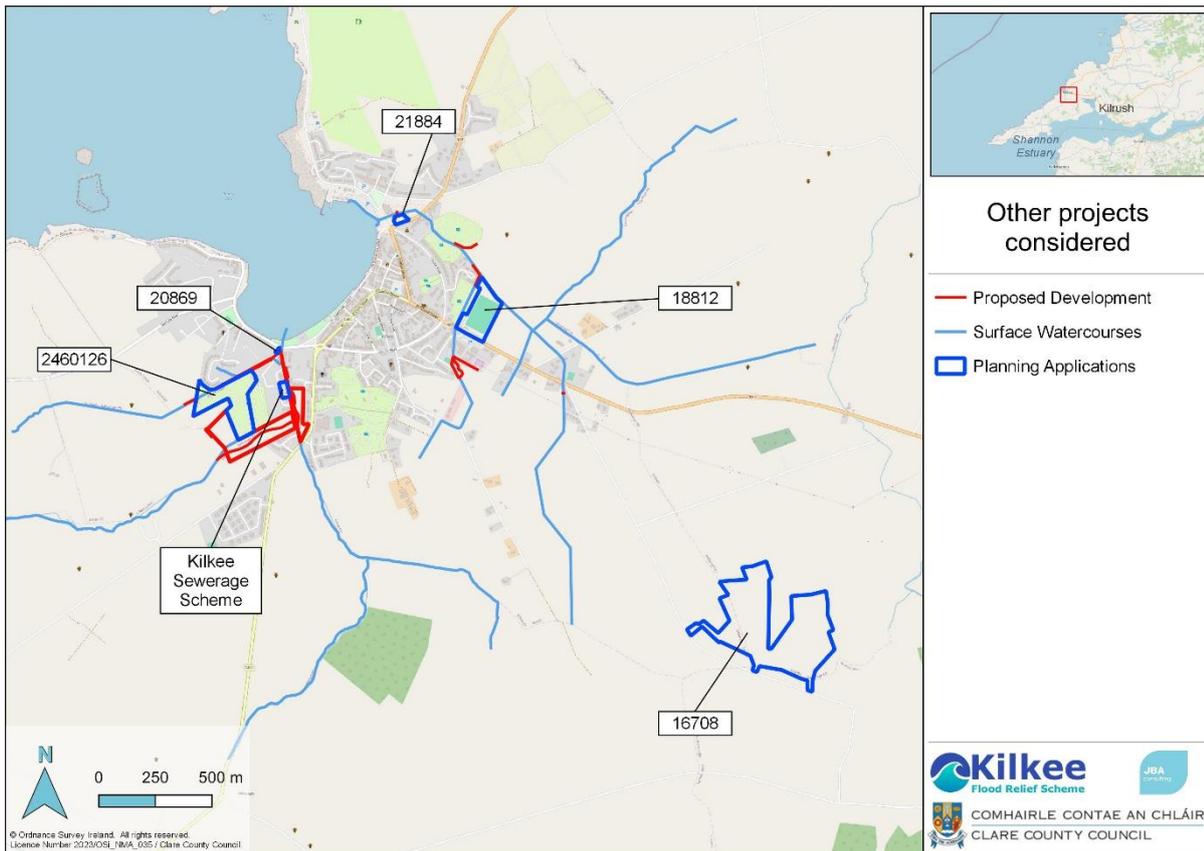


Figure 6: Location of other projects considered for Cumulative Impacts

The following projects (and their location in proximity to the proposed development) were considered when assessing the potential for cumulative impacts:

- Planning file Ref 2460002 - Kilkee Sewerage Scheme Victoria Park, Kilkee, Co. Clare
- Planning file Ref 16708 – Solar Farm, Dough Lisdeen, Termon West, Kilkee
- Planning file Ref 18812 – Extension to Sports Club, Kilrush Road, Dough, Kilkee
- Planning file Ref 20869 - Extension to residential property, Well Road, Marine Parade, West End, Kilkee
- Planning file Ref 21884 - Kilkee Sub Aqua Club, Pound Street, Kilkee Co Clare
- Planning file Ref 2460126 – Mixed development (2 residential properties, electrical outbuilding) Well Road, Kilkee Lower, Kilkee Co Clare

The potential for cumulative impacts of these projects on environmental aspects was assessed and is summarised below:

Biodiversity

Two projects have the potential for cumulative impacts on biodiversity.

Planning Ref. 21884 - The new water sports facility in Kilkee is near the works on the Atlantic Stream. The facility will link into the existing water drainage network. There may be an overlap in disturbance between the construction phases of both projects. However, the new water sports facility has screened out impact on birds within the NIS, as has this project, given the distance to the SPAs and lack of bird activity in the works area. Locally important non-QI populations are similarly unlikely to be impacted, even if both projects occur simultaneously, as both projects are occurring in a similar footprint within a busy urban town, where birds within the zone of disturbance impact are already tolerant of disturbance from recreational walkers on the beach, dogs, boats and noise from the town itself. As such, no cumulative impact is anticipated from the two projects.

Planning Ref. 2460002 -The Kilkee Sewerage Scheme (The WWTP and new pumping station) is likely to have positive impact on the local water quality within Kilkee, and a reduction in nutrient output to Kilkee Reefs SAC. Operationally, there is little potential for cumulative impact.

An overlap in the construction works between the new pumping station and the works on the Victoria Stream may result in additional pressure on the Victoria Stream, including where it is pumped out to Intrinsic Bay. Moreover, the existing plant in Victoria Park will maintain a storm overflow into the Victoria stream. The redevelopment of the site will upgrade the outfall pipe. This work and discharge point may have a cumulative impact.

With this in consideration and the fact that that the proposed development will potentially impact the QIs or conservation objectives of Kilkee Reefs SAC, it can be stated that in the absence of mitigation for this proposed development, there is some potential for cumulative impacts to occur with other local projects.

The new WWTP planning documents were presented to Clare County Council in January 2024; the development will involve two sites, one out of town upstream of the Well stream works. The second site will consist of the construction of a new Foul Pumping Station at the existing plant in Victoria Park, with the construction of an emergency storage tank; surge kiosk; odour control building; control panel kiosk; standby generator; foul pumping station; petrol interceptor; potable water / break tank kiosk; gantry's for pump and cleaning system removal; installation of underground internal site pipework including surface water drainage and petrol interceptor; ESB building and Panel Room; 2.4m high wire mesh security boundary fence; replacement of existing chain-link fence; safety bollards; new signage; an access gate; temporary construction access including the demolition and reinstatement of a boundary wall at the existing Victoria PS site; temporary works area; permanent access off Victoria Park; and all hard and soft landscaping including screen planting.

The new WWTP will use the same existing outfall pipe into Intrinsic Bay. Disturbance impacts on the stream and associated habitats during the construction works are not considered to be significant, even if both projects happen simultaneously, as no habitats or species highly sensitive to disturbance are present, and comprehensive mitigation measures are in place. Detailed water quality protection measures are in place during the construction of this project. The water quality being discharged should be improved as it will have been treated prior to discharge, and improved water quality in the Victoria Stream will be result from this scheme once operation. As such, The WWTP works and management are independent from the FRS and therefore are not considered in detail here.

Population and human health

All developments on the list above - If the construction periods of the developments listed above and in Figure XX are to overlap with the proposed development, there is a potential to impact on population and human health through disruptions Kilkee. These effects will be temporary while the construction phase progresses and will not be significant given the size and nature of the proposed development and others in the area.

Once operational, the proposed FRS, when considered cumulatively with the above developments, will have a positive impact on population and human health.

Land and Soil

Planning file Ref 16708 - Dough Lisdeen, Termon West, Kilkee The largest development falling within 5km of the proposed development is a solar farm at a site southeast of Kilkee. The farm will consist of up to 37,800m² of solar panels on ground mounted steel frames, underground cables and ducts, 2 no. Electricity control cabins, hardstanding area and all other associated ancillary and site works. The construction period for each development is likely to overlap, however, due to the distance from Kilkee town cumulative impacts are not anticipated to be significant.

The construction phase of the Kilkee Sewerage Scheme is expected to commence in 2024. The chosen site falls along the Victoria Stream adjacent to the proposed storage area and Carrigaholt Road Field. This will result in additional construction traffic and materials in a confined area. Liaison between the appointed contractors will be required to mitigate any significant cumulative effects arising from the coincidental construction periods. Significant cumulative effects on soils and geology are not anticipated.

Permission has been granted for several other small residential and commercial extensions within the town. Due to the size and nature of these developments they are not expected to result in significant cumulative effects on soils and geology. Overall, ensuring relevant legislation and proposed mitigation measures are adhered to and implemented, the cumulative effects associated with developments in the area are long-term with an imperceptible impact on land, soils, and geology.

Water

Other than the Kilkee Sewerage Scheme, no cumulative impacts are likely for Water, due to the size and nature of other developments in the area.

Planning Ref. 2460002 -Uisce Éireann is progressing the design stage of a project to install a new wastewater treatment plant in Kilkee and end the discharge of raw sewage to the marine environment. The project will bring several benefits to Kilkee including as improved water quality in the receiving waters at Intrinsic Bay, in compliance with national and EU regulations relating to the treatment of wastewater. In addition, there will be an improvement regarding protection of recreational swimming, fishing, boating and sightseeing waters.

Future steps of the project will include a new Wastewater Treatment Plant, an upgraded pumping station, and a new rising main to transfer treated wastewater to existing outfall. Additionally, the existing Victoria pumping station will undergo major modernization works, including the installation of new pumps and related equipment. The cumulative impact of the proposed development and the proposed Sewerage Scheme will likely be positive, due to the associated benefits likely to result from the improved management of foul water in Kilkee and receiving waters.

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