Bonneagar Iompair Éireann

Transport Infrastructure Ireland

PROJECT:

M18 Motorway Service Area

DOCUMENT:

Site Selection Report

DATE:

April 2016

HalcrowBarry

Bonneagar Iompair Éireann

Transport Infrastructure Ireland

Project: M18 Motorway Service Area

Document title: Site Selection Report

Document Number: Y15112 DOC-006

Contents amendment record

This document has been issued and amended as follows:

Issue	Revision	Description	Date	Originator	Checked By	Approved By
1	A	Final	20/01/16	F.Ryan	J.Noonan	P.Morehan
1	B	Final with minor amendments	04/04/16	F. Ryan	J. Noonan	P. Morehan

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Contents

1 Introduction

1.1 Overview

The M18 Motorway Service Area (MSA) entails the development of a service area on the M18 Motorway between Junction 7 (Sixmilebridge) and Junction 12 (Ennis). The purpose of a service area is to provide rest and refuelling facilities for users of the M18. The MSA will include an amenity building (including a convenience shop, restaurant, washrooms and tourist information), fuel facilities, parking and a picnic area.

Halcrow Barry Ltd. were appointed by Transport Infrastructure Ireland (TII) (formerly the National Roads Authority (NRA)) in July 2015 to undertake all services necessary to purposefully deliver the site selection, preliminary design, planning and Environmental Impact Assessment (EIA) in accordance with NRA Project Management Guidelines[1] (PMG) Phases 2, 3 and 4 in the development of the M18 MSA.

This report outlines the findings of the Site Selection Study and identifies the preferred site for the M18 MSA.

On approval of the preferred site, a preliminary design and Environmental Impact Statement (EIS) for the scheme will be undertaken which will be submitted to An Bord Pleanála (ABP) for planning approval.

The M18 MSA is being developed in line with TII's National Policy as outlined in the Service Area Policy (NRA, August 2014).

[1] This report contains numerous references to documents published by TII/NRA. The documents are referenced according to the title of the document at the time of publication. Therefore the documents published prior to August 2015 include 'NRA' in the title rather than 'TII'

2 Background to the Project

2.1 TII Policy

The construction of the motorway network since 2000 to present has dramatically changed the driving experience in Ireland. An integral part of a safe motorway network is the provision of suitable services and facilities for road users to avail of at reasonable intervals. In fact, this need has recently been given legal standing by European Union regulations under the Trans-European Transport Networks (TEN-T) policy. This legal requirement is further emphasised in the following EU Regulations and Directives:

Policy	Regulation/Directive
Trans-European Transport Networks	Regulation (EU) No 1315/2013
Driving Time and Rest Periods	Regulation (EU) No 561/2006
Road Infrastructure Safety Management	Directive 2008/96/EC
Intelligent Transport Systems	Directive 2010/40/EU

In Ireland, the Service Area Policy (NRA, 2014) sets out the national policy with regard to the provision of MSAs on the national road network.

The policy targets the provision of Service Areas at regular intervals on the dual carriageway/motorway network. The proposals for the location of MSAs on the national road network can be seen in Figure 2.1 overleaf.

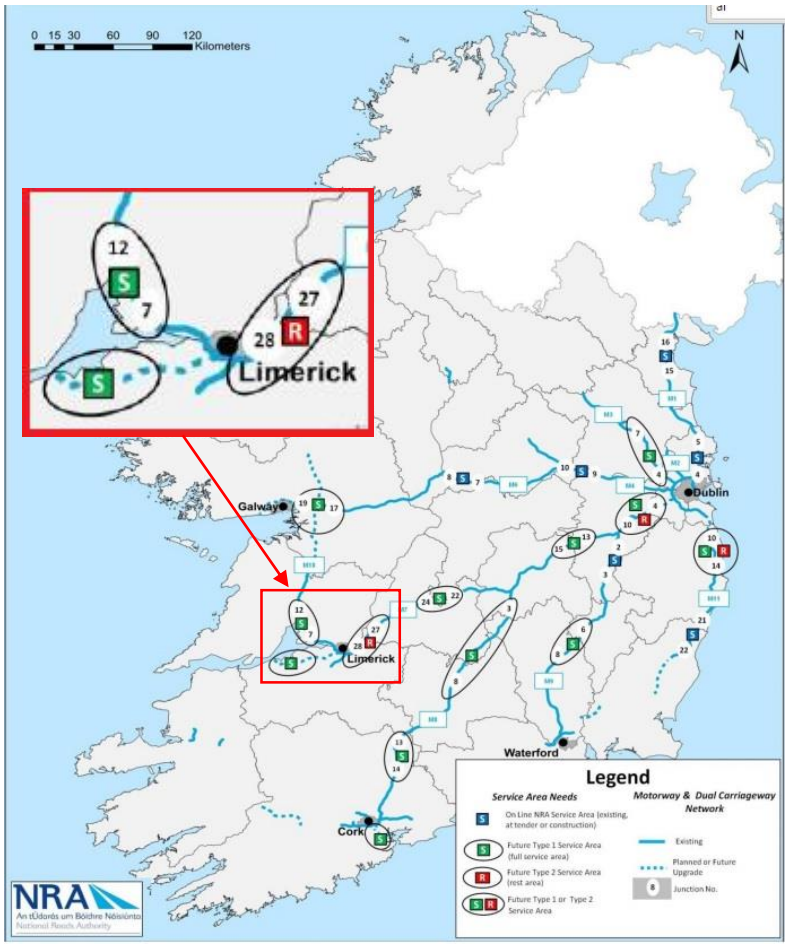


Figure 2.1. Service Area Policy – Service Area Needs

As shown in Figure 2.1, the policy identifies the need for a service area to be located on the M18 between Junction 7 and Junction 12. This length of motorway is thus considered the study area for the proposed scheme. The Study Area is shown in detail on Drawing Y15112-M18-SSR-001 in Appendix A.

2.2 Project description/ Facilities to be provided

The TII policy identifies the possibility of developing two different types of MSA depending on the characteristics of the motorway network at any given location. The types of service areas are as follows:

- Type 1 (Full Service Areas) – including an amenity building together with fuel facilities, parking toilet and picnic facilities; and
- Type 2 (Rest Areas) – including parking, picnic and toilet facilities.

A Type 1 MSA is specified within the TII policy at this location on the M18 to serve traffic travelling in both directions of the motorway.

As set out in the TII policy the key needs of road users to be addressed by Type 1 MSA include:

- Areas for commercial vehicles to park allowing drivers take their mandatory break and rest periods (including overnight parking);
- Areas for all road users to park and rest in order to reduce fatigue and;
- Access to facilities for road users including:
    - fuel stations;
    - toilets;
    - Showers;
    - convenience shops;
    - restaurant/food outlets tourist information;
    - play areas for children;

Once in place, service areas will need to continuously develop in order to meet the evolving needs of road users. Future needs are likely to include parking areas with enhanced security and the ability for advance booking of safe and secure parking for commercial vehicles.

The proposed M18 MSA will incorporate all of the above mentioned elements and will be designed in accordance with NRA TA 70. "The Location and Layout of On-line Service Area" (NRA, 2014).

In addition to the above, a motorway junction will be constructed as part of the development which will provide access from the motorway to the MSA. The junction type is subject to further design and specific constraints at particular locations but the most likely junction type is a standard dumbbell arrangement (Refer to Section 3.3.5 Key Assumptions).

Other notable elements of the MSA will include a wastewater treatment plant, controlled local road access, landscaping, and a Garda/Road Safety Authority enforcement area.

2.3 Implementation of TII policy

The M18 MSA is being developed as part of the TIIs Tranche 4 MSAs. Tranche 4 includes 3 no. MSAs at the following locations:

- M3 (between Junctions 4 and 7) – Clonee to Blundelstown;
- M18 (between Junctions 7 and 12) – Sixmilebridge to Ennis; and

- M6(M17/M18) (between Junction 17 and 19) – Athenry to Oranmore.

Other MSAs have been developed in a number of Tranches as follows:

- Tranche 1 MSAs are located on the M1 at Lusk and Castlebellingham and on the M4 at Enfield. These service areas are in operation since 2010;
- Tranche 2 MSAs are located on the M9 at Kilcullen, M11 at Gorey and M6 at Athlone. These service areas are currently at construction stage and will commence operation in 2016; and
- Tranche 3 MSAs incorporates MSAs on the N28 and N69. These MSAs are currently in the planning stage.

2.4 M18 MSA Indicative Programme

The current projected timeline (subject to funding) for the development of the M18 MSA is as follows:

- August 2015 to December 2016 – Site Selection, Preliminary Design, EIA and Compulsory Purchase Order (CPO);
- December 2016 to March 2017 – ABP Oral Hearing and ABP Consideration of Planning Application;
- 2017 – Public Procurement for Construct and Operate Contract;
- 2017/2018 – Construction; and
- 2019 – Operation.

3 Methodology

3.1 Introduction

The objective of the Site Selection Study is to determine the optimum site for a service area within the defined study area.

To determine the preferred site a particular methodology that follows a systemic and consistent approach has been adopted.

This methodology generally follows the principles and guidelines developed by the TII for road schemes as set out in the NRA PMG. However where required Halcrow Barry, utilising the experience of previous TII MSAs projects, have adapted the approach to meet the needs of a MSA scheme.

3.2 Reference documents

As mentioned the methodology generally follows the principles and guidelines set out in the NRA's PMG. Other documents and guidelines that have been referenced in the site selection study are as follows:

- NRA Service Area Policy;
- NRA DMRB;
- NRA TA 70;
- NRA Project Appraisal Guidelines (PAG);
- NRA Environmental Impact Assessment of National Road Schemes – A Practical Guide;
- Environmental Protection Agency (EPA) Environmental Impact Assessment Guidance;
- Clare County Development Plan 2011 – 2017;
- Office of Public Works (OPW) Preliminary Flood Risk Assessment;
- OPW Shannon Catchment Flood Risk Assessment and Management (CFRAM);
- Geological Survey of Ireland (GSI) Datasets;
- Transport Research Laboratory (TRL) Report 441, Turning Flows at Motorway Service Areas (TRL,2000);
- Department of Arts, Heritage and the Gaeltacht (DAHG) - Record of Monuments & Places; and
- DAHG - National Inventory of Archaeological Heritage.

3.3 Key assumptions

3.3.1 Turn in rate

The turn in rate is defined as the percentage of vehicles using the motorway that will turn in to the MSA to avail of the facilities.

The turn in rate of 12 % is assumed to be the standard rate adopted for the M18 MSA. This rate is adopted following a review of recorded turn in rates for the Tranche 1 MSAs, and having consideration for the characteristics of the motorway network in the regions. In determining a turn in rate 'TRL Report 441, Turning flows at Motorway Service Areas' was also considered.

3.3.2 Base Year, Opening Year, Design Year

The base year, opening year and design year are as follows;

- Base Year: 2014;
- Opening Year: 2018; and
- Design Year: 2043.

3.3.3 Traffic volumes & growth

The traffic volumes are based on existing count data from the mainline motorway, with no traffic expected to be generated by the scheme.

Traffic volumes were obtained from TII counter at M18 South Ennis, Co. Clare. This counter records a figure of 23,370 AADT with 4.2% HCV for the year 2014. It is assumed that the traffic volumes are the same for all sites being considered for the M18 MSA. The traffic volumes for the M18 MSA are therefore:

M18 between Junctions 7 & 12 (Medium Growth)			
Year	2014	2018 (Opening Year)	2043
AADT	23,370	24,593	32,526
%HCV	4.2	4.1	3.4
HCV	982	1,017	1,103
Cars & LGVs	22,388	23,576	31,423

Table 3.1: Traffic volumes and growth for M18 South Ennis, Co. Clare. Figures taken from TII Traffic Data Site.

Traffic growth will be in line with national traffic growth forecasts as outlined in the medium growth scenario in Unit 5.5 of NRA PAGs.

3.3.4 *Online facility*

The M18 MSA is to be developed on the basis that it is an online MSA i.e. the MSA is directly accessible from the motorway and is not located at an existing junction.

The provision of an online MSAs is consistent with the TII policy which identifies a preference for such facilities, having regard for public convenience, control over the quality, extent and nature of services to be provided, and the ability of the Authority to respond to emerging law, such as the ITS Directive and the TEN-T Regulations.

3.3.5 *Single Sided Facility*

The M18 MSA is being developed on the basis that it is a single sided facility. A single sided facility is required where traffic volumes are less than 40,000 vehicles per day in the year of opening (NRA TA 70 paragraph 3.4). This assumption is made following analysis of traffic flows and has been discussed and agreed with the TII as outlined in TA 70.

A single sided MSA is a facility that is located on one side of the motorway but can be accessed from both carriageways (both directions of travel) via a grade separated junction, for example a dumb – bell junction.

3.3.6 *Required Site Area*

For the purpose of this assessment a site area of approximately 15ha was taken at each of the site locations. It can be assumed that the site boundaries would follow physical constraints as far as is practicable.

The figure of 15 hectares (ha) was adopted following a review of the TII MSAs developed to date. This area should be more than adequate to accommodate all the proposed features including landscaping and other environmental mitigation features. It is a conservatively high estimate and it is recognised that the area required will change or be refined in subsequent stages as the design develops. However to assess sites on an equal basis all were considered to be 15 ha in size.

A rectangular shape of 300m X 500m has generally been adopted but this dimension is flexible and can be adjusted to account for local constraints where required.

3.3.7 *Other Site Requirements*

Water supply – it is assumed that water supply will be provided from public mains supply. It may be possible that an onsite well will supply the water needs of the MSA, which will be investigated at subsequent stages.

Wastewater discharge – it is assumed that the wastewater will be treated onsite followed by pumping via a rising main to the local sewer network. An initial review of the study area and consultation with the local authority and Irish Water considered this option as

the most likely solution. Alternative treatment and discharge options i.e. discharge to ground or local stream, will be considered further during the preliminary design stage and the preferred solution at the preferred site will ultimately be adopted. Details of the treatment and discharge will be subject to agreement with Irish Water and Clare County Council. Consultation with the aforementioned bodies is ongoing in relation to the wastewater treatment and discharge.

Local access road – a local controlled access road is required to facilitate staff and emergency access.

3.4 Description of Methodology

3.4.1 *Preamble*

The methodology developed followed a step by step approach:

i. Identify constraints;
ii. Geometric appraisal;
iii. Identification of potential sites;
iv. Evaluation of potential sites under various Engineering, Environmental and Economic considerations; and
v. Determination of preferred site.

3.4.2 *Description of steps to determine preferred site.*

i. Identify Constraints

The significant constraints within the study area were identified. Physical features such as the road network, rivers/streams, service and utility infrastructure, as well as significant environmental features were all recorded and mapped.

Information on existing features and constraints were sourced from national databases, as-built motorway construction information and various third parties, before being confirmed by site visits.

ii. Geometric Appraisal

The geometric appraisal encompassed a broad analysis of the geometry of the motorway through the study area. This included a review of the existing horizontal and vertical curvature parameters to determine if the service area diverge and merge lanes could be incorporated into the existing motorway alignment in such a way that they would not adversely affect the safety of existing road users. It also included an assessment of weaving lengths between the existing junctions, such that vehicles would not be forced to perform potentially unsafe manoeuvres in entering/exiting the service area.

A primary constraint in identifying possible suitable locations is the necessity to avoid conflict between traffic using the service area slip roads and traffic using the slip roads of the nearest adjacent junction. NRA standard TD 22 "Layout of Grade Separated Junctions" (NRA, 2009) identifies that ideally a minimum distance of 2km should be provided from one junction to the next to allow for sufficient lengths for streams of vehicles to safely merge and diverge between the junctions. Where a new junction is being constructed and the minimum distance of 2km is not achievable this may be reduced to 1km as a relaxation from standard where the traffic figures are sufficiently low in the design year. A Departure from Standard may be applied for through the TII departures process where the traffic figures are higher.

The geometric appraisal ultimately identified lengths of motorway where an MSA junction could be accommodated and these are shown in drawing Y15112-M18-SSR-002.

iii. Identification of Sites

From the geometric appraisal outlined above, a number of locations where a junction could be located on the existing motorway were identified. The next step was the identification of sites. This involved a review of these locations and the surrounding area in order to determine if and where a site for a MSA could be accommodated.

The identification of sites involved the identification of an area of approximately 15 ha that could accommodate a MSA having consideration for the local constraints and features.

Local constraints that influenced the location of the potential sites were rivers, streams, dwellings, topography, existing field boundaries, HV voltage electricity pylons, etc.

iv. Evaluation of Potential Sites under various Engineering, Environmental and Economic Considerations - Multi Criteria analysis

The potential sites were assessed against each other under three main headings; 1.) Engineering, 2.) Environmental, and 3.) Economic. The various sub-elements of these assessment criteria are listed in Table 3.2 below, and are discussed further in Section 3.5 herein.

Engineering	Environmental	Economic
1.) Traffic Volumes	1.) Air Quality	1.) Net Economic Benefit
2.) Road Safety	2.) Noise	
3.) Physical Characteristics of the Site	3.) Landscape & Visual	
4.) Service & Utility connections	4.) Agriculture	
5.) Geotechnical	5.) Non- Agricultural Properties/ Material Assets	
6.) Distance to adjacent on-line service area or locally available facilities	6.) Ecology	
	7.) Archaeology	
	8.) Cultural & Architectural Heritage	
	9.) Human Beings/ Socio Economic	
	10.) Planning	
	11.) Geology & Hydrogeology	
	12.) Hydrology	
	13.) Waste	

Table 3.2. Site Selection Assessment Criteria

The criteria above have been identified utilising the TII's and Halcrow Barry's extensive experience in the site selection of MSAs and similar projects.

A qualitative ranking system, similar in nature to that outlined in the NRA's 'Environmental Impact Assessment of National Road Schemes – A Practical Guide', has been developed to compare specific site characteristics, as follows in Table 3.3:

Extreme Positive	Severe Negative
Major Positive	Major Negative
Moderate Positive	Moderate Negative
Minor Positive	Minor Negative
Neutral	

Table 3.3. Qualitative Ranking System

The above site specific ranking system was then used to determine, compare and contrast the relative advantages and disadvantages of each location in relation to the other, as opposed to a set of universal or general criteria, and to subsequently determine which of these site locations best met the criteria. Where no relative advantage or disadvantage has been identified between the site locations for a particular criterion, each of the assessed sites has been given a neutral rating. For the environmental

assessment, where all sites may have an overall negative impact for a particular criteria but one site has been assessed as having an advantage, this site will be assigned a baseline neutral ranking with subsequent sites ranking either minor negative, moderate negative or major negative from this baseline.

For each of the criteria, a qualitative approach was adopted to assign the relative rankings of each site. Therefore, judgement was applied in arriving at the rankings assigned. A description of each criteria is provided in Section 3.5.

v. Determination of Preferred Site

The above ranking system was then used to determine which of the potential sites best met the criteria. The assessment was carried out by comparing the merits of each site against each other as opposed to being compared against a set of general/national criteria/values. The sites that rated best in comparison to each other are therefore given the best ranking, the sites that compare worst against each other are given the lowest, i.e. negative ranking. A fair and unbiased qualitative assessment of each site's merits has been undertaken based on all the information available.

For drawing a conclusion as to which site represents the best option considering all of the criteria put together, judgement was applied and a qualitative assessment undertaken to arrive at the preferred option. Since no single site ranked highest or equal highest in each and every criteria, it follows that the chosen preferred site had to be a compromise of all the competing factors.

3.5 Description of Assessment Criteria

3.5.1 Engineering

1) Traffic - The traffic volumes of the section of motorway in which each of the potential sites are located was considered. It is deemed preferable to locate a MSA on a section of motorway which has the highest traffic volumes as in this way the MSA will serve the highest possible number of road users. It is noted however within the Study Area of the M18 MSA, the traffic volumes are similar throughout.

2) Road Safety - A Road Safety Impact Assessment (RSIA) as per NRA TD 18 has been undertaken for the M18 MSA. The RSIA considered the safety implications of the development of an MSA at each of the potential site locations. The RSIA also identified a site preference or ranking in terms of road safety of the potential sites.

3) Physical Characteristics of Site - This criteria considers a number of the physical features and constraints at or in the vicinity of the site that will be a factor in the development of a MSA. The factors considered include:

- Land Availability & Setting;
- Terrain;

- Conflicts with existing utilities and services;
- Surface water features;
- Motorway structures and other motorway features; and
- Flooding.

4) Service and utility connections - This criteria considers the potential for the MSA to be served by surrounding infrastructure. Key requirements of an MSA are water supply, wastewater discharge, connection to the local road network, telecommunications, electrical supply and an outfall for surface water runoff.

5) Geotechnical - The existing ground/geotechnical conditions can become a significant engineering challenge in the development of a service area. An assessment of the likely geotechnical risks at each site have been assessed.

6) Distance to adjacent online service area or locally available services - The location of adjacent online service areas has been considered in the site selection process. On consideration it is recognised that the location of adjacent online service area or locally available services is not a major differentiator between potential sites within the same study area. The potential sites being considered are on the same stretch of motorway and therefore the relative location of the nearest MSA is similar to within a few km. This criteria is therefore not considered further and excluded from the assessment tables provided.

   It is noted that there is no online MSA along the existing M18 Motorway close to the study area. There are local off-line fuel facilities in Newmarket-on-Fergus on the R458 along with petrol stations within Shannon or on the L3122 south of Shannon. Further off line facilities are located on the R458 in Clarecastle and in Ennis.

   Planning applications for facilitates at Junction 12 (Ennis) and Junction 11 (Clarecastle) have been submitted. However, the outcome of these applications is not known at the time of writing this report.

   There are fuel facilities at Banogue, Co. Limerick (Maxol) on the N20 and at Adare, Co. Limerick (Campus) on the N21.

   The above mentioned petrol/service stations are not considered comparable to a Type 1 NRA MSA in terms of facilities and services provided.

3.5.2 Environmental

1) Air - Assessment of air quality for each of the M18 MSA site options was conducted through a calculation of the index of overall change in exposure of the nearby population to NOx and PM_{10}. The index is calculated based on the number of

sensitive receptor locations within 50m of road links (new or existing) that would experience a significant change in traffic as a result of the M18 MSA scheme. A significant change in traffic is defined as an increase or decrease in traffic of 10% or more, and 50m represents the distance within which detectable impacts of road traffic might be found.

2) Noise - Reference has been made to guidance documents for the assessment of noise for new national road schemes, namely the "Guidelines for the Treatment of Noise and Vibration in National Road Schemes" (NRA, 2004) and "Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes" (NRA, 2014). The methodology outlined in both documents has been broadly used to compare and rank the sites under consideration

   In order to compare the potential sites and to determine any preferences in terms of noise, the assessment of potential impact is based primarily upon property counts in the vicinity of each site, and likely changes in noise environment.

3) Landscape & Visual Impact - The methodology for the landscape and visual assessment has been prepared with regard to the NRA guidelines "A Guide to Landscape Treatments for National Road Schemes in Ireland" (NRA, 2006) and the EPA guidance documents on the preparation of an EIS (EPA, 2002 & 2003). Landscape has two separate but closely related aspects both assessed as part of the site selection process. The first is the visual, i.e. the extent to which a new structure in the landscape can be seen. The second is landscape character impact, i.e. effects on the fabric or structure of the landscape. The methodology for the preparation of Landscape and Visual Impact assessment included a desktop review of the study area to identify landscape planning designations and a roadside survey to identify key receptors.

4) Agriculture - The methodology for the preparation of agriculture report was based on a desktop review of the study area, local knowledge of agriculture along the M18 scheme and a roadside survey to identify agricultural and property constraints and current land use and farming activity.

   The evaluation of the site options comprised a qualitative and quantitative assessment of agricultural property at each of the proposed site options. The qualitative assessment includes a description of land use, land quality, farm activity and soils information. The quantitative assessment of the lands within the site option boundary includes the following:

   - Land take (ha);
   - Land use (% area);
   - Grassland / Tillage lands under land quality (% area);
   - Farm houses within site option boundary (No.);

- Farm buildings, farm yards (No.); and
- Key agricultural enterprises – Type(s) (No.).

5) Non Agricultural Properties/ Material Assets - This section assesses the impact of the proposed development on non-agricultural properties and material assets. The assessment is based on a desk study, and on information gathered during the roadside survey to identify agricultural and property constraints. The desk study included an inspection of the land registry records, wind shield surveys, consultation with service providers, examination of aerial photographs and inspection of planning records to assess the degree of impact on non-agricultural properties or other material assets

6) Ecology - The assessment is based on a desk study utilising a variety of existing data sources including recent aerial imagery, National Parks and Wildlife Service on-line mapping services showing the designated area boundaries and other online data sources including the National Biodiversity Data Centre, Bat Conservation Ireland, Botanical Society of Britain and Ireland, and BirdWatch Ireland websites. The assessment and evaluation of the various site options is based on the impact assessment criteria defined within the "Guidelines for Assessment of Ecological Impacts on National Road Schemes" (NRA, 2008).

7) Archaeology - The site selection constraints study has been undertaken in accordance with "Guidelines for the Assessment of Archaeological Heritage Impacts of National Road Schemes". In accordance with the "Environmental Impact Assessment of National Road Schemes – A Practical Guide (NRA, 2008) an impact rating for each of the options on features of archaeological significance has been given; they are categorised as being either a positive or negative, direct or indirect impact, or as having no predicted impact. A significance impact or rating level for impacts is given i.e. slight, moderate, significant and profound in accordance with the criteria provided in the published EPA guidance documents on the preparation of an EIS (EPA, 2002 & 2003) and NRA Environmental Impact Assessment guidelines. Sites were subsequently ranked as per Table 3.3.

8) Architectural & Cultural Heritage - The site selection study has been undertaken in accordance with the NRA "Guidelines for the Assessment of Archaeological Heritage Impacts of National Road Schemes" (NRA 2005). In accordance with the "Environmental Impact Assessment of National Road Schemes – A Practical Guide" (NRA, 2008), an impact rating for each of the options on features of architectural and cultural heritage significance has been given; they are categorised as being either a positive or negative, direct or indirect impact, or as having no predicted impact. A significance impact or rating level for impacts is given i.e. slight, moderate, significant and profound in accordance with the criteria provided in the published EPA guidance documents on the preparation of an EIS (EPA, 2002 & 2003) and "Environmental

Impact Assessment of National Road Schemes – A Practical Guide" (NRA, 2008) Sites were subsequently ranked as per Table 3.3.

9) Human Beings/Socio Economic - The methodology for the assessment of the potential impact on Human Beings / Socio Economic was based on a desktop review of the study area, planning history records and full review of development plans and, where they exist, local area plans. The assessment addresses impacts at a strategic level rather than for individuals or identifiable properties that have been considered for Site Selection purposes within criteria concerned with Agriculture, Agronomy and Property. Socio Economic Impact on Human Beings is considered from the perspective of severance of identifiable settlements and business units.

   The site selection criteria as a whole reflect each of the disciplines engaged to undertake the environmental assessment and design of the eventual preferred MSA site. Those disciplines in turn reflect the grouped format structure of an EIA. Any environmental effect ultimately affects the quality of life of human beings either directly in the form of human health matters e.g. road safety, air and water quality or indirectly e.g. loss of habitat and therefore reduction in biodiversity or loss/disturbance of archaeological remains and therefore a negative impact on the heritage value of the environment and collective memory. As such Human Beings as a site selection metric/criteria pervades all other site selection criteria and is considered inherent in the site selection process for that reason. Human Health Impacts are considered under separate criteria i.e. Road Safety, Noise, Air Quality assessments.

10) Planning - The methodology for the assessment of the potential impacts on Planning was based on a desktop review of the study area to identify constraints like Land Use Zoning, live planning applications/permissions and identify anomalous land uses and rank accordingly.

11) Geology and Hydrogeology - The site selection study has been undertaken in accordance with the EPA guidance documents on the preparation of an EIS (EPA, 2002 & 2003). An application of these guidelines to Geology and Hydrogeology is outlined in "Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes" (NRA, 2009).

12) Hydrology - The site selection assessment for hydrology has been undertaken in accordance with the EPA guidance documents on the preparation of an EIS (EPA, 2002 & 2003) and the NRA document *"*Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes*"* (NRA, 2009).

13) Waste - The assessment has been prepared for the provision of waste management for each of the proposed MSA sites in accordance with the NRA "Guidelines for the Management of Waste from National Road Construction Projects" (NRA 2008).

Operational waste in the form of refuse from restaurant, shop and filling station activities is considered to be neutral across all sites.

3.5.3 Economic

1) Benefit Cost Ratio

The Benefit Cost Ratio (BCR) is given by the ratio of the discounted sum of all future benefits to the discounted sum of all costs. It is one of a number of indicators that describe the efficiency of an investment and provides a means to compare alternative investments. Thus:

$$BCR = PVB/PVC$$

The Present Value of Benefits (PVB) represents the value in the present value year of all the benefits that will accrue over the appraisal period. It is calculated according to the following formula:

$$PVB = \sum_{y=year\ 0}^{y=year\ n} \frac{B_y}{(1+r)^{y-p}}$$

Where B_y is the benefit occurring in each year, from the first year in which benefits are accrued (*Year 0*) discounted as appropriate, up to the limit of the appraisal period (*year n*).

The Benefit (B) in any given year is calculated as follows:

$$B = (CSi * DU) + ((1-P) * NR) + (Akm * a * f * c) + R$$

Where:

- CSi is the average consumer surplus associated with each user of the MSA;
- DU is the number of daily users of the MSA;
- (1-P) is equal to 1 minus the overall profitability rate in the retail sector as a % of NR (for example if the profitability in the retail sector is 35%, 1-P = .65);
- NR is the net revenue after cost of sales;
- A km – represents the distance between Service Areas;

- a – represents the accident rate associated with road usage;
- f – represents the proportion of accidents attributable to fatigue;
- c – represents the established monetary values associated with casualties; and
- R – represents the residual value associated with the project.

The Present Value of the stream of Costs (PVC) represents the value in the present value year of all the costs that will accrue over the appraisal period, comprising mainly construction and maintenance costs. It is calculated in a similar way to the approach for calculation of PVB. For some schemes, it is possible that construction costs may have been incurred prior to the present value year. In such cases, this would require an inflation of the scheme costs to the present value year using the discount rate.

The approach to calculating PVC is therefore:

$$PVC = \sum_{y=year\ 0}^{y=year\ n} \frac{C_y}{(1+r)^{y-p}}$$

where C_y is the cost incurred in year y, discounted as appropriate, up to the limit of the appraisal period *year n. Year 0* is the first year that costs are incurred, which may be prior to the present value year.

The Costs (C) in any given year is calculated as follows:

$$C=OPC + K$$

Where:

- OPC are the operating and maintenance costs
- K represents the capital construction costs

The Benefits (B) and Costs (C) outlined above are defined in the NRAs Project Appraisal Guidelines Unit 11 – Development of Business Case for Service Areas.

At the site selection stage key differentiators between the potential sites which affect the BCR calculation are primarily the number of daily users of MSA (DU) and the construction cost (K).

3.6 Consultation

The site selection study incorporated consultation with the public, landowners and various third parties with respect to Site 1W and Site 1E only. As discussed in Section

4.2 of this report, following a geometric appraisal and due to other challenges with Location 2, this location was not presented to the public at this stage.

3.6.1 *Statutory Consultation*

Statutory consultees were issued with information letters inviting comment relating to the proposals.

Other stakeholders, including Clare County Council, Irish Water, and the ESB, were also consulted to establish requirements of others.

3.6.2 *Briefing of Local Area Municipal District Councillors*

Public consultation in the form of a number of briefing meetings with Shannon Municipal District Councillors were held on the 14th of September and the 10th of November. At the meetings Halcrow Barry provided a presentation on the project to Councillors which comprised of the following items:

- TII Service Area Policy;
- Site Selection Methodology;
- Assessment Criteria and Scoring System;
- The M18 MSA Study Area;
- The M18 Geometric Appraisal; and
- Key Issues relating to the potential sites.

3.6.3 *Meetings with Potential Affected Landowners*

Landowner Consultation meetings were held on Thursday 19th of November 2015 in The Inn at Dromoland, Newmarket-on-Fergus, Co. Clare between 11am and 3pm. The meeting was used to:

- Inform the landowners of the site selection process;
- Confirm details of what was currently farmed on their holding (e.g. Dairy, Beef, Sheep, Equine or Crops etc.);
- Discover any particular local issues with the land of significance (e.g. non recorded flooding, local springs, disposal of motorway construction material to raise field levels etc.) that may not be known by the design team; and

- Present to the landowner how a proposed site, were it to be chosen would impact upon their holding.

Halcrow Barry met with ten landowners during this session and subsequently separately with two other landowners who were unable to attend on the day.

3.6.4 *Public Information Evening*

The Public Information meeting took place in The Inn at Dromoland, Newmarket-on-Fergus, Co. Clare on Thursday 19th of November 2015 where members of the public were invited to comment on the drawings and meet with TII, Westmeath National Roads Office and Halcrow Barry.

To publicise this event, advertisements were placed on the Clare County Council's website on the 13th of November 2015 and in local publications; The Clare Champion, published on the 12th of November 2015 and The Clare People, published on the 17th of November 2015. Radio advertisements were also broadcast on Clare FM.

A letter drop was also conducted in the vicinity of the proposed MSA sites.

Notices were also placed in prominent locations in Newmarket-on-Fergus in advance of the event. The locations included:

- Newmarket-on-Fergus Library;
- Newmarket-on-Fergus Spar;
- Newmarket-on-Fergus Euro Spar;
- Newmarket-on-Fergus Church; and
- Newmarket-on-Fergus Medical Centre.

3.6.5 *Submissions Received*

A total of 8 written submissions were received on or before the 27th of November 2015.

In summary of the eight submissions received, 50% were opposed to the development of a MSA at either Location 1E or 1W. Further details are as follows:

- Four were in favour of a MSA at Location 1W, of these four, two were also in favour of Site 1E while two were opposed to Site 1E
- Four were not in favour of Location 1W and 1E.

The main issues raised in the submissions received was the proximity of the proposed development to Newmarket-on-Fergus, environmental impacts on nearby residents, the cumulative impact of the proposed development on residents and businesses of Newmarket-on-Fergus and environs.

Issues raised by Landowners, Councillors and the General Public during the Public Consultation phase have been considered and incorporated in the overall assessment of the individual sites and subsequent ranking of sites when compared to one another.

3.7 Site visits

A number of site visits were undertaken by the project team through the course of the Site Selection Study. Preliminary site visits were carried out in August and September 2015 and on the 13th of November 2015. In addition walkover surveys of the Sites 1W and 1E were undertaken on the 2nd of October 2015.

Following public consultation and prior to finalising the site selection process, further site visits were undertaken on the 27th of November 2015 and 10th of December 2015 to the specific sites under consideration.

4 Evaluation of Study Area

4.1 *Features and Constraints*

The study area runs from Junction 7 (Sixmilebridge) to Junction 12 (Ennis), a distance circa 15km. Drawing Y15112-M18-SSR-001 shows the extent of the study and highlights some key constraints.

Towns located in the vicinity of the study area are Shannon, Ennis, Clarecastle, and Newmarket-on-Fergus.

A number of regional and local roads which cross over/under the M18 were identified as follows:

- R458;
- R472;
- R471;
- L3157; and
- L3148.

The Ennis to Limerick rail line crosses under the motorway at a point between junctions 11 and 12.

The River Rine flows in a south westerly direction through the study area as well as a number of other smaller streams and watercourses. Apart from industrial zoned lands in the Shannon area, the land is mainly agricultural in nature with a relatively open landscape.

GSI data provides bedrock information for the study area as follows:

- Between Junctions 7 & 8 – Dark muddy limestone, shale;
- Between Junctions 8 & 9 – Sandstone, mudstone and thin limestone;
- Between Junctions 9 & 10 – Dark muddy limestone shale & massive unbedded lime-mudstone; and
- Between Junctions 10 & 12 – Undifferentiated limestone.

Dromoland Belvedere is a structure associated with Dromoland Castle Demesne and is prominently located on a hilltop east of the study area between Junctions 10 and 11. Manus House, a protected structure, is located west of the study area between Junctions 11 and 12. Lough Gash, a local turlough, karst feature and SAC is situated immediately west of Newmarket-on-Fergus. Carrigoran House, an assisted living facility, is identified west of Junction 10 (Newmarket-on-Fergus). Dromoland Castle Hotel and Dromoland Lough are further identified situated east of the M18 between Junction 10 and Junction 11.

4.2 Geometric Appraisal

The main geometric constraints encountered in the identification of suitable locations were achievable weaving distances in relation to adjacent junctions, ramp lengths and the avoidance of existing structures.

The geometric appraisal included an assessment of existing structures and railway infrastructure which might constrain the development of the proposed service area. While a given location may appear initially promising, quite often the frequency of bridge structures along the mainline roadway results in inadequate site frontage to allow for access to the location, or inadequate forward visibility on the approaches to the location. Hence, an assessment of both these existing structures as well as the mainline road geometry in the vicinity of each location was necessary at this stage, with sections deemed to have insufficient frontage being excluded from further consideration.

This assessment returned that there are two potential locations within the study area that could accommodate a junction, these are shown on Drawing Y15112-M18-SSR-002 in Appendix A.

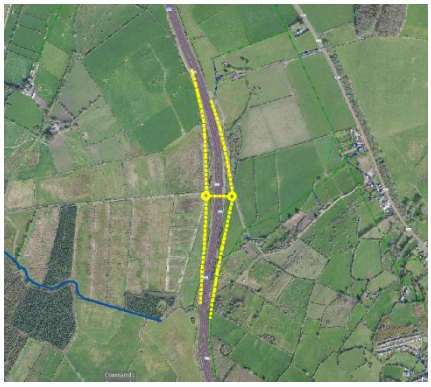
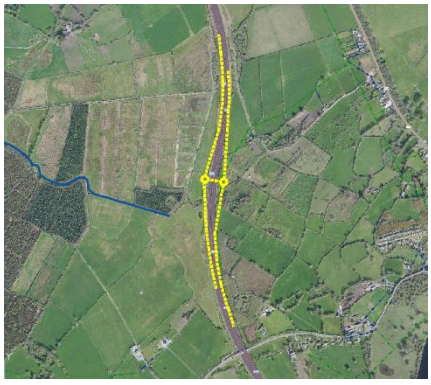
Location 1 was assessed on the basis that two junction alternatives are feasible to access lands on both the western and eastern side of the carriageway at this location.

For the purpose of the geometric assessment these junction options are identified as follows:

- Location 1 - Zone 1 – Northern Junction Option (Ch 71.7 to 72.5)
- Location 1 - Zone 2 – Southern Junction Option (Ch 72.6 to 73.3)

With regard to Location 2 (Ch 68.5 to 69.1), it was recognised at an early stage of the process that this location was severely constrained, that it posed significant geometric challenges and that it potentially would not ultimately offer a solution. However, it was included in the overall assessment process.

A description of the locations and the geometric constraints associated with each is summarised in the Table 4.2 following:

Approximate Chainage	Feature
Ch 71.7 to 72.5  Figure 4.2.1 – Proposed MSA Location 1	**Location 1 - Zone 1 (Northern Junction Option)** Approx. 0.8km section with proposed junction between Ch: 71.7 to 72.5 north of the R609 Overbridge. Dumb-bell Grade Separated Junction with Type A Diverge and Type B Merge. Departures apply associated with weaving length below 1km due to proximity of the Junction 10 (Newmarket-on-Fergus) Grade Separated Junction, as per the NRA DMRB TA70/14 and TD22/06. Type A Diverge comprise of 180m direct taper and slip road with minimum length of 295m. The grade separated junction would be located on a 1,250m horizontal radius and the vertical geometry consists of a 373k crest curve, a longitudinal gradient of 1.3% and 178k sag curve. On the immediate approach to the proposed junction, there may be a departure from standard in relation to the forward stopping sight distance for the southbound diverge and merge. Type B Merge comprise of 230m auxiliary lane and 75m direct taper. Two potential service area sites identified, one each on either side of the motorway.
Ch 72.6 to 73.3  Figure 4.2.2 – Proposed MSA Location 1	**Location 1 - Zone 2 (Southern Junction Option)** Approx. 0.7km section with proposed junction between Ch: 72.6 to Ch: 73.3 north of the R609 Overbridge. Dumb-bell Grade Separated Junction with Type A Diverge and Type B Merge. Departures apply associated with weaving length below 1km due to proximity of the Junction 11 (Clarecastle) Grade Separated Junction, as per the NRA DMRB TA70/14 and TD22/06. Type A Diverge comprise of 180m direct taper and slip road with minimum length of 295m. The grade separated junction would be located on a 1,250m horizontal radius and within a 178k vertical sag curve and 507k vertical crest curve. The maximum

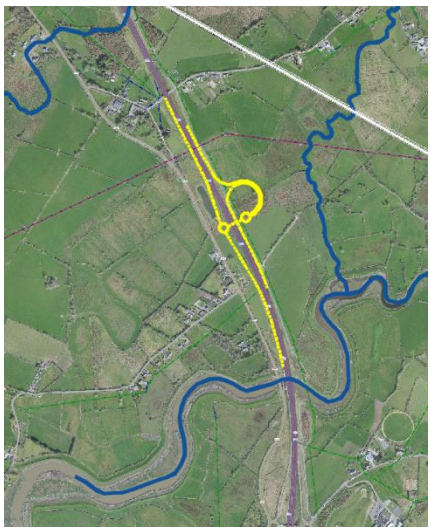
	longitudinal gradient would be less than 2%. A departure may be required for stopping sight distance on the immediate approach to the junction on the northbound diverge and merge. On the immediate approach to the junction, there may be a departure from standard in relation to the forward stopping sight distance for the northbound diverge and merge. Type B Merge comprise of 230m auxiliary lane and 75m direct taper. Two potential service area sites identified, one each on either side of the motorway.
Ch 68.5 to 69.1  Figure 4.2.3 – Proposed MSA Location 2	**Location 2** Approx. 0.6km section with proposed junction between Ch: 68.5 to Ch: 69.1 south of Junction 12 (Ennis). Departures apply associated with weaving length below 2km due to proximity of the Clarecastle Grade Separated Junction, as per the NRA DMRB TA70/14 and TD22/06. Due to space available, a combination of Loop and Dumb-bell Roundabout Grade Separated Junction, with parallel auxiliary lane between the proposed MSA junction and Junction 12 is proposed. One potential service area site is identified, on the eastern side of the motorway only.

Table 4.2. Description of Location Options

5 Evaluation of Potential Sites

5.1 *Description of Potential Sites*

On consideration of the local constraints, features, and geometric assessments of Zone 1 and Zone 2, the potential sites at each location were identified. A total of three sites were identified.

These sites are shown on drawings Y15112-M18-SSR-003 and Y15112-M18-SSR-004.

The sites are described in the following paragraphs.

5.1.1 *Site 1W*

Site 1W, is situated on the western side of the existing M18 motorway, approximately 8.5km south east of Ennis and approximately 1.7km north-west of Newmarket-on-Fergus. The section of mainline onto which the site fronts is in cut at the southern section of the site which turns to an embankment that ranges from approximately 2.5m above the surrounding ground level to approximately 8m above ground level at the northern end of the site frontage. There is an accommodation underpass located at mile maker N18D2ML toward the northern end of the site location.

With respect to constructing a suitable junction for site access, it is estimated that an embankment height of approximately 12.5m would be required on the western side of the mainline to achieve the height required for an overbridge. On the eastern side of the mainline the land is raised and would require a lower embankment height of approximately 5m. The feasibility of adopting an underbridge as the junction arrangement for a service area at this location was assessed on a preliminary basis and subsequently discounted due to the proximity of the existing nearby underpass, potential difficulties with resultant drainage designs and potential flooding issues. It is anticipated that the construction of an overbridge would require an extension of the existing underpass on both sides of the mainline to allow sufficient width for the associated slip roads.

Sufficient area is available for locating a single sided service area facility at the site. There is sufficient distance between the overbridges north and south of the site to locate the grade separated junction required for a single sided service area. A departure for weaving length from the Dromoland Junction to the north and the Newmarket-on-Fergus Junction to the south would be required to accommodate a grade separated junction at this location. However, weaving distances both north and south would still meet the required 1km minimum. No departures or relaxations arise from the vertical or horizontal alignment of the mainline at this section.

From examination of the Preliminary Flood Risk Assessment (PRFA) mapping it became apparent at an early stage, that a significant portion of Site 1W could be susceptible to flooding.

The majority of the site is underlain by marine and estuarine silts and clays which overlie undifferentiated Visean Limestone. Site investigations carried out as part of the M18 Ballycasey to Dromoland Scheme indicated extensive peat and soft organic clay to depths in excess of 4.8m below ground level (bgl) at the centre of Site 1W.

Lough Gash, a local turlough and karst feature, has been identified approximately c.1.5km south east of the site. The site is located on a regionally important aquifer which is a karstified conduit. No wells have been identified within 1km of the site (GSI).

There is adequate electrical and telecoms supply available in close proximity to the site location. The closest wastewater treatment facility with sufficient capacity is located in Newmarket-on-Fergus which would require an approximately 2.5km long rising main to connect with the potential service area. Potable water would be sourced from the water main located in the nearby regional road R458.

Approximately five landowners could be directly affected by the development of a service area on this site. In addition, the service road access would marginally affect additional landowners as its likely route travels approximately 500m to 800m southward, parallel with the mainline, to the next overbridge in that direction. Severance of lands is likely to occur at this site location, requiring access to fields severed south of the site to be maintained in particular.

Site 1W is located outside of any designated conservation area and there will be no loss of habitat within any Natura 2000 site or proposed Natural Heritage Area (pNHA). However, as the site is located within the catchment and relatively close proximity (c.1km) of the River Shannon Special Area of Conservation (SAC) and River Shannon and River Fergus Special Protected Areas (SPA) it would require adequate design and mitigation to ensure no negative impacts would arise as a result of reduced water quality. The ecological ranking of Site 1W takes in to account the proximity and connectivity of the site with the designated area network, in combination with the existing ecological sensitivities apparent at the site. Site 1W in addition, has the potential to support the Annex II listed Marsh Fritillary Butterfly.

There are four recorded sites within Location 1W; a field system complex in the NW of the area and an enclosure in the eastern section of the area (CL042-125002 and CL042-156). A mound (CL042-094) and a redundant record (CL042-157) were recorded in the southern section of Site 1W. There is one possible circular enclosure on aerial photography in the South of Location 1W (referenced AP1, ITM 537904 668296).

There are no Recorded Protected Structures (RPS) or National Inventory of Architectural Heritage (NIAH) sites, Architectural Conservation Areas (ACAs), or stray finds recorded within Site 1W and no features were evident on aerial photography within the site option. No features of interest were noted on the first edition 6-inch Ordnance Survey (OS) map and a disused gravel pit was noted on the revised 25-inch map.

There is also a predicted indirect negative impact on the architectural and cultural heritage of Dromoland Belvedere located c. 1.2km north east of Site 1W.

5.1.2 *Site 1E*

Site 1E is on the eastern side of the M18 motorway, approximately 8.5km south east of Ennis and c.1.6km north west of Newmarket-on-Fergus. Similar to Site 1W, the section of road onto which the site fronts is on embankment for much of the length of the potential site frontage apart from the extreme south of the site which is in cut. The land is undulating on the eastern side of the mainline and rises from a level 7m to 8m below the existing road level of the M18 mainline at the northern end of the site to approximately 1m to 2m above existing road level in the southern half of the site. Furthermore, the land further east from the mainline on which the main body of the service area would be located is higher than the existing road level, and drops steeply just to the east of the road. There is an accommodation underpass located at mile maker N18D2ML toward the northern end of the site location.

A grade separated junction at this location would be subject to similar considerations as those described for Site 1W. A departure for weaving distance would be required, both to the north and south of the potential service area junction, and no departures would arise from the vertical alignment of the mainline. In addition, access to the nearby accommodation underpass would have to be maintained and the same extension works to both ends of the underpass would still be required.

Borehole and Trial Pit records from the site investigations undertaken as part of the M18 Ballycasey to Dromoland Road Scheme are located on the western side of the mainline or on the mainline. No data is available on the ground conditions on the eastern side of the mainline relevant to Site 1E. However, the land on the eastern side of the mainline is raised significantly compared with that on the western side with Glacial Till observed over Limestone bedrock in the exposed cut face immediately north of the accommodation underpass within Site 1E. Similar to Site 1W, Lough Gash, a turlough and karst feature, has been identified c. 1.5km south of Site 1E. The site is also located on a regionally important aquifer which is a karstified conduit. No wells have been identified within 1km of the site (GSI).

There is adequate electrical and telecoms supply available in close proximity to the site location. The closest wastewater treatment facility is located in Newmarket-on-Fergus

which would require an approximately 2km long rising main to connect with the potential service area. The treatment facility at Newmarket-on-Fergus has recently been upgraded and it expected that this plant has capacity available to cater for a potential service area. It is expected that potable water would be sourced from the water main located in the nearby regional road R458.

Approximately five landowners would be directly affected by the development of a service area on this site, and by the construction of the service road access. The service road access would connect to the R458, approximately 300m east of the site.

Site 1E is located outside of any designated conservation area and there will be no loss of habitat within any Natura 2000 site or pNHA. However, as the site is located within the catchment and relatively close proximity (c.1km) of the River Shannon SAC and River Shannon and River Fergus SPA it would require adequate design and mitigation to ensure no negative impacts arise as a result of reduced water quality. The ecological ranking of Site 1E takes in to account the proximity and connectivity of the site with the designated area network, in combination with the existing ecological sensitivities apparent at the site.

There are two recorded sites; a ringfort (CL042-096), partly within Site 1E and a ringfort classified in the record as a cashel (CL042-095) located in the southern section of the site.

There are no RPS or NIAH sites, ACAs or stray finds within Site 1E and no features were evident on aerial photography within the site option. One small structure was depicted on the first edition 6-inch OS map in the west of the area, and was no longer present on the revised edition.

There is also a predicted indirect negative impact on the architectural and cultural heritage of Dromoland Belvedere located c. 1.2km north of Site 1E.

5.1.3 *Site 2E*

Site 2E is on the eastern side of the M18 Ennis Bypass scheme, approximately 4.5km south east of Ennis and 4.5km north west of Newmarket-on-Fergus. The site in general is below the level of the mainline. The north western corner of the site is c. 3m higher than existing road level, and then drops gradually towards a stream which is c. 4m below the existing mainline at its lowest point. There is a relatively large level difference in the northern end of the site with levels decreasing from c. 9m in elevation to c. 2m in elevation over a short distance. This area of the site sits c. 4m below the existing road surface at its lowest elevation. The remaining site area is undulating on the eastern side of the mainline and falls from a height of c. 3m above the existing road level of the M18 mainline at the western side end of the site to approximately 4m below the existing road level at the eastern end of the site.

Sufficient area is available for locating a single sided service area facility at the site. A design combination of a Loop and Dumb-bell Roundabout Grade Separated Junction would be required. There is sufficient distance between the overbridges north and south of the site to locate the grade separated junction required for a single sided service area. A departure for weaving length from the Ennis Junction to the north and the Clarecastle Junction to the south would be required to accommodate a grade separated junction at this location. However, weaving distances both north and south would still meet the required 1km minimum. No departures or relaxations arise from the vertical or horizontal alignment of the mainline at this section.

The site area is underlain by estuarine sediments silts and clays with an undifferentiated Visean Limestone bedrock. The site is located on a regionally important aquifer which is a karstified conduit. No karst features were identified within the site. Two swallow holes were identified within c. 2.7km of the site in the townland Knockanimano with an enclosed depression c. 2.7km of the site in the area of Kilbreckan. Four wells are located within 1km of the proposed site area.

Supply of electrical services are available within close proximity to the site. The closest wastewater treatment facility is located in Newmarket-on-Fergus which would require an approximately 5km long rising main to connect with the potential service area. It is expected that potable water would be sourced from the water main located in the regional road R458.

Site 2E is located outside of any designated conservation area and there will be no loss of habitat within any Natura 2000 site or pNHA. However, Site 2E has a number of open drains which drain for approximately 400m before entering the Lower River Shannon SAC directly. The site therefore presents a more significant risk of impacting on these Natura 2000 sites as a result of construction and operation impacts. The ecological ranking of Site 2E takes in to account the proximity and connectivity of the site with the designated area network, in combination with the existing ecological sensitivities apparent at the site.

There is one recorded archaeological site partly within the north-east of Site 2E; an enclosure identified through aerial photography (CL042-195). Ringforts are plentiful in the surrounding landscape and there is evidence of prehistoric activity in the flat cemeteries uncovered along the route of the motorway. The enclosure could be prehistoric or early medieval in date. There is good potential for avoidance of this site which is situated in the north-east of the Site 2E.

There are no RPS or NIAH sites, ACAs, stray finds or additional features evident on aerial photography within Site 2E. No features of interest are depicted on the first edition 6" OS map.

Outside of Site 2E there are two protected structures; Manus House (NIAH 20404203, RPS 52) and Glenard House (NIAH 20404202, RPS 48), c. 460m north-west and c. 660m north-west respectively. Both of these structures are surrounded by mature trees and are on the opposite side of the motorway.

5.2 Summary of Assessment

5.2.1 Site 1W

The assessment of Site 1W is summarised in the following table:

Criteria		Sub-Criteria	Ranking	Comment
Engineering	Traffic Volumes		**Neutral**	Traffic Volumes are the similar across all sites.
	Road Safety		**Neutral**	There is insufficient weaving distance between the proposed grade separated junction and adjacent junctions. Therefore a departure would be required due to a weaving length below 1km as per the NRA DMRB TA70/14 and TD22/06.
	Physical Characteristics of the Site	Land Availability & Setting	**Neutral**	Adequate available land to provide a facility for circa 10 to 15 hectares in size.
		Terrain	**Neutral**	Site 1W varies in elevation from 2m to 17m with relatively tightly spaced contours in the south west corner of the site.
		Conflicts with existing services	**Minor Negative**	There is a potential impact on the Ballyconneely pumping station and ESB lines due to the proposed junction.
		Surface Water features	**Neutral**	Drainage channels present through the site.
		Motorway Structures - Culverts/Other	**Neutral**	Facility will impact on existing access tracks and underpass.
		Flooding	**Major Negative**	Significant flood risk on high proportion of the site.
	Service/Utility Connections	Potable Water Supply	**Neutral**	Supply is available via bridge crossing to Newmarket-on-Fergus.
		Wastewater Disposal	**Neutral**	Disposal option is available via bridge crossing to Newmarket-on-Fergus.
		Broadband/ Telecommunications	**Neutral**	Broadband is available.
		Electrical Supply	**Neutral**	Electricity Supply is available.
		Surface Water Outfall	**Neutral**	Surface water outfall is available.
		Local Road Access	**Neutral**	Local access is available.
	Geotechnical		**Moderate Negative**	During the construction of the mainline at Site 1W the removal of existing soil was replaced with poor quality soil. Further GI would be required at this location. On the assumption that this is poor quality made ground, it was determined that Site 1W is a significant geotechnical risk which ultimately may require the use of piles during construction. On this basis it was ranked as a moderate negative.
Environmental	Air Quality		**Neutral**	No Sensitive receptors within 50m of proposed scheme which would experience a significant change in road traffic. The population exposure to NOx and PM_{10} would be neutral across sites.
	Noise		**Neutral**	Site has the lowest number of potential receptors within the -50m, 50-100m, 100-200m and 200-300m bands and is the preferred site - Ranks as neutral

Criteria	Sub-Criteria	Ranking	Comment
	Landscape & Visual	**Neutral**	Sites 1W is located in relatively open landscape south west of Dromoland. Dromoland Belvedere (a protected structure associated with Dromoland Castle Demesne) is prominently located on a hilltop (visible but to a lesser extent than 1E)
	Agriculture	**Neutral**	These lands are comprised of low-lying grasslands and a small plot of commercial forestry. Lands south of the forestry are used for grazing and the farming enterprises include beef livestock and equines. Access to lands within Site 1W is from the south via a private internal farm road, an access accommodation track running parallel to the M18 or from the M18 underpass structure. The field nearest the M18 is extensively grazed by equine livestock and remaining grasslands are more intensively grazed by livestock including equines. There are no dwelling houses or farmyards present within the area of the site option. (Impact across all sites is deemed moderate negative (all ranked as neutral).
	Non Agricultural Properties / Material Assets	**Neutral**	Material Assets: Natural ammenities, geological resource, public ammenities all neutral across the potential sites. MSA sites have been located to limit direct impacts on non-agricultural properties.
	Ecology	**Neutral**	Site 1W consists primarily of improved agricultural grassland. A large drain runs east / west along the northern boundary. A small block of conifer plantation occurs north of this drain. The drain in the northern section of the site runs towards the SAC/SPA. (Joint preferred)
	Archaeology	**Minor Negative**	Significant negative direct impact on one recorded monument (upstanding Mound) & potential significant negative direct impact on a possible sub-surface enclosure identified through aerial photography field system and a sub-surface enclosure).
	Architectural & Cultural Heritage	**Minor Negative**	Moderate - Significant negative indirect impact on the visual setting of Dromoland Belvedere located c.1375m NNE.
	Human Beings / Socio Economic	**Neutral**	Socio economic impact is neutral when compared against all sites. Potential sites have been located to reduce the impact on public amenities / communities.
	Planning	**Neutral**	Land use zoning - 'Countryside' - identified as part of "Rural Areas strong urban pressure" in areas of special planning control. Clare County Development Plan 2011-2017. No Landuse zoning constraint. No live planning applications recorded on location.

Criteria	Sub-Criteria	Ranking	Comment
	Geology & Hydrogeology	**Neutral**	Undifferentiated Visean Limestone. Karst Feature: Turlough (Lough Gash) is located approximately 2.3km to the south east of the location. Site underlain by a regionally important aquifer - karstified (Conduit). High to extreme aquifer vulnerability. No wells within 1KM radius (GSI Database). Karst Feature: Turlough (Lough Gash) is located approximately 2.3km to the south of the location.(Overburden encountered in GI Mainline GI indicates that the aquifer will be protected but will remain HIGH).
	Hydrology	**Neutral**	Site 1W is within the catchment and relatively close proximity (c1km) of the SAC/ SPA but outside the designated area network.
	Waste	**Moderate Negative**	A significant portion of the excavated material will not be reusable on site and will be required to be discarded to licenced facility. No contaminated ground anticipated from previous GI.
Economy	Benefit Cost Ratio	**Neutral**	Differences in BCR across the three sites are due to the differing construction costs. Site 1W has relatively high construction cost (primarily due to poor ground conditions) when compared to Site 1E.

5.2.2 Site 1E

Criteria		Sub-Criteria	Ranking	Comment
Engineering	Traffic Volumes		**Neutral**	Traffic Volumes are the similar across all sites.
	Road Safety		**Neutral**	There is insufficient weaving distance between the proposed grade separated junction and adjacent junctions. Therefore a departure would be required due to a weaving length below 1km as per the NRA DMRB TA70/14 and TD22/06.
	Physical Characteristics of the Site	Land Availability & Setting	**Neutral**	Adequate land available to provide a facility for circa 10 – 15 hectares in size.
		Terrain	**Minor Negative**	Site 1E varies in elevation from 2m to 39m. The area where the MSA will be located is relatively flat, however significant fill be required for the junction construction.
		Conflicts with existing services	**Moderate Negative**	There is potential for the junction to impact on the Ballyconneely pumping station. In addition to this, there is the potential for a minor watermain/ESB diversion.
		Surface Water features	**Neutral**	No surface water features on site.
		Motorway Structures - Culverts/Other	**Neutral**	Facility will impact on existing access tracks and underpass.
		Flooding	**Neutral**	No flood risk on site, some impact on flood plain due to anticipated junction.
	Service/Utility Connections	Potable Water Supply	**Neutral**	Supply is available via bridge crossing to Newmarket-on-Fergus.
		Wastewater Disposal	**Neutral**	Disposal option is available via bridge crossing to Newmarket-on-Fergus.
		Broadband/ Telecommunications	**Neutral**	Broadband is available.
		Electrical Supply	**Neutral**	Electricity Supply is available.
		Surface Water Outfall	**Neutral**	Surface water outfall is available.
		Local Road Access	**Neutral**	Local access is available.
	Geotechnical		**Neutral**	Site has reasonable ground conditions (based on exposed cut face immediately north of the accommodation underpass).
Environmental	Air Quality		**Neutral**	No Sensitive receptors within 50m of proposed scheme which would experience a significant change in road traffic. The population exposure to NOx and PM10 would be neutral across sites.
	Noise		**Minor Negative**	Site has the largest number of potential receptors within the -50m, 50-100m, 100-200m and 200-300m bands. Joint least preferred site - Moderate Negative impact. Ranks as Minor negative in comparison with other sites.
	Landscape & Visual		**Minor Negative**	Sites 1E is located in relatively open landscape west of Dromoland. Dromoland Belvedere (a protected structure associated with Dromoland Castle Demesne) is prominently located on a hilltop (between the M18 to west and R458 to east) immediately north of Sites 1E.

Criteria	Sub-Criteria	Ranking	Comment
	Agriculture	**Neutral**	Landtake comprises of approximately 15ha improved grassland of average to good land quality. These lands are currently used for moderately intensive beef livestock grazing and fodder production. Site 1E is located on an external boundary between two farm holdings and does not impact on farmyard facilities. Site 1E will impact on access to the existing M18 underpass and may result in severance of access to areas located west of the M18.There are no dwelling houses or farmyards present within the area of the site option. (Impact across all sites is deemed moderate negative (all sites ranked as neutral).
	Non Agricultural Properties / Material Assets	**Minor Negative**	Material Assets: Natural ammenities, geological resource, public ammenities all neutral across the potential sites. MSA sites have been located to limit direct impacts on non-agricultural properties - notwithstanding this indirect impacts likely on derelict dwellings / buildings immediately south of the proposed MSA.
	Ecology	**Neutral**	Site 1E is located outside of any designated conservation area and there will be no loss of habitat within any Natura 2000 site or pNHA. The site is located north of a dwelling house and associated outbuildings may support roosting bats. An area of scrub occurs in the south-western part of the site in the vicinity of an agricultural underpass. (Joint preferred site)
	Archaeology	**Neutral**	Moderate negative direct impact on the southern part of one recorded monument (upstanding ringfort).
	Architectural & Cultural Heritage	**Moderate Negative**	Significant negative indirect impact on the visual setting of Dromoland Belvedere located c.600m N. Least preferred site.
	Human Beings / Socio Economic	**Neutral**	Socio economic impact is neutral when compared against all sites. Potential sites have been located to reduce the impact on public amenities / communities.
	Planning	**Neutral**	Land use zoning - 'Countryside' - identified as part of "Rural Areas strong urban pressure" in areas of special planning control. Clare County Development Plan 2011-2017. No Landuse zoning constraint. No live planning applications recorded on location.

Criteria	Sub-Criteria	Ranking	Comment
	Geology & Hydrogeology	**Minor Negative**	Undifferentiated Visean Limestone. Karst Feature: Turlough (Lough Gash) is located approximately 2km to the south east of the location. Site underlain by a regionally important aquifer - karstified (Conduit). High to extreme aquifer vulnerability. No wells within 1KM radius (GSI Database). Needs survey to confirm - approx 1.5km from site Dromoland Castle has 2 No. GW supply wells (GSI Website). Karst Feature: Turlough (Lough Gash) is located approximately 2km to the south of the location. Bedrock observed in exposed rock face at underpass which will be encountered on excavation of the site increasing the aquifer vulnerability to Extreme.
	Hydrology	**Neutral**	Site 1E is within the catchment and relatively close proximity (c1km) of the SAC/ SPA but outside the designated area network.
	Waste	**Neutral**	Anticipated all earthworks material encountered on site will be reused on site in junction construction or landscape bunds. No contaminated ground anticipated from previous GI.
Economy	Benefit Cost Ratio	**Minor Positive**	Differences in BCR across the three sites are due to the differing construction costs. Site 1E has the lowest construction cost .

5.2.3 Site 2E

Criteria		Sub-Criteria	Ranking	Comment
Engineering	Traffic Volumes		**Neutral**	Traffic Volumes are the similar across all sites.
	Road Safety		**Moderate Negative**	1 departure required due to weaving length. Loop design may lead to safety issues. Combination of Dumb-Bell and Loop Grade Separated Junction with Type A Diverge and Type B Merge and parallel auxiliary lane between the proposed MSA and the existing J11 M18. Type A Diverge comprise of 180m direct taper and slip road with minimum length of 295m, i.e. Desirable Minimum SSD of the Mainline. Type B Merge comprise of 230m auxiliary lane and 75m direct taper. A length of approx. 300m falls under within the 1km weaving length of the junction 11. Relaxations/ Departures apply associated with relaxation of weaving length to 1km, as per the NRA DMRB TA70/14 and TD22/06. Departure on SSD on Immediate Approach to Junction for NB Diverge, which could be designed out at Detail Design stage while designing the auxiliary lane.
	Physical Characteristics of the Site	Land Availability & Setting	**Neutral**	Adequate land to provide a facility for circa 10 to 15 hectares in size.
		Terrain	**Neutral**	Site 2E varies in elevation from 2m to 9m. There are tightly spaced contours at the north western corner of the site.
		Conflicts with existing services	**Neutral**	No significant conflicts are known.
		Surface Water features	**Neutral**	The site is constrained by the presence of streams and rivers.
		Motorway Structures - Culverts/Other	**Moderate Negative**	Facility impacts on existing structures, attenuation areas. Potential requirement for widening over water of the existing motorway bridge and the direct impact on an existing attenuation area. It was deemed that the required costly measures and re-profiling of the attenuation area quantify a moderate negative.
		Flooding	**Major Negative**	Significant flood risk on the site.
	Service/Utility Connections	Potable Water Supply	**Minor Negative**	Supply is available – Long distance main required to Newmarket-on-Fergus.
		Wastewater Disposal	**Minor Negative**	Disposal option is available – Long distance rising main required to Newmarket-on-Fergus.
		Broadband/ Telecommunications	**Neutral**	Broadband is available.
		Electrical Supply	**Neutral**	Electricity Supply is available.
		Surface Water Outfall	**Neutral**	Surface water outfall is available.
		Local Road Access	**Neutral**	Local access is available.

Criteria	Sub-Criteria	Ranking	Comment
	Geotechnical	**Minor Negative**	Estuarine sediments silts and clays. Limestone Till. Significant excavate and replace from mainline construction placed on site.
Environmental	Air Quality	**Neutral**	No Sensitive receptors within 50m of proposed scheme which would experience a significant change in road traffic. The population exposure to NOx and PM_{10} would be neutral across sites.
	Noise	**Minor Negative**	Site has the largest number of potential receptors within the -50m, 50-100m, 100-200m and 200-300m bands. Joint least preferred site - Moderate Negative impact. Ranks as Minor negative in comparison with other sites
	Landscape & Visual	**Neutral**	Site 2E is located in a very open location north of the River Rine and overlooked to some degree by more elevated residential properties c. 400m to the north. The site is within flat estuarine landscape character area 14 Fergus Estuary
	Agriculture	**Neutral**	Site 2E is an area of approximately 15ha comprised entirely of improved grassland. Land quality is generally poor to medium and is used for grazing by sheep and beef livestock. There will be an impact on access via the access track to the remaining lands to the east and south of the site. There will be an impact on an animal handling pen located at a field gate on the access accommodation track. The impact on the access tracks / holding pens result in the impact being assessed as moderate negative (all proposed sites ranked as neutral).
	Non Agricultural Properties / Material Assets	**Neutral**	Material Assets: Natural ammenities, geological resource, public ammenities all neutral across the potential sites. MSA sites have been located to limit direct impacts on non-agricultural properties.
	Ecology	**Minor Negative**	Site 2E consists of a series of large agricultural fields of improved pasture with a number of open drains which flow south to join the River Rine which is within the Lower River Shannon SAC upstream of the M18 motorway, while the SPA extends as far as the M18. (Least preferred Site Ranking).
	Archaeology	**Neutral**	Moderate negative direct impact on one recorded monument (sub-surface enclosure identified through aerial photography).
	Architectural & Cultural Heritage	**Neutral**	Neutral impact. Protected structure Manus House (RPS 52) is located c.460m NW and has good tree coverage in the direction of Location 2E. Preferred Site.
	Human Beings / Socio Economic	**Neutral**	Socio economic impact is neutral when compared against all sites. Potential sites have been located to reduce the impact on public ammenities / communities

Criteria	Sub-Criteria	Ranking	Comment
	Planning	**Neutral**	Land use zoning - 'Countryside' - identified as part of "Rural Areas strong urban pressure" in areas of special planning control. Clare County Development Plan 2011-2017. No Landuse zoning constraint. No live planning applications recorded on location.
	Geology & Hydrogeology	**Neutral**	Undifferentiated Visean Limestone. No Karst Features identified on GSI Website (Site 2.7km SE of known 2 No. Swallow Holes (Townland Knockanimano) and approx 2.7km south of Enclosed depression (Kilbreckan). Site underlain by a regionally important aquifer - karstified (Conduit). Aquifer vulnerability High to Extreme. 4 wells within 1km on GSI Database. Site locatated approx 2.2km south west of Carrowmere GWS (EPA Website). Site located within groundwater salmonoid Regs (EPA Website). (Overburden encountered in GI Mainline GI indicates that the aquifer will be protected but will remain HIGH).
	Hydrology	**Minor Negative**	Located immediately north of transitional surfacewater body in Salmonoid Regs (EPA Website). Outfall directly to River Fergus SPA / Lower River Shannon SAC.
	Waste	**Minor Negative**	A significant portion of the excavated material will not be reusable on site and will be required to be discarded to licenced facility. No contaminated ground anticipated from previous GI.
Economy	Benefit Cost Ratio	**Neutral**	Differences in BCR across the three sites are due to the differing construction costs. Site 2E has relatively high construction costs due to relocation of attenuation area and widening of existing river structure. There is also a significant spoil heap onsite that will potentially need to be disposed of off-site.

5.3 Options Comparison

The following table compares the potential sites across all the criteria.

Criteria		Sub-Criteria	Site 1W	Site 1E	Site 2E
Engineering	Traffic Volumes		Neutral	Neutral	Neutral
	Road Safety		Neutral	Neutral	Moderate Negative
	Physical Characteristics of the Site	Land Availability & Setting	Neutral	Neutral	Neutral
		Terrain	Neutral	Minor Negative	Neutral
		Conflicts with existing services	Minor Negative	Moderate Negative	Neutral
		Surface Water features	Neutral	Neutral	Neutral
		Motorway Structures - Culverts/Other	Neutral	Neutral	Moderate Negative
		Flooding	Major Negative	Neutral	Major Negative
	Service/Utility Connections	Potable Water Supply	Neutral	Neutral	Minor Negative
		Wastewater Disposal	Neutral	Neutral	Minor Negative
		Broadband/ Telecommunications	Neutral	Neutral	Neutral
		Electrical Supply	Neutral	Neutral	Neutral
		Surface Water Outfall	Neutral	Neutral	Neutral
		Local Road Access	Neutral	Neutral	Neutral
	Geotechnical		Moderate Negative	Neutral	Minor Negative
Environmental	Air Quality		Neutral	Neutral	Neutral
	Noise		Neutral	Minor Negative	Minor Negative
	Landscape & Visual		Neutral	Minor Negative	Neutral
	Agriculture		Neutral	Neutral	Neutral
	Non Agricultural Properties / Material Assets		Neutral	Minor Negative	Neutral
	Ecology		Neutral	Neutral	Minor Negative
	Archaeology		Minor Negative	Neutral	Neutral
	Architectural & Cultural Heritage		Minor Negative	Moderate Negative	Neutral
	Human Beings / Socio Economic		Neutral	Neutral	Neutral
	Planning		Neutral	Neutral	Neutral
	Geology & Hydrogeology		Neutral	Minor Negative	Neutral
	Hydrology		Neutral	Neutral	Minor Negative
	Waste		Moderate Negative	Neutral	Minor Negative
Economy	Benefit Cost Ratio		Neutral	Minor Positive	Neutral

As can be seen from the table above the key differentiating issues between the sites include:

- Road Safety;
- Conflicts with Existing Services;
- Motorway Structures – Culverts/Other;
- Flooding;
- Geotechnical;
- Architectural and Cultural Heritage;
- Waste; and
- Benefit Cost Ratio.

In terms of road safety all three sites are likely to require departures from standards. Site 1W and 1E will require a departure as the sites are located within the 2km weaving distance of Junction 10 and Junction 11 on the M18. Site 2E will also require a departure for weaving. Site 2E requires a Dumbell and Loop grade separated junction which is not recommended in terms of road safety. On the basis of Site 2E requiring a loop design it is the least preferred site from a safety point of view.

Site 2E performs relatively well with respect to "conflicts with existing services". Both Site 1W and 1E and their associated junction may impact on pipework associated with Ballyconneely water supply pumping station and as result this performs relatively poorly.

From a Motorway Structures point of view Site 1W and 1E will equally impact on an existing farm underpass. However in comparison Site 2E will have significant impact on the River Rine bridge crossing, requiring significant widening works to be carried out to facilitate the auxiliary lane as part of the proposed junction. Site 2E also has a significant impact on an existing attenuation area which would require its relocation and reprofiling of its associated pipework.

With respect to flooding, following an examination of OPW Preliminary Flood Risk Assessment (PFRA) Mapping it was concluded that Site 1E had the least flooding risk associated with it in comparison with Sites 1W and 2E which have a relatively high flood risk potential.

Site 1E performs the best overall in terms of geotechnics, with Site 2E performing slightly worse than Site 1E as a result of soil being deposited on top of the original ground during construction of the mainline. Site 1W ranks the least favourable as a dig and deposition operation carried out during the mainline construction leads to a potential geotechnics risk. Land on the western side of the carriageway also has peat issues in places.

Site 1E performs the best from a construction waste point of view as it is envisaged the rock and top soil encountered will be substantially reused on site. Site 2E performs slightly worse than Site 1E as it is anticipated that soil/material deposited during the mainline construction will need to be disposed of off-site. Site 1W performs worst overall as there is a significant amount of material to be disposed of off-site.

Site 1E performs the worst from an Architectural and Cultural Heritage point of view due to its proximity to the Dromoland Belvedere. Site 1W while located further away and on the opposite side of the mainline has less of an impact on the Belvedere, it is still considered to have a negative effect on it. Site 2E is relatively close to Manus House but it is considered to have little impact on it and therefore is the best performing site from an Architectural and Cultural Heritage point of view.

Site 1E is the most beneficial in of the Economic Assessment due to the lower construction costs. Site 2E and 1W have higher construction costs than Site 1E.

6 Recommendation

6.1 *Identification emerging preferred site*

On the basis of the assessment undertaken to date, Site 1E is identified as the preferred site followed by Site 1W.

Site 2E is the least preferred site. It performs relatively poorly from a geometric point of view requiring a loop design to gain access. The potential junction for this site would also require the relocation of an existing attenuation area, widening of the adjacent river bridge and the construction of an auxiliary lane. Site 2E also performs relatively poorly from an air quality and a noise point of view. Site 2E would also require a relatively long connection distance to water supply and foul water disposal facilities.

Site 1W ranks second. There is a significant flood risk associated with this site, coupled with relatively poor ground conditions, therefore this site performs relatively poorly from an engineering point of view. The site is relatively remote from receptors, however it performs relatively poorly from an archaeological and cultural and architectural heritage point of view.

Site 1E ranks as the preferred site as it performs best overall from both and engineering and environmental point of view. The site has relatively good ground conditions although it undulates slightly near the mainline in parts. The site is also relatively remote from receptors but not as remote as Site 1W. It also performs relatively poorly from an archaeological and cultural and architectural heritage point of view.

However, on balance across all criteria, Site 1E has the most benefits and is therefore the preferred site. Halcrow Barry recommend that the preferred site is adopted and progressed to the next Stage Preliminary Design.

Appendix A

Drawings

Study Area Showing Key Constraints for M18 Service Area	Y15112-M18-SSR-001
Alignment Appraisal for M18 Service Area	Y15112-M18-SSR-002
Site Locations M18 Service Area	Y15112-M18-SSR-003
Site Locations M18 Service Area	Y15112-M18-SSR-004

ENNIS

EXTENT OF STUDY

J 12

CLARECASTLE

J 11

NEWMARKET-ON-FERGUS

J 10

J 9

J 8

J 7

SHANNON

EXTENT OF STUDY

LEGEND:

- (pNHA) PROPOSED NATURAL HERITAGE AREA
- (NHA) NATURAL HERITAGE AREA
- (SPA) SPECIAL PROTECTION AREA
- (SAC) SPECIAL AREA OF CONSERVATION
- ARCHAEOLOGICAL MONUMENT
- STREAM
- EXISTING ESB HV OVERHEAD
- EXISTING ESB HV UNDERGROUND
- EXISTING RAILWAY LINE
- EXISTING MOTORWAY JUNCTION
- EXISTING MOTORWAY OVERBRIDGE
- EXISTING MOTORWAY ACCOMMODATION UNDERPASS

Meters

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Rev.	Date	By	Amendments
B	11.01.16	FR / PM	INFORMATION
A	11.09.15	RO'B / PM	INFORMATION

Job

TRANCHE 4 MOTORWAY SERVICE AREAS

Title

STUDY AREA SHOWING KEY CONSTRAINTS FOR M18 SERVICE AREA

Issue Details			Office Use Only	
Designed: RS	Draft	X	Job No. Y15112	
Drawn: RO'B	Approval		Date: JANUARY 2016	
Checked: JN	Tender		Drawing No. Y15112-M18-SSR-001	Rev. B
Approved: PM	Construction			
Scale: 1:20,000 @ A1 1:40,000 @ A3	Record		File Ref. Y15112	

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Rev.	Date	By	Amendments
C	11.01.16	FR / PM	INFORMATION
B	20.10.15	FR / PM	JUNCTION NUMBER UPDATED
A	11.09.15	RO'B / PM	INFORMATION

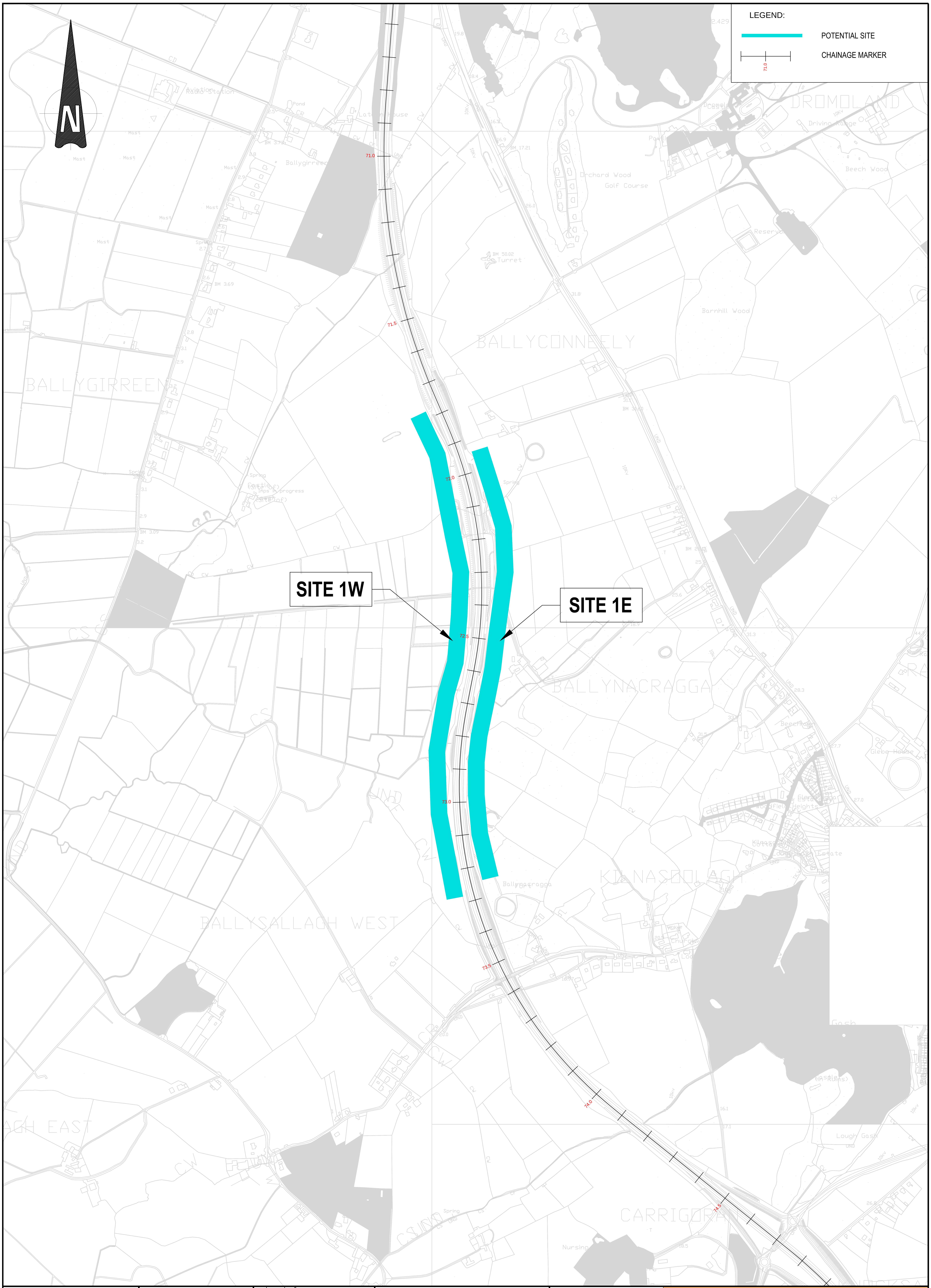
Job

TRANCHE 4 MOTORWAY SERVICE AREAS

Title

ALIGNMENT APPRAISAL FOR M18 SERVICE AREA

Issue Details				Office Use Only	
Designed: RS	Draft		Job No. Y15112		
Drawn: RO'B	Approval	X	Date: JANUARY 2016		
Checked: JN	Tender		Drawing No. Y15112-M18-SSR-002	Rev. C	
Approved: PM	Construction				
Scale: 1:20,000 @ A1 1:40,000 @ A3	Record		File Ref. Y15112		



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D	11.01.16	FR/PM	INFORMATION
C	20.10.15	FR/PM	INFORMATION
B	11.09.15	MH/PM	INFORMATION
A	11.09.15	RO'B/PM	INFORMATION

Job

TRANCHE 4 MOTORWAY SERVICE AREAS

Title

SITE LOCATIONS
M18 SERVICE AREA

Issue Details			Office Use Only	
Designed: RS	Draft		Job No. Y15112	
Drawn: RO'B	Approval	X	Date: JANUARY 2016	
Checked: JN	Tender		Drawing No. **Y15112-M18-SSR-003**	Rev. **D**
Approved: PM	Construction			
Scale: 1:5,000 @ A1 1:10,000 @ A3	Record		File Ref. Y15112	

Rev	Date	By	Amendments
D	11.01.16	FR/PM	INFORMATION
C	20.10.15	FR/PM	INFORMATION
B	11.09.15	MH/PM	INFORMATION
A	11.09.15	RO'B/PM	INFORMATION

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SITE LOCATIONS
M18 SERVICE AREA

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Designed: RS	Draft		Job No. Y15112
Drawn: RO'B	Approval	X	Date: JANUARY 2016
Checked: JN	Tender		Drawing No. Y15112-M18-SSR-004 — Rev. D
Approved: PM	Construction		
Scale: 1:5,000 @ A1 1:10,000 @ A3	Record		File Ref. Y15112