Appendix S4

Management Plan for Materials Arising On-Site

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1 INTRODUCTION

This report describes options for managing the materials arising on-site from the construction of the Corrib Onshore Pipeline project specifically the tunnel, the Landfall Valve Installation (LVI) and the demobilisation of the tunnelling compound.

The pipeline route now proposed includes a section (between Glengad and Aghoos) that is proposed to be tunnelled. The total length of the tunnel is approximately 4.9km and the tunnel will have an outer diameter of 4.2m. The tunnelling works will be carried out from a compound at Aghoos.

Details of the types and quantities of materials arising are provided along with a preferred strategy for managing the materials which maximises the resource potential of the material. Contingency arrangements are also described.

Materials arising from the demobilisation of the tunnelling compound on-site and the options for managing these are also addressed in this report.

This report does not address the management of disposal of peat. This is covered in Volume 3 of the Environmental Impact Statement (EIS).

This report has been prepared by RPS Consulting Engineers.

2 CONSTRUCTION ACTIVITIES

A summary of the construction works are outlined in the following Sections. Further details are provided in the relevant sections of the Environmental Impact Statement (EIS).

2.1 TUNNELLING WORKS

Construction of the Corrib Onshore Pipeline in Sruwaddacon Bay will be by segment lined tunnelling. This will entail constructing a 4.9km long concrete lined tunnel into which the pipeline will subsequently be installed. The tunnel will be constructed using a Tunnel Boring Machine (TBM).

The Tunnel Boring Machine (TBM) will be used to gradually excavate the tunnel at the front of installed concrete segments. As the excavation moves forward, new concrete segments will be assembled directly behind the TBM. The TBM will use the front edge of the concrete lined tunnel to push against and gradually cut away the material at the front of the machine. Figure 2.1 illustrates the proposed method.

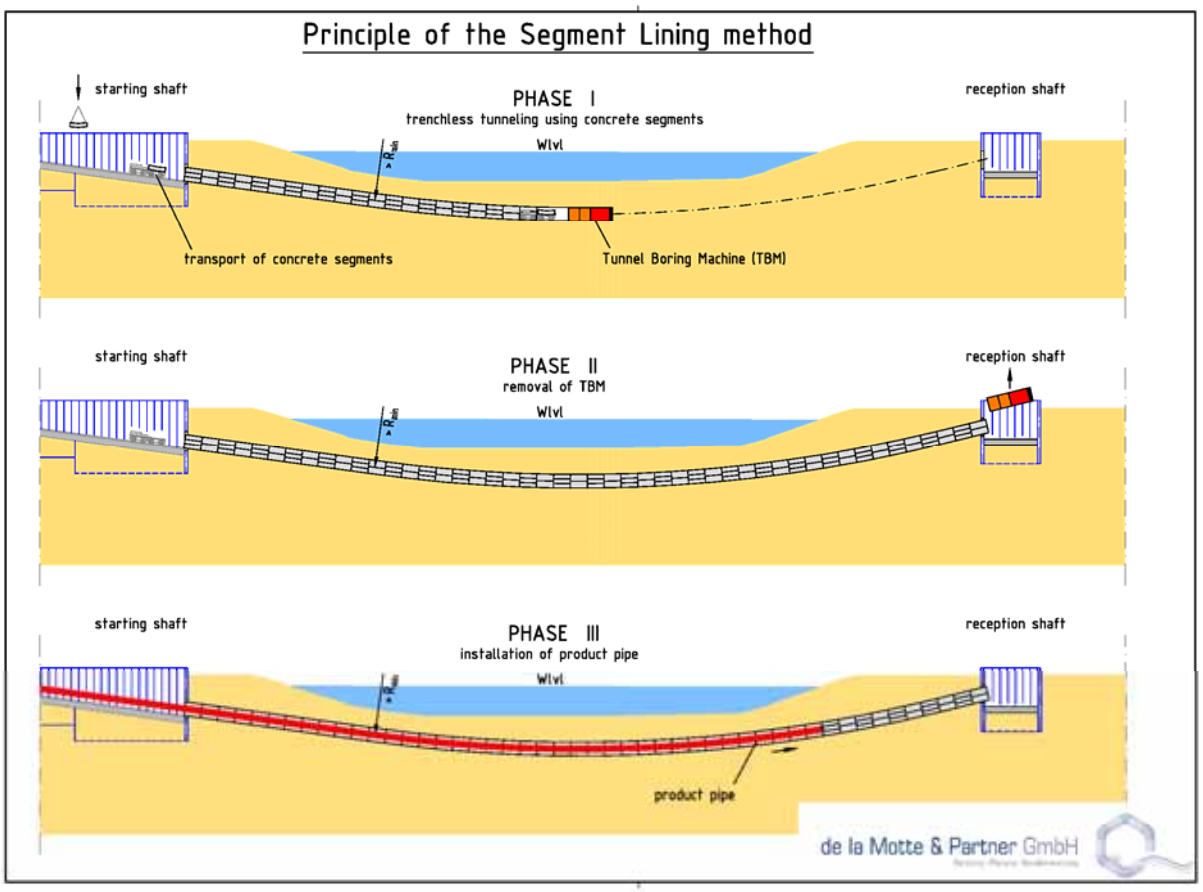


Figure 2.1 Segment Lining Method

Excavated cuttings from in front of the TBM will be removed (and crushed where necessary) through the cutting head. The cuttings will be mixed with the cutting fluid (bentonite slurry) and pumped to the start pit via dedicated hoses running through the advancing tunnel bore. When this mixture reaches the surface at the start pit, the excavated material will be separated from the bentonite slurry and segregated into different material gradings after which it will be stockpiled temporarily on-site. A description of the materials generated by the tunnelling works is set out in Section 3.2.

It is intended to reuse significant quantities of the materials arisings on-site with excess material reused or recovered off-site, (see Section 5.2). The drilling fluid in the tunnelling process will be recycled.

2.2 DEMOBILISATION OF TUNNELLING COMPOUNDS

The construction of the tunnelling compound will require the removal of the vegetated upper layer of peat in the area. The layer will be approximately 0.6m deep and the material will be carefully removed for stockpiling locally. To facilitate construction, the peat material will be replaced by stone and selected fill and capped with dense bitumen macadam. Figure 5.3 shows cross sectional details of the tunnelling compound.

When the tunnel is complete and the pipeline system has been installed, the area will be reinstated using the layer of peat that was stockpiled locally for this purpose. Any surplus excavated stone and fill material will be excavated and stockpiled for reuse and recovery off-site as outlined in Section 5.2. Following reinstatement, temporary fencing will be removed and the lands returned to normal use.

Construction and reinstatement of the tunnelling compound and stringing area at Aghoos is described in detail in Chapter 5 of the EIS.

2.3 LANDFALL VALVE INSTALLATION

During the construction of the LVI an estimated 7,000m^3 of soil and rock material will be generated and managed in accordance with best practice, see Section 5.2. The first stage of the construction of the LVI will be to excavate the site to the required levels. Topsoil will be stored separately to preserve the local seed-bank and facilitate reinstatement. Bedrock is located approximately 3 - 4m below ground level and after removal of the topsoil and overburden layers, approximately 3m of excavation in the rock layers will be required.

More details of the construction of the LVI are included in Chapter 5 of the EIS.

3 DESCRIPTION OF TUNNELLING ARISINGS

The proposed tunnelling works will generate different types of materials. This material will be predominantly made up of rock cuttings and stone, sands and gravels, with lesser quantities of silts and other residual materials. The vertical alignment of the tunnel may vary between a minimum cover of 5.5m and a maximum depth of 10m below the indicated centreline (see Appendix M1-A). On this trajectory, the proposed tunnelling works will generate predominantly sand and gravels within the superficial deposits of Sruwaddacon Bay.

The following sections provide a general description of the tunnelling material and its expected composition.

3.1 LOCAL GEOLOGY

Information on the overburden deposits in Sruwaddacon Bay has been compiled from available geophysical data, from the Geological Survey of Ireland (GSI), across the bay and geotechnical data gathered as part of the previous onshore pipeline application lodged in 2009.

A geophysical survey was carried out in Sruwaddacon Bay in 2007 by Osiris Projects, refer to Appendix M1 for details. The geophysical survey indicated predominantly granular deposits in the bay. The deposits were up to depths of about 25m below bed level becoming shallower at the bay edges where exposures can be seen at ground surface. The sediments are a mixture of “reworked” medium to fine marine sands throughout the central parts of the bay and mixed gravel deposits derived from glacial tills and weathered bedrock at the margins of the bay and in areas of stronger current.

A more detailed description of the bedrock and overburden geology underlying the Bay can be found in Section 15.1 of the EIS and Appendix M1.

3.2 COMPOSITIONAL PROFILE OF TUNNELLED MATERIAL

Material extracted from the tunnelling works will be wet due to the introduction of drilling fluid (mostly water) during the drilling works, and will be returned to the launch pit for processing. Once the material reaches the launch pit, the separation plant will separate the materials being returned into different grades of crushed rock, sand, clays and silts. The separation plant will be a six stage process and a specification detail of the system is presented in Table 3.1.

Table 3.1 Specification of Separation Plant

Stage	System Output Procedure	Particle Separation Size
1	Shaker	> 8 mm (in rock the D50 of this will be approx 30 to 40 mm)
2	Cyclone	250 µm - 8mm
3	Cyclone	100 µm - 250 µm
4	Cyclone	50 µm - 100 µm
5	Centrifuge	6 µm - 50 µm
6	Filter Press	< 6 µm

It is expected that a large portion of the materials, with the exception of silts, once separated will be reusable as a Class 1 material (National Roads Authority (NRA) Design Manual for Roads and Bridges

Specification for Road Works, Series 600, Earthworks) and can be stockpiled on site. The coarse fraction of the materials (coarse gravel, cobbles) excavated by the TBM will be crushed at / within the cutting head. The maximum particle size of rock arisings from the TBM will be 30mm – 40mm. Figure 3.1 shows typical rock cuttings and a typical materials separation plant from a tunnelling process where a TBM was used.

Figure 3.1 Typical Rock Cuttings and Materials Separation Plant from Tunnelling Process

From the boreholes drilled in the Bay, it is estimated that there is an average of approximately 15% of silts/clays within the sands and gravels within the Bay. This type of material has limited reuse potential and suitable outlets for the material can be difficult to identify. As a result this material may need to be disposed of at an EPA Waste Licensed facility. Further details on the management of silts and residual materials from the tunnelling process are detailed in Section 5.2.

3.3 TUNNEL ARISINGS AND BENTONITE

Bentonite, a naturally occurring clay mineral (montmorillonite), will be used within the tunnelling process to aid the pumping of cuttings through the slurry pipe and also as a lubricant to the tunnelling head. The tunnelling slurry will be a suspension of very fine inert clay (bentonite) in water and is widely used in construction projects. The use of bentonite will be managed carefully at a bentonite handling unit, within the site compound, close to the launch pit.

After recovery through the separation plant, the excavated material will contain a residual quantity of bentonite of approximately 0.4% by weight. As bentonite is a natural material the trace quantities in the excavated tunnel materials are not considered as a contaminant, a view confirmed with the Environmental Protection Agency. At this concentration the bentonite has a negligible effect on the mechanical qualities of the material and will not impact on its classification as a construction material under the NRA Specification (Series 600 Earthworks). A detailed description of the use of bentonite in the tunnelling process is described in Chapter 5 of the EIS.

Apart from the trace quantities of bentonite in the excavated material, residual bentonite fines (after processing) will be generated daily from the tunnelling works estimated to be 1.75 tonnes per day. At the end of the tunnelling works bentonite fines will also be generated as part of the cleaning of the TBM and the draining of the slurry lines. This process will result in approximately 250m^3 bentonite slurry (approximately 8.75 tonnes of bentonite fines). This material will be disposed of at the end of tunnelling works and the options are outlined in Section 5.2.4.

4 QUANTITIES OF MATERIAL ARISINGS

Table 4.1 summarises the estimated quantities of material arising from the tunnelling works as well as arisings from the construction of the LVI and the demobilisation of the tunnelling compound. The quantities are presented in terms of m^3 and tonnes (a bulk density factor of 2 has been applied for the conversion of cubic metres into tonnes).

The tunnelling quantities presented represent the current best estimate of material arising from these works based on a tunnel trajectory which is mainly through sands and gravels. This is a conservative approach as this represents the scenario where there would be the greatest range in materials arising (rock cuttings, sands, gravels and silts / fines).

The quantity of material estimated to arise from the tunnelling works from Aghoos to Glengad is approximately 68,000m^3 or approximately 136,000tonnes. In addition there will be an estimated 7,000m^3 or 14,000tonnes of material generated by the construction of the LVI. It is anticipated that the tunnelling works will generate approximately 13.8m^3 of spoil material per meter tunnelled (based on tunnel diameter of 4.2m). It is anticipated that the tunnelling works will progress at an average rate of approximately 11m per day (this rate could be higher or lower on a daily basis depending on the material being tunnelled). Therefore, the quantity of tunnelling spoil arising from the works is expected to be on average of the order of 150m^3 per day.

In Table 4.1 the estimated quantity of material generated from the tunnelling works and LVI construction is separated out into three main constituents; rock cuttings and stone, sands and gravels and silts. Based on the geophysical and geotechnical information gathered to-date the representative quantity of each constituent has been estimated (based on the tunnel alignment shown in Appendix M1-A). It is estimated that 20% (approximately 27,200 tonnes) of the tunnelling materials generated will be rock and stone cuttings with the remainder (108,800 tonnes) primarily sands and gravels. It is expected that 15% of the sand and gravels will be silty material and the corresponding quantities are calculated to be 16,320 tonnes. The remainder will be sand and gravels estimated to be 92,480 tonnes.

Potential options and anticipated quantities of material for the reuse of material on-site and the possible reuse, recovery or disposal of material off-site are detailed in Table 4.1. In order to optimise the reuse of material on-site, due consideration has to be given to the programming of specific tasks and storage capacity on-site. The potential options identified for on-site reuse will occur for the most part after the tunnelling works.

The rock cuttings and stone generated from the tunnelling works can be reused in a number of site construction works, full details are provided in Section 5.2.1. The stone road has the largest requirement for this type of material and it is expected that most of the rock and stone cuttings will be used here. The possible on-site reuse applications include the:

- Permanent Access road at Glengad.
- Pipeline stringing area at Aghoos.
- Stone road.

Sand and gravels will also be reused on-site, albeit to a lesser degree, for example, in the construction of the pavement surface for the pipeline stringing area. Further details of the reuse on-site of sands and gravels are detailed in Section 5.2.1.

Surplus material generated from the tunnelling works will be sent off-site with the preferred approach to transport the material to a local construction project where the material can be put to use. Alternatively the material could be sent to a number of quarries identified in the area where the material would be reused in land remediation activities or processed for subsequent recovery. As a last resort material may be sent to landfill although this option will only be employed after all other options have been exhausted. The off-site options for managing the material are explored in more detail in Sections 5.2.3 and 5.2.4.

The material used in the construction of the tunnelling compound will be excavated at the end of the construction schedule and removed off-site following the completion of the entire on-site works. This material will be suitable for reuse in other construction projects off-site and suitable projects will be targetted. Alternatively this material may be transported to a local quarry which has the relevant planning and waste permission in place to accept the material for recovery. Further details of the management of this material are outlined in Section 5.2.

Table 4.1 Estimated Quantities of Materials Generated from Tunnelling Works and Other Related Works

	Rock Cuttings / Stone		Sand & Gravel		Silts/other non reusable		Total Arisings		Comments
	(m3)	Tonnes	(m3)	Tonnes	(m3)	Tonnes	(m3)	Tonnes	
Materials Arisings On-Site									
Landfill Valve Installation (LVI)	7,000	14,000	0	0			**7,000**	**14,000**	Excavation mainly in rock
Tunnelling (Aghoos)	13,600	27,200	46,240	92,480	8,160	16,320	**68,000**	**136,000**	4.9km x 4.2m O.D. 15% of sands / gravels is silt / other non re-useable
Total	**20,600**	**41,200**	**46,240**	**92,480**	**8,160**	**16,320**	**75,000**	**150,000**	
Materials Required On-Site (During Construction)									
LVI Permanent Access Road	600	**1,200**	-	-	-	-			
Aghoos Pipe Stringing Area	23,000	**46,000**	-	-	-	-			Compatible with programme
Stone Road	55,000	**110,000**	-	-	-	-			Subject to programme
Pipe Bedding	-	-	5,500	11,000	-	-			
Total	**78,600**	**157,200**	**5,500**	**11,000**	**0**	**0**			
Materials for Management Off-site									
Tunnel arisings (surplus materials)	0	**0**	40,740	81,480	8,160	16,320	**48,900**	**97,800**	Potential to re-use on-site sands / gravels by mixing with rock cuttings / stone. No re-use potential for silts and other material.
Bentonite arising during tunnelling	-	-	-	-	1,320*	779	**1,320***	**779**	Low / no re-use potential. * Bentonite fines after processing (density 0.59t/m3)
Surplus bentonite (from TBM & bentonite system, arising at end of project)	-	-	-	-	15*	9	**15***	**9**	
Demobilisation of compounds (Arising at end of project)	45,000	**90,000**	-	-	-	-	**45,000**	**90,000**	Removal of excess stone upon completion. Good re-use potential (off-site).
Totals	**45,000**	**90,000**	**40,740**	**81,480**	**9,495**	**17,108**	**95,235**	**188,588**	

Note: Above breakdown is based on tunnelling through 20% rock /80% sand and gravels.

5 MANAGEMENT OPTIONS FOR MATERIALS

The options for managing the material generated on-site are explored in detail and are outlined in this chapter of the report. A preferred approach which maximises the resource potential of the material is identified along with contingency arrangements if the preferred options do not materialise.

5.1 WASTE POLICY AND BEST PRACTICE

Ireland's waste policy sets out the preferred approach to sustainably managing inert wastes and wastes generated from construction projects. Irish waste policy is set down in a series of Policy Statements published by the Department of the Environment, Heritage and Local Government (DEHLG) which set targets and environmental objectives.

In the first National Waste Policy Statement, Changing Our Ways (1998), the DEHLG adopted the EU hierarchy of options for managing wastes. The design of the hierarchy favours higher management options in favour of disposal. This philosophy sits at the core of waste management in Ireland and fundamentally aims to minimise the disposal of material to landfill in favour of more sustainable solutions.

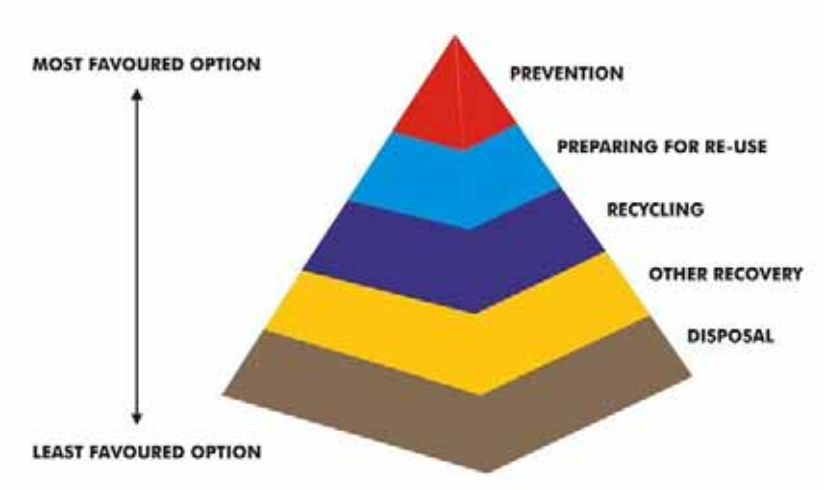


Figure 5.1 Hierarchy of Waste Management Options

Changing Our Ways identifies the need for stakeholders in the construction industry to take responsibility for managing construction wastes. The industry has responsibility to divert material from landfill by developing "environmental sustainability policies" to "ensure the environmentally sound management" of inert wastes on-site. This Policy Statement set the national recycling target of 85% for the construction waste stream by 2013.

Subsequent National Policy Statements have endorsed these original policy objectives and the hierarchical approach to waste management. Regional Waste Management Plans prepared by Local Authorities across Ireland have similarly followed suit.

The Replacement Waste Management Plan for the Connacht Region 2006 – 2011 (hereafter referred to as the Replacement Plan) takes account of national waste policy whilst setting out the strategic framework for the management of wastes generated in the region. The Replacement Plan contains specific objectives for the better management of wastes arising from construction projects in the region during the lifetime of the Plan.

The Replacement Plan requires stakeholders in the construction industry to "ensure that reuse and recycling of construction and demolition waste is maximised". In summary the Plan's stated policy for managing inert waste is:

"…To maximise the reuse and recycling of C&D waste" (*Page 100, Chapter 15, Replacement Plan*).

The implementation of this policy is set out in a series of specific objectives which endeavour to deliver sustainable management practices for inert wastes in Connacht. Those policy objectives which are most relevant are as follows:

- ***Recover and reuse materials where possible, in preference to disposal***
- ***Promote and encourage the development of C&D Waste facilities at quarry sites (both active and closed)***
- ***Promote and encourage the development of C&D waste facilities by the private sector***
- ***Reduce and or eliminate quantities of C&D recyclable waste other than clays or subsoils used in land reclamation***

Replacement Plan, Chapter 15, Page 100.

The Corrib Onshore Pipeline project is within the Connacht Region and is required to take account of the Replacement Plan policy objectives with respect to the management of inert materials generated on-site. Section 5.2 sets out the preferred strategy for managing material generated from the LVI construction, tunnelling works and similar material generated from the demobilisation of the tunnelling compound.

5.2 A SUSTAINABLE MANAGEMENT APPROACH

Inert materials generated from the LVI construction, tunnelling works and the demobilisation of the tunnelling compound will be managed sustainably and in accordance with best practice as set out in National and Regional Waste Policy.

The aim will be to reuse as much as possible of the material generated by the works. As set out in Section 3.3 the material generated will be a clean natural material and it is expected this material will be classified as a Class 1 material (as per NRA Specifications).

On-site material generated from the LVI construction tunnelling works can be put to reuse in one of several possible construction applications. These options are outlined in more detail in Section 5.2.1. Excess material which cannot be reused on-site will be managed in an appropriate manner. The demobilisation material falls into this category as it will arise at the end of the construction project. The proposal is to send this material off-site primarily for the purpose of reuse at a third party construction site or alternatively for recovery at a local quarry or waste facility. The strategy for managing material sent off-site is outlined in Sections 5.2.2 and 5.2.3.

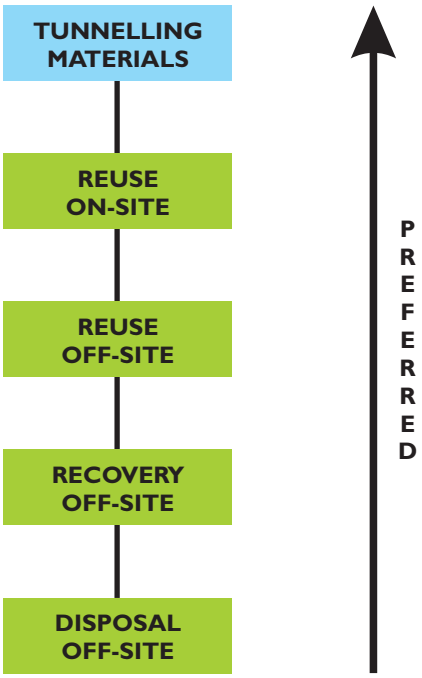
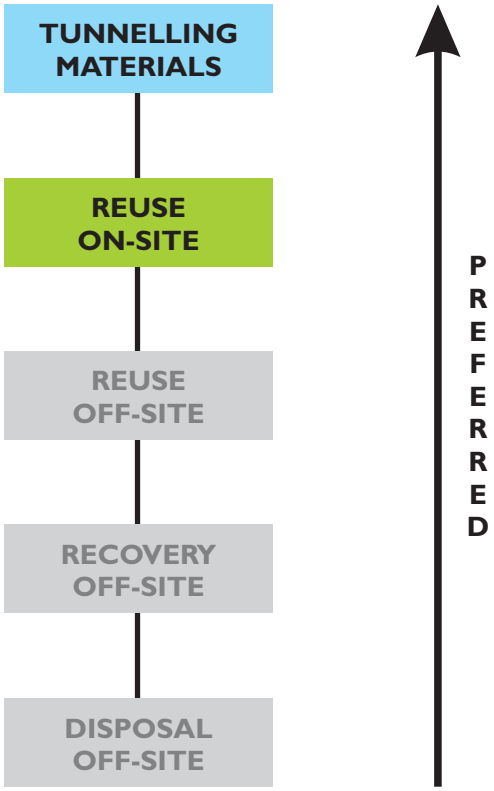


Figure 5.2 Preferred Strategy for Management of Materials

As a final option material which cannot be reused on-site or reused or recovered off-site at a suitable location/facility will be sent for disposal at an appropriately authorised waste facility such as a municipal or inert waste landfill. It is anticipated that the quantity of materials sent off-site for disposal will be limited and this option will be a "last resort" after exhausting higher order solutions. In order to account for a worst case scenario, facilities have been identified that have the capacity (both in terms of total tonnages and yearly limits) to take the entirety of the material generated. More details of the disposal solution are outlined in Section 5.2.4.

5.2.1 Reuse On-Site

The preferred outcome from an environmental, transportation and resource efficiency perspective is to maximise the reuse of material generated from the tunnelling works on-site. To enhance the suitability of the material it is likely that standard screening and or grading of the material will be carried out to ensure the end material is of a consistent quality and unsuitable fractions such as shells and similar matter are removed. The nature of the material and its reuse on-site will not require a waste permission to be put in place.



The material processed will be a clean and valuable resource. From the geotechnical data gathered, it is expected the material will be categorised as a Class 1 material suitable in accordance with NRA specifications and suitable as general fill. It is proposed to undertake standard testing e.g. Particle Size Distribution at regular intervals, to validate the specification and classification of the material.

The classified material will be made available for reuse as a suitable material in a number of possible applications on-site including:

- Permanent Access road
- Pipeline stringing area
- Stone road
- Pipe bedding.

It has been estimated based on an analysis of the quantities presented in Table 4.1 that a minimum of 35% of material generated by the LVI construction and tunnelling works will be reused on-site. There is potential for further reuse of material on site depending on the type and quality of the material excavated.

As a Class 1 material, the arisings will be suitable for the stone road construction in the forestry from a geotechnical engineering point of view where the peat excavated forms a clean excavation, i.e. the peat is more fibrous and "punching in" of rock is not required. Where the peat is more amorphous a coarser rock fill material is typically used to displace and penetrate through the peat and to offer the high shear resistance needed to support the excavation.

For the upper zones of the stone road, finer grained Class 1 materials would be acceptable and materials generated from the tunnelling works (including sands and gravels) would be suitable, refer to Figure 5.3.

The pipeline stringing area will be constructed using the same principles as the stone road with materials available from the tunnelling works suitable for reuse as a fill material. On average fill material to a depth of 1m will be required across the stringing area to replace the peat removed during construction. A cross section of the pipeline stringing area showing construction layers is shown in Figure 5.3.

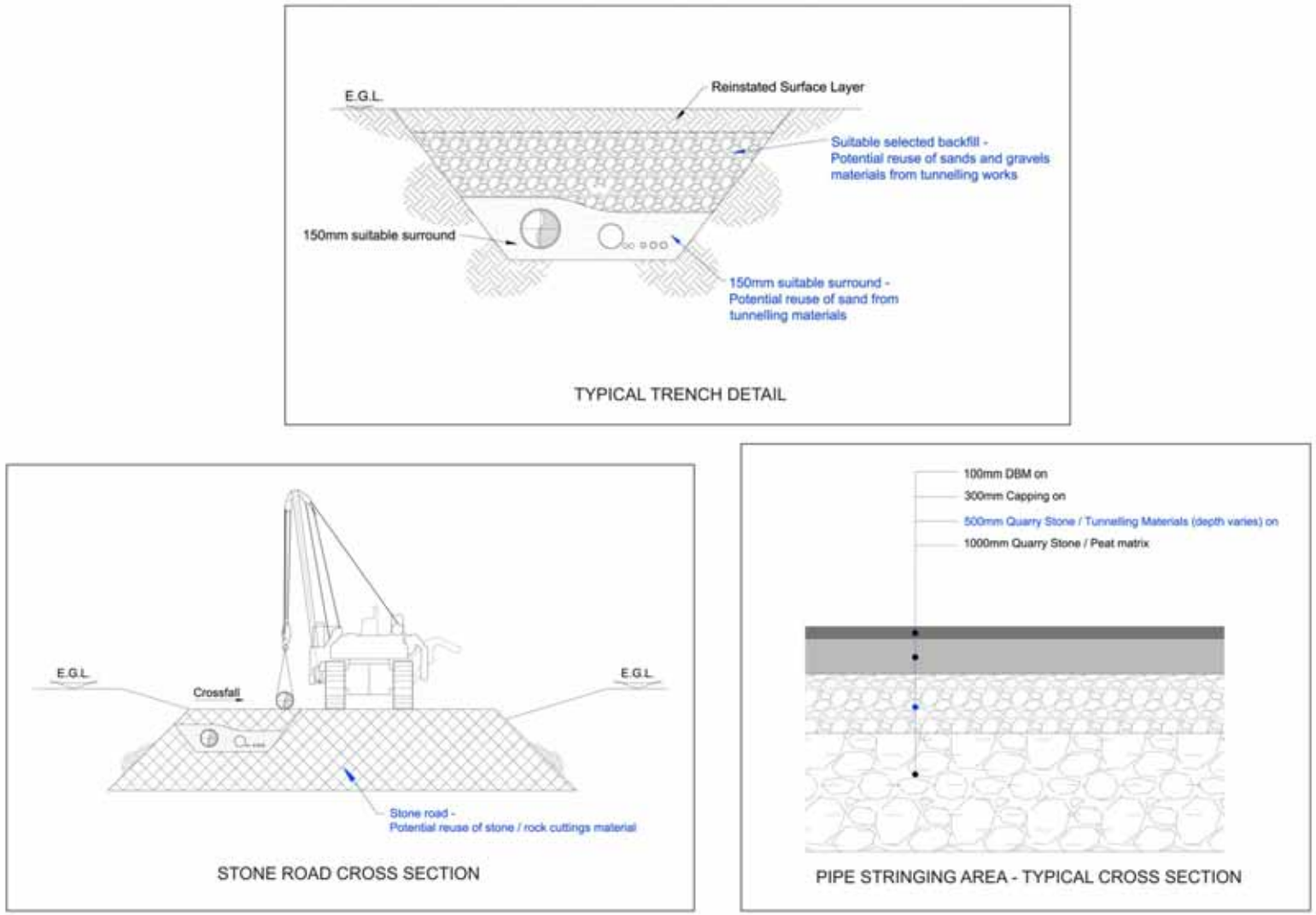
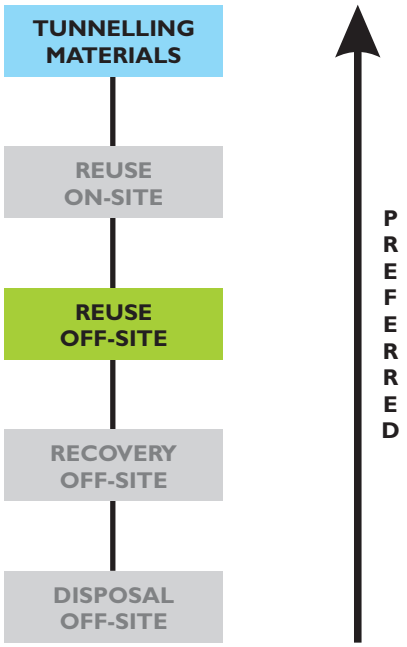


Figure 5.3 Construction Applications for the Reuse of Materials On-Site

It is also proposed to reuse quantities of sand and gravel materials generated by the tunnelling works as a bedding layer around the pipeline as a protective coating. The sand material will be very suitable for this application and an illustration showing its use is shown in Figure 5.3.

5.2.2 Reuse Off-Site

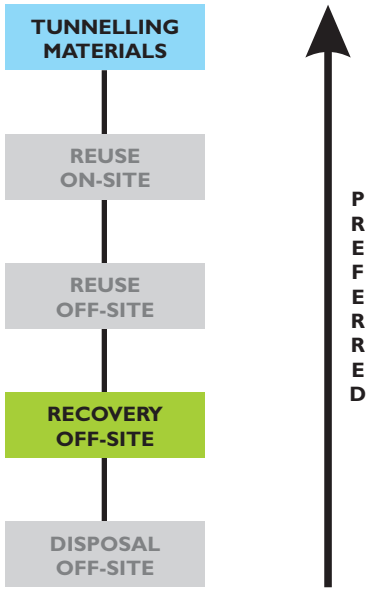


The reuse of material generated from the works will be maximised on-site, however excess materials will remain and require management. The excess materials will be primarily sand and gravels but also silt type material. Estimated quantities of the excess material are detailed in Table 4.1.

The preferred approach for the management of the excess materials will be to reuse them as a Class 1 fill material at third party development projects including existing quarries. There are several medium to large scale developments, particularly new renewable energy projects, planned in the area which will have a need for substantial fill materials. The material could be reused as fill in the construction of forestry roads, access roads or in foundations. Provisional discussions have been held with a number of developers, including Bord na Móna and Coillte, regarding the need and suitability of material from the tunnelling works and demobilisation. The developers contacted have expressed an interest in taking such material subject to their construction projects proceeding; the timeframes coinciding (i.e. availability of material from the onshore pipeline development coinciding with their construction requirements); and the surplus material meeting their requirements. At this stage it is too early to put into place commercial agreements but ongoing communication in relation to construction schedules with the different parties will continue.

The reuse of material off-site as a fill in third party construction project represents a good use of the resource and reduces the quantity of virgin material required for construction. Any material sent off-site for reuse will be tested to confirm its suitability in terms of it meeting the appropriate class specification. Similar testing as proposed for material to be reused on-site is proposed to ensure quality is maintained. The suitability of the material will be validated by the Project Engineer from the destination site prior to the transportation of material off-site. These controls will ensure the material can be treated and handled as a resource material and not as a waste.

5.2.3 Recovery Off-Site



If the options to reuse material off-site at third party development locations do not materialise the excess material will be sent for recovery at a location with a waste authorisation in place. Any material sent off-site, for recovery to a waste facility will be transported by a haulier holding a valid waste collection permit

There are several sites in Mayo which hold a Waste Facility Permit and can accept clean inert waste material for recovery as land remediation activity. These facilities are permitted by Mayo County Council and information on the location and details of the operation are all publicly available.

In close proximity to the site is the Tallagh Inert Landfill (formerly an operational quarry close to Belmullet) which holds a Waste Facility

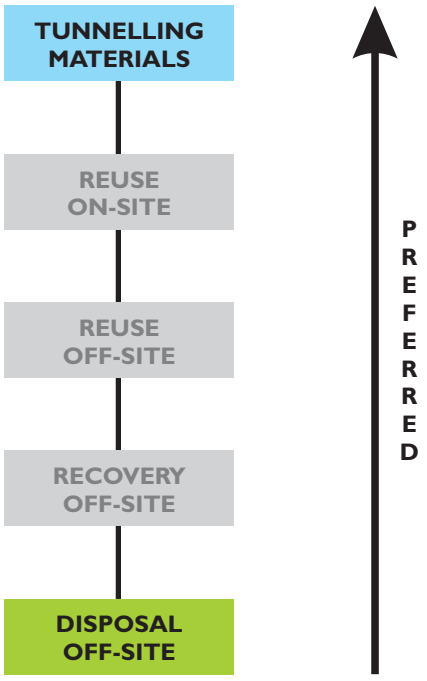
Permit (PER 144) for the acceptance of inert waste material for the purpose of land remediation. In 2009 the operator of this facility applied to the EPA for a Waste Licence for the acceptance of 24,900 tonnes of inert waste material on an annual basis for land remediation purposes. The operator has estimated that over 600,000 tonnes of material can be accepted over the lifetime of the planned Tallagh Inert Landfill facility as part of the rehabilitation works. The facility is expected to be fully Licensed in 2010.

In addition to the Tallagh Inert Landfill there are quarries in the local area which have been contacted to discuss possible outlets for materials arising on the Corrib Onshore Pipeline project. The acceptance of material at these sites for recovery purposes will need to comply with existing planning conditions and or an appropriate waste authorisation provided this is necessary and in place.

Excess material from the project site could also be recovered at the Derrinumera Landfill Facility which is owned and operated by Mayo County Council. Active landfills have an ongoing requirement for inert materials for daily cover purposes and the material from the tunnelling works could be available for this purpose. Similarly the tunnelling material from the site could be used for recovery purposes in the future capping of landfill cells at the facility and the possible construction of internal access roads as part of the site development works. Discussions have been held with Mayo County Council in this regard.

5.2.4 Disposal Off-Site

The disposal of excess materials generated on the Corrib Onshore Pipeline project to a Waste Licensed facility will only be considered when all other options to reuse or recover the material off-site have been exhausted.



It is expected that a minimum quantity of material will be sent to landfill for disposal. Depending on the quality of the silts separated from the excavated materials this material may be sent for disposal although the reuse and recovery options of this material will be first explored. If this material is found to be unsuitable for reuse or recovery purposes it will be sent to Derrinumera Landfill at Newport for disposal. Discussions have been held with Mayo County Council in this regard.

Table 5.1 provides a summary of the facility in terms of acceptable material and annual quantities and the Waste Licence indicates that inert wastes can be accepted for disposal.

Similarly bentonite residues and other similar materials arising as a result of the on-site processing may require disposal and, if so, will be sent to this landfill facility.

It is estimated that over 17,000 tonnes of material will require disposal off-site. The majority of this material will be silt.

Table 5.1 Details of the Derrinumera Landfill Facility

Facility	Description	Capacity / Potential Capacity	Materials Accepted	Location (Distance by Road)
Derrinumera Landfill (W0021-02)	EPA Waste Licensed Facility	Waste Licence **40,000 tonnes per annum** non-hazardous including C&D wastes. Potential capacity 400,000 tonnes to 2020	Household and Commercial residual waste & non hazardous C&D waste.	Newport, Mayo (70km)

5.3 CONTINGENCY PLAN FOR MATERIALS

In the event that suitable outlets cannot be identified for part or all of the materials generated during the course of the works, a Contingency Plan has been developed as a precautionary measure or "safeguard solution" and will ensure that the materials arising on-site will have a certain destination outlet.

The worse case scenario is that none of the material generated from the tunnelling works, the LVI construction nor the demobilisation of the tunnelling compound can be reused or recovered on-site or off-site as described in Sections 5.2.1, 5.2.2 and 5.2.3. In this event a suitable destination facility is required which can accept the estimated 240,000 tonnes of inert waste generated over approximately a 26 month construction period. The destination needs to be certain and the facility identified needs to be operational during the construction period when the material will arise.

The overall quantity of material eliminates waste facilities authorised with a Local Authority issued Certificate of Registration or Waste Permit. These authorisations are typically used for inert waste facilities although tonnages range from 10,000 to a maximum of 100,000 tonnes depending on the particular activity. Furthermore the lifetime for these authorisations is set by statute to 5 years, after which an option to renew the authorisation is available or alternatively it is abandoned.

Considering all of these issues a Waste Licensed Facility will be the most suitable destination. Waste Licenses are issued for different waste operations including landfills (municipal and inert), transfer stations, materials recovery facilities, biological treatment facilities and incinerators. From these possible destinations an inert landfill is the preferred option as it provides the certainty required.

Table 5.2 provides summary details of the two largest inert landfill facilities in Ireland. Both are operated by Murphy Environmental Limited and are located at sites in Meath and Dublin. The table shows that either facility has the capacity to accept all of material generated during the construction of the onshore pipeline and are safeguard solutions.

The latest Annual Environmental Reports (AER) available (2008) on the EPA website show that the facility in Gormanstown accepted 350,000 tonnes of inert waste while the Naul facility accepted approximately 226,000 tonnes for that year. These reports highlight the spare and available capacity at each facility and their suitability as safeguard solutions for materials generated by the project. The AERs for the facilities also provide details of the remaining void capacity at each site. The facility located in the Naul had a remaining void capacity of over 4.1 million m^3 at the end of 2008 and has 16 years of operation remaining based on the maximum annual tonnage being received,

Similarly the facility at Gormanstown has a significant remaining void capacity to be filled over its lifetime which has been confirmed with the EPA Inspector for the site.

Table 5.2 Details of Contingency Facilities for Inert Materials

Facility	Description	Licensed Annual Capacity	Materials Accepted	Location
Murphy's Quarry Inert Landfill (W0151-01)	EPA Waste Licensed Facility	750,000 tonnes 738,00 tonnes can be accepted for disposal at the site. 12,000 tonnes can be accepted for recovery.	Inert Wastes. Purpose: To fill/rehabilitate the quarry void. To recover material through processing.	Gormanstown, Co. Meath
Murphy's Quarry Inert Landfill (W0129-02)	EPA Waste Licensed Facility	500,000 tonnes	Inert Wastes. Purpose: To fill/rehabilitate the quarry void.	Naul, Co. Dublin

5.4 SUMMARY

A summary of the management options for the materials arising from the tunnelling works and the demobilisation of the compound area is presented in Figure 5.4.

The preferred strategy is to reuse as much of the material as possible on-site. This quantity is estimated to be at least 35% of the tunnelling materials. The reuse options on the Corrib Onshore Pipeline project are more limited for the material generated by the demobilisation works as this excavation will follow the construction of the tunnel and ancillary structures.

Excess material from the tunnelling works and material arising from the demobilisation of the tunnelling compound will be made available for reuse off-site. It is anticipated that the available material will be a clean and valuable resource meeting the specifications of a typical Class 1 material. This material can be reused in local projects under development and/or quarries in the local area and beyond. Initial discussions with developers have been met with positive responses. The availability of the material and the scheduling of local construction projects will be kept under review as the project develops.

If reuse of material is not possible surplus material will be sent for recovery, either for land remediation or processing, to a suitable site in the area. Any site identified will need to have the appropriate planning permission or waste authorisation in place to accept the material on-site. County Mayo has 17 active Waste Permitted Facilities and one Municipal Waste Landfill facility which could accept inert waste from the project site for recovery purposes. These facilities are all possible options. A former quarry located at Tallagh, Belmullet, (Tallagh Inert Landfill) currently holds a waste permit and has applied for an EPA Waste Licence to accept inert waste for remediation purposes and will be used to recover material if the reuse options are not available.

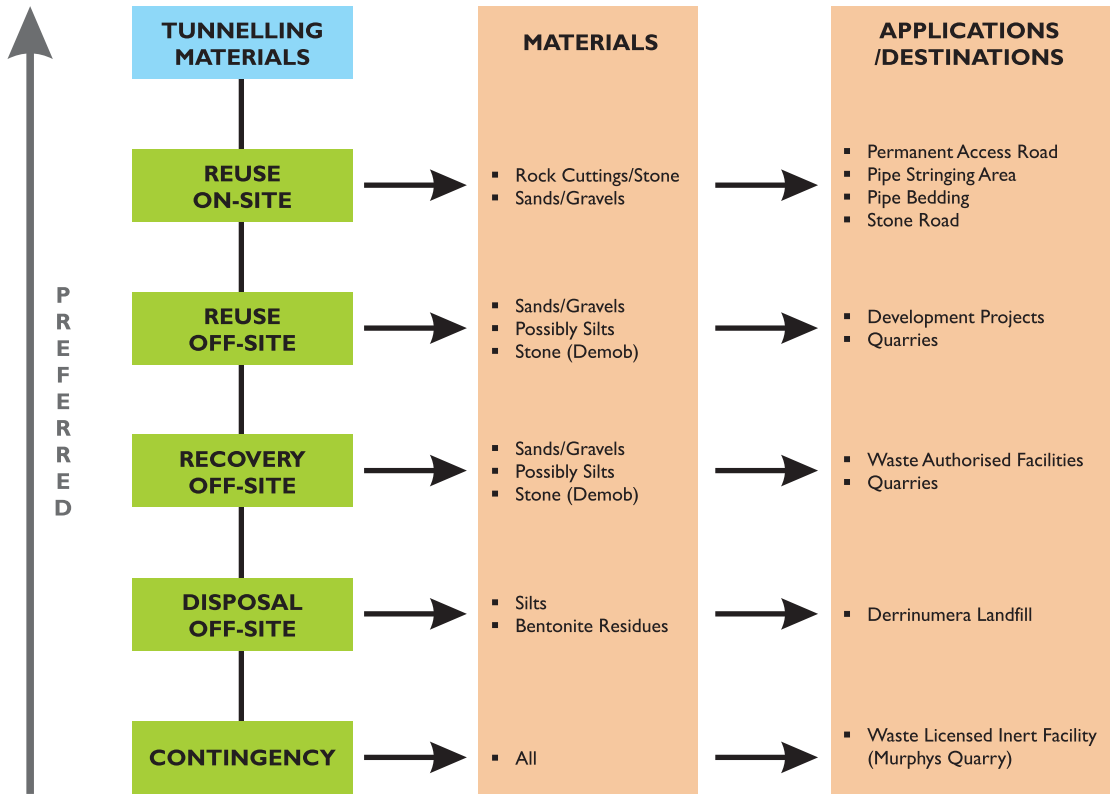


Figure 5.4 Materials Management Plan Summary

As a last resort material will be sent for disposal off-site. At this stage the most likely material which will be managed in this manner will be silts, bentonite residues or other residue material. Reuse and recovery options will be explored for these materials although disposal may be the only option. The intention will be to send these materials for disposal at Derrinumera Landfill, which is owned and operated by Mayo County Council. This facility holds an EPA Waste Licence and can accept inert waste for disposal.

The Contingency Plan for the management of materials has identified two Inert Waste Licensed Facilities operated by Murphy Environmental Ltd., as the safeguard solution for all of the materials arising from the construction of the LVI, tunnel and demobilisation of the tunnelling compound.