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8.0 DESCRIPTION OF THE PROPOSED DEVELOPMENT

8.1 Introduction

This section of the EIS describes the preliminary design of the various elements of the proposed development. It is proposed to accept, process, recover and use inert materials, including inert wastes, to restore a Site that includes extensive areas of worked out sand and gravel extraction, partially restored lands, silt ponds, processing plant, concrete batching plant and surface water ponds. This section of the EIS also describes the proposed construction, operation, management and closure of the Facility.

The proposed Facility will include 4 major elements:

- Reception Area where trucks carrying potential restoration materials will be received, checked in, and weighed;
- Inert Waste Processing Area (IWPA) to extract useful soils/fines and hardcore materials from inert waste streams arising at building and road works sites;
- A surface water management pond and screening berms on the western side of the Site, and screening berms on the northern side of the Site; and
- Zones where soils and like material will be placed on the ground to build up the surface contours to final design levels conceived by the project engineers, scientists and landscape architects.

The assumptions made in relation to the design of the Facility are provided in Section 8.2 below. The starting point for the design is the identification of the lands to be included in the development.

The boundary of the proposed Facility and the lands to be used for the development are shown on Figure 8.1. An aerial photograph (June 2004) which depicts the physical features at the Site is presented as Figure 8.2.

8.2 Design Assumptions

The assumptions made at the outset of the preliminary design process for the restoration works are outlined below:

End Use of Site and Final Contour Plan

The Applicant's intention is to continue to restore the worked out sand and gravel pit to create a landform that is in keeping with the rolling nature of the Eastern Kildare Uplands Transition Character. The currently proposed end use will be agricultural with some passive recreational

features around the western boundary. Figure 8.3 shows a final contour plan for the restored site, developed by the landscape architects, ecologists, engineers and planners for the project in detailed consultation with Punchestown Racecourse, Kildare Co. Council and the Applicant.

Types of Materials to be used to Complete the Restoration Works

The types of materials to be used in the restoration works will be *inert* in accordance with the definitions provided in the Council Directive 99/31/EC, on the landfill of waste (Article 2).

Hydrogeological Conditions and Constraints

Section 12.0 of the EIS deals with the Site groundwater conditions in detail. Based on a review of the available groundwater monitoring data, groundwater flow beneath the Site in both the overburden and bedrock is generally toward the west-northwest.

The aquifer in the southeast corner of the Site has been classified by the GSI as having Extreme vulnerability because rockhead is at a high elevation (Figure 12.7). Therefore, in accordance with the precautionary principal, no materials will be placed in this area, and an appropriate exclusion zone has been applied. The remainder of the Site was classified by the GSI as having High vulnerability. However, the results of a ground investigation carried out by Golder indicate that there is a minimum of 70 m of glacial deposits (mainly silty sands) underlying the Site, indicating that a vulnerability rating of Moderate is more appropriate (see subsection 12.3.14).

Ecological Conditions and Constraints

During Site visits in 2007 and 2008 Golder ecologists observed lapwing on agriculturally improved wet grasslands on the southern part of the Site adjoining Pond B. The filling restoration works will be carried out in a manner such that the areas important to lapwing for nesting and foraging will be retained through appropriate mitigation measures.

Footprint of Materials to be placed to Complete the Restoration Works

The footprint of the materials to be placed on the Site, to enable its restoration, will be constrained by hydrogeological and ecological conditions and 100 m buffers defined around adjacent residences where possible. Also, through consultation with Management of the Punchestown Racecourse, there will be constraints placed on, and requirements made of, the proposed works to satisfy the needs of the Racecourse Management. The area in which materials will be placed to satisfy the various project requirements is shown on Figure 8.3.

Engineered Containment and Control Requirements

Imported materials will be placed on existing ground conditions, depicted on Figure 8.1, to enable construction of the landform as shown on Figure 8.3. As some of these materials will be considered wastes by definition, and therefore a waste licence will be required, the Best

Practice engineering requirements of the EPA will also need to be satisfied. Some of the EPA requirements that are expected, based on experience and guidance provided in the EPA Landfill Manuals on Site Design and Restoration and Aftercare (EPA 2000, EPA 1999), will include:

- Perimeter bunds or berms to control runoff, as required, and provide visual screening;
- Surface water management and silt settlement ponds;
- Internal drainage systems to handle runoff from the emplaced materials during the process of filling and undertaking the restoration works;
- An engineered base liner. The specification of the base liner will meet the minimum requirements prescribed by the EPA in Licences for inert waste landfills i.e. a mineral layer 1 metre thick and having a permeability of less than or equal to 1×10^{-7} m/sec;
- Perimeter drainage channels/infiltration trenches and contour drainage channels to convey run-off from the restored surface, to help ensure that there is no water ponding on the surface; and
- An engineered capping system comprising an inert soil layer at least 1 metre thick and including a minimum of 150 mm of growth medium e.g. topsoil.

Infrastructure Requirements

Ancillary works will be required, prior to placement of materials on the ground in engineered lined cells. These works will include: construction of access roads across the Site; drainage channels; and surface water management and silt settlement ponds. A wheel-wash will be provided to mitigate dust and mud impacts. A weighbridge and a waste reception check-in area will also be provided, to monitor the quantity of the different types of materials imported to the proposed Facility and also to record the quantity of any unsuitable or recoverable materials exported from the Facility. A waste quarantine area will also be provided to hold materials that are deemed to be inappropriate for processing and restoration and not meeting the acceptance criteria for restoration materials.

Engineering Materials

There will be a need to find a source of engineering materials to construct: screening bunds or berms; the low-permeability lining system in the engineered cells; and the capping system. All the required engineering materials may not be available within the Site and, consequently, some may need to be imported where necessary. It is expected, though, that most of the materials will come from the Site for these purposes, except the screening berms which may be formed from suitable imported clayey soils.

8.3 Overview of Proposed Development

The Site to be restored is ca. 68.0 ha. The development Site will include buffer lands (where no works will be carried out), reception/entrance area, an Inert Waste Processing Area,

surface water management ponds, perimeter screening and landscaped berms, and engineered cells/zones where inert materials (soils) will be placed to restore the Site and recreate a new landform. The engineered Facility will have a number of elements and will be constructed in a number of stages. The principal elements are as follows:

- Facility Services and Infrastructure (Section 8.4)
- Initial Development/Restoration Works (Section 8.5)
- Ongoing Restoration Works (Section 8.6)
- Landscaping (Section 8.7)
- Monitoring Infrastructure (Section 8.8)

These various elements are discussed separately in the sub-sections indicated above.

In keeping with the requirements of the EPA in regard to licensed waste management facilities and Best Available Techniques (BAT), a range of services and infrastructure features will be provided at the Facility. Most of the infrastructure itemised below will be provided on a temporary basis and will be removed upon completion of the capping and final landscaping works.

Permanent Works will include:

- Drainage channels and surface water management ponds/infiltration basins for surface water run-off;
- Screening berms and embankments;
- Infiltration trenches for surface water run-off;
- Some of the access roads and tracks on the Site;
- Monitoring installations; and
- Security measures, which will mainly consist of stock proof fencing, security fencing and lockable gates.

Temporary Works will include:

- Site accommodation including general office (existing), canteen (existing), and weigh bridge office (existing);

- Paved entrance road and hard-standing areas for plant and construction materials and car parking;
- Weighbridge (existing);
- Wheel-wash facility for road-going vehicles;
- Fuel tanks and storage/load out areas (existing), to be modified and enhanced with bunding and fuel interceptor;
- Waste quarantine area;
- Inert Waste Processing Area with crushing and screening plant;
- Laboratory facilities (for materials/soils testing);
- Mobile crushing and screening plant; and
- Compound for plant and equipment.

Further details on these services and Facility infrastructure and the proposed restoration works are presented in the sub sections that follow.

8.4 Facility Services and Infrastructure

All of the proposed and/or Facility site services infrastructure are described in the following subsections and shown on Figures 8.4, 8.5 and 8.6.

8.4.1 Site Security Arrangements Including Gates and Fencing

There is already an appropriate gate and fencing at the entrance to the Facility; however, security around much of the perimeter is not sufficient for a licensed facility. Permanent security will be provided around the Facility itself by enhancing existing dense hedgerows, and installing 1.2 m high post-and-wire fencing where required.

8.4.2 Site Access and Roads

The Facility will be accessed from an existing entrance located on the Local Road L6042. Some minor cut-and-fill earthworks will be required to improve the surface of the haul roads throughout the Site, in preparation for the construction of the proposed landform for acceptance of inert materials.

All haul roads will be engineered and constructed of hardcore material and some of these will be surface treated, in particular at the entrance to the Facility.

8.4.3 Hard-Standing Areas

Hard-standing areas will comprise well-compacted granular fill (hardcore) or, in select areas, concrete and/or macadam surfaces. The purpose of the hardcore is to provide a lay-down area for materials and areas for parking vehicles. The concrete surfaced area will be for waste quarantine, and bunded areas for refuelling plant (Figures 8.4 and 8.5). The concrete-surfaced hard-standing areas will be removed upon completion of the project.

8.4.4 Weighbridge

A weighbridge currently exists on the Site and this will be maintained in position for the duration of the Restoration Project. This will allow weighing-in of incoming loads and weighing-out of any wastes which do not meet the acceptance criteria (described later) and are thus rejected and sent off-Site to other licensed facilities.

8.4.5 Wheel-Wash

A new purpose-built wheel-wash will be fed by a water supply borehole on-Site (see Figure 8.5). The wheelwash will be maintained for the duration of the Restoration Project and the effluent from the wheel wash will be recycled.

8.4.6 Laboratory Facilities

There will be a basic materials-testing laboratory on the Site to assess the fill materials used in construction of embankments, liner and the capping system.

8.4.7 Fuel Storage Areas

Diesel fuel and hydraulic oil will be stored on-Site in appropriately bunded areas. Two (2 No.) 5,000 litre diesel tanks are proposed, which will fuel all plant utilised for the duration of the Restoration Project. An appropriately bunded fuel load-out area, with fuel interceptor, will be provided (Figure 8.5). Mobile plant will be driven to the fuel load-out area for refuelling. A bunded fuel bowser will be used, as required, to fuel fixed plant.

8.4.8 Waste Quarantine Areas

In line with best-practice procedures, a waste quarantine area will be provided on-Site to hold, pending removal from Site, inappropriate wastes that are rejected at the Facility during waste placement. Two waste quarantine areas (contained, concrete, hard-standing areas) will be provided on-Site: it is proposed to use an existing shed in the inert waste processing area for

quarantine of smaller waste items, and a concrete surfaced area for skips to quarantine rejected waste (Figure 8.5).

8.4.9 Materials Inspection Areas

All imported materials will be inspected as it is tipped in selected lined cells or fill zones. It will also be inspected when tipped in the Inert Waste Processing Area (Figure 8.5).

8.4.10 Traffic Control

The operator that is appointed to construct, operate and close the Facility will control traffic in and around the Site. Signage on Site will be used wherever required.

8.4.11 Sewerage Infrastructure

The foul sewage will be handled in the existing septic tank/percolation system (Figure 8.5) and, as required, approved temporary toilet blocks draining to a sealed holding tank. The tank will be pumped out by an approved contractor on an as-needed basis.

8.4.12 Other Services

The Facility will require power, telephone and a water supply.

There are single-phase and three-phase power supplies at the existing Cemex Facility. This will be utilised for the duration of the Restoration Project.

There are also telephone lines serving the existing Cemex Facility which again will be utilised for this project.

Fixed overhead pole lighting will be provided in the main reception area and office area/compound of the Site. This lighting will be removed upon completion of the project. Temporary mobile lighting will be used in the areas of major construction and earthworks. Power for this lighting will be provided by diesel generators.

There is mains water available at the gate of the existing Cemex facility, which will be utilised for potable water for the duration of the project. Water for dust suppression and wheel wash will be abstracted from an existing groundwater well on-Site, close to the entrance to the Facility (Figure 8.5). This is an historical well, and if supply is found to be not suitable an alternative borehole will be drilled.

8.4.13 Plant Sheds, Garages, and Equipment Compound

Equipment will initially be parked on the Site in a compound that will be constructed just south of the inert waste processing area (Figure 8.5). Plant may also be parked within the base of the existing worked out sand and gravel pit. Major servicing/repairs of mobile plant will take place off-Site. Minor servicing will take place in an existing shed midway along the eastern boundary of the Site (Figure 8.4).

All liquid hydrocarbons handled on-Site will be carefully managed and contained in bunds.

8.4.14 Site Accommodation

There is an existing office/store alongside the weighbridge (Figure 8.5). The interior of this building will be refurbished and used. The interior of the existing offices and canteen to the east of the entrance at the Site will be refurbished and used during the land-restoration project.

8.4.15 Inert Waste Processing Area (IWPA) and Plant

The sources of materials to be used for berm construction, lining and capping will be from either on-Site or off-Site sources. Since it is possible that materials with mixed particle sizes may be available from within the Site footprint or from off-Site sources, these materials will be screened and/or crushed as required to produce some of the berm-material requirements. Furthermore, the Applicant endorses National Waste Management policies and intends to recover inert materials that can be used off-Site in construction of roads and the manufacturing of concrete products. This is considered to be a suitable and sustainable concept that both the planning authority and the Agency support. As such, provision has been made for an inert waste processing area (IWPA) in which suitable and appropriate screening and crushing plant will be set up and operated in the northern part of the Site as shown on Figure 8.5.

The area set aside will include a 5 m high noise-attenuation berm, hardcore surface area and will be landscaped appropriately (Figures 8.5 and 8.6). Screening and crushing plant will be employed to process imported materials to produce recycled aggregates for on-Site or off-Site use.

It is expected that the majority of inert waste materials arriving at the Facility will be source-segregated, therefore will be emplaced directly in lined cells with no on-Site segregation/processing. However, it is expected that ca. 15% of the inert waste materials will not be source-segregated, thus requiring processing prior to emplacement. As such, the IWPA will be used to sort/process loads, if necessary, of mixed inert waste arriving on Site.

8.5 Initial Development/Restoration Works

Upon receipt of a waste licence and planning permission, and establishment of the infrastructure described in the preceding section of this EIS, the ongoing restoration works described herein, including importation of inert soil, will be undertaken concurrently with the construction of essential and enabling drainage works.

8.5.1 Existing Surface Water Drainage and Initial Drainage Works

8.5.1.1 Existing Surface Water Drainage

As shown on Figure 8.1 there are 5 No. existing ponds on the Site labelled A1, A2, A3, B and C. To restore the Site ponds A1, A2 and A3 will be filled in. A new pond will be constructed on the western boundary (Figure 8.3), as agreed with the Management of Punchestown Racecourse.

Table 8.1: Existing Site Drainage Conditions – Details of Surface Water Catchments

Catchment Area	Area (ha)	Description	Discharge Outlet/ Water Flows Toward
A	ca. 12.7	Bare soils, some made ground and hardcore in the eastern part	Infiltrates directly to ground or runs to Ponds A1, A2, A3 & infiltrates there; no external discharge.
B	ca. 6.0	Bare soils, minor recolonising vegetation	Infiltrates directly to ground or runs toward eastern corner; no external discharge.
C	ca. 2.4	Bare ground, some hard-standing areas	Runs toward Pond C, minor infiltration directly to ground. Pond C discharges after settlement to stream by road (tributary of Morell River).
D	ca. 22.2	Mostly grassed, some recolonising vegetation, some bare ground in western part	Infiltrates directly to ground or runs toward western corner; no external discharge.
E	ca. 23.7	Grassed, small amount of scrub along boundary with residence to east (area includes 2.8 ha beside residence); rushes to south of Pond B.	Infiltrates directly to ground or runs toward Pond B; no external discharge.
F	ca. 3.4	Grassed	Infiltrates directly to ground or runs toward south-western corner; some small runoff off-Site.

The existing surface water drainage on the Site can be subdivided into six (6 no) catchments labelled A to F on Figure 8.1. The size of each of these catchments, their ground surface and their discharge outlet, is described in Table 8.1. It can be seen from Table 8.1 that, in essence, little of the rainfall currently falling on the Site leaves the Site footprint.

8.5.1.2 Initial Drainage Works

The proposed initial drainage works, designed to protect groundwater, manage runoff and prevent silting of natural watercourses located downstream of the Application Site, are described below and shown schematically in Figure 8.7.

1. A new pond will be excavated mid-way along the western boundary of the Site, to the depth of the winter-high water table (Figure 8.7 – View A).
2. When the new pond is excavated an infiltration swale will be cut (through native soils and down to winter-high water table) southward along the western boundary to connect Ponds A1 and A2 with the new pond.
3. The existing compound, the proposed location of the Inert Waste Processing Area (IWPA), will be dug out so as to accommodate the infrastructure required, and graded so that all runoff is directed to Pond C, the existing silt pond beside the Site entrance (Figure 8.5 shows the proposed layout of the IWPA).
4. Pond A3 will be pumped-out into the infiltration swale.
5. Concurrently with Step 4, Pond A3 will be backfilled with native Site-won free-draining natural materials to an elevation 1 m above winter-high water table.
6. A made ground cofferdam will be constructed across the inlet between Ponds A1 and A2 to allow pumping out of Pond A2 into the infiltration swale (Figure 8.7 – View B).
7. Pond A2 will be pumped-out into the infiltration swale.
8. Concurrently with Step 7, Pond A2 will be backfilled with native Site-won free-draining natural materials to an elevation 1 m above winter-high water table.
9. Pond A1 will be pumped out to the swale feature on the western boundary. Concurrently with pumping out, Pond A1 will be backfilled with native Site-won free-draining natural materials to an elevation 1 m above winter-high water table (Figure 8.7 – View C).

Drains/infiltration ditches will be constructed along the north and western boundary of the Site as necessary to prevent off-Site surface water runoff.

8.5.2 Perimeter and Internal Berms and Embankments

The location of proposed berm construction is shown in Figure 8.4. A landscape and noise attenuation berm will be constructed on the northern/north-eastern side of the Site. Where necessary, a temporary 3 m high screen mound will be constructed along the eastern limits of the restoration operations to restrict views of the development from the rear of properties on the eastern boundary.

An internal visual screening berm will be constructed on the northern side of the proposed IWPA as shown on Figures 8.5 and 8.6.

Prior to commencement of restoration works in the southern part of the Site, a screening and noise attenuation berm will be constructed immediately north of Pond B in order to protect the area which is important to lapwing for nesting and foraging. A suitably qualified person or ecologist will be present during the construction of the berm, to oversee the works. The lapwing will be monitored during the breeding and non-breeding season during the restoration works.

A visual screening berm will be constructed along the western boundary, as agreed with the Management of Punchestown Racecourse, in conjunction with construction of the new pond and infiltration trench and backfilling of ponds described in the previous section.

All internal earth-fill slopes will be formed at grades no steeper than 1V:2H. All outer slopes will be graded to 1V:2H or shallower. External slopes will be topsoiled, trimmed, and seeded as soon as possible after completion.

The embankments will be constructed from site-won materials or suitable imported material, which will include granular and cohesive materials.

8.6 Ongoing Restoration Works

Source-segregated inert materials (ca. 85%) and on-Site processed and segregated inert wastes will be used at the Site to achieve a final restoration surface. The following is a detailed description of the design of the restoration works.

8.6.1 Overview of Design

The potential extent of the placement of inert material and the proposed restoration levels for the restored landform are shown on Figure 8.3. Cross-sections of the completed landform are shown on Figure 8.8.

Excavation cuts and fills will be required to prepare the Site for lining materials and make it ready to accept imported soils etc. Earthworks construction will be ongoing over the life of landfilling activities on the Site.

The infill below the surrounding land surface will range between 3 and 30 metres deep. The maximum level of deposited inert materials will be 168 mAOD.

The edge of the lined area (footprint) of the inert Facility will be ca. 40 ha. Buffer lands will be available for fencing, environmental monitoring installations, Site roads, and surface water drainage systems. The buffer lands will also allow for provision of landscaping berms and other vegetation as previously described.

The buffer lands in the southern part of the Site will be retained as they provide important habitat for lapwing.

8.6.2 Lining System

Areas upon which imported liner and materials will be placed will include a base and slope lining system. Best practice for facilities such as that proposed at the Walshestown Pit dictates that a lining system on the base side slopes will be a mineral liner that will comprise a layer of compacted clayey silt (i.e. a compacted clay liner – CCL) a minimum of 1 m thick. The soil liner will have a co-efficient of permeability of less than or equal to 1×10^{-7} m/sec. The existing ground surface will be graded and/or excavated to allow construction of the lining system. Suitable existing in-situ soils will be excavated and re-used to form the liner. Some imported materials may be required to form a liner meeting the specifications.

8.6.3 Phasing of Ongoing Restoration Works

The conceptual plan for this Site is to develop the lined inert facility in distinct zones, as identified through a progressive filling and restoration colour system on Figures 8.9 and 8.10.

The southern part of the Site will be screened off prior to the commencement of restoration works (during the non-breeding bird season of 1 September to 1 March), in order to protect lapwing habitat.

The first zones to be restored will be in the vicinity of Ponds A1, A2 and A3 – with these ponds being backfilled initially with native Site-won free-draining natural materials and then imported materials.

Later zones will be backfilled in stages (bench-style). Restoration filling will occur behind the screening berm and continue until such time as it is necessary to start another stage or bench. Any previously unlined ground will be lined before it is filled over, so that as

benching progresses lining progresses. A schematic cross-sectional representation of this filling process is shown on Figure 8.10.

The final zone comprises the area of the proposed IWPA and adjoining hardstand. It is assumed for the purpose of this report that the IWPA and associated infrastructure and hardstand will be decommissioned. This area would then be filled and restored to ultimately produce a landform suitable for light agricultural grazing to maintain species rich grasslands, and in keeping with the surrounding landscape.

8.6.4 Surface Water Management Works during and post completion of the Restoration Works

During the restoration activities and upon completion of the landform there will be a need to manage runoff and prevent silting of natural watercourses located downstream of the Application Site. In order to take consideration of possible increased storm surges (and a possible 5% increase in annual precipitation) due to climate change, surface water management features will be designed to accommodate the volume of water expected in a 1-in-100 year storm of 60 minute duration plus 20% (i.e. 46.44 mm), as used by OPW in flood relief design works (pers. comm. Mr. Tony Smyth, 17 October 2008). The proposed surface water management works are described below.

A perimeter infiltration swale will be constructed at the foot of the screening berm around the northern and western Site perimeter to collect rainfall runoff and allow it to infiltrate to ground (Figure 8.4). Falls in this trench will be designed such as to feed water which does not infiltrate to ground toward the proposed new pond on the western boundary.

To prevent ponding in contours on the restored surface and minimise infiltration to the backfilled body, temporary and/or permanent collector trenches will be constructed within zones, as required, to direct water to the perimeter infiltration trench.

Storm water will be accommodated in the new pond on the western boundary where infiltration to ground will occur through the base and sides. Provision for overflow will be installed at an elevation of ca. 145 mAOD, with discharge being by means of a pipe to Pond B.

The final restoration surface contours are shown on Figure 8.3. It has been designed, and will be constructed, in such a way that rainfall will shed to the perimeter infiltration trench. The resulting surface water catchments are also shown on Figure 8.3, and their size, a description of their ground surface, and their discharge outlets, are given in Table 8.2. It can be seen from the table that, in essence, little of the rainfall landing on the Site in future will leave the Site footprint, therefore preserving the current water balance of the Site.

Table 8.2: Proposed Site Drainage Conditions – Details of Surface Water Catchments

Catchment Area	Area (ha)	Description	Discharge Outlet/ Water Flows Toward
G	ca. 3.6	Grassed	Runs off to surface water management Pond C
H	ca. 3.1	Grassed	Runs off to infiltration trench on northern and northeastern boundaries
I	ca. 25	Grassed	Runs off to the new water feature and infiltration trench on western boundary & infiltrates there; stormwater overflow at ca.145 mAOD to Pond B
J	ca. 11.8	Grassed (includes majority of area beside residence to east)	Runs off to constructed surface watercourse feature which feeds to new water feature on western boundary
K	ca. 17.6	Grassed	Some reduction in northern extent of existing catchment E (Figure 8.1 & Table 8.1), otherwise no change; infiltrates directly to ground or runs toward Pond B. No external discharge.
F	ca. 3.4	Grassed	No change: infiltrates directly to ground or runs toward south-western corner of Site; some small runoff off-Site

Note: total catchment area described above is 64.5 ha.

8.6.5 Capping System

Capping operations will be carried out on an on-going basis once final restoration levels are reached. The purpose of the cap will be to:

- Shed rainfall and minimize infiltration;
- Isolate inert materials from the terrestrial environment; and
- Ensure there is no dust from the Facility in the post-closure period.

The proposed capping system which will be completed over an area of ca. 40 ha is presented in Table 8.3 starting from the surface down.

Table 8.3: Components of the Proposed Capping System

Component	Nominal Thickness (mm)
Growth Medium	150
Subsoil	850

8.6.6 Material Requirements

The Site footprint and the existing and final restoration contours govern the volume of the material required to complete the restoration works. The final restoration contours are shown on Figure 8.3. The shape and height of the landform, which plateaus at ca.168 mAOD, have been designed based on input from the project engineers, scientists and landscape architects. Capping layers totalling one metre (including minimum 150 mm of growth medium with the balance subsoil) will be placed to complete the final surface of the landform.

The cut-and-fill requirements to form the western swale, surface water pond, berms and IWPA are indicated in Table 8.4.

Table 8.4 Earthworks Quantities

Works	Volume Estimates (m ³)	
	Cut	Fill
Initial Berm and Surface Water Pond/Swale	20,000	60,000
Inert Waste Processing Area	93,000	3,000
Total	113,000	63,000

The computed potential volume of the void formed by the existing and proposed ground levels on Figure 8.8 is approximately 4.2 million m³. This volume will include lining and capping layers.

The anticipated tonnage of inert materials that will be imported to fill the ca. 4.2 million m³ void is ca. 7.6 million tonnes, based on a post-settlement density of 1.8 tonnes/m³.

8.6.7 Detailed Restoration Master Plan

The following concepts are included in the restoration master plan for the Walshestown Site (Figure 10.3):

- Permanent Water feature on the common boundary with Punchestown Racecourse. This water feature will also support wintering waterfowl; and
- Reconstruct Priests' Hill to provide viewing area for Herdsgarden Leap.

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8.7 Landscaping and Restoration

8.7.1 Introduction

Final restoration (planting) proposals have been developed on the basis of the following key objectives:

- Final end-use is to provide semi-natural grassland area;
- Encourage wide range of habitats for maximum ecological diversity and its value for wildlife;
- Integrate the final landform into the local landscape;
- To improve the visual quality of the existing Site for surrounding sensitive visual receptors, in particular views from the Punchestown Racecourse; and
- To deliver a high quality planting scheme of lasting benefit.

The plan is described under the following headings:

- Existing and Proposed Habitats (Section 8.7.2);
- Planting and Maintenance (Section 8.7.3); and
- Commitments to Habitat Creation and Retention (Section 8.7.4).

8.7.2 Existing and Proposed Habitats

Habitats on the Site vary in their ecological value, the highest value habitats being the wet grassland in the southern section of the Site, where lapwing, a Red listed species (Lynas *et al.*, 2007), forage and nest. Other habitats that are rated as high and locally important are the exposed sandy slopes which contain Sand martin colonies (an Amber listed species) and the mature hedgerows and treelines that edge the Site, as they serve as wildlife corridors linking to the surrounding landscape. The areas of calcareous grassland add diversity to the Site and provide valuable habitat for a variety of species such as orchids and invertebrates. The scrub is dominated by gorse patches and is considered of moderate value.

This Site was previously managed for agriculture, similar to the fields of the surrounding area. The planned restoration offers an opportunity to increase the nature diversity within the local landscape and establish habitats with a greater nature conservation value than the ones that previously existed on the Site. Proposed new habitats include semi-natural grassland, species-rich hedgerows, woodland and scrub areas, while retaining other habitats. These habitats are outlined below.

Proposed species mixes relating to each habitat are detailed in Section 8.7.3.1. The final restoration plan is presented on Figure 10.3.

Proposed nature conservation elements are as follows:

- Existing hedgerows and treelines will be retained where possible. It is vital that the retained hedgerows and treelines are not damaged during the construction/operational phases. A 3 m buffer will be fenced off between the hedgerow and the active restoration area in order to protect the integrity of the hedgerow and associated understorey.
- Creation of woodland using native species. Small clusters of native Ash trees will be planted on the slopes of the northwestern edge of the Site forming a link with the hedgerows bordering the Site. The trees will add to the diversity of the Site and provide habitat for tree and woodland species.
- Additional hedgerow and scrub will be planted. Hedgerow design will reflect the local type in both structure and species. Stock will be native and preferably local if possible. For stock-proofing a 4:1 hawthorn to blackthorn mix should be used. The species mix to be used in this case is detailed in Section 8.7.3.1.

The planted hedgerow along the northwest boundary of the Site will be managed to retain a box-like hedgerow of 3m. While other areas of planted hedgerow will be allowed to mature and will only need trimming every 10 to 15 years.

- Grassland creation with bare patches will be created. Areas of this habitat are to be created as part of the planned restoration, and managed appropriately for the development and maintenance of a species-diverse sward. It is envisaged that a combination of light seeding and natural regeneration will allow the establishment of species-diverse grassland. Areas of exposed stone and bare patches will be scattered across the grassland to create a mosaic of habitats for flora and fauna such as basking butterflies and moths as well as for other invertebrates. The grassland will be left to develop for two years and then grazed lightly to maintain a diverse sward.

An area of grassland will be fenced off in the northern part of the Site to allow meadow to develop, it is expected that this area will be grazed to some extent by rabbits, which are currently present on the Site. The different grazing patterns will promote greater diversity within this and other grasslands of the Site.

If grazing is not carried out then half of the area of grassland can be cut each winter (with cuttings removed to prevent additional nutrient input to the soil) to promote the development of short and tall swards, which provide good cover for faunal species (Gilbert & Anderson, 1998).

- Retention of wet improved grassland and pond. The area of wet improved grassland and pond which is edged by bare patches in the southern part of the Site will be

retained in order to protect the lapwing (a Red listed species). The area will be fenced off and screened by a berm in order to minimise disturbance to the lapwing and other birds using the area. The screening berm will be positioned during the non-breeding bird season (1 September to 1 March) in order to avoid disturbance of breeding lapwing.

Lapwing require two types of habitat – open ground for nesting (bare patches and scrapes) and wet pasture grassland for feeding. Key to successful chick-rearing is the close proximity of these habitats. The current management and grazing regime of the grassland along with the adjacent open bare patches appears ideal for lapwing.

- Creation of a water feature A water feature will be located on the western edge of the site to offer habitat for those waterfowl species currently using the water bodies on the Site. This pond will continue to be fed from groundwater and surface water. A long narrow ditch/swale will extend from the pond north ; its water levels will fluctuate and will add to the diversity of wetland habitat on the Site. It is likely that it will become colonised by rushes and provide habitat for species such as Snipe and Moorhen.

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8.7.3 Planting and Maintenance

8.7.3.1 Plant Species

The plant species chosen for the restoration proposals have been based upon their ecological value, their occurrence in the locality and reliability of establishment under a variety of soil conditions. The proposed plant species would consist of native species of local provenance, where possible, but as a minimum, of Irish provenance. Transplant material of height range 300-600 mm, either cell grown or bare root stock, is most likely to be used.

Hedgerow Mix (double staggered row with 7 no. plants per linear metre):

<i>Crataegus monogyna</i>	Hawthorn	50%
<i>Prunus spinosa</i>	Blackthorn	25%
<i>Corylus avellana</i>	Hazel	10%
<i>Ilex aquifolium</i>	Holly	5%
<i>Rosa canina</i>	Dog Rose	5%
<i>Euonymus europaeus</i>	Spindle tree	5%

Berms (soil stabilisation mix):

<i>Agrostis stolonifera</i>	Creeping bent	30%
<i>Festuca rubra</i>	Red fescue	30%
<i>Trifolium pratense</i>	Red clover	25%
<i>Ranunculus repens</i>	Creeping buttercup	5%
<i>Lotus corniculatus</i>	Birds-foot trefoil	5%
<i>Leucanthemum vulgare</i>	Ox-eye daisy	5%

Neutral Grassland seedmix:

<i>Festuca rubra</i>	Red fescue	10%
<i>Cynosurus cristatus</i>	Crested dog's-tail	30%
<i>Holcus lanatus</i>	Yorkshire fog	6%
<i>Dactylis glomerata</i>	Coltsfoot	6%
<i>Agrostis capillaris</i>	Common bent	20%
<i>Anthoxanthum odoratum</i>	Sweet vernal-grass	5%
<i>Festuca pratensis</i>	Meadow fescue	2%
<i>Lotus corniculatus</i>	Common bird's-foot-trefoil	5%
<i>Plantago lanceolata</i>	Ribwort plantain	2%
<i>Trifolium pratense</i>	Red clover	2%
<i>Bellis perennis</i>	Daisy	2%
<i>Lathyrus pratense</i>	Meadow vetchling	2%
<i>Leucanthemum vulgare</i>	Oxeye daisy	5%
<i>Knautia arvensis</i>	Field scabious	2%
<i>Rhinanthus minor</i>	Yellow rattle	1%

Woodland - Clusters of Trees:

Clusters of Ash *Fraxinus excelsiour* will be planted on the slopes of the northwestern corner of the Site. Trees will be planted at varying distances between 1.5m X 1.5m to 3m X 3m spacings. A total of five clusters of 10 trees in each will be planted.

8.7.3.2 Planting Techniques

Trees and shrubs

Tree and shrub species will be planted directly into previously prepared pits incorporating 30gms of approved slow release fertiliser per planting station. Trees and hedgerow planting will be protected by rabbit-proof guards and staked appropriately.

Semi-natural grassland

The area to be developed as grassland will comprise subsoil (200mm depth) that will be cross-rippled and sown with a neutral grassland seedmix from indigenous seed sources; areas treated in this manner will become naturally colonised by species from adjacent plant communities (NRA, 2005). **No fertiliser or soil improver** will be used in the scrub or grassland areas.

Bare patches of ground will be left in places throughout the grassland area to create a habitat mosaic and to provide alternative habitat for invertebrates etc. as well as potential nesting areas for ground nesting bird species.

Temporary berms

Temporary soil berms will be planted with a light grass seedmix as outlined above, in order to stabilise the berms, prevent erosion of soil and also to prevent colonisation by pernicious weed species such as ragwort.

8.7.3.3 Maintenance

As a general practice, areas of planting will be maintained in good condition through inspection of rabbit spirals and the making good of any damage to them. Planted areas will be maintained where necessary and all failures or badly damaged plants will be replaced on an annual basis. Seeded areas will be monitored for pernicious weed growth and a consistent sward maintained for its nature conservation interest.

Newly created grassland will be allowed to develop over two years and thereafter some light winter grazing will be sufficient to maintain a diverse sward. Some spot treatment to control pernicious weeds may also be required.

The planted hedgerow along the northwestern boundary of the Site will be managed to retain a box-like hedgerow of 3m. While other areas of planted hedgerow will be allowed to mature and will only need trimming every 10 to 15 years.

8.7.3.4 Long-term Management

The management objectives aim to create a mosaic of habitats comprising scrub, grassy verges along hedgerow and treelines, semi-natural grassland whose species composition reflects, as far as feasible, the character of similar semi-natural habitats.

The following objectives for each habitat type will be included in the management plan:

- Scrub – Some thinning will be necessary to improve the structure of the scrub; in some areas a dense thicket will be left;

Hedgerows – These will be managed by cutting and coppicing when necessary (between 1 September and end February); The planted hedgerow along the northwest boundary of the Site will be managed yearly to retain a box-like hedgerow of 3m. While other areas of planted hedgerow will be allowed to mature and will only need trimming every 10 to 15 years.

- Grassland – The grassland areas once established would, without any management, eventually become rank, lose species diversity and become colonised by scrub. Therefore management by light winter grazing is appropriate where indicated in this plan; and
- An area will be fenced off in the northern section of the Site to allow a wildflower meadow to develop, it is envisaged that this area will be maintained by grazing by the residential rabbit population (Figure 10.3).

8.7.4 **Commitments to Habitat Creation and Retention**

This plan has detailed commitments to retain/enhance or create the following habitats:

- Retention, where possible of habitats on the Site including hedgerow, treelines, pond and wet agricultural grasslands (for lapwing and other bird species);
- Promotion of nature conservation and a diversity of habitats in the Site including creation of semi-natural neutral grassland with some bare areas, hedgerows, woodland, scrub and wet areas; and
- Monitoring of lapwing during the breeding and non-breeding season over the course of the restoration works.

8.8 Monitoring Infrastructure

During the initial construction of enabling work and the following restoration works air quality, groundwater, surface water and noise will be monitored.

All existing monitoring boreholes remaining after completion of the Facility will be retained. At least three down-gradient and two up-gradient monitoring boreholes in the overburden and bedrock will be provided (Figure 19.1).

Surface water quality will be monitored at a select number of locations downstream of the Facility.

8.9 Indicative Programme of Work

A preliminary programme for the works described above has been devised. The likely scale of the overall works programme is estimated at about 15 years. The programme from date of grant of permission is provided in Table 8.5.

Table 8.5: Programme of Development Works at the Walshestown Pit

Stage	Description	Duration (years)
1	Compliance Reporting	0.25
2	Preparatory Works – set up Site infrastructure and construct perimeter drainage systems and berms	0.75
3	Importation of Materials for Land Restoration	12.5
4	Final Capping and Drainage Works and Decommissioning	1.5
	Total	15.0

8.10 Management of the Facility

8.10.1 Overview

It is proposed to appoint a person with appropriate experience to oversee the construction, operation and closure of the Facility, including the decommissioning of all temporary works and restoration of all disturbed areas within the licensed Facility. The licensee will be

required by conditions of the Waste Licence to appoint a competent person to act as an overall Facility Manager. An Assistance Facility Manager will need to be named to stand in for the Facility Manager during holidays or in case of illness or other reasons of unavailability.

Monitoring of the Facility will be conducted by a person with appropriate experience.

At this early stage in the approval process it is not possible to provide details of designated staff at the proposed Facility. However, Table 8.6 sets out the competence requirements for the key staff.

8.10.2 Facility Management Personnel

The following management structure (Table 8.6) describes the competence requirements of key staff during construction of the proposed facility.

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Table 8.6: Competence Requirements of Key Staff at the Proposed Facility

Name	Position	Based	Duties and Responsibilities	Experience / Qualifications
To be confirmed prior to works	Facility Manager	Site	Supervision of operations on Site, management of waste licence conditions, supervisor of Site engineering works and overall management of Site staff. Responsible for the day-to-day running of the Facility as per licence requirements. This includes the operation and control of all abatement systems on Site as per operational and environmental management procedures.	Suitable engineering or similar appropriate qualification. Minimum 5 years waste management experience. Safe Pass Programme FÁS, Waste Management Training Programme, or equivalent.
To be confirmed prior to works	Assistant Facility Manager	Site	Back up person to the Facility Manager in the event of holidays, illness or other reasons of unavailability. Duties will be as indicated for the Facility Manager.	Suitable engineering or similar appropriate qualification. Safe Pass Programme FÁS, Waste Management Training Programme or equivalent.
To be confirmed prior to works	Scientific Officer	Site	Responsible for on Site monitoring and reporting as per the frequency of the waste licence.	Appropriate Scientific Qualification.
To be confirmed prior to works	Weighbridge Operator	Site	Responsible for documentation of all material that arrives at the Site (inspection and recording) and the maintenance of the weighbridge to maintain accurate readings of incoming material.	Safe Pass Programme FÁS.
To be confirmed prior to works	Facility Foreman	Site	Carry out daily Facility-related operations as per operational and management procedures.	Safe Pass Programme FÁS, Waste Facility Operative Training Programme or equivalent.

8.11 Health and Safety

Worked out sand and gravel sites such as the Walshestown Pit can present occupational safety and health risks for workers during restoration activities, as known and unknown safety hazards can be encountered at any stage of site works.

The Walshestown Facility will be designed and constructed in accordance with the requirements of relevant Irish Health & Safety Legislation. Strict safety management systems and a strong safety culture will be in place during the construction and operation of the Facility including the closure and aftercare phase. These systems will ensure compliance with relevant Irish legislation and safe working conditions on the Site.

A preliminary Health & Safety Plan will be developed during the design stage in accordance with the Safety and Health at Work (Construction) Regulations 2006. This will be further developed on appointment of the main contractor in advance of restoration activities commencing. The main contractor will assume the role of Project Supervisor Construction Stage (PSCS) as per the requirements of the aforementioned construction safety Regulations. The Health & Safety Plan will include details on Site arrangements for safety as well as specific information on Site risk assessments.

Employee safety training will focus on increasing site specific hazard awareness, procedures and preventative measures to minimise the risk of a serious incident occurring. Personnel will be equipped with knowledge and skills to recognise the hazards present, how to assess and minimise the risk which will enable them to perform their duties in a manner that does not represent a safety hazard. All personnel on Site will have defined safety responsibilities and accountabilities.

Public safety will be addressed by restricting Site access during construction and operational phases.

The Applicant has a Corporate Safety Statement. A Site specific Safety Statement will be developed as per the requirements of the Safety Health & Welfare at Work Act 2005 and subsequent regulations. This document will detail the safety management on Site as well as provide a comprehensive hazard and risk assessment for all ongoing Site tasks and activities.

8.12 Hours of Construction, Operation and Other Restoration Work

In keeping with EPA Guidance, activity operations shall be confined to the hours between 07.00 and 18.00, Monday to Friday inclusive (excluding Bank Holidays) or as may be agreed with the Planning Authority/EPA, and between 07.00 and 14.00 on Saturdays, with no activities being permitted on Sundays or public holidays.

8.13 Plant

It is anticipated that the following plant (Table 8.7) will likely be needed during the initial enabling works:

Table 8.7: Potential List of Plant

Plant	Size	Number
Tracked excavators	20 to 35 tonne	4 No.
Mini digger/JCB		2 No.
Tracked low ground pressure bulldozers	D4 and D6	2 No.
Dump trucks	Variety 5 to 25 tonne	6 No.
Compactors	18 tonne dead weight	2 No.
Tractor with water bowser, leachate bowser and fuel bowser		1 No.
Sump and centrifugal pumps	Variety	4 No.
Tower lights		6 No.
Mobile finger screen		1 No.
Mobile crusher		1 No.
Two-way or three-way split screener		1 No.

8.14 Waste Management Procedures

8.14.1 Waste Reception

All wastes will be accepted via the Site entrance. Upon arrival, all delivery vehicles shall be directed to the Facility check-in office and weighbridge where the arrival of each load will be recorded. All documentation accompanying the waste and the waste carrier will be inspected, and the nature of the waste will be confirmed by the Weighbridge Operator/Check in Person. A waste transfer note containing the details of the load delivery time, date, tonnage, and carrier's details will be produced at the weighbridge.

An inspection of the haulier's consignment documents will be made by the Weighbridge Operator/Check in Person. If paper work is incomplete the Weighbridge Operator/Check in Person will retain the load until further information is provided. When the Weighbridge Operator/Check in Person is satisfied with the paper work and the origin of the wastes he/she will inform the driver of relevant Site Safety information and direct the driver to the tipping area.

8.14.2 Waste Handling Procedures

Restoration of the Site will be carried out in agreement with the EPA and in line with best practice. Restoration will be completed on a phased basis and will involve the filling of cells defined within each vertical stage in maximum 2 to 3-metre lifts with fill slopes no steeper than 1V:2H, to ensure the maximum slope stability. Phasing allows progressive filling and restoration to occur simultaneously. As shown on Figures 8.8 and 8.9 filling will progress in vertical stages and restoration will proceed from west to east. Each lift will be divided into cells in which surface water drainage will be managed. The size of cells will vary within any given vertical stage, but would typically be 1 to 2 ha in area.

Each landfill cell will be notionally subclassified into grids, identified by a unique reference number, in order to identify the specific deposition area of each waste load and build up a 3-D model of each landfill cell. The grid location of each incoming load will be recorded.

Waste will be deposited, inspected and spread in 2 to 3-metre lifts in each cell, with a bulldozer and compactor on Site ensuring waste is positioned and spread as required to ensure maximum cell stability.

8.14.3 Summary

A summary of the proposed waste placement procedure is provided below:

1. Cell construction will involve:
 - Preparation of the cell;
 - Laying of cell liner;
 - Testing of the cell liner; and
 - Validation that the cell meets EPA requirements.
2. The cell will be divided into sub-grids and an appropriate referencing system assigned (e.g. C1/D1 refers to cell 1, grid reference D, level 1);
3. Incoming loads will be directed to cell sub-grid;
4. Waste will be deposited by the delivery contractor;
5. Deposited waste will be spread and compacted;
6. Cell will be filled to a height of 3 m and then the next lift in the cell will be constructed until the entire cell has been filled; and
7. Upon completion of the final lift, capping will be applied and the cell restored.

8.15 Raw Materials, Substances Preparations and Energy

8.15.1 Diesel

The annual diesel consumption of the plant proposed for use at the Facility is not currently available as all plant has not been selected. Details will be provided to the EPA upon letting of the contract for the works.

8.15.2 Electricity

Electricity consumption is not currently available as all plant has not been selected. Details will be provided to the EPA upon letting of the contract for the works.

8.15.3 Water

The Site is connected to Kildare Co. Co. mains supply, and potable water will be obtained from this supply. Water for dust suppression and wheel wash will be abstracted from an existing groundwater well on-Site, close to the Facility entrance (see Figure 8.5). This is an historical well, and if supply is found to be not suitable an alternative borehole will be drilled.

8.15.4 Herbicides

The Licensee will furnish to the EPA the nature and quantities of chemicals if and when they are used.

8.15.5 Energy Audits

Energy audits will be undertaken at the Facility as part of the Environmental Management System (EMS) for the Facility. Reference to the appropriate guidance material and reporting of recommendations of the audit will be included in the Annual Environmental Report which will be a requirement under a Waste Licence issued by the Agency.

8.16 Potential Emissions from the Facility

The potential emissions from the Facility during its construction and closure, and post-closure phases are to air, surface water, groundwater and land. The emissions and the environmental media potentially affected are outlined in Table 8.8.

These emissions, mitigation strategies and the potential residual environmental effects are discussed in the relevant sections of the EIS. Mitigation strategies have also been discussed in previous sub sections of Section 8.0.

Table 8.8: Potential Emissions and Media Potentially Affected

Potential Emission	Environmental Media Potentially Affected
Dust	Air
Noise from plant and vehicles on Site	Air
Leachate from wastes	Groundwater beneath the Site and adjoining surface water

8.17 Potential Environmental Nuisances

The following sections describe the relevant environment; nuisance and mitigation strategies to control or eliminate these nuisances.

8.17.1 Bird Control

Birds will not be attracted to the proposed Facility hence no mitigation strategies are required. If birds appear there are various techniques to prevent intrusion that will be considered and implemented as required.

8.17.2 Dust Control

In order to ensure that no dust nuisance occurs during any phases of the development a series of mitigation measures and good working practices will be implemented as part of a dust minimisation plan. These measures are outlined below:

- Site roads will be regularly cleaned and maintained as appropriate. Hard surface roads will be swept to remove mud and aggregate materials from their surface;
- Any un-surfaced roads will be restricted to essential Site traffic only. Furthermore, any road that has the potential to give rise to fugitive dust will be regularly watered, as appropriate, during dry and/or windy conditions;
- Vehicles using Site roads will have their speed restricted, and this speed restriction will be enforced rigidly. On any un-surfaced Site road and on hard surfaced roads that Site management dictates speed will be restricted to 20km per hour;
- All vehicles exiting the Site will make use of a wheel wash facility, prior to entering onto public roads, to ensure mud and other wastes are not tracked onto public roads;
- Public roads outside the Site will be regularly inspected for cleanliness, and cleaned as necessary; and
- Water misting or sprays will be used as required if particularly dusty activities, (such as capping) are necessary during dry or windy periods.

In addition, the Waste Licence issued by the EPA may include additional measures and a requirement to monitor dust and particulates.

8.17.3 Fire Control

As the wastes are predominantly a mineral soil or broken rockfill, fires arising from these materials are not expected to be an issue or concern. In case of fire relating to offices, plant etc, standard fire prevention and control measures will be as follows:

- Emergency response contact numbers will be posted on prominent positions on the Site (fire service, police, ambulance and other agencies);
- A telephone system on the Site will ensure instant contact with the emergency services;
- A water supply (well or ponds) will be available on the Site;
- Fire hoses and extinguishers will be available on the Site;
- No burning of waste will be permitted on the Site; and
- There will be no unauthorised people allowed access to the Site and there will be a security company ensuring surveillance outside normal working hours.

8.17.4 Litter Control

Litter arising from the wastes to be received is not expected to be a problem as these wastes are expected to be predominantly mineral soils or broken rock. Litter from construction material packaging and the construction offices is a management responsibility and procedures will be put in place to deal specifically with these materials e.g. bins skips, refuse receptacles etc. Littering on the Site by anyone will not be tolerated and will result in disciplinary action. Litter management will include the operation of a litter patrol, which will inspect the Site boundaries and beyond daily and recover all wind-blown litter. All vehicles transporting waste on public roads will be required to have their loads covered.

8.17.5 Traffic Control

The entrance will allow movement of traffic into and out of the Site. Traffic signs will be used at the Site entrance and throughout the Site to control traffic. Speed limits will be imposed within the Facility. A traffic and transport assessment (TTA) is given in Section 9.0 and Appendix 4.

8.17.6 Vermin Control

Vermin control is not expected to be required as none of the wastes are putrescible. Vermin control is a management responsibility and procedures will be put in place to deal specifically with this issue if required. The Licensee will furnish to the Agency the nature and quantities of chemicals used if and when they are used.

8.17.7 Road Cleansing

Road cleansing is a management responsibility and procedures will be put in place to deal specifically with this issue. All lorries will go through a wheel-wash prior to exiting the Site. Road cleansing and sweeping will be carried out as required.

8.18 Closure, Restoration and Aftercare Management Plan

This is a requirement associated with holding a waste licence issued by the EPA. Licensees are required to compile what is known as a closure plan or Closure, Restoration and Aftercare Management Plan (CRAMP). The plan is usually given as a condition of the licence to be submitted within a certain timeframe.

In the case of the proposed restoration of the Walshestown Pit, the requirement for a Waste Licence is solely for restoration purposes and therefore the restoration of the Site is fully assessed throughout this report. However, the procedure for developing a CRAMP, in accordance with the “*Guidance on Environmental Liabilities, Risk Assessment, Residuals Management Plans and Financial Provision*”, (EPA 2006) is considered in Table 8.9.

8.19 References

Council Directive (1999) on the landfill of waste. (99/31/EC)

EPA (2000) Landfill Manual: Landfill Site Design. *Environmental Protection Agency, Wexford*.

EPA (1999) Landfill Manual: Restoration and Aftercare. *Environmental Protection Agency, Wexford*

Gilbert, O. L., & Anderson, P. (1998). *Habitat Creation and Repair*. Oxford University Press.

Lynas, P., Newton, S.F. & Robinson, J.A. (2007). The status of birds in Ireland: an analysis of conservation concern 2008-2013. *Irish Birds* **8(2)**, 149-166.

NRA (2005). *A Guide to Landscape Treatments for National Road Schemes in Ireland*. National Roads Authority, Ireland.

Table 8.9: Summary Preliminary Closure Restoration and Aftercare Management Plan (CRAMP)

Stage	Activity	Assessment
Closure	Wastes will be stopped from entering the Facility in Year 15.	<p>The type of closure can be categorised as either a Clean Closure or a Non-Clean Closure.</p> <p>Upon cessation of operations and subsequent decommissioning, there will be no remaining liabilities, thus this is considered a “clean closure”.</p> <p>On-going monitoring at the Site will be required as part of the closure process, for a limited period of 5 years post closure.</p>
Decommissioning	The decommissioning of the Inert Waste Facility will take the form of the removal of the non-permanent infrastructure at the Site. All plant equipment and vehicle use will cease and the final capping will be checked.	The activity at the Site will cease except for the on-going medium-term monitoring (5 years).
Restoration	<p>The restoration stage will be undertaken in conjunction with the closure and decommissioning stages. After placement of the capping layer, the subsoil and growth medium will be placed across the capped surface. The final restored levels are shown in Figure 8.3.</p> <p>The restored surface will be developed into a variety of habitats to promote biodiversity, and will include a surface drainage system comprising French drains with perforated pipes. The area will be fenced by enhancing existing dense hedgerows and installing 1.2 metre high post-and-wire fencing where required.</p>	The restoration process will be full and complete, leaving a landscaped finish and ultimately improving the condition of the area both visually and in terms of the reduced health and safety risks. More details on the landscape plan are given in Section 16.0.
Aftercare Management Plan	An aftercare management plan comes in the form of engineering works maintenance, landscape management and potential emission control. It is unlikely that the Facility would ever be surrendered or transferred, thus the responsibility of the aftercare will remain with the Licensee.	Monitoring for 5 years, annual grazing each September.

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16. LANDSCAPE AND VISUAL IMPACT (REVISED FROM DEC.2008)

Section 1 (Introduction), Section 6 (Site Setting), Section 8 (Description of the Proposed Development) and Section 10 (Flora & Fauna) of the EIS should be referred to before reading this section.

16.1 Introduction

This section of the EIS is a summary of the anticipated landscape and visual impacts of the proposed restoration of Walshestown Pit (the 'Site') from initial Site establishment, during the operational period and through to final restoration and Site closure. The location of the Site is shown in Figure 16.1.

The following assessment has been conducted in accordance with current guidance, namely Guidelines for Landscape and Visual Impact Assessment, (Second Edition); 2002, (The Landscape Institute and Institute of Environmental Management and Assessment.)

A desk-based study was carried out to gather information on the existing landscape and visual resource, planning context and planning designations. Information has been gathered from the following sources:

- Ordnance Survey (Ireland) coloured maps with contours;
- Aerial photography;
- Kildare County Development Plan 2005-2011; and
- Landscape Character Assessment, CAAS Environmental Services Ltd, 2003.

This assessment was prepared during May 2008; however consideration is also being given to potential impacts during the winter period. The assessment describes the following:

- The location, the Site and the existing landscape context;
- The evaluation of existing landscape quality and sensitivity to the proposed development;
- The predicted impact on landscape character as a result of phased infilling together with consideration of mitigation measures, both during the short and medium term and on final Site restoration;
- The visual impact of the development from key receptors and the sensitivity of those receptors for each development phase; and
- The degree of compliance with planning policy related to landscape.

16.2 Site Context

The Application Site falls within the townland boundaries of Walshestown, Blackhall, Bawnoge and Tipperkevin, Co Kildare. The Site is equidistant between the towns of Naas which is situated ca.5 km to the northwest and Blessington to the southeast. Immediately to

the north of the Site is the local primary road, Reference L6042, from which access to the Site is gained.

The proposed development consists of phased infilling principally within an area of land that had previously been worked for sand and gravel, the reserve of which is now exhausted. The unrestored working areas and plant Site area amounts to ca. 40 hectares with the remaining ca.28 hectares having been previously restored and currently used for grazing. It is proposed to infill the Site at an average of 330,000 tonnes per annum over a 13 year period.

The proposed development will comprise the following:

- Importing inert materials;
- Handling and screening of inert materials where necessary in the inert waste processing area;
- Recovery of soils from on-Site or off-Site sources for the purposes of using these materials for final restoration;
- Backfilling the Site with available on-Site and imported inert materials;
- Re-contouring the Site generally to re-instate the landform back to a rising landform which merges with the surrounding topography and landscape; and
- Final restoration of the Site and the removal of all plant and machinery.

Site establishment works will be carried out at the outset to minimise infilling impacts and progressive restoration will be undertaken in parallel with infill development works.

16.3 Landscape Baseline Conditions

16.3.1 Description of Site

The Application Site largely comprises of land which has been previously worked for sand and gravel. Some of the unrestored areas of the Site have become vegetated with pioneer species typical of recolonising ground. Access to the Site is from the L6042 road which leads directly into the plant Site, which was previously used for the processing of sand and gravel from the Site and is now non-operational. A concrete batching plant remains on the Site along with a weighbridge and office. Lands to the south of the Site have been restored and are used for grazing. There are three sizeable water bodies on Site (ponds A1/A2, A3 and B), these have been created by previous quarrying activities. Surrounding the Site on all boundaries are mature hedgerows and some hedgerow trees. The western and northern Site boundaries are defined by a single line of Cypress and Larch trees respectively. (It is noted that since this LVIA was carried out, these trees have since been removed by Punchestown Management in agreement with Cemex personnel)).

Grazing of hedgerows and trees is in evidence along hedgerow boundaries, where access by stock is possible.

The following native tree and shrub species have been noted on Site; ash (*Fraxinus excelsior*), elder (*Sambucus nigra*) and hawthorn (*Crataegus monogyna*) trees, with gorse (*Ulex europaeus*), bramble (*Rubus fruticosus*), ivy (*Hedera helix*), nettle (*Urtica dioica*), curled dock (*R. crispus*), creeping buttercup (*R. repens*), creeping thistle (*Cirsium arvense*), herb-Robert (*Geranium robertianum*), sticky mouse-ear (*Cerastium glomeratum*), dandelion (*Taraxacum* agg.), fescues (*Festuca* sp.) and meadow grass (*Poa* sp.) in the understorey.

16.3.2 Landscape Context

A Landscape Character Assessment (LCA) for Kildare County was undertaken by CAAS Environmental Services Ltd in October 2003 and is included as a supporting document in the County Development Plan 2005-2011. The purpose of the LCA is to identify and describe the landscape character of each part of the County, its capacity to accept change (or to absorb development without disproportionate effects) and to produce a series of policies to guide development in each type of landscape. The landscape of Kildare County has been divided into seventeen Character Units within this document.

The Site is situated within the Landscape Character area identified as “The Eastern Transition Lands” and described as follows:

This transitional landscape character unit, located between the uplands and lowlands to the east of the County is characterised by undulating topography.....The fields are generally of medium size and regular pattern, with commonly maintained hedgerows. Gorse and natural vegetation occur at some areas of this unit.

The terrain gently rises from the lowland areas to the hilltops of the eastern Kildare Uplands (Chapter 19 of the of the Development Plan). The land undulates through a series of hilltops, the main ones being: Old Killkullen Hill (179 mAOD), Bullhill (174 mAOD), Mullacash Hill (171 mAOD), Nine Tree Hill (168 mAOD) and Carrighill (166 mAOD). The elevated vantage points along the local roads provide long distance views of the Kildare lowlands. The skyline to the east of this unit is defined by the eastern uplands, distant views including the neighbouring Wicklow Mountains, define the extent of visibility. The Hilltops of the Chair of Kildare Hills partially define the skyline to the west.

Critical Landscape Factors are as follows

- Undulating Topography

Undulating topography which characterises this unit, provides a physical shielding within the lee of the hills and thus, can conceal relatively large new features on the lower lying lands. Furthermore, the dynamic and complex nature of undulating land encloses local vistas, rendering development unobtrusive on the overall landscape.

- Slopes

Sloping land often provides an area with its character and intensifies the visual prominence of any feature over greater distances. The gentle slopes of the hills in this character unit start to define the visual boundary of the adjacent lowland areas (further defined by the Eastern Uplands) and provide an increased potential for development to penetrate the ridgelines when viewed from local roads and villages in the area.

- Low Vegetation

The grassland, tillage fields and generally low hedgerows of this area are usually uniform in appearance, failing to break up vistas, and allowing long distance visibility. Existing well maintained hedgerows partially screen the lowest land parcels. Nevertheless, the commonly low vegetation proves unable to visually absorb new development.

- Shelter Vegetation

Shelter vegetation is represented at some stretches of this unit by coniferous plantations and the presence of scattered trees that grow on field hedgerows. In a similar manner to undulating topography, shelter vegetation has a shielding and absorbing quality in landscape terms. It can provide a natural visual barrier and also adds to the complexity of a vista, breaking it up to provide scale and containment for built forms.

High amenity areas are identified in the LCA i.e. those areas which have high outstanding natural beauty and/or a unique interest value. The Site does not fall within any high amenity areas identified within the LCA, the nearest proposed Natural Heritage site is at Redbog, situated ca. 5 km away to the northeast. The Site is also not within the sphere of influence of any Protected Views and Scenic Routes.

Habitats on Site consist primarily of recolonising bare ground, dry calcareous and neutral grassland, dry meadows and improved wet agricultural grassland.

The Site is not affected by any of the following environmental and landscape designations:

- National Heritage Areas;
- Special Areas of Conservation (SACs); or
- Special protection Areas (SPAs).

With regard to archaeology, the only item of interest within the Application Site is the proposed continuation of a possible trackway (KD024-32) 'The Pilgrims Walk' through the southern part of the Site. The continuation of this feature is included in the Final Restoration Plan (Section 10 and Figure 10.3).

With regard to tree preservation orders, these are identified on the Development Plan maps, but are all located in excess of 3 km away from the Site. The Site is also not within any of the High Amenity Views and Prospects identified in the LCA to be protected within Policy 9.45 of the current County Development Plan, Volume 1.

Figure 16.2 shows the Site in the context of local land use. Agricultural land within the study area is principally pastoral land, used both for grazing and silage. Development consists of a scattering of dwellings along local roads. There are a small number of scattered woodland copses located throughout the study area consisting mainly of deciduous trees. Deciduous tree cover consists mainly of hedgerow trees which appear in studded form along field boundary lengths, and as dense wooded lines. Field boundaries are primarily mixed hedgerows with a low percentage of walled boundaries. Field patterns and scale are varied throughout the study area.

16.3.3 Topography, Geology and Hydrology

The Site rises from approximately 145 mAOD at the northwestern boundary rising to 169 mAOD in the east. The eastern Site boundary runs parallel to a ridgeline trending northeast to southwest. This ridgeline is further defined by a local road, mature hedgerow and a small number of residential properties several of which overlook the Site. Other significant hills and ridges within the study area are located ca. 2 km to the east within the Eastern Uplands, such as Slieveroe Hill rising to 332 mAOD.

The basic bedrock geology for this area of Kildare County consists of fine grained greywacke, siltstones and shales (Carrighill Formation). Geological information described in this section is based on the Geological Survey of Ireland publication, Sheet No. 16. Additional detailed information has been taken from ground investigations carried out to assess the geological and hydrogeological conditions of the Application Site.

Figure 16.3 shows the Site location, landform/topographical analysis of the study area and its surroundings. Figure 16.4 depicts the existing site conditions (aerial photograph taken in 2004 which reflects current status).

There are very few watercourses and ditches in the area, the nearest watercourse being a small stream feature located to the north of the Site.

Overburden across the Site and its environs consists of hard, silty boulder clay overlain with fluvioglacial sands and gravels that have typically been removed during previous pit operations.

16.3.4 Local Landscape Character

The Site is situated within the Landscape Character Area identified as “The Eastern Transition Lands” . A rural landscape dominated by pastoral fields in a variety of scales, generally of irregular shape, and enclosed by mixed hedgerows and blocks of plantation woodland. Landform consists of undulating ridges affording to both open and enclosed views. Views are generally more open to the west and restricted by the eastern uplands to the east. Punchestown Racecourse and associated buildings to the west of the Site have a strong visual presence in the landscape. The buildings are large scale and form a landmark within the surrounding area. Residential properties are low in density and located in close proximity to the local roads.

16.3.5 Planning Policy Context

This section describes landscape designations and components of the physical landscape within the study area which have been, or may be, affected by the development proposals. We have reviewed the most relevant guidance documents related to landscape and visual impacts of this development and taken them into consideration.

Documents reviewed are as follows:

- Planning and Development Act 2000;
- Landscape and Landscape Assessment: Consultation Draft of Guidelines for Planning Authorities (June 2000); and
- Kildare County Development Plan 2005-2011.

The relevant Policy Statements within the Kildare County Development Plan are as follows:

Transition Areas

TA 1 To maintain the visual integrity of areas, which have retained a dominantly undisturbed upland character.

TA 2 To recognise that the lowlands are made up of a variety of working landscapes, that are critical resources for sustaining the economic and social well-being of the County.

TA 3 To continue to permit development that can utilise existing infrastructure, whilst taking account of local absorption opportunities provided by the landscape, landform and prevailing vegetation.

TA 4 To continue to facilitate appropriate development in an incremental and clustered manner, where feasible, that respects the scale, character and sensitivities of the local landscape, recognising the need for sustainable settlement patterns and economic activity within the County.

16.4 Methodology

Two separate methodologies have been used to assess landscape and visual impacts; these are described below.

16.4.1 Methodology for Assessment of Landscape Impacts

In defining the landscape impact significance, Tables 16.1 and 16.2 below have been used as guides. First the ‘*sensitivity*’ of the landscape resource and ‘*magnitude*’ of change that the proposed works will cause is assessed from Tables 16.1 and 16.2. This is then carried forward to Table 16.3 to help identify the ‘*significance*’ of landscape impacts on a scale of substantial, moderate or slight magnitude. The tables are only used as guides and it is up to the Landscape Architect carrying out the assessment to determine the final significance impact threshold of each effect based on professional judgement and experience. This exercise was carried out by Mr Barrie Gannon, Senior Landscape Architect (Golder Associates UK Ltd [GAUK]).

Table 16.1: Sensitivity Classification of Landscape Resource

Sensitivity of Landscape Resource	
Landscape of particularly distinctive character, susceptible to relatively small changes e.g. National Park.	High
Landscape with relatively ordinary characteristics reasonably tolerant of changes.	Medium
Landscape with few features of value or interest, potentially tolerant of significant change.	Low

Table 16.2: Magnitude Classification of Landscape Resource

Magnitude of Change	
Substantial change in landscape characteristics over an extensive area, ranging to very intensive change over a more limited area. Permanent, long term.	Substantial
Moderate change in landscape component over a wide area and/or moderate change in localised area.	Moderate
Discernable but slight change in any landscape component. Short term, temporary.	Slight
Virtually imperceptible change. Insignificant scale to affect the integrity of the landscape component.	Negligible

Table 16.3: Impact Significance (The Relationship Between Sensitivity and Magnitude)

	Low Sensitivity	Medium Sensitivity	High Sensitivity
Substantial Magnitude	Moderate impact	Substantial impact	Substantial impact
Moderate Magnitude	Slight impact	Moderate impact	Substantial impact
Slight Magnitude	Slight impact	Slight impact	Moderate impact
Negligible Magnitude	Negligible impact	Slight impact	Slight impact

Note: Landscape impacts could be adverse or beneficial.

16.4.2 Methodology for Assessment of Visual Impacts

Visual impact is the result of a change in view from receptors such as residential property, public rights of way, and land with public access, roads and offices. Residential properties are considered the most sensitive receptors to changes in view whereas road users are the least sensitive as their experience is transient. The magnitude of impact is assessed according to the scale of the effect, which will depend largely upon the size and type of the development and the distance of the receptor from the Site. The significance of visual impact depends upon the sensitivity of the receptor and the magnitude and duration of the effect.

Tables 16.4 and 16.5 were used as guides in determining the visual impact significance thresholds. First the *sensitivity* and *magnitude* were assessed from Tables 16.4 and 16.5. This was then carried forward to Table 16.6 to identify the *significance* of visual impacts. It was then judged by the GAUK Landscape Architect whether the significance of visual impact is *adverse* (negative) or *beneficial* (positive).

Table 16.4: Sensitivity of Visual Receptors

Sensitivity of Visual Receptor	
Residential properties less than 1 km from the development with direct views from ground floor and first floor windows towards the development. Public Rights of Way less than 1 km from the development with direct views.	High
Residential properties over 1 km from the development or with more restricted views towards the development. Public Rights of Way more than 1 km from the development, or with restricted views. Local side roads and lanes. Sporting and recreational facilities, allotments.	Medium
Offices, commercial developments and industrial sites. Main roads and rail routes.	Low

Table 16.5: Classification of Magnitude of Visual Receptors

Magnitude of Impact (Scale)	
The majority of viewers affected/major changes over a large proportion of the view.	Substantial
Many of the potential viewers affected/major changes over a smaller proportion of the view/moderate change in view/partial view.	Moderate
Few viewers affected/minor change in view/glimpsed view.	Slight
Indiscernible change in the view.	Negligible

Table 16.6: Significance of Impact (Relationship Between Sensitivity and Magnitude)

	Low Sensitivity	Medium Sensitivity	High Sensitivity
Substantial Magnitude	Moderate	Substantial	Substantial
Moderate Magnitude	Slight	Moderate	Substantial
Slight Magnitude	Slight	Slight	Moderate
Negligible Magnitude	Neutral	Neutral	Slight

16.5 Predicted Landscape Impacts

The predicted impacts of the development on the landscape have been assessed during initial Site establishment, phased restoration and on final restoration/Site closure.

The Site is located in the Eastern Transition Lands as described in Section 16.3.2.

The main effects on the landscape will be:

- i. Construction of a screen mound principally along the Site's western boundary between Punchestown Racecourse, together with associated planting and development of a linear water feature;
- ii. Seeding and greening the Site's eastern slopes to further reduce adverse views from Punchestown Racecourse by planting with rapid establishment grassland species;
- iii. Construction of internal access roads, inert waste processing area, and additional screening berms;
- iv. Progressive phased restoration;
- v. Removal of all machinery and buildings on final restoration; and
- vi. Completion of final restoration works, post closure.

Landscape effects consist of the changes in the landscape, its character and quality that might result from the proposed development. The effect that these changes have on the landscape reflects the **sensitivity** of that landscape to change and the **magnitude** of that change.

The significance of landscape impacts reflects the sensitivity of the landscape to change and the magnitude of those changes. The results of this assessment are presented in Table 16.7 below.

Table 16.7: Assessment of Landscape Effects

Development Activity		Effect upon landscape resource	Sensitivity	Magnitude	Significance of landscape impact	Mitigation
1	Construction of screen mound to the western boundary	Long term change to landform and land use	Medium	Moderate	Moderate adverse	This feature is being introduced to screen views from Punchestown Lands. The mound will be seeded and planted with native woodland species to increase its screening potential.
2	Construction of screen mound round inert waste processing area	Medium term change to landform and land use	Medium	Moderate	Moderate adverse	This feature is being introduced to screen views of the inert waste processing area. The mound will be planted as above.
3	Extension of a large open water body	Introduction of a water feature into the landscape	Medium	Moderate	Moderate adverse or neutral	Gently shelving water edge profile will be developed for public safety, visual enhancement and habitat creation benefit.
4	Construction of internal access road	Medium term change to landform and land use	Medium	Moderate	Moderate adverse	Construction of screen mound and associated planting will obscure Site activities.
5	Phased restoration	Permanent landtake	Medium	Moderate	Moderate beneficial	Disturbed areas of land minimised and new habitats created at the earliest opportunity.
6	Removal of all machinery and buildings on final restoration	Removal of alien features in the landscape	Medium	Moderate	Moderate beneficial	Removal of alien features.
7	Completion of final restoration works, post closure	Removal of temporary screen mounds and alien features, enhancement of Site conservation and bio-diversity	Medium	Moderate	Moderate beneficial	Removal of alien features and some restoration back to former agricultural uses.

16.5.1 Summary of Predicted Landscape Impacts

The proposed restoration of the Walshestown Pit will principally result in a final landform that will be in keeping with the landscape character of this area (Eastern Transition Lands) as described in the LCA of Kildare County Development Plan 2005-2011. Fields of similar size of those to the east will be created within a gently falling landform from east to west. The fields will be defined by hedgerows together with hedgerow trees. The more open landform of the Punchestown lands which abuts the Site's western edge will be visually connected by the proposed linear water feature with open areas of water being generally uncommon in the area.

16.6 Visual Baseline Conditions

16.6.1 Existing Visual Amenity

A visual analysis was carried out in May 2008 to assess the overall Site when weather conditions and visibility were good. Viewpoints into the Site were considered and viewpoints selected and used in the photomontage predictions of likely visual impacts.

Views are generally more limited to the north, east and south of the Site due to intervening topography, hedgerows and scattered woodland blocks; Figure 16.2 shows the key receptor locations.

The visual receptors identified in Figure 16.2 (A to D inclusive) were visited in May 2008 when all deciduous trees and hedgerows were in full leaf and therefore, restricted views, presenting a best case in limiting views of the Site. An assessment was made of all the visual impacts of the Site's infill development proposals from initial establishment to final restoration. Distance of visual receptors from the proposed development varies from 50 m to 1 km. Photomontages have been produced to illustrate the visual effect the proposals would have from the viewpoint of these visual receptors. This was done for the three principal development phases.

In total, four visual receptors have been assessed in terms of how they might be visually affected by the different phases of the proposed development (A to D). Each visual receptor was assessed on the perceived visual impact the proposed development would have upon it in terms of its effects on property and/or recreational amenity. A list of potential receptors that have been considered as part of this assessment follows.

Residential Receptors A – Properties along L6042 road north of the Site

- Establishment Phase:
 - Screen mounding and planting will be carried out to north eastern margins of the Site to restrict views of the proposed inert waste processing area. Construction of the perimeter screen mounding works will be ca. 300 m away at its nearest location to these properties and its impact is considered to be **substantial adverse** during this phase of development.
- Operational Phase:
 - During the operational infilling phase the impact is considered to be **slight adverse**. Views of the proposed waste processing area will be substantially screened.
- Final Restoration/Post Closure:
 - On final restoration and post closure all processing plant, screen mounding and some temporary planting will be removed; the likely impact is considered to be **moderate beneficial**.

Residential Receptors B - Properties to the east of Site situated on western side of local access road

Establishment Phase:

- If necessary, construction of a temporary screen mound along the eastern limits of the restoration operations will be constructed in consultation and agreement of the land owners to restrict views of the development from the rear of these properties on a temporary basis if they so wish only.. Seeding works on the temporary screen mound will also be carried out. Impact is considered to be **moderate adverse**.
- Operational Phase:
 - During the Site operational phase, views of the lower level restoration operations are likely. These infilling operations will take place sequentially with progressive restoration following on to minimise the disturbance-footprint at any one period in time. Impact is considered to be **moderate adverse**.
- Final Restoration/Post Closure:
 - On final restoration and post closure, all temporary screen mounding and some temporary planting will be removed if it was constructed with the agreement of the landowner only; the likely impact is considered to be **moderate beneficial**.

Residential Receptors C - Properties to the east of Site situated on the eastern side of local access road

- Establishment Phase:
 - All construction works in advance of restoration operations are likely to be obscured due to intervening topography and hedgerows. Impact is therefore considered to be **neutral**.
- Operational Phase:
 - During the Site Operational Phase the additional on Site planting and 'gapping-up of hedgerows' will mature and further screen the development. Impact is therefore considered to be **slight beneficial**.
- Final Restoration/Post Closure:
 - On final restoration and post closure, all temporary screen mounding and some temporary planting will be removed; the likely impact is considered to be **slight beneficial**.

Recreational Receptor D – Views from Punchestown Racecourse Establishment Phase:

- Views from the racecourse Grandstand and public circulation areas to the Site's western boundary are all open and not obscured by topography. Major earthworks carried out to form a permanent screen mound will be planted with grass species. Impact is considered to be **substantial adverse**.
- Operational Phase:
 - During the operational restoration phase impact is likely to be **neutral to moderate adverse** as land raising continues above the screen mound crest line. The back slope along the eastern boundary will be seeded in the establishment phase to further reduce potential impacts from Punchestown Racecourse. Additional temporary screening measures will also be put in place.
- Final Restoration/Post Closure:
 - On completion of final restoration and post closure, all temporary screen mounding will be removed, with all remaining planted and grassed areas being mature. Impact is considered to be **moderate beneficial**.

16.7 Predicted Visual Impacts

A visual screening berm will be constructed along the western boundary to screen views from Punchestown lands. An internal visual screening berm will also be constructed on the northern side of the proposed Inert Waste Processing Area. Only if required by the residents a

temporary screen mound will be constructed along the eastern limits of the restoration operations to restrict views of the development from the rear of the properties of residential receptors B. External slopes, in particular along the eastern boundary will be covered with topsoil, trimmed and seeded with suitable grasses during the Site establishment works to reduce potential visual impacts from users at Punchestown (Figures 16.5 and 16.6 – Conceptual Restoration Filling Plan and Final Restoration Plan).

A summary of the visual impacts from receptors, using the methodology described in Section 16.4, is summarised in Table 16.8. The receptor locations are shown in Figure 16.2.

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Table 16.8: Visual Receptors and Impact Assessment

Ref	Receptor Type	Distance from full boundary	Sensitivity of Visual Receptor (Table 16.4)	Magnitude of Change (Table 16.5)	Significance of Visual Effect during infilling (Table 16.6)	Mitigation and Restoration	Residual Impact (Final Restoration/Site Closure)
A	Residential Properties along the L6042 Road north of Site	150 m approx	High	Moderate	Substantial adverse	Screen mounding and woodland planting	Moderate beneficial
B	Residential Properties east of Site	50 m approx	High	Moderate	Substantial adverse	Temporary screen mounding if required by residents	Moderate beneficial
C	Residential Properties to the east of Site	100 m approx	High	Moderate	Substantial adverse	Temporary screen mounding if required by residents	Moderate beneficial
D	Recreational receptors at Punchestown Racecourse	Varies 800 m approx	Medium	Negligible	Substantial adverse	Screen mounding woodland planting and greenery of eastern slopes	Substantial beneficial

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16.7.1 Summary of Visual Impacts

The proposed development will have *substantial (short to medium term) adverse* impact on a small number of residential receptors during early establishment and operational phases (i.e. during first 3 years). Substantial adverse impact on views from Punchestown will also occur until the screening berms are constructed. This is primarily due to the fact that visually the Site will change relatively little during the operational phases. Despite the fact that screen mounding and planting will be put in place, some views of the restoration operations will be evident throughout the restoration process.

The main elements of final restoration/post closure include the decommissioning and demolition of the plant and all built structures, restoring the open nature of the landscape. When combined with the areas of woodland planting, wetland and grassland creation the Site will take on a far more aesthetically pleasing form, as a result the visual impact moves from *substantial adverse* to *moderate/substantial beneficial*.

16.8 Landscape Proposals and Mitigation

Restoration proposals have been developed on the basis of the following key objectives:

- To allow for an end use that is appropriate to the Site's location;
- To integrate the final landform into the local landscape and in keeping with the transitional landscape character of the area;
- To maximise ecological diversity of the Site and its value for wildlife;
- To provide a land use that complements and enhances the use of Punchestown Racecourse; and
- To deliver a high quality restoration scheme that is sustainable and of lasting benefit.

The proposed Restoration Concept is illustrated in Figures 16.5 and 16.6. Please see Section 8.7 for the detailed landscape and restoration plan. The rural location of the Site, within a predominantly agricultural landscape, lends itself to a mixed end use of agriculture, wetlands and nature conservation elements. The proposed after-use will seek to extend and enhance the existing setting and adjacent land uses associated with Punchestown Racecourse, which is of national importance. These proposals will also be of significant benefit to local residences. Proposed hedgerows will be recreated using native Irish species listed as occurring in Kildare in the Hedgerow Survey of Kildare (Kildare Heritage Series No.1). Ecologically sound principles will be applied to the creation of new habitats to increase and enhance the existing ecological diversity of the locality.

Land uses, current and proposed, as a percentage of the Site area are summarised in Table 16.9.

Table 16.9: Land Use Impact

Land Use	Existing		Proposed	
	Ha	%	Ha	%
Agricultural land/Species Rich Grassland	23.1	34.0	39.0	57.4
Trees/hedgerows	0.1	0.1	6.0	8.8
Water bodies	3.3	4.8	3.0	4.4
Bare ground and hard surfaces	31.8	46.8	0	0 ^{Note1}
Unmanaged grassland and scrub	9.7	14.3	20.0	29.4
Total	68.0	100.0	68.0	100.0

Note 1 Some small patches of bare ground will be left in the unmanaged grassland and scrub areas to allow for lapwing nesting.

16.9 Conclusions

The ca. 68.0 hectare Site lies within a transitional landscape comprising agricultural pasture land together with the adjacent nationally important Punchestown Racecourse. The Site is not within a designated or nationally protected landscape area nor has it any other designations attached to it. The infill development will, , physically change the topography of the Site by creating a landform which rises gently from west to east, which is considered in keeping with the landscape character of this area (Eastern Transition Lands) as described in the LCA of Kildare County Development Plan 2005-2011. The final restoration will also reinstate fields of similar shape, size and composition to those surrounding the Site (Section 8.7).

Visual impacts are significant from the recreational receptors at Punchestown Racecourse in the short term during early Site establishment, these impacts will reduce once screen mounding is in place and perimeter planting becomes established. Seeding and greening of the eastern slopes, where necessary, will further reduce potential impacts from the Punchestown aspect.

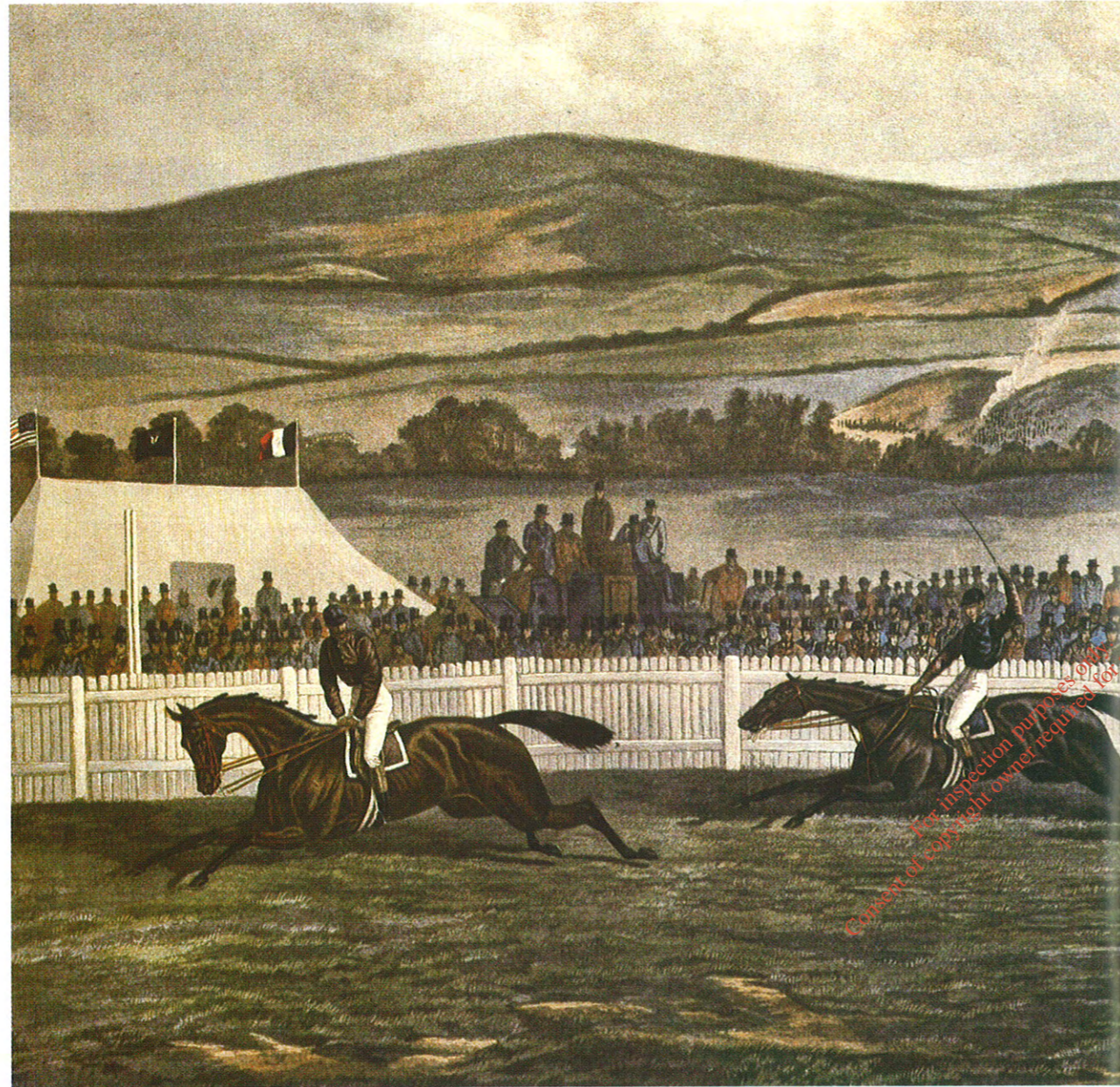
Visual impacts are limited to a few residential properties around the Site and to road users gaining local access. A progressive restoration programme will provide a mixed end use of grazing and nature conservation elements including a linear wetland area. Adjoining and visually linking the Site with Punchestown, fields divided by species-rich hedgerows will be created (Figure 16.6).

The impact on landscape character during early establishment and operational phases (i.e. during first 3 years) is predicted to be moderate adverse to substantial adverse, but due to the mitigation measures included in the proposed restoration/final closure scheme the overall impact on landscape character (after completion) is predicted to be moderate beneficial.

The proposals include restoration of the entire Site; which will improve the immediate setting and surrounding landscape. A combination of grassland establishment and planting of hedgerows/hedgerow enhancement will significantly improve the integration of the Site into the surrounding landscape. The use of native plant species will help to reinforce this

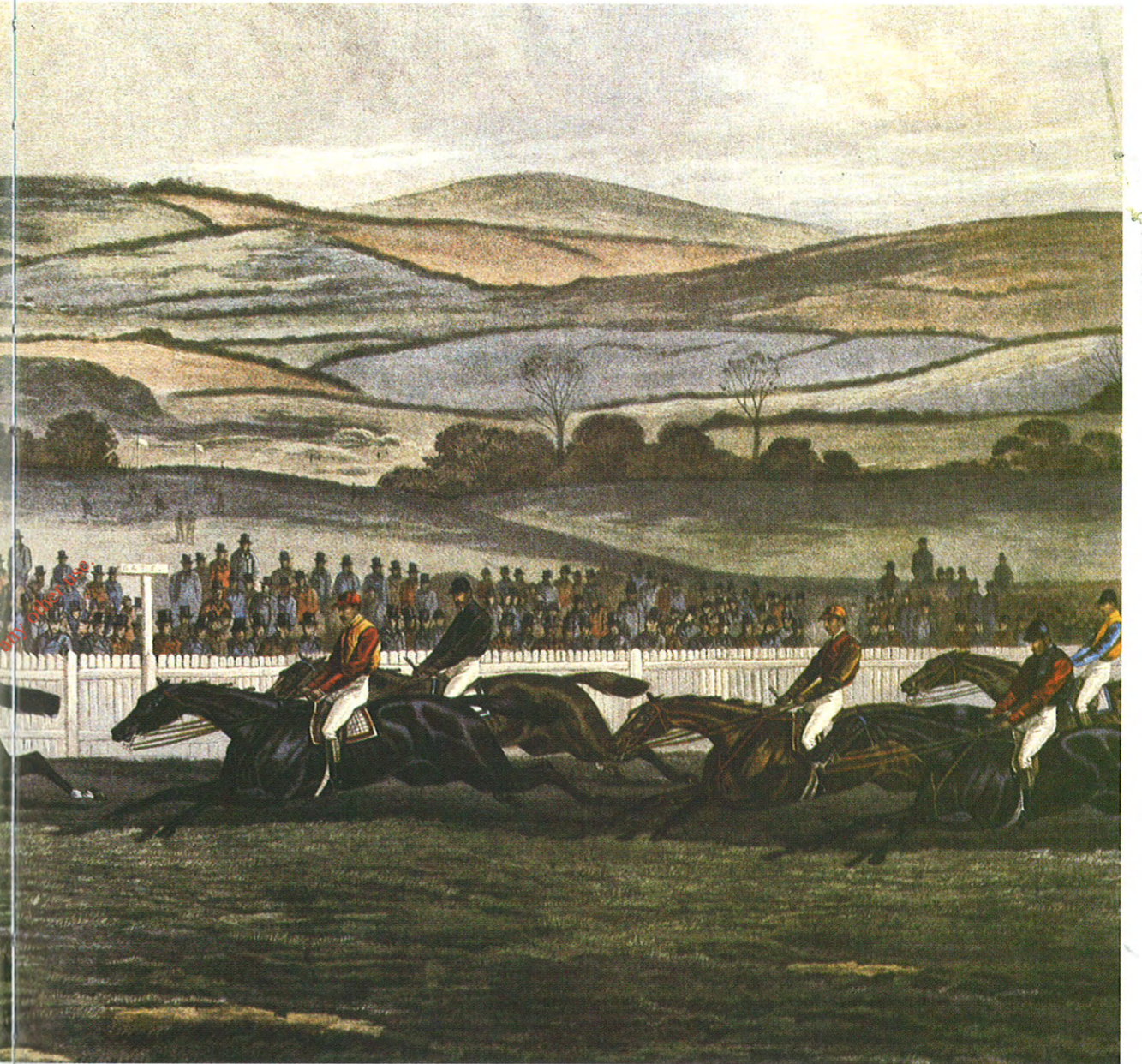
integration. The creation of a lake feature will add diversity for the wildlife and add to the mosaic of habitats of the Site.

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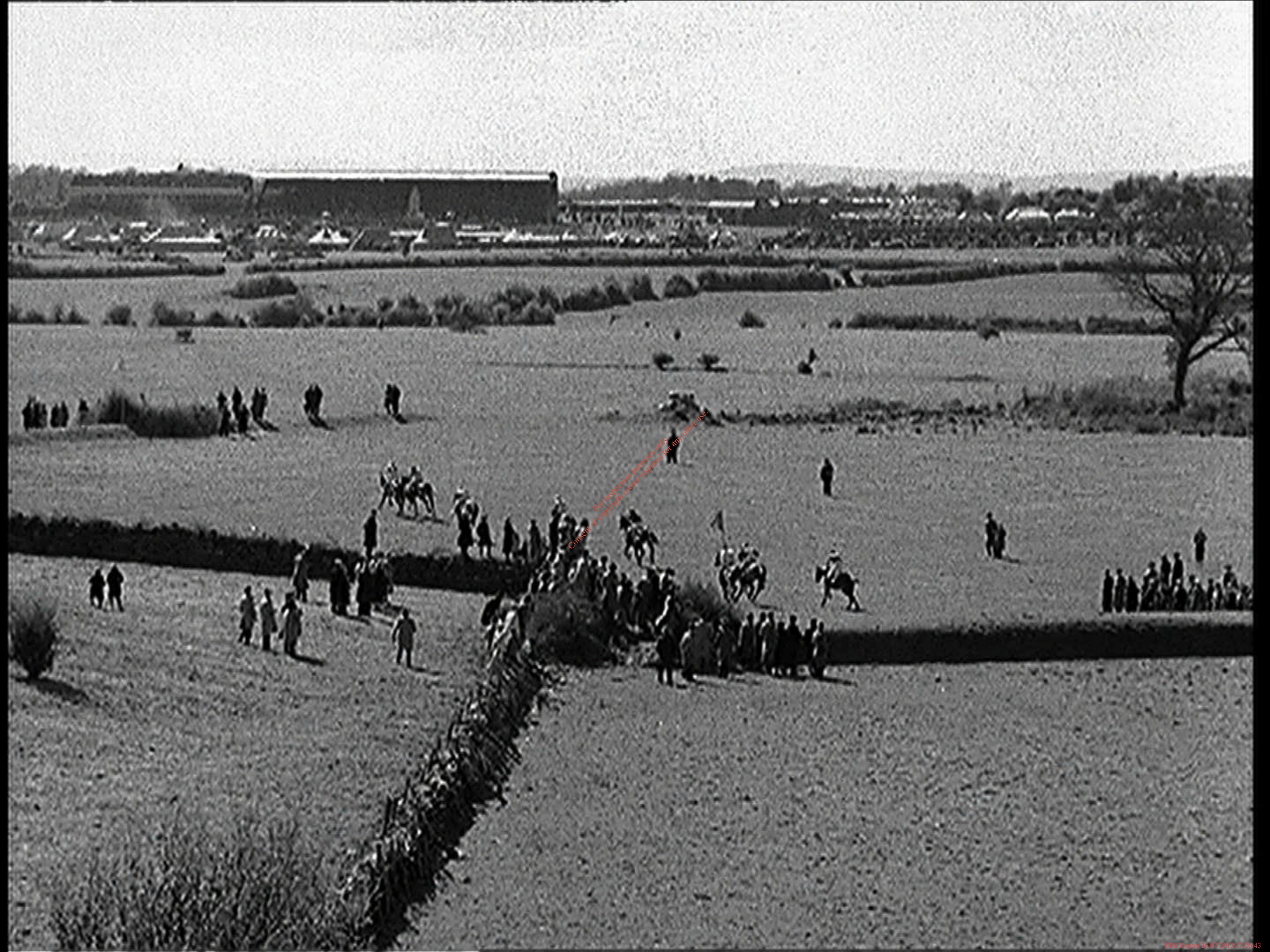


THE FINISH OF THE CONYNGHAM CUP AT PUNCHESTOWN 1872

*Left to Right: Captain Smith (Heraut D'Armes), Mr G Moore (Curragh Ranger), Mr Whyte (Bashful),
Captain MacFarlane (Waterford), Mr Beasley (Hubert), Mr Thomas (Star of the Sea),
Mr St James (Lamp).*



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ENGRAVED BY E.G. HESTER*





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SLR Consulting Ltd.,
FAO: Mr. Derek Luby,
7 Dundrum Business Park,
Windy Arbour,
Dundrum,
Dublin 14

28th January 2009

Dear Mr. Luby,

I refer to our meeting on 23rd January 2009, during which your client Mr. John Behan raised a number of points regarding the operation of the proposed restoration activities at our Site in Walshestown, Co. Kildare. We would like to clarify our position in relation to the points you and your client raised.

Hours of Operation:

CEMEX (ROI) Ltd. (CEMEX) proposes to operate the facility in alignment with Condition 1.7 of the Behan's Land Restoration Ltd. Proposed Determination Ref. No. W0247-01, which states the following:

"Waste may be accepted at the facility only between the hours of 08:00 and 18:00 Monday to Friday inclusive (excluding Public Holidays), and between 08:00 and 14:00 hours on Saturdays, unless otherwise agreed by the Agency.

The Facility may be operated only between the hours of 08:00 to 18:00 Monday to Friday inclusive (excluding Public Holidays), and 08:00 to 14:00 on Saturdays, unless otherwise agreed by the Agency."

Currently our application documents for our proposed facility at Walshestown state that the Site will accept waste from 07:00hrs to 18:00hrs Monday to Saturday, and process waste at the Inert Waste Processing Area from 08:00hrs to 14:00hrs Monday to Saturday.

We wish to advise you that CEMEX proposes to only operate the Facility from 08:00 onwards in alignment with Condition 1.7 stated above, and will inform both the Planning Authority and the EPA of this proposed change in writing. This will be carried out at 'Further Information' stages of the planning and licensing process.

CEMEX (ROI) Limited

Block A1 East Point Business Park, Dublin 3, Ireland Tel +353 1 8658700 /Fax +353 1 8556595
Registered Office Block A1 East Point Business Park, Dublin 3, Ireland www.cemex.ie
Directors: R. Gonzalez (Nicaragua), J. Murray, D. O'Donnell, Registered in Ireland No. 79451

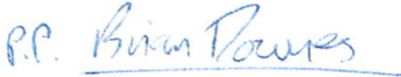
Proposed Car Park & Walking Track:

As depicted in Figure 10.3 of the EIS for the Walshestown Site, (December 2008), it is proposed to construct a car park at the entrance to the Facility upon completion of the restoration works. It is also proposed to have a walking track around the perimeter of the Facility post restoration.

However, during our meeting on Friday last, concerns were raised about the possibility of unsocial behaviour at the proposed car park and walking track. In order to alleviate these concerns, CEMEX proposes to remove these two items from the proposal. CEMEX will inform both the Planning Authority and the EPA of this proposed change in writing. This will be carried out at 'Further Information' stages of the planning and licensing process.

On behalf of CEMEX, I hope that this letter is sufficient for your needs. If you have any other queries, please do not hesitate to contact me directly on 086 6838413.

Yours sincerely



Pierce Power
Senior Development Manager

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