

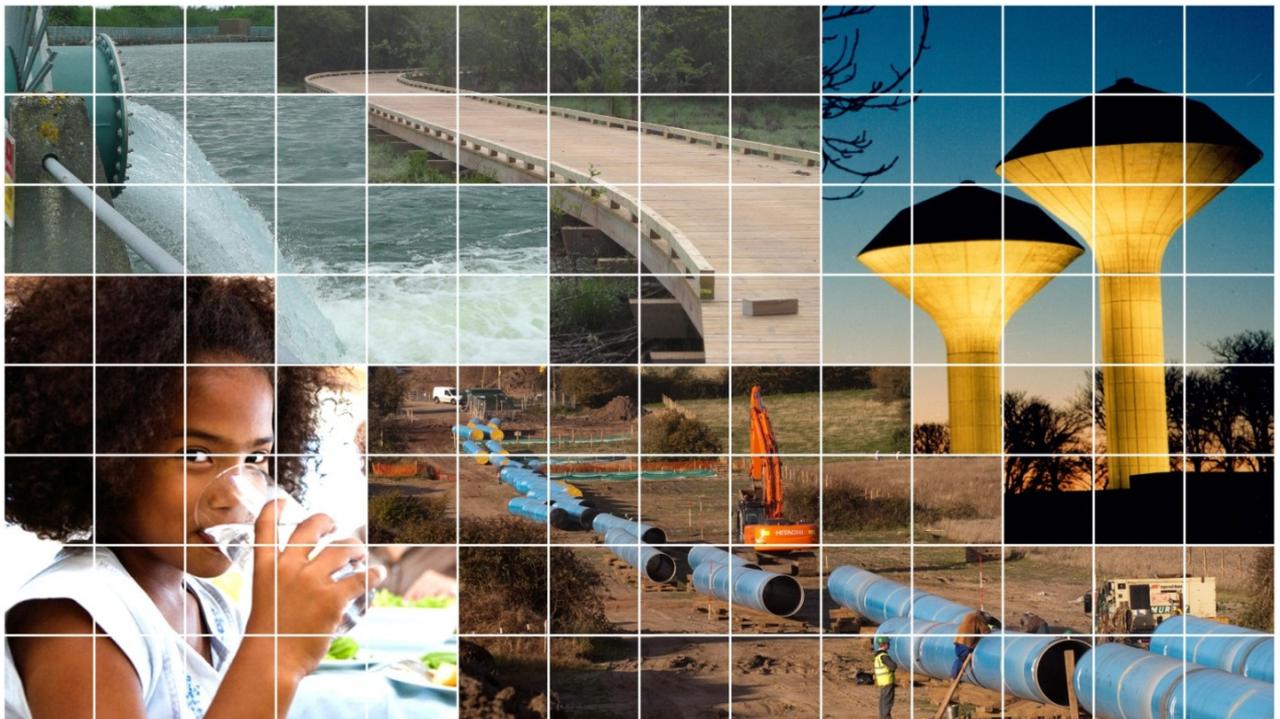
Water Supply Project – Dublin Region

Appropriate Assessment Screening - Site Investigation Works at Garryhinch Bog



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1 Introduction

Irish Water, via a contract procured by Dublin City Council (DCC), has engaged Jacobs-Tobin to provide consultancy services in respect of the Water Supply Project-Dublin Region (WSP-DR) (“the Project”), which is a strategic national project.

This report considers the site investigation works (hereafter “the works”) ongoing at Garryhinch Bog, Co. Offaly. These works commenced on 12th November 2014 and are expected to be complete by end February 2015. This report, Revision D, updates a previous screening report for the same proposed works, Revision C, dated 23rd October 2014, which determined that these works could be screened out of Appropriate Assessment with no significant effects likely to European (or Natura 2000) Sites. Further detail is provided in this Revision D report to address observations provided by Department of Arts, Heritage and the Gaeltacht (DAHG) regarding Revision C of the AA screening report, refer to section 5.

The site investigation works are part of preliminary investigations to assess the general suitability of the site for water impoundment. Garryhinch bog is owned by Bord na Móna and it is a former major sod peat production facility.

The ongoing EIA/planning approval process for the Project, to which the works relate, will appraise the Garryhinch bog option within a wider group of identified water supply options that includes abstraction, use of groundwater, and desalination.

In accordance with the EC Habitats Directive 92/43/EEC (hereafter “The Habitats Directive”) as transposed by the Birds and Natural Habitats Regulations 2011 (S.I. 411 of 2011), this Screening statement for Appropriate Assessment assesses the effects of the works on European sites (“Natura 2000 sites”¹). All other proposed plans or projects, including the overall Project and any future sampling associated with it, were also assessed with regard for in-combination effects.

¹ “European site” replaced the term “Natura 2000 site” under the EU (Environmental Impact Assessment and Habitats) Regulations 2011 S.I. No. 473 of 2011.

2**The Appropriate Assessment Process****2.1 Introduction to Appropriate Assessment**

The requirement to carry out an AA comes from Article 6(3) of the Habitats Directive. The first step of the AA process is to carry out a Screening to establish whether, in relation to a particular plan or project, an AA is required. Article 6(3) states:

‘Any plan or project not directly connected with or necessary to the management of the site but likely to have [or capable of having²] a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site’s conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.’

The above requirement has been implemented in the Republic of Ireland by the European Communities (Birds and Natural Habitats) Regulations 2011 S.I 477 of 2011 and the Planning and Development Acts 2000-2010, as amended.

2.2 Appropriate Assessment Methodology

The European Commission (2002) and Department of Environment, Heritage and Local Government (2010) have divided the provisions of Article 6 into four “stages” in the AA process. This approach is used industry-wide as standard and is followed in this Screening Statement. These four stages are as follows:

- **Stage One: Screening (overview)** - This process identifies the likely effects upon a European site from a project or plan, either alone or in combination with other projects or plans, and considers whether these effects are likely [or capable of being] significant. Reasoned application of the Precautionary Principle is fundamental to the Screening Stage (and AA). Where there is evidence of possible effects on a European site(s) from the project, but uncertainty remains, significant effects must be presumed without evidence to the contrary. The project will be “screened-in”, requiring a Stage Two AA. Where there is no evidence of significant effects, and no reasonable scientific doubt remains regarding this judgement, the assessment is stopped, and the project is “screened-out” from further assessment. The broad approach to undertaking the screening assessment is outlined in Section 2.2.1, while the detailed approach is provided in Section 6.1.
- **Stage Two: Appropriate Assessment** – The competent authority then considers the effect of the project or plan on the integrity of the European site(s), with respect to the site structure and function and its conservation objectives either alone or in combination with other projects or plans. Where there are adverse effects identified, mitigation measures are proposed as

² In accordance with the Opinion of Advocate General Eleanor Sharpston in *Reference for a Preliminary Ruling from the Supreme Court (Ireland)*, Case C-258/11, the term “likely to have a significant effect” in Article 6 (3) was interpreted as “capable of having a significant effect” (i.e. a lower probability is required to trigger Appropriate Assessment).

appropriate to avoid adverse effects. For projects, Stage Two of the AA process is documented within a Natura Impact Statement (NIS). This is provided to the competent authority by the applicant, to facilitate an informed assessment of the project.

- **Stage Three: Assessment of alternative solutions** - The process of examining alternative ways to complete the project and avoid adverse effects to the integrity of any European sites is likely to have been incorporated into Stages One and Two of the AA process. However, alternatives will be revisited at this stage. In the event that two (or more) alternative projects or plans are being developed, AAs will be undertaken for all.
- **Stage Four: Assessment where no alternative solutions exist and where adverse effects remain** - Stage Four is highly unlikely to be required. Implementation of mitigation under Stage 2 and/or use of alternatives under Stage 3 are preferable options to Stage Four.

2.2.1 Screening Methodology

This screening report was informed by a desk study of all relevant environmental information, consultation with the project team, a site visit in December 2015 to review the contractors activities and a follow up site survey by a qualified experienced senior ecologist on 20th January 2015 as part of the site activity monitoring. The screening process involved the following steps (broadly based on EC, 2000b):

1. Determining whether the project or plan (in this instance the proposed works) is directly connected with or necessary to the management of the site (In this case it is not)
2. Describing the project (see Section 3);
3. Assessing the baseline environment (Section 4) to identify the relevant European site(s) which may be potentially affected (Section 6); and
4. Assessing the significance of any effects on relevant European site(s) (see Section 6).

The approach to completing steps 3 and 4 is expanded upon in Section 6. The AA Screening process was undertaken in accordance with the following guidance:

- *Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities* (Department of Environment, Heritage and Local Government (DEHLG), 2010);
- *Managing Natura 2000 Sites: The Provisions of Article 6 of the Habitat's Directive 92/43/EEC* (EC Environment Directorate-General, 2000);
- *Assessment of Plans and Projects Significantly Affecting Natura 2000 sites - Methodological Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC* (The European Commission (EC), 2002); and
- *Findings from the International Workshops on Appropriate Assessment in Oxford (2011), and Mikolov (2013).*

3 Description of Proposed Works

3.1 Description of Proposed Works

The works are ground investigations aimed at providing detailed information in relation to the nature and thickness of the materials, the depth to natural strata, the groundwater regime and to provide design parameters for the construction of a raw water storage reservoir subdivided into a number of cells. The site investigation works are designed as a Preliminary Investigation (EN1997-1) to assess the general suitability of the site for water impoundment. This site investigation comprises the following site investigation methods³:

- Geophysics survey across the site to investigate the depth to rock and karst features.
- Dynamic probing.
- The drilling of boreholes (Shell & Auger and Rotary Coring) including the associated sampling and in-situ field tests.
- The excavation of Trial Pits to log natural soils, rock and groundwater and to obtain test samples.
- In-situ plate load tests.
- The retention of groundwater, soil and rock samples for testing.
- Monitoring of and permeability testing in groundwater during and after completion of the site works.
- Laboratory testing of soil, rock and groundwater.
- Reinstatement of all boreholes, trial pits, etc.
- Surveying of exploratory hole positions and levels to National Grid and Datum.

Works methods are described in more detail below.

Geophysics:

Geophysical surveys involve measuring the physical properties of the ground using methods that are non-destructive and non-invasive. Geophysics surveys are undertaken across the site. Two methods are being employed on site:-

- **2D-Resistivity Survey:** The 2D-Resistivity Survey consists of continuous lines with 5m electrode spacing. The electrodes penetrate the ground.
- **Seismic Refraction Survey:** The seismic survey consists of p-wave seismic refraction profiling with each of the set-ups consisting of 24nr geophones at 3m spacing placed along the ground.

Dynamic Probing:

In total 325nr Dynamic Probes are proposed. Dynamic probing is an in situ test used to determine the resistance of soils to the intermittent penetration of a cone, driven dynamically in a standard manner. The equipment consists of a 90° cone, a series of extension rods and a driving device. There are two type of test: Heavy Dynamic Probing (DPH) and Super Heavy Dynamic Probing (DPSH). The dimensions of the cone and the mass and drop height of the driving weight differ between the two tests; typically in a DPSH Test a 63.5kg weight is dropped 750mm and in a DPH Test a 50kg weight is dropped 500mm. The extension rods used in the test are 35mm diameter. The driving device is a purpose-designed probing rig on an all

³ Garryhinch Ground Investigation – Appendix A: Schedules to the Specification. May 2014

terrain vehicle. Silt or other deposits are not generated as part of the testing process.

Trial Pits:

134nr trial pits to a maximum depth of 5m are proposed. Excavators, with wide tracks suitable for crossing bogs are used for trial pits. Trial pits are excavated to a maximum depth of 5m, to a width of 1m and have a typical base area of 2m². Excavated material is stockpiled close to the excavation and once completed the same material is used to backfill the trial pit excavation. Trial pit excavation is carried out in generally dry weather conditions so as to minimise sediment runoff. The works do not take long (typically 3 trial pits can be dug/ day).

Shell/Auger Boreholes:

91nr Sink Shell/Auger boreholes to a maximum depth of 10m are proposed. Shell and auger is the most common drilling method used for geotechnical site investigation.

Standard light-cable percussion boring uses a two tonne capacity winch driven by a diesel engine and a tripod derrick approximately 7m in height. The borehole is formed using a ‘clay cutter’ for cohesive soils or a ‘shell’ for non-cohesive materials. A chiselling tool can be used to penetrate very hard ground or obstructions. The sides of the borehole are supported using steel casing which is lowered into the ground as the boring proceeds. If the exploratory hole is formed in sands or gravels, particularly within the saturated zone below the water table, the steel casing will be driven into position to support the borehole sides to allow in-situ testing to be carried out and the soil to be recovered using the shell. The borehole is reinstated with arising and the steel casing is removed on completion.

Shell and auger boreholes are generally 200mm in diameter and penetrate the ground to varying depths depending on rock or other hard strata levels. At Garryhinch Bog the Shell and Auger rig is brought to position of the proposed boreholes using a 4-wheel drive vehicle or all terrain vehicle and a steel slay. Controls for silt or other deposits are not required. Plate 3-1 below details the excavator on site.



Plate 3-1: Shell and Auger borehole excavation on site

Rotary Coring:

35nr Rotary Cores (minimum 75mm diameter) to a minimum depth of 5m up to 50m and 5nr Rotary Cores (250mm / 140mm diameter) to a maximum depth of 50m will be conducted across the site. Rotary drilling is used for obtaining representative samples of rock. The drilling method involves a powered rotary cutting head on the end of a shaft, which is driven into the ground as it rotates. The system requires lubrication (air, water or drilling mud) to keep the cutting head cool. At the Garryhinch site water will be used to keep the cutting head cool. The process involves the supply and recirculation of a water flush into the rotary core holes. It is envisaged that 200/300 gallons of water will be required per drilling rig per day. Water will be sourced from drains on site if a suitable supply is available, otherwise water will be brought to site by tanker. The water recirculation process involves piping of the water into a series of three interconnected collection tanks where fines from the rotary core hole settle out to allow the water to be reused. Fines settled in the collection tanks are periodically removed and bagged for disposal off site.

The rotary cores are generally 75mm in diameter. Surface water pollution controls are considered regarding any material deposition (avoiding drains etc) and therefore there are no losses of fines into the surface water environment.

All drilling works detailed above will also include the excavation, backfilling and reinstatement of all exploratory holes.

Two access locations are proposed for entry to the site, a northern access location controlled by an automatic gate with the southern access location being open. Access routes across the site use existing tracks and access points where possible. The routes across the bog follow existing "high bog" fields hence avoiding as much as possible crossing of existing drainage ditches. These fields exist at regular intervals across the sites and were designed to allow peat extraction machinery good access. Regularly distributed boundary drainage ditches mean these high fields are well drained, relatively dry habitats, which minimises risk of soil disturbance and peat runoff. In addition most of the former bare peat fields and ditches are now heavily vegetated (estimated > 90%) with scrub, heath and wet grassland (rush) vegetation, which further stabilises peat. In some areas shallow drainage ditches (no standing water) are partially filled in with peat to create temporary bridges so as to allow machinery access.

It is anticipated that works will require 16 calendar weeks in total. Works commenced in November 12th 2014 and are expected to be finished by end February 2015. The works period does not coincide with sod peat production activities around the periphery of the site.

All works are carried out during daylight hours to minimise disturbance to roosting birds and other wildlife. Works are at a highly localised scale (maximum 2 working rigs – 2 vehicles) within a very extensive cutover bog site (>1000HA).

The site was visited in December 2014 by Jacobs/Tobin to assess the contractors site activities and this was followed on 20th January 2015 by monitoring of the proposed works by a senior ecologist from TOBIN Consulting Engineers. These visits sought to confirm that the previous AA screening report was accurate and to also provide more detail to address DAHG observations. During this January 2015 visit It was confirmed that no significant overland water flow occurred on the site at the time despite recent heavy rain and extensive flooding evident on the River Barrow, south of the site. This January 2015 survey also included a re-appraisal of

likely surface water runoff risk at smaller drains crossing the site and larger drains at the extremity of the site which are designed to ultimately receive waters from the site, refer to Plate 3-2 and 3-3 below.

It was confirmed that drainage ditches are predominantly well vegetated and many are dry. All drainage ditches observed with water have no significant flow and act as settlement ponds for waters (rainfall) that arrive on the overall site.



Plate 3-2: *Densely vegetated field drains on flat topography limit possible peat runoff. Many of the extensive numbers of drainage ditches on the site are dry.*



Plate 3-3: *The main drain at the northern edge of the bog which ultimately receives surface waters from drains across the site, and links to the River Barrow. This was characterised by no obvious flow (ice covered), clear water (despite heavy recent rain), patches of bulrush *Typha latifolia* (vegetation cover) and a very flat topography. No evidence of excessive silt runoff was recorded as a result of the site investigation works or other nearby activities.*

3.2 General Good Practice for Pollution and Invasive Species Control

3.2.1 Pollution control

Proper site management during construction is being carried out to ensure that all necessary measures are taken to prevent run-off/pollutants from entering any watercourse/ drainage ditch on site.

The contractor prepared and submitted detailed method statements incorporating environmental management plans prior to the commencement of works. The contractor is complying with the following mitigation measures in order to remove any risk of a pollution incident:

- The Contractor is taking all necessary precautions to ensure that no pollution discharge either of solid or liquid material is made to any watercourses;
- The Contractor's methods of operation prevent the pollution of land, ditches, streams, rivers, drains, watercourses and the like and prevent erosion of their beds or banks. All works areas are being offset from the main drainage features with typically a buffer of at least 5m being retained;
- Soil stripping and vegetation removal is being kept to a minimum so as to limit the volume of surface water run-off;;
- The Contractor is implementing strict controls of erosion, sediment generation and other pollutants associated with the ground works, including the provision of attenuation measures, silt traps or geotextile curtains to reduce and intercept sediment release into the local watercourses where a risk is identified. The site is crossed by existing drainage ditches associated with previous peat extraction operations. The flat nature of the site landscape and dense vegetation in the drains means they act as settlement ponds for possible excess peat runoff.
- All fuel or lubricating oils stored in bulk on the site are located as far as reasonably possible from any watercourse;
- The Contractor inspects the machinery for leaks on a regular basis;
- The stockpiling of excessive volumes of loose soil material onsite is avoided. Any temporary stockpile areas, such as at the location of trial pits, are kept away from drains and watercourses. Extensive areas of exposed ground and soil stockpiles will not likely arise;
- The Contractor will ensure that any excavated soil is used / disposed of responsibly. Its disposal should not lead to significant loss or damage of any natural or semi-natural habitats on the site. It will not be spread close to any local watercourse as it may result in an increase in the sediment load of that watercourse; and
- On completion of the Works all apparatus, plant, tools, offices, sheds, surplus materials, rubbish and temporary erections or works of any kind will be removed from the site by the Contractor

3.2.2 Biosecurity

- In order to prevent the spread of invasive species (e.g. Japanese knotweed, *Rhododendron*, Pitcher Plant and Giant Rhubarb) the Contractor cleaned all equipment prior to arrival on-site and has also used local excavators that have been working in the bog.

4**Description of Relevant Baseline Environment****4.1 Sources Informing the Baseline Description**

The baseline environment of the site for the proposed works as it related to European sites was analysed using the key sources below. Additional information sources are included in the References section 8:

- Ordnance Survey Ireland mapping and aerial photography available from www.osi.ie;
- Information on land zonings and land-use plans available from the Department of the Environment, Community and Local Government at www.myplan.ie;
- Mapping of European site boundaries, Conservation Objectives and habitat/species distributions from NPWS online at www.npws.ie;
- Information on the distribution of protected and invasive species taken from the National Biodiversity Data Centre website www.biodiversity.ie;
- Information on the conservation status of relevant cSAC species and habitats from NPWS conservation status assessments (NPWS, 2013a; 2013b); and
- Information on the conservation status of bird species of designated sites from the Birds of Conservation concern in Ireland 2014-2019 (Colhoun & Cummins, 2013).

Relevant plans from national to local scales are critical to inform a robust assessment of in-combination impacts, and these are listed below:

- National Biodiversity Plan, 2011-2016;
- Offaly County Development Plan 2009-2015; and
- Phase 2 Strategic Environmental Assessment (SEA) for the Water Supply Project – Dublin Region.

4.2 Baseline Description

The following baseline data was relevant to the identification of any source-pathway-receptor relationships between the works and any European sites.

Information on the site was obtained from;

- Meetings and discussions by the Jacobs-Tobin project team in 2014 and 2015 and breeding and winter bird studies on the site Crushell (2013).
- Information on surface and groundwater was obtained from <http://gis.epa.ie/Envision>, April 2014.
- Ongoing appraisal/ monitoring of works is being conducted by experienced TOBIN Consulting Engineer staff to confirm no possible risks to receiving waters and drains including monitoring by a qualified senior ecologist with extensive water quality risk assessment experience, from TOBIN Consulting Engineers. Further site visits are planned until the end of February 2015.

The site at Garryhinch is owned by Bord na Móna and it is a former major sod peat production facility (until 1990s). It is located north of the R423 road between Portarlinton and Mountmellick and east of the N80 road between Tullamore and Mountmellick. The site area within the overall Garryhinch cutover bog (>1000HA) extends to approximately 580 hectares. It is subject of an Integrated Pollution Control Licence issued by the EPA (IPC licence No. 503). The site at Garryhinch is, in part, utilised by local Contractors for the production of sod peat with remnant high

bog margins, an area that extends to some 155 hectares of the total lands, around the edge of the bog.

The surrounding landscape is quite flat and largely dominated by farmland. Much of the grassland located adjacent to the site has been reclaimed in the past from bogland. Three main access routes developed on old railway embankments orientated east-west are still kept clear throughout the site by regular traffic from contractors involved in turf cutting. In addition to peat cutting around the margins, other land-uses that continue within the site include grazing (horses) and some timber harvesting for fuel.

Garryhinch contains a relatively large area of cutaway bog that has mostly re-vegetated (>90%). The majority of this area is relatively well drained and “dry” with dry heath and birch scrub/woodland habitats predominating. Bare peat areas occur in those areas that are still in peat production around the margins of the site. Some small discrete areas of wetland habitat occur with poor to rich fen vegetation present. During summer there are no areas of standing water although during winter, standing water develops in areas of bare peat in the Northern part of the site. There is an extensive network of drainage ditches throughout the site most of which are now heavily vegetated.

The site is located approximately 1.8km north of the River Barrow which is designated as the River Barrow and River Nore cSAC (Site Code: IE002162). Aquatic qualifying habitats and species are therefore a key consideration for this report (see Table 6-1 for a list of qualifying interest species for the River Barrow and River Nore cSAC). The study site is located within the South Eastern River Basin District and the Barrow Main Water Management Unit. Soils have been classified as Cut - Raised Bog cutaway/cutover”.

The Backwood watercourse and Cottoners Brook are the two main surface water features draining Garryhinch Bog study area. The River Barrow is noted to be classed as “At risk of not achieving good status” with Cottoners Brook and a proportion of the River Backwood classed as being “Possibly at risk of not achieving good status”. There are no EPA monitoring stations on Cottoners Brook or the River Blackwood. Water quality in the River Barrow at the Bridge south east of Hammerlane (downstream of the confluence between Cottoners Brook and the River Barrow) is noted to be of moderate status (Q3-4) based on the EPA classification. A further 1.7km downstream at Portnahinch Bridge (south of Garryhinch House), water quality was scored as being of “Good” status (Q4). Water quality at Kilnahown Bridge, located approximately 4km further downstream or 2.5km downstream of the confluence of the Backwood river and Barrow River is also of “Good” status (Q4). Based on surface water features in the local area displayed on EPA website, all surface water from Garryhinch Bog study site should enter the River Barrow upstream of Kilnahown Bridge water sampling location. The Barrow is also noted to be a nutrient sensitive river by the EPA.

The study site is mainly located within Portlaoise “poorly productive bedrock” groundwater body with a small proportion of the eastern area of the site is contained within Rhode “productive fissured bedrock” groundwater body. Both the Rhode and Portlaoise waterbodies are classed as being “At risk of not achieving good status”.

The maps and data in the detailed conservation objectives for the River Barrow and River Nore SAC were examined to determine which species/habitats exist within the potential zone of impact of the proposed works. Particular attention was paid to qualifying interests downstream of the proposed works (Section 6).

The site is ca. 6km northeast of the Slieve Bloom Mountains SPA which is designated for breeding hen harrier. Ruddock *et al* (2010) confirmed breeding hen harrier in this SPA site. Hen harrier forage in open habitats such as open bog, scrub and moorland. Breeding and wintering bird surveys have been undertaken at Garryhinch bog in 2011 and 2012 (Crushell, 2013) and additional observations have also been made of Hen Harriers by Bord na Mona ecologists (Catherine Farrell pers.comm). No evidence of breeding hen harrier has been observed on the site. Hen harriers were recorded during the wintering seasons 2011-2012, 2012-2013 and 2013-2014. It was concluded in Crushell (2013) that suitable winter roost habitats probably exist within the overall Garryhinch Bog site and wider area, based on observations of foraging Hen Harrier. It was considered that the local population that use the site during the winter are likely to breed within the Slieve Bloom Mountains SPA. However based on the very extensive migrations observed in tracking by National Parks and Wildlife Services⁴ these may in fact be individual wintering Hen Harrier from other breeding areas.

⁴ <http://www.npws.ie/news/name,14158,en.html>

5

Consultation

A meeting was held between Jacobs Tobin, Irish Water, the NPWS Head of Ecological Assessment, and NPWS Divisional Ecologists for the southern and eastern regions on the 16th April 2014 to discuss the overall Water Supply Project. Irish Water stated that a preferred option for the overall project may be secured by December 2015. The specifics of the proposed site investigation works at Garryhinch Bog were not discussed, but the NPWS' comment on the Appropriate Assessment for the overall project are applicable, namely that AA needs to clearly assess the significance of the effects on European sites, based on objective and scientific information [be] well-referenced and substantiated, and address the issue of cumulative effects and alternatives.

The NPWS District Conservation Officer for Kildare/Laois/Offaly was contacted in September 2014 with regard to identifying any particular threats or pressures to designated habitats and species of the nearby SAC's and SPA. She highlighted concerns regarding potential run-off to the River Barrow and River Nore SAC, and impacts to foraging or roosting hen harrier associated with the Slieve Bloom Mountains SPA.

Bord na Móna's ecologists Dr Catherine Farrell and David Fallon were contacted in September 2014 and January 2015 respectively. Dr Farrell confirmed that hen harrier surveys had been undertaken in the area which had highlighted the possibility of a winter roost at the site. Mr Fallon confirmed mammal surveys (including Otter) were conducted on the site in 2011 and no Otter breeding sites were recorded.

Correspondence was received from Department of Arts, Heritage and the Gaeltacht (DAHG), REF: GPre00139/2014 regarding the draft AA Screening for Site Investigation Works at Garryhinch Bog and AA Screening for Water and Hydrographic Sampling Programmes (Lough Derg) on 11th December 2014.

Specific observations were raised in this letter regarding the AA screening for site investigation works at Garryhinch Bog summarised as follows;

1. Demonstrate more effectively that silt attenuation measures for site investigation works will prevent any silt runoff that enters drains around the site from reaching watercourses linked to the River Barrow.
2. Furthermore, it is noted that Jacobs Tobin are of the view that the potential for in-combination effects from surrounding land practices will not arise as works will not be undertaken in the same area simultaneously. However, the sequential manner of works that may cause siltation events to occur does not preclude the possibility of significant negative effects on freshwater species and should be re-considered in a revised screening exercise.
3. With regard to the Hen Harrier, Jacobs Tobin note that there is a possibility that a Hen Harrier winter roost occurs in the northeast quarter of the site and it is deemed that the proposed works would not result in a significant effect on the conservation status of this species (see page 15). The reasons given are that the works are short term (circa 12 weeks), the disturbance will be minor (boreholes and trail pits) and the roost is considered to extend over several hectares so the hen harrier can move within the wide area, if the

works are undertaken where it causes them disturbance. It is noted on Page 9 that it is considered that the local population that use the site during the winter are likely to breed within the SPA. The applicant is advised to elaborate on its reasons for its conclusion of no significant effects in this regard.

The main aim of this updated Revision D screening report is to provide further information and detail to adequately address the specific observations from DAHG regarding site investigation works at Garryhinch Bog.

6**Screening Assessment****6.1 Methodology for Identification of Relevant Sites****6.1.1 Identifying Relationships between the Works and any ‘Relevant’ European sites**

A standard source-receptor-pathway conceptual model was used to identify a preliminary list of ‘relevant’ European sites (i.e. those which could be potentially affected). This conceptual model is a standard tool in environmental assessment⁵. In order for an effect to occur, all three elements of this mechanism must be in place. The absence or removal of one of the elements of the mechanism means there is no likelihood for the effect to occur. In the context of the proposed works, the model comprises:

- Source (s) – e.g. sediment run-off from proposed works
- Pathway (s) – e.g. drains and streams connecting to the river SAC
- Receptor (s) – Qualifying aquatic habitats and species of European sites.

The model was focused solely on the habitats and species for which sites were designated as described under the sites’ Conservation Objectives. If any relevant sites were identified, the pathways required assessment of whether effects would be “likely” and/or “significant”.

Where uncertainty existed due to data gaps, the precautionary principle prevailed. To account for far-field effects and/or more subtle indirect effects, Jacobs Tobin ecological expertise was applied to an examination of known threats and ecological requirements of qualifying ecological interests⁶.

The duration and scale of the works and their associated effects was also a key consideration, in particular because the European Court of Justice has recently ruled—albeit in specific reference to priority habitats—that effects to site integrity must be “lasting”⁷.

6.1.2 Proximity of European sites and their Qualifying Interests

Of primary importance for an analysis of some effects was the location and proximity of European sites to the proposed works. In the case of pollution effects, increasing the distance between the pollution source and the ecological receptor will—for many contaminants—increase the rate of likely dispersion and dilution of polluting materials by virtue of the increased volumes and mixing interactions. Location and proximity of the works is also important in relation to the potential disturbance of mobile qualifying species—both within and outside European sites.

⁵See for example, the methodology employed by the Environmental Protection Agency to assess waste disposal sites (EPA, 2007) and in groundwater monitoring (Daly, 2004).

⁶ Threats and underlying ecological requirements sourced from NPWS (2013), other published sources, and Jacobs’ professional judgement as appropriate.

⁷ Judgment Of The European Court (Third Chamber) on 11 April 2013 in Case C-258/11 (REQUEST for a preliminary ruling under Article 267 TFEU from the Supreme Court (Ireland)) in relation to Peter Sweetman, Ireland, Attorney General, Minister for the Environment, Heritage and Local Government v An Bord Pleanála, para 46 (and others).

Figure 1 illustrates all sites within 15km as per Irish departmental guidance. The sites within 15km are also listed in Table 6-1. Five European Sites lay within 15km of the proposed works.

Site Name and Code	Qualifying Interests (Summarised)	Distance from Garryhinch Bog
Candidate Special Areas of Conservation		
River Barrow and River Nore cSAC [2162]	<i>Vertigo moulinsiana</i> , <i>Margaritifera margaritifera</i> , crayfish, three lamprey species, twaite shad, salmon, otter, Killarney fern, floating river vegetation, tall herb fringe communities, petrifying springs, estuarine mud and saltmarsh habitats, old sessile oak woods and alluvial woodlands.	c. 1.8km south
Charleville Wood cSAC [571]	<i>Vertigo moulinsiana</i> and Old sessile oak woods.	c.14km north west
Slieve Bloom Mountains cSAC [412]	Wet heath, alluvial forest and blanket bog	c.10km south west
Mountmellick Site [2141]	<i>Vertigo moulinsiana</i>	c.4km south east
Special Protection Areas		
Slieve Bloom Mountains SPA [4160]	Hen harrier	c.6km south west

Table 6-1: All European sites within 15km of Garryhinch Bog

6.2 Relevant European Sites

Relevant sites are listed in Table 6-2 below. For these sites, source-receptor-pathway relationships between the proposed works and any Qualifying Interests were identified. Qualifying interests not likely to be affected are struck out from Table 6-2, and the rationale explained in section 6.2.1.

Site and Code	Qualifying Interests potentially affected	Distance	Source-Pathway Receptor Relationships requiring assessment
River Barrow and River Nore cSAC Site Code: IE002162	<ul style="list-style-type: none"> • Desmoulin's whorl snail (<i>Vertigo moulinsiana</i>) • Freshwater pearl mussel (<i>Margaritifera margaritifera</i>) • White-clawed crayfish (<i>Austropotamobius pallipes</i>) • Sea lamprey (<i>Petromyzon marinus</i>) • Brook lamprey (<i>Lampetra planeri</i>) • River lamprey (<i>Lampetra fluviatilis</i>) • Twaite shad (<i>Alosa fallax fallax</i>) • Salmon (<i>Salmo salar</i>) • Estuaries • Mudflats and sandflats not covered by seawater at low tide • Salicornia and other annuals colonizing mud and sand • Atlantic salt meadows (<i>Glaucopuccinellietalia maritimae</i>) • Otter (<i>Lutra lutra</i>) • Mediterranean salt meadows (<i>Juncetalia maritimi</i>) • Killarney fern (<i>Trichomanes speciosum</i>) • Nore Pearl mussel (<i>Margaritifera durrovensis</i>) • Water courses of plain to montane levels with <i>the Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation • European dry heaths • Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels • Petrifying springs with tufa formation (Cratoneurion) • Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in British Isles • Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae) 	c. 1.8km south	Indirect impact via sediment run-off from proposed site investigation works.
Slieve Bloom Mountains SPA Site Code: IE004160	<ul style="list-style-type: none"> • Hen Harrier <i>Circus cyaneus</i> 	c.6km south west	Indirect disturbance to roosting or foraging hen harrier associated with the SPA.

Table 6-2: Relevant European Sites

6.2.1 Qualifying Interests excluded from the assessment

Garryhinch bog and the proposed site investigation works are not within any European site (cSAC/SPA). The key concern with respect to a potential source-receptor pathway relationship relates to the potential for sediment run-off to influence the water quality of the River Barrow and consequently possibly affect the aquatic designated habitats and species of the River Barrow and River Nore SAC. The detailed qualifying interests (Table 6-2), NPWS conservation objectives and

maps were reviewed together with NPWS (2013a&b) to determine qualifying features with the potential to be effected by the proposed works.

Features excluded are either terrestrial features with no potential to be linked by run-off (e.g. Killarney fern, oak woodlands), or they are features associated with the lower reaches of the SAC at a significant distance from the proposed works (e.g. estuarine habitats, twaite shad). Freshwater Pearl Mussel *Margaritifera margaritifera* is presently extinct from the main channel of the River Barrow (NPWSa, 2013), occurring in the catchments of three tributaries (Aughavard River, Mountain River and Ballymurphy River) (Moorkens *et al*, 1992; Lucey, 1998). Nore Freshwater Pearl Mussel *Margaritifera margaritifera durrovensis* does not occur in any part of the River Barrow with suitable habitat being restricted to a 37km stretch of the River Nore (NPWSa, 2013).

It was considered that qualifying interests relevant for consideration, refer to Table 6-2 include:-

1. Aquatic based

- Salmon,
- Brook Lamprey,
- River Lamprey,
- courses of plain to montane levels with *the Ranunculion fluitantis* and *Callitriche-Batrachion* vegetation

2. Otter (partially aquatic based)

6.2.2 European sites excluded from the assessment

The rationale for excluding other designated sites, refer to Table 6-1, is as follows:

- Charleville wood, located c. 14km northwest, on the outskirts of Tullamore is designated for rare *Vertigo* snail and sessile oak woodlands. Due to the type of Qualifying Interests, distance from the area of site investigation works and type of works, no direct and/or indirect impacts are anticipated.
- Slieve Bloom Mountains cSAC is located in an upland region, approximately 10km south west of the site. Due to the type of Qualifying Interest habitats, distance from the area of site investigation works (located upstream, ecology of the habitats) and type of works, no direct and/or indirect impacts are anticipated.
- Mountmellick cSAC is located c. 4km south east, to the south of the River Barrow. This site is designated for *Vertigo moulinsiana*. Due to the Qualifying Interests type and location of the site in a different surface water sub-catchment from the area of works, no direct and/or indirect impacts are anticipated.

6.3 Assessment of Significance of effects for Relevant Sites

The works are not directly connected with or necessary to the management of any European site.

6.3.1 Defining “Likely” and “Significant” Effects

“Significant” effects on a European site(s) are those that have the potential to affect the “favourable conservation status” of species or habitats for which a site is designated (terms defined below). It is possible that effects from a project alone may not significantly affect a European site, but that significant effects may occur when accounting for in-combination effects. The potential for “synergistic” effects (i.e. when the joint effect of in-combination effects is greater than the sum of the individual effects) should also be considered.

With regard to the term “likely”, the European Court of Justice has argued that translations of the Habitats Directive into the working languages of other member states have substituted the term “likely” in article 6(3) with “possible”. In this regard, Irish governmental guidance from the DEHLG states that: “A precautionary approach is fundamental”. Accordingly, it should be established that there is no potential that significant (adverse) effect(s) may occur. Any uncertainty or identified significant adverse effects require an Appropriate Assessment to be undertaken.

6.3.2 Defining Conservation Objectives

Conservation Objectives were obtained from the online database of the NPWS in June 2014 for any sites that could be affected based on the characteristics of the works.

To date, the NPWS have produced site-specific Conservation Objectives for only some European sites⁸. The NPWS have published generic objectives for cSACs and SPAs for all other sites, using the general definitions of “favourable conservation condition” for species and “favourable conservation status” of habitats in the Habitats Directive. Generic objectives read as follows:

“To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA”; and

“To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected”:

Detailed conservation objective are available for the River Barrow and River Nore cSAC and are published on the NPWS website⁹.

6.3.3 Assessment of Likely Significant Impacts for the River Barrow and River Nore cSAC

Consideration is detailed here regarding likely significant effects to the River Barrow and River Nore cSAC and Slieve Bloom Mountains SPA qualifying interests identified in Table 6-2. from the works.

The River Barrow and River Nore cSAC is located c. 1.8km south of the site and is designated for a variety of species and habitats. The River Barrow (cSAC) is linked to the site by the Cottoners Brook and Backwood river.

⁸ Sites for which site-specific objectives have been published are listed on <http://www.npws.ie/protectedsites/conservationmanagementplanning/conservationobjectives/>

⁹

<http://www.npws.ie/media/npwsie/content/images/protectedsites/conservationobjectives/CO002162.pdf>

Qualifying interests identified as requiring consideration regarding significant (adverse) effects are assessed under two main Groups below;

1. Aquatic Based Species/ Habitats

Potential impacts from the project could possibly include short term localised increases in silt and suspended solids in surface water run-off from the site during the site investigation works. This could occur from disturbance of soil surface and/or extracted material from site investigation works being washed off site and downstream.

This impact is considered highly unlikely to occur based on the following assessment;

- The proposed individual works areas are over a short term timescale (not permanent), are highly localised (within the site) and of minimal area (typically less than 4m² works areas on site at one time), refer to section 3.1 for further description. The scale of potential risk of effects is significantly less than ongoing peat cutting activities on the site and surrounds.
- The very flat nature of the site topography, existing vegetated drains (act as settlement ponds) will further limit possible soil water runoff to off site watercourses linked to the River Barrow (cSAC).
- As a final precaution silt attenuation measures listed for inclusion in the Environmental Management Plan will remove any possible significant residual risk of silt runoff entering drains around the site.
- Monitoring observations by a senior ecologist on 19th January 2015 confirmed no significant runoff at works areas to date and hence it is considered that any silt runoff to drains is negligible and consequently negligible to offsite receiving waters.

When identifying if uncertainty exists regarding significant effects it is important to consider the scale (temporal and extent) of any possible residual runoff effects against the sensitivities of identified relevant qualifying interests; Salmon, Brook Lamprey, River Lamprey, Otter and courses of plain to montane levels with *the Ranunculon fluitantis* and *Callitricho-Batrachion* vegetation.

Possible residual silt runoff will be of a very limited and temporary scale. It will be rapidly diluted/ assimilated on site (settlement ponds in drains). The temporary nature of works also means possible runoff will not lead to permanent impacts.

In this regard it can be determined with high certainty that no significant effects will arise to relevant aquatic qualifying interests in the River Barrow and Nore SAC from the works and the risks of significant silt runoff affecting aquatic interests identified are considered negligible. For example possible residual silt runoff will not be of a concentration, and over a long enough period, to affect sensitive stages in the lifecycle of salmon (e.g. spawning and juvenile salmon), spawning lamprey and larval (nursery areas), floating river vegetation (e.g. River Water Crowsfoot *Ranunculus fluitans*) and Otter (prey species) in the River Barrow linked to the development.

2. Otter

The Otter is a wide ranging species which may move between the SAC and Garryhinch bog (site). Garryhinch Bog is sub-optimal forage habitat for Otter. No Otter breeding sites were observed in Garryhinch Bog during Otter surveys conducted in 2011. Otter breeding sites are not likely to occur on the wider bog though will potentially occur on larger streams off site linked to the River Barrow. It is considered that no significant effects will arise to Otter from the proposed works.

6.3.4 Assessment of Likely Significant Impacts for Slieve Bloom SPA

This upland site is designated for breeding Hen Harrier *Circus cyaneus*. Ongoing Surveys (2013 and 2014) by consultants on behalf of Bord na Móna (Crushell 2012) have indicated that there are no breeding Hen Harrier at Garryhinch bog. However Hen Harrier, (including possible individuals from Slieve Blooms - the closest-breeding site), use the site in winter, and there is a possibility of a winter roost on the site.

It is considered certain that any possible disturbance to foraging or roosting Hen Harriers, due to the proposed ground investigation works, will not result in 'significant' adverse effects to the conservation status of this species for the following reasons:

- The works will not have any effects on breeding Hen Harrier individuals, roost, nest (habitat), prey species and forage (habitat) in the Slieve Blooms SPA or the nationally important overall Hen Harrier population in Ireland and indeed potential migrants from the UK.
- The proposed works at Garryhinch are short term in nature (not permanent) expected to last ca. 12 weeks;
- All works cease at dusk and commence after dawn during the period when Hen Harrier have left possible roost areas.
- On a daily basis disturbance risk associated with the works is not likely as the individual works areas are highly localised and occur to a very small proportion of the overall Garryhinch bog site (typically a maximum of two work areas at any time);
- The autumn/ winter period (works period) is not a particularly sensitive period for Hen Harrier, unlike the breeding season (Late March to August). In winter Hen Harrier rapidly disperse throughout the Irish landscape (post breeding season) and cover extensive local migrations whilst temporarily using a variety of lowland roost habitats (wetlands, scrub, bogs, bracken) including the midlands raised bogs (cutover and remnant raised bogs). Hen Harriers have vast areas of potential and alternative roost habitat within the site which they will move between as observed at other roost sites by the author. As detailed above Hen Harrier will not be present when works are ongoing (works in daylight only) and roost habitat is not significantly modified by the works.
- Hen Harrier continue to roost in similar habitats throughout Ireland, many sites of which are subject to ongoing and similar scale temporary disturbance in autumn and winter e.g. peat cutting, shooting, farming activity etc.
- Areas of remnant raised bog at the edge of the site (sensitive habitat and potential roost habitat) are not included in works area.
- Observations of bird species on the site in January 2015 were recorded. It was confirmed that typical expected species occur on site as highlighted in Crushell (2012) including scarcer species such as Teal, Stonechat, Raven and Kestrel. Ongoing works are not disturbing these birds significantly and this would be expected also for possible Hen Harrier in the area;
- Prey species (small passerines and mammals) continue to use the Garryhinch Bog during works and foraging success for wintering Hen Harrier will not be effected.

In conclusion no adverse effects are arising to Hen Harrier associated with the works.

6.4 Potential In-combination Effects

The area of site investigation works lies north of the River Barrow within a landscape dominated by a mix of agriculture, peat extraction and forestry land practices. The site is also located approximately 3km north east of Mountmellick town with domestic rural settlements also present within the local vicinity.

The main potential source of in-combination impact considered is on surface and ground water quality from peat cutting. Peat cutting and extraction will continue within some areas proposed for site investigation works. Peat cutting and extraction was completed before the site investigation works commenced and no further peat cutting will arise during the works period. Peat cutting areas are shown in Figure 2.

There is no site investigation proposed in Areas A2 or A3 (c. 18 hectares). Site investigation works will be limited to geophysics and 4 boreholes in Area C. Site investigation works were not carried out in Area A1, Area B, and Area C until all production of sod peat had been completed and the harvest collected in late August/early September.

Potential in-combination effects from surrounding land practices, mainly peat sod production are not considered significant as works will not be undertaken in the same area simultaneously. Significant effects on aquatic Qualifying Interests of the cSAC are not envisaged. Based on Map 7 of the Conservation Objectives; White-Clawed Crayfish are the only qualifying interest located in close proximity to the area of works. Based on NPWS Article 17 report (2013b) good quality habitat for this species is defined as moderate to good water quality, which as demonstrated above in Section 4.2 reflects the current situation. In-combination effects to White-Clawed Crayfish and other aquatic species will not be significant. While possible linkage exists the levels of silt runoff will be negligible in the context of the proposed works and potential risk discussed in section 6.3 above.

It is considered that no significant (adverse) in-combination effects will arise from the proposed works given the project “alone” effects are not considered significant.

7

Screening Conclusion

It is determined with high certainty that the ongoing site investigation works, alone or in combination with other plans or projects are not likely to cause significant (adverse) effects, alone and in-combination (with other projects/ plans) on European Sites, and specifically the River Barrow and Nore SAC.

This assessment is based on consideration of;

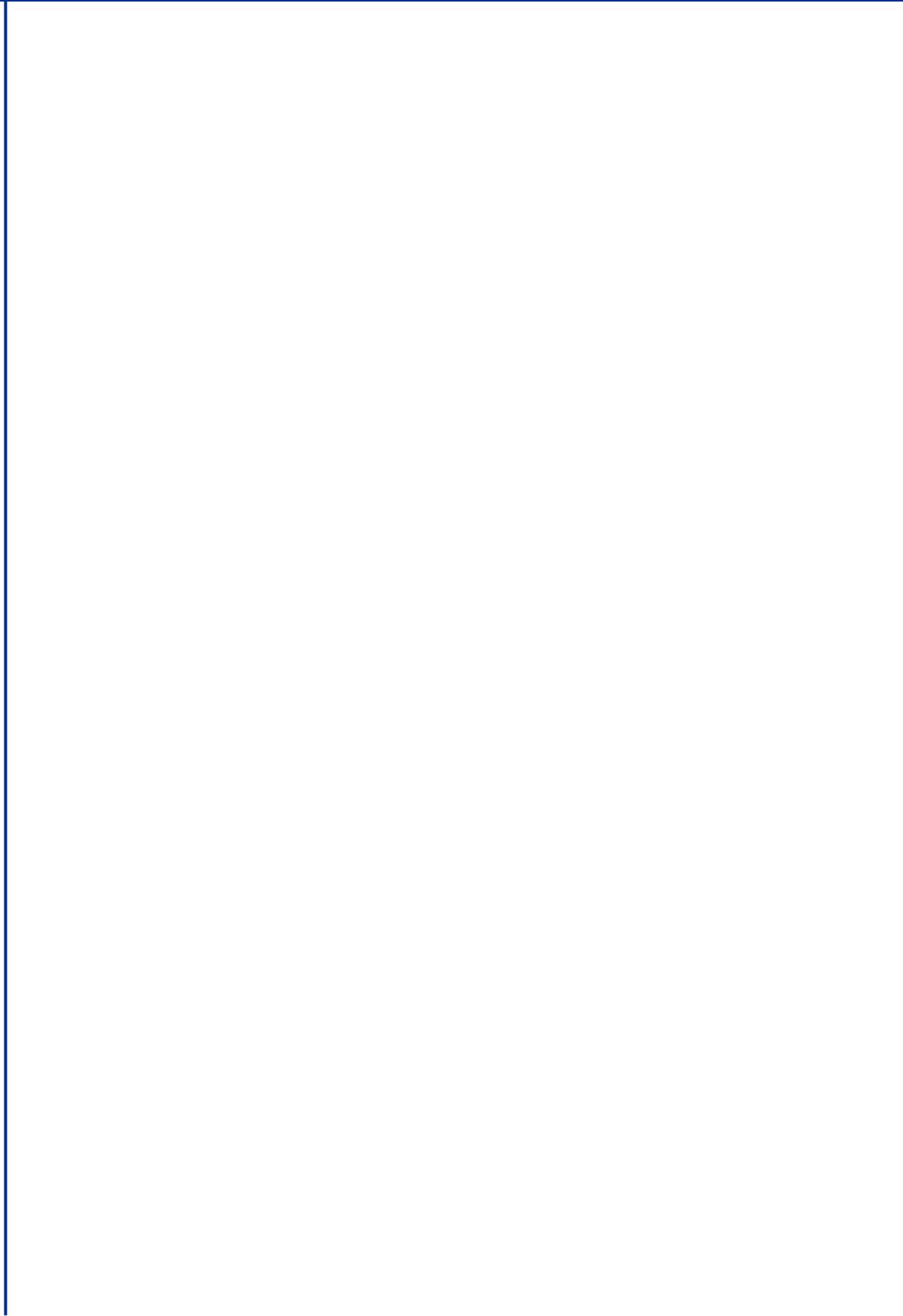
1. Relevant qualifying interests, their sensitivities and Conservation Objectives,
2. Potential source pathways between Natura 2000 sites identified and the proposed development,
3. The temporary and localised (scale) nature of the proposed development,
4. Monitoring observations by an ecologist of ongoing works;
5. Identified likely risk of significant peat runoff (based on flat topography, existing vegetated drains (natural silt runoff controls) and use of good environmental management practice, and
6. By applying the precautionary principle.

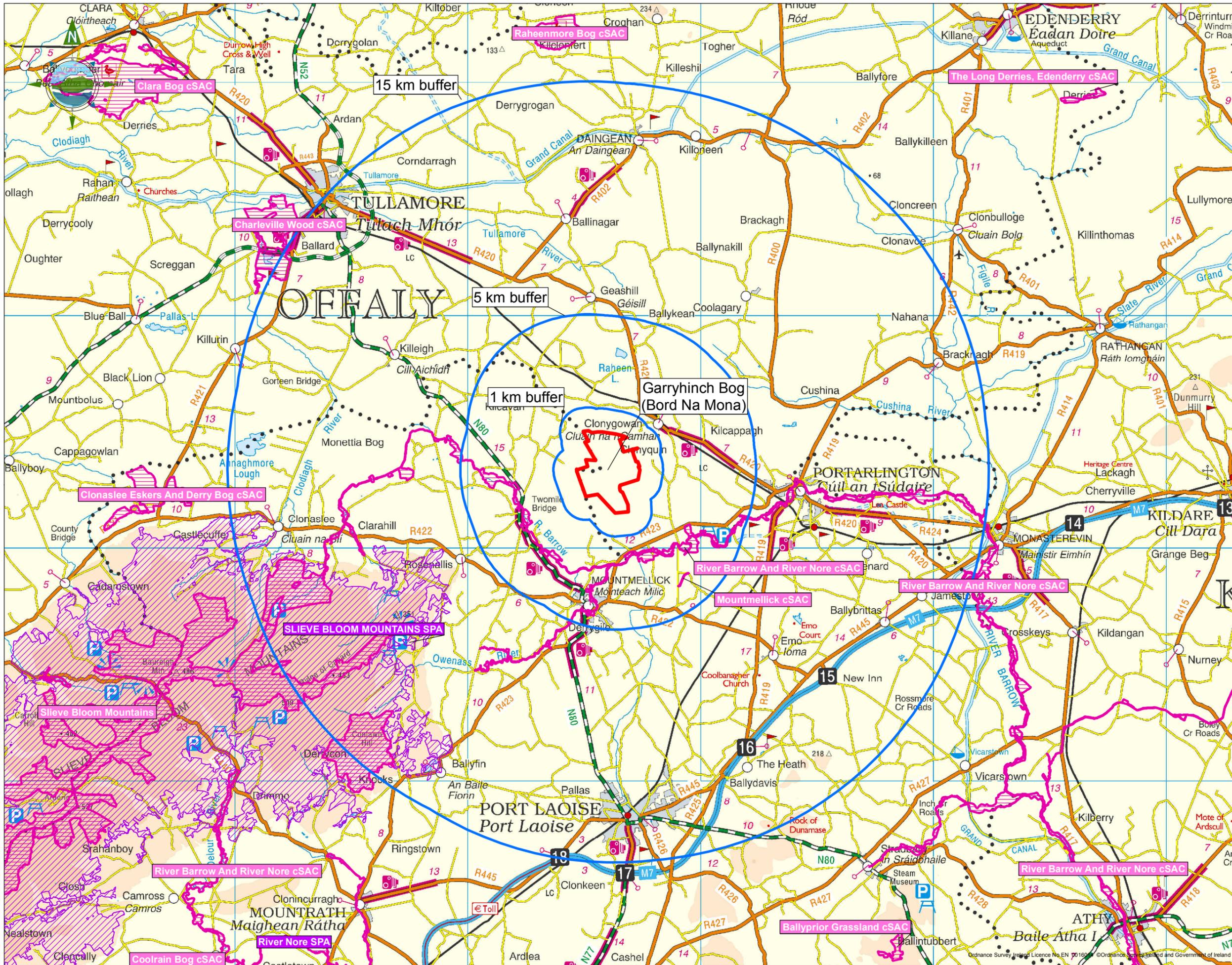
Further assessment under Stage 2 of the Appropriate Assessment process, is considered not required. The finding of no significant effects is summarised in the screening matrix in Appendix 1.

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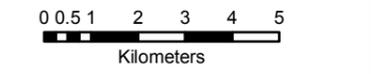
Figure 1 European Sites within 15km





Legend

- Garryinch Bog - Study Area
- Buffer from Study Area
- Special Area of Conservation
- Special Protection Area



- NOTES**
1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
 2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
 3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
 4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	25-04-14	Issued	G.F.	J.AH

Client:
DUBLIN CITY COUNCIL

Project:
DUBLIN WATER SUPPLY PROJECT

Title:
**Appropriate Assessment Screening:
Garryinch Bog Site
Investigation Works**

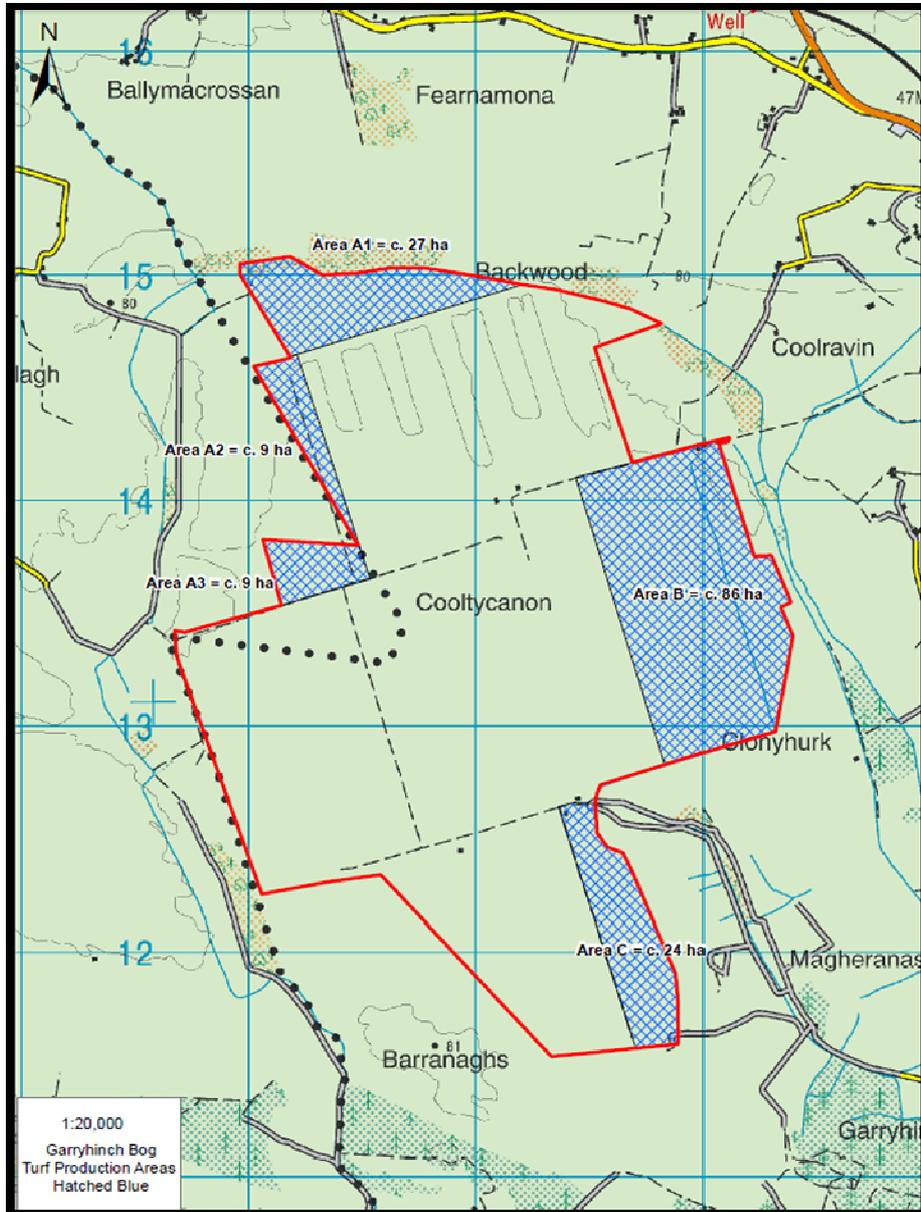
Scale @ A3: 1:150,000

Prepared by: G.F. Checked: J.AllenHamilton Date: April 2014

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Figure 2 Sod Peat Production Areas at Garryhinch Bog



Appendix 1 Screening Matrix

European Sites under Consideration:
River Barrow and River Nore SAC, Slieve Blooms SPA
Assessment Criteria:
Describe the individual elements of the project (either alone or in combination with other plans or projects) likely to give rise to impacts on the Natura 2000 site
See Section 3
Describe any likely direct or indirect impacts of the project (either alone or in combination with other plans or projects) on the Natura 2000 site by virtue of:
<ul style="list-style-type: none"> • Size and scale • Land-take • Distance from the Natura 2000 site or key features of the site • Resource requirements • Emissions • Excavation requirements (e.g. impacts of local hydrogeology) • Transportation requirements • Duration of construction, operation etc.
There will be no likely direct or indirect effects (refer to section 6.3)
Describe any likely changes to the site arising as a result of:
<ul style="list-style-type: none"> • Reduction of habitat area • Disturbance to key species • Habitat or species fragmentation • Reduction in species density • Changes in key indicators of conservation value (e.g. water quality, etc.)
There will be no likely changes to the Natura 2000 sites.
Describe any likely impacts on the European Site as a whole in terms of:
<ul style="list-style-type: none"> • Interference with the key relationships that define the structure and function of the site • Interference with key relationships that define the function of the site
See Section 6.3.3, 6.3.4 and 6.4
Provide indicators of significance as a result of the identification of impacts set out above in terms of:
<ul style="list-style-type: none"> • Reduction of habitat area • Disturbance to key species • Habitat or species fragmentation • Loss • Change to key elements of the site (e.g. water quality, hydrological regime, etc.)

There will be no significant effects.

Describe from the above those elements of the project, or combination of elements, where the above impacts are likely to be significant or where the scale or magnitude of impacts is not known.

The proposed works are not likely to have a significant effect on any European sites, either alone or in combination with other plans or projects.

Outcome of screening stage (AA required / not required):

Consequently, it is considered that a ('Stage 2') Appropriate Assessment is not required.