Kildare County Council
Comhairle Contae Chill Dara

JACOBS

Kerdiffstown Landfill Remediation Project

Kildare County Council

Environmental Impact Assessment Report (EIAR) Volume 1 of 4: Non-Technical Summary

32EW5604 DOC 0053 | Final

August 2017

Preface

This document is the Non-Technical Summary (NTS) of the Environmental Impact Assessment Report (EIAR) for the Kerdiffstown Landfill Remediation Project.

A copy of the EIAR and the planning application is available to view at the offices of Kildare County Council, Áras Chill Dara, Devoy Park, Naas, Co Kildare and Kildare County Council, Kerdiffstown Landfill Remediation Project Office, Kerdiffstown, Naas, Co Kildare, between the hours of 9.30am to 12.30pm and 2.30pm to 4.30pm on working days and the offices of An Bord Pleanála, 64 Marlborough Street, Dublin 1 for a period of **7 weeks commencing on date 31 August 2017.**

The planning application and EIAR (including this NTS) may be viewed/ downloaded online at:

http://kildare.ie/CountyCouncil/kerdiffstownlandfillremediationproject/KLRPEnvironmentalImpactAssessmentReport/

or at www.kerdiffstowncleanup.ie

A bound paper copy of the EIAR may be purchased on payment of the below specified fees to Kildare County Council at the addresses above and at a cost of:

- EIAR Volume 1 of 4 Non-Technical Summary: €5
- EIAR Volume 2 of 4 Main Report: €25
- EIAR Volume 3 and 3A Figures and Photomontages: €50
- EIAR Volume 4 of 4 Appendices: €25
- Digital Copy of Full EIAR on CD €10

Any submission/observations in relation to the proposed Project may be made to An Bord Pleanála, 64 Marlborough Street, Dublin 1. Any submission must be accompanied by a fee of €50, except for certain prescribed bodies.

Submissions/observations must be received by the Board not later than **5.30pm on 19th October 2017**.

Non-Technical Summary

This document is the Non-Technical Summary (NTS) of the Environmental Impact Assessment Report (EIAR) prepared for the proposed Kerdiffstown Landfill Remediation Project (hereafter referred to as the proposed Project). The former landfill is currently closed and requires remediation to reduce the risks to public health and safety and the environment.

The proposed Project is to remediate the site by capping wastes across the site, by providing a landscaped profile to the site and improving the landfill infrastructure systems, to ultimately provide a multi-use public park. This summary has been prepared on behalf of Kildare County Council (KCC).

Background to the Proposed Project

Kerdiffstown Landfill is a former sand and gravel quarry which had been progressively backfilled with wastes by a variety of operators since the 1950s.

The facility at Kerdiffstown was operated under a local authority waste permit followed by a waste licence, issued by the Environmental Protection Agency (EPA) in 2003; with a revised licence issued in 2006. The site consisted of an extensive recycling facility, a lined landfill cell, which had been partially filled with waste, and large unlined areas of the site in which substantial quantities of waste have been deposited. There are also smaller quantities of waste stockpiled around the site. The presence of such large quantities of waste and the lack of appropriate infrastructure to manage pollution arising from this waste, results in the potential for environmental pollution to occur.

Kerdiffstown Landfill Remediation Project - Site Extents

In June 2010, the former operator of the landfill vacated the site and it was left in an unsecured condition. In January 2011, a major fire developed within the mass of mounded waste material present in the north of the site which required the intervention of a number of state agencies, including KCC and the EPA.

The facility at Kerdiffstown is now in the early stages of remediation (the action of reversing or stopping environmental pollution). In February 2011, the EPA took control of the site until it was transferred to KCC in June 2015. Since February 2011 the EPA and KCC have been using the powers under Section 56 of the Waste Management Act 1996 (as amended) to manage the site and put in place measures to prevent and limit pollution such as the presence of site representatives on site to oversee the management of existing landfill infrastructure, and implement interim landfill control measures for emissions including odour, dust, surface water, groundwater and landfill gas (the gas is generated by waste within the landfill and typically contains methane and carbon dioxide as well as odour causing compounds). Leachate (rainwater or water that has flowed through the waste on site and leached out some of its elements) is also managed and monitored on site.

The EIAR and this NTS form part of the planning application to An Bord Pleanála and the Industrial Emissions Activities Licence (IEAL) application to the EPA for the proposed Project.

The proposed Project will comprise a Remediation Phase and an Operational Phase. During the Remediation Phase, construction works required to remediate the site, install landfill management infrastructure and create the multi-use public park will take place. The Operational Phase of the proposed Project will comprise the operation of the multi-use public park and the ongoing maintenance of the landfill management infrastructure.

As part of the proposed Project the site will not accept waste for disposal. However, the construction works associated with the Remediation Phase will require the importation of engineering materials, such as aggregate, subsoil and top soil to support capping and landscaping works and which may still be classed as waste, depending on its origin. Acceptance of such material will be controlled under specifications and acceptance criteria, to comply with the IEAL regulated by the EPA.

Need for the Proposed Project

The Kerdiffstown Landfill site is currently closed, in a disused state and poses a long-term risk to the environment due to pollution by landfill gas, odour and leachate. Therefore, there is a need to remediate the site.

Remediation is required to meet the following broad objectives:

- Reduce or limit future leachate impact upon groundwater and surface water receptors and reduce/control the future production of leachate from the site;
- Ensure landfill gas is managed and controlled in such a way that it does not pose a future risk to nearby properties, residents and other identified receptors;
- Address odour generation, both in the long term and during future remediation works; and
- Provide an end-use which fits within planning and any other relevant licencing conditions.

Objectives

The overall objective of the proposed Project is to remediate the land contained within the Kerdiffstown Landfill site. The specific objectives of the proposed Project are:

- The removal of risks to public health and safety;
- Reduction in the environmental risk of the site to an acceptable level;
- Delivery of a remediation solution which is acceptable to the local community;
- Completion of the Remediation Phase within 8 years; and
- Integration of sustainability and sustainable design and development in both the remediation works and the operation of the multi-use public park.

Environmental Impact Assessment

Environmental Impact Assessment (EIA) is the process by which an assessment is undertaken and if the anticipated effects are unacceptable, design measures or other relevant mitigation measures can be taken to reduce or avoid those effects. The Environmental Impact Assessment Report (EIAR) reports the findings of the EIA carried out on the proposed Project. The main objectives of the report are to;

- Describe the baseline conditions prior to any work commencing on the proposed Project;
- Describe the assessment methodologies used to assess the predicted environmental impacts of the proposed Project;
- Describe environmental issues and any likely significant effects which may arise during the construction and operation of the proposed Project; and
- Propose measures to mitigate these effects.

This NTS presents a summary of the EIAR, including key aspects of the proposed Project and the associated beneficial and adverse impacts of importance.

Consultation

As part of the outline design and assessment process the Kerdiffstown Project Team engaged with local residents, interested groups and other local commercial interests since 2011. In 2011, a

Community Liaison Group was set up and meetings held on a quarterly basis. Updates on the latest developments at the site were provided and feedback welcomed from the group participants. The consultation process for the proposed Project to date has involved two key consultation phases;

- Public and stakeholder consultation on the proposed end-use, which included letters, consultation events and a defined consultation period; and
- EIA Scoping consultation.

Early involvement of the public and other stakeholders ensured that the views of groups and individuals were taken into consideration throughout the preparation of the EIAR and during the development of the proposed Project outline design.

It was recognised at an early stage of the proposed Project that public and stakeholder engagement is a critical component to the process of developing a sustainable, long-term end-use for Kerdiffstown Landfill.

KCC are committed to continuing this engagement with key stakeholders and the public and will continue to address any issues or concerns raised throughout the Remediation and Operational Phases for the proposed Project. In addition, the project website (http://www.kerdiffstowncleanup.ie/) will be kept up to date with details from the statutory approvals process, project news, community updates and Press Releases.

Description of the Proposed Project

Previous studies for the proposed remediation works concluded that the best solution, with the lowest environmental impact would involve capping the current areas of waste, following only minimal excavating and movement of these wastes. Capping is a technology that forms a barrier between the waste and the surface, thereby protecting people and the environment from potential harmful effects, and limiting the migration of pollutants including landfill gas and leachate. The movement of some wastes and material within the site is required in order to achieve stable engineered slopes and to allow for the management of surface water drainage.

The main features of the proposed Project include:

- Remediation of the site including the installation of a capping system across all the waste on site;
- Installation of new systems to manage and control leachate and landfill gas and which will include the construction of a dedicated Landfill Infrastructure Compound and landfill gas flares (where extracted landfill gas is burned off);
- Installation of a landfill gas vent trench system to vent landfill gas, where levels are very low;
- Works will also include the construction of a leachate pipe from the site, which will cross under the Morell River and into Johnstown Pumping Station, from which the leachate will be diverted/ transported to the Osberstown Wastewater Treatment Plant (WWTP);
- Installing surface water drainage to manage water on, and draining from, the site including surface water ponds and a surface water outfall point to the Morrell River;
- Construction of a foul water sewer pipeline connecting the site with the Johnstown Pumping Station. This pipeline will run parallel to the leachate pipeline and will carry waste water from the site office and changing room building;
- Works will also require the demolition of three residences next to the current Project site boundary to facilitate necessary project infrastructure;
- Development of a public park with multi-use sports pitches, car parking, a changing room building, children's playground and a network of paths across the site; and
- Upgrading access to the site from the L2005 Kerdiffstown Road required for the Remediation Phase, with provision of footpath and cycleways to ensure the safety of all road users during Remediation Phase and for access to the park during the Operational Phase.

Remediation Phase

The remediation works presented in the EIAR include the following key elements:

- Re-profiling the site (moving of waste and material) to address current over-steep slopes to allow the installation of a capping system and to allow for surface water drainage;
- Capping the waste to prevent rainwater entering the waste, and therefore reducing leachate production, and to facilitate management of landfill gas and odour, with the type of capping varying to suit the waste in each area;
- Management of leachate to transport it from the site to the Osberstown WWTP;
- Management of landfill gases to capture and burn them in a landfill gas flare (with a second flare acting as a back-up). Only one landfill gas flare will ever be in operation; and
- Development and construction of multi-use public park.

Other supporting works are required to facilitate the remediation and future end-use of the site.

The remediation of the proposed Project and development of the multi-use public park is anticipated to take approximately five to seven years, with approximately four years of intensive construction works to remediate the site. For the purposes of the environmental assessment, the four year construction period is presented in eight phases, each with an average phase length of 6 months but it is acknowledged that there may be some overlap between these phases and activities. The start date of each phase is dependent on a number of factors such as when a planning

decision is made and the granting of an IEAL from the EPA, and how long it takes to find suitable material to bring to the site to carry out the remediation works. The length of time each phase takes to be completed may also be affected by weather conditions on site such as very wet or dry (resulting in dust generation) conditions. The scheduling of work will also be dictated by the need to minimise environmental emissions such as odours in order to fully comply with planning approval conditions and IEAL.

Prior to commencement of the Remediation Phase, the appointed contractor responsible for the remediation works will prepare a Construction Environmental Management Plan. The document shall contain the mitigation measures and plans identified in the EIAR and will embrace the conditions set out in the planning approval and the requirements of the site's Industrial Emissions Activities Licence (IEAL).

Operational Phase

Once the Remediation Phase is complete, the site will be a multi-use public park including playing pitches, changing rooms, a playground, walking paths, and vehicle and bicycle parking. Landfill management infrastructure will continue to protect the environment, resulting in environmental benefits both on and off site.

Proposed Project Landscape Masterplan

Using computer modelling the way the waste within the site will settle and compact over time, and the shape this settlement will give to the land, has been estimated. As the waste settles it will produce landfill gas which will be collected, monitored and controlled. This management of the landfill gas, in addition to the collection and disposal of leachate and ongoing groundwater and surface water monitoring will require some permanent buildings and equipment to be present on the site in the Landfill Infrastructure Compound.

Management of the Public Park

The park will be open to the public for use as an amenity area. KCC will retain ownership of the park and will have overall responsibility for managing and maintaining the site.

A KCC Site Manager will be based on site to maintain and will oversee the monitoring and control mechanisms for the landfill infrastructure at the site. Park rangers and / or maintenance teams will also attend site when necessary.

Although the end-use proposal for the site is a multi-use public park the site will still be 'operated' under the IEAL granted by the EPA. The IEAL for the site will set conditions and emission limits for the ongoing aftercare of the end-use at the site. KCC, as the IEAL holder, will be required to adhere to these conditions to minimise potential environmental impacts, and provide data and reports to the EPA to confirm compliance.

Health & Safety of Visitors

The end-use for the site has considered the health and safety of visitors by incorporating the following elements:

- Proposals for a capping system which will provide a barrier between the waste material and the park users.
- The landfill gas management system and leachate management system will allow for safe use of the park by the public.
- Presence of council staff including the KCC Site Manager on site during normal working hours and park opening hours. Pathways and

surface water pond areas will be closed off by locking gates outside of park opening hours.

- Key plant and equipment, such as the Landfill Infrastructure Compound, will be out of bounds, with no access to the public.
- A footpath and cycleway will be provided to allow pedestrians and cyclists to safely gain access to the site from the footbridge over the N7 from Johnstown, linking also to existing footpaths leading to Junction 8 over the N7 and to an underpass at Goff's, leading to Kill.
- Suitable signage will be placed around the site, warning visitors of the potential for deep water (such as the surface water ponds) and the presence of key landfill infrastructure. A number of life buoys will be provided around the perimeter of the ponds, and the ponds will also be fenced off to prevent access and to promote biodiversity in these areas.
- Monitoring equipment at the site will be fitted with lockable covers.

These health and safety considerations and procedures will be regularly reviewed and developed, most notably during the detailed design phase and on completion of the remediation works.

Alternatives Considered

Alternative Designs

The assessment of alternative options for the Kerdiffstown Landfill site was undertaken in 2010, and further refined in 2013. As a result of the assessments, six feasible options for remediating the site were considered. These included the 'do nothing' and 'do minimum' scenarios, and four options for remediation of the site.

Do – Nothing and Do Minimum

Consideration of the 'do nothing' scenario involved leaving the site as is and discontinuing the ongoing environmental monitoring, while the do minimum scenario would involve continuing the environmental monitoring and taking reactionary action in the event of an environmental hazard occurring. Both options would leave the site in breach of environmental legislation and may result in human health risks. Both were therefore not considered further.

Do Something

There were three short-listed remedial options which were considered further. Scenario A was the simplest solution but provided the least protection of ground and surface water. Scenario C was the most complicated solution, created the greatest potential odour, noise, traffic and greenhouse gas problems and also took the longest time to complete. Scenario B was selected as the preferred option, on the basis of the optimal balance between landfill gas control, odour and nuisance impacts, and duration. Based on the significant increase in understanding of the site since 2013, Scenario B has since been further developed and refined to the proposed Project as described in this EIAR.

Off Site Disposal

The option to excavate and remove all of the wastes for off-site disposal was also dismissed early in the options assessment process. If just considering groundwater the option of "dig and dump" is appealing; however, the environmental consequences of excavating 3.1M m^3 of waste would be highly significant involving the uncontrolled release of landfill gas resulting in very significant odour impact over a period of years, as well as thousands of tonnes of Greenhouse Gases (GHGs). The implications for traffic alone would also be enormous with over 300,000 traffic movements; at least 7,000,000 kilometres travelled and greater than 10,000 tonnes of GHGs released, assuming that the nearest landfill to the proposed Project had the capacity to receive all the material which is unlikely.

Alternative End-Uses

In 2016 an assessment for possible end-uses of the Kerdiffstown Landfill was undertaken from which, KCC selected three options for further consideration and external consultation. These were:

- Agriculture (pasture for grazing);

- Country park; and
- Multi-use public park.

Each of the end use options were assessed using a simple scoring system which looked at technical and environmental advantages and disadvantages. An option of developing the site for industrial or commercial purposes was also included in the assessment at this stage, as there is precedent for such developments on closed landfill sites. A period of public consultation and engagement with elected members was also undertaken.

Ultimately the assessment and consultation concluded that the preferred end-use for the site was a multi-use public park.

Alternative Processes

To achieve the proposed remediation of the site, from a disused landfill to a multi-use public park, a number of options were explored for each of the following;

- Safe road access to the site;
- Demolition works to clear the site;
- Landfill Infrastructure Compound (site office, pumps, landfill gas flares, storage areas, and leachate treatment equipment);
- Site profile (the landform of the site);
- Methods of capping the waste;
- Management of landfill gas and leachate; and
- Management of surface water/runoff.

In all instances a number of options were explored with the chosen options being the most viable and sustainable, and being most aligned with the objectives of the proposed Project.

Impacts of the Proposed Project

The following sections summarise the likely significant impacts of the proposed Project on the environment including details of the relevant mitigation measures. Full details of each assessment and the associated findings of the EIA are presented in the EIAR (Volume 2: Main Report).

Air Quality and Odour

An assessment of the impact of the proposed Project on air quality and odour was undertaken which focused on key pollutants emitted from landfill sites which includes landfill gases, combustion gases from the landfill gas flare and vehicles and dust from remediation works and movement of vehicles.

The Existing Landfill Gas Flare

The current air quality across the area where the proposed Project is located was established using national baseline data and data from monitoring undertaken at the site. Generally, the air quality in and around the proposed Project site is typical of an unpolluted rural environment.

An air dispersion modelling assessment was carried out to determine the potential for changes to air quality as a result of the proposed Project and accounted for the location and height of the landfill gas flare which will be present within the Landfill Infrastructure Compound.

The impact assessment found that the highest potential for impact to air quality and odour was related to the disturbance of waste and materials during demolition and site re-profiling works during the Remediation Phase. However, all impacts were assessed as being short-term. With the implementation of appropriate dust and odour control measures, the Remediation Phase of the proposed Project is not predicted to cause any significant residual adverse impacts.

The air dispersion modelling for the Operational Phase of the proposed Project concluded that there would be no significant residual impacts caused during this phase. During the Operational Phase, odour will be reduced by the installation of the extensive network of landfill gas extraction and venting systems and the landfill gas flare that converts landfill gas into harmless substances. With the capping and landfill gas management systems in place, it is not anticipated that any diffuse odour impacts would occur once the multi-use public park is operational.

Noise and Vibration

This assessment looked at the potential impact on receptors from noise and vibration as a result of the proposed Project.

A review of available baseline data from noise monitoring surveys and data showed that the current noise environment of the proposed Project area is dominated by traffic noise from the nearby N7 dual carriageway and M7 motorway, both during the day and at night. The vibration survey found that there are currently no significant sources of vibration other than passing vehicles in the vicinity of the proposed Project.

Following the collection of baseline data, noise and vibration impacts associated with the Remediation and Operational Phases of the proposed Project were predicted through calculations and noise modelling. Representative receptors including residential properties were identified and used in the modelling.

Noise Monitoring at the site

A number of measures to reduce and limit noise during the Remediation Phase will be undertaken including the selection of noise controls such as acoustic screens and barriers and equipment enclosures. Noise monitoring will also be undertaken during the Remediation Phase to monitor compliance with required noise limits.

The impact assessment concluded that, with appropriate mitigation, the Remediation Phase would not result in any significant residual adverse impacts and that during the Operational Phase of the proposed Project there were no significant noise levels associated with the Landfill Infrastructure Compound (such as pumps, air blowers, the landfill gas flare) traffic generation or the operation of the multi-use public park.

In terms of vibration, the assessment found that none of the proposed works has the potential to cause damage to any of the buildings in the vicinity of the proposed Project.

Landscape and Visual

This assessment looked at the potential impacts of the proposed Project on the surrounding landscape and views.

The site lies within the Landscape Character Area (LCA) 'Northern lowlands – Naas and environs'. This LCA is characterised by agricultural lands, small settlements and some commercial activity. There are no landscape designations relevant to the land at the site. The LCA has low sensitivity to change and has the ability to accommodate development.

View point looking towards the proposed Project site from Palmerstown House Estate

The impact assessment found that impacts during the Remediation Phase of the proposed Project would be largely negative, while the Operational Phase impacts would be largely positive when compared to the existing situation. During remediation the main source of impact included the general increase in activity on and around the site from earthmoving equipment, Heavy Goods Vehicles (HGVs), and general traffic, as well as the greater area of exposed earth at the site. All Remediation Phase impacts were deemed to not be significant, and temporary in nature.

During the Operational Phase of the proposed Project, the landscape and visual impacts were assessed as being largely positive due to the end-use of the site as a multi-use public park and earth moving equipment and HGVs being no longer present at the site. In addition, the establishment of grass in areas of the site will give a more parkland feel to the site.

The main landscape and visual mitigation measures will relate to tree and shrub planting within and around the site. This planting will include some amenity planting around the site entrance along with native hedgerow, perimeter and semi-parkland trees at various locations. There will be limitations as to where tree planting can take place so as not to impact on the integrity of the capping system. Ponds proposed to manage surface water runoff on site during the Operational Phase will planted with a variety of wetlands plants which will also benefit biodiversity. Where boundary vegetation from residential properties is removed to facilitate the upgrading of the L2005 Kerdiffstown Road, this will be replaced with new walls, fences and planting.

Archaeology, Cultural Heritage and Architectural Heritage

This assessment examined the potential impacts of the proposed Project on archaeology, cultural heritage and architectural heritage.

A Recorded Monument located in the western part of the proposed Project area is the site of a mound which may have represented an early medieval settlement area. However, the monument was disturbed by quarrying activity in the 1950s. A further five sites or groups of sites are located outside of the proposed Project area but within a 500m radius and include the church and graveyard located immediately east, in the vicinity of Kerdiffstown House.

Architecturally the landscape surrounding the proposed Project area is characterised by large country manors and associated demesne landscapes. Kerdiffstown House, adjacent to the proposed Project and the nearby Palmerstown House are examples of this architectural heritage. There are no protected structures within the proposed Project area, but there are nine structures situated within a 500m radius of the site, the nearest being Kerdiffstown House.

Kerdiffstown House

The impact assessment concluded that it is possible that ground disturbances during the remediation works may have a significant impact on the Recorded Monument (mound in the west of the site). However, it is likely that the mound has been removed by quarrying activity during the 1950s. Additionally, a survey undertaken as part of the EIA failed to identify responses indicative of the mound. Ground disturbances associated with the realignment of the Kerdiffstown House driveway, insertion of a drainage system in the area surrounding the recorded church site, and the construction of the pipeline and outfall to the River Morell may have a significant impact on any associated below ground remains, if present. There are no direct or indirect impacts predicted to the nearby structures or monuments

It is predicted that the Operational Phase of the proposed Project will have a significant positive impact on archaeological heritage surrounding the proposed Project area due to the stabilisation of slopes and visual improvement of the landscape. Similarly, it will have a significant positive impact on the architectural resources surrounding the site, including the demesne landscapes, due to the visual improvement of the landscape.

Mitigation measures to reduce the impact of the proposed Project include the completion of archaeological surveys and testing of a section of the field which contains the Recorded Monument (mound in the west of the site), and to the immediate north and south of the recorded church to the east of the site. Non-intrusive fencing will be placed around the church and graveyard site during remediation works, an archaeological wade survey at the proposed location of the surface water outfall to the Morell River and monitoring of topsoil stripping through the southern part of Kerdiffstown Demesne will also be undertaken.

Biodiversity

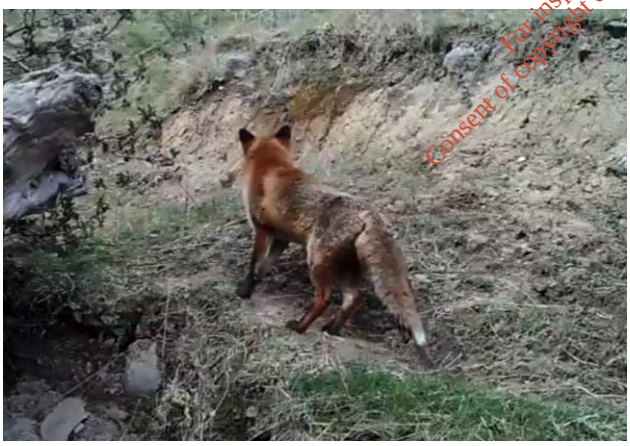
This assessment looked at the potential for the proposed Project to impact the plants and animals on and around the site.

Ecological surveys were undertaken spanning all four seasons and included a habitat survey, bat

surveys, a breeding bird survey, protected mammal surveys, amphibian surveys and water quality monitoring.

An Appropriate Assessment Screening Report which looks at the impact of the proposed Project on designated Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) was also carried out and concluded that, taking account of the distance to the nearest designated site, an Appropriate Assessment was not required for the proposed Project. The nearest designated site is Red Bog, Kildare SAC (000397) which is located approximately 7.5km away from the proposed Project site.

With regards to protected species, two badger setts were identified during field surveys and bat roosts and bat activity was also recorded on site during bat surveys. There were 38 species of breeding bird recorded during the breeding bird surveys. Habitats at the site generally comprised dry meadows and grassy verges and scrub. The site was dominated by tree lines, scrub, grassland and occasional hedgerow.



Fox at the landfill site

Potential impacts associated with the Remediation Phase include removal of areas of grassland and scrub vegetation, changes to habitats and impacts on protected species such disturbance of badger. During the Operational Phase the new surface water outfall to the Morell River has the potential to impact biodiversity and potential impacts to animals within the site are related to new lighting associated with the multi-use public park.

Key mitigation measures to minimise impacts to biodiversity during the Remediation Phase include the;

- Timing of works around breeding and hibernating seasons;
- Relocation and retention of some species; and
- Use of appropriate lighting to minimise light spill.

During the Operational Phase mitigation measures and enhancement features include;

- Measures to manage surface water runoff to the Morell River;
- Water quality monitoring;
- Planting of perimeter trees;
- Design of wetland ponds to create new habitats;
- Use of species-rich native seed mixes and suitable vegetation across the site;
- Provision of fenced off wildlife areas to which the general public will not have access; and
- Provision of nesting boxes and artificial hibernating areas.

The assessment concluded that with the proposed mitigation in place, there would be no significant residual adverse impacts to the ecological receptors in the long-term. The mitigation measures will also result in significant residual beneficial impacts to wetland habitats, amphibians and reptiles.

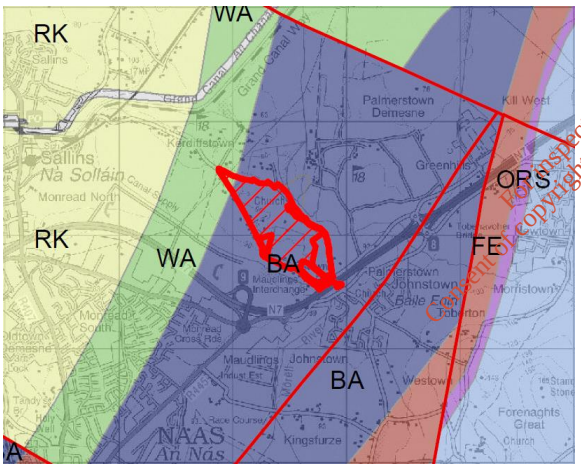
Soils, Geology, Contaminated Lands and Groundwater

This assessment looked at the potential for soils, rock, contaminated land and groundwater to be impacted by the proposed Project.

Investigations have been undertaken in three phases at the site since 2010, with the most recent being completed in 2016/2017. These site investigations have involved the installation of boreholes (deep narrow holes into the ground to look at soils, rock and groundwater) and the digging of trial pits (an excavation pit to determine the composition and structure of the soils and rock)

both within the site and in the lands surrounding the site. Groundwater and gas monitoring has also been routinely carried out at a number of the boreholes since 2011. The results of the site investigations and monitoring programmes have informed the knowledge of the existing environment.

The site is underlain by soil and rock of mostly fluvio-glacial sands and gravels (rocks formed from glacial meltwater), under which lies a bedrock of muddy limestones. The site is mostly underlain by a muddy Limestone Formation (The Ballysteen Formation) that is classified as a Locally Important Aquifer (Ll). The very northern tip of the site is reported on regional scale maps to be underlain by a karstified Regionally Important Aquifer (Rkd), the Waulsortian Limestone Formation. However, no outcrops of rock or borehole evidence has indicated that this is the case on site.



Bedrock Geology beneath the site

Groundwater flow is broadly in a north-easterly direction. Groundwater chemical analysis results indicate elevated concentrations of parameters which are typical of landfill leachate, including ammoniacal nitrogen, chloride and trace organic compounds occurring, in the groundwater beneath the site. Such contamination is also observed in some wells to the east of the site. There is no evidence to date that any contamination has reached the Morell River.

One of the most significant impacts during the Remediation Phase will be as a result of re-profiling/earth moving works which may cause changes to landfill gas movements and allow greater amounts of gas to vent to the air. Other impacts during the works include the potential to increase groundwater contamination through changing groundwater infiltration and release of potential trapped areas of leachate.

Operational Phase impacts will be beneficial due to the reduction in water entering into the waste due to the capping, therefore reducing the production of leachate over time. Enhanced landfill gas control measures will also have a beneficial effect on receptors.

Mitigation during the Remediation Phase will include a programme of groundwater monitoring in the vicinity of works as specified by the IEAL which will be granted by the EPA. Landfill gas monitoring will also be carried out regularly throughout the remediation works to monitor gas movements. Monitoring of gas and groundwater will be continued into the Operational Phase of the proposed Project and will be as per the required monitoring as specified in the sites IEAL. With these mitigation measures there will be no significant residual adverse impacts as a result of the proposed Project.

Water - Hydrology

This assessment looked at the potential for rivers, streams and ponds in the vicinity of the site to be impacted by the proposed Project.

All available hydrology (the properties and movement of water) and water quality information for this area was studied, supplemented by site visits and an examination of existing water quality monitoring results which were collected over a number of years from the waterbodies surrounding the site.

Several waterbodies in the area could potentially be impacted such as the Morell River, the Rathmore Stream and the Canal Feeder Stream. There are also minor surface water features (such as lakes / ponds) associated with Palmerstown

Golf Course. The existing water quality monitoring results indicate the there is no evidence of landfill leachate in the Morell River where it flows past the site. Similarly, the Canal Feeder Stream shows little evidence of impact from the landfill.

Morell River

During the Remediation Phase there is the potential for pollution of rivers and streams from sediment and polluting substances entering watercourses during earth moving and re-profiling works, as a result of water flowing through waste and landfill materials and accidental spills of chemicals such as concrete or diesel. Potential Operational Phase impacts are only anticipated for the Morell River relating to the new outfall, which will discharge clean surface water from the site.

In order to mitigate impacts during the Remediation Phase, there will be no direct hydrological connection from the site to the Morell River and the existing connection from the site to the Canal Feeder stream will be disconnected. An Erosion and Sediment Control Plan will be prepared prior to commencing the remediation works which will include measures to prevent the release of sediment or any other pollutants into the watercourses. Water monitoring will be also undertaken during the Remediation Phase as specified by the IEAL granted by the EPA.

Operational Phase mitigation measures include the sizing of surface water ponds to ensure no additional flood risk in the area, as well as provision of a shut-off valve at these ponds to isolate surface water runoff to the outfall into the Morrell River. An Emergency Plan will be put in place so that any potential spills or leakages will be contained, removed or remediated before it reaches any surface water receptor. Real-time water quality monitoring will be in place in the surface water pond and water quality monitoring in accordance with the IEAL will also be undertaken. With these mitigation measures, there will be no significant residual adverse impacts as a result of the proposed Project.

Traffic and Transport

This assessment looked at the potential impacts on the local traffic and transport network as a result of the proposed Project. Site access to the proposed Project site will be improved with a new junction arrangement which includes realignment of the L2005 Kerdiffstown Road and provision of a new footpath and cycleway. The footpath and cycleway will link to Johnstown via the footbridge over the N7 to the south east of the site.

The traffic and transport network were assessed through analysis of existing traffic data, measurements of the existing character and traffic conditions of the road network, and estimates of the additional traffic to be generated by the proposed Project.

Baseline traffic levels on the roads around the site are generally low with the L2005 Kerdiffstown Road currently operating significantly below its capacity. Existing Heavy Goods Vehicle's (HGV) traffic is low.

The impact assessment was carried out using a worst case daily Remediation Phase trip total of 140 two-way HGV movements and 40 two-way car or Light Goods Vehicle (LGV) movements added to the expected 2018 traffic levels. The results indicated that the proposed Project will not have a significant impact in terms of traffic generation on all assessed road sections due to the available capacity of the roads in the vicinity of the proposed Project.

HGV traffic accessing and exiting the site during the Remediation Phase of the proposed Project will

route via Junction 8 of the N7 and will not be permitted to route via Sallins.

During the Operational Phase of the proposed Project, the estimated traffic volumes under a worst case scenario are still substantially below the guideline thresholds and are therefore not considered significant. Site access improvements will include the realigned L2005 Kerdiffstown Road with the provision of the cycleway and footpath, and the installation of a new roundabout to ensure safe access to the site during the both Remediation Phase and for the multi-use public park.

Overall there will be a permanent significant positive impact associated with the improvements to the site access and associated realignment of the L2005 Kerdiffstown Road.

Photomontage of the view along L2005 with proposed improved access arrangements

In addition to the works on the L2005 Kerdiffstown Road, a number of mitigation measures are also proposed to ensure any impacts are kept to a minimum such as;

- Preparation of a Construction Traffic Management Plan in advance of the Remediation Phase which will outline the appropriate and safe routes to and from the proposed Project;
- Erection of appropriate warning signs on approach to the proposed Project site;
- Timing of HGV movements to occur outside of peak hours;
- Frequent consultation with the Community Liaison Group in order to keep them updated on the schedule of works and traffic management measures, as well as giving a forum for feedback from the community;
- A Mobility Management Plan will also be prepared in advance of the Remediation Phase, and will continue to be relevant during the Operational Phase, in order to provide the mechanism to support and promote sustainable travel for staff, contractors and visitors.

As a result of these mitigation measures there will be no significant residual adverse impacts as a result of the proposed Project.

Waste

This assessment looked at the potential impacts associated with the generation of waste during the Remediation and Operational Phases of the proposed Project.

Leachate is the largest waste currently generated from the site, with small amounts of other wastes associated with the site offices and security huts and waste tyres currently in use as weighting on the temporary capping system in the lined landfill cell currently on site.

Tyres currently holding down the temporary capping system

Remediation Phase impacts will be short term and include waste produced during demolition of on-site concrete structures and three residential dwellings adjacent to the site. Any hazardous waste encountered during demolition works, during the movement of waste and materials on site or generated from remediation or operational activities such as chemicals, paints and oils will not

remain on the site, but will be sent to appropriately licensed facilities for safe disposal.

Operational Phase impacts will be minimal, and include positive improvements from the existing conditions with the provision of the leachate pipe from the site, which will cross under the Morell River and into Johnstown Pumping Station transporting leachate to the Osberstown WWTP. Other Operational Phase wastes will include general and mixed recycling wastes from site staff and park visitors and green waste from landscaping activities and which will be sent to appropriately licensed facilities. The quantities will be small with minimal impact.

A number of mitigation measures are proposed to reduce waste related impacts during both Remediation and Operational Phases of the proposed Project. During the Remediation Phase, wastes arising from the site will be reused on site where possible. Where waste cannot be reused it will be removed from site by a suitably licensed waste management contractor and undertaken in accordance with the Construction Environmental Management Plan. For the Operational Phase, maintenance of the multi-use public park will be carried out in accordance with Management Plans as required by the IEAL. With these mitigation measures there will be no significant residual adverse impacts as a result of the proposed Project.

Population and Human Health

This assessment looked at the potential impacts to population and human health associated with the proposed Project.

Population

The site is located within an extensive green belt, consisting of largely undeveloped agricultural land as well as recreational/leisure amenity areas in the form of golf courses. In the vicinity of the site, the urban areas are those of Naas and the suburban villages of Johnstown and Sallins. The receptors closest to the site are typically detached residences or commercial premises that surround the site boundary. The main employment centres in the area are within the urban centres of Naas and Johnstown Village. Commercial receptors located along L2005 Kerdiffstown Road connecting the N7 dual-carriageway to Sallins Village also act as small scale employment centres. At present, the land proposed for the proposed Project consists of a former landfill, and therefore is not economically active. The remediation will also require the demolition of three residences to facilitate necessary infrastructure.

The impacts during the Remediation Phase will be short term, and will arise from noise, odour and visual impacts which may adversely impact local amenities for periods during the works. There will also be some slight impacts to motorists on the L2005 Kerdiffstown Road during the realignment works. Positive impacts will arise from the proposed Project with some potential for increased employment during the Remediation Phase, and the related increase in economic activity for local businesses as a result of the additional activity in the area.

In overall terms the Operational Phase of the proposed Project will have a positive impact on the population of the surrounding community. The provision of a multi-use public park will improve the amenity value of the area and could also encourage further future development of the surrounding area. The access to the site for motorists, pedestrians and cyclists will also be greatly improved with the realignment of the L2005 Kerdiffstown Road through the proposed Project.

A number of mitigation measures and opportunities for future enhancement have been identified as part of this assessment. During the Remediation Phase noise and odour control measures will be implemented to minimise impacts from the remediation works. There will also be continued communications with the local community and the Community Liaison Group in order to ensure that people are kept up-to-date on the proposed Project and to provide an avenue through which concerns or issues can be raised.

Human Health

The local community is expected to benefit considerably from the proposed Project from a public health perspective, through the transformation of the site from a disused landfill site to a multi-use public park open to the public.

The primary concerns from a health perspective during the Remediation Phase relates to air quality (dust) and odour impacts, landfill gas, contaminated waste and material, as well as noise to a lesser extent, but all being temporary in nature. A suite of mitigation measures has been proposed to meet the required environmental standards that protect human health, such as the installation of a more effective landfill gas and leachate management systems and the implementation of a Construction Environmental Management Plan during the Remediation Phase. Aside from the temporary effects associated with the Remediation Phase, the proposed Project as a whole will positively impact the health of the local and regional community through the improved control on emissions, and the provision of a recreational amenity.

With mitigation measures in place, no residual adverse impacts are anticipated as a result of the proposed Project.

Material Assets

The material assets assessment looked at the impact of the proposed Project on residential property, major utilities and imported material. Other assets such as cultural heritage, land use, social amenities and groundwater were dealt with in other chapters in the EIAR.

There are five existing residential properties bordering the site. The major utilities which are used by the site currently are electricity, telecommunications and drinking water. There is currently no foul sewer or gas connection to the site. Wastewater from the existing site office kitchen and welfare facilities is currently collected in a wastewater tank. Surface water drains collect rainwater from parts of the site and move it to a site discharge pipe via an interceptor (to filter pollutants) and into the Canal Feeder Stream to the south-west of the site.

The Remediation Phase will require the importation of approximately 130,000m^3 of material to the site. Other materials such as road and building materials, as well as landscaping and materials for the proposed sports pitches will also be required by the proposed Project.

The main impacts associated with the Remediation Phase of the proposed Project will be associated with the demolition of residential properties and lands, with three properties requiring removal in order to accommodate end-use infrastructure. There may also be temporary impacts to utilities where there is a need to upgrade or relocate existing services. The importation of material will have impacts associated with noise and possible road congestion from HGV movements delivering the material.

The Operational Phase impacts will largely be negligible, with the main impact associated with the proposed new foul sewer and leachate pipeline connections for the leachate management system and the on-site welfare facilities. The additional inputs from the site to the sewer network will increase the demand on the public sewers and associated wastewater treatment facilities. A number of mitigation measures have been proposed. With respect to major utilities, measures include avoidance of interaction with overhead utility lines in and around the site and the protection of all underground services for which diversion is not required. Existing utility connections will be used where possible and further consultation will be undertaken with Irish Water and Osberstown WWTP on the proposed new foul sewer and leachate connections. With respect to the imported material, only material which meets suitable engineering standards will be sourced as required. In so far as is possible, material will be sourced locally, to minimise the environmental footprint

With mitigation measures in place, no significant residual adverse impacts are anticipated as a result of the proposed Project. The proposed Project as a whole will have a positive impact as

the new multi-use public park in itself will become a material asset for the surrounding community.

Cumulative Impacts

The cumulative impacts assessment provides an overview of the combined impacts of the proposed Project and other proposed developments. Cumulative impacts can result from actions taking place within the same timeframe and/or area as the proposed Project.

There are a number of projects which have been proposed or are planned within the area around the proposed Project site over the coming years, for which the possibility of cumulative impacts has been assessed. These projects include the following:

- Infilling of a quarry at Kerdiffstown;
- The M7 Naas Newbridge Bypass Upgrade + M7 Osberstown Interchange & R407 Sallins Bypass Schemes;
- Applegreen Service Station at Naas (Planning Application 15500 – currently withdrawn);
- Housing Development at Craddockstown, Naas; and
- Upper Liffey Valley Sewerage Scheme & Osberstown Wastewater Treatment Plant Upgrade.

Following assessment against each of the environmental aspects, the cumulative impacts of the proposed Project and the above developments would be minimal, and no additional mitigation measures are proposed above that already identified in the EIAR.