

Water Supply Project

Eastern and Midlands Region

Appendix G

Break Pressure Tank Site Selection



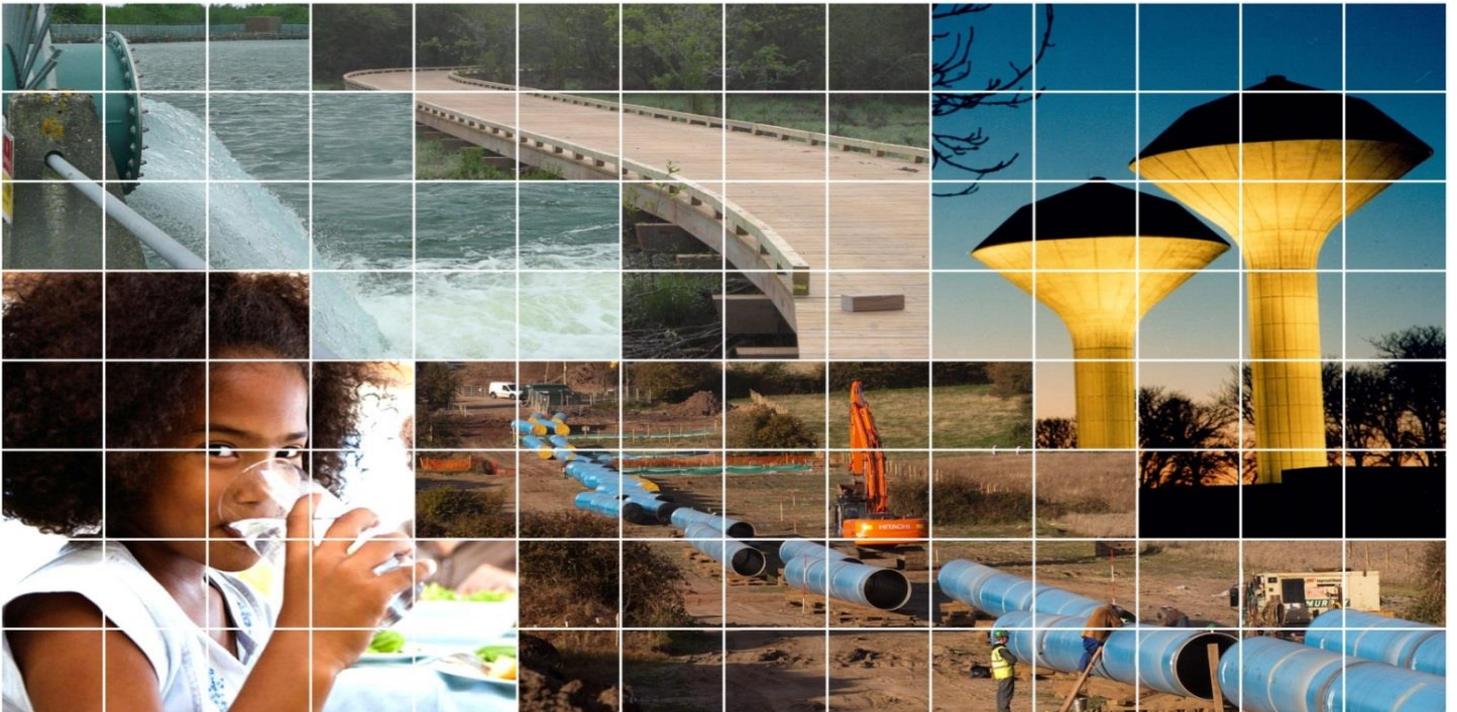
Water Supply Project, Eastern and Midlands Region

Irish Water

Final Options Appraisal Report – Non Linear Infrastructure Siting

Appendix G Break Pressure Tank Site Selection

November 2016



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1. Break Pressure Tank Siting – Process Summary

Option C (Parteen Basin Reservoir Direct) has been confirmed as the Preferred Scheme on environmental grounds, on cost-benefit grounds, and in terms of meeting the fundamental objectives of the Water Services Strategic Plan and of the WSP itself; refer to Section 9 of the Final Options Appraisal Report (FOAR).

The Preferred Scheme will comprise a number of constituent components of infrastructure that collectively make up the water supply system (Figure 1.1). These can broadly be defined as:

Non – Linear Infrastructure, including the Raw Water Abstraction Works, Water Treatment Plant, Break Pressure Tank and Termination Point Reservoir (FOAR Section 11) and

The Transmission Pipeline (Linear Infrastructure) – refer to FOAR Section 12.

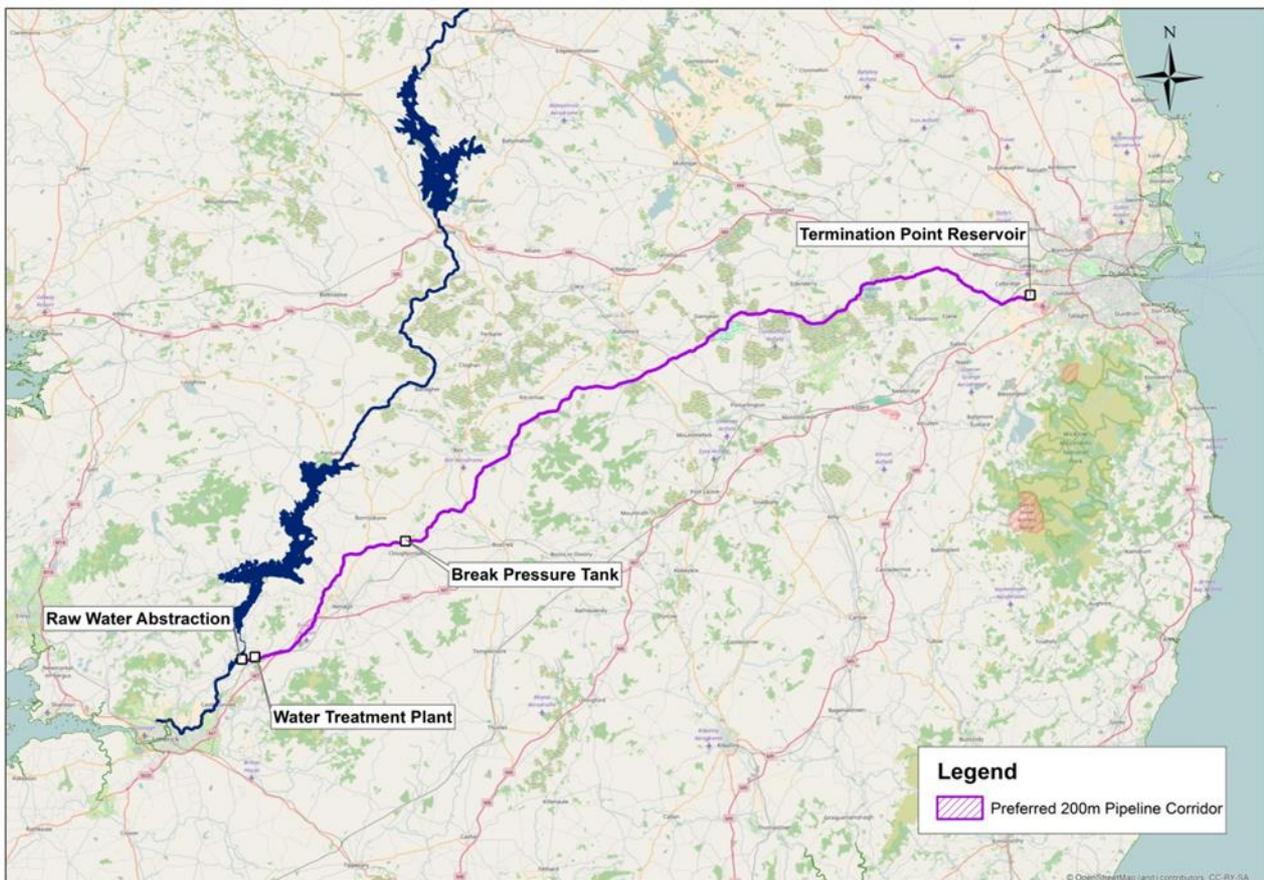


Figure 1.1 The Transmission Pipeline (Linear Infrastructure) and Other (Non – Linear Infrastructure)

FOAR Sections 11 and 12 outline how the different siting options for these components were developed to minimise impact on their environment; Appendices E to H detail the appraisal of these site and route options. They set out multi-criteria analyses (MCA) of the options available, to identify a preferred site for each component from the multiple sites considered (FOAR Section 11), and to identify the preferred pipeline route corridor in a similar way (FOAR Section 12), with recommendations on preferred sites and pipeline routes.

The process of multi-criteria analysis is outlined in the FOAR Section 11.1.

The non – linear infrastructure components comprise the followings assets:

Intake and Raw Water Pumping Station (FOAR Section 11.3 and Appendix E)

Abstraction of raw water will be from the Lower Lake (Parteen Basin) via a submerged pipeline or open channels, which will extend a relatively short distance out into the basin. The abstraction works will incorporate a raw water pumping station which will deliver raw water to the proposed water treatment plant.

Water Treatment Plant (FOAR Section 11.4 and Appendix F)

The water treatment plant will treat the raw water from Parteen Basin to Drinking Water Standards for human consumption in accordance with relevant legislation. The water treatment plant will also incorporate a high lift pumping station to deliver treated water to a Break Pressure Tank.

Note: The transmission pipeline is discussed in FOAR Section 12 and Appendix I.

Break Pressure Tank (FOAR Section 11.5 and this Appendix G)

A Break Pressure Tank (BPT) will be located at the highest elevation of the transmission pipeline and is required to manage the water pressures that will be generated in the operation of the transmission pipeline. The tank is the point at which the transmission line will change from a pumped to a gravity flow. In practice, treated water will be pumped from the water treatment plant to this tank, and the water will flow by gravity from the tank to the termination point reservoir. It will act as a balancing tank for pumped flows, e.g. from the WTP, it will help to limit variability in operating pressures, and it will provide sufficient storage such that there is adequate reserve flow to maintain the on-going pipe full after the pumps have stopped or tripped.

Termination Point Reservoir (FOAR Section 11.6 and Appendix H)

Located at the end of the transmission pipeline, the Termination Point Reservoir (TPR) acts as storage facility for the treated water; providing capacity to serve the varying demand profile of the Dublin Water Supply Area. The TPR will be integrated with the existing water distribution system (FOAR Section 11.7) at Peamount in south Dublin, ensuring onward transmission to end users.

This Appendix G describes the multi criteria analysis (MCA) process used to appraise a **Least Constrained Break Pressure Tank Site (BPT)**.

Multi criteria analysis (MCA) is a mechanism that explicitly considers multiple criteria within a decision-making environment. The fundamental approach is to utilise Specialist expertise to conduct the analysis. Comparing alternatives against multiple objectives and criteria through MCA allows for a collective balancing of different impact types, understanding of the merits of each option, and the establishment of a preference ranking, in a collective way; informing and justifying the decision making process.

For the MCA the following specialisms and disciplines were involved:

- i. Ecology – the consideration of impact on animals, plants and their environment.
- ii. Water – the consideration of impacts on the surface water environment.
- iii. Air and Noise - the consideration of air and noise pollution
- iv. Cultural Heritage - the consideration of existing archaeological and built heritage
- v. Soils, Geology and Hydrogeology – the consideration of impact on soils, geology and hydrogeology.

- vi. Landscape and visual – the consideration of landscape and visual impact.
- vii. Agronomy – the consideration of impact on land based enterprise.
- viii. People – the consideration of impacts on people
- ix. Planning – the consideration of planning and land use policy in relation to proposed works
- x. Engineering - the consideration of technical challenges associated with proposed works.
- xi. Traffic - the consideration of impact on traffic and road network

The following methodology was employed:

1. Each of the specialist disciplines (identified above) assessed the site options against the criteria of Table 1-1 to determine the site option for each ancillary component with the overall least impact from their specialist perspective.
e.g. The ecology specialist assessed the three BPT sites against Biodiversity, Flora and Fauna, Fisheries criteria to determine the site option with least impact from an ecology perspective.
2. The preliminary position of each Specialist, on each ancillary component, presented in matrix format, was collated for each of the ancillary components and presented at a workshop where all the Specialists were represented.
e.g. The ecology specialist assessment for the BPT sites was compiled with the assessments of Air and Noise etc. to present a complete MCA assessment of the sites.
3. In this workshop setting, the matrix of preliminary individual assessments for each individual component was presented to the collective specialist group. The position of each of the specialists was then discussed to reach a consensus of agreement on a preferred site for each main infrastructure component, from the various alternatives.
e.g. The ecology specialist assessment was balanced against that of the other specialists to inform an overall ranking of the BPT sites, and support preference towards one.

A breakdown of the criteria employed by each of the specialisms is presented in Table 1-1.

Table 1-1 Applicable Criteria for each Specialism

Specialism	Applicable Criteria
Ecology	Biodiversity, Flora and Fauna, Fisheries
Air and Noise	Air/Climatic Factors
Cultural Heritage	Cultural Heritage (including Architecture & Archaeology)
Soils, Geology and Hydrogeology	Soils, Geology and Hydrogeology
Landscape and visual	Landscape & Visual
Agronomy	Material Assets (Land use)
Water	Water
Engineering	Material Assets (Energy), Safety, Engineering and Design, Capital and Operational Cost, Sustainability
Planning	Planning Policy
People	Tourism, Population, Human Health

The Specialists, in completing the MCA, also incorporated feedback from the POAR consultation process, primarily to establish if the process had identified any new information which needed to be included in the

assessment process for relevant individual specialists. This was to establish if the consultation submissions contained additional information relevant to the MCA and to determine any impact on the individual assessments, or collective arrangements facilitated by the workshop setting.

1.1.1 Categories of impact

A simple classification was used for the MCA - one of five categories of impact were applied to each of the locations under consideration; colour coded for ready identification. These were:

Very high	Dark blue
High	Blue
Mid-range	Green
Low	Light Green
Very low	Cream

1.2 Preliminary Sites

For the WSP the BPT is ideally located at, or near, the highest elevation along the transmission pipeline as this gives the greatest opportunity for harnessing the natural topography to convey water, by gravity to the termination point (see FOAR Section 11.6).

Initial hydraulic analysis determined that an elevation in excess of 125mOD presents this opportunity. A detailed discussion is included in Section 2.1.2 on the identification of a suitable elevation for siting the BPT.

The Knockanacree area of County Tipperary satisfied the primary selection criteria (minimum elevation >125mOD). When local constraints were considered three sites were identified, as shown in Figure 1.2, and a MCA undertaken for each of them (Section 1.3).



Figure 1.2 Potential Break Pressure Tank Sites

1.3 MCA of Preliminary Sites

The assessment of each potential site, by specialism, is presented in Section 1.3.1.

1.3.1 Matrix of Multi-Criteria Analysis

Ref	Criteria	BPT Site 1	BPT Site 2	BPT Site 3
1.0	Environmental *			
1.1	Biodiversity, Flora & Fauna (Terrestrial)			
1.1.1	Potential to impact on Natura 2000 Sites	N/A - no connectivity	N/A - no connectivity	N/A - no connectivity
1.1.2	Potential to impact on Natural Heritage Areas and proposed Natural Heritage Areas	N/A - no connectivity	N/A - no connectivity	N/A - no connectivity
1.1.3	Potential impact Annex I listed habitats (designated)	N/A - No connectivity to European Sites. A field survey identified agricultural grassland (GA1) / Scrub and mature trees	N/A - No connectivity to European Sites. A field survey identified agricultural grassland (GA1)	N/A - No connectivity to European Sites. A field survey identified agricultural grassland (GA1) in proximity to broadleaved woodland
1.1.4	Potential impact Annex I listed habitats (non-designated)	A field survey identified agricultural grassland (GA1) / Scrub and mature trees	A field survey identified agricultural grassland (GA1)	A field survey identified agricultural grassland (GA1) / Scrub, in proximity to broadleaved woodland
1.1.5	Potential to impact high ecological value habitats (semi natural habitats)	A field survey identified agricultural grassland (GA1) / Scrub and mature trees	A field survey identified agricultural grassland (GA1) / Scrub	A field survey identified agricultural grassland (GA1) / Scrub, in proximity to broadleaved woodland
1.1.6	Potential to impact on protected Flora - Flora Protection Order	A field survey identified agricultural grassland (GA1) / Scrub and mature trees	A field survey identified agricultural grassland (GA1) / Scrub	A field survey identified agricultural grassland (GA1) / Scrub, in proximity to broadleaved woodland
1.1.7	Potential to impact on Annex II species	N/A	N/A	N/A
1.1.8	Potential to Impact on Annex IV species (wherever they occur)	Field surveys concluded there is a low potential for roosting bats (Annex IV species) in the area due lack of suitable habitat.	Field surveys concluded the hedgerows/ treelines were not a continuous linear feature and were of a moderate ecological value for commuting bats (Annex IV species).	Annex IV bat species may use the site for foraging. Field surveys concluded there is a potential for roosting in mature trees to the south of the site and the nearby woodland.

1.1.9	Potential to impact on the breeding / wintering habitat for Annex I listed and other qualifying interest bird species	Breeding birds potentially affected in the local context.	Breeding birds potentially affected in the local context.	Breeding birds potentially affected in the local context.
1.1.10	Potential to impact flora and fauna protected under Wildlife Act e.g. Birds, badger	There is potential for badgers to occur within the scrub habitat; however, there were no signs of activity along the hedgerows while undertaking the field survey.	There is potential for badgers to occur along the hedgerows. No evidence of badger activity was recorded during the field survey.	There is potential for badgers to occur within the scrub habitat and the woodland adjacent to the proposed site. There were no signs of activity along the hedgerows while undertaking the field survey.
1.1.11	Potential to impact on salmonid habitat - protected under SI Regulations	N/A - no connectivity to aquatic habitats, no pathways to effects on aquatic receptors	N/A - no connectivity to aquatic habitats, no pathways to effects on aquatic receptors	N/A - no connectivity to aquatic habitats, no pathways to effects on aquatic receptors
1.1.12	Potential to impact on a freshwater pearl mussel - protected under SI Regulations	N/A - no connectivity to aquatic habitats, no pathways to effects on aquatic receptors	N/A - no connectivity to aquatic habitats, no pathways to effects on aquatic receptors	N/A - no connectivity to aquatic habitats, no pathways to effects on aquatic receptors
1.1.13	Potential to impact upon high quality aquatic habitat for protected aquatic species.	N/A - no connectivity to aquatic habitats, no pathways to effects on aquatic receptors	N/A - no connectivity to aquatic habitats, no pathways to effects on aquatic receptors	N/A - no connectivity to aquatic habitats, no pathways to effects on aquatic receptors
1.1.14	Potential to impact on coastal zone habitats (intertidal)	N/A - no connectivity to coastal / marine habitats. No potential for effects on coastal / marine receptors	N/A - no connectivity to coastal / marine habitats. No potential for effects on coastal / marine receptors	N/A - no connectivity to coastal / marine habitats. No potential for effects on coastal / marine receptors
1.1.15	Potential to impact on marine habitats (e.g. Subtidal)	N/A - no connectivity to coastal / marine habitats. No potential for effects on coastal / marine receptors	N/A - no connectivity to coastal / marine habitats. No potential for effects on coastal / marine receptors	N/A - no connectivity to coastal / marine habitats. No potential for effects on coastal / marine receptors
1.1.16	Potential to impact marine/coastal birds	N/A - no connectivity to coastal / marine habitats. No potential for effects on coastal / marine receptors	N/A - no connectivity to coastal / marine habitats. No potential for effects on coastal / marine receptors	N/A - no connectivity to coastal / marine habitats. No potential for effects on coastal / marine receptors
1.1.17	Potential to impact marine mammals	N/A - no connectivity to coastal / marine habitats. No potential for effects on coastal / marine receptors	N/A - no connectivity to coastal / marine habitats. No potential for effects on coastal / marine receptors	N/A - no connectivity to coastal / marine habitats. No potential for effects on coastal / marine receptors
1.2	Biodiversity, Flora & Fauna (Aquatic)			
1.2.1	Potential to impact on Natura 2000 Sites	N/A - no connectivity to aquatic habitat or designated European Sites	N/A - no connectivity to aquatic habitat or designated European Sites	N/A - no connectivity to aquatic habitat or designated European Sites
1.2.2	Potential to impact on Natural Heritage Areas and proposed Natural Heritage Areas	N/A - no connectivity to aquatic habitat or NHA/pNHA sites	N/A - no connectivity to aquatic habitat or NHA/pNHA sites	N/A - no connectivity to aquatic habitat or NHA/pNHA sites

1.2.3	Potential impact Annex I listed habitats (designated)	N/A - no connectivity to aquatic habitat or designated European Sites	N/A - no connectivity to aquatic habitat or designated European Sites	N/A - no connectivity to aquatic habitat or designated European Sites
1.2.4	Potential impact Annex I listed habitats (non-designated)	N/A - no connectivity to aquatic habitats, no pathways to effects on aquatic receptors	N/A - no connectivity to aquatic habitats, no pathways to effects on aquatic receptors	N/A - no connectivity to aquatic habitats, no pathways to effects on aquatic receptors
1.2.5	Potential to impact high ecological value habitats (semi natural habitats)	N/A - no connectivity to aquatic habitats, no pathways to effects on aquatic receptors	N/A - no connectivity to aquatic habitats, no pathways to effects on aquatic receptors	N/A - no connectivity to aquatic habitats, no pathways to effects on aquatic receptors
1.2.6	Potential to impact on protected Flora - Flora Protection Order	N/A - no connectivity to aquatic habitats, no pathways to effects on aquatic receptors	N/A - no connectivity to aquatic habitats, no pathways to effects on aquatic receptors	N/A - no connectivity to aquatic habitats, no pathways to effects on aquatic receptors
1.2.7	Potential to impact on Annex II species	N/A - no connectivity to aquatic habitats, no pathways to effects on aquatic receptors	N/A - no connectivity to aquatic habitats, no pathways to effects on aquatic receptors	N/A - no connectivity to aquatic habitats, no pathways to effects on aquatic receptors
1.2.8	Potential to Impact on Annex IV species (wherever they occur)	N/A - aquatic Annex IV species do not occur	N/A - aquatic Annex IV species do not occur	N/A - aquatic Annex IV species do not occur
1.2.9	Potential to impact on the breeding / wintering habitat for Annex I listed and other qualifying interest bird species	N/A - aquatic habitats for Annex I or other bird species do not occur	N/A - aquatic habitats for Annex I or other bird species do not occur	N/A - aquatic habitats for Annex I or other bird species do not occur
1.2.10	Potential to impact flora and fauna protected under Wildlife Act e.g. Birds, badger	N/A - aquatic habitats for WA protected species do not occur	N/A - aquatic habitats for WA protected species do not occur	N/A - aquatic habitats for WA protected species do not occur
1.2.11	Potential to impact on salmonid habitat - protected under SI Regulations	N/A - no connectivity to aquatic habitats, no pathways to effects on aquatic receptors	N/A - no connectivity to aquatic habitats, no pathways to effects on aquatic receptors	N/A - no connectivity to aquatic habitats, no pathways to effects on aquatic receptors
1.2.12	Potential to impact on a freshwater pearl mussel - protected under SI Regulations	N/A - no connectivity to aquatic habitats, no pathways to effects on aquatic receptors	N/A - no connectivity to aquatic habitats, no pathways to effects on aquatic receptors	N/A - no connectivity to aquatic habitats, no pathways to effects on aquatic receptors
1.2.13	Potential to impact upon high quality aquatic habitat for protected aquatic species.	N/A - no connectivity to aquatic habitats, no pathways to effects on aquatic receptors	N/A - no connectivity to aquatic habitats, no pathways to effects on aquatic receptors	N/A - no connectivity to aquatic habitats, no pathways to effects on aquatic receptors
1.2.14	Potential to impact on coastal zone habitats (intertidal)	N/A - no connectivity to coastal / marine habitats. No potential for effects on coastal / marine receptors	N/A - no connectivity to coastal / marine habitats. No potential for effects on coastal / marine receptors	N/A - no connectivity to coastal / marine habitats. No potential for effects on coastal / marine receptors
1.2.15	Potential to impact on marine habitats (e.g. Subtidal)	N/A - no connectivity to coastal / marine habitats. No potential for effects on coastal / marine receptors	N/A - no connectivity to coastal / marine habitats. No potential for effects on coastal / marine receptors	N/A - no connectivity to coastal / marine habitats. No potential for effects on coastal / marine receptors

1.2.16	Potential to impact marine/coastal birds	N/A - no connectivity to coastal / marine habitats. No potential for effects on coastal / marine receptors	N/A - no connectivity to coastal / marine habitats. No potential for effects on coastal / marine receptors	N/A - no connectivity to coastal / marine habitats. No potential for effects on coastal / marine receptors
1.2.17	Potential to impact marine mammals	N/A - no connectivity to coastal / marine habitats. No potential for effects on coastal / marine receptors	N/A - no connectivity to coastal / marine habitats. No potential for effects on coastal / marine receptors	N/A - no connectivity to coastal / marine habitats. No potential for effects on coastal / marine receptors
1.3	Fisheries			
1.3.1	Potential to impact on water quality and inshore fishing grounds based on regional fisheries datasets.	N/A - no connectivity to aquatic / fisheries habitats	N/A - no connectivity to aquatic / fisheries habitats	N/A - no connectivity to aquatic / fisheries habitats
1.3.2	Potential to impact on transient protected marine species (cetaceans and salmonids), which may pass through the affected area within the survey area footprint.	N/A - no connectivity to coastal / marine habitats. No potential for effects on coastal / marine receptors	N/A - no connectivity to coastal / marine habitats. No potential for effects on coastal / marine receptors	N/A - no connectivity to coastal / marine habitats. No potential for effects on coastal / marine receptors

1.4	Water			
1.4.1	<p>Potential to support the objectives of the WFD water bodies .</p> <ul style="list-style-type: none"> - Potential to impact on the water quality, hydromorphology of a WFD water bodies of "good" or higher status. - Potential to impact on a WFD Annex IV - Protected Areas: A) Waters used for the abstraction of drinking water - Potential to impact on a WFD Annex IV - Protected Areas: B) Areas designated to protect economically significant aquatic species - Potential to impact on a WFD Annex IV - Protected Areas: C) Recreational Waters - Potential to impact on a WFD Annex IV - Protected Areas: D) Nutrient Sensitive Areas - Potential to impact on a WFD Annex IV - Protected Areas: E) Areas designated for the protection of habitats or species (Ecology Scope) 	<p>There are no identified constraints with BPT Site 1. There are no water bodies within the boundary or within 100m of BPT Site 1. Therefore there are no differentiators in terms of surface water.</p>	<p>There are no identified constraints with BPT Site 2. There are no water bodies within the boundary or within 100m of BPT Site 2. Therefore there are no differentiators in terms of surface water.</p>	<p>There are no identified constraints with BPT3. There are no water bodies within the boundary or within 100m of BPT Site 3 . Therefore there are no differentiators in terms of surface water.</p>

1.4.2	Area prone to flooding (PRFA/SCFRAMs) and predicted flood extents within and adjacent to the site. - Proximity to water bodies in terms of flooding and as an indicator of sensitive surface water receptors.	No known fluvial flooding within 100m of the site	No known fluvial flooding within 100m of the site	No known fluvial flooding within 100m of the site
1.5	Air/Climatic Factors			
	NOISE			
1.5.1	Potential for Construction phase noise impact at Sensitive receptors	Approx. 424m from site boundary to nearest residential receptor.	Approx. 314m from site boundary to nearest residential receptor.	Approx. 400m from site boundary to nearest residential receptor.
1.5.2	Potential for Operational phase noise impact at Sensitive receptors	Approx. 424m from site boundary to nearest residential receptor.	Approx. 314m from site boundary to nearest residential receptor.	Approx. 400m from site boundary to nearest residential receptor.
1.5.3	Existing Ambient Noise Climate in the Area (significant noise sources)	Existing ambient and background noise expected to be very low.	Existing ambient and background noise expected to be very low.	Existing ambient and background noise expected to be very low.
1.5.4	Construction Phase Impact rating	Very Low	Low	Very Low
1.5.5	Operational Phase Impact rating	Very Low	Low	Very Low
	AIR			
1.5.6	Potential for Construction phase Air Quality impact at Sensitive receptors	Approx. 424m from site boundary to nearest residential receptor.	Approx. 314m from site boundary to nearest residential receptor.	Approx. 400m from site boundary to nearest residential receptor.
1.5.7	Potential for Operational phase Air Quality impact at Sensitive receptors	Approx. 424m from site boundary to nearest residential receptor.	Approx. 314m from site boundary to nearest residential receptor.	Approx. 400m from site boundary to nearest residential receptor.

1.5.8	Proximity to EPA Waste Licensed facility	No EPA Waste Licenced Facilities in the Area	No EPA Waste Licenced Facilities in the Area	No EPA Waste Licenced Facilities in the Area
1.5.9	Proximity to EPA IPPC Licensed Intensive Agriculture facility	No EPA IPPC Licensed Intensive Agriculture Facilities in the Area	No EPA IPPC Licensed Intensive Agriculture Facilities in the Area	No EPA IPPC Licensed Intensive Agriculture Facilities in the Area
1.5.10	EPA Air Quality Zone Classification	Zone D	Zone D	Zone D
1.5.11	Wind Rose Assessment	South Westerly Prevailing Wind. Average Wind Speed of 4.7 m/s over period 1981- 2010 (Shannon Airport)	South Westerly Prevailing Wind. Average Wind Speed of 4.7 m/s over period 1981- 2010 (Shannon Airport)	South Westerly Prevailing Wind. Average Wind Speed of 4.7 m/s over period 1981- 2010 (Shannon Airport)
1.5.12	Construction Phase Impact rating	Very Low	Low	Very Low
1.5.13	Operational Phase Impact rating	Very Low	Very Low	Very Low
1.6	Material Assets (Energy)			
1.6.1	Potential for energy recovery	N/A	N/A	N/A
1.7	Cultural Heritage (including Architecture & Archaeology)			
1.7.1	Potential to impact (direct/indirect) on National Monuments (designated sites)	Very low none are present	Very low none are present	Very low none are present
1.7.2	Potential to impact (direct/indirect) on RMPs (designated sites)	Mid-range due to the proximity of surrounding monuments	Mid-range due to the proximity of surrounding monuments	High due to the close proximity of surrounding monuments - this site have the potential to impact on inter visibility between sites

1.7.3	Potential to impact (direct/indirect) on RPS (designated sites)	Very low none are present	Very low none are present	Very low none are present
1.7.4	Potential to impact (direct/indirect) on NIAH	Very low none are present	Very low none are present	Very low none are present
1.7.5	Potential to impact (direct/indirect) on historic designed landscapes	Very low none are present	Very low none are present	Very low none are present
1.7.6	Potential to impact on ACA	Very low none are present	Very low none are present	Very low none are present
1.7.7	Recorded shipwreck sites	Very low none are present	Very low none are present	Very low none are present
1.8	Landscape & Visual			
1.8.1	Potential to impact on designated areas of 'Highly Sensitive Landscape'	Very Low - Situated in LCA 4 Borrisokane Lowlands "this is not a sensitive landscape albeit that its capacity to accommodate future development is a function of good design as this is a flat and really quite visually exposed landscape." (North Tipperary Landscape Character Assessment, 2009)	Very Low - Situated in LCA 4 Borrisokane Lowlands "this is not a sensitive landscape albeit that its capacity to accommodate future development is a function of good design as this is a flat and really quite visually exposed landscape." (North Tipperary Landscape Character Assessment, 2009)	Very Low - Situated in LCA 4 Borrisokane Lowlands "this is not a sensitive landscape albeit that its capacity to accommodate future development is a function of good design as this is a flat and really quite visually exposed landscape." (North Tipperary Landscape Character Assessment, 2009)

1.8.2	Potential to impact on rare or distinctive landscape elements (rock outcrops, water bodies etc.)	Very Low - Scohaboy Bog (NHA) situated to the north of proposed BPT, however, due to separation distance this feature will not be affected.	Very Low - Scohaboy Bog (NHA) situated to the north of proposed BPT, however, due to separation distance this feature will not be affected.	Very Low - Scohaboy Bog (NHA) situated to the north of proposed BPT, however, due to separation distance this feature will not be affected.
1.8.3	Potential to disrupt landscape structure (treelines / hedgerows / field pattern etc.)	Low - Interrupts several tree lined hedgerows.	Very Low - Situated between mature tree lined hedgerows. BPT is positioned on areas of low patchy scrubby hedgerows.	Very Low - Interrupts small area of hedgerow to north.
1.8.4	Potential to impact on woodlands and significant tree groups	Low - Positioned on small area of scrubby woodland vegetation.	No Impact	Very Low - Interrupts small area of scrubby vegetation to north. Southern tip of BPT perforates small area of mature deciduous woodland.
1.8.5	Potential to impact on historic designed landscapes	Low - Close to Knockanacree house and woodland (public recreational area).	Low - Close to Knockanacree house and woodland (public recreational area).	Mid-range - Adjacent to Knockanacree house and woodland (public recreational area).
1.8.6	Potential to alter the prevailing landscape character	Low - Working landscape already containing communications mast. Close to hilltop woodland	Low - Working landscape already containing communications mast. Close to hilltop woodland	Mid-range - Within working landscape but very close to historic hilltop woodland
1.8.7	Potential to impact on designated scenic routes / views	Mid-range - scenic viewpoint identified by Coillte Outdoors, oriented towards BPT site, from northern boundary of Knockanacree woodlands.	Mid-range - scenic viewpoint identified by Coillte Outdoors, oriented towards BPT site, from northern boundary of Knockanacree woodlands.	High - scenic viewpoint identified by Coillte Outdoors, oriented towards BPT site, from northern boundary of Knockanacree woodlands.
1.8.8	Potential to impact on views from heritage/tourist/amenity features of national or regional importance	Low - Views from Knockanacree woodland walks (local amenity value)	Low - Views from Knockanacree woodland walks (local amenity value)	Low - Views from Knockanacree woodland walks (local amenity value)

1.8.9	Potential to impact on views from settlements	Very Low - Views from Cloughjordan screened by Knockanacree woods.	Very Low - Views from Cloughjordan screened by Knockanacree woods.	Very Low - Views from Cloughjordan screened by Knockanacree woods.
1.8.10	Potential to impact on views from dwellings / local roads	Low - Farmsteads and rural dwellings located along the local roads to the east and northwest. BPT site locate on brow of hill.	Low - Farmsteads and rural dwellings located along the local roads to the east and northwest. BPT site locate on brow of hill.	Very Low - Farmsteads and rural dwellings located along the local roads to the east and northwest. BPT site substantially screened beyond brow of hill and by vegetation.
1.8.11	Potential to impact on views from motorways	Very Low - M7 motorway situated 9km south of proposed BPT site at its nearest point.	Very Low - M7 motorway situated 9km south of proposed BPT site at its nearest point.	Very Low - M7 motorway situated 9km south of proposed BPT site at its nearest point.
1.8.12	Potential to impact on views from other major roads (national or regional roads)	Very Low - Proposed BPT site is situated 1km northwest of R941. R490 situated 1.5km southwest	Very Low - Proposed BPT site is situated 1km northwest of R941. R490 situated 1.5km southwest	Very Low - Proposed BPT site is situated 1km northwest of R941. R490 situated 1.5km southwest
1.8.13	Potential to impact on views from rail lines	Very Low - Railway line situated 3km south of proposed BPT site.	Very Low - Railway line situated 3km south of proposed BPT site.	Very Low - Railway line situated 3km south of proposed BPT site.
1.8.14	Potential to impact on arrival views from Airports including aerial approach and vehicular egress	Very Low - No airports in the vicinity.	Very Low - No airports in the vicinity.	Very Low - No airports in the vicinity.
1.8.15	Potential to impact on views from national 'way marked' walking routes	Very Low - No 'way marked' walking routes in the vicinity (Local walks at Knockanacree only).	Very Low - No 'way marked' walking routes in the vicinity (Local walks at Knockanacree only).	Very Low - No 'way marked' walking routes in the vicinity (Local walks at Knockanacree only).
1.8.16	Potential to impact on local walks	Low - Woodland walks located in Knockanacree woods close to south of proposed BPT site. Nenagh Cycle Hub Loop 3 passes along the local road a short distance northwest of site.	Low - Woodland walks located in Knockanacree woods close to south of proposed BPT site. Nenagh Cycle Hub Loop 3 passes along the local road a short distance northwest of site.	Mid-range - Woodland walks located in Knockanacree woods immediately south of proposed BPT site. Nenagh Cycle Hub Loop 3 passes along the local road a short distance northwest of site (likely screened)

1.8.17	Potential to impact on views from angling or swimming locations (rivers, lakes, sea)	Very Low - Ballyfinboy River, a recognised fishery, is situated 1.5km southwest of the proposed BPT site at its nearest point.	Very Low - Ballyfinboy River, a recognised fishery, is situated 1.5km southwest of the proposed BPT site at its nearest point.	Very Low - Ballyfinboy River, a recognised fishery, is situated 1.5km southwest of the proposed BPT site at its nearest point.
1.8.18	Potential that landscape screening measures will be ineffective or incongruous	Low - Views from identified viewpoint within Knockanacree woods may be partially obstructed by mitigation screening, however intervening hedgerows currently exists to fore of BPT site.	Low - Views from identified viewpoint within Knockanacree woods may be partially obstructed by mitigation screening, however intervening hedgerows currently exists to fore of BPT site.	Mid-Range - Views from identified viewpoint within Knockanacree woods may be partially obstructed by mitigation screening.
1.9	Material Assets (Landuse)			
1.9.1	Approximate % Reduction in overall farm holding	reduction on holding unknown	reduction on holding unknown	reduction on holding unknown
1.9.2	Farming Enterprise	Mixed livestock	Mixed livestock	Mixed livestock
1.9.3	Number of landowners impacted within site boundary	The study area contains 2 landowners	The study area contains 1 landowner	The study area contains 1 landowner
1.9.4	Land Quality	medium/good	good	medium/good
1.9.5	Severance based on site location within overall land holdings	Individual farm impact to be evaluated when exact location decided	Individual farm impact to be evaluated when exact location decided	Individual farm impact to be evaluated when exact location decided
1.9.6	Potential Impacts on landholdings	Loss of land, possible severance and injurious affection	Loss of land, possible severance and injurious affection	Loss of land, possible severance and injurious affection
1.9.7	Crop rotation practiced	Predominately permanent pasture	Predominately permanent pasture	Predominately permanent pasture

1.9.8	Overall Impact	Low impact-slight at national level	Medium impact-slight at national level	Low impact-slight at national level
1.10	Tourism			
1.10.1	Potential to impact on known tourism amenities/facilities or Tourism Hotspots located within 1km from site boundary.	Light Green - Access road to the west forms part of a route used by the Nenagh Cycling Club. The road to the east is a single lane, rural route with local access only. No other known tourism amenities/facilities or tourism hotspots are located within 1km of the site boundary.	Light Green - Access road to the west forms part of a route used by the Nenagh Cycling Club. The road to the east is a single lane, rural route with local access only. No other known tourism amenities/facilities or tourism hotspots are located within 1km of the site boundary.	Light Green - Access road to the west forms part of a route used by the Nenagh Cycling Club. The road to the east is a single lane, rural route with local access only. No other known tourism amenities/facilities or tourism hotspots are located within 1km of the site boundary.
1.11	Population			
	PEOPLES & COMMUNITIES			
1.11.1	Number of residential & commercial buildings 0-500m from site boundary	Green - BPT 1 is located approximately 440m away from residential receptors to the east of the site. The access roads to the west and east are rural, single lane carriageways and would most likely require some works to accommodate construction traffic.	Green - BPT 2 is located approximately 280m away from residential receptors to the east of the site. The access roads to the west and east are rural, single lane carriageways and would most likely require some works to accommodate construction traffic.	Green - BPT 3 is located approximately 400m away from residential receptors to the east of the site. The access roads to the west and east are rural, single lane carriageways and would most likely require some works to accommodate construction traffic.
1.11.3	Potential to impact on known community amenities and facilities within 1km from site boundary.	Cream - No known community amenities or facilities within 1km of the site boundary.	Cream - No known community amenities or facilities within 1km of the site boundary.	Cream - No known community amenities or facilities within 1km of the site boundary.

1.11.4	Potential to impact on areas of Significant Population Densities	Light Green - No areas of Significant Population Densities within 1km of this site location. Cloughjordan is located 1.4km to the south and is designated as an 'Eco-Village'.	Cream - No areas of Significant Population Densities within 1km of this site location. Cloughjordan is located 1.3km to the south and is designated as an 'Eco-Village'.	Light Green - No areas of Significant Population Densities within 1km of this site location. Cloughjordan is located 1.4km to the south and is designated as an 'Eco-Village'.
1.12	Human Health			
1.12.1	Human Health	Regardless of plant siting, all plant would be operated within appropriate safeguards i.e. permissions and licences with respect to human health to ensure that there are no significant health risks to the population.	Regardless of plant siting, all plant would be operated within appropriate safeguards i.e. permissions and licences with respect to human health to ensure that there are no significant health risks to the population.	Regardless of plant siting, all plant would be operated within appropriate safeguards i.e. permissions and licences with respect to human health to ensure that there are no significant health risks to the population.
1.13	Soils, Geology and Hydrogeology			
1.13.1	Aquifer Classification - importance of the groundwater resource to a given area	Locally Important (LI)	LI	LI
1.13.2	Vulnerability Classification - potential for groundwater contamination	Extreme Vulnerability	Extreme Vulnerability	Extreme Vulnerability
1.13.3	GSI Groundwater Protection Response matrix	N/A	N/A	N/A
1.13.4	Groundwater Supplies - identification of water supply springs and bored wells based on GSI, EPA and FCC	None identified	None identified	None identified

	records			
1.13.5	Groundwater Source Protection Area's and Zones of Contribution as per available GSI & EPA data	None identified	None identified	None identified
1.13.6	Potential to impact on Geological Heritage Sites / County Geological Sites	None identified	None identified	None identified
1.13.7	Potential to interact with contaminated land	None identified	None identified	None identified
1.13.8	Potential to sterilise mineral resource	N/A	N/A	N/A
1.13.9	Potential to encounter shallow bedrock during construction (interactions with other disciplines during construction - noise, dust etc)	DTB <3m	DTB <3m	DTB <3m
1.13.10	Potential impact on karst features	None identified	None identified	None identified
1.13.11	Potential to encounter soft ground	None identified	None identified	None identified
1.13.12	Soils Types	BminSW	BminSW	BminSW
1.13.13	Sub Soil Types	Rck/ TLs	Rck/ TLs	Rck/ TLs
1.13.14	Depth to rock	Estimated <3m	Estimated <3m	Estimated <3m
2.0	Technical **			
2.1	Safety			
	TRAFFIC			
2.1.1	Length of access road required	580m	320m	450m

2.1.2	Number of crossings required for access road	n/a	n/a	n/a
2.1.3	Potential Impact on landowners	3	2	3
2.1.4	Works required to provide safe access entrance	Local Road will require potential widening of road, full depth pavement construction, and land acquisition. Potential for construction vehicles to access via pipeline route to be investigated.	Local Road will require potential widening of road, full depth pavement construction, and land acquisition. Potential for construction vehicles to access via pipeline route to be investigated.	Local Road will require potential widening of road, full depth pavement construction, and land acquisition. Potential for construction vehicles to access via pipeline route to be investigated.
2.1.5	Potential impact on surrounding local road network	No details of Local Road Traffic Volumes or potential construction and operational traffic volumes.	No details of Local Road Traffic Volumes or potential construction and operational traffic volumes.	No details of Local Road Traffic Volumes or potential construction and operational traffic volumes.
2.1.6	Frequency of accidents near entrance	1 Head on conflict 2010 - R490 Regional Road to North West of Site 1 Head on conflict 2007 - Local Road to south of site between R490 and R491 1 Angle Right Turn collision 2006 - Crossroad Junction R491 South East of Site	1 Head on conflict 2010 - R490 Regional Road to North West of Site 1 Head on conflict 2007 - Local Road to south of site between R490 and R491 1 Angle Right Turn collision 2006 - Crossroad Junction R491 South East of Site	1 Head on conflict 2010 - R490 Regional Road to North West of Site 1 Head on conflict 2007 - Local Road to south of site between R490 and R491 1 Angle Right Turn collision 2006 - Crossroad Junction R491 South East of Site
2.1.7	Frequency of accidents on surrounding network (indication of general road safety issues)	1 Head on conflict 2010 - R490 Regional Road to North West of Site 1 Head on conflict 2007 - Local Road to south of site between R490 and R491 1 Angle Right Turn collision 2006 - Crossroad Junction R491 South East of Site	1 Head on conflict 2010 - R490 Regional Road to North West of Site 1 Head on conflict 2007 - Local Road to south of site between R490 and R491 1 Angle Right Turn collision 2006 - Crossroad Junction R491 South East of Site	1 Head on conflict 2010 - R490 Regional Road to North West of Site 1 Head on conflict 2007 - Local Road to south of site between R490 and R491 1 Angle Right Turn collision 2006 - Crossroad Junction R491 South East of Site
2.1.8	Road link impacted upon by all construction traffic (excluding major routes)	Local Road to Site from R491 - Cul De Sac Road requiring potential road widening and surfacing	Local Road to Site from R491 - Cul De Sac Road requiring potential road widening and surfacing	Local Road to Site from R491 - Cul De Sac Road requiring potential road widening and surfacing
2.1.9	Construction Risk	Local Road to Site from R491 - Cul De Sac Road requiring potential road widening and surfacing	Local Road to Site from R491 - Cul De Sac Road requiring potential road widening and surfacing	Local Road to Site from R491 - Cul De Sac Road requiring potential road widening and surfacing

2.2	Planning Policy			
2.2.1	Existing Land Use on Site	Agricultural and forestry	Agricultural	Agricultural and forestry
2.2.2	Site Zoning	No Zoning	No Zoning	No Zoning
2.2.3	Airport Public Safety and Noise Zones on site	n/a	n/a	n/a
2.2.4	Local Objectives on Site	n/a	n/a	n/a
2.2.5	Other Local Objectives on Site	n/a	n/a	n/a
2.2.6	Land Uses present within 1km of Land Parcel Boundary	Rural Residential, agricultural, Scohaboy Bog NHA, forestry, telecommunications mast	Rural Residential, agricultural, Scohaboy Bog NHA, forestry, telecommunications mast	Rural Residential, agricultural, Scohaboy Bog NHA, forestry, telecommunications mast
2.2.7	Zoning present within 1km of Land Parcel Boundary	Agricultural	Agricultural	Agricultural
2.2.8	Airport Public Safety and Noise Zones within 1km of land parcel boundary	n/a	n/a	n/a
2.2.9	Local Objectives within 1km of Land Parcel Boundary	Scohaboy Bog NHA	Scohaboy Bog NHA	Scohaboy Bog NHA
2.2.10	Other Local Objectives present within 1km of Land Parcel Boundary	n/a	n/a	n/a
2.3	Engineering and Design			

2.3.1	Hydraulic requirements (minimum 125m elevation)	Approximately 135mOD	Approximately 130mOD	Approximately 140mOD
2.3.2	Constructability	Integrating with the landscape is complicated by the extent of construction footprint on a steep incline.	Integrating with the landscape is complicated by the extent of construction footprint on a relatively steep incline.	Integrating with the landscape - construction footprint on a gentle incline.
2.3.3	Land Access	New access road will be required to access the site; the existing track to the communications mast is unsuitable. This access will be required initially for construction, but also for permanent access. Access between the site and the R490 is facilitated by an unknown local road which may need to be upgraded to manage construction traffic. The length of access road required is approximately 700m.	New access road will be required to access the site. This access will be required initially for construction, but also for permanent access. Access between the site and the R491 is facilitated by an unknown local road which may need to be upgraded to manage construction traffic. The length of access road required is approximately 300m.	New access road will be required to access the site. This access will be required initially for construction, but also for permanent access. Access between the site and the R491 is facilitated by an unknown local road which may need to be upgraded to manage construction traffic. The length of access road required is approximately 375m.
2.4	Capital and Operational Costs			
2.4.1	CAPEX	< €2M	< €2M	< €2M
2.4.2	OPEX	< €50k per annum	< €50k per annum	< €50k per annum

1.4 Preferred Site

A comparison of the three BPT site locations is presented in Table 1-2. For ease of reference the colour legend is repeated as follows:-

Impact Category	Colour Code
Very high	Dark blue
High	Blue
Mid-range	Green
Low	Light Green
Very low	Cream

Table 1-2 – MCA – Comparison between BPT Sites

Constraint	BPT Site 1	BPT Site 2	BPT Site 3
Ecology	Light Green	Cream	Light Green
Surface Water	Cream	Cream	Cream
Air Quality	Light Green	Green	Light Green
Noise	Light Green	Green	Light Green
Cultural Heritage	Blue	Blue	Blue
Landscape and Visual	Light Green	Light Green	Green
Agronomy	Light Green	Green	Light Green
People	Light Green	Green	Light Green
Soils, Geology & Hydrogeology	Light Green	Light Green	Light Green
Planning Policy	Blue	Blue	Blue
Traffic	Light Green	Light Green	Light Green
Engineering & Design	Dark blue	Blue	Blue
Overall Ranking	3	2	1

With reference to the appraisal criteria presented in Table 1-2, where the sites are ranked in order of preference and least constraint, BPT Site 3 represents the preferred location for the siting of the Break Pressure Tank for the following reasons:

- It is on a side of the ridge that is less inclined than the other two sites which will facilitate integration of the works into the existing landscape. It would also be screened by the forestry.
- The works associated with the communications mast appear to have been completed whilst maintaining an access through this area. This may suggest previous investigations concluded that was an area of least constraint.
- It maintains its elevation relative to the termination point thereby giving greater flexibility for routing a pipeline whilst still retaining a delivery under gravity.
- Of the three sites it appears, from the various Specialist assessments, to have the least impact collectively.

BPT Site 1 was considered to have the most impact as it would have to be located on the more steeply inclined side of the ridge; and would be difficult to integrate sensitively into the landscape. The final elevation may have to be dropped to affect this, which impacts on the system operation to deliver a gravity supply.

Similarly to the other sites it is the effectiveness of siting this component of infrastructure within the landscape. Whilst the site topography would be more accommodating than BPT Site 1 it is not as favourable as BPT Site 3; the completed works would also have to be at a lower elevation.

Note: the ridge is prominent in the landscape and has a number of recorded archaeological sites. It is important that before a final site for the BPT is selected, in situ investigation be carried out to confirm, or otherwise, the extent of archaeological remains.

2. Screening to Identify Preliminary Sites

2.1.1 Introduction

The Break Pressure Tank (BPT) is a critical component of the water supply infrastructure, strategically located along the transmission pipeline, for the management of the water pressures that will be generated during the operation of the system.

For the WSP, ideally it is located at, or near, the highest elevation along the transmission pipeline as this gives the greatest opportunity for harnessing the natural topography to convey water, by gravity to the termination point.

Initial hydraulic analysis determined that an elevation in excess of 125mOD presents this opportunity.

2.1.2 Identification of suitable elevation for BPT siting

Areas in excess of 125mOD on the transmission pipeline were mapped. In conjunction with other constraints, e.g. environmental; three potential locations, or areas, were identified for the potential siting of a BPT; as shown in Figure 2.1.

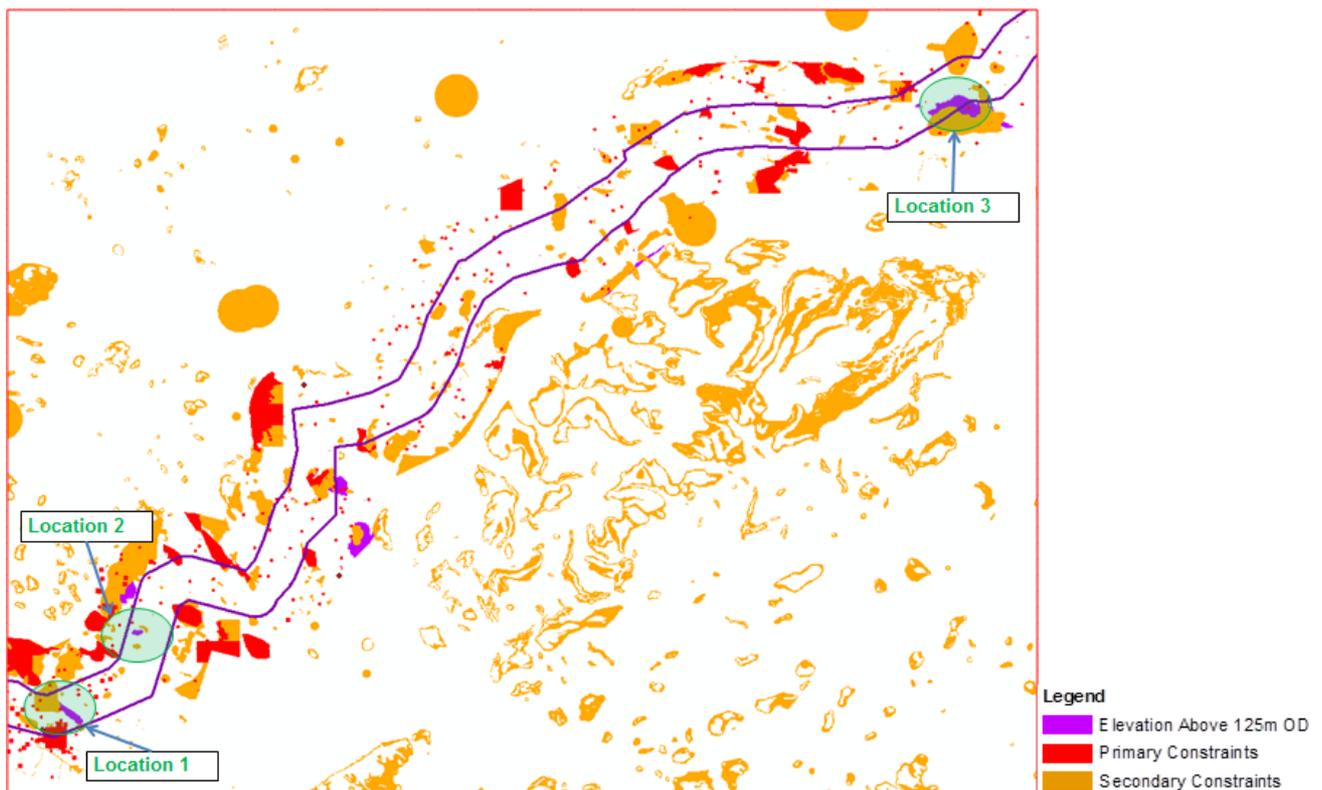


Figure 2.1 – Potential BPT Locations above 125mOD

Location 1 (near Cloughjordan) was deemed preferable to Locations 2 and 3; as it is at a higher elevation than the alternatives, where the additional potential energy head is technically important in the operation of the gravitational section. In addition, it offers the greatest flexibility for siting the BPT as this elevated area is relatively extensive, over 2,200m in width.

Location 2, at a lower elevation (134mOD), was characterised by a much smaller land extent limiting the available construction 'footprint'.

Location 3 is much farther east than either of the other two locations, approximately 65km beyond Location 1; and at an elevation of 145mOD. This would introduce greater operational complexity¹ into the water supply system without any obvious benefit; compounded by the fact that a pipeline would have to be routed through Location 1 in any event.

At Location 1 the highest elevation points (approximately 147mOD) are situated to the north on a prominent ridge; but do also contain a number of local environmental constraints, as shown in Figure 2.2. Siting a BPT in this northern area was investigated further as the increased elevation maximises the opportunity for routing a pipeline, by gravity, to the termination point whilst avoiding the various, and extensive, constraints en route.

¹ The transmission pipe west of the BPT will be a pumped system whilst it will be operated by gravity to the east of it. Pumped systems are much more complex to operate than gravity systems.

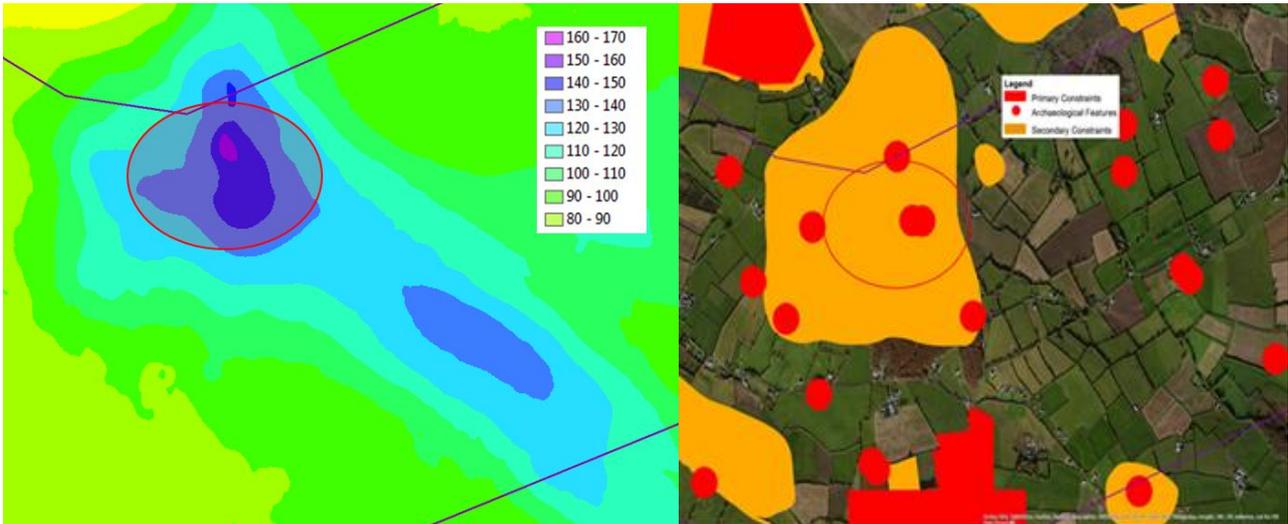


Figure 2.2 – Elevation and Local Constraints at Location 1 (Knockanacree)

An indicative ground elevation of the transmission pipeline, via Location 1, between the abstraction location and the termination point is shown in Figure 2.3. The highest elevation point is situated in the Knockanacree area, near Cloughjordan.

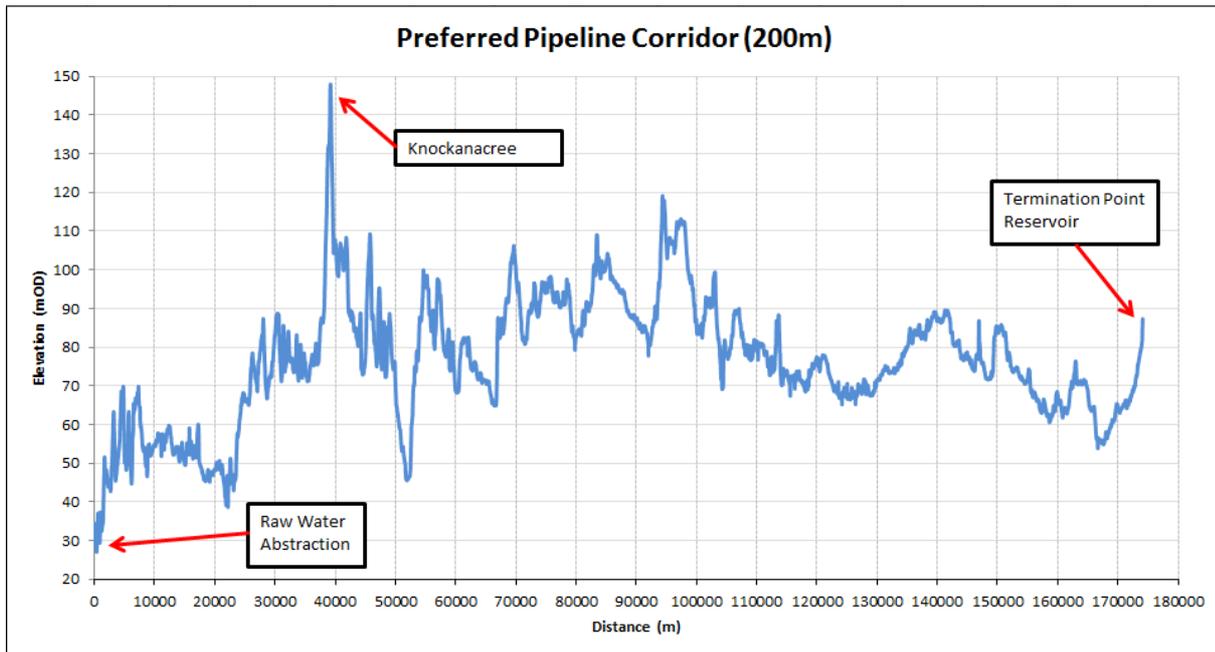


Figure 2.3 – Indicative Ground Elevation (Location 1) of Transmission Pipeline

2.1.3 Appraisal of BPT Sites

Local constraints were considered in the Knockanacree area, subject to satisfying the primary selection criteria (minimum elevation >125mOD). Three sites were identified, as shown in Figure 1.2, and a MCA undertaken for each of them.

3. BPT Site 1

BPT Site 1 is located in the townland of Knockanacree, north of the Knockanacree Woods and trails. The Eco Village of Cloughjordan is located approximately 1.7km south east. There are local un-named roads running south west to north east, west of the site, and north to south on the eastern side. There are a number of rural/agricultural residential developments to the west and east of the site. See Figure 3.1.



Figure 3.1 – BPT Site 1

(i) Ecology

The BPT Site 1 is located predominantly within improved agricultural grassland which was evaluated as being of local importance (lower value) with limited potential for protected flora or fauna to occur. The site includes an area of mature trees and scrub (WS1), with some gorse, hawthorn, elder, bramble and ash in the south eastern portion. There are no Annex I habitats or potential Annex I habitats located within or adjacent to the site. There are also no surface water features on or adjacent to the site.

Due to the managed agricultural landscape and the limited ecological potential of the scrub habitat present within the site, the potential occurrence of protected flora was evaluated as 'low'. No records of Flora Protection Order species were identified. A field survey did not note the presence of Annex II species. Annex IV bat species are likely to use this general location and forage along the field boundaries. The trees within the scrub habitat were considered to be unsuitable for roosting bats.

The site is considered to have low breeding and wintering bird value. Passerine bird species are likely to be present. A field survey determined there was no protected flora or fauna under the Wildlife Act 1979

(Amendment 2000) present at this site at the time of the survey; however, there is potential for badgers to occur within the scrub habitat to the southeast of the site.

There is no connectivity to salmonid or freshwater pearl mussel watercourses or no potential effects on coastal or marine receptors at the site. The potential for significant impacts affecting ecological receptors is evaluated as 'very low'.

(ii) Aquatic Ecology

There are no surface water features on or adjacent to the site. There are no designated European Sites, Annex I habitats or potential Annex I habitats located within or adjacent to the site boundary. No protected flora species listed on the Flora Protection Order were recorded from either desktop study or field survey; the potential for these species to occur is evaluated as 'low'.

In the absence of any connectivity to aquatic or water-dependant habitats, the desk study and field survey determined that no aquatic Annex II species are likely to occur at this site. No aquatic Annex IV species were recorded at this site and no aquatic habitat exists to support breeding or wintering Annex I water birds.

In the absence of any connectivity to aquatic or water-dependant habitats, the evaluation concluded that there is no potential for aquatic species protected under the Wildlife Act 1979 (Amendment 2000) to occur within or adjacent to this site. There is no connectivity to salmonid or freshwater pearl mussel watercourses and no potential effects on coastal or marine receptors at the site. The potential for significant impacts affecting aquatic ecological receptors is evaluated as 'very low'..

(iii) Surface Water

There are no identified constraints with regard to the proposed site as there are no water bodies within the site boundary or within 100m of the proposed site location, and the area is not prone to fluvial flooding.

(iv) Air Quality

The focus of the assessment consisted of determining the potential for dust emissions to occur during the construction phase of the proposed development. Receptors which are closer to the site have a higher risk of experiencing dust impacts during the construction phase, as there is unlikely to be any significant impacts to occur during the operational phase. The proposed site is approximately 424m from the nearest sensitive receptor, with the longer the distance being the most preferable from an air quality point of view.

(v) Noise

The focus of the assessment consisted of determining the potential for noise/vibration emissions to occur during the construction and operational phase of the proposed development. Receptors which are closer to the site have a higher risk of experiencing noise/vibration impacts during the construction/operational development phases. The site lies approximately 424m from the site boundary to the nearest residential receptor, with the site with the longer the distance being the most preferable from noise/vibration point of view.

(vi) Cultural Heritage

There are no recorded built heritage sites located within the vicinity of this site. As such the impact potential has been defined as very low. There are five recorded archaeological sites located within 500m of the site. The closest is TN011-016, which is an earthwork situated approximately 65m to the northeast. Two enclosures are located approximately 135m and 170m southeast (TN011-022 and 23). A larger ring fort is located approximately 320m to the west-southwest and an earthwork is located approximately 415m to the north. Given the elevation of the site and the presence of a number of sites that are likely to be early medieval in date, there is a mid-range potential to impact on associated archaeological remains.

(vii) Landscape and Visual

The site is situated on an elevated ridge of high ground where several field boundaries converge. This site contains a small area of scrubby woodland vegetation as well as pastoral farmland and a communications mast rises just to the southeast. Two local roads pass to the east and west of the site and they are approximately 300m and 400 from the site respectively, at their nearest points. A small number of rural dwellings line these roads. Knocknacree Wood, which is a Coillte owned forest and recreation area, lies approximately 200m to the south of this site. The walking route maps for Knocknacree Wood identify a panoramic viewpoint along the northern edge of the forest. Southwards, beyond Knocknacree Wood is a junction between the R491 and the R490 regional roads which run in easterly and westerly directions respectively. The settlement of Cloughjordan is located approximately 2km to the south of the site.

(viii) Agronomy

a) Number of Landowners impacted within the site boundary

According to folio data supplied by the land registry two land owners are impacted within the site boundary.

b) Land Quality

According to the EPAs Soil Classification of Ireland, the soils in the region consist in the main of a fine loamy drift with limestone. The soils are particularly suited to grassland. The land quality would be considered good quality land. However the area of land within the site boundary appears to be poorer quality land than the surrounding land. Part of the land is planted with trees.

c) Crop Rotation Practised

The land is in permanent pasture and crop rotation is not practised. The land is used for grazing of livestock.

(ix) People

The site straddles the boundaries of two land folios however it would potentially disrupt the land folio TY20048N to a greater degree than the alternative land folio TY36604N given the indicated site boundary as seen in Figure 3.1. This site is also immediately adjacent to (<50m) an existing telecommunications mast (ownership unknown) to the south which possesses a boundary fence and separate access track. The nearest residential receptor is located approximately 420m to the south-east of the site. Access roads either side of the prospective site could potentially require upgrade works to accommodate construction traffic while the local road to the west of the site is designated as a cycle route for the Nenagh Cycling Club.

(x) Soils, Geology and Hydrogeology

The site has been mapped² as rock close to surface and shallow, well drained, mineral soil, derived mainly from calcareous parent materials and belonging to the soil groups Grey Brown Podzolics, Brown Earths (BminSW).

The vulnerability of the site is classified as 'Extreme' Vulnerability based on the GSI data. The bedrock map indicates that the site is underlain by Dinantian Pure Unbedded Limestones. There are no geological heritage sites or source protection zones located within 1 km. The site is a green field site with low potential for encountering contamination. There are no active quarries or pits on or immediately adjacent to the site.

² Information regarding the soil classifications was obtained from the EPA web-mapping site, containing soil information from the Teagasc/EPA soil & subsoil mapping project.

(xi) Planning Policy

Land Use Zoning

The site is located within the functional area of Tipperary County Council. The lands are currently unzoned and in agricultural and forestry use.

Local objectives

There are no specific local objectives for the site.

Overview of Potential Planning Issues

The site is located in an area of unzoned lands. There are no specific local objectives pertaining to the site itself or within the immediate vicinity of the site. It is located outside of the environs of the settlements in the area. The site location is relatively of equal proximity to sensitive residential receptors; care must be taken with any potential siting of any infrastructure within this site.

(xii) Traffic, Engineering and Design

The R490 regional road runs in a south-west north-east orientation to the north west of the proposed site. The R491 runs in a north-south orientation to the west of it. An unknown local road joins the R491 to the R490 to the south. Access between the site and the R491 is facilitated by an unknown local road. The site could potentially utilise these regional routes with connectivity to the N51 National Route to the north-west of the site. Access to and from the N52 National Route can be facilitated via the existing junction of the R491 with the N512 in Borrisokane. Travel distance from the N52 National Route to the R490 is approximately 7.4km.

The site is currently serviced by an internal access track from the adjoining local road network. Utilisation of the existing access track would require the upgrading of the track to facilitate construction vehicles or the utilisation of Bog Mats for the construction period. Minor junction improvements of the existing access would be required to facilitate the access and egress of vehicles from the local road network.

4. BPT Site 2

BPT Site 2 is located in the townland of Knockanacree, north of the Knockanacree Woods and trails. The Eco Village of Cloughjordan is located approximately 1.7km south east. There are local un-named roads running south west to north east, west of the site, and north to south on the eastern side. There are a number of rural/agricultural residential developments to the west and east of the site. See Figure 4.1.



Figure 4.1 – BPT Site 2

(i) Ecology

The BPT Site 2 is located within improved agricultural grassland which was evaluated as being of local importance (lower value) with limited potential for protected flora or fauna to occur. There are no Annex I habitats or potential Annex I habitats located within or adjacent to the site. There are also no surface water features on or adjacent to the site.

Due to the managed agricultural landscape and the limited ecological potential of the agricultural grassland habitat present within the site, the potential occurrence of protected flora was evaluated as 'low'. No records of Flora Protection Order species were identified. A field survey did not note the presence of Annex II species. Annex IV bat species may use this general location and forage along the field boundaries, although the hedgerows were noted as being of moderate ecological value due to evidence of maintenance and the lack of continuity regarding its linear features.

The site is considered to have low breeding and wintering bird value. Passerine bird species are likely to be present. There was no evidence of flora or fauna protected under the Wildlife Act 1979 (Amendment 2000) occurring at this site while carrying out the field survey.

There is no connectivity to salmonid or freshwater pearl mussel watercourses or no potential effects on coastal or marine receptors at the site. The potential for significant impacts affecting ecological receptors is evaluated as 'very low'.

(ii) Aquatic Ecology

There are no surface water features on or adjacent to the site. There are no designated European Sites, Annex I habitats or potential Annex I habitats located within or adjacent to the site boundary. No protected flora species listed on the Flora Protection Order were recorded from either desktop study or field survey; the potential for these species to occur is evaluated as 'low'.

In the absence of any connectivity to aquatic or water-dependant habitats, the desk and field studies determined that no aquatic Annex II species are likely to occur at this site. No aquatic Annex IV species were recorded at this site and no aquatic habitat exists to support breeding or wintering Annex I water birds.

In the absence of any connectivity to aquatic or water-dependant habitats, the evaluation concluded that there is no potential for aquatic species protected under the Wildlife Act 1979 (Amendment 2000) to occur within or adjacent to this site. There is no connectivity to salmonid or freshwater pearl mussel watercourses and no potential effects on coastal or marine receptors at the site. The potential for significant impacts affecting aquatic ecological receptors is evaluated as 'very low'.

(iii) Surface Water

There are no identified constraints with regard to the proposed site as there are no water bodies within the site boundary or within 100m of the proposed site location and the area is not prone to fluvial flooding.

(iv) Air Quality

The focus of the assessment consisted of determining the potential for dust emissions to occur during the construction phase of the proposed development. Receptors which are closer to the site have a higher risk of experiencing dust impacts during the construction phase, as there is unlikely to be any significant impacts to occur during the operational phase. The proposed site is approximately 314m from the nearest sensitive receptor, with the longer the distance being the most preferable from an air quality point of view.

(v) Noise

The focus of the assessment consisted of determining the potential for noise/vibration emissions to occur during the construction and operational phase of the proposed development. Receptors which are closer to the site have a higher risk of experiencing noise/vibration impacts during the construction/operational development phases. The site lies approximately 314m from the site boundary to the nearest residential receptor, with the site with the longer the distance being the most preferable from noise/vibration point of view.

(vi) Cultural Heritage

There are no recorded built heritage sites located within the vicinity of this site. As such the impact potential has been defined as very low. There are four recorded archaeological sites located within 500m of the site. The closest is TN011-023, which is an enclosure situated approximately 82m to the south-southeast. A further enclosure is located approximately 87m to the southwest (TN011-022). An earthwork is located approximately 82m to the northwest (TN011-016) and a further earthwork is located approximately 400m to the north-northwest. Given the elevation of the site and the presence of a number of sites that are likely to be early medieval in date, there is a mid-range potential to impact on associated archaeological remains.

(vii) Landscape and Visual

The site traverses two pastoral fields and the communications mast rises a short distance upslope to the southwest. Two local roads pass to the east and west of the site and they are approximately 200m and 500m

from the site respectively, at their nearest points. Knocknacree Wood recreation area lies approximately 200m to the south of this site. The walking route maps for Knocknacree Wood identify a panoramic viewpoint along the northern edge of the forest. Southwards, beyond Knocknacree Wood is a junction between the R491 and the R490 regional roads, which run in easterly and westerly directions respectively. The settlement of Cloughjordan is located approximately 2km to the south of the site.

(viii) Agronomy

a) Number of Landowners impacted within the site boundary

According to folio data supplied by the land registry one land owner is impacted within the site boundary.

b) Land Quality

According to the EPAs Soil Classification of Ireland, the soils in the region consist in the main of a fine loamy drift with limestone. The soils are particularly suited to grassland. The land quality would be considered good quality land.

c) Crop Rotation Practised

The land is in permanent pasture and crop rotation is not practised. The land is used for grazing of livestock.

(ix) People

The site is located in its entirety within the boundaries of the TY36604N land folio however it does disrupt the existing internal field boundaries of the folio itself. The site is located approximately 75m north-east of the telecommunications mast and 280m north-west of the nearest residential receptor. Access roads either side of the site could potentially require upgrade works to accommodate construction traffic while the local road to the west of the site is designated as a cycle route for the Nenagh Cycling Club.

(x) Soils, Geology and Hydrogeology

The site has been mapped³ as rock close to surface and shallow, well drained, mineral soil, derived mainly from calcareous parent materials and belonging to the soil groups Grey Brown Podzolics, Brown Earths (BminSW).

The vulnerability of the site is classified as 'Extreme' Vulnerability based on the GSI data. The bedrock map indicates that the site is underlain by Dinantian Pure Unbedded Limestones. There are no geological heritage sites or source protection zones located within 1 km of the site. It is a green field site with low potential for encountering contamination. There are no active quarries or pits on or immediately adjacent to the site.

(xi) Planning Policy

Land Use Zoning

The site is located within the functional area of Tipperary County Council. The lands are currently unzoned and in agricultural use.

Local objectives

There are no specific local objectives for the site.

³ Information regarding the soil classifications was obtained from the EPA web-mapping site, containing soil information from the Teagasc/EPA soil & subsoil mapping project.

Overview of Potential Planning Issues

The site is located in an area of unzoned lands. There are no specific local objectives pertaining to the site itself or within the immediate vicinity of the site. The site is located outside of the environs of the settlements in the area. The site location is relatively of equal proximity to sensitive residential receptors; care must be taken with any potential siting of any infrastructure within this site.

(xii) Traffic, Engineering and Design

The R490 regional road runs in a south-west north-east orientation to the north west of the proposed site. The R491 runs in a north-south orientation to the west of it. An unknown local road joins the R491 to the R490 to the south. Access between the site and the R491 is facilitated by an unknown local road. The site could potentially utilise these regional routes with connectivity to the N51 National Route to the north-west of the site. Access to and from the N52 National Route can be facilitated via the existing junction of the R491 with the N512 in Borrisokane. Travel distance from the N52 National Route to the R490 is approximately 7.4km.

The site is currently serviced by an internal access track from the adjoining local road network. Utilisation of the existing access track would require the upgrading of the track to facilitate construction vehicles or the utilisation of Bog Mats for the construction period. Minor junction improvements of the existing access would be required to facilitate the access and egress of vehicles from the local road network.

5. BPT Site 3

BPT Site 3 is located in the townland of Knockanacree, north of the Knockanacree Woods and trails. The Eco Village of Cloughjordan is located approximately 1.7km south east. There are local un-named roads running south west to north east, west of the site, and north to south on the eastern side. There are a number of rural/agricultural residential developments to the west and east of the site. See Figure 5.1.



Figure 5.1 – BPT Site 3

(i) Ecology

The BPT Site 3 is located within improved agricultural grassland, with some scrub occurring in the north east and southwest corners of the site. The site is located directly north of a large area of mixed broadleaved woodland. Habitats within the site are evaluated as being of local importance (lower value) with limited potential for protected flora or fauna to occur. There are no Annex I habitats or potential Annex I habitats located within or adjacent to the site. There are also no surface water features on or adjacent to the site.

Due to the managed agricultural landscape and the limited ecological potential of the agricultural grassland habitat present within the site, the potential occurrence of protected flora was evaluated as 'low'. No records of Flora Protection Order species were identified. A field survey did not note the presence of Annex II species. Annex IV bat species are likely to use this general location and forage along the field boundaries, also utilising the woodland margin to the south and potentially foraging within the mature scrub in the southwest corner of the site.

The site is considered to have low breeding and wintering bird value. Passerine bird species are likely to be present. A field survey was carried out to determine the presence of flora or fauna protected under the Wildlife Act 1979 (Amendment 2000). While no protected species were recorded, there is potential for badger activity within the scrub habitats.

There is no connectivity to salmonid or freshwater pearl mussel watercourses or no potential effects on coastal or marine receptors at the site. The potential for significant impacts affecting ecological receptors is evaluated as 'very low'.

(ii) Aquatic Ecology

There are no surface water features on or adjacent to the site. There are no designated European Sites, Annex I habitats or potential Annex I habitats located within or adjacent to the site boundary. No protected flora species listed on the Flora Protection Order were recorded from either desktop study or field survey; the potential for these species to occur is evaluated as 'low'.

In the absence of any connectivity to aquatic or water-dependant habitats, the desk and field studies determined that no aquatic Annex II species are likely to occur at this site. No aquatic Annex IV species were recorded at this site and no aquatic habitat exists to support breeding or wintering Annex I water birds.

In the absence of any connectivity to aquatic or water-dependant habitats, the evaluation concluded that there is no potential for aquatic species protected under the Wildlife Act 1979 (Amendment 2000) to occur within or adjacent to this site. There is no connectivity to salmonid or freshwater pearl mussel watercourses and no potential effects on coastal or marine receptors at the site. The potential for significant impacts affecting aquatic ecological receptors is evaluated as 'very low'.

(iii) Surface Water

There are no identified constraints with regard to the proposed as there are no water bodies within the site boundary or within 100m of the proposed site location and the area is not prone to fluvial flooding.

(iv) Air Quality

The focus of the assessment consisted of determining the potential for dust emissions to occur during the construction phase of the proposed development. Receptors which are closer to the site have a higher risk of experiencing dust impacts during the construction phase, as there is unlikely to be any significant impacts to occur during the operational phase. The proposed site is approximately 400m from the nearest sensitive receptor, with the longer the distance being the most preferable from an air quality point of view.

(v) Noise

The focus of the assessment consisted of determining the potential for noise/vibration emissions to occur during the construction and operational phase of the proposed development. Receptors which are closer to the site have a higher risk of experiencing noise/vibration impacts during the construction/operational development phases. The site lies approximately 400m from the site boundary to the nearest residential receptor, with the longer the distance being the most preferable from noise/vibration point of view.

(vi) Cultural Heritage

There are no recorded built heritage sites located within the vicinity of this site. As such the impact potential has been defined as very low. There are four recorded archaeological sites located within 500m of the site. The closest is TN011-022, which is an enclosure situated approximately 45m to the east. A further enclosure is located approximately 100m to the east (TN011-023). An earthwork is located approximately 240m to the north (TN011-016) and a larger ring fort is located approximately 327m to the west. Given the elevation of the site and the close proximity of a number of sites that are likely to be early medieval in date, there is the potential that the site may contain associated archaeological remains. It is also possible that the site will impact negatively on the

inter visibility between the two sites to the east and the larger ring fort to the west. Therefore there is a high potential to impact on archaeological remains.

(vii) Landscape and Visual

The site encompasses two small sections of scrubby woodland, but principally contains pastoral farmland. The communications mast rises just along the ridge to the northeast. Two local roads pass to the east and west of the site and they are approximately 300m and 500m from the site respectively, at their nearest points. Knocknacree Wood recreation area lies almost adjacent to the south of this site. The walking route maps for Knocknacree Wood identify a panoramic viewpoint along the northern edge of the forest in close proximity to this site. Southwards, beyond Knocknacree Wood is a junction between the R491 and the R490 regional roads, which run in easterly and westerly directions respectively. The settlement of Cloughjordan is located approximately 2km to the south of the site.

(viii) Agronomy

a) Number of Landowners impacted within the site boundary

According to folio data supplied by the land registry one land owner is impacted within the site boundary.

b) Land Quality

According to the EPAs soil Classification of Ireland, the soils in the region consist in the main of a fine loamy drift with limestone. The soils are particularly suited to grassland. The land quality would be considered good quality land. However the area of land within the northern boundary and the southern boundary of the site appears to be poorer quality land than that surrounding it. The land along the southern boundary appears to be wetter land and is planted with trees.

c) Crop Rotation Practised

The land is in permanent pasture and crop rotation is not practised. The land is used for grazing of livestock.

(ix) People

The site is located in its entirety within the boundaries of the TY20048N land folio however it does impede upon some existing forestry resources within it. This site is located next to (<50m) the telecommunications mast to the north-east. The location of this site would require the existing access track to the telecommunications mast to be altered. The closest residential receptor is located approximately 390m east of the proposed site. Access roads either side of the prospective sites could potentially require upgrade works to accommodate construction traffic while the local road to the west of the site is designated as a cycle route for the Nenagh Cycling Club.

(x) Soils, Geology and Hydrogeology

The site has been mapped⁴ as rock close to surface and shallow, well drained, mineral soil, derived mainly from calcareous parent materials and belonging to the soil groups Grey Brown Podzolics, Brown Earths (BminSW).

The vulnerability of the site is classified as 'Extreme' Vulnerability based on the GSI data. The bedrock map indicates that the site is underlain by Dinantian Pure Unbedded Limestones. There are no geological heritage sites or source protection zones located within 1 km of the site. The site is a green field site with low potential for encountering contamination. There are no active quarries or pits on or immediately adjacent to the site.

⁴ Information regarding the soil classifications was obtained from the EPA web-mapping site, containing soil information from the Teagasc/EPA soil & subsoil mapping project.

(xi) Planning Policy

Land Use Zoning

The site is located within the functional area of Tipperary County Council. The lands are currently unzoned and in agricultural and forestry use.

Local objectives

There are no specific local objectives for the site.

Overview of Potential Planning Issues

The site is located in an area of unzoned lands. There are no specific local objectives pertaining to the site itself or within the immediate vicinity of the site. The site is located outside of the environs of the settlements in the area. BPT Site 3 is slightly more removed from sensitive residential receptors than BPT Site 1 and BPT Site 2; care must be taken with any potential siting of any infrastructure within this site.

(xii) Traffic, Engineering and Design

The R490 regional road runs in a south-west north-east orientation to the north west of the proposed site. The R491 runs in a north-south orientation to the west. An unknown local road joins the R491 to the R490 to the south. Access between the site and the R491 is facilitated by an unknown local road. The site could potentially utilise these regional routes with connectivity to the N51 National Route to the north-west of the site. Access to and from the N52 National Route can be facilitated via the existing junction of the R491 with the N512 in Borrisokane. Travel distance from the N52 National Route to the R490 is approximately 7.4km.

The site is currently serviced by an internal access track from the adjoining local road network. Utilisation of the existing access track would require the upgrading of the track to facilitate construction vehicles or the utilisation of Bog Mats for the construction period. Minor junction improvements of the existing access would be required to facilitate the access and egress of vehicles from the local road network.

6. BPT Sites – MCA Comparison

(i) Ecology

The three potential break pressure sites are located within improved agricultural grassland, with some scrub habitat occurring within BPT Site 1 and BPT Site 3. All sites are evaluated as being of local importance (lower value) with limited potential for protected flora or fauna to occur. The potential for significant impacts affecting ecological receptors at all three sites is evaluated as ranging from ‘very low’ to ‘low’.

An evaluation of the sites with respect to the discrete site boundaries and adjacent ecological receptors indicates that BPT Site 2 is the least constrained location on the basis of ecological receptors within and directly adjacent to the site. Potential access requirements to all sites would require additional assessment.

(ii) Aquatic Ecology

Pathways for impacts potentially affecting aquatic ecological receptors have been evaluated for all three potential Break Pressure Tank sites. In the absence of any aquatic features or water-dependant habitats occurring within or connected to any of the three potential sites, it is evaluated that there are no distinguishing features within any one of these sites which would allow for a ranking of preference. The potential for significant impacts affecting aquatic ecological receptors at all three sites is evaluated ‘very low’. All sites are evaluated as being equal in terms of aquatic ecology.

(iii) Surface Water

Table 6-1 summarises the key constraints for the site locations within the abstraction areas near Parteen Basin.

Table 6-1 Comparison of BPT Sites – Surface Water Constraints

Study Area	Rivers / Streams	Lakes	WFD good or higher status	Drinking water	Shellfish Area	Recreational Waters	Nutrient Sensitive	cSAC & SPA
BPT Site 1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BPT Site 2	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BPT Site 3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

v - Within close proximity

vv - Within location

n/a – not applicable

There are no identified constraints at all sites. Therefore there is no preference in relation to the location of the BPT from a surface water perspective.

(iv) Air Quality

With regards to air quality, the potential sites are equal in terms of their air quality zone, prevailing wind direction and proximity to intensive agriculture and waste licence facilities. It is expected that there will be no significant air quality and climate impacts during the operational phase of the break pressure tank. The main potential for air quality impacts arise from dust emissions during the construction phase of the proposed development. Construction dust has the potential to cause local impacts through dust nuisance at the nearest houses.

Construction activities such as excavation, earth moving and backfilling may generate quantities of dust, particularly in dry and windy weather conditions. While dust from construction activities tends to be deposited within 200m of a construction site, the majority of the deposition occurs within the first 50m. As a result, the main differentiating criterion to be applied is the distance of the proposed location to nearby sensitive receptors. Considering this, BPT Site 1 and BPT Site 3 are the preferred locations from an air quality perspective as they are at a greater distance from nearby sensitive receptors. They are both approximately 150m from the nearest sensitive receptor.

(v) Noise

BTP Site 1 and BPT Site 3 are preferred, from a noise/vibration point of view, as they are at the greatest distance from nearby residential receptors. BTP Site 2 is located slightly closer to nearby residential receptors and therefore there is a slightly higher potential noise/vibration impact from this site. However, it is considered that all of the sites could be feasible, without generating noise/vibration at nuisance levels, with the provision of suitable construction/operational phase noise/vibration mitigation measures.

(vi) Cultural Heritage

All of the sites are very similar as they are located in close proximity to a group of monuments likely to be early medieval in date, which were established at this elevation in order to provide views of the surrounding landscape. BPT Site 3 is possibly the least preferable as it has the potential to impact on the visibility between the large ring fort to the west and two enclosures to the east. It also has the closest proximity to the known archaeological resource.

(vii) Landscape and Visual

The three break pressure tank site options are all in close proximity to each other and consequently they have many of the same constraint attributes. However, there are subtleties relating to the local terrain of each site, which have consequences for the likely visibility of a break pressure tank facility. BPT Site 1 is located at the northern end of this ridge of high ground just on the western side of the crest. The greatest potential for visibility of this site is from the local road downhill to the west at distances in excess of 400m and with considerable screening afforded by intervening hedgerow vegetation. Furthermore, the dwellings lining this road tend to avail of slightly elevated views over the lower lying landscape further to the west. BPT Site 2 is located just over the ridge from BPT Site 1 and is more likely to be visible from dwellings lining the local road to the east. Again there is considerable intervening hedgerow screening in respect of these receptors. BPT Site 3 is located on a plateau section of the ridge where it is backed by Knocknacree Wood. In combination with considerable hedgerow screening, this will make it a difficult site to see from the local roads and residences downhill to the east and west due to the intervening, vegetated brow of the hill.

Even though the BPT Site 3 is the least likely to be visible from surrounding roads and residences it lies almost adjacent to Knocknacree Wood recreation area. Several of the sign posted walking trails skirt the northern fringe of the Wood and converge on a highlighted viewpoint on the ridge at its northern edge. This would afford foreground views of the BPT Site 3 and it is likely to represent a visual intrusion on the identified view even if designed with a minimal degree of above-ground infrastructure. Furthermore, any attempts to screen the site using mitigation planting are likely to result in some obstruction or foreshortening of this view. Whilst BPT Site 1 and BPT Site 2 may also be visible in the context of the identified view, they will be less prominent features and are much more likely to be screened by intervening vegetation. There would also be a greater potential to subtly screen these site from view without noticeably intruding on the identified vista.

For the reasons outlined above, the least preferred option is the BPT Site 3 site due to potential effects on the amenity of recreationalists using Knocknacree Wood. BPT Site 1 and BPT Site 2 have a very similar degree of preference with the only differentiating factor being the potential impact on an area of scrubby woodland at BPT Site 1. If this can be avoided by way of design refinement, these sites are considered equal.

(viii) Agronomy

The study was carried out having regard to agricultural practices within each of the potential site locations. Individual farm studies were not conducted.

The three selected Break Pressure Tank sites have broadly similar land quality and farming patterns.

However due to land quality and intensity of use within BPT Site 2, it is deemed to be the most constrained site. BPT Site 1 is deemed to be the least constrained site because of the land quality and intensity of use.

It is concluded that the overall impact at BPT Site 1 and BPT Site 3 would be low at farm level, the overall impact at BPT Site 2 would be mid-range at farm level. The overall impact would be low at local level and would be slight at national level.

(ix) People

Key comparisons of the sites in regards to residential, commercial and sensitive receptors have been made. From the outset it must be noted that there are no commercial receptors or tourism amenities/hotspots located within 1km of any of the prospective sites.

BPT Site 2 is located the closest distance from a residential receptor (approximately 280m) and is the most constrained from this consideration.

BPT Site 1 and BPT Site 3 have very similar characteristics, while they are both located in close proximity to a commissioned telecommunication mast as well as potentially disturbing some forested resources, they cannot be ruled out on that basis. BPT Site 3 is located approximately 390m away from the nearest residential receptor while BPT Site 1 is approximately 420m away from it. Therefore BPT Site 1 is put forward as the most suitable site location for the Break Pressure Tank in respect to Population and Tourism.

(x) Soils, Geology and Hydrogeology

No significant constraints were identified at the Break Pressure Tank sites (BPT Site 1, BPT Site 2, and BPT Site 3). The underlying aquifer is described as a locally important aquifer.

All three sites are underlain by extreme groundwater vulnerability. There is a low potential that soft ground will be encountered at any site. The sites are well drained. There are no geological heritage sites located at or within 1 km of any of the three sites. All sites are located on green field sites with a low potential for encountering soil contamination. There is a negligible potential of sterilisation of mineral resources at these locations. All sites are evaluated as equal in terms of the potential for significant impacts on soils, geology and hydrogeology.

(xi) Planning Policy

All three sites are located outside of the nearest settlements. Thus there are no specific zonings associated with these locations. Overall the general County Development Plan policies and objectives will apply to areas which are 'unzoned', or not subject to the Settlement Plan.

There is a small amount of rural housing located in proximity to the proposed locations. BPT Site 1 and BPT Site 2 are marginally closer to residential properties. Proximate residential and agricultural land uses will need to be considered in the final siting of the plant within the chosen location. The proximity of the proposed Break Pressure Tanks to the village of Cloughjordan was also reviewed. In each case the sites are located over 1.5km from the settlement. At this distance the potential impact of the proposed development is considered to be low. Access to the sites may potentially be gained from the local roads to the north-west or the east. The Scohaboy Bog NHA is located between 700m and 900m from the three potential sites.

In Planning policy terms, there is little to distinguish one site from the other.

(xii) Traffic, Engineering and Design

Based on the criteria considered as part of the assessment process, the potential for each of the proposed break pressure tank sites are comparable with respect to potential impacts due to the close proximity of the sites to each other and also within similar distances to the same road networks.

6.2 Preferred Site

A comparison of the three BPT site locations is presented in Table 6-2.

Table 6-2 – MCA – Comparison between BPT Sites

Constraint	BPT Site 1	BPT Site 2	BPT Site 3
Ecology	Green	Yellow	Green
Surface Water	Yellow	Yellow	Yellow
Air Quality	Green	Green	Green
Noise	Green	Green	Green
Cultural Heritage	Blue	Blue	Blue
Landscape and Visual	Green	Green	Green
Agronomy	Green	Green	Green
People	Green	Green	Green
Soils, Geology & Hydrogeology	Green	Green	Green
Planning Policy	Blue	Blue	Blue
Traffic	Green	Green	Green
Engineering & Design	Blue	Blue	Blue
Overall Ranking	3	2	1

With reference to the appraisal criteria presented in Table 6-2, where the sites are ranked in order of preference and least constraint, BPT Site 3 represents the preferred location for the siting of the Break Pressure Tank for the following reasons:

- It is on a side of the ridge that is less inclined than the other two sites which will facilitate integration of the works into the existing landscape. It would also be screened by the forestry.
- The works associated with the communications mast appear to have been completed whilst maintaining an access through this area. This may suggest previous investigations concluded that was an area of least constraint.
- It maintains its elevation relative to the termination point thereby giving greater flexibility for routing a pipeline whilst still retaining a delivery under gravity.
- Of the three sites it appears, from the various Specialist assessments, to have the least impact collectively.

BPT Site 1 was considered to have the most impact as it would have to be located on the more steeply inclined side of the ridge; and would be difficult to integrate sensitively into the landscape. The final elevation may have to be dropped to affect this, which impacts on the system operation to deliver a gravity supply.

Similarly to the other sites it is the effectiveness of siting this component of infrastructure within the landscape. Whilst the site topography would be more accommodating than BPT Site 1 it is not as favourable as BPT Site 3; the completed works would also have to be at a lower elevation.

Note: the ridge is prominent in the landscape and has a number of recorded archaeological sites. It is important that before a final site for the BPT is selected, in situ investigation be carried out to confirm, or otherwise, the extent of archaeological remains.

