

8 LANDSCAPE AND VISUAL

8.1 INTRODUCTION

8.1.1 *Guidance used in the Landscape and Visual Impact Assessment*

This chapter describes the landscape and visual effects of the proposed development at the Drehid Waste Management Facility, County Kildare in accordance with the relevant Environment Protection Agency (EPA) Guidelines and general national and international best practice guidelines on the preparation of Landscape and Visual Impact Assessments. The following sources and guidelines were used in the assessment:

- ‘*Guidelines on the Information to be contained in Environmental Impact Statements*’, EPA, 2002;
- ‘*Advice Notes on Current Practice (in the preparation of Environmental Impact Statements)*’, EPA, 2003;
- Draft “*Guidelines on the Information to be contained in Environmental Impact Assessment Reports*”, EPA, May 2017;
- *Guidelines for Landscape and Visual Impact Assessment (GLVIA), Third Edition*, Landscape Institute and Institute of Environmental Management and Assessment (IEMA); 2013;
- ‘*Photography and Photomontage in Landscape and Visual Impact Assessment*’, Landscape Institute Advice Note 01/2011;
- Kildare County Development Plan 2017-2023;
- National Parks and Wildlife Service (NPWS), <http://www.npws.ie/>;
- Irishtrails; <http://www.irishtrails.ie/>; and
- Ordnance Survey Ireland, 1:50,000 Discovery Mapping.

8.1.2 *Characteristics of the Proposed development*

A detailed description of the proposed development is provided in Chapter 3. The location of the individual development components is shown on Planning Drawing 8108-2010 and Figure 3.2: Site Layout Plan within Chapter 3 of this EIAR.

Main Access

The main access will be via the existing access point on the R403 and the existing internal 4.8 km access road between the entrance and the existing Drehid Waste Management Facility.

Proposed landfill and building structures

The main components of the proposed development including their height with potential for landscape and visual effects are listed below:

Non-hazardous landfill

The footprint of the proposed non-hazardous landfill will be 20.9 ha. The final maximum level is expected to be 115.75 mOD or approx. 31 m in height. The surrounding ground is in the region of 84-85 mOD.

Hazardous landfill

The footprint of the proposed hazardous landfill will be 10.8 ha. The final maximum level is expected to be 115.75 mOD or approx. 31 m in height. The surrounding ground is in the region of 84-85 mOD.

Extension to the existing composting facility

The proposed composting building extension will be located to the east and adjacent to the existing facility. The height of the buildings will be 12 m at the eaves.

Leachate Plant

The proposed Leachate Plant will consist of a control building a range of tanks with a maximum height of 6.55 m and a total height of 9.05 m including lifting beams.

IBA reception and Maturation Facility

The height of the buildings will be 12 m at the eaves.

Metals Recovery Facility

The height of the buildings will range between 9.5 m and 12 m.

Maintenance Building

The height of the building will be 9 m at the eaves.

Waste Control Building

The height of the building will be 4 m.

Ash Solidification Facility

The solidification building will be 14 m at the eaves. The adjacent 12 silos will reach a height of 22 m.

Hazardous Waste Storage and Quarantine Area

The height of the storage structures will be 5.9 m.

Waste handling building

The height of the building will be 12 m at the eaves.

Earthen berms

Earthen berms with an average height of 5 m, which will naturally re-vegetate and be planted with bands of peatland tolerant woodland mix, are proposed to the northeast and east of the proposed landfill mounds and to the west of the proposed car parking facilities and access road as indicated in Drawing 8108-2010.

Other structures

Other structures such as site infrastructure including roads, access tracks, weighing bridges, parking facilities, surface water attenuation areas and maintenance yards are very unlikely to be visible outside of the Bord na Móna land holding due to their low height and/or location at ground level.

When operational, the potential visible aspects of the development will include vehicles, staff and plant working on the mounds as they grow, and the mounds themselves increasing gradually in height and breadth. Completed sections of the landfill will be grassed resulting in a permanent low hill-like appearance.

Timescale

The proposed development is planned to remain operational for 25 years.

8.2 METHODOLOGY

8.2.1 Landscape and Visual Impact Assessment Criteria

The draft EPA guidelines from May 2017 provide a general methodology and impact ratings for all types of specialist assessments. Best practice guidance, such as the “*Guidelines for Landscape and Visual Impact Assessment, 3rd Edition, 2013, Landscape Institute (UK) & IEMA*” provide specific guidelines for landscape and visual impact assessments. Therefore, a combination of the draft EPA guidelines, the Landscape Institute guidelines and professional experience has informed the methodology for the assessment herein. The Landscape Institute guidelines require the assessment to identify, predict and evaluate the significance of potential effects to landscape characteristics and established views. The assessment is based on an evaluation of the sensitivity to change and the magnitude of change for each landscape or visual receptor. For clarity, and in accordance with best practice, the assessment of potential effects on landscape character and visual amenity, although closely related, are undertaken separately.

The significance of an effect is determined by two distinct considerations:

1. The nature of the RECEPTOR likely to be affected, namely:
 - The **susceptibility** of the receptor to the type of change arising from the proposed developments; and
 - The **sensitivity** to change is related to the **value** attached to the receptor.

2. The nature or magnitude of the EFFECT likely to occur, namely:
 - The **size and scale** of the landscape and visual effect (for example, whether there is a complete or minor loss of a particular landscape element);
 - The **geographical extent** of the areas that will be affected;
 - The **duration** of the effect and its **reversibility**; and
 - The **quality** of the effect – whether it is neutral, beneficial or adverse.

8.2.2 Assessment Process

The assessment is undertaken based on the following key tasks and structure:

- Establishment of the Baseline;
- Appreciation of the proposed development; and
- Assessment of Effects.

8.2.3 Establishment of the Baseline

A baseline study has been undertaken through a combination of desk based research and site appraisal in order to establish the existing conditions of the landscape and visual resources of the study area. Desk based research has involved a review of mapping and aerial photography, relevant planning and policy documents, the relevant Landscape Character Assessments and other relevant documents and publications.

8.2.4 Appreciation of the Proposed development

In order to be able to accurately assess the full extent of likely effects on landscape character and visual amenity it is essential to develop a thorough and detailed knowledge of the proposed development. This includes a comprehensive understanding of its location, nature and scale and is achieved through a review of detailed descriptions of the proposed development and drawings (see Planning Application Drawings accompanying the application) and an on-site appraisal.

The landscape and visual impact assessment has considered all elements of the proposed development. Please refer to Chapter 3 for a detailed description of individual development parts.

8.2.5 Assessment of Effects

The landscape and visual impact assessment seeks to identify, predict and evaluate the significance of potential effects to landscape characteristics and established views. The assessments are based on an evaluation of the sensitivity to change and the magnitude of change for each landscape or visual receptor.

The assessment acknowledges that landscape and visual effects change over time as the existing landscape internal and external to the proposed development evolves and proposed planting establishes and matures. The assessment therefore reports on potential effects during both

construction/operation and completion (cessation of landfill works) of the proposed development. The prominence of the proposed development in the landscape or view will vary according to the existing screening effects of local topography, intervening existing vegetation and building structures.

8.2.6 Scope

8.2.6.1 Study Area

A study area radius of 5 km has been set from the centre of the proposed development for the assessment of landscape and visual effects. The extent of the study area is based on initial findings during the desktop study and later during verification on site.

It is acknowledged that the proposed development may be visible from locations beyond 5 km from elevated locations, such as Carbury Hill, and as such it is important to note that the study area defines the area within which potential effects could be significant, rather than defining the extent of visibility.

8.2.6.2 Effects Scoped Out

The landfill structures will become permanent features in the landscape following the completion of landfill activities and the implementation of landscape mitigation measures. The assessment takes account of this in the determination of residual landscape and visual effects.

Effects arising from the process of decommissioning of the building structures are considered to be of a similar nature and duration to those arising from the construction process and therefore have not been considered separately in this chapter. Where this assessment refers to potential construction effects of buildings, these are also representative of predicted decommissioning effects.

8.2.7 Landscape Effects

Landscape effects describe the impact on the fabric or structure of a landscape or landscape character. The assessment of landscape effects firstly requires the identification of the components of the landscape. The landscape components are also described as landscape receptors and comprise the following:

- Individual landscape elements or features;
- Specific aesthetic or perceptual aspects; and
- Landscape character, or the distinct, recognisable and consistent pattern of elements (natural and man-made) in the landscape that makes one landscape different from another.

The assessment will identify the interaction between these components and the proposed development during construction and operation. The condition of the landscape and any evidence of current pressures causing change in the landscape will also be documented and described.

8.2.8 Landscape Sensitivity to Change

The evaluation of landscape sensitivity to change involves consideration of the nature of the landscape and its ability to accommodate change without compromising its key elements or characteristics. Sensitivity to change is defined through appraisal of landscape value, undertaken as part of the baseline study, and the susceptibility of the landscape to change.

8.2.8.1 Landscape value

Landscape value is frequently addressed by reference to international, national, regional and local designations, determined by statutory and planning agencies. However, absence of such a designation does not necessarily imply a lack of quality or value. Factors such as accessibility and local scarcity can render areas of nationally unremarkable quality, highly valuable as a local resource. The quality and condition is also considered in the determination of the value of a landscape. The evaluation of landscape value is undertaken with reference to the definitions stated in Table 8-1: Landscape Value.

Table 8-1: Landscape Value

LANDSCAPE VALUE	CLASSIFICATION CRITERIA
High	Nationally designated or iconic, unspoilt landscape with few, if any, degrading elements.
Medium	Regionally or locally designated landscape, or an undesignated landscape with locally important landmark features and some detracting elements.
Low	Undesignated landscape with few if any distinct features or with several degrading elements.

8.2.8.2 Landscape Susceptibility

Landscape susceptibility relates to the ability of a particular landscape to accommodate the proposed development. Landscape susceptibility is appraised through consideration of the baseline characteristics of the landscape, and in particular the scale or complexity of a given landscape.

The evaluation of landscape susceptibility is undertaken with reference to a three-point scale, as outlined in the table below:

Table 8-2: Landscape Susceptibility Criteria

LANDSCAPE SUSCEPTIBILITY	CLASSIFICATION CRITERIA
High	Small scale, intimate or complex landscape considered to be intolerant of even minor change
Medium	Medium scale, more open or less complex landscape considered tolerant to some degree of change
Low	Large scale, simple landscape considered tolerant of a large degree of change

8.2.8.3 Landscape Sensitivity

Landscape sensitivity to change is determined by employing professional judgment to combine and analyse the identified landscape value, quality and susceptibility and is defined with reference to the scale outlined in the following table:

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Table 8-3: Landscape Sensitivity to Change Criteria

LANDSCAPE SENSITIVITY	CLASSIFICATION CRITERIA
High	<ul style="list-style-type: none"> • Landscape characteristics or features with little or no capacity to absorb change without fundamentally altering their present character • Landscape designated for its international or national landscape value or with highly valued features • Outstanding example in the area of well cared for landscape or set of features that combine to give a particularly distinctive sense of place • Few detracting or incongruous elements
Medium-high	<ul style="list-style-type: none"> • Landscape characteristics or features with a low capacity to absorb change without fundamentally altering their present character • Landscape designated for regional or county-wide landscape value where the characteristics or qualities that provided the basis for their designation are apparent or a landscape with highly valued features locally • Good example in the area of a well-cared for landscape or set of features that combine to give a clearly defined sense of place
Medium	<ul style="list-style-type: none"> • Landscape characteristics or features with moderate capacity to absorb change without fundamentally altering their present character • Landscape designated for its local landscape value or a regional designated landscape where the characteristics and qualities that led to the designation of the area are less apparent or are partially eroded or an undesignated landscape which may be valued locally – for example an important open space • An example of a landscape or a set of features which is relatively coherent, with a good but not exceptional sense of place - occasional buildings and spaces may lack quality and cohesion
Medium-Low	<ul style="list-style-type: none"> • Landscape characteristics or features which are reasonably tolerant of change without detriment to their present character • No designation present or of little local value • An example of an un-stimulating landscape or set of features; with some areas lacking a sense of place and identity
Low	<ul style="list-style-type: none"> • Landscape characteristics or features which are tolerant of change without detriment to their present character • An area with a weak sense of place and/or poorly defined character /identity • No designation present or of low local value or in poor condition • An example of monotonous unattractive visually conflicting or degraded landscape or set of features

8.2.8.4 Magnitude of Landscape Change

Magnitude of change is an expression of the size or scale of change in the landscape, the geographical extent of the area influenced and the duration and reversibility of the resultant effect. The variables involved are described below:

- The extent of existing landscape elements that will be lost, the proportion of the total extent that this represents and the contribution of that element to the character of the landscape;
- The extent to which aesthetic or perceptual aspects of the landscape are altered either by removal of existing components of the landscape or by addition of new ones;
- Whether the effect changes the key characteristics of the landscape, which are integral to its distinctive character;
- The geographic area over which the landscape effects will be felt (within the development application boundary itself; the immediate setting of the site; at the scale of the landscape type or character area; on a larger scale influencing several landscape types or character areas); and
- The duration of the effects (short term, medium term or long term) and the reversibility of the effect (whether it is permanent, temporary or partially reversible).

Changes to landscape characteristics can be both direct and indirect. **Direct change** occurs where the proposed development will result in a physical change to the landscape within or adjacent to the proposed development site. **Indirect changes** are a consequence of the direct changes resulting from the proposed development. They can often occur away from the proposed development site (for example, off-site construction staff parking) and may be a result of a sequence of interrelationships or a complex pathway (for example, a new road or footpath construction may increase public access and associated problems e.g. littering). They may be separated by distance or in time from the source of the effects.

The magnitude of change affecting the baseline landscape resource is based on an interpretation of a combination of the criteria set out in Table 8-4: Magnitude of Landscape Change Criteria (Landscape Effects).

Table 8-4: Magnitude of Landscape Change Criteria (Landscape Effects)

MAGNITUDE	CLASSIFICATION CRITERIA
None	No change
Negligible	Little perceptible change
Low	<ul style="list-style-type: none"> • Minor change, affecting some characteristics and the experience of the landscape to an extent; and • Introduction of elements that is not uncharacteristic
Moderate	<ul style="list-style-type: none"> • Noticeable change, affecting some key characteristics and the experience of the landscape; and • Introduction of some uncharacteristic elements.
High	<ul style="list-style-type: none"> • Noticeable change, affecting many key characteristics and the experience of the landscape; and • Introduction of many incongruous developments
Very High	<ul style="list-style-type: none"> • Highly noticeable change, affecting most key characteristics and dominating the experience of the landscape; and • Introduction of highly incongruous development

8.2.9 Visual Effects

Visual effects are determined by the extent of visibility and the nature of the visibility (i.e. how a development is seen within the landscape); for example, whether it appears integrated and balanced within the visual composition of a view or whether it creates a focal point.

Negative visual effects may occur through the intrusion of new elements into established views, which are out of keeping with the existing structure, scale and composition of the view. Visual effects may also be beneficial, where an attractive focus is created in a previously unremarkable view or the influence of previously detracting features is reduced. The significance of effects will vary, depending on the nature and degree of change experienced and the perceived value and composition of the existing view.

8.2.9.1 Receptors

For there to be a visual impact there is the need for a viewer. Views experienced from locations such as settlements, recognised routes and popular vantage points used by the public have been included in the assessment. Receptors are the viewers at these locations. The degree to which receptors, i.e. people, will be affected by changes as a result of the proposed development depends on a number of factors, including:

- Receptor activities, such as taking part in leisure, recreational and sporting activities, travelling or working;
- Whether receptors are likely to be stationary or moving and how long they will be exposed to the change at any one time;
- The importance of the location, as reflected by designations, inclusion in guidebooks or other travel literature, or the facilities provided for visitors;

- The extent of the route or area over which the changes will be visible;
- Whether receptors will be exposed to the change daily, frequently, occasionally or rarely;
- The orientation of receptors in relation to the proposed development and whether views are open or intermittent;
- Proportion of the developments that will be visible (full, sections or none);
- Viewing direction, distance (i.e. short-, medium- and long-distance views) and elevation;
- Nature of the viewing experience (for example, static views, views from settlements and views from sequential points along routes);
- Accessibility of viewpoint (public or private, ease of access);
- Nature of changes (for example, changes in the existing skyline profile, creation of a new visual focus in the view, introduction of new man-made objects, changes in visual simplicity or complexity, alteration of visual scale, landform and change to the degree of visual enclosure);
- Nature of visual receptors (type, potential number and sensitivity of viewers who may be affected); and
- Impact of ancillary developments.

8.2.10 Visual Sensitivity to Change

Sensitivity to change is defined through appraisal of the viewing expectation, or value placed on the view as identified in the baseline study, and its susceptibility to change.

8.2.10.1 Value of the View

Value of the view is an appraisal of the value attached to views and is often informed by the appearance on Ordnance Survey of tourist maps and in guidebooks, literature or art. Value can also be indicated by the provision of parking or services and signage and interpretation. The nature and composition of the view is also an indicator. The value of the view is determined with reference to the definitions outlined in Table 8-5: Value of the View.

Table 8-5: Value of the View

VALUE	CLASSIFICATION CRITERIA
High	Nationally recognised view of the landscape, with no detracting elements.
Medium	Regionally or locally recognised view, or unrecognised but pleasing and well composed view, with few detracting elements.
Low	Typical or poorly composed view often with numerous detracting elements.

8.2.10.2 Visual Susceptibility

The GLVIA guidelines identify that the susceptibility of visual receptors to changes in views and visual amenity is a function of:

- The occupation or activity of people experiencing the view at a particular location; and
- The extent to which their attention or interest may therefore be focused on the views and visual amenity they experience at particular locations.

For example, residents in their home, walkers whose interest is likely to be focused on the landscape or a particular view, or visitors at an attraction where views are an important part of the experience often indicate a higher level of susceptibility. Whereas receptors occupied in outdoor sport, where views are not important, or at their place of work, are often considered less susceptible to change. Visual susceptibility is determined with reference to the three-point scale and criteria outlined in the table below:

Table 8-6: Visual Susceptibility

SUSCEPTIBILITY	CLASSIFICATION CRITERIA
High	Receptors for which the view is of primary importance and are likely to notice even minor change
Medium	Receptors for which the view is important but not the primary focus and are tolerant of some change
Low	Receptors for which the view is incidental or unimportant and is tolerant of a high degree of change

8.2.10.3 Visual Sensitivity

Sensitivity to change considers the nature of the receptor; for example a person occupying a residential dwelling is generally more sensitive to change than someone working in a factory unit. The importance of the view experienced by the receptor also contributes to an understanding of the susceptibility of the visual receptor to change as well as the value attached to the view.

A judgement is also made on the value attached to the views experienced. This takes account of:

- Recognition of the value attached to particular views, for example in relation to heritage assets, or through planning designations;
- Indicators of the value attached to views by visitors, for example through appearance in guidebooks or on tourist maps, provision of facilities for their enjoyment (sign boards, interpretive material) and references to them in literature or art; and

- Possible local value; it is important to note that the absence of view recognition does not preclude local value, as a view may be important as a resource in the local or immediate environment due to its relative rarity or local importance.

The visual sensitivity to change is based on interpretation of a combination of all or some of the criteria outlined in the table below:

Table 8-7: Sensitivity to Change Criteria

VISUAL SENSITIVITY	CLASSIFICATION CRITERIA
High	<ul style="list-style-type: none"> • Users of outdoor recreational facilities, on recognised national cycling or walking routes or in nationally designated landscapes • Residential buildings
Medium-high	<ul style="list-style-type: none"> • Users of outdoor recreational facilities, in highly valued landscapes or locally designated • landscapes or on local recreational routes that are well publicised in guide books • Road and rail users in nationally designated landscapes or on recognised scenic routes, likely to be travelling to enjoy the view
Medium	<ul style="list-style-type: none"> • Users of outdoor recreational facilities including public open space in moderately valued Landscapes • Users of primary transport road network, orientated towards the proposed development, likely to be travelling for other purposes than just the view
Medium-Low	<ul style="list-style-type: none"> • People engaged in active outdoor sports or recreation and less likely to focus on the view • Primary transport road network and rail users likely to be travelling to work with oblique views of the project or users of minor road network
Low	<ul style="list-style-type: none"> • People engaged in work activities indoors, with limited opportunity for views of the proposed development

8.2.10.4 Magnitude of Visual Change

Visual effects are direct effects as the magnitude of change within an existing view will be determined by the extent of visibility of the proposed development. The magnitude of the visual effect resulting from the development at any particular viewpoint or receptor is based on the size or scale of change in the view, the geographical extent of the area influenced and its duration and reversibility. The variables involved are described below:

- The scale of the change in the view with respect to the loss or addition of features in the view and changes in its composition, including the proportion of the view occupied by the development;

- The degree of contrast or integration of any new features or changes in the landscape form, scale, mass, line, height, skylining, back-grounding, visual clues, focal points, colour and texture;
- The nature of the view of the development, in relation to the amount of time over which it will be experienced and whether views will be full, partial or glimpses.
- The angle of view in relation to the main activity of the receptor, distance of the viewpoint from the development and the extent of the area over which the changes will be visible; and
- The duration of the effects (short term, medium term or long term) and the reversibility of the effect (whether it is permanent, temporary or partially reversible).

The magnitude of visual effect resulting from the development at any particular viewpoint or receptor is based on the interpretation of the above range of factors and is set out in Table 8-8: Magnitude of Visual Change Criteria (Visual effects).

Table 8-8: Magnitude of Visual Change Criteria (Visual effects)

MAGNITUDE	CLASSIFICATION CRITERIA
None	No change in the existing view
Negligible	The development will cause a barely discernible change in the existing view
Low	The development will cause very minor changes to the view over a wide area or minor changes over a limited area
Moderate	The development will cause modest changes to the existing view over a wide area or noticeable change over a limited area
High	The development will cause a considerable change in the existing view over a wide area or a significant change over a limited area
Very High	The development will cause significant changes in the existing view over a wide area or a change which will dominate over a limited area

The table below provides the definition of the duration of landscape and visual effects:

Table 8-9: Definition of Duration of Effects

DURATION	DESCRIPTION
Temporary	Effects lasting one year or less
Short Term	Effects lasting one to seven years
Medium Term	Effects lasting seven to fifteen years
Long Term	Effects lasting fifteen to sixty years
Permanent	Effects lasting over sixty years

The quality of both, landscape and visual effects, can be Beneficial (Positive), Adverse (Negative) or Neutral according to the definitions set out in the table below:

Table 8-10: Definition of Quality of Effects

QUALITY OF EFFECTS	DESCRIPTION
Neutral	This will neither enhance nor detract from the landscape character or view
Beneficial (Positive)	This will improve or enhance the landscape character or view
Adverse (Negative)	This will reduce the quality of the existing landscape character or view

The objective of the assessment process is to identify and evaluate the potentially significant effects arising from the proposed development. The assessment will identify the residual effects likely to arise from the finalised design taking into account mitigation measures and change over time.

The significance of effects will be assessed by considering the sensitivity of the receptor and the predicted magnitude of effect in relation to the baseline conditions. In order to provide a level of consistency and transparency to the assessment, and to allow comparisons to be made between the various landscape and visual receptors subject to assessment, the assessment of significance is informed by pre-defined criteria as outlined in the table below. When assessing significance, individual effects may fall across several different categories of significance and professional judgement is therefore used to determine which category of significance best fits the overall effect to a landscape or visual receptor.

The significance of the effects can be adverse (negative) or beneficial (positive) according to the definitions set out in Table 8-11: Categories of Significance of Landscape and Visual Effects.

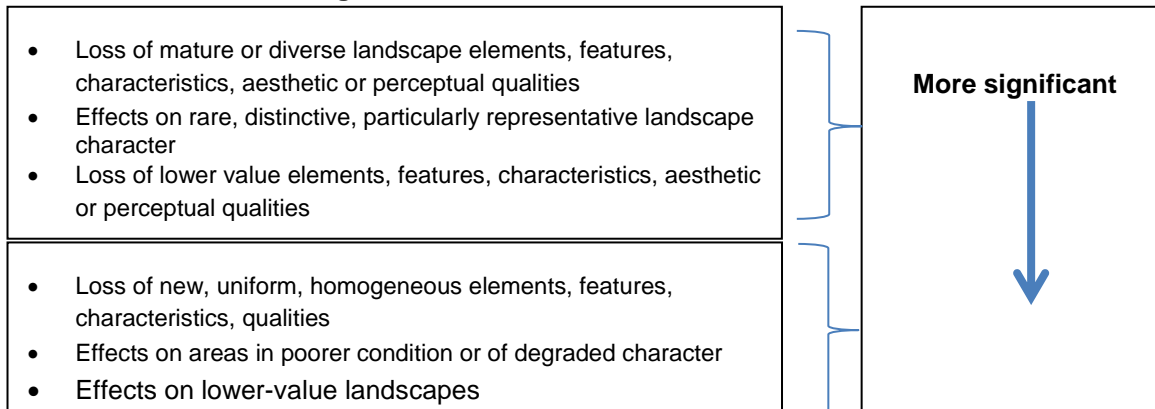
Table 8-11: Categories of Significance of Landscape and Visual Effects

SIGNIFICANCE CATEGORY	DESCRIPTION OF EFFECT
Major Beneficial Effect	The project will: <ul style="list-style-type: none"> greatly enhance the character (including quality and value) of the landscape; enable the restoration of characteristic features and elements lost as a result of changes from inappropriate management or development; enable a sense of place to be created or greatly enhanced; cause a very noticeable improvement in the existing view; and open up a new view of local landscape dominating the future view.
Moderate Beneficial Effect	The project will: <ul style="list-style-type: none"> enhance the character (including quality and value) of the landscape; enable the restoration of characteristic features and elements partially lost or diminished as a result of changes from inappropriate management or development; enable a sense of place to be restored; and cause a noticeable improvement in the existing view.
Minor Beneficial Effect	The project will: <ul style="list-style-type: none"> complement the character (including quality and value) of the landscape; maintain or enhance characteristic features and elements; enable some sense of place to be restored; and cause a barely perceptible improvement in the existing view. This will typically occur where the viewer is at some distance from the development and the development newly appears in the view, but not as a point of principal focus. It will also occur where the development is closely located to the viewpoint but is seen at an acute angle and at the extremity of the overall view.
None	No change resulting from the development
Negligible Effect (applies to both, adverse and beneficial)	The project will: <ul style="list-style-type: none"> maintain the character (including quality and value) of the landscape; blend in with characteristic features and elements; enable a sense of place to be retained; and not result in a discernible improvement or deterioration in the existing view.
Minor Adverse Effect	The project will: <ul style="list-style-type: none"> not quite fit the character (including quality and value) of the landscape; be at variance with characteristic features and elements;

SIGNIFICANCE CATEGORY	DESCRIPTION OF EFFECT
	<ul style="list-style-type: none"> • detract from a sense of place; and • cause a barely perceptible deterioration in the existing view. This will typically occur where the viewer is at some distance from the development and the development newly appears in the view, but not as a point of principal focus. It will also occur where the development is closely located to the viewpoint but is seen at an acute angle and at the extremity of the overall view.
Moderate Adverse Effect	<p>The project will:</p> <ul style="list-style-type: none"> • conflict with the character (including quality and value) of the landscape; • have an adverse impact on characteristic features or elements; • diminish a sense of place; and • cause a noticeable deterioration in the existing view.
Major Adverse Effect	<p>The project will:</p> <ul style="list-style-type: none"> • be at complete variance with the character (including quality and value) of the landscape; • degrade or diminish the integrity of a range of characteristic features and elements; • damage a sense of place or cause a sense of place to be lost; • cause the integrity of characteristic features and elements to be lost; • cause a very noticeable deterioration in the existing view; and • obstruct an existing view of local landscape and the development will dominate the future view.

While the above table provides a useful way of categorising effects, significance can also be described in a more qualitative manner, in accordance with the sliding scale of significance as shown in Table 8-12: Scale of Significance.

Table 8-12: Scale of Significance



The significance of the effects is determined by the matrix shown in the table below.

Table 8-13: Significance of Effects Matrix⁶⁹

SIGNIFICANCE OF EFFECTS (effects rated Moderate & above are considered significant)		SENSITIVITY				
		High	Medium-High	Medium	Medium-Low	Low
MAGNITUDE OF CHANGE	Very High	Major	Major	Moderate-Major	Moderate	Moderate
	High	Major	Moderate-Major	Moderate-Major	Moderate	Minor-Moderate
	Moderate	Moderate-Major	Moderate	Moderate	Minor-Moderate	Minor
	Low	Moderate	Moderate	Minor-Moderate	Minor	Minor-Negligible
	Negligible	Minor	Minor-Negligible	Minor-Negligible	Negligible	Negligible

Effects will be assessed for all phases of the proposed development. Construction effects are considered to be temporary, short term effects which occur during the construction/decommission phase only. Operational/residual effects are those long term effects which will occur as a result of the presence or operation of the development.

⁶⁹ Note that the matrix is a guide - the determination of significance of effects also requires an element of professional judgement

The quality of each effect is based on the ability of the landscape character or visual receptor to accommodate the proposed development, and the impact of the development within the receiving context. Once this is done, the quality of the effect is then assessed as being neutral, beneficial or adverse. A change to the landscape or visual resource is not considered to be adverse simply because it constitutes an alteration to the existing situation.

8.2.11 Cumulative Effects

In addition to landscape and visual effects, it is also important to consider potential cumulative effects. Significant cumulative effects may occur where a number of similar developments combine to increase the prevalence of that type of development within a landscape or view to the extent that they become a defining characteristic. The cumulative assessment evaluates the additional change resulting from the proposed development in relation to the theoretical baseline scenario and follows a similar methodology to that used for the landscape and visual assessments.

8.2.11.1 Cumulative Landscape Effects

In terms of landscape character, cumulative effects may result where a number of similar developments combine, increasing the prevalence of this type of development within a landscape to an extent where these may become a defining characteristic. The likely significance of these effects relates to the number of similar developments affecting the landscape, their scale, the inter-relationship between their respective visual envelopes and the sensitivity and ability of the particular landscape to accommodate this type of development.

The assessment considers the potential for combined impacts to static views within the landscape which may be either **simultaneous** (where the development will be observable at the same time) or **successive** (where an observer will be required to turn to experience multiple developments). The assessment also considers the potential for **sequential** impacts which may be experienced whilst moving through the landscape.

8.2.11.2 Landscape Sensitivity to Cumulative Change

The evaluation of cumulative sensitivity to change considers the landscape value, identified within the landscape assessment baseline, the ability of the landscape receptor to accommodate several similar developments, and the cumulative baseline scenario. The landscape sensitivity to cumulative change is defined with reference to the definitions outlined in Table 8-14: Landscape Sensitivity to Cumulative Change.

Table 8-14: Landscape Sensitivity to Cumulative Change

Landscape Sensitivity	Classification Criteria
High	The baseline development scenario is very close to or achieves the maximum scope for developments, resulting in little opportunity for additional development without significant impact.
Medium	The baseline development scenario leaves some opportunity for additional development within the landscape without resulting in significant impacts.
Low	The baseline scenario has little influence on the ability of the landscape to accommodate change, resulting in a landscape potentially tolerant of a large degree of additional development.

8.2.11.3 Cumulative Magnitude of Change

Magnitude of change concerns the measurement of change which will occur as a result of the introduction of the proposed development into the baseline scenario. This involves the consideration of the potential nature, size, scale and location of the proposed change within the context of the existing baseline scenario. The evaluation of the magnitude of change is based on the criteria outlined in the main landscape assessment methodology.

8.2.11.4 Cumulative Visual Effects

In terms of visual amenity, cumulative effects may result where a number of similar developments combine, to increase the appearance and dominance within a particular view. The likely significance of these effects relate to the number of developments visible, their scale, location and inter-relationship to each other within the view.

The assessment considers the potential for combined views of developments from both static viewpoint receptors and routes. Combined views of developments may be either simultaneous (where similar developments will be observable at the same time) or successive (where an observer will be required to turn to experience multiple similar developments). The assessment also considers the potential for sequential effects experienced from route receptors where different developments become visible whilst moving through the landscape. Sequential effects may be occasional, frequent or constant.

In order to ensure that the cumulative assessment focuses on potentially significant effects, it is based on those viewpoints and route receptors identified within the detailed assessment as being significantly affected by the proposed development.

8.2.11.5 Visual Sensitivity to Cumulative Change

The evaluation of cumulative sensitivity to cumulative change considers the value of the view and the cumulative baseline scenario and is defined with reference to the definitions outlined in Table 8-15:

Visual Sensitivity to Cumulative Change.

Table 8-15: Visual Sensitivity to Cumulative Change

Visual Sensitivity	Classification Criteria
High	Locations where cumulative developments are well accommodated within a sensitive or well composed view and where changes will be highly noticeable.
Medium	Locations where cumulative developments are present but not prominent in the view and receptors are tolerant of a degree of change.
Low	Locations where cumulative developments are prominent in the view and receptors are tolerant of a large degree of change.

8.2.11.6 Cumulative Magnitude of Change

Magnitude of change concerns the measurement of change which will occur as a result of the introduction of the proposed development into the baseline scenario. This involves the consideration of the potential nature, size, scale and location of the proposed change within the context of the existing baseline scenario. The evaluation of the magnitude of change is based on the criteria outlined in the main landscape assessment methodology.

8.2.12 Field Work

Site surveys of the 5 km study area and beyond were carried out on 21st April 2016 and 1st June 2016 identifying the potential visibility of the proposed development and key viewpoints within the local and wider landscape. Photosheets showing the existing view and the superimposed development on photomontages and wireline drawings have been produced from key representative viewpoints, taking into account topography, existing buildings, screening vegetation and other localised factors. Photomontages 1 – 4 are included in Appendix 8.1.

8.2.13 Selection of Viewpoints

Viewpoint selection has been carried out according to the current best practice standards and the following industry guidelines:

- *Photography and Photomontage in Landscape and Visual Impact Assessment*, Landscape Institute Advice Note 01/2011.

It is not feasible to produce photomontages from every possible viewpoint in the 5 km study area. Photomontages have been produced from key viewpoints, which are representative of the nature of

visibility at various distances, from landscape designations and in various contexts. As the viewpoint photographs were taken in June, deciduous trees show foliage and therefore do not illustrate the winter season scenario without foliage, i.e. worst case scenario. However, existing screening provided by foliage has been accounted for when determining the magnitude of change of landscape and visual effects.

Photomontages are one source of information and used as a tool to help to understand the nature of potential effects and to assist the determination of the magnitude and significance of residual landscape and visual effects. The selection process of viewpoint locations is as follows:

- The location of viewpoints within the study area is informed by desktop and site surveys;
- Visual impact mapping of open and intermittent views during the site survey assesses the potential visibility of the proposed development from settlements, national, regional and key local roads including scenic routes, as well as from cycling and walking routes, relevant highpoints and other landscape designations etc.;
- Identification and selection of representative viewpoints showing typical open or intermittent views within a local area, which will be frequently experienced by a range of viewers; and
- Identification and selection of specific views from key viewpoints in the landscape such as routes or locations valued for their scenic amenity, main settlements etc. In this instance the study area during the site survey extended beyond the 5 km boundary to take account of the nearest elevated grounds at Carbury Hill.

8.2.14 Photomontages

Photomontages are photorealistic visualisations produced using specialist software. They illustrate the likely future appearance of the proposed development from a specific viewing point. They are useful tools for examining the impact of the development from a number of critical viewpoint positions along the public road network within the study area.

However, photomontages in themselves can never provide the full picture in terms of potential impacts, they can only inform the assessment process by which judgements are made. A visualisation can never show exactly what the proposed development will look like in reality due to factors such as; different lighting, weather and seasonal conditions which vary through time and the resolution of the image. As the photomontages are representative of viewing conditions encountered, some of them may show vegetation or topography screening some or all parts of the developments. Such conditions are normal and representative.

The images provided give a reasonable impression of the scale of the development and the distance to the development, but can never be 100% accurate. It is recommended that decision-makers and any interested parties or members of the public should ideally visit the viewpoints on site, where

visualisations can be compared to the 'real life' view, and the full impact of the proposed development can be understood.

The visual impact assessment on site identified a range of viewpoints located within the study area at varying distances from the proposed developments to show the effect of the development in key close, middle and distant views.

Viewpoints / Photomontages 1-4 show the proposed development including the following information:

- Existing View, showing the baseline image;
- Photomontage, showing the proposed development including full height of landfill mounds prior to the establishment of vegetation cover;
- Photomontage, showing the proposed development including full height of landfill mounds at cessation of works following establishment of vegetation cover; and
- Wireline drawing, indicating visible and non-visible permitted and proposed structures.

In views where the proposed development will be fully screened, the existing view and the wireline drawing are shown only, indicating the location of the permitted and proposed development structures for information.

Photomontage images have been produced with reference to best practice and the following industry guidelines:

- *Photography and Photomontage in Landscape and Visual Impact Assessment*, Landscape Institute Advice Note 01/2011, 2011;
- *Guidelines for Landscape and Visual Impact Assessment (GLVIA), Third Edition*, Landscape Institute and Institute of Environmental Management and Assessment, IEMA, 2013; and
- *Visual Representation of Wind Farms, Version 2.1*, Scottish Natural Heritage, December 2014 (in relation to viewpoint selection, technical equipment, function and limitations of visualisations).

The photography, used to produce the baseline images and photomontages, was taken using a Canon EOS 5D Mark III camera with a 50 mm fixed lens, mounted on a tripod at a height of approximately 1.6 m above ground level.

8.2.15 Zone of Theoretical Visibility (ZTV)

Mapping the extent of the area from which a development is likely to be visible was originally known as a Visual Envelope Map (VEM), then as a Zone of Visual Influence (ZVI) and more recently as a Zone of

Theoretical Visibility (ZTV). These changes in terminology reflect attempts to address frequent challenges occasioned by the mapping. Thus, as a theoretical methodology, ZTV prediction does not take into account the effects of seasons, lighting, weather conditions or visibility over distance. Moreover, a ZTV does not take into account the screening effects of vegetation or built structures and can omit topographical variations of up to 10 m. Therefore, in reality, ZTV mapping's principal use is to identify viewing points for further analysis.

Considering the mostly flat or gently undulating nature of the study area and the significant vegetation cover within the Bord na Móna site and throughout the study area, as well as existing built structures, the production of a ZTV would not be useful in the identification of viewpoints within the study area. The assessment relied therefore on comprehensive site surveys to establish the nature of visibility within the study area and to identify key viewpoint locations.

8.3 RECEIVING ENVIRONMENT / BASELINE DESCRIPTION

The location of the proposed development is situated within a Bord na Móna land holding, in relatively flat low-lying cutaway bogland, adjacent to an existing landfill in operation and a consented, but not yet built, Mechanical Biological Treatment (MBT) Facility. The Bord na Móna land holding and the lands surrounding it are generally averaging between 80-90 mOD. The maximum height of land within the area surveyed is 142 mOD (Carbury Hill, approximately 6.5-7 km to the west). The existing landfill, as it has been gradually capped and grassed, has created a new rising land form within the bog. The introduction of this land use has also included the construction of access roads, car parks, buildings, attenuation and storage areas within the cutaway bog. The Hill of Allen (219 mOD), a landmark within the wider landscape, is located approximately 10 km south of the proposed development and outside of the study area. The hill is subject to extensive quarrying.

The cutaway bogland consists of areas of open peat, low vegetation, regenerating woodland and scrub vegetation of varying heights. A network of bog train tracks remains. The existing landfill is serviced by a 4.8 km long internal, private haul road, used only by HGVs and trucks bringing material to and from the site, and by staff vehicles. Regenerating vegetation is increasingly enclosing the views within the bog. There is significant existing screening vegetation located within the western sections of the Bord na Móna land holding and along sections of the eastern and southern boundary.

While the bog includes areas of tall vegetation, its primarily open nature contrasts with the surrounding landscape. The Bord na Móna land holding is surrounded on all sides by agricultural pastureland with a well-developed pattern of medium-sized and larger fields and an established hedgerow infrastructure.

There are a number of occupied properties located within a 2 km radius of the existing landfill site. A larger number of properties are located within a 4 km offset, in particular to the west, south and east of the site.

Local road L5025 (Derrymahon Road) traverses the Bord na Móna land holding approximately 0.8 km north of the existing landfill. The R403 runs to the west and south of the lands, via Derrinturn and Allenwood. The R402 runs to the northwest, and the remainder of the study area is served by a local road network. There are residential and farm properties along all of the surrounding roads, with a higher density of settlement around Derrinturn and Allenwood.

The Grand Canal runs 3-4 km to the south and southwest of the application site, via Allenwood and Robertstown.

Site Description

Plates 1-5 below show the location and existing views of the proposed development in relation to the existing landfill and associated infrastructure. The cutaway bog at this location is flat and consists predominantly of regenerating scrub, including gorse and birch.



Plate 1: Location of Viewpoints 1, 2a & 2b in relation to existing landfill development



Plate 2: Viewpoint 1 across proposed landfill site from car park of existing facility



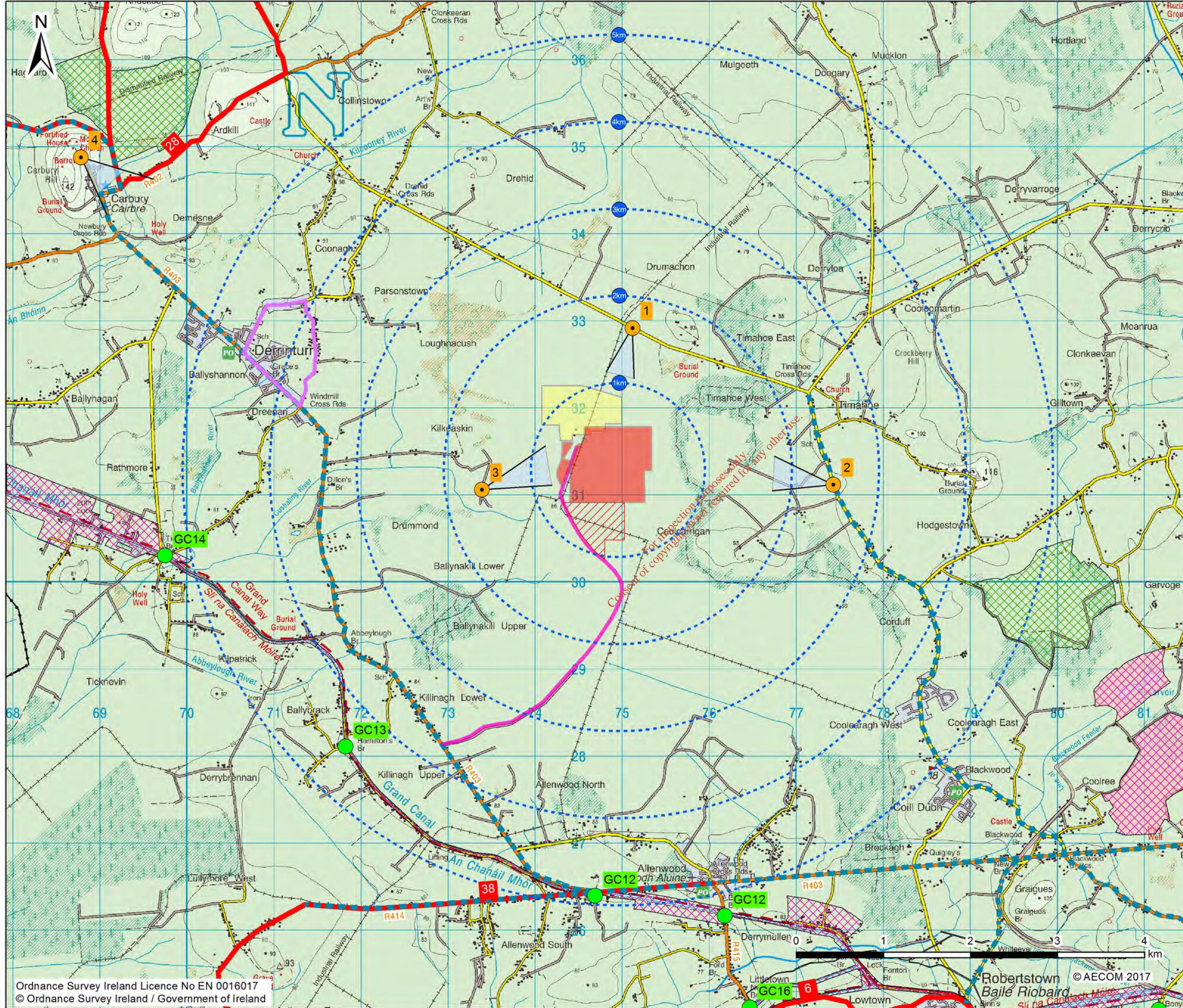
Plate 3: Viewpoint 2a of proposed landfill location from existing access road



Plate 4: Viewpoint 2b of proposed landfill location from existing access road

Site Access

The main access to the site location for the proposed development is the previously constructed dedicated access road from the R403 regional road to the existing Drehid Waste Management Facility, as shown in Figure 8.1: Landscape Designations and Photomontage Locations.



Legend

- Photomontage Locations
- Distance from Site Centre
- Existing Waste Management Facility
- Proposed Landfill Development
- Consented MBT Facility
- Existing Access Road
- North Kildare Tourist Route
- Scenic Viewpoints
- Derrinturn Sí na Sláinte
- Scenic Route (Kildare Co. Development Plan 2017-2023)

National Parks and Wildlife Service (NPWS)

- proposed Natural Heritage Area (pNHA)
- Natural Heritage Area (NHA)
- Special Area of Conservation (SAC)

Client
BORD NA MÓNA
Naturally Driven

Project
Proposed Development at Drehid Waste Management Facility

Drawing Title
Landscape Designations and Photomontage Locations

Drawing Number
Figure 8.1

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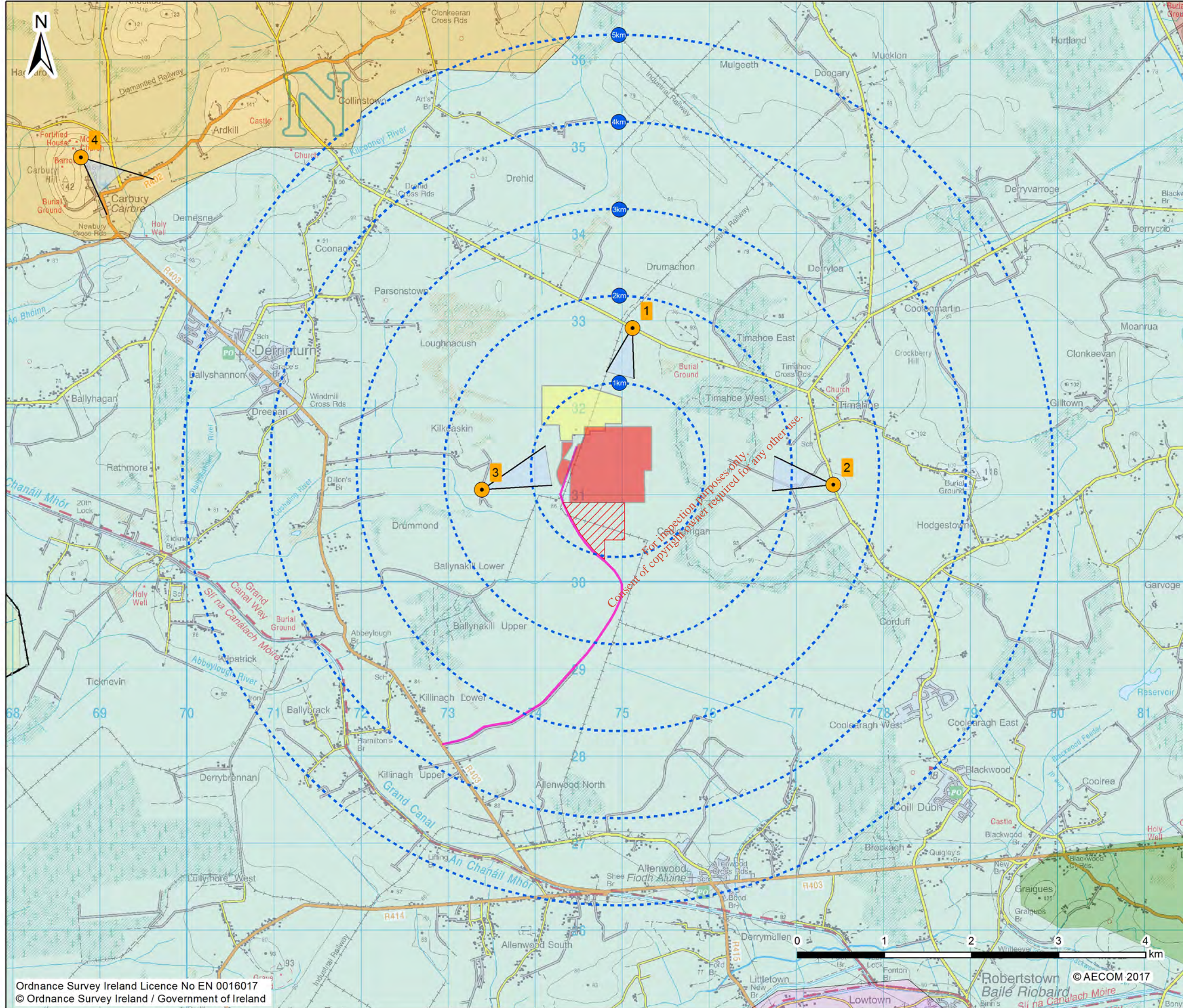
TOBIN
Consulting Engineers

Drawing Status: **Planning**

Drawn	Checked	Project Director	Date
C. O'Sullivan	J. Schulze	E. Frampton	17.02.2017

Scale @ A3
AECOM Project Number
60501437

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- ### Legend
- Photomontage Locations
 - Proposed Landfill Development
 - Distance from Site Centre
 - Existing Waste Management Facility
 - Consented MBT Facility
 - Existing Access Road

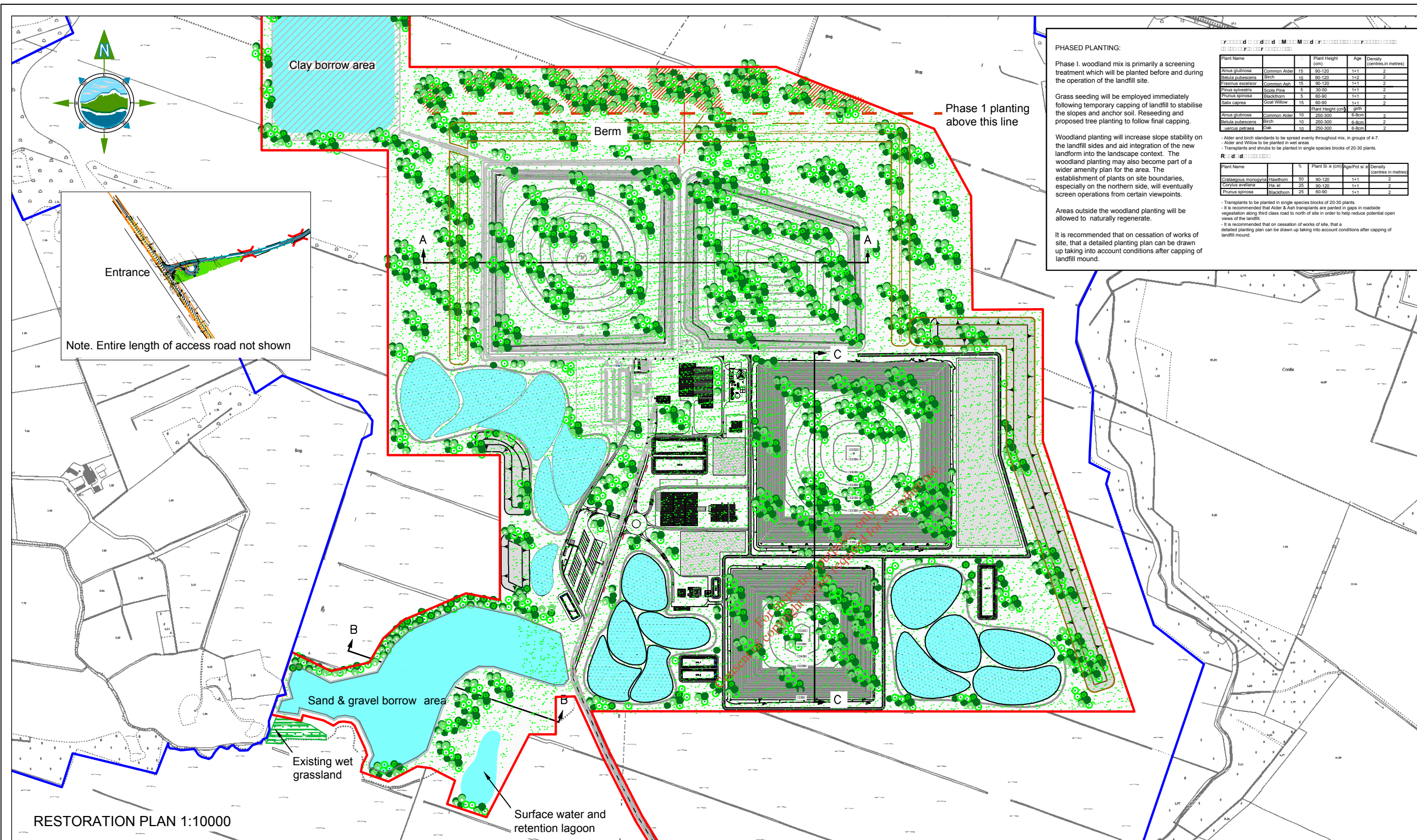
- ### Landscape Character Areas
- Northern Lowlands
 - North Western Lowlands
 - Northern Hills
 - Western Boglands

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<p>Client</p> <p>Naturally Driven</p>			
<p>Project</p> <p>Proposed Development at Drehid Waste Management Facility</p>			
<p>Drawing Title</p> <p>Landscape Character Areas</p>			
<p>Drawing Number</p> <p>Figure 8.2</p>		<p>Rev</p>	
<p>Consultant</p> <p>Consulting Engineers</p>			
<p>Drawing Status:</p> <p>Planning</p>			
<p>Drawn</p> <p>C. O'Sullivan</p>	<p>Checked</p> <p>J. Schulze</p>	<p>Project Director</p> <p>E. Frampton</p>	<p>Date</p> <p>17.02.2017</p>
<p>Scale @ A3</p> <p>As indicated</p>		<p>AECOM Project Number</p> <p>60501437</p>	
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PHASED PLANTING:

Phase 1 woodland mix is primarily a screening treatment which will be planted before and during the operation of the landfill site.

Grass seeding will be employed immediately following temporary capping of landfill to stabilise the slopes and anchor soil. Reseeding and proposed tree planting to follow final capping.

Woodland planting will increase slope stability on the landfill sides and aid integration of the new landfill into the landscape context. The woodland planting may also become part of a wider amenity plan for the area. The establishment of plants on site boundaries, especially on the northern side, will eventually screen operations from certain viewpoints.

Areas outside the woodland planting will be allowed to naturally regenerate.

It is recommended that on cessation of works of site, that a detailed planting plan can be drawn up taking into account conditions after capping of landfill mound.

Plant Name	Common Name	Plant Height (cm)	Age	Density (centres in metres)
<i>Alnus glutinosa</i>	Common Alder	15	90-120	1:1
<i>Betula pubescens</i>	Birch	15	90-120	1:2
<i>Prunus spinosa</i>	Blackthorn	5	90-90	1:1
<i>Salix caprea</i>	Goat Willow	15	90-90	1:1
<i>Prunus spinosa</i>	Blackthorn	5	90-90	1:1
<i>Salix caprea</i>	Goat Willow	15	90-90	1:1
<i>Alnus glutinosa</i>	Common Alder	10	250-300	6:8cm
<i>Betula pubescens</i>	Birch	10	250-300	6:8cm
<i>Quercus petraea</i>	Oak	10	250-300	6:8cm

R. d. id:

Plant Name	Common Name	Plant Height (cm)	Age	Density (centres in metres)
<i>Calluna vulgaris</i>	Heather	50	90-120	1:1
<i>Corylus avellana</i>	Hazelnut	25	90-120	1:1
<i>Prunus spinosa</i>	Blackthorn	25	90-90	1:1

NOTES:

- Alder and birch standards to be spread evenly throughout mix, in groups of 4-7.
- Alder and Willow to be planted in wet areas.
- Transplants and shrubs to be planted in single species blocks of 20-30 plants.
- Transplants to be planted in single species blocks of 20-30 plants.
- It is recommended that Alder & Ash transplants are planted in gaps in roadside vegetation along first class road to north of site in order to help reduce potential open views of the landfill.
- It is recommended that on cessation of works of site, that a detailed planting plan can be drawn up taking into account conditions after capping of landfill mound.

Legend:

- Woodland Mix
- Woodland Mix Phase 1
- Natural Regeneration
- Proposed Roadside Planting
- Berm
- Pond
- Proposed Contours
- Site Boundary
- Site Access Road
- Existing Wet Grassland
- Existing Planting at Entrance

- NOTES:**
- FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
 - ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE.
 - ENGINEER/EMPLOYERS REPRESENTATIVE, AS APPROPRIATE, TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES.
 - THE CONTRACTOR SHALL UNDERTAKE A THOROUGH CHECK FOR THE ACTUAL LOCATION OF ALL SERVICES/UTILITIES, ABOVE AND BELOW GROUND, BEFORE ANY WORK COMMENCES.
 - ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD.

OSI 1:5,000 SERIES SHEET NO'S:
3187, 3188, 3253, 3254, 3318, 3319, 3381, 3382.

Rev	Date	Description	By	Chkd.
A	Dec. '17	PLANNING ISSUE	MN	DC

Client: **BORD NA MÓNA**
Naturally Driven

Project:
PROPOSED DEVELOPMENT AT DREHID WASTE MANAGEMENT FACILITY

Title:
LANDFILL RESTORATION PLAN

Scale @ A3: **AS SHOWN**

Prepared by: M. Nolan Checked: A. Austin Date: December 2017

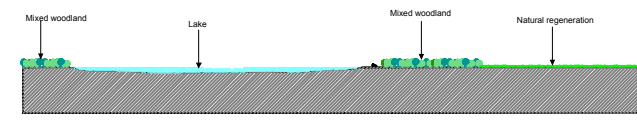
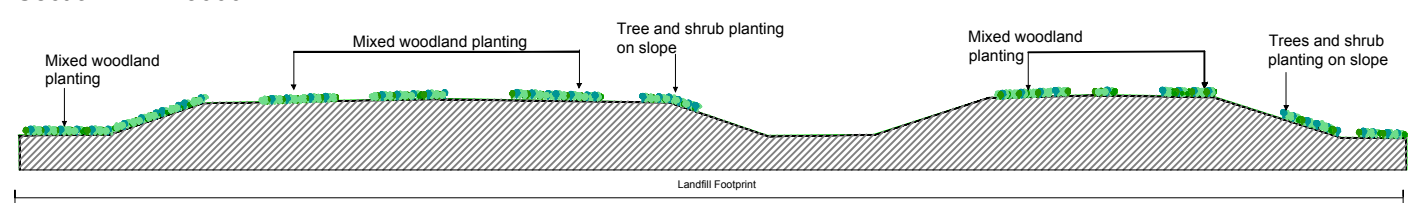
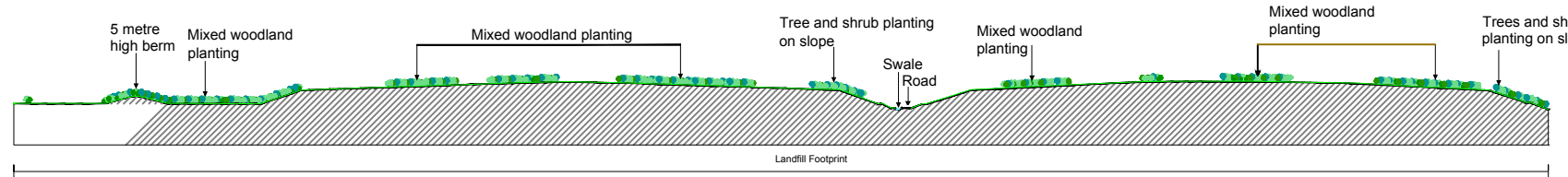
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Drawing No.: **Figure 8.3** Revision: **A**



8.3.1 Landscape Character Areas / Types

Principal Landscape Character Areas as described in the Kildare County Development Plan 2017-2023 (CDP)

The current development plan contains a Landscape Character Assessment which describes Principal Landscape Character Areas and strategies for the protection of specific landscape features.

The proposed development is located within Principal Landscape Character Area 'Western Boglands' as set out in the current CDP and shown in Figure 8.2: Landscape Character Areas. The CDP categorises the sensitivity of principal landscape character areas into 5 Classes. The 'Western Boglands' are listed as Class 3 with a 'High' sensitivity. Landscapes of High sensitivity are described in the Plan as "*areas with reduced capacity to accommodate uses without significant adverse effects on the appearance or character of the landscape having regard to prevalent sensitivity factors*".

Table 14.3 of the CDP identifies the *likely compatibility* between a range of land-uses and Principal Landscape Areas. In this table, the Western Boglands are described as being of Medium compatibility with Industrial projects.

Principal landscape sensitivity factors include *Peat Bogs* – and Table 14.4 states that Industrial development is "very unlikely to be compatible" with *Peat Bogs*.

However, it should be noted that the existing landfill and associated infrastructure has established a waste management character to the cutaway bog at Drehid and Policy LL 5 in the CDP states: "*To recognise that cutaway and cut-over boglands represent degraded landscapes and/or brownfield sites and thus are potentially robust to absorb a variety of appropriate developments.*"

Policy LA 3 states that it is required to prepare "... a *Landscape/Visual Impact Assessment to accompany significant proposals that are likely to significantly affect:*

- *Landscape Sensitivity Factors*
- *A Class 4 or 5 Sensitivity Landscape (i.e. within 500 m of the boundary)*
- *A route or view identified in maps 14.2 and 14.3 (i.e. within 500 m of the boundary)"*

8.3.2 Scenic Routes

The following scenic routes, as indicated on Map 14.3 and described in Appendix 4 in Kildare County Development Plan 2017-2023, have been identified within the study area:

- Scenic Route No. 28 – Views from county roads (L5017 and L26) of Carbury Castle and Hill: Teelough road junction with the R402 regional road and upland area at Mylerstown.
- Scenic Route No. 38 – Views of Allenwood to Lullymore Local Road.

The North Kildare Touring Route, promoted by www.discoverireland.ie, is signposted along some of the roads in the study area. These designations are indicated in Figure 8.1: Landscape Designations and Photomontage Locations.

8.3.3 Scenic Viewpoints

The following scenic viewpoints, as indicated on Map 14.3 and described in Table 14.8 in Kildare County Development Plan 2017-2023, have been identified within the study area and are indicated in Figure 8.1.

- GC12 Bond Bridge, Derrymullen
- GC13 Hamilton's Bridge, Killinagh Lower
- GC14 Ticknevin Bridge, Ticknevin

As well as these specific viewpoints, the Kildare County Development Plan also mentions the sensitivity of views to and from waterways and to and from hills.

8.3.4 Demesne Landscapes and Gardens

Demesne landscapes within Ireland have been itemised and described in the National Inventory of Architectural Heritage (Gardens). Within the study area, one known such demesne is located at the foot of Carbury Hill:

- Newberry Hall – described in the inventory as having *main features substantially present - some loss of integrity*

While not on the inventory of historic gardens, immediately adjacent to the Bord na Móna land holding to the east, Coolcarrigan House and Gardens is open to the public and used for weddings.

8.3.5 Environmental Designations

The study area contains the following areas designated for their ecological value and indicated in Figure 8.1.

Special Areas of Conservation (cSAC)

- Ballynafagh Bog 000391
- Ballynafagh Lake 001387

Proposed Natural Heritage Areas (pNHAs)

- Ballynafagh Bog 001391
- Ballynafagh Lake 001387
- Grand Canal 002104

Natural Heritage Areas (NHAs)

Carbury Bog	001388
Hodgestown Bog	001393

While these areas are designated for ecological reasons, they are generally examples of intact landscapes and are therefore considered as potential sensitive receptors.

8.3.6 Slí na Sláinte walking routes

A looped Slí na Sláinte walk runs through Derrinturn approximately 4 km west of the application site.

8.3.7 Walking Routes

The Grand Canal Way and the Barrow Way are located within the study area approximately 3 km southwest of the application site.

8.3.8 Likely Future Receiving Environment / Do Nothing Scenario

All components of the baseline are constantly changing due to a combination of natural and human processes. When predicting likely direct and indirect effects it is important to remember that there are two available for comparison: the existing baseline environment and the future baseline environment without the implementation of the proposed development but considering natural changes only.

In landscape terms, if the development did not go ahead, the proposed development site will remain as an area of regenerating cutaway bog. The succession and maturing of existing vegetation will continue depending on a number of factors for example existing soil / peat conditions, the likelihood of erosion, water levels and the re-establishment of a balanced ecosystem. However, the location of the proposed development site adjacent to an existing waste management site to the north / northwest and a consented but not yet constructed MBT Facility to the south will retain the site as being subject to development consideration.

In visual terms, the content in available views of the development site will remain similar, although vegetation is likely to increase and grow in height over time.

8.4 POTENTIAL EFFECTS ON LANDSCAPE AND VISUAL

The following potential direct visual effects, direct and indirect landscape effects, as well the duration and nature of effects arising from the proposed development, have been identified. Viewpoints / Photomontages 1 - 4 illustrate the proposed development. A description of each photomontage is included in Section 8.4.2 herein.

The proposed development comprises a number of tall structures such as the two landfill mounds and a range of buildings. The landfill mounds with a proposed height of approx. 31 m and the structures of the Ash Solidification Facility (14 m) including silos (22 m) will become the tallest features of the proposed development. Other building heights range between 4 m and 12 m at the eaves. The buildings will be constructed in phases. The landfill mounds will become the tallest features over time. The magnitude of visual change in existing views will be determined by the visibility of the building structures and the increasing height of the landfill mounds and their visibility as well as by the effectiveness of existing intervening screening vegetation, the new internal haul roads and the distance of the landfill mounds from the nearest settlement, landscape designation, walking route as well as the general road network from which views may be possible.

Views of the proposed development site are generally well screened by intervening roadside vegetation, vegetation located between publicly accessible roads and the proposed site and by the existing landfill facility. It should be noted that the consented MBT facility will also screen the proposed development, but primarily in views within the Bord na Móna land holding.

There is potential for cumulative landscape and visual effects arising from the existing landfill and the consented MBT facilities, which is described in detail in Section 8.4.3 herein.

8.4.1 Landscape Effects

Direct or indirect landscape effects on the fabric of the landscape and its receptors are closely related to the nature and extent of visibility.

The proposed development will continue the emerging trend within the Bord na Móna land holding – a landscape changing in character from regenerating cutaway bog to large scale waste management with light industrial buildings. While the land holding has a history of large-scale peat extraction, the proposed development site currently consists of re-vegetating cutaway bog. The existing Drehid Waste Management Facility is located immediately adjacent to the north of the proposed development and the consented but not yet built MBT Facility will be located to the immediate south of the proposal. The proposed development will therefore appear as a contiguous development. However, the proposed landfill mounds will ultimately be higher than the existing landfill mound to the north, northwest resulting in an increase in the overall height of the facility in this location.

The proposed development site is located in the Landscape Character Area 'Western Boglands'. The sensitivity of this LCA has been described as 'High' in Kildare County Development Plan 2017-2023. However, the development will be entirely located within cutaway bogland, which represents a degraded landscape as recognised by the Kildare CDP. The sensitivity of the development site itself as well as its susceptibility is therefore considered Low. Direct and permanent change will occur locally

where the proposed development will be physically located. The magnitude of landscape change within the proposed development site is considered high. Bearing in mind the existing and permitted developments adjacent to either side of the proposed development site, the proposed development will continue to alter the landscape character intensively over a limited area from a cutaway bogland into a large scale waste management character with light industrial buildings. The highest direct landscape effects will arise from changes to landform and existing vegetation on the site. The significance of change is considered to be Moderate adverse.

Outside the Bord na Móna land holding, recognisable changes to the landscape character will be limited and localised due to the flat nature of the overall study area and significant intervening vegetation, which will prevent the full recognition of the scale of the changes to landform within the land holding. Moderate Adverse and significant indirect landscape effects will be localised and concentrate in areas outside the Bord na Móna land holding to the east, north, northeast and west. These areas will experience adverse landscape effects related to partial visibility of the proposed development components, particularly in areas within 2 km of the Bord na Móna land holding, and on elevated sections of Carbury Hill located approximately 6.7 km northwest of the proposed development site. There will be Low indirect landscape effects on the setting of Newberry Demesne, as experienced from Carbury Hill (refer to Viewpoint / Photomontage 4) due to the introduction of the landfill mounds in the background landscape. However, there will be no significant change to the landscape character in low lying areas to the southwest, south and southeast beyond 2 km of the site.

Potentially sensitive landscape receptors have been described above and a summary of landscape effects of the proposed development on these receptors is provided in Table 8-16: Summary of Landscape Effects.

Table 8-16: Summary of Landscape Effects

RECEPTOR	SUSCEPTIBILITY	SENSITIVITY	MAGNITUDE OF LANDSCAPE CHANGE	DIRECT/INDIRECT	SIGNIFICANCE
Site landscape character and character of immediate vicinity	Low	Low	High	Direct	Moderate Adverse
Landform within the Bord na Móna land holding	Medium	Medium	Very High	Direct	Moderate-Major Adverse
Existing vegetation within the Bord na Móna land holding	Low	Medium	Very High	Direct	Moderate Adverse
General Landscape Character outside the Bord na Móna land holding (within 2 km radius on flat land)	Medium	Medium	Moderate	Indirect	Moderate Adverse
General Landscape Character outside the Bord na Móna land holding (beyond 4 km radius on flat land)	Medium	Medium	Low	Indirect	Minor-Moderate Adverse
Landscape Character as perceived from nearest elevated location (Carbury Hill at 6.7 km distance)	Medium	Medium-High	Moderate	Indirect	Moderate Adverse
SAC/pNHA Ballynafagh Bog Ballynafagh Lake	Medium	Medium-High	None	Indirect	None
pNHA Grand Canal	Medium	Medium-High	None	Indirect	None
NHA Carbury Bog Hodgestown Bog	Medium	Medium-High	None	Indirect	None
Setting of Newberry House Demesne as experienced from Carbury Hill	Medium	High	Low	Indirect	Minor-Moderate Adverse

8.4.2 Visual Effects

The proposed development is located in a mainly flat landscape and therefore even relatively low vegetation can provide screening to receptors. The highest visual effects tend to occur where there is no intervening vegetation between the viewer and the proposed development, or where the viewer is at an elevated position. Four photomontages from representative viewpoint locations have been prepared illustrating the nature of visibility of the proposals at various distances, contexts and elevations.

Viewpoint / Photomontage 1 is located on the L5025 (Derrymahon Road) and 1.15 km from the nearest part of the proposed landfill structure. The view is orientated to the south, southwest. Many potential views along this road are screened by roadside hedgerows and intervening vegetation in the middle distance.

The susceptibility to change in this and similar views is considered medium as receptors will be users of the local road network with an oblique view of the proposed development. The landscape is flat and views are often enclosed by roadside or other vegetation. Where views do open up they generally take in areas of cutaway bog or medium sized fields. The value of this view is considered Medium-Low. The sensitivity of this or similar views in the area is considered Medium-Low. While the view is not the primary focus of receptors, the cutaway bogland landscape forms part of a degraded landscape.

The existing landfill mound and machinery is partially visible from this viewpoint. At operation, the proposed landfill mounds and machinery will also become visible over time as the height of the mounds increases and eventually reach their full height. They will become visible above the band of trees to the left of the existing facility. Short sections of the eaves of the proposed compost facility extension will also become visible in the middle distance. However, the remaining proposed ancillary plant development will be fully screened by intervening vegetation. The existing landfill, when complete, will further screen the proposed landfill mound, resulting in a thin band of working landfill visible in the medium term with the ridge of a low artificial hill visible from this location following the 25-year operational lifespan and on a permanent basis. The magnitude of visual change is considered Moderate. The significance of visual effects is considered Moderate adverse.

When complete, the upper sections of the landfill will remain visible against the sky but will blend in with the existing vegetation in the middle distance once the landscape mitigation measures have established. The magnitude of residual visual change will therefore be Moderate-Low. The residual significance of visual effects is therefore considered Moderate-Minor adverse in this view, which represents the most open view along this road. In the event of the existing regenerating intervening vegetation in the middle ground (which is to be retained) achieving heights of 10-15 m and more, the proposed development will become further screened in this view and visual effects will reduce to Low and the residual significance will be Minor adverse.

Viewpoint / Photomontage 2 is located on the L5025 in the vicinity of the townland of Timahoe, and 2.21 km from the nearest part of the proposed landfill structure. The view is orientated to the west, southwest.

The susceptibility to visual change is considered Medium as receptors will be users of the local road network with an oblique view of the proposed development. This image represents an open view towards the site but intervening vegetation in the middle distance or roadside vegetation along this road to either side limits other views into the site. The value of this view is considered Medium. The sensitivity of this or similar views in the area is considered Medium - while the view is not the primary focus of receptors, the Western Boglands landscape is of High value as reflected in the county landscape character assessment. This road is also part of the North Kildare Touring Route leading to Coolcarrigan House and Gardens which are open to the public and used for weddings.

The existing landfill development is fully screened by intervening vegetation. The photomontage and wireline drawing demonstrate that the proposed development at Drehid Waste Management Facility will also be fully screened by intervening vegetation. There is therefore no visual change to this viewpoint.

Viewpoint / Photomontage 3 is located on an access lane leading into the bog east from the R403 just south of Derrinturn and 1.29 km from the nearest part of the proposed landfill structure. The view is orientated to the east, southeast.

The susceptibility to change is considered high considering that the key receptor is residential in this area. The site becomes visible for the last approximate 500 m of the lane. The value of this view is considered Medium. The sensitivity of this or similar views in the area is considered High, primarily due to this road being the access to the residence located at the end of the road and the intermittent nature of intervening vegetation. As the cutaway bog continues to regenerate, however, it is likely that the current partial views of the site will become fully screened.

During the operational period, machinery and the growing landfill mounds will be openly visible from this location, extending the visible landfill development to the right of the currently visible existing development. The proposed landfill will, at this distance, appear as an extension to the existing mound. Following the completion of construction works, the capped and grassed mounds will be taller than the existing landfill mound. The majority of the proposed ancillary plant structures will be screened by intervening vegetation. Short sections of building eaves and the upper parts of the solidification facility silos will be visible. The magnitude of visual change is considered High-Moderate. While the nature of the development is already established on site, this particular view will change from one primarily of flat regenerating bog, to one where a significant portion of the view will include light industrial activity and

artificial mounds, with a new skyline in a flat landscape. The significance of the visual effects is therefore Major-Moderate adverse.

At cessation of operations, the proposed earthen berms with bands of mixed tree planting will further screen lower sections of the existing and the proposed landfill developments. In the event of the existing regenerating intervening vegetation in the fore- and middle ground (which is to be retained) achieving heights of 4-5 m and more, the proposed development becomes almost fully screened in this view and visual effects will reduce significantly. The residual visual change is therefore considered Low-Negligible. The residual significance is considered Moderate-Minor adverse.

Viewpoint / Photomontage 4 is located close to the summit of Carbury Hill, and approximately 150 m from the end of a public road leading from the R403 to Carbury Hill. The photomontage location is located 6.75 km from the nearest part of the proposed landfill structure. The view is orientated to the southeast. The proposed development will not be visible from the end of the public road in the vicinity of the church and graveyard due to its lower elevation and the screening effects of intervening vegetation in the middle ground.

The susceptibility to change is considered High as receptors affected will be people who have deliberately walked to this vantage point to access the heritage features located on Carbury Hill, or simply to enjoy the view. The value of this view is considered Medium. The sensitivity of this or similar views in the area is considered Medium-High considering the elevated position and expansive panorama available. The view includes a broad sweep of flat agricultural and wooded landscapes including Newberry Hall and its demesne in the middle ground. The Wicklow Mountains are visible on the horizon.

The existing landfill mound and machinery at Drehid is visible in the far middle distance in the left side of the image. The consented, but not yet built MBT Facility, is located to the immediate right of the proposed landfill mounds. Short sections of the buildings' eaves will be discernible resulting in cumulative visual impacts (refer to Section 8.4.3 for a detailed description). At operation, the proposed landfill mounds and machinery will become visible when they reach a similar height to the existing landfill, and will, after the 25 year operational period, appear higher than the existing landfill mound. Sections of the proposed plant building roof structures and upper parts of the silos of the solidification facility will also be visible. However, they will not break the skyline in this view. There will be a permanent change to the vista as the proposed landfill mounds will become a recognisable new feature in long distance views to the higher ground in the far distance. The magnitude of visual change is considered Moderate as the proposed development will add a low hill-like feature in the distance, which is not characteristic in this elevated view. The impact will be highest while the mounds are being

constructed and machinery will be distantly visible during operational periods. The significance of visual effects is considered Moderate adverse.

At cessation of landfill works, the impact will reduce as the mounds grass over. They will appear as low hill-like mounds from this viewpoint and will not be immediately apparent to the average viewer. The residual magnitude of change is considered to be Low. The residual significance of change is therefore Moderate-Minor adverse.

Views from Scenic Routes, Scenic Viewpoints and Natura 2000 sites

The proposed development will not be visible from any of the scenic viewpoints as recognised by Kildare County Development Plan 2017-2023.

The proposals will not be visible from Scenic Route 38, any Natura 2000 sites, the Derrinturn Slí na Sláinte or the North Kildare Touring Route.

However, the upper parts of the landfill mounds may be partially visible from a short stretch of approximately 300 m along the R402 (Scenic Route 28) at Ardkill, where views open up on slightly higher ground. It is unlikely that the proposed development will be noticeable to the average traveller on this route as the view is oblique, and the visual change during operation is therefore considered Low. The significance is considered Moderate-Minor adverse. The visual change following cessation of landfill works is considered Low-Negligible. The residual significance is considered Minor adverse.

Views from residences within the 5 km study area

While it has not been possible to access individual properties within the study area, information gathered from publicly accessible locations, such as roads and access tracks during site surveys and during studying aerial photography has informed the assessment of relevant residential properties within the study area as described herein.

The proposed development will not be visible from the majority of residences within the 5 km study area radius. This is due to the flat or gently undulating nature of the study area and significant existing intervening vegetation, which will mostly prevent extensive cross-country views and often entirely screen potential views of the proposed development.

The visual sensitivity of residential receptors, which may experience potential views of the proposed development on a daily basis as the landfill mounds grow, is High. The susceptibility to visual change is considered Medium-High as changes in views, even minor changes, will likely be noticed. The value of views from private residences is considered High.

The number of properties which may experience views of the upper parts of the proposed landfill mounds and machinery as the mounds grow is limited to isolated properties located to the immediate west of the proposed development along the access track east of the R403 leading into the bog. Properties will experience similar views and visual effects as illustrated in Viewpoint / Photomontage 3 and described above.

Further, a small cluster of potentially affected residences is located to the northeast of the proposed site along the L5025 (Derrymahon Road) east of the location of Viewpoint / Photomontage 1 in the townlands of Timahoe East and Timahoe West as well as east in the townland of Coolcarrigan. While the majority of the proposed development will be fully screened by intervening vegetation, views of the upper most parts of the landfill mounds and machinery may be possible at some properties as the mounds grow to full height. The visual change at operation is considered to be Moderate and the significance of visual effects will be Moderate adverse. Residual visual effects following the cessation of landfill works and following the establishment of mitigation planting on the mounds are considered Moderate-Low. The residual significance of visual effects is therefore considered Moderate-Minor adverse.

Table 8-17: Summary of Visual Effects

Summary of visual effects				<i>Visual effects during operation and prior to establishment of vegetation cover</i>	
RECEPTOR	SUSCEPTIBILITY	VALUE	SENSITIVITY	MAGNITUDE	SIGNIFICANCE
Photomontage 1	Medium	Medium-Low	Medium-Low	Moderate	Moderate adverse
Photomontage 2	Medium	Medium	Medium	None	None
Photomontage 3	High	Medium	High	High-Moderate	Major-Moderate adverse
Photomontage 4	High	Medium	High-Medium	Moderate	Moderate adverse
Views from Scenic Viewpoint 12	High	High	High	None	None
Views from Scenic Viewpoint 13	High	High	High	None	None
Views from Scenic Viewpoint 14	High	High	High	None	None
Views from Slí na Sláinte	High	Medium	High	None	None

Summary of visual effects				<i>Visual effects during operation and prior to establishment of vegetation cover</i>	
RECEPTOR	SUSCEPTIBILITY	VALUE	SENSITIVITY	MAGNITUDE	SIGNIFICANCE
View from North Kildare Tourist route	High	High-Medium	High	None	None
View from Scenic Route 28	High	High-Medium	High	Low	Moderate-Minor adverse
View from Scenic Route 38	High	High-Medium	High	None	None
View from Natura 2000 sites	High	High	High	None	None

8.4.3 Cumulative landscape and visual effects

8.4.3.1 (In Combination) Cumulative effects of the proposed landfill development in conjunction with other similar existing developments

The proposed development is located directly adjacent to the existing landfill and will be viewed as a contiguous development. Therefore, cumulative effects in combination will occur where both developments are visible at close distance within the Bord na Móna land holding and where both developments are visible in the wider landscape as described in Section 8.4.2 above.

The sensitivity of the site landscape character is considered Low. The change in cumulative landscape effects within the land holding is Moderate due to the perceived increase in scale of landfill activities and the resulting intensification of transformation of regenerating bogland to a waste management character with light industrial buildings. The significance of cumulative landscape effects is considered Moderate-Minor adverse. The change in cumulative visual effects within the land holding are considered Moderate-High due to the alteration of the landform, increase in landfill development and associated ancillary built structures. The cumulative visual significance within the land holding and close to the proposed development is considered Moderate adverse.

Cumulative landscape effects outside the land holding in mainly flat land will be restricted to localised areas due to the extent of existing intervening vegetation throughout the study area. Cumulative landscape effects will be experienced in areas within approximately 2 km to the east, north, northeast and west of the proposed development site. The sensitivity of areas outside the land holding is considered Medium. Considering the existing landfill site adjacent to the proposed development, the cumulative change in landscape effects is considered Low-Moderate. The significance is Minor-Moderate adverse. The change in cumulative visual effects on the skyline in relevant views (refer to Viewpoints / Photomontages 1 & 3) is considered to range between Low and Moderate depending on the combined visible extend of the existing and proposed landfill development. The significance of

cumulative visual effects is considered to range from Minor-Moderate adverse (Viewpoint / Photomontage 1) and Moderate adverse (Viewpoint / Photomontage 3).

The sensitivity of the landscape character and the visual amenity to cumulative change in elevated views such as from Carbury Hill is considered Medium-High. Views from the upper parts of Carbury Hill, as represented by Viewpoint / Photomontage 4, will experience a moderate change in cumulative landscape and visual effects due to the extension of artificial mounds across a greater portion of the skyline. The significance of these effects at operation is considered Moderate adverse.

Residual cumulative landscape and visual effects following the establishment of proposed mitigation planting and its significance are considered Low/Minor-Moderate adverse outside the land holding. They will be limited to areas where sections of both the existing and the proposed landfill development are visible.

8.4.3.2 (In Combination) Cumulative effects of the proposed landfill development in conjunction with other consented developments (MBT facility)

The proposed development is located north and directly adjacent to the consented, but not yet constructed MBT Facility, and will be viewed as a contiguous waste management development. Therefore, cumulative effects in combination will occur where both developments are visible at close distance within the Bord na Móna land holding and where both developments are visible in the wider landscape as described in Section 8.4.2 above.

The sensitivity of the site landscape character is considered Low. The change in cumulative landscape effects within the land holding is Moderate due to the perceived increase in scale of waste management activities and associated built structures. The significance of cumulative landscape effects is Minor-Moderate adverse. The result of cumulative landscape effects in combination establishes further the change of land use from cutaway bog to large scale waste management with light industrial buildings.

The MBT Facility is similar in height to the proposed buildings and structures but considerably lower than the proposed landfill mounds. It will also be partly screened by the retention of existing vegetation. It will not be as visible in the wider landscape as the proposed development (refer to Viewpoints / Photomontages 1 – 4) due to significant intervening vegetation.

The residual cumulative landscape and visual effects outside the Bord na Móna land holding on low lying and elevated grounds, are therefore considered Negligible except in views from an access road to the west of the site with open and intermittent views of the site, where cumulative landscape and visual effects are considered to be Low. Considering the generally Medium sensitivity of areas outside the land holding, the significance of cumulative landscape and visual effects in views where the proposed

development will be visible in combination with the permitted MBT Facility, is therefore Minor-Negligible adverse.

8.4.3.3 Cumulative effects of the proposed development in conjunction with other large scale developments

It should be noted that on the 14th October 2016, An Bord Pleanála refused planning permission for Maighne Wind Farm, consisting of 47 wind turbines, which was proposed to be partially located within the study area, approximately 2 km north of the proposed landfill site. The High Court subsequently invalidated the refusal by An Bord Pleanála to grant planning permission in September 2017, and ruled that the application for Maighne Wind Farm should be remitted back to An Bord Pleanála for reconsideration.

The proposed landfill and wind farm developments will introduce verticality; however, they are different in scale, materials and general nature and will therefore not result in cumulative effects resulting in an increase of a particular development type (landfill or wind farm) within the landscape or available views within the study area.

8.4.4 Effects at construction

Landscape and visual effects during the construction stage will be experienced in the vicinity of the development site, from locations with views of the proposed development site and along the roads where construction traffic will travel. Existing boundary vegetation and road side vegetation in the area will fully screen the site clearance, earthworks, compound, construction works and the associated machines moving at the proposed development.

Landscape and visual effects at the construction stage will be highest within the immediate vicinity of the development site within the Bord na Móna land holding and at the site entrance on the R403. The landscape and visual effects and their significance at construction stage will be temporary, adverse and range from low/minor-negligible (in the wider study area) to high/very high (within 500 m radius from the proposed development site).

8.4.4.1 Indirect Effects

The main indirect effects on the landscape character will result from the increase in construction traffic movement to and from the site and concentrate along the R403 and the site entrance. These effects will be temporary.

8.4.5 Lighting Effects

Additional lighting will be utilised – on machinery and to light working areas at night time (morning and evening operations) depending on the seasons. This will result in night time visibility of the operations

from locations where the site is visible, as described in Section 8.4.2 above. There is already an established use of such lighting with the operation of the existing landfill and the proposals will therefore enlarge the currently lit areas. Landscape effects will be Moderate to High in the immediate vicinity, as a currently dark night landscape will be replaced by a lit environment. However, it is unlikely that there will be any other receptors apart from workers at the landfill facility who will experience the effects of lighting at this close distance.

The impact on views from longer distances will reduce due to the effects of distance and intervening topography and vegetation. Adverse visual effects on residences will be limited and localised due to the extensive screening effect of intervening vegetation in the study area. Residences potentially affected are located within 2 km to the east, west and northeast where lighting will become visible in areas that are currently dark in the background during operational hours as the landfill mounds grow higher. The magnitude of change in visual effects on relevant nearest residences will be Moderate-Low. The significance of these effects will range from Moderate adverse to Minor adverse depending on the distance from the development.

An increase in lighting in the distance will also be experienced in elevated views such as from Carbury Hill. However, it is likely that the numbers of receptors on Carbury Hill, away from the road in dark conditions will be very low. Generally, the effect on elevated areas located at a longer distance (approximately 4-7 km) from the site will reduce to low and negligible. The significance of landscape effects will range between Minor adverse and negligible due to the effects of distance and intervening vegetation.

8.5 MITIGATION MEASURES

Mitigation is a term used to describe the measures or actions that may be taken to minimise environmental effects. The purpose of mitigation is to avoid, reduce and where possible remedy or offset, any significant adverse direct and indirect effects on the environment arising from the proposed development.

8.5.1 Avoidance Measures

- Minimising earthworks and change in levels
- Restricting areas for construction works and temporary storage to a minimum

8.5.2 Reduction Measures

- Retention of all existing perimeter planting and re-generating vegetation where possible and sufficiently protect in areas close to construction works as described in BS 5837:2005.
- Disturbance of existing vegetation will be minimised where possible and proposed planting will help integrate the proposed development into the surrounding landscape, provide screening

where needed, reflect vegetation patterns of local habitats and minimise the effect on the landscape character of the area.

8.5.3 Remediation Measures

- The main long term mitigation measure will be the staged grassing of the mounds as each section is completed.
- In the shorter term, 5 m high berms enclosing the development from the north, east and west will be planted with bands of native peatland tolerant woodland mix taking into account the specific drier soil conditions of the mounding. Remaining areas of the berm will naturally revegetate over time (refer to Figure 8.3: Restoration Drawing). This will screen the lower parts of the proposed development in views within the Bord na Móna land holding and in potential views from the west, northeast and east outside of the Bord na Móna land holding.
- The appliance of RAL 6006 colour for all proposed building cladding and roof structures including tanks and silos is recommended in order to help the integration of the building structures into the surrounding landscape, in near and distant views outside of the Bord na Móna land holding.
- Use of new lighting that is directional and cowled to ensure that light is directed downwards and inwards in order to minimise the visual effects of the proposed lighting. The exact specification will be confirmed at the detailed design stage.

8.6 RESIDUAL EFFECTS

Effective implementation and establishment of proposed mitigation measures will have a beneficial impact and help to 'soften' landscape and visual effects associated with the proposed development, particularly for areas located within 2 km of the proposed development site and elevated areas within 5 km and beyond. Identified adverse landscape and visual effects will reduce, in tandem with the maturing of the existing and retained vegetation as well as the proposed planting within the Bord na Móna land holding. Sensitive design and colouring of the proposed building structures as well as staged greening of the landfill mounds will help integrating the proposed development into the surrounding environment.

8.6.1 Landscape Effects

Long term residual landscape effects will arise from the change in landform by the landfill mounds and berms and the subsequent alterations to existing re-generating vegetation. The proposed development will together with the existing landfill development alter significantly and permanently the landform and landscape character within the Bord na Móna land holding.

Outside the Bord na Móna land holding residual and recognisable changes to the landscape character will be limited due to the flat nature of the overall study area and significant intervening vegetation,

which will prevent the full recognition of the scale of changes to the landform within the land holding. Views, from which the changes in landform will be recognisable, will be localised and limited to a number of viewpoints mainly located to the west, north, northeast and east within 2 km from the proposed site centre. Residual landscape change is considered to range from Moderate to Low. The residual significance in landscape effects will range from Moderate-Minor adverse to Negligible. There will be no significant change to the landscape character in low lying areas to the southwest, south and southeast beyond 2 km of the site.

While the landfill mounds will become a permanent feature in elevated views, such as from Carbury Hill. The overall perception of the landscape character will not change in these views. The residual magnitude of landscape change in these views is considered to be Low as the landfill will have a low and hill-like appearance once the landscape mitigation planting has established. The significance of residual landscape change is considered to be Minor adverse and not significant.

8.6.2 Visual Effects

The residual visual effects will include partial visibility of the completed landfill mounds from viewpoints along the L5025 (Derrymahon Road) to the north of the site and views from the end of the lane leading into the bog to the west of the site and a longer distance view from Carbury Hill.

Localised visual effects will also be experienced from locations northeast in the townlands of Timahoe East and Timahoe West as well as east in the townland of Coolcarrigan.

Visibility of an increased number of vehicles entering and leaving the site will also be possible at the site entrance and along the R403. A detailed description of the predicted traffic flows is provided in Chapter 10.

In a worst case scenario, if roadside vegetation was removed along the L5025, more views of the proposed development will be possible along that road. In the case of the removal of mature tree bands and hedgerows between the site and Timahoe, more views will be possible from this area. Both these situations are unlikely and are outside of the control of the developer.

A summary of residual visual effects is included in Table 8-18: Summary of Residual Visual Impacts (Effects).

Table 8-18: Summary of Residual Visual Impacts (Effects)

				Residual visual effects following establishment of mitigation	
RECEPTOR	SUSCEPTIBILITY	VALUE	SENSITIVITY	MAGNITUDE	SIGNIFICANCE
Photomontage 1	Medium	Medium-Low	Medium-Low	Moderate-Low	Moderate-Minor adverse
Photomontage 2	Medium	Medium	Medium	None	None
Photomontage 3	High	Medium	High	Low-Negligible	Moderate-Minor adverse
Photomontage 4	High	Medium	High-Medium	Low	Moderate-Minor adverse
Views from Scenic Viewpoint12	High	High	High	None	None
Views from Scenic Viewpoint 13	High	High	High	None	None
Views from Scenic Viewpoint 14	High	High	High	None	None
Views from Slí na Sláinte	High	Medium	High	None	None
View from North Kildare Tourist route	High	High-Medium	High	None	None
View from Scenic Route 28	High	Medium-High	High	Low-Negligible	Minor adverse
View from Scenic Route 38	High	Medium-High	High	None	None
View from Natura 2000 sites	High	High	High	None	None

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8.7 CONCLUSION

Landscape Effects

The proposed development will continue the emerging trend within the Bord na Móna land holding – a landscape changing in character from regenerating cutaway bog to large scale waste management with light industrial buildings. The existing Drehid Waste Management Facility and the consented MBT Facility are located immediately adjacent to either side of the proposed development and the proposal will appear as a contiguous development. However, the proposed landfill mounds will ultimately be higher than the existing mound resulting in an increase in the overall height of landfill mounds in this location.

In general, the greatest landscape effects will arise from changes to landform and existing vegetation within the land holding. Outside the Bord na Móna land holding, recognisable changes to the landscape character will be limited due to the flat nature of the overall study area and significant intervening vegetation, which will prevent the full recognition of the scale of the landform changes within the land holding. Effects will be limited and localised and concentrate in parts of the wider landscape outside the Bord na Móna land holding to the east, north, northeast and west. These areas will experience adverse landscape effects related to partial visibility of the proposed development components, particularly in areas within 2 km of the Bord na Móna land holding, and on elevated sections of Carbury Hill located approximately 6.7 km northwest of the proposed development site. There will be no significant change to the landscape character in low lying areas to the southwest, south and southeast beyond 2 km of the site.

While the landfill mounds will become a permanent feature in elevated views, such as from Carbury Hill, the overall perception of the landscape character will not change in these views as the landfill will become a permanent low hill-like feature in the middle distance once the landscape mitigation planting has established. The significance of residual landscape change is considered to be Minor adverse and not significant.

Visual Effects

The proposed development is located in a mainly flat, basin-like landscape and therefore even relatively low vegetation can provide screening within the wider landscape. The highest visual effects tend to occur where there is no intervening vegetation between the viewer and the proposed development, or where the viewer is at an elevated viewing position. While the development will be openly visible at close range within its immediate vicinity within the Bord na Móna land holding, all views of the proposed development outside of the Bord na Móna land holding will be partially screened by topography or vegetation.

Open and extensive cross-country views are rarely possible due to the mainly flat nature of the majority of the study area. The most open views of the proposals will be from locations identified along the L5025 (Derrymahon Road) to the north of the site as well as to the west near the end of an access lane leading into the bog from the R403 just south of Derrinturn, and the summit of Carbury Hill approximately 150 m from the end of a local road leading from the R403 to Carbury Hill. Viewpoints / Photomontages 1-4 have been prepared to illustrate the nature of these views. Localised effects will also be experienced from locations northeast in the townlands of Timahoe East and Timahoe West as well as east in the townland of Coolcarrigan.

The proposed development will not be visible from any of the scenic viewpoints as recognised by Kildare County Development Plan 2017-2023. The upper parts of the landfill mounds and ancillary building structures may be partially visible from a short stretch of approximately 300 m where views open up on slightly higher ground on the R402 at Ardkill. It is unlikely that the proposed development will be noticeable to the average traveller on this route as the view is oblique.

Cumulative Effects

The proposed development is located directly adjacent to the existing landfill and the consented MBT facility and will be viewed as a contiguous large scale waste management development with light industrial buildings. Therefore, cumulative effects in combination will occur where sections of the existing, permitted and proposed developments are visible together at close distance within the Bord na Móna land holding, and where sections of these developments are visible together in the wider landscape as described in Section 8.4.2 above. The overall cumulative landscape effects are considered Moderate-Minor adverse within the land holding due to the perceived increase in scale of landfill activities and the resulting additional change in landscape character of the site. The cumulative visual significance within the land holding and close to the proposed development is considered Moderate adverse.

Cumulative landscape effects outside the land holding in mainly flat land will be limited and restricted to localised areas due to the extent of existing intervening vegetation throughout the study area. Considering the existing landfill site adjacent to the proposed development, the cumulative change in landscape effects is considered Low-Moderate. The significance is Minor-Moderate adverse.

Views from the upper parts of Carbury Hill will experience a moderate change in cumulative landscape and visual effects due to the extension of artificial mounds across a greater portion of the skyline. The significance of these effects is considered Moderate adverse during operation. Cumulative landscape and visual effects following the establishment of proposed mitigation planting and its significance is considered Low/Minor-Moderate adverse.

9 LAND

9.1 INTRODUCTION

9.1.1 *Guidance Used in the Land Impact Assessment*

This chapter describes the effects on Land of the proposed development at the Drehid Waste Management Facility, County Kildare in accordance with the relevant Environment Protection Agency (EPA) Guidelines. The following sources and guidelines were used in the assessment:

- ‘*Guidelines on the Information to be contained in Environmental Impact Statements*’, EPA, 2002;
- ‘*Advice Notes on Current Practice (in the preparation of Environmental Impact Statements)*’, EPA, 2003;
- “*Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports*”, EPA, August 2017;
- Kildare County Development Plan 2017-2023; and
- Ordnance Survey Ireland, 1:50,000 Discovery Mapping.

The amended Directive introduces *Land* as a prescribed environmental factor. Recital 9 gives context to this addition, showing that it relates to the issue of ‘*land take*’. This change aligns the Directive with proceedings of the United Nations Conference on Sustainable Development (Rio de Janeiro, 2012) and with Commission strategy. As detailed in the “*Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports*”, EPA, August 2017, Article 3(1) of the amended EIA Directive requires that the environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on a number of factors including *Land* (listed separately). The Guidelines also provide the list of Environmental Factors to be considered in Figure 3.1 and again *Land* is included as a separate bullet point. Land (with a focus on land use; land take) is therefore included as a separate chapter in this EIAR.

9.1.2 *Characteristics of the Proposed development*

A detailed description of the proposed development is provided in Chapter 3. The location of the individual development components is shown on Planning Drawing 8108-2010.

9.2 RECEIVING ENVIRONMENT / BASELINE DESCRIPTION

9.2.1 *Site Location*

The Bord na Móna property, as outlined in blue in Chapter 1 on Figure 1.1, is located within the County Kildare townlands of Drehid, Ballynamullagh, Kilmurry, Mulgeeth, Mucklon, Timahoe East, Timahoe

West, Coolcarrigan, Corduff, Coolearagh West, Allenwood North, Killinagh Upper, Killinagh Lower, Ballynakill Upper, Ballynakill Lower, Drummond, Kilkeaskin, Loughnacush, and Parsonstown.

The application boundary, outlined by the red line on Figure 1.1, (which is defined as the area in which the application for development is being made and within which all activities associated with the proposed development will occur), is confined to the townlands of Timahoe West, Coolcarrigan, Killinagh Upper, Killinagh Lower, Drummond, Kilkeaskin, Loughnacush, and Parsonstown. It should be noted that the activities associated with the proposed development will be confined to a landbank of approximately 272 ha.

The permitted Drehid WMF operates subject to an Industrial Emissions Directive (IED) licence, issued by the EPA, (W0201-03) and subject to the planning approval for the facility. Access into the previously permitted Drehid Waste Management Facility has been provided from the R403 regional road via a dedicated site entrance and a 4.8 km access road. This entrance and road will also provide access from the R403 regional road to the proposed development. As noted in Chapter 1, an application for an IED Licence is being made to the EPA for the proposed development; the application area for the licence is also shown outlined in red on Figure 1.1.

The planning application boundary of the proposed development runs to within 2.6 km of the village of Derrinturn, (approximately 2.6 km to the west) and to within 1.7 km of Timahoe Crossroads (approximately 1.7 km to the east).

9.2.2 Land Use

The proposed development is located within a segment of land within the Bord na Móna landholding, which is located to the east of the existing access road and directly south of the existing Drehid Waste Management Facility. The land within the site boundary consists of the flat lying and gently undulating topography typical of cut away peatland.

There is a permission for an MBT Facility which lies immediately south of the proposed development. Land use on and adjacent to the proposed development site is primarily disused cutaway bogland which was used for production of sod peat for energy generation up to 1993. There are no public amenities on the proposed development site such as walking routes. There are no agricultural, horticultural or commercial forestry activities taking place on the subject lands.

Immediately adjacent to the proposed development site there are areas of land where turbary, commercial forestry and agricultural usage are evident.



Plate 5: View of proposed landfill location from existing access road

9.2.3 Topography

A detailed topographical survey was carried out at the site in February 2016 by TOBIN Consulting Engineers. The output of this survey of the proposed site is presented as a topographic contour map on Drawing No. 8101-2004. An aerial photo of the site is shown in Figure 9.1: Aerial Photograph of Landholding.

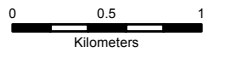
The proposed site is situated in relatively flat low-lying cutaway bogland with levels ranging from 83 m to 86 mOD. Whilst the topography throughout the overall landholding is also relatively flat at 80 to 90 mOD, screening of the site operations from the adjoining roads will be provided by existing hedgerows and tree lines, which will be augmented by additional planting surrounding the proposed development. The remote nature of the location of the facility footprint, lying approximately 1 km south of county road L5025, 2.7 km (Waste control area) from county road L1910 and 3.3 km from regional road R403, provides considerable separation distances between the proposed development and adjacent roads.

These separation distances are enhanced by the growth of bog willow tree stands over several parts of the cutaway bogland and by dense hedge lines and commercial forestry to the east, south and west of the site.



Legend

- Site Boundary
- Bord na Móna Ownership Boundary



- NOTES**
1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
 2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
 3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
 4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Rev	Date	Description	By	Chkd.
Rev A	NOV '17	EIAR Issue	F.H.	A.A.

Client:
BORD NA MÓNA
 Naturally Driven

Project:
**PROPOSED DEVELOPMENT AT
 DREHID WASTE
 MANAGEMENT FACILITY**

Title:
**AERIAL PHOTOGRAPH OF
 LANDHOLDING**

Scale @ A3: 1:40,000

Prepared by:	Checked:	Date:
F. Healy	A. Austin	November 2017

Project Director: D. Grehan

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Rev: **A**

Figure 9.1



9.2.4 Likely Future Receiving Environment / Do Nothing Scenario

All components of the baseline are constantly changing due to a combination of natural and human processes. When predicting likely direct and indirect effects it is important to remember that there are two available for comparison: the existing baseline environment and the future baseline environment without the implementation of the proposed development but considering natural changes only.

In land use terms, if the development did not go ahead, the proposed development site will remain as an area of regenerating cutaway bog. The succession and maturing of existing vegetation will continue depending on a number of factors for example existing soil / peat conditions, the likelihood of erosion, water levels and the re-establishment of a balanced ecosystem. However, the location of the proposed development site adjacent to an existing waste management site to the north / northwest and a consented but not yet constructed MBT Facility to the south will ensure that the site remains as being subject to development consideration, and the resultant potential for land take and change of land use.

9.3 POTENTIAL EFFECTS ON LAND

9.3.1 Land Use

This section outlines the potential direct or indirect effects on the land (land use) at the proposed development site which are closely related to the scale and nature of the proposed development.

As described in detail in Chapter 3 of the EIAR, the proposed development will include an extended composting plant, a Non-Hazardous Landfill, a Hazardous Landfill, a Metals Recovery Facility, Ash Solidification Facility and a Leachate Treatment Facility. The redline application area of 272 ha, includes an area of approximately 120 ha where development will take place for the first time. The proposed development, described in detail in Chapter 3, will include additional landfill footprints, which will be gradually developed, utilised for waste deposition and then progressively capped and grassed, creating a new rising land form within the bog. The change of land use at the proposed development site will also include the construction of access roads, car parks, buildings, surface water attenuation lagoons and integrated constructed wetlands within the cutaway bog.

The proposed development will continue the emerging trend within the Bord na Móna land holding at the Drehid Waste Management Facility of land changing in use from regenerating cutaway bog to large scale waste management with light industrial buildings.

While the land holding has a history of large-scale peat extraction, the proposed development site currently consists of re-vegetating cutover bog with a mosaic of bare peat and revegetated areas with scrub, woodland, heath and grassland communities present. There are no agricultural, horticultural or commercial forestry activities taking place on the subject lands. The proposed development does not

therefore result in for example the removal of productive land from potential agricultural or other beneficial uses:

The existing Drehid Waste Management Facility is located immediately adjacent to the north of the proposed development and the consented but not yet built MBT Facility will be located to the immediate south of the proposal. The proposed development will therefore appear as a contiguous development of adjacent lands.

Direct and permanent change to the land will occur locally where the proposed development will be physically located resulting in a land take for the proposed development and change in land use at the proposed site. The magnitude of change within the proposed development site is considered high. Bearing in mind the existing and permitted developments adjacent to either side of the proposed development site, the proposed development will continue to alter the land use intensively from a cutaway peatland into a large-scale waste management character with light industrial buildings. However, the subject site is not currently being utilised for any agricultural, horticultural, commercial forestry or amenity use and the proposed development does not therefore result in for example the removal of productive land from potential agricultural or other beneficial uses. The significance of change is therefore considered to be Moderate adverse.

9.4 MITIGATION MEASURES

Mitigation is a term used to describe the measures or actions that may be taken to minimise environmental effects. The purpose of mitigation is to avoid, reduce and where possible remedy or offset, any significant adverse direct and indirect effects on the environment arising from the proposed development.

Given the scale and nature of the proposed development and that the most significant effect on the land is due to the actual physical imposition of the development on the land the possibility of mitigation measures is somewhat restricted. However, the following mitigation measures are proposed for the facility.

9.4.1 Avoidance Measures

- Optimised sizing of footprints of the proposed facility.
- Minimising areas for earthworks thereby reducing land take requirements.
- Restricting areas for construction works and temporary storage to a minimum.

9.4.2 Reduction Measures

- Retention of all existing perimeter planting and re-generating vegetation where possible and sufficiently protect in areas close to construction works as described in BS 5837:2005.

- Disturbance of existing vegetation will be minimised where possible and proposed planting will help integrate the proposed development into the current land use.

9.4.3 Remediation Measures

- The main long-term mitigation measure will be the staged grassing of the mounds as each section is completed.

9.5 RESIDUAL EFFECTS

Effective implementation and establishment of proposed mitigation measures will have a beneficial impact and help to reduce effects associated with the proposed development on the current land use. Identified adverse effects will reduce, in tandem with the maturing of the existing and retained vegetation as well as the proposed planting within the Bord na Móna land holding.

9.6 CONCLUSION

As this infrastructure will be located adjacent to the existing waste management activity, it is considered that it will not result in a significant change of use to the overall Bord na Móna landholding at the Drehid Waste Management Facility. However, the scale, nature and physical footprint of the proposed development will have a long-term moderate adverse effect on the land use at the proposed development site.

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