

Water Supply Project

Eastern and Midlands Region

Appendix F

Water Treatment Plant Site Selection



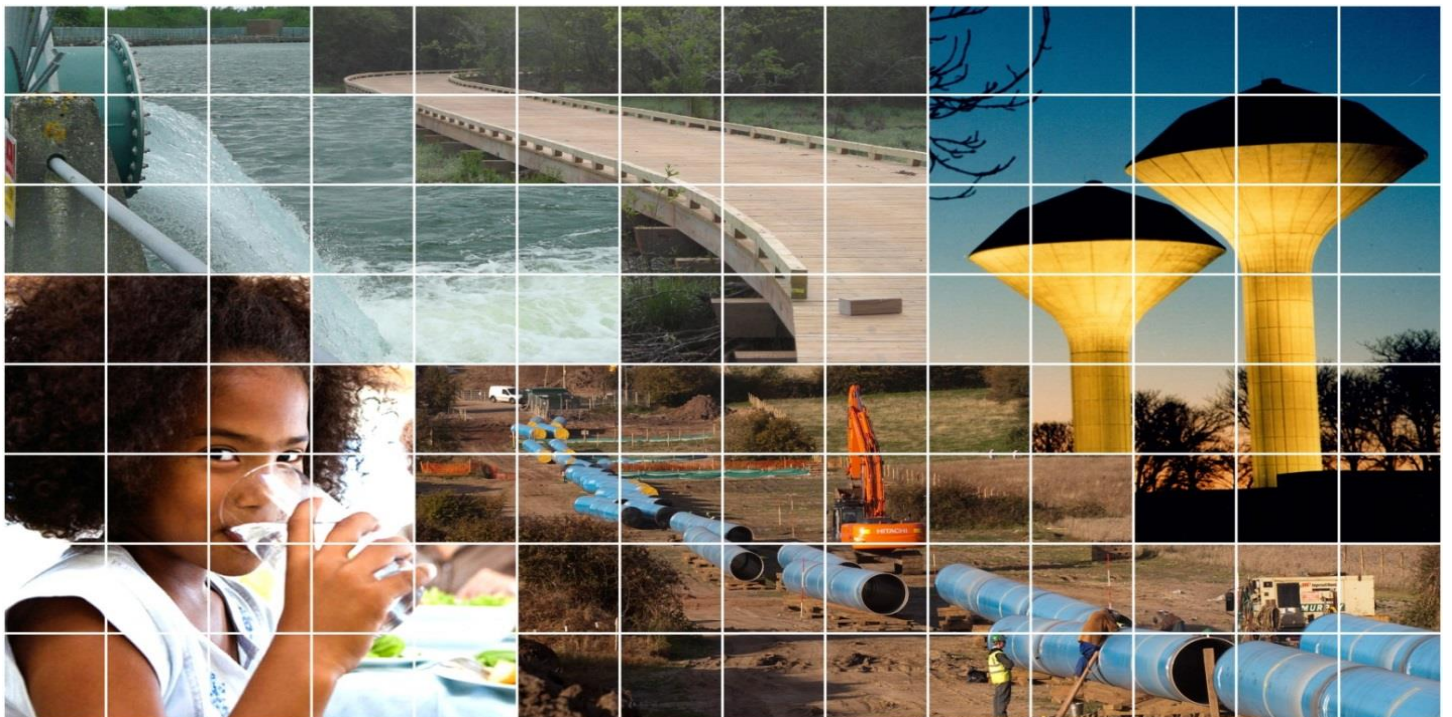
Water Supply Project, Eastern and Midlands Region

Irish Water

Final Options Appraisal Report – Non Linear Infrastructure Siting

Appendix F Water Treatment Plant Site Selection

November 2016



Contents

| | | |
|----|---|----|
| 1. | Water Treatment Plant Siting – Process Summary..... | 1 |
| 2. | Screening to Identify Preliminary Sites..... | 22 |
| 3. | WTP Site 1 | 26 |
| 4. | WTP Site 2 | 30 |
| 5. | WTP Site 3 | 35 |
| 6. | WTP Sites – MCA Comparison..... | 39 |

1. Water Treatment Plant 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.

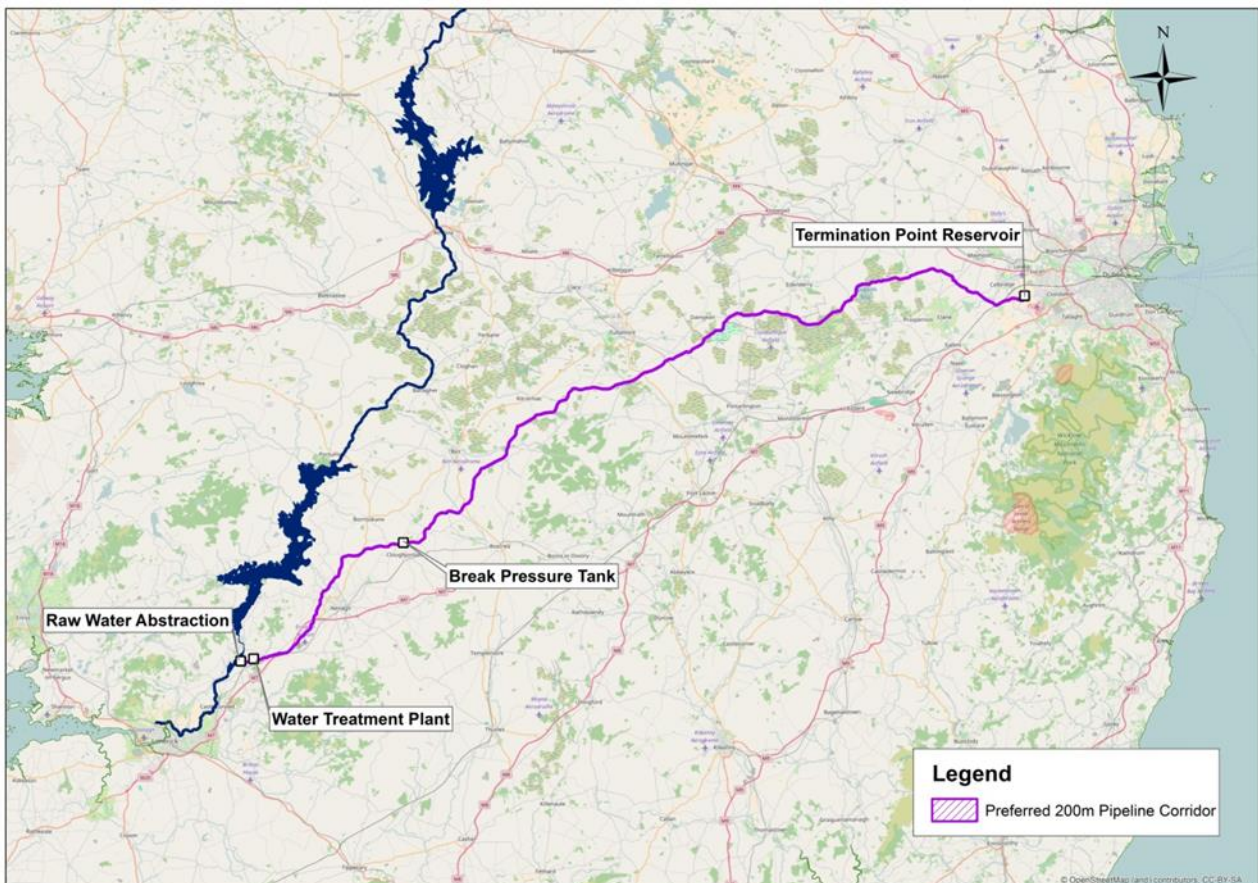


Figure 1.1 The Transmission Pipeline (Linear Infrastructure) and Other (Non – Linear Infrastructure)

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 this 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 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 F describes the multi criteria analysis (MCA) process used to appraise a **Least Constrained Water Treatment Plant Site (WTP)**.

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 four WTP 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 WTP 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 WTP 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, Risk |
| 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

Based on a preferred location for abstraction along the eastern shore of Parteen Basin, as set out in FOAR Section 11.3 and Appendix E, a number of potential WTP site areas were identified.

Figure 1.2 shows the preferred location of the raw water abstraction point and three potential areas for siting a WTP in close proximity (less than 3km) to it. Also shown on Figure 1.2 are the extents of the Lower River Shannon Special Area of Conservation and other constraints that exist within each of these areas.



Figure 1.2 Potential Water Treatment Plant Site Areas

Area 1 was identified as the least constrained area for siting a WTP as it is largely composed of open farmland, with no direct impact on properties or priority habitats. Area 2 is environmentally constrained by the Lower River Shannon SAC, including the Kilmastulla River; the area also lies within the flood plain of the Kilmastulla River. Area 3 encompasses considerable existing development, including residential properties. It also includes the

Shannonside Business Park, and could therefore be considered as having an established use upon which a large WTP would have a less significant impact than it would have on the more rural settings in Areas 1 and 2. However, the presence of the Kilmastulla River (which is in the SAC), the Limerick-Nenagh railway line and the R445 (old N7) road makes identification of a land parcel of adequate size for the WTP, and which does not infringe upon one of these constraints, difficult to ascertain.

A detailed discussion on the Potential Water Treatment Plant Areas is included in Section 2.

A detailed assessment was undertaken of Area 1 and three potential sites were identified, as shown in Figure 1.3.



Figure 1.3 Potential Water Treatment Plant Sites

A detailed discussion on the three potential sites for the WTP is included in Sections 3, 4 and 5.

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 | WTP1 | WTP2 | WTP3 |
|-------|---|--|---|---|
| 1.0 | Environmental * | | | |
| 1.1 | Biodiversity, Flora & Fauna (Terrestrial) | | | |
| 1.1.1 | Potential to impact on Natura 2000 Sites | Significant adverse effects evaluated as unlikely, hydrological pathway to Lower Shannon SAC via minor stream at access track from northwest. Potential access from south would require crossing of a tributary of the Kilmastulla River, directly upstream of the Lower Shannon SAC site boundary. Mitigation required. | Significant adverse effects evaluated as unlikely, hydrological pathway to Lower Shannon SAC via minor stream to north. | Significant adverse effects evaluated as unlikely, hydrological pathway to Lower Shannon SAC via minor stream to northwest. |
| 1.1.2 | Potential to impact on Natural Heritage Areas and proposed Natural Heritage Areas | Significant adverse effects evaluated as unlikely | Significant adverse effects evaluated as unlikely | Significant adverse effects evaluated as unlikely |
| 1.1.3 | Potential impact Annex I listed habitats (designated) | N/A - no designations | N/A - no designations | N/A - no designations |
| 1.1.4 | Potential impact Annex I listed habitats (non-designated) | N/A - Sites surveyed, no Annex I habitats | N/A - Sites surveyed, no Annex I habitats | N/A - Sites surveyed, no Annex I habitats |
| 1.1.5 | Potential to impact high ecological value habitats (semi natural habitats) | Site surveyed; no high value terrestrial habitats. Potential access from south would require crossing of a tributary of the Kilmastulla River, directly upstream of the Lower Shannon SAC site boundary. Mitigation required. | N/A - Sites surveyed, no high value terrestrial habitats | N/A - Sites surveyed, no high value terrestrial habitats |
| 1.1.6 | Potential to impact on protected Flora - Flora Protection Order (FPO) | N/A - Sites surveyed, no FPO species | N/A - Sites surveyed, no FPO species | N/A - Sites surveyed, no FPO species |

| | | | | |
|--------|---|--|---|---|
| 1.1.7 | Potential to impact on Annex II species | Site surveyed; no Annex II species likely to occur. Potential access from south would require crossing of a tributary of the Kilmastulla River, directly upstream of the Lower Shannon SAC site boundary. Mitigation required. | N/A - Sites surveyed, no Annex II species likely to occur | N/A - Sites surveyed, no Annex II species likely to occur |
| 1.1.8 | Potential to Impact on Annex IV species (wherever they occur) | Site surveyed, Annex IV bat species likely to use the site and forage along boundaries, no potential roost recorded | Annex IV bat species likely to use the site and forage along boundaries, no potential roost recorded | Annex IV bat species likely to use the site and forage along boundaries, no potential roost recorded |
| 1.1.9 | Potential to impact on the breeding / wintering habitat for Annex I listed and other qualifying interest bird species | Site surveyed, low breeding and wintering bird value | Site surveyed, low breeding and wintering bird value | Site surveyed, low breeding and wintering bird value |
| 1.1.10 | Potential to impact flora and fauna protected under Wildlife Act e.g. Birds, badger | Site surveyed, passerine bird species recorded, no signs of WA species, e.g. Badger recorded, no protected flora. | Site surveyed, passerine bird species recorded, no signs of WA species, e.g. Badger recorded, no protected flora. | Site surveyed, passerine bird species recorded, no signs of WA species, e.g. Badger recorded, no protected flora. |
| 1.1.11 | Potential to impact on salmonid habitat - protected under SI Regulations | N/A - no connectivity to Salmonid Regulation watercourse. | N/A - no connectivity to Salmonid Regulation watercourse. | N/A - no connectivity to Salmonid Regulation watercourse. |
| 1.1.12 | Potential to impact on a freshwater pearl mussel - protected under SI Regulations | N/A - no connectivity to Freshwater Pearl Mussel watercourse | N/A - no connectivity to Freshwater Pearl Mussel watercourse | N/A - no connectivity to Freshwater Pearl Mussel watercourse |
| 1.1.13 | Potential to impact upon high quality aquatic habitat for protected aquatic species. | N/A | Minor 1st order stream to northwest of site unlikely to contain protected aquatic species | Minor 1st order stream to north of site unlikely to contain protected aquatic species |
| 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 | Significant adverse effects evaluated as unlikely, hydrological pathway to Lower Shannon SAC via minor stream at access track from northwest. Potential access from south would require crossing of a tributary of the Kilmastulla River, directly upstream of the Lower Shannon SAC site boundary. Mitigation required. | Significant adverse effects evaluated as unlikely, hydrological pathway to Lower Shannon SAC via stream to north. | Significant adverse effects evaluated as unlikely, hydrological pathway to Lower Shannon SAC via stream to northwest. |
| 1.2.2 | Potential to impact on Natural Heritage Areas and proposed Natural Heritage Areas | N/A | N/A | N/A |
| 1.2.3 | Potential impact Annex I listed habitats (designated) | N/A - no aquatic Annex I habitats occur | N/A - no aquatic Annex I habitats occur | N/A - no aquatic Annex I habitats occur |
| 1.2.4 | Potential impact Annex I listed habitats (non designated) | N/A - no aquatic Annex I habitats occur | N/A - no aquatic Annex I habitats occur | N/A - no aquatic Annex I habitats occur |
| 1.2.5 | Potential to impact high ecological value habitats (semi natural habitats) | Site surveyed, no high value aquatic habitats. Potential access from south would require crossing of a tributary of the Kilmastulla River, directly upstream of the Lower Shannon SAC site boundary. Mitigation required. | Minor 1st order stream to northwest of site evaluated as being of high local importance. | Minor 1st order stream to northwest of site evaluated as being of high local importance. |
| 1.2.6 | Potential to impact on protected Flora - Flora Protection Order | N/A - no aquatic FPO species occur | N/A - no aquatic FPO species occur | N/A - no aquatic FPO species occur |
| 1.2.7 | Potential to impact on Annex II species | Site surveyed, no Annex II species likely to occur. Potential access from south would require crossing of a tributary of the Kilmastulla River, directly upstream of the Lower Shannon SAC site boundary. Mitigation required for Otter, Atlantic salmon. | N/A - no aquatic Annex II species occur | N/A - no aquatic Annex II species occur |

| | | | | |
|--------|---|--|---|---|
| 1.2.8 | Potential to Impact on Annex IV species (wherever they occur) | N/A - no aquatic Annex IV species occur | N/A - no aquatic Annex IV species occur | N/A - no aquatic Annex IV species occur |
| 1.2.9 | Potential to impact on the breeding / wintering habitat for Annex I listed and other qualifying interest bird species | N/A - no aquatic habitat exists to support breeding / wintering Annex I water birds | N/A - no aquatic habitat exists to support breeding / wintering Annex I water birds | N/A - no aquatic habitat exists to support breeding / wintering Annex I water birds |
| 1.2.10 | Potential to impact flora and fauna protected under Wildlife Act e.g. Birds, badger | Common frog may occur on site. Potential access from south would require crossing of a tributary of the Kilmastulla River, directly upstream of the Lower Shannon SAC site boundary. Mitigation required for aquatic species including brown trout, Atlantic salmon, Otter, riparian breeding birds. | Minor 1st order stream to northwest of site unlikely to contain protected aquatic species, Common frog may occur. | Minor 1st order stream to northwest of site unlikely to contain protected aquatic species, Common frog may occur. |
| 1.2.11 | Potential to impact on salmonid habitat - protected under SI Regulations | N/A - no connectivity to Salmonid Regulation watercourse | N/A - no connectivity to Salmonid Regulation watercourse | N/A - no connectivity to Salmonid Regulation watercourse |
| 1.2.12 | Potential to impact on a freshwater pearl mussel - protected under SI Regulations | N/A - no connectivity to Freshwater Pearl Mussel watercourse | N/A - no connectivity to Freshwater Pearl Mussel watercourse | N/A - no connectivity to Freshwater Pearl Mussel watercourse |
| 1.2.13 | Potential to impact upon high quality aquatic habitat for protected aquatic species. | N/A - no connectivity to high quality aquatic habitat | Minor 1st order stream to northwest of site unlikely to contain protected aquatic species | Minor 1st order stream to north of site unlikely to contain protected aquatic species |
| 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 habitats of fisheries importance | N/A - no connectivity to aquatic habitats of fisheries importance | N/A - no connectivity to aquatic habitats of fisheries importance |
| 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 WTP1. There are no water bodies within the boundary or within 100m of WTP1 therefore this is the least constrained Option.</p> | <p>The constraints associated with this site are: - SHANNON (LOWER)_050 waterbody which is moderate status.</p> <p>There is one waterbody within the boundary or within 100m of WTP2 therefore this is the more constrained Option compared to WTP1.</p> <p>It is however noted that the potential construction phase impacts are mitigable.</p> | <p>The constraints associated with this site are: - SHANNON (LOWER)_050 waterbody which is moderate status.</p> <p>There is one waterbody within the boundary or within 100m of WTP3 therefore this is the more constrained Option compared to WTP1.</p> <p>It is however noted that the potential construction phase impacts are mitigable.</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 | Some Fluvial flooding the 1%AEP within the site boundary | Some Fluvial flooding the 1%AEP within 100m of the site |
| 1.5 | Air/Climatic Factors | | | |
| | NOISE | | | |
| 1.5.1 | Potential for Construction phase noise impact at Sensitive receptors | Approx. 430m from site boundary to nearest residential receptor. | Approx. 250m from site boundary to nearest residential receptor. | Approx. 125m from site boundary to nearest residential receptor. |
| 1.5.2 | Potential for Operational phase noise impact at Sensitive receptors | Approx. 430m from site boundary to nearest residential receptor. | Approx. 250m from site boundary to nearest residential receptor. | Approx. 125m from site boundary to nearest residential receptor. |
| 1.5.3 | Existing Ambient Noise Climate in the Area (significant noise sources) | Nearest residences located along local road. Existing ambient and background noise expected to be very quiet. TBC | Nearest residences located along local road. Existing ambient and background noise expected to be very quiet. TBC | Nearest residences located along local road. Existing ambient and background noise expected to be very quiet. TBC |
| 1.5.4 | Construction Phase Impact rating | Very Low | Low | Mid Range |
| 1.5.5 | Operational Phase Impact rating | Very Low | Low | Mid Range |
| | AIR | | | |
| 1.5.6 | Potential for Construction phase Air Quality impact at Sensitive receptors | Approx. 430m from site boundary to nearest residential receptor. | Approx. 250m from site boundary to nearest residential receptor. | Approx. 125m from site boundary to nearest residential receptor. |
| 1.5.7 | Potential for Operational phase Air Quality impact at Sensitive receptors | Approx. 430m from site boundary to nearest residential receptor. | Approx. 250m from site boundary to nearest residential receptor. | Approx. 125m 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 | Mid Range |
| 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) - CH | | | |
| 1.7.1 | Potential to impact (direct/indirect) on National Monuments (designated sites) | Very low - none present within the receiving environment | Very low - none present within the receiving environment | Very low - none present within the receiving environment |
| 1.7.2 | Potential to impact (direct/indirect) on RMPs (designated sites) | Low - Two RMP within 500m | Very low - none present within the receiving environment | Low - Two RMP within 500m |
| 1.7.3 | Potential to impact (direct/indirect) on RPS (designated sites) | Very low - none present within the receiving environment | Very low - none present within the receiving environment | Very low - none present within the receiving environment |
| 1.7.4 | Potential to impact (direct/indirect) on NIAH | Very low - none present within the receiving environment | Very low - none present within the receiving environment | Very low - none present within the receiving environment |
| 1.7.5 | Potential to impact (direct/indirect) on historic designed landscapes | Very low - none present within the receiving environment | Very low - none present within the receiving environment | Very low - none present within the receiving environment |

| | | | | |
|------------|--|---|---|---|
| 1.7.6 | Potential to impact on ACA | Very low - none present within the receiving environment | Very low - none present within the receiving environment | Very low - none present within the receiving environment |
| 1.7.7 | Recorded shipwreck sites | Very low - none present within the receiving environment | Very low - none present within the receiving environment | Very low - none present within the receiving environment |
| 1.8 | Landscape & Visual | | | |
| 1.8.1 | Potential to impact on designated areas of 'Highly Sensitive Landscape' | Mid-range - 'General sensitivity' identified in current CDP. Draft CDP indicates 'Class 4 sensitivity' (2nd highest of 6 no. categories). This LCA has 'low' capacity to accommodate industrial developments, but indicates that 'low' effects are likely to arise from 'water services' developments. | Mid-range - 'General sensitivity' identified in current CDP. Draft CDP indicates 'Class 4 sensitivity' (2nd highest of 6 no. categories). This LCA has 'low' capacity to accommodate industrial developments, but indicates that 'low' effects are likely to arise from 'water services' developments. | Mid-range - 'General sensitivity' identified in current CDP. Draft CDP indicates 'Class 4 sensitivity' (2nd highest of 6 no. categories). This LCA has 'low' capacity to accommodate industrial developments, but indicates that 'low' effects are likely to arise from 'water services' developments. |
| 1.8.2 | Potential to impact on rare or distinctive landscape elements (rock outcrops, water bodies etc.) | Very low - Forestry and rough grazing | Very low - Forestry and rough grazing | Very low - Forestry and rough grazing |
| 1.8.3 | Potential to disrupt landscape structure (treelines / hedgerows / field pattern etc.) | Low - Typical hedgerows | Low - Typical hedgerows | Low - Typical hedgerows |
| 1.8.4 | Potential to impact on woodlands and significant tree groups | Very low - No woodlands or significant treelines | Very low - No woodlands or significant treelines | Very low - No woodlands or significant treelines |
| 1.8.5 | Potential to impact on historic designed landscapes | Very low - Does not appear to be a designed landscape remnant? See CH appraisal | Very low - Does not appear to be a designed landscape remnant? See CH appraisal | Very low - Does not appear to be a designed landscape remnant? See CH appraisal |
| 1.8.6 | Potential to alter the prevailing landscape character | Mid-range - Industrial infrastructure within undeveloped and isolated rural context | Mid-range - Industrial infrastructure within undeveloped and isolated rural context | Mid-range - Industrial infrastructure within undeveloped and isolated rural context |
| 1.8.7 | Potential to impact on designated scenic routes / views | Very low - None in the vicinity | Very low - None in the vicinity | Very low - None in the vicinity |

| | | | | |
|--------|--|---|---|---|
| 1.8.8 | Potential to impact on views from heritage/tourist/amenity features of national or regional importance | Very low - not readily visible from surrounding area | Very low - not readily visible from surrounding area | Low - slight potential to be seen from Birdhill area |
| 1.8.9 | Potential to impact on views from settlements | Very low - not visible from settlements | Very low - not visible from settlements | Low - slight potential to be seen from Birdhill area |
| 1.8.10 | Potential to impact on views from dwellings / local roads | Very low - does not appear to be visible from any dwellings | Low - slight potential to be seen from a farmstead to the north | Low - slight potential to be seen from dwellings lining R494(W) and R496 (N) |
| 1.8.11 | Potential to impact on views from motorways | Very low - none in the vicinity | Very low - none in the vicinity | Very low - none in the vicinity |
| 1.8.12 | Potential to impact on views from other major roads (national or regional roads) | Very low - not likely to be visible | Low – Slight potential to be visible from local road to NE | Low - slight potential to be seen from R494(W) and R496 (N) |
| 1.8.13 | Potential to impact on views from rail lines | Very low - not likely to be visible | Very low - not likely to be visible | Very low - not likely to be visible |
| 1.8.14 | Potential to impact on arrival views from Airports including aerial approach and vehicular egress | Very low - none in the vicinity | Very low - none in the vicinity | Very low - none in the vicinity |
| 1.8.15 | Potential to impact on views from national 'way marked' walking routes | Very low - none in the vicinity | Very low - none in the vicinity | Very low - none in the vicinity |
| 1.8.16 | Potential to impact on local walks | Very low - none in the vicinity | Very low - none in the vicinity | Very low - none in the vicinity |
| 1.8.17 | Potential to impact on views from angling or swimming locations (rivers, lakes, sea) | Very low - none in the vicinity | Very low - none in the vicinity | Very low - none in the vicinity |
| 1.8.18 | Potential that landscape screening measures will be ineffective or incongruous | Very low - dense tall screening vegetation would not appear out of place or contribute to visual impacts | Very low - dense tall screening vegetation would not appear out of place or contribute to visual impacts | Very low - dense tall screening vegetation would not appear out of place or contribute to visual impacts |

| | | | | |
|--------|--|--|--|--|
| 1.9 | Material Assets (Landuse) | | | |
| 1.9.1 | Landtake | 12ha | 12ha | 12ha |
| 1.9.2 | Farming Enterprise | Beef & Sheep | Beef & Sheep | Dairy |
| 1.9.3 | Number of landowners impacted within site boundary | 2 | 6 | 1 |
| 1.9.4 | Land Quality | Poor/Medium | Medium/Good | Good |
| 1.9.5 | Severance based on site location within overall land holdings | Individual farm impact to be evaluated when exact site location decided | Individual farm impact to be evaluated when exact site location decided | Individual farm impact to be evaluated when exact site 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, disruption to existing farm infrastructure |
| 1.9.7 | Crop rotation practiced | No predominately permanent pasture | No predominately permanent pasture | No predominately permanent pasture |
| 1.9.8 | Overall Impact | Low impact-slight at national level | Low impact-slight at national level | Mid- range 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. | No tourism amenities/facilities or tourism hotspots located in this area | No tourism amenities/facilities or tourism hotspots located in this area | No tourism amenities/facilities or tourism hotspots located in this area |

| | | | | |
|-------------|---|--|--|--|
| 1.11 | Population | | | |
| | PEOPLES & COMMUNITIES | | | |
| 1.11.1 | Number of residential & commercial buildings 300-500m from site boundary | Residential receptors located within 500m (470m approx.) of this proposed site. | Residential receptor located within 500m (295m approx.) of this proposed site | 2 no. residential receptors with associated farm buildings as well as the Forthenry Business Park within 500m of this proposed site |
| 1.11.3 | Potential to impact on known community amenities and facilities within 1km from site boundary. | Site location for the proposed WSP Water Treatment Plant is located away from any known community amenities or facilities. | Site location for the proposed WSP Water Treatment Plant is located away from any known community amenities or facilities. | Site location for the proposed WSP Water Treatment Plant is located away from any known community amenities or facilities. |
| 1.11.4 | Potential to impact on areas of Significant Population Densities | Site location for the proposed WSP Water Treatment Plant is located away from any significant population densities | Site location for the proposed WSP Water Treatment Plant is located away from any significant population densities | Site location for the proposed WSP Water Treatment Plant is located away from any significant population densities |
| 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) | Mainly LI | LI |
| 1.13.2 | Vulnerability Classification - potential for groundwater contamination | Low Vulnerability | Low Vulnerability | Low 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 records | None identified | None identified | None identified |

| | | | | |
|---------|---|---|---|---|
| 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 | Not applicable | Not applicable | Not applicable |
| 1.13.9 | Potential to encounter shallow bedrock during construction (interactions with other disciplines during construction - noise, dust etc.) | Soil exposures indicated DTB>3m | Soil exposures indicated DTB>3m | Soil exposures indicated DTB>3m |
| 1.13.10 | Potential impact on karst features | None identified | None identified | None identified |
| 1.13.11 | Potential to encounter soft ground | Areas of Soft, poorly drained soils and peaty podzols present | Areas of Soft, poorly drained soils and peaty podzols present | Areas of Soft, poorly drained soils and peaty podzols present |
| 1.13.12 | Soils Types | AMinPD, surface water/ groundwater gley | AMinPD, surface water/ groundwater gley | AMinPD, surface water/ groundwater gley |
| 1.13.13 | Sub Soil Types | TLPDSSs | TLPSSs | TLPDSSs |
| 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 | High | Mid-range | High |
| 2.1.2 | Number of crossings required for access road | Low | Very Low | Low |

| | | | | |
|------------|---|---|---|--|
| 2.1.3 | Potential Impact on landowners | Low | High | Low |
| 2.1.4 | Works required to provide safe access entrance | Low | High | Mid-range |
| 2.1.5 | Potential impact on surrounding local road network | Low | High | Mid-range |
| 2.1.6 | Frequency of accidents near entrance | Very Low | High | Low |
| 2.1.7 | Frequency of accidents on surrounding network | Very Low | High | Low |
| 2.1.8 | Road link impacted upon by all construction traffic | Low | High | Low |
| 2.1.9 | Construction Risk | Low | Very High | High |
| 2.2 | Planning Policy | | | |
| 2.2.1 | Planning Policy | Tipperary County Development Plan (North Tipp) | Tipperary County Development Plan (North Tipp) | Tipperary County Development Plan (North Tipp) |
| 2.2.2 | Existing Land Use | Agricultural | Agricultural | Forestry |
| 2.2.3 | Zoning | No Zoning | No Zoning | No Zoning |
| 2.2.4 | Local Objectives | N/A | N/A | N/A |
| 2.2.5 | Other local objectives | N/A | N/A | N/A |
| 2.2.6 | Land Uses present in the vicinity | Village of Birdhill 2.5km distance | Village of Birdhill 2.6km distance | Village of Birdhill 2.3km distance |
| 2.2.7 | Zoning present in the vicinity | Birdhill Settlement Plan / Ballina Settlement Plan | Birdhill Settlement Plan / Ballina Settlement Plan | Birdhill Settlement Ballina / Settlement Plan |

| | | | | |
|-------|--|---|---|---|
| 2.2.8 | Local objectives in the vicinity | N/A | N/A | N/A |
| 2.2.9 | Other local objectives in the vicinity | Birdhill Settlement Plan / Ballina Settlement Plan | Birdhill Settlement Plan / Ballina Settlement Plan | Birdhill Settlement Plan / Ballina Settlement Plan |
| 2.3 | Engineering and Design | | | |
| 2.3.1 | Constructability | Greenfield site with few constraints apart from access | Greenfield site with few constraints apart from access | Greenfield site with few constraints apart from access |
| 2.3.2 | Process waste arising's | Process wastes will be treated and retained on site | Process wastes will be treated and retained on site | Process wastes will be treated and retained on site |
| 2.3.3 | Power availability | 38kV line in area; capacity to be confirmed | 38kV line in area; capacity to be confirmed | 38kV line in area; capacity to be confirmed |
| 2.4 | Capital and Operational Costs | | | |
| 2.4.1 | CAPEX | €97.75m | €97.75m | €97.75m |
| 2.4.2 | OPEX | €12.83m / annum | €12.83m / annum | €12.83m / annum |

1.4 Preferred Site

A comparison of the three WTP 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 WTP Sites

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

With reference to the appraisal criteria presented in Table 1-2, where the sites are ranked in order of preference and least constraint, WTP Site 1 represents the preferred location for the siting of a water treatment plant for the following reasons:

- WTP Site 1 benefitted from more favourable potential traffic connections to the N7 and ability to significantly mitigate, through avoidance, human health impacts associated with construction and haulage traffic employing regional and local roads in the area.
- WTP Sites 2 and 3 are more constrained by residential and commercial receptors, and proximity to a watercourse which is categorised as 'moderate status'.

2. Screening to Identify Preliminary Sites

2.1.1 Introduction

The water treatment plant will be constructed in two phases; the first phase will be designed to deliver an initial output of treated water of 160MI/day (from 2024/2025), rising to 240MI/day (up to 2030). Phase 2 will be designed to bring the treated water output from the plant to 320MI/day by 2050. Four modular water treatment streams, each capable of producing 80MI/day of treated water, would be needed to meet these output requirements. It is estimated that a site area of 14 hectares will be needed to accommodate a 330MI/day water treatment plant.

2.1.2 Preliminary Screening of Water Treatment Plant Sites

A screening of sites for the raw water abstraction location in Parteen Basin, set out in Appendix E, has concluded that the preferred location for such abstraction is along the eastern shore of the lake, immediately north of the ESB embankment. It is desirable that the water treatment plant (WTP) site for the project be located in relatively close proximity to the raw water abstraction site, to minimise the length of raw water rising mains required to deliver water to the WTP from the raw water abstraction point.

The Birdhill to Ballina road (R494) runs in a north-south direction approximately 800-900m east of the preferred abstraction location, effectively bisecting the area that might be suitable for locating a 14ha water treatment plant site. It would not be desirable to have a facility of this size and type located so close to the public road as it would have a strong visual impact in what is essentially a rural area. There are also a considerable number of existing residential properties along the R494, shown as 'existing residences' on Figure 2.1, restricting the choices available.

Figure 2.1 shows the preferred location of the raw water abstraction point and three general areas in reasonably close proximity (less than 3km) to it; and which were investigated as possible locations for a water treatment plant site. Also shown on Figure 2.1 are the extents of the Lower River Shannon SAC, and other constraints that exist within each of these areas, including potential fluvial/ pluvial flood and sites of archaeological interest.



Figure 2.1 Potential Water Treatment Plant Site Areas

The first of the three areas considered, Area 1, covers 1.37km² and lies 1.5km to 2.5km north east of the abstraction location and the R494 Birdhill to Ballina road.

Area 2 is south of the abstraction point and covers an area of 2.3km². It extends north of the Kilmastulla River, and is bounded along the west by Parteen Basin and to the south east by the R466 road between Birdhill and O'Briensbridge.

Area 3 (0.87km²) incorporates considerable existing development, including residential properties. However it does include the Shannonside Business Park, which contains existing industrial type buildings and activity, and could therefore be considered as having an established use upon which a large water treatment plant would have a less significant impact than it would have on the more rural settings in Areas 1 and 2.

Area 1 is largely composed of open farmland. Sites within this area are not highly visible from the public roads, are not in close proximity to a large number of houses and do not impact directly on priority habitats.

The greater part of Area 2, as can be seen from Figure 2.1, is environmentally constrained by the Lower Shannon SAC, including the Kilmastulla River, which traverses the northern part of the area. Furthermore, a study of flood mapping shows that Area 2 also lies within the flood plain of the Kilmastulla River. The northern portion of the area, north of the Kilmastulla River is less environmentally constrained but would still involve having a major construction site bounded on two sides by the Lower River Shannon SAC, in the form of Parteen Basin and the Kilmastulla River itself. Therefore Area 2 is considered to be a less suitable location for a WTP site than Area 1.

The Kilmastulla River also crosses Area 3, as does the Limerick-Nenagh railway line and the R445 (old N7) road. This makes this area difficult from a siting viewpoint as no site of the required size can be found adjacent to the Shannonside Business Park that does not straddle the Kilmastulla River. Nor is there any site of sufficient size available entirely north of the Kilmastulla that does not come very close to existing housing. Area 3 was therefore not considered further as a potential location for the water treatment plant site.

Figure 2.2 shows three potential sites within Area 1, plotted on mapping which includes designated areas, flood mapping (blue) and woodlands (grey), archaeological sites and existing residential properties. Figure 2.3 shows the sites incorporating contours for the area.

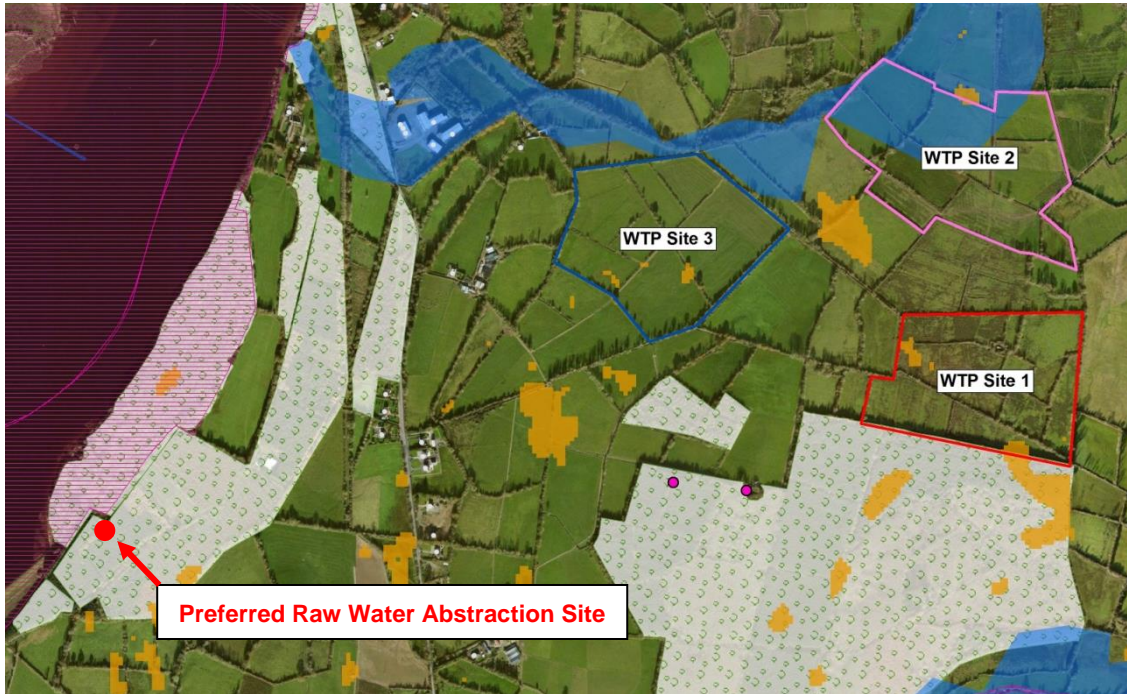


Figure 2.2 Potential Water Treatment Plant Sites

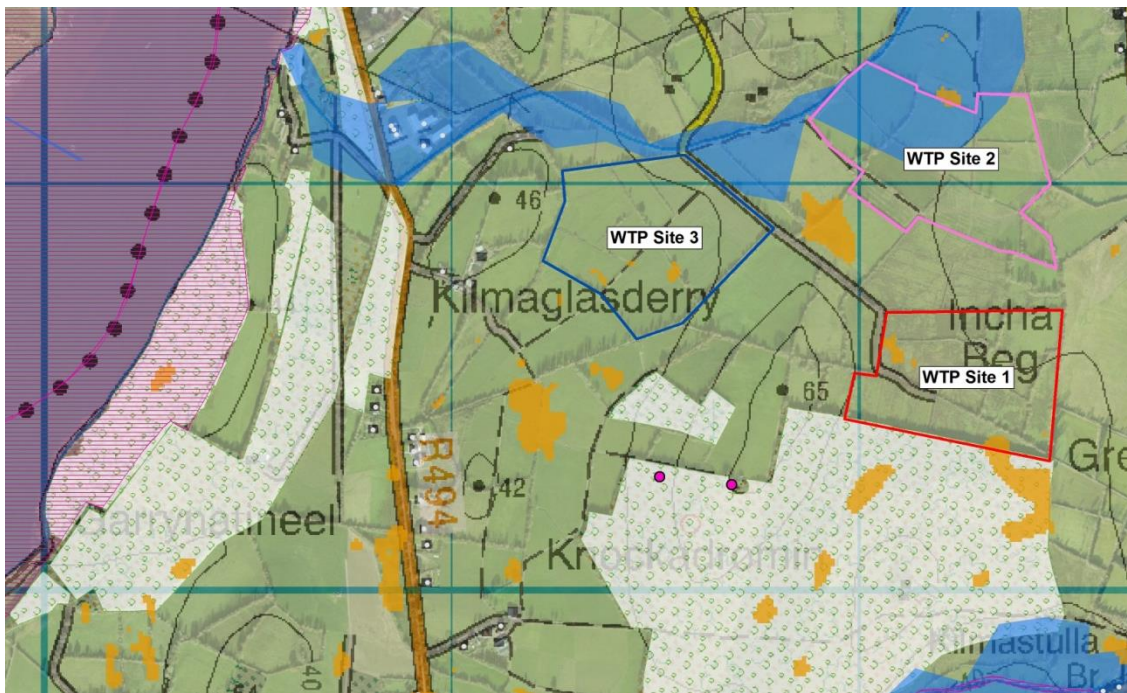


Figure 2.3 Potential Water Treatment Plant Sites with Contours

Site identification was carried out against the following criteria:

- Maximise distances from existing housing

- Sites should have no or minimal impact on designated sites or other identified ecology habitats
- Sites should avoid the high ground immediately west of Site 1 and have low visual impact
- Access from public roads is available or feasible
- Sites should have no or minimal impact on archaeological sites

Table 2-1 summarises the initial assessment of the sites.

Table 2-1: Summary Comparison of Potential Water Treatment Plant Locations

| | WTP Site 1 | WTP Site 2 | WTP Site 3 |
|--|---|---|---|
| Proximity to Housing | 9 properties within 500m of eastern site boundary | 5 properties within 500m of eastern and northern site boundaries | 10 properties within 500m of western and southern boundaries. |
| Impact on Designated Sites or other habitats | Open farmland; no designated sites or known ecological habitats within site | Open farmland; no designated sites or known ecological habitats within site | Open farmland; no designated sites or known ecological habitats within site |
| Visual impacts | Ground levels on site estimated to be generally 45m-50m OD. Screened from R494 by forestry and high ground. Screened from R445 (old N7) by forestry. | Likely to be visible from local road to east of site, although traffic on this road is likely to be light | Likely to be visible from R494, but screening could mitigate this |
| Access from Public Roads | Site could be accessed by upgrading existing track from R496 (~1.6km long). Alternative access roads could be constructed from R494, (1.2km long) or from R445 (650m long). | Access available via local roads but these would need to be upgraded | Access from R494 possible (450m long) |
| Impact on archaeological sites | No known monuments within the site | No known monuments within the site | No known monuments within the site |
| Flood risk | Low | Small portion to north of site within a flood plain. Enough land available outside flood plain to accommodate required site footprint | Low |

3. WTP Site 1

WTP Site 1 is contained within a sparsely populated rural area that is enclosed within a broad triangle formed by the R496, R445 and R494 regional roads. It is located close to amenity woodland to the south in the townland of Incha Beg and is the most southern site location of the prospective sites; see Figure 3.1.



Figure 3.1 – WTP Site 1

(i) Ecology

The WTP Site 1 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 at the site. There are also no surface water features on or adjacent to the site; however, access to R445 from this site may require a potential crossing of a tributary of the Kilmastulla River, due south. The crossing point is located directly upstream of the Lower River Shannon SAC boundary on the Kilmastulla River main channel.

No protected flora species were recorded on this site and the potential of occurrence was evaluated as 'low'; therefore, no species listed on the Flora Protection Order are expected to occur. Ecological surveys found that no Annex II species are likely to occur at this site; however, as mentioned, access for this site could potentially cross a tributary of the Kilmastulla River which is located directly upstream of the Lower River Shannon SAC boundary. Mitigation would be required if this access route is employed. Annex IV bat species are likely to use this general location and forage along the boundaries, but no potential roosts were recorded on the site.

The site was found to have low breeding and wintering bird value. Passerine bird species were present but no flora or fauna protected under the Wildlife Act 1979 (Amendment 2000) were recorded at this site.

There is no connectivity to salmonid or freshwater pearl mussel watercourses or no potential effects on coastal or marine receptors at the site.

(ii) Aquatic Ecology

There are no surface water features on or adjacent to the site; however, access to the R445 would include a potential crossing of a tributary of the Kilmastulla River, due south. The crossing point is located directly upstream of the Lower River Shannon SAC boundary on the Kilmastulla River main channel.

There are no Annex I habitats or potential Annex I habitats located at WTP Site 1. No protected flora species were recorded and the potential of occurrence was evaluated as 'low'; therefore, no species listed on the Flora Protection Order are likely to occur. Ecological surveys found that no aquatic Annex II species are likely to occur at this site; however, as mentioned, access for this site could potentially cross a tributary of the Kilmastulla River which is located directly upstream of the Lower River Shannon SAC boundary. Mitigation would be required if this access route is employed. No aquatic Annex IV species were recorded at this site and no aquatic habitat exists to support breeding or wintering Annex I water birds.

Aquatic species protected under the Wildlife Act 1979 (Amendment 2000) include the Common Frog which may occur at this site. Potential access from the south, which would require crossing of a tributary of the Kilmastulla River, would require mitigation for aquatic species including Brown Trout, Atlantic Salmon; Otter and riparian breeding birds.

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 aquatic ecological receptors at is evaluated as 'very low'.

(iii) Surface Water

There are no identified constraints with the site. There are no water bodies within the boundary or within 100m of the proposed site.

(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 430m 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 430m 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 is no recorded built heritage or cultural heritage sites located within the vicinity of this site. As such the impact potential has been defined as very low. Similarly there is one recorded archaeological site located approximately 310m southwest of the site; the potential impact has been defined as very low. A review of the historic mapping, along with a field inspection revealed that this site does contain a circular enclosure, which has the potential to represent the remains of an early medieval ring fort, although the site is not a recorded monument. The site also contains the ruins of two vernacular structures which are marked on the historic maps.

The southern part of the site is very water logged and has the potential to contain prehistoric burnt mound activity.

(vii) Landscape and Visual

The site encompasses a number of productive agricultural fields of various sizes, and borders a large commercial forestry plantation along its southern boundary. The settlement of Birdhill lies near the junction of the R494 and the R445 to the southwest of the site, whilst the settlement of Ballina lies near the junction of the R494 and the R496 to the northwest. The settlement of Killaloe is situated on the western banks of the Shannon just under 3km northwest of the site. The Draft Tipperary Landscape Character Assessment identifies that the site is contained within 'LCA 12 River Shannon – Newport', which in turn lies within a 'Lakeland Enclosure' landscape type from the Draft North Tipperary Landscape Character Assessment. This has a landscape sensitivity rating of 'class 4' (second highest of 6 categories).

(viii) Agronomy

a) Farm Enterprise

The site is currently in grassland. The farm enterprise is grass based mainly on cattle and sheep production. There are no farm buildings located within the site boundary. The site area encompasses a number of fields with varying sizes separated by mature hedgerows.

b) 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.

c) Land Quality

According to the Environmental Protection Agency's (EPAs) Soil Classification of Ireland, the soils in the region consist in the main of a fine loamy drift with siliceous stones. The soils are particularly suited to grassland. The land appears to be quite wet in places with rushes present on the land. The land along the north eastern boundary of the site is the best quality land. The land quality would be considered poor to medium quality.

d) Crop Rotation Practised

The land is in permanent pasture and crop rotation is not practised.

(ix) People

The site, which consists of vacant greenfield/agricultural land, is located close to amenity woodland in the townland of Incha Beg. There are no residential, commercial or sensitive receptors in close proximity to the site however there are a number of residential receptors located along a local access road approximately 470m to the east. Access to the site is expected to be gained from the regional R445 [the old national (N7) route] which is located to the south of the site and would follow the eastern boundary of the forest amenity. Access to the site from the east is restricted given the present condition of the local road and the location of the residential receptors associated with it making it unsuitable for construction or operational traffic. There are no tourism amenities/ hotspots located within 500m of this site.

(x) Soils, Geology and Hydrogeology

The site has been mapped¹ as deep poorly drained, mineral soil, derived mainly from non-calcareous parent materials (AminPD). A site visit and site investigation was undertaken in July 2016. Based on the site visit, soils comprise of soft to moderately firm, moist, grey brown, sandy CLAY with occasional sandstone boulders and cobbles. The steeper sloping drumlins to the north east are generally associated with dryer soils.

¹ Information regarding the soil classifications was obtained from the EPA web-mapping site, containing soil information from the Teagasc/EPA soil & subsoil mapping project.

The vulnerability for the site is classified as 'low' vulnerability based on the GSI data. No bedrock exposure was recorded in the drainage ditches or across the site.

The bedrock map indicates that the site is underlain by Dinantian Lower Impure 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 negligible 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.

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. The site is located outside of the environs of the settlements in the area; care must be taken with any potential siting of any infrastructure within this site.

(xii) Traffic, Engineering and Design

Access can be attained from the R445 regional road, comprising a carriageway cross section of two 3.25m wide traffic lanes, two 1.9m wide cycle lanes and 1.5m wide grass verges. Pavement and road marking conditions along the R445 are good. The second potential access is from an unnamed local road to the east of the proposed site. The local road has connectivity to the R445 to the south and the R496 to the north.

Access from R445 would be within the existing 80km/h rural speed limit zone. Visibility is locally restricted due to existing landscaping elements but can be improved via setback and cutting back of the existing landscaping. The Road Safety Authorities Collision Statistics database has recorded three number minor collisions (2 in 2007 and 1 in 2005) within the vicinity.

Access to the site from R445 will require the construction of up to 625m of access road with culvert (to cross existing land drain) and a potential crossing of the Kilmastulla River.

Access from the unnamed local road, orientated north south between the R496 and the R445 regional roads, would be within an 80 km/h speed limit, with pavement conditions along the road being poor. The carriageway comprises a 3.0m wide traffic lane with no central road markings and no hard strips. Access for large vehicles is restricted due to the horizontal alignment of the local road. Vehicles are required to negotiate a series of ninety degree bends. The use of the local road network will result in the requirement for extensive pavement renewal and potential full depth road construction. Additional lands would be required to improve visibility splays and to provide passing bays along the local road network. The Road Safety Authorities Collision Statistics database has no recorded collisions within the vicinity of the proposed access.

4. WTP Site 2

WTP Site 2 is located to the north of WTP Site 1 and east of WTP Site 3 and contained within a sparsely populated rural area that is enclosed within a broad triangle formed by the R496, R445 and R494 regional roads; see Figure 4.1.



Figure 4.1 – WTP Site 2

(i) Ecology

WTP 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 at the site. There is a minor watercourse which flows along the northern boundary, resulting in a pathway for potential impacts on the Lower River Shannon downstream within Parteen Basin.

No protected flora species were recorded and the potential of occurrence was evaluated as 'low'; therefore, no species listed on the Flora Protection Order are expected to occur. Ecological surveys found that no Annex II species are likely to occur at this site. Annex IV bat species are likely to use this general area and forage along the boundaries of the site, but no potential roosts were recorded during site visits.

The WTP Site 2 was found to have low breeding and wintering bird value. Passerine bird species were present but no flora or fauna protected under the Wildlife Act 1979 (Amendment 2000) were recorded at this site.

There is no connectivity to salmonid or freshwater pearl mussel watercourses or no potential effects on coastal or marine receptors; however, there is a minor 1st order stream to the northwest of the site but it is unlikely to contain protected aquatic species. The potential for significant impacts affecting ecological receptors at the site is evaluated as 'low'.

(ii) Aquatic Ecology

There is a minor watercourse which flows along the northern boundary of the site, resulting in a pathway for potential impacts on the Lower River Shannon downstream and within Parteen Basin. The crossing point of this waterbody through the potential site, is located directly upstream of the Lower River Shannon SAC boundary on the Kilmastulla River main channel.

There are no Annex I habitats or potential Annex I habitats located at the site. No protected flora species were recorded and the potential of occurrence was evaluated as 'low'; therefore, no species listed on the Flora Protection Order are likely to occur. Ecological surveys found that no aquatic Annex II or Annex IV species are likely to occur. No aquatic habitat exists to support breeding or wintering Annex I water birds.

The minor 1st order stream to the northwest of the site is unlikely to contain protected aquatic species with the exception of the Common Frog which is protected under the Wildlife Act 1979 (Amendment 2000).

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

(iii) Surface Water

Table 4-1 details the Water Framework Directive (WFD) water bodies within the area of WTP Site 2.

Table 4-1 WTP Site 2 WFD Watercourses

| Waterbody Name | Waterbody Type | EU WFD Code | WFD Status (2010-2012) |
|---------------------|----------------|-----------------|------------------------|
| Shannon (Lower)_050 | River/Stream | IE_SH_25S012500 | Moderate |

The constraints associated within the site are:

- Shannon (Lower)_050 waterbody which is of 'moderate' status lies to the northwest boundary of the site. This waterbody is located 1.5km upstream of Parteen Basin.
- There is one waterbody, within the boundary of the site, showing some fluvial flooding in the 1% Annual Exceedance Probability (AEP)².

(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 250m from the nearest sensitive receptor, with the longer the distance being the most preferable from an air quality point of view.

² The AEP is the estimated likelihood of a particular magnitude flood occurring or being exceeded in any given year. Thus, a 1% AEP event represents an estimated flood event which has a 1% (or 1 in 100) chance of occurring or being exceeded in any given year.

(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 WTP Site 2 lies approximately 250m 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 is no recorded archaeological, built heritage or cultural heritage sites located within the vicinity of this site. As such the impact potential has been defined as very low. A review of the historic mapping, along with a field inspection, revealed that the north-eastern boundary is formed by a stream. The presence of water courses within the landscape increases the chance of discovering prehistoric burnt mound activity.

(vii) Landscape and Visual

The site encompasses several geometric agricultural fields that are defined by mature tree lined hedgerows. There is a local road serving a small number of dwellings that runs in a north - south direction between the R496 and R495, which passes approximately 350m to the east at its closest point. The settlement of Birdhill lies near the junction of the R494 and the R445 to the southwest of the site, whilst Ballina lies near the junction of the R494 and the R496 to the northwest. The settlement of Killaloe is situated on the western banks of the Shannon just under 3km northwest of the site. The Draft Tipperary Landscape Character Assessment identifies that the site is also contained within 'LCA 12 River Shannon – Newport', which in turn lies within a 'Lakeland Enclosure' landscape type from the Draft North Tipperary Landscape Character Assessment. This has a landscape sensitivity rating of 'class 4' (second highest of 6 categories).

(viii) Agronomy

a) Farm Enterprise

The site is currently in grassland. The predominant farm enterprise within the site area is grass based mainly on cattle and sheep production. The site area encompasses a number of fields with varying sizes separated by mature hedgerows.

b) Number of Landowners impacted within the site boundary

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

c) 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 siliceous stones. The soils are particularly suited to grassland. The land quality would be considered medium to good quality land.

d) Crop Rotation Practised

The land is in permanent pasture and crop rotation is not practised. The land along the northern boundary of the site appears to be used for silage production.

(ix) People

There are no residential, commercial or sensitive receptors in immediate proximity to the site however there are a number of residential receptors located along a local access road approximately 295m to the east. As stated above in regard to WTP Site 1, access to the site from the east is restricted given the present condition of the local road and the location of the residential receptors associated with it making it unsuitable for traffic

associated with construction or operation phases. There are no tourism amenities/ hotspots located within 500m of this site.

(x) Soils, Geology and Hydrogeology

The site has been mapped³ as deep poorly drained, mineral soil, derived mainly from non-calcareous parent materials (AminPD). A site visit and site investigation was undertaken in July 2016. Based on the site visit, soils comprise of moderately firm, moist, grey brown, sandy CLAY with occasional sandstone boulders and cobbles.

The vulnerability of the site is classified as 'low' vulnerability based on the GSI data. No bedrock exposure was recorded in the drainage ditches or across the site.

The bedrock map indicates that the site is underlain by Dinantian (early) Sandstones, Shales and Limestones and Dinantian Lower Impure 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 negligible 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.

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; care must be taken with any potential siting of any infrastructure within this site.

(xii) Traffic, Engineering and Design

Access can be attained from an unnamed local road to the east of the proposed site. The local road has connectivity to the R445 to the south and the R496 to the north. The second potential access is situated to the end of an existing farm access track

Access from the unnamed local road, orientated north south between the R496 and the R445 regional roads, would be within an 80 km/h speed limit, with pavement conditions along the road being poor. The carriageway comprises a 3.0m wide traffic lane with no central road markings and no hard strips. Access for large vehicles is restricted due to the horizontal alignment of the local road. Vehicles are required to negotiate a series of ninety degree bends. The use of the local road network will result in the requirement for extensive pavement renewal and potential full depth road construction. Additional lands would be required to improve visibility splays and to provide passing bays along the local road network. The Road Safety Authorities Collision Statistics database has no recorded collisions within the vicinity of the proposed access.

The existing junction of the farm access road to the R496 regional road is sited in a dip in the vertical road alignment of the R496. The access is situated within the 80 km/h speed limit zone. Adjoining domestic properties are not visible from the existing junction. During the site visit it was noted that the majority of domestic properties require the use of convex mirrors to facilitate safe access and egress from their properties due to visibility issues. The provision of an access off the existing access track will require two number river/stream crossings. The track is approximately 3m in width with established trees to either side. The Road

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.

Safety Authorities Collision Statistics database has no recorded collisions within the vicinity of the proposed access.

5. WTP Site 3

WTP Site 3 is located to the west of WTP Site 1 and WTP Site 2 and contained within a sparsely populated rural area that is enclosed within a broad triangle formed by the R496, R445 and R494 regional roads; see Figure 5.1.



Figure 5.1 – WTP Site 3

(i) Ecology

WTP Site 3 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 at the site. There is a minor watercourse which flows along the northern boundary, resulting in a pathway for potential impacts on the Lower River Shannon downstream and within Parteen Basin.

No protected flora species were recorded and the potential of occurrence was evaluated as 'low'; therefore, no species listed on the Flora Protection Order are expected to occur. Ecological surveys found that no Annex II species are likely to occur at this site. Annex IV bat species are likely to use this location and forage along the boundaries of the site; however no potential roosts were recorded during site visits.

The site was found to have low breeding and wintering bird value. Passerine bird species were present but no flora or fauna protected under the Wildlife Act 1979 (Amendment 2000) were recorded at this site.

There is no connectivity to salmonid or freshwater pearl mussel watercourses or no potential effects on coastal or marine receptors at the site; however, there is a minor 1st order stream to the northwest but it is unlikely to contain protected aquatic species. The potential for significant impacts affecting ecological receptors is evaluated as ‘low’.

(ii) Aquatic Ecology

Pathways for impacts potentially affecting aquatic ecological receptors have been identified for the site. There is a minor watercourse which flows along the northern boundary, resulting in a pathway for potential impacts on the Lower River Shannon downstream and within Parteen Basin. The crossing point of this waterbody is located directly upstream of the Lower River Shannon SAC boundary on the Kilmastulla River main channel.

There are no Annex I habitats or potential Annex I habitats located at the site. No protected flora species were recorded and the potential of occurrence was evaluated as ‘low’; therefore, no species listed on the Flora Protection Order are likely to occur. Ecological surveys found that no aquatic Annex II or Annex IV species are likely to occur at this site. No aquatic habitat exists to support breeding or wintering Annex I water birds.

The minor 1st order stream to the northwest of the site is unlikely to contain protected aquatic species with the exception of the Common Frog which is protected under the Wildlife Act 1979 (Amendment 2000).

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 aquatic ecological receptors is evaluated as ‘low’.

(iii) Surface Water

Table 5-1 details the WFD water bodies within the area of WTP Site 3.

Table 5-1 WTP Site 3 WFD Watercourses

| Waterbody Name | Waterbody Type | EU WFD Code | WFD Status (2010-2012) |
|---------------------|----------------|-----------------|------------------------|
| Shannon (Lower)_050 | River/Stream | IE_SH_25S012500 | Moderate |

The constraints associated within the site are:

- Shannon (Lower)_050 waterbody which is of ‘moderate’ status lies outside the north boundary of the site. This waterbody is located 1.3km upstream from of Parteen Basin.
- There is no fluvial flooding in the 1% AEP within the site boundary but there is some flooding within 100m of the site boundary.

(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 125m 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 125m 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 is no recorded built heritage or cultural heritage sites located within the vicinity of this site. As such the impact potential has been defined as very low. Similarly there is one recorded archaeological site located approximately 330m south of the site; the impact potential has been defined as very low. A review of the historic mapping, along with a field inspection failed to identify any previously unrecorded sites of archaeological potential. The northern-eastern part of the site is in proximity to a water course, which does increase the potential for prehistoric burnt mound activity.

(vii) Landscape and Visual

The site is contained in an area of productive agricultural farmlands defined by patchy tree lined hedgerows. The settlement of Birdhill lies near the junction of the R494 and the R445 to the south of the site, whilst Ballina lies near the junction of the R494 and the R496 to the north. The settlement of Killaloe is situated on the western banks of the Shannon just under 3km northwest of the site. The Draft Tipperary Landscape Character Assessment identifies that the site is also contained within 'LCA 12 River Shannon – Newport', which in turn lies within a 'Lakeland Enclosure' landscape type from the Draft North Tipperary Landscape Character Assessment. This has a landscape sensitivity rating of 'class 4' (second highest of 6 categories).

(viii) Agronomy

a) Farm Enterprise

The site is currently in grassland and is part of a dairy enterprise. There are no farm buildings located within the site boundary. The site area encompasses a number of large fields separated by mature hedgerows.

b) 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.

c) 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 siliceous stones. The soils are particularly suited to grassland. The land quality would be considered good quality land.

d) Crop Rotation Practised

The land is in permanent pasture and crop rotation is not practised. The land is used for grazing dairy herd and for silage production.

(ix) People

There are no sensitive receptors located in close proximity to this site location however there is one residential receptor with associated farm buildings located approximately 200m west. There are no tourism amenities/hotspots located within 500m of this site. Access to the site is expected to be gained by way of an access road from the regional R494, a frequently used roadway between Killaloe/ Ballina and the M7 Motorway to the south.

(x) Soils, Geology and Hydrogeology

The site has been mapped⁴ as deep poorly drained, mineral soil, derived mainly from non-calcareous parent materials (AminPD). A site visit and site investigation was undertaken in July 2016. Based on the site visit, soils are moderately firm, moist, grey brown, sandy CLAY with occasional sandstone boulders and cobbles.

The vulnerability for the site is classified as 'low' vulnerability based on the GSI data. No bedrock exposure was recorded in the drainage ditches or across the site.

The bedrock map indicates that the site is underlain by Dinantian (early) Sandstones, Shales and Limestones and Dinantian Lower Impure 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 negligible 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.

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. The site is located outside of the environs of the settlements in the area. Of the three potential Water Treatment Plant site locations, WTP Site 3 has the closest proximity to sensitive receptors; care must be taken with any potential siting of any infrastructure within this site.

(xii) Traffic, Engineering and Design

Access can be attained from the R494 regional route, running in a north-south orientation between Ballina Co. Tipperary and the M7 Motorway. The regional route comprises a carriageway cross section of two 3.0m wide traffic lanes with no hard shoulders/strips. Pavement and road marking conditions along the R463 are poor, with evidence of pavement degradation in the form of surface cracks.

Access would be sited within the existing 80km/h rural speed limit zone. Visibility splays are restricted at locations but can be improved with respect to the set-back distance, by trimming and cutting back of the existing landscaping and boundary treatments.

The Road Safety Authorities Collision Statistics database has recorded three number minor collisions (2 in 2007 and 1 in 2005) within the vicinity of the proposed access

An access track, with culvert over existing drains, of approximately 475m in length would be required to facilitate access; and will be required to cross an existing stream/river.

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.

6. WTP Sites – MCA Comparison

(i) Ecology

The three potential treatment sites are located within improved agricultural grassland. 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 WTP Site 1 is the least constrained location on the basis of ecological receptors within and directly adjacent to the site. However, it is noted that potential access requirements to all sites could give rise to watercourse crossings, with connectivity to the Lower River Shannon SAC downstream. Potential access to WTP Site 1 from the south could require a crossing of a tributary of the Kilmastulla River, directly upstream of the SAC boundary, increasing the potential for significant impacts on this receptor.

(ii) Aquatic Ecology

Pathways for impacts potentially affecting aquatic ecological receptors are identified for all three potential water treatment plant sites. The potential for significant impacts affecting aquatic 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 WTP Site 1 is the preferred location on the basis of ecological receptors within and directly adjacent to the site. However, it is noted that potential access requirements to all sites could give rise to watercourse crossings, with connectivity to the Lower River Shannon SAC downstream. Potential access to WTP Site 1 from the south could require a crossing of a tributary of the Kilmastulla River, directly upstream of the SAC boundary, increasing the potential for significant impacts on this receptor.

(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 WTP Sites – Surface Water Constraints

| Study Area | Rivers / Streams | Lakes | WFD good or higher status | Drinking water | Shellfish Area | Recreational Waters | Nutrient Sensitive | cSAC & SPA |
|------------|------------------|-------|---------------------------|----------------|----------------|---------------------|--------------------|------------|
| WTP Site 1 | | | | | | | | |
| WTP Site 2 | vv | | | | | | | v |
| WTP Site 3 | vv | | | | | | | v |

v - Within close proximity

vv - Within location

There are no identified constraints within WTP Site 1. WTP Sites 2 and 3 are constrained by one waterbody located on the northern boundaries of both sites. This waterbody flows directly into Parteen Basin; a designated cSAC waterbody. Therefore WTP Site 1 is considered to be the least constrained site as there are no water bodies or other WFD designations located within the site boundary or within 100m of the site.

(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 water treatment plant. 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, WTP Site 1 is the preferred location from an air quality perspective as it is at a greater distance from nearby sensitive receptors.

(v) Noise

WTP Site 1 is most preferred from a noise/vibration point of view as it is at the greatest distance from nearby residential receptors. However, it is considered that all of the site options 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 proposed sites are similar in nature when it comes to potential impacts on the recorded archaeological, architectural and cultural heritage resource and as such there is little to separate them on this basis. However, a more detailed analysis of the sites, along with a field inspection has shown that WTP Site 1 contains a circular enclosure that has the potential to represent the remains of an early medieval ring fort. It also contains the remains of two vernacular structures. Based on this, this is considered to be the least preferable site. WTP Site 2 is bordered by a water course to the west and a further small stream passes through the site. The presence of water courses within the landscape increases the potential for the discovery of prehistoric burnt mound activity and the site has second preference over all. WTP Site 3 is considered to be the most preferable site from a cultural heritage perspective.

(vii) Landscape and Visual

All of the WTP sites are considered to be viable possibilities in landscape and visual terms as there are few differentiating constraints within the sparsely populated, relatively homogenous and apparently robust landscape area of gently undulating farmland and forestry that contains them all. Notwithstanding the general sense of landscape robustness experienced during fieldwork, all of these sites are contained within 'LCA 12 River Shannon – Newport', which in turn lies within a 'Lakeland Enclosure' landscape type from the Draft North Tipperary Landscape Character Assessment. This has a landscape sensitivity rating of 'class 4' (second highest of 6 categories). This is the same unit that contains the two RWA sites on the eastern bank of Parteen Basin. However, by comparison, there is much less of a sense of a lakeland context in the vicinity of the three WTP sites than at the RWA sites and the WTP sites also lie in close proximity to the 'Nenagh Corridor' landscape unit to the east, which has a sensitivity rating of only 'Class 1' (second lowest of 6 categories). For this reason the westernmost WTP site (WTP Site 3) is considered to be marginally more constrained than the easternmost sites, which lie nearer the periphery of 'LCA 12 River Shannon – Newport' as it transitions onto a lower sensitivity landscape.

It is considered that all three of the potential WTP sites have the potential for noticeable impacts on landscape character because they would place substantial water services infrastructure into a relatively undeveloped and somewhat isolated rural context. However, this is not a differentiating factor in determining the least constrained option.

In terms of visibility, it is considered that both WTP Site 2 and WTP Site 3 have the potential to be seen from some surrounding roads and residences, albeit at reasonable viewing distances and within a substantially

screened context of intervening hedgerow vegetation. By comparison the WTP Site 1 site avails of considerable terrain, forestry and hedgerow screening and will not be readily visible from surrounding roads, dwellings and settlements.

With regard to the foregoing, WTP Site 1 site is considered to be marginally less constrained than the WTP Site 2 site, which in turn is marginally less constrained than the WTP Site 3.

(viii) Agronomy

A desktop study of each of the potential locations has been carried out for the purpose of establishing a least constrained Water Treatment Plant location. 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 sites have broadly similar land quality and farming patterns.

However due to the presence of a dairy farm within WTP Site 3 and implications for the enterprise from significant land take, or severance of grazing paddocks from the farm buildings, it is deemed to be the most constrained site. WTP 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 WTP Site 1 and WTP Site 2 would be low at farm level, whilst the overall impact at WTP Site 3 would be mid-range. The overall impact would be low at local level and would be slight at national level.

(ix) People

From a socio-economic perspective, there is very little to differentiate the three proposed sites for the WTP in terms of population and tourism constraints. All three of the proposed sites are located in rural green field/ agricultural land and away from residential, commercial and sensitive receptors.

WTP Site 1 is the most southern site location of the prospective sites located close to amenity woodland to the south in the townland of Incha Beg. There are no residential, commercial or sensitive receptors in close proximity to the site however there are a number of residential receptors located along a local access road approximately 470m to the east. Access to the site is expected to be gained from the regional R445 which is the old N7 national route and located to the south of WTP Site 1 and would similarly follow the eastern boundary of the forest amenity.

WTP Site 2 is the most northern site location of the prospective sites, next to the Roolagh Stream (EPA Waterbody Status 'Moderate') on its northern boundary in the townland of Incha More. There are no residential, commercial or sensitive receptors in close proximity to the site however there are a number of residential receptors located along a local access road approximately 295m to the east. It was proposed that this local access road could be used, once it was enhanced and provisions made to accommodate additional heavy traffic, for construction and subsequent operational traffic to and from the WTP if it were located at WTP Site 2. After further assessment and discussion with the Traffic and Transport Specialist it was deemed unsuitable for upgrading as the road is closely lined with residential receptors and the natural course of the route is characterised by a number of sharp twists and turns, which would be unsuitable for heavy good vehicles (HGVs) and other construction traffic. Any upgrade to the road would bring about considerable impacts on the community. As a result of this, the access road for construction traffic would need to follow the path of the proposed access road for WTP Site 1 (from the R445) however continue north a considerable distance to the proposed WTP 2 site.

WTP Site 3 is the most western site location (in the townland of Kilmaglasderry) of the prospective sites and consists of vacant green field/ agricultural land while located in close proximity to the commercial centre Fort Henry Business Park to the north-west. There are no sensitive receptors located in close proximity to this site location however there is one residential receptor with associated farm buildings located approximately 200m west of the site. Access to the site is expected to be gained by way of an access road from the regional R494, a frequently used roadway between Killaloe/Ballina and the M7 Motorway to the south. Given its proximity to

residential and commercial receptors, it is recommended that this site location is excluded from further consideration.

As a result, WTP Site 1 was determined as the site of preference according to Population and Tourism aspects. This is the only site of the two (WTP Site 1 and WTP Site 2) that could be accessed easily by construction and operational traffic once construction and operational phases commence retrospectively as access would be gained from the R445. This would also remove the likelihood of cumulative impacts on neighbouring residential receptors along the local access road to the east.

(x) Soils, Geology and Hydrogeology

No significant constraints were identified at the water treatment plant sites (WTP Site 1, WTP Site 2, and WTP Site 3). The underlying aquifer is described as a locally important aquifer.

All three sites are underlain by low groundwater vulnerability. There is a moderate potential that soft ground will be encountered at WTP Site 1, but no peat was encountered at this location. The site is poorly drained and comprises a very clayey till chiefly derived from shale and sandstone. There are no geological heritage sites located at or within 1 km of any of the three WTP sites; all are located on greenfield 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 chosen for consideration of the potential location of the Water Treatment Plant are within close proximity to each other, at a location approximately 1.6km from Parteen Basin. All three sites are located outside of the nearest settlements of Birdhill and Ballina. 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.

The proximity of the three sites to the nearby settlements of Ballina and Birdhill was reviewed. In both instances the settlements are located in excess of 2.3km from the chosen sites. The potential impact of the proposed development on these settlements is considered to be low. There is a small amount of rural housing located in proximity to the proposed locations. The WTP Site 3 in particular is located within approximately 200m of a working farm. Proximate residential and agricultural land uses will need to be considered in the final siting of the plant within the chosen location.

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, there is greater potential for WTP Site 1 to result in lower impacts than any of the other proposed site locations. This is due to the ability to provide direct access off the R445 with adequate visibility splays as a result of the former classification of the R445 as the N7 National Route which was designed to cater for larger traffic volumes and improved visibility splays.

6.2 Least Constrained Site

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

Table 6-2 – MCA – Comparison between WTP Sites

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

With reference to the appraisal criteria presented in Table 6-2, where the sites are ranked in order of preference and least constraint, WTP Site 1 represents the preferred location for the siting of a water treatment plant for the following reasons:

- WTP Site 1 benefitted from more favourable potential traffic connections to the N7 and ability to significantly mitigate, through avoidance, human health impacts associated with construction and haulage traffic employing regional and local roads in the area.
- WTP Sites 2 and 3 are more constrained by residential and commercial receptors, and proximity to a watercourse which is categorised as 'moderate status'.

