4 ALTERNATIVES

4.1 Introduction

This chapter sets out the context in which the main reasonable alternatives were considered for the proposed development and an indication of the main reasons for the final project chosen, taking into account the effects on the environment. It outlines the main operational alternatives considered by IMS to meet the identified need set out in **Chapter 2** of this EIAR.

The consideration of alternatives has been undertaken by a multi-disciplinary technical, environmental and planning project team and is considered to have concluded with the identification and selection of a solution that provides the best balance between technical, environmental and community / social indicators.

The 2022 EPA 'Guidelines on the information to be contained in Environmental Impact Assessment Reports' highlights the different categories under which alternatives should be considered as listed below:

- Alternative Locations;
- Alternative Layouts;
- Alternative Designs;
- Alternative Processes; and
- Alternative Mitigation Measures.

Within these scenarios, a number 'Do-Something' alternative scenarios were investigated.

4.2 Legislative Context

The consideration of alternatives is a mandatory part of the EIA process. Article 5(1)(d) of the Directive, provides that the information to be provided by the developer shall include:

> *'A description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment;'*

In terms of the proposed development, this requirement has been transposed through Schedule 6 of the Planning and Development Regulations 2001, as amended, which requires that the EIAR contain the following:

> *'1(d) A description of the reasonable alternatives studied by the person or persons who prepared the EIAR, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the proposed development on the environment..'*

The 2022 EPA Guidelines states the following in respect of alternatives:

> *'The objective is for the developer to present a representative range of the practicable alternatives considered. The alternatives should be described with 'an indication of the main reasons for selecting the chosen option'. It is generally sufficient to provide a broad description of each main alternative and the key issues associated with each, showing how environmental considerations were taken into account in deciding on the selected option. A detailed assessment (or 'mini-EIA') of each alternative is not required'.*

Alternatives may be considered at several stages in the EIA process, reflective of initial stages where location and form are most relevant and at later stages where alternative designs may be required to address emerging environmental issues.

The 'Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment', August 2018, Department of Housing, Planning and Local Government (DHPLG) indicates, for reasonable alternatives that:

> *4.12. The Directive requires that information provided by the developer in an EIAR shall include a description of the reasonable alternatives studied by the developer. These are reasonable alternatives*

which are relevant to the project and its specific characteristics. The developer must also indicate the main reasons for the option chosen taking into account the effects of the project on the environment.

4.13. Reasonable alternatives may relate to matters such as project design, technology, location, size and scale. The type of alternatives will depend on the nature of the project proposed and the characteristics of the receiving environment. For example, some projects may be site specific so the consideration of alternative sites may not be relevant. It is generally sufficient for the developer to provide a broad description of each main alternative studied and the key environmental issues associated with each. A 'mini- EIA' is not required for each alternative studied.

This chapter has been prepared in line with the requires of the legislation and following the EPA and DHPLG guidelines.

4.3 Alternative Locations

IMS is seeking consent to develop a Circular Economy (CE) Campus and an integrated waste management facility at the existing waste operation located on the Hollywood site. As such, there is little scope for assessing alternative locations for the proposed operation as the existing quarry void location is fixed and IMS do not have access or ownership of alternative quarry voids that may be considered as reasonable alternative locations for the proposed development. Notwithstanding this limitation, an analysis of the suitability of the current site location to process these waste steams is presented.

As discussed in **Chapter 2**, the current and projected increase in the generation of construction waste streams (including brownfield soils comprising non-hazardous soils and inert soils) is driving the need for development of greater capacity and diversity for treatment of these streams to meet the demands of the NDP, NPF and the wider circular economy policy.

Table 4-1 lists the main facilities authorised to accept non-hazardous soils and inert soils in the Dublin area, the distance from the Hollywood facility and the current capacity of each facility. Only two facilities have a larger capacity than the Hollywood facility, however, the Murphy Concrete facility ceased waste acceptance in 2019. Several of the other sites are not operational, have ceased waste acceptance or are due to close in the short term, thereby increasing the demands on existing operational facilities. The overriding reason for the selection of the Hollywood site is due to the increasing demand for construction waste treatment facilities, the scale of the facility, the capacity to accept a diversified waste mix without adverse impacts and the reduction of alternate capacity forecasted in the GDA.

Similarly, the site is located within 30km of both the waste to energy plant at Poolbeg and at Carranstown making the site an ideal and proximate location for the treatment of IBA from these facilities.

The Hollywood site is ideally placed with a significant capacity to allow for maximising the circular potential of a greater diversity of waste streams and to facilitate more sustainable treatment at this site. The proposed development seeks to maximise this capacity and diversify the waste streams accepted at the site to meet this projected demand.

As such, the existing void space at the former quarry coupled with the proximity to the sources of waste streams relevant to the proposal, make the Hollywood site the optimum location for the proposed development with no potential alternative location options available.

It is also noted that the local authority draft guidance for siting of waste facilities includes the following siting restrictions specifically for soil and stone recovery facilities:

- 75 metres from a residential property to the principal processing area for facilities operating under waste licence (nearest residential property to processing yard is 120 metres and in ownership of IMS);
- 75 metres from a business/industrial property to the principal processing area for facilities operating under waste licence (nearest commercial property to processing yard is 530 metres); and
- Licensed Sites to be located within 15km of a national road (site is 3km from the M1).

As such, the location of the development site is fully aligned with the siting principles listed in the draft waste policy document and benefits from the rural location.

Table 4-1 Disposal facilities and the approximate distance from the proposed development

Facility	Approximate Distance from Hollywood Site	Current Capacity	Current Status
IMS Hollywood W0129-02 (i.e. the existing operation at the proposed development)	-	500,000	Operational
Murphy Concrete W0151-01	13km	750,000	Closed and under Restoration
Blackhall Soil W0247-01	64km	344,000	Operational
Kiernan Sand & Gravel W0262-01	40km	167,400	Closed and under Restoration
Huntstown W0277-03	23km	1,500,000	Operational
Milverton W0272-01	12km	400,000	Operations yet to commence.
Walshestown W0254-01	80km	330,000	Operational
Drehid W0201-03	63km	120,000	Operational but scheduled to close in 2028
Ballynagran W0165-02	80km	203,000	Operational but scheduled to close in 2026
Clonbullogue W0049-02	96km	70,000	Operational
Knockharley W0146-02	25km	200,000	Operational

4.4 Alternative Site Layouts

The assessment of alternative site layouts is included in this EIAR to consider how different elements of the proposed development may be arranged on site and what environmental and design implications will arise with these alternative layouts. Development of the site will occur within the landownership boundary and in direct control of IMS. The site ownership has sufficient area available to maintain a buffer zone around the sites perimeter.

As the void space is fixed and the changes to site infrastructure (entrance, admin building, weighbridges, etc.) have been permitted under F19A/0077, there is limited scope for alternative layouts of the proposed development. The principal options to be assessed under this heading relates to the proposed layout of landfill cells across the site and the locations of inert, non-hazardous and hazardous (if any) cells within the final layouts.

An alternative cell layout considered in this analysis is based on the proposal previously permitted in June 2011 (ABP Case reference: PL06F.PA0018). The key element to this previous development was the construction of a series of specially engineered landfill cells for inert, non-hazardous and hazardous wastes with the projected capacities as per those presented in **Table 4-2**. The table shows that the predominant waste type permitted by this development was hazardous waste at 45% of the total volume followed by non-hazardous waste at 25% and inert at 20%.

Table 4-2 Permitted Development - Landfill Waste Stream Estimates

Stream	Estimate Volume (m^3)	Fraction
Hazardous Waste	1,735,500.00	45%
Non-Hazardous Waste	1,324,000.00	35%
Inert Waste	755,500.00	20%
Total	**3,815,000.00**	**-**

The cell layout for this permitted development is shown in **Figure 4-1** showing the broad outline of the inert cells in green, the non-hazardous cells in blue and the hazardous cells in pink. This layout shows the inert

cells located along the western boundary of the site, the non-hazardous cells to the north and central part of the site and the non-hazardous cells to the south of the site.

As noted, while permitted by ABP, the EPA refused to grant a licence (W0129-03) for this development and layout. The EPA considered that the activity presented an unacceptable risk of input of hazardous substances into groundwater which is prohibited under Directive 2006/118/EC as implemented by S.I. No. 9 of 2010, European Communities Environmental Objectives (Groundwater) Regulations, 2010.

One of the main contributory reasons for the EPA refusal was the volume of hazardous waste to be landfilled at the site. In addition, a further contributory factor was the location of the non-hazardous cells to the south of the site above the more sensitive groundwater body (i.e. the Loughshinny Formation) which is largely unprotected to the south of the site.

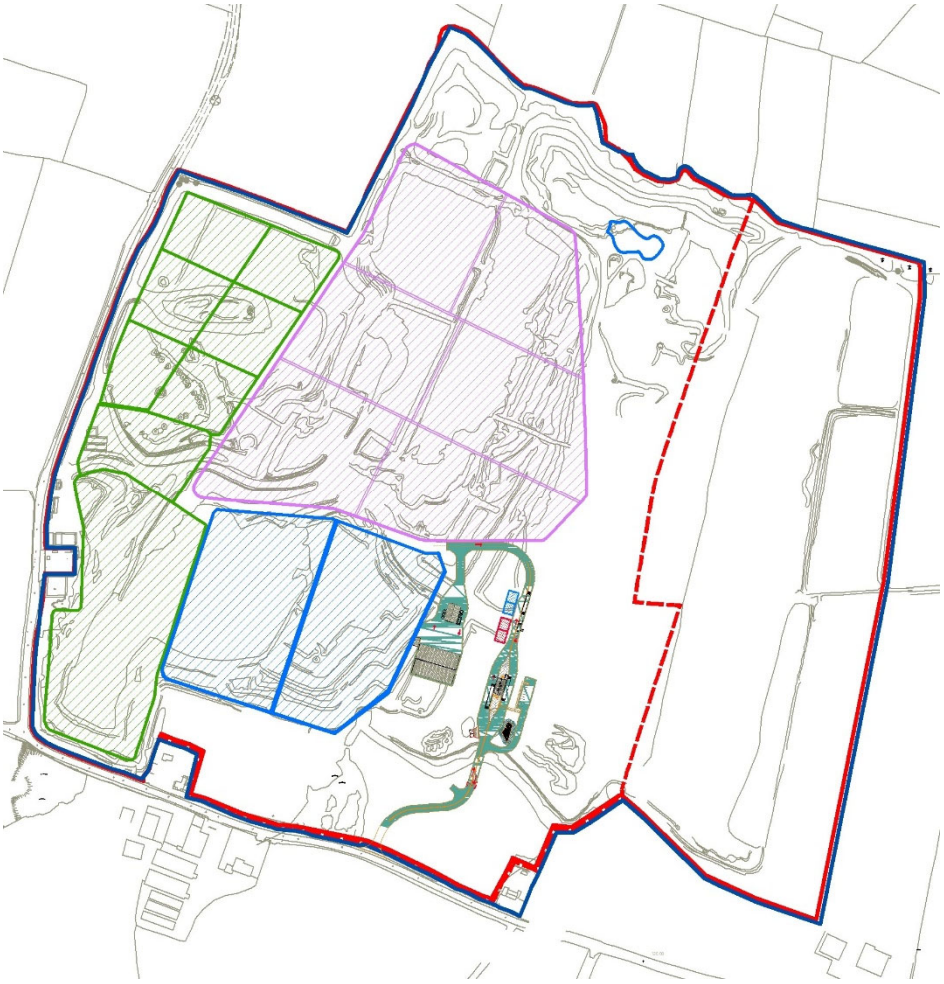

Figure 4-1 Approximate Cell Layout for the 2011 Permitted Development

The alternative layout considered is the proposed development which also consists of a 25-year permission to develop engineered landfill cells on the site to landfill a mixture of non-hazardous and inert wastes only (no hazardous waste) at a rate of 500,000 tonnes per annum. This proposal is similar in scale to that permitted by ABP in 2011 as outlined above but with no hazardous waste fraction to mitigate potential risk to groundwater. The indicative capacities for each waste stream are shown in **Table 4-3.**

Table 4-3 Proposed Development - Landfill Waste Stream Estimates

Stream	Estimate Volume (m^3)	Fraction
Hazardous Waste	0	0%
Non-Hazardous Waste	3,216,952	75%
Inert Waste	1,069,877	25%
Total	**4,286,829**	**-**

Again, the layout of cell for the cell layout for the proposed development is shown in **Figure 4-2** showing the broad outline of the inert cells in green/blue and the non-hazardous cells in yellow. This layout also shows the inert cells located along the western boundary of the site as per the 2011 alternative layout. In addition, the inert cells also form the southern boundary of the site where the limestones of the Loughshinny Formation are less protected and more sensitive. This orientation of inert waste cells over this body further reduces the risks identified by the EPA in the refusal of the 2011 permitted development where non-hazardous waste cells overlay this area.

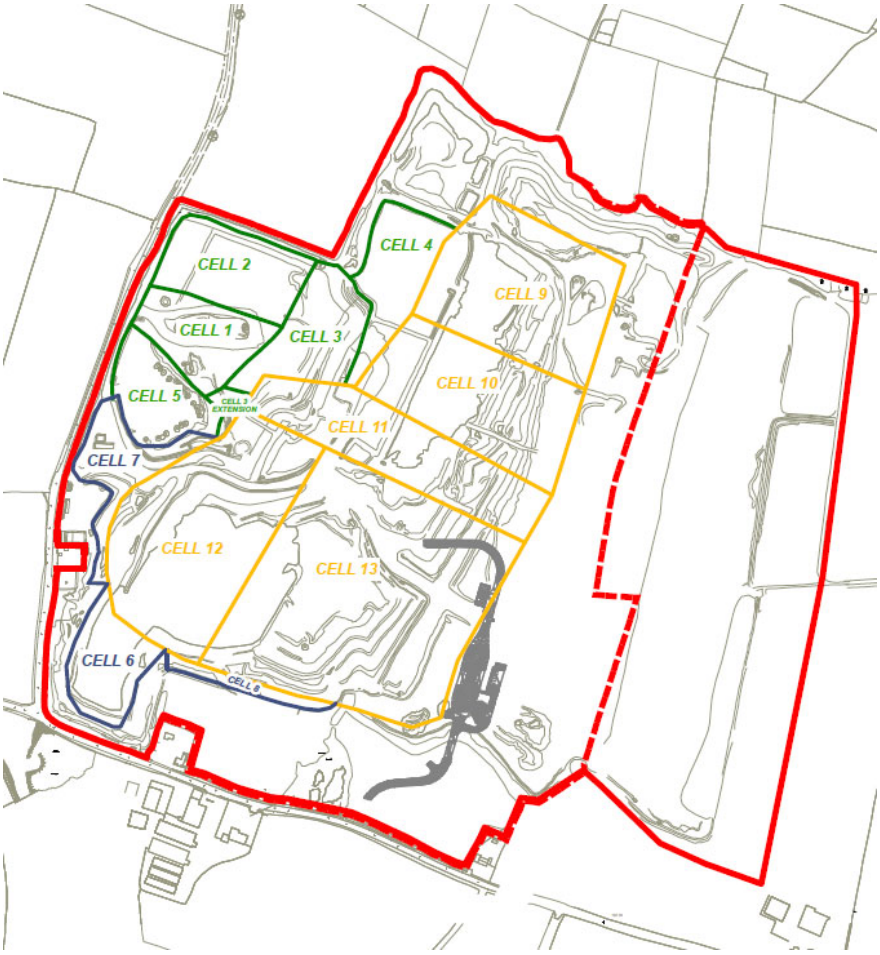

Figure 4-2 Cell Layout for the Proposed Development

In the proposed development the non-hazardous cells are proposed to the north of the site where the Loughshinny formation continues to dip and is overlaid by an increasing thickness of Namurian deposits offering greater protection to this groundwater body. Again, this further reduces the risk to groundwater over that presented in the 2011 cell layout alternative where hazardous cells were located in this area. Further details on the impact to the underlying geology is addressed in **Chapter 9** of this EIAR.

In short, the proposed development cell layout addresses the EPA concerns by altering the cell layout and eliminating the hazardous waste fractions thereby eliminating the risk of input of hazardous substances into groundwater. As such, this alternative cell layout has been adopted relative to the layout presented in the 2011 consented operation.

4.5 Alternative Designs

This section provides an overview of the alternative technologies considered for the operation elements of the proposed development. The existing operation is licensed under the following class of activity in the Third Schedule of the EPA Acts:

- Class 5 '*Specially engineered landfill, including placement into lined discrete cells, which are capped and isolated from one another and the environment*'.

This operation is the principle waste disposal activity permitted at the site and will also be the principle activity at the proposed development albeit for a greater diversity of waste streams to also include non-hazardous wastes. The design criteria for landfill cells are clearly set out in Annex I of the Landfill Directive 99/31/EC and supplemented with the EPA Landfill Site Design Manual. As a consequence, there is limited capacity for alternative cell design characteristics at the proposed development.

For water control and leachate management, the following is mandatory for non-hazardous landfill cells:

- Control water from precipitations entering into the landfill body;
- Prevent surface water and/or groundwater from entering into the landfilled waste;
- Collect contaminated water and leachate. If an assessment based on consideration of the location of the landfill and the waste to be accepted shows that the landfill poses no potential hazard to the environment, the competent authority may decide that this provision does not apply; and
- Treat contaminated water and leachate collected from the landfill to the appropriate standard required for their discharge.

The above provisions may not apply to landfills for inert waste under the Directive.

Similarly, the geological barriers (liners) for each type of landfill waste cell are dictated by the Directive whereby the base and sides must consist of a mineral layer which satisfies permeability and thickness requirements with a combined effect in terms of protection of soil, groundwater and surface water at least equivalent to the one resulting from the following requirements:

- Landfill for non-hazardous waste: $K \leq 1.0 \times 10^{-9}$ m/s; thickness ≥ 1m; and
- Landfill for inert waste: $K \leq 1.0 \times 10^{-7}$ m/s; thickness ≥ 1m.

The cell design for each of the waste types proposed for the integrated waste management facility will comply with the requirements of Annex I of the Landfill Directive 99/31/EC and supplemented with the EPA Landfill Site Design Manual. As such, there is limited opportunity for alternative designs in cell construction and there are no novel or evolving designs under consideration or any deviations from standard proposed for the site.

Once a licence is granted, all cells must be designed and documented in Specified Engineering Work (SEW) reports that will be issued to the EPA for approval prior to the commencement of any cell development. All cells will be constructed under a Construction Quality Assurance plan which is documented by a qualified engineer and are submitted to the EPA under the licence.

In short, cell design is mandated by the Landfill Directive 99/31/EC and regulated by the EPA through the SEW process. There are limited alternative options for consideration for cell design the proposed development will comply in full with the requirements of the Landfill Directive 99/31/EC.

4.6 Alternative Size and Scale

The size of the development is fixed through the available void space with no potential for alternative sizing of the landfill space without compromising the landscape characteristics of the area. In terms of scale, alternative infilling rates have been considered in this EIAR to determine the viability of increased or reduced infill rates at the site. This section considers three alternate scenarios as follows:

- Maintaining the existing Waste Licence acceptance limit (500,000 tpa);
- Reducing the maximum waste acceptance to 250,000 tpa; and
- Increasing maximum waste acceptance to 750,000 tpa.

Using the reduced maximum waste acceptance (250,000 tpa) would extend the timeframe to restore the site to natural ground levels beyond the 25 years proposed for the development. This extended timeframe would reduce the daily traffic volumes accessing the site with a resultant reduced traffic, air and noise impact albeit over a longer timeframe relative to the existing operation. This positive impact would be somewhat offset by the longer duration to restore the site to natural ground levels and return the site to natural ground levels. As a consequence, this will result in a negative land use and landscape impact relative to the existing scenario.

Using the increased maximum waste acceptance (750,000 tpa) would conversely reduce the timeframe required to infill the remaining void. This reduced timeframe will have positive impact for land use and

landscape as the site will be restored to natural ground levels in the short term. However, there would be a corresponding increase in site operations and traffic and hence an increased impact to the human environment in the area. The Roads Department of FCC have previously raised concerns about the sustainability of the road network to accept more than the currently operational 500,000 tonnes per annum at the site.

Based on this analysis, the current maximum waste acceptance rate of 500,000 tpa is recommended as the preferred scale of the development. A reduced rate would result in an extended timeframe to infill that would exceed the applications intended timeframe and will have negative to neutral implications on ecology and landscape. The 750,000 tpa infill rate would decrease the timeframe required, however, it will result in significant negative impacts to traffic, noise and air quality relative to the existing operation.

In conclusion, after consideration of all the alternative sizes of operation, the 500,000 tpa rate was selected as the preferred alternative as it is considered to be the most suitable regarding the remaining area of the void space to be filled in a 25-year timeframe. The proposed development has suitable capacity for the acceptance of expected volumes of target wastes projected in **Chapter 2**.

4.7 Alternative Site Processes

The following section outlines the main aspects which were considered for the alternative operations of the main elements of the proposed development. The alternative processes are assessed relative to the Do-Nothing scenario (**Section 4.7.1**) and the main alternatives Multi-Criteria Analysis (MCA) is summarised in **Table 4-4.**

4.7.1 Do-Nothing (Disposal Option)

In the Do-Nothing scenario, the facility would continue operating under the conditions of the current planning permission (FCC Reg. Ref. F19A/0077) and Waste Licence W0129-02 accepting a maximum of 500,000 tpa of inert waste. In addition to the disposal of this waste on-site, the scenario also includes for the end of waste and aggregate processing operations on site. This scenario represents a largely 80% disposal 20% recovery existing operation.

This scenario accounts for the complete infilling and restoration of the site into the surrounding landscape. This is a long term positive impact for health, land and soil, water, air quality and climate albeit with potential for some nuisance and adverse impact in the short to medium term until the permission expires in 2035.

This scenario also results in a significant positive for the landscape in the long term by restoring the High Amenity quality of the landscape assuming that the void is fully infilled by 2035.

This is a mixed impact for biodiversity with potential negative medium term (7-15 years) due to disturbance of species and positive long term (7-60 years) impacts with the potential for creation of additional habitat.

The continued operations include the ongoing monitoring and mitigation of potential adverse environmental impacts associated with infilling the void, this will benefit land and soil, water, air quality and biodiversity. Traffic and associated nuisances and hazards are a potential negative impact due to continued vehicle movement in the medium term.

The alternative scenario does pose potential medium term negative impacts to traffic, noise and dust generation associated with the facilities operations. However, the long term impacts are significantly greater, improving biodiversity, landscape, noise, water and air quality once the restoration of the site is complete, enhancing its scenic and amenity qualities in line with the Fingal County Council Development Plan (2017-2023).

In summary, the Do-Nothing alternative is a viable alternative as it provides a significant capacity for the acceptance of inert waste. The operation would result in the restoration of the existing quarry void to former levels as per the existing planning permission.

4.7.2 Cessation of Site Operations

In this scenario, the facility would remain in its present condition as a partially infilled former quarry and the following considerations are taken into account in relation to this scenario:

- Under such a scenario all operations at the site would cease and there will be no further infilling or other works undertaken;
- The existing condition of the site with high rock walls and deep standing water present a health and safety hazard to humans and livestock;
- In its current un-vegetated condition, the void has the potential to generate dust nuisance;
- In the absence of this facility and the continuing national, regional and local growth over the medium to long term, together with the National Development Plan, the waste would require the sourcing of alternative sites, involving greater haul distances, with consequent cost and road nuisance impacts;
- The ground in the quarried area has already been disturbed during previous activities, existing archaeological heritage on site has been disturbed; and
- This scenario denies the restoration of the site that would improve the visual impacts of the site and improve ecological value. This scenario will deny the site being used in the future for other purposes including habitat development.

This scenario would see operations cease and the site will be left in its current condition. This scenario poses negative implications to the population as the direct (i.e. site workers) and indirect jobs (i.e. transportation) will be lost when operations cease. A significant void space will remain after the expiration of the existing licence. The site will be a danger to humans and livestock with high rock walls and standing water, with a negative impact on human health and livestock.

Biodiversity will experience both positive and negative implications. Existing biodiversity in the area will receive no further disturbance, however, the site will not be restored resulting in a long term negative to the natural ecology and biodiversity in the area. This scenario would remain neutral for land and soil impacts, however, negative impacts regarding water may arise as the controlling and mitigating measures currently in place will cease.

Air quality will be impacted positively and negatively. The positive effects result from the reduction in traffic as transportation associated with the site will cease. The negative effect is the dust generation that will not be monitored and mitigated against following the end of the Waste Licence, resulting in dust dispersion.

The most significant impact of this scenario is the negative impact on landscape and the High Amenity zoning for the area. As stated, the planning applications have been granted to infill, restore and reinstate the site into the surrounding landscape. Through a cessation of operations, the site will not be restored and a void will remain, this will have negative effects on health, biodiversity and air quality.

This alternative offers short term (1-7 years) positives as it would negate any further effects on biodiversity associated with the site and would reduce the noise and traffic in the surrounding road networks. However, long term issues will arise as the mitigation measures currently in place under the Waste Licence will subsequently cease.

Condition 10 of the Waste Licence commits IMS to the full restoration of the site to natural levels at the final contours presented in the Waste Licence application as such the cessation of the activity is a breach of the licence.

Accordingly, the closure of the site and cessation of works is a significant potential negative due to the potential adverse impacts to landscape, land and soil, air quality, health and population. In addition, the restoration of the site is compelled through the planning permission and Waste Licence and this approach does not provide a viable alternative.

4.7.3 Resumption of Quarrying

In the quarrying alternative, the site would cease infilling operations and return to its previous use as a shale and limestone quarry. The following considerations in relation to this scenario are the same as those listed in **Section 4.7.2**, however, the quarrying operation for shale and limestone would further increase the void space available at the site.

Quarrying would have a neutral effect on the population as it will result in a loss of jobs in the waste and associated transportation sector, however, jobs will be created in the quarrying and associated transportation sector. The rock walls and physical characteristics of the site would continue to pose a significant risk to human health.

The operations associated with quarrying would have negative impacts on traffic as the volume of vehicle movement associated with the site will increase from the cessation scenario, resulting in negative impacts to air quality and noise. Quarrying activities result in the deterioration in water quality that will have an impact on the associated water courses. The activities relating to this alternative will expand the void space already available and require greater measures for land and soil restoration if the site is to be reinstated in the future.

The material assets related to quarrying have both positive and negative implications. The extraction of shale and limestone can be sold, however, due to the nature of the site and economic value of the extraction material, this is not a viable alternative.

The significant impacts of the quarrying alternative are the negative impacts to biodiversity and the landscape of the area. The quarrying operation would further increase the void space available at the site that will further negatively impact the landscape from the cessation scenario. Biodiversity is also negatively affected as the site will not be restored and reinstated into the surrounding landscape and the quarrying activities would negatively impact the existing biodiversity.

The quarrying of shale and limestone from the site is excluded from further consideration.

4.7.4 Diversify Waste Operations (Recovery Option)

In the Diversify Waste Operations alternative scenario, the facility would operate under the conditions of a revised Industrial Licence W0129-04, accepting a maximum of 500,000 tpa of a more diverse mix of inert and non-hazardous wastes. In addition to the disposal of this waste on-site, the scenario also includes for the enhanced recovery operations on site. The diverse waste operations with proposed infrastructure would see the operational lifetime of the site extended for 25 years.

This scenario reverses the disposal/recovery split of the Do-Nothing Option to a largely 80% recovery and a 20% disposal operation. This alternative is more aligned with the waste hierarchy and circular economy policy.

The scenario will result in positive population impacts as the continued operation will provide jobs over a longer timeframe for the population relative to the Do-Nothing option. The infilling and restoration of the site to previous levels would generate additional positive impacts similar to the Do-Nothing scenario. The void would be restored, reducing risk to human health and enhance the areas biodiversity and ecology as it will blend in with the surrounding land. The operation includes the ongoing monitoring and mitigation of potential environmental impacts, resulting in positive impacts for land and soil, water, air quality and biodiversity as the new IE Licence conditions would ensure the site does not attribute to negative environmental impacts.

During the operation of the facility, there is potential for negative environmental impacts to occur. With the waste infilling over a 25 year timeframe, vehicle and HGV movements will occur over a longer period compared to the Do-Nothing scenario, subsequently generating a negative noise impact on the local area.

The greater diversity of waste to include non-hazardous waste has the potential for a greater impact on soils, groundwater and water through an increased risk profile of the site relative to the Do-Nothing scenario. However, the cells will be designed in accordance with the protections afforded by the Landfill Directive and the EPA guidance to mitigate the potential for any adverse impacts to soils, groundwater and water.

The material asset impact of the Diversify Waste Operations alternative is more positive than the Do-Nothing scenario on two fronts:

- Firstly, the greater diversity of wastes accepted will provide a greater certainty and security to the construction sector in the region through a committed supply chain for construction wastes, including brownfield wastes, to ensure authorised and efficient management of these streams; and
- The enhanced circular recovery and recovery operations at the site will increase the use of secondary raw materials in the market which is aligned with circular economy principles and reduces the need for quarrying of virgin aggregates with the associated adverse impacts.

The diverse waste operations scenario will generate medium term negative environmental impacts but it provides greater positive long term environmental impacts. During operation adverse air quality, noise and traffic will arise. The visual impact during the operational stages of landfilling is deemed insignificant as the operation will not be visible. There is potential for a visual impact during the final stages of operation when the works are at, or near, the level of the surrounding ground. Long term, the restoration will significantly improve the surrounding landscape and provide positive population, health, biodiversity, land and soil, water and air quality impacts.

In summary, the proposed development will occur within the proposed IE Licence boundary with sufficient area available in the ownership and direct control of IMS to allow a buffer zone to be maintained. The site is a HA (High Amenity) Objective zone in the Fingal County Council Development Plan (2017-2023), these zones are created to '*protect and enhance high amenity areas*'. The infill and restoration of the void will enhance the areas scenic and amenity qualities, providing long term environmental benefits.

4.7.5 Article 27 Operation

In the Article 27 alternative scenario, the site would cease EPA licenced waste infilling operations and surrender the EPA licence. The site would then be used for accepting 'clean' soil and stone or other by-products to infill the void space and restore the site.

The Waste Framework Directive provides for uncontaminated excavated soil to be considered in accordance with the definition of waste. The provisions on by-products and the provisions covering End-of-Waste status set out in Recital 11 of the 2008 Waste Framework Directive. Excess soil and stone produced during construction projects may be a by-product if it meets each of four by-product conditions. Article 27 declarations offer alternatives in certain circumstances, where there is a certain demand for the soil and stone material. IMS operating at Hollywood would make use of this option where circumstances allow (i.e. exporting outlets are available).

Becoming an Article 27 site, the facility could only accept certain uncontaminated excavated soil. This would limit the quality and quantity of soil and stone that the facility could intake, this would result in an inconsistent intake rate with inconsistent traffic patterns. By limiting the available material, the facility can intake to certain uncontaminated excavated, the void space will take a longer period to infill than if it was used for a soil recovery facility or inert landfill. Through becoming an Article 27 site, the mitigation and monitoring measures in place as a condition of the Waste Licence will cease, resulting in potential negative impacts on water and air quality.

The Article 27 scenario will limit the amount of employment the facility will generate, the primary employment sector would be transportation of soil and stone to the site. The infilling and restoration of the void would result in positive health, biodiversity, land and soil, water, air and landscape. However, adverse impacts mentioned in the other operational alternatives (i.e. traffic, noise and air quality) will become longer term impacts due to the uncertainty of sourcing and the extended timeframe to infill the void.

The Article 27 notifications process does not afford IMS the certainty it requires to manage soil and stone. This scenario will result in the infilling and restoration of the void however, a timeframe cannot be applied with certainty as there is additional dependence on external factors.

The Article 27 alternative is not suitable for the proposed development due to the uncertainty associated with the infilling and restoration of the site, as per the current planning permission.

4.7.6 Summary of Process Alternatives

The main process alternatives Multi-Criteria Analysis (MCA) is summarised in **Table 4-4.** In summary, the cessation, quarrying and Article 27 alternatives may be easily discounted based on the potential for adverse environmental impact with limited options for regulation and mitigation. Both the Do-Nothing and the diversified operation have limited environmental impact as both will be fully regulated by the EPA.

The Do-Nothing operation has a lower potential impact to soils/geology and water through the infilling with inert material only. However, the diversified operation has the greater material asset impact through the contribution to the self-sufficiency to the State in the management of a wider range of waste streams in the GDA including non-hazardous soils from brownfield development and IBA. As such, the diversified operation is the preferred operational scenario.

Table 4-4 Main alternatives Multi-Criteria Analysis

Approach	Population	Health	Biodiversity	Land and Soil	Water	Air Quality and Climate	Noise	Traffic	Material Assets	Cultural Heritage	Landscape
	Environmental Considerations										
Do-Nothing	+	+/-	+	+	+/-	+/-	-	-	+/-	0	++
Cessation	-	-	+/-	0	+/-	+/-	+	++	0	0	--
Quarrying	+/-	-	--	-	-	-	-	-	+/-	0	--
Diversify Operations	+	+/-	+	+	+/-	+/-	-	-	+	0	++
Article 27	+/-	+	+	+	+/-	+/-	-	-	+/-	0	+

Note: + Positive; - negative; +/- positives and negatives; 0 neutral (reference to do nothing)

4.8 Alternative Mitigation Measures

The main potential for adverse environmental impact from the proposed development relates to the potential for the waste body to generate leachate. Leachate is a generic term given to water that has come into contact with landfilled waste materials, and in doing so has dissolved contaminants from the waste. These contaminants may include organic and inorganic compounds and elements, many of which will have been released by biological degradation of the wastes. The nature of the leachate is dictated by the nature of the wastes deposited at a site.

Leachate quantity can be determined by the overall water balance for each landfill site. A water balance calculation is provided in **Chapter 5** of this EIAR and includes details on the likely leachate generation volumes considering waste volumes, input rates and absorptive capacity, effective and total rainfall, and infiltration. The leachate generation calculations will provide a likely predicted volume for design purposes of the leachate treatment facility.

In assessing the leachate treatment options to determine the effectiveness of the technique in managing hazardous substances, reducing hazard and rendering substances suitable for release to other processes must be considered. For the leachate treatment sector in particular, because of the variable and complex composition of leachates, not only primary hazards but also secondary hazards must be considered. The following three alternatives have been considered in this analysis:

- Storage and tankering of leachate off site for treatment;
- Transport of leachate by pipeline off site for treatment; and
- On-site treatment of leachate.

The tankering option includes collection, storage and tankering off site of all leachate to a suitably licenced WWTP under agreement with Irish Water. Leachate tankered off site to a licensed WWTP will need to have a set of acceptance limits agreed with Irish Water and these will be included within the IE licence. This option does result in additional but minimal road traffic on the local road network.

A pipeline alternative has also been considered whereby a pipeline would be constructed to transport the leachate to a suitably licenced WWTP under agreement with Irish Water. However, the site location has a significant influence on the practicalities of connection to foul sewer. The extent of the sewer network in the North Dublin area has been provided in **Figure 4-3**. This details of the nearest waste water treatment plant (WWTP) agglomerations are shown for clarity.

For both the tankering and pipeline options, there are no direct impacts to the environment at the site. Leachate is treated off site at licensed facilities and discharged under controlled and monitored conditions.

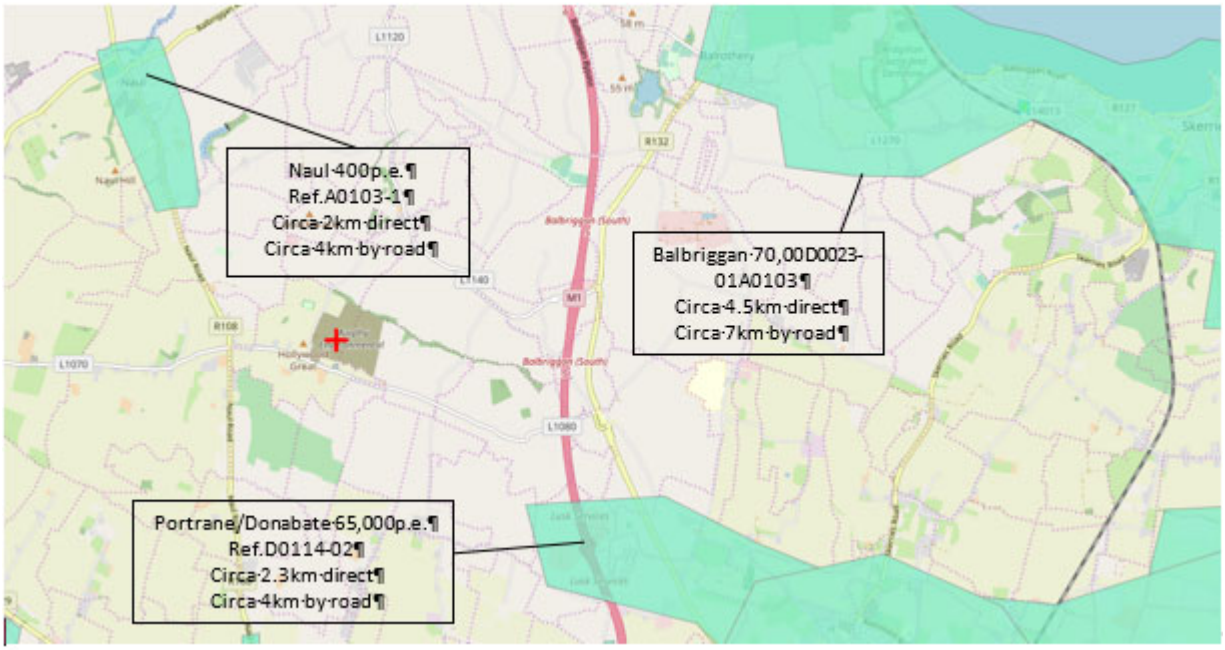

Figure 4-3 WWTP Agglomerations for Leachate Disposal

The onsite treatment alternative includes for the construction and operation of an onsite leachate treatment system at the Hollywood site. Treatment of landfill leachates may involve the adoption of one or more treatment processes and a specific treatment requirement may involve the use of primary, secondary and tertiary processes. On-site treatment using Reverse Osmosis (RO) has been identified as a reasonable alternative for the on-site treatment of leachate at the proposed development. This process involves the installation and operation of a chemical pre-treatment and RO plant on site to treat all leachate.

It is assumed for the purpose of this consideration that the RO plant would concentrate the leachate to circa 20% of the total volume and this high concentration leachate would be then tankered off site to a suitably licensed WWTP under agreement with Irish Water.

The remaining 80% hydraulic load may be recirculated through the system or may be diverted to a secondary treatment system such as an integrated constructed wetland (ICW). This ICW may be developed as part of, or as an addition to, the attenuation pond to the north of the site. This treated water would then discharge to the Ballough Stream at greenfield run off rates. In the event that on site treatment is proposed, the EPA will require any discharge to a stream (such as the Ballough Stream to the north of the site) to comply with the requirements of the Surface Waters Regulations (S.I. No. 272 of 2009) as well as the relevant Best Available Technique (BAT) reference document or conclusions for the sector, in this case the BAT Guidance Note Waste Sector (Landfill) (Dec 2011).

For the purposes of assessing the viability of on-site treatment, the likely design criteria that the EPA would require in the revised licence for any such treatment is presented in **Table 4-5**. Any discharge to the Ballough Stream would be required to comply with the BAT discharge limits and/or the surface water EQS within the stream.

The onsite treatment alternative would result in a direct discharge of treated leachate from the ICW to the Ballough Stream. While such a discharge would be subject to EPA regulation, there remains a risk of impact to the stream and the downstream Rogerstown Estuary SAC and SPA. This SAC has the following features of interest:

- Estuaries [1130];
- Mudflats and sandflats not covered by seawater at low tide [1140];
- Salicornia and other annuals colonising mud and sand [1310];
- Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330];
- Mediterranean salt meadows (Juncetalia maritimi) [1410];
- Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120]; and

- Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130].

It is also noted that the conservation status of the SAC and the mudflats and sandflats is currently being compromised by the fugitive discharges from an existing landfill downstream of the site.

Table 4-5 Surface Water Regulations and BAT Discharge Limits

Parameters	Unit	Surface Water Regulations (Good Status as an annual mean)	BAT for the Landfill Sector
BOD	mg O_2/l	1.5	25
pH	pH Unit	6.0< pH < 9.0	6 - 9
Suspended Solids	mg/l	-	25 to 35
Total Ammonia	mg N/l	0.065	10
Total Nitrogen (as N)	mg/l	-	15
Molybdate Reactive Phosphorus	mg P/l	0.035	
Total Phosphorus (as P)	mg/l	-	2
Arsenic	µg/l	25	
Chromium III	µg/l	4.7	
Chromium VI	µg/l	3.4	
Copper	µg/l	5	
Fluoride	µg/l	500	
Zinc	µg/l	8	
Lead and its compounds	µg/l	7.2	
Nickel and its compounds	µg/l	20	
Cadmium and its compounds	µg/l	0.08	

For the above reasons, there is a potential risk associated with any treated leachate discharge to the stream and a potential for adverse impact on biodiversity and water quality.

These risks are largely negated by off-site treatment as the process of tankering off-site reduces the environmental impact of the proposed development on the aquatic environment. While there is some potential additional traffic impact, it is considered that overall the tankering alternative provides the lowest environmental impact of the alternatives considered.

The pipeline offers a poor material asset impact through the need for additional lands, wayleaves, etc. to construct and maintain a pipeline through the land between the site and the WWTP.

In short, the preferred alternative in the short term is the tankering of untreated leachate from the site to a suitably licensed WWTP for treatment. While the on-site treatment carries a potential risk, the development of on-site treatment is more sustainable in the long term and this application includes passive provision for a future RO plant to treat leachate on the site in the medium term. The detailed design of this system will be agreed with the EPA through the SEW process.

4.9 Conclusions

Having regard to the reasonable alternatives considered in relation to the current proposal, the preferred project alternative on which this EIAR is based includes the following:

- The Diversify Waste Operations scenario whereby the facility will operate under the conditions of a revised Industrial Licence W0129-04, accepting a more diverse mix of inert and non-hazardous wastes with a revised suite of infrastructure;
- The cell layouts with the inert cells located to the south western end of the site, where the limestones of the Loughshinny Formation are more vulnerable and this low risk waste will have no adverse impact;
- All cell design undertaken in line with the Annex I of the Landfill Directive 99/31/EC;

- Maintaining the existing waste acceptance limit (500,000 tpa); and
- Tankering leachate off-site to an EPA approved waste water treatment plant is the preferred leachate management option but with provision for future on-site treatment under agreement with the EPA.

This scenario may cause some long term potential negative issues (i.e. hydrogeology, traffic, noise and dust) that may be suitably mitigated, however, the complete restoration will result in long term positive impacts to health, biodiversity, land and soil, water, air quality, noise, traffic and landscape. The complete restoration of the site is considered to represent a viable option, in terms of location, availability, existing markets, technical characteristics and manageable environmental impact.

4.10 References

1. Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment.
2. The European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296 of 2018).
3. The European Union (Waste Management) (Environmental Impact Assessment) Regulations 2020 (S.I. No. 130 of 2020).
4. The Environmental Protection Agency (Integrated Pollution Control) (Licensing) (Amendment) Regulations 2020 (S.I. No. 189 of 2020).
5. The Environmental Protection Agency (Industrial Emissions) (Licensing) (Amendment) Regulations 2020 (S.I. No. 190 of 2020).
6. The European Union (Environmental Impact Assessment) (Environmental Protection Agency Act 1992) (Amendment) Regulations 2020 (S.I. No. 191 of 2020).
7. Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment, DHPLG (August 2018).
8. Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR) (EPA, 2022).