# Appendix B.6 - 2

# Meath County Council Notification of Decision to Grant Permission (Planning ref NA/160408)

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**Meath County Council**
**Planning Department**
**Buvinda House**
**Dublin Road**
**Navan**
**Co. Meath**
**C15 Y291**
**Phone: 046 909 7000 Fax: 046 909 7001**

**Planning & Development Act 2000 – 2015**
**NOTIFICATION OF DECISION**

**TO:** Boliden Tara Mines Limited
Knockumber
Navan
County Meath

GRANT

PLANNING REGISTER NUMBER: NA/160408
APPLICATION RECEIPT DATE: 27/04/2016
FURTHER INFORMATION DATE: 16/09/2016

In pursuance of the powers conferred upon them by the above-mentioned Act, Meath County Council has by Order dated 14.11.16 decided to **GRANT** PERMISSION to the above named for development of land, in accordance with the documents submitted namely:- the development works will consist of: The lateral extension to the existing tailings storage facility (TSF) in the townland of Randalstown and the construction of an Integrated Constructed Wetlands (ICW) system in the townland of Simonstown, Navan, Co. Meath. The proposed TSF extension to be referred to as Stage 6, will extend over an area of c. 58 hectares (internal basin area of c. 43 hectares), extend to a height of 22m above ground level and will provide a storage volume of approximately 9.6 million cubic metres of mine tailings (13.6 million tonnes). The development will be undertaken in two phases; Phase 1 and Phase 2. Phase 1 will extend to a height of 14 metres; 59.29 mAOD while Phase 2 will extend the overall height to 22 metres; 67.29 mAOD. The TSF extension will be constructed using fill materials sourced in-situ from development of the basin area of the facility and the remainder imported from third party, licenced suppliers. The constructed TSF cell will incorporate a composite lining system. Access to the site will be from existing site entrance along the L-74141. To facilitate the construction of the TSF extension an existing unoccupied single storey dwelling and ancillary farm buildings will be demolished. A temporary car park will be constructed to exist for the duration of the construction works. The ICW will be constructed over an area of c. 12 ha and will be located on the applicant's property south of the existing TSF in the townland of Randalstown and Simonstown, Navan, Co. Meath. The ICW will discharge to the Blackwater River via an underground pipeline. Access to the ICW site will be from the TSF site. An Environmental Impact Statement (EIS) for the development will be submitted to the Planning Authority with the planning application. A Natura Impact Statement (NIS) for the development has been prepared and will be submitted to the Planning Authority with the planning application. The proposal will require a revision of the Company's Industrial Emissions Licence (IEL) P0516-03 by the Environmental Protection Agency. Significant further information/revised plans submitted on this application at Randalstown, Simonstown, Windtown and Nevinstown, Navan, County Meath, subject to the 28 conditions set out in the Schedule attached.

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DATE: 14.11.16

M. Loughran
On behalf of MEATH COUNTY COUNCIL

Provided there is no appeal against this DECISION a grant of planning permission will issue at the end of four weeks.

**THIS NOTICE IS NOT A GRANT OF PERMISSION AND WORK SHOULD NOT COMMENCE UNTIL GRANT OF PLANNING PERMISSION HAS ISSUED**

NOTE:

1. Any appeal against a decision of a Planning Authority under Section 34 of the Planning and Development Act, of 2000-2015 may be made to An Bord Pleanala. Any person may appeal WITHIN FOUR WEEKS beginning on the date of the decision.

2. Appeals should be addressed to An Bord Pleanala, 64 Marlborough Street, Dublin 1. An appeal by the applicant should be accompanied by this form. **In the case of a third party appeal, the acknowledgement from the Planning Authority of receipt of the submission or observation made by the person to the Planning Authority at application stage should be submitted and the name of the person, particulars of the proposed development and the date of the decision of the Planning Authority should be stated.**

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## Guide to Fees payable to the Board

a. Appeal against a decision of a planning authority on a planning application relating to commercial development[1] made by the person by whom the planning application was made, where the application included the retention of development is € 4,500 or € 9,000 if EIS/ NIS involved[2].

b. Appeal against a decision of a planning authority on a planning application relating to commercial development[1], made by the person by whom the planning application was made, other than an appeal mentioned at (a) is € 1,500 or € 3,000 if EIS / NIS involved[2].

c. Appeal against a decision of a planning authority on a planning application made by the person by whom the planning application was made, where the application included the retention of development, other than an appeal mentioned at (a) or (b) is € 660.

d. Appeal other than an appeal mentioned at (a), (b), (c) or (f)[3] is € 220

e. Application for leave to appeal is € 110.

f. Appeal following a grant of leave to appeal € 110.

g. Any first party appeal solely against contribution conditions under section 48 or 49 of the 2000 – 2015 Acts, as amended, attracts a fee of €220 irrespective of the nature of the application

**An appeal will be invalid unless accompanied by the appropriate fee and evidence of payment of submission fee to the Planning Authority.**

Submissions or observations to An Bord Pleanala by or on behalf of a person (other than the applicant) as regards an appeal made by another person must be submitted within four weeks of receipt of the appeal by An Bord Pleanala and must be accompanied by a fee of € 50.

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Footnote

[1] Commercial development includes 2 or more dwellings. See Board's order determining fees and its appeal guide.

[2] The higher fee applies where an Environmental Impact Statement (EIS) or Natura Impact Statement (NIS) was submitted to the planning authority under section 172(1) and / or 177T of the 2000 - 2015 Planning Act or article 103(1) of the 2001-2015 Planning Regulations, as amended except where the appeal relates solely to a section 48 / 49 development / supplementary development contribution scheme and/or a special financial contribution. (refer to (g) above.

[3] Applies to:- (i) All third party appeals except where the appeal follows a grant of leave to appeal; (ii) First party normal planning appeals (section 37) not involving commercial or unauthorised development, or an EIS; (iii) All other appeals (non-section 37).

**While every care has been taken to ensure the accuracy and completeness of this information, it is the responsibility of any person / body making an appeal to ensure that their appeal is accompanied by the correct fee.**

**For more information on Appeals you can contact An Bord Pleanala at:**
Tel: 01 - 8588100 or LoCall: 1890 275 175
Fax: 01 – 8722684
E-mail: bord@pleanala.ie
Web: www.pleanala.ie

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## Schedule of Conditions

1. The proposed development shall be constructed, operated, decommissioned. rehabilitated and closed in accordance with the complete documentation, including the planning application and drawings together with the Stage 6 Design Report, and the Natura Impact Statement and Environmental Impact Statement submitted to the Planning Authority on 27th April 2016 and as amended by further information submitted to the Planning Authority on the 16th September 2016 and the 21st September 2016 except as may otherwise be required in order to comply with the following conditions.

   **Reason:** in the interest of proper planning and sustainable development.

2. This development shall be constructed in two phases, the first phase comprising on works within stage 6A. No works on stage 6B shall commence without first having fully completed the Stage 6A works as certified in writing by the Planning Authority. This permission shall have effect for a period of five years from the date of grant of this permission.

   The temporary wastewater treatment system and car park area shall be removed at the end of the five year period and the areas shall be re-instated to their current state.

   **Reason:** This duration is considered reasonable and necessary to allow for the phased nature of the construction.

3. The Passive Treatment System to the south of the existing Tailings Storage facility shall not be permitted. The Passive Treatment System shall be subject of a separate planning approval.

   Any such application shall include inter alia:

   - Examples of international case studies which provide a long term evidence base (circa 5 years in duration) to demonstrate the efficacy of Integrated Constructed Wetlands in relation to treatment of mine wastes;
   - A report demonstrating that the soil liner of the Integrated Construction Wetlands can achieve a permeability of $1x10^{-9}$ $m.s^{-1}$ prior to utilising the facility for the treatment of tailings waters;
   - Details of onsite research undertaken and design of experiments/trials to test site suitability for such a system;
   - Details of the intended programme for the delivery of ICW within the confines of the planning process timelines;
   - Details of hydraulic design calculations and longitudinal sections for Culverts C3, C4 and C7 from the proposed Integrated Construction wetland demonstrating that they have adequate capacity to convey the relevant 1 in 1000 year extreme flood event.

   **Reason:** In the interest of protection of the environment

4. In the event of the failure of any tailings retaining structure, any delivery or return pipeline, all mining operations shall cease and production shall not be recommenced until such time as satisfactory arrangements for disposal of tailings have been provided and agreed in writing with the Planning Authority.

   **Reason:** To minimize the risk of pollution and in the interest of public health.

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5. The proposed development shall only be used for the disposal of tailings which result from the processing of ore mined at the Tara Mine unless otherwise permitted by virtue of a separate planning permission.

**Reason:** In the interest of development management, the proper planning and sustainable development of the area and to define the source of tailings.

6. (a) Any changes to the method of mineral extraction and processing which result in a material change to the characteristics of the tailings as defined in the Environmental Impact Assessment and the response to the further information shall be subject to the written approval of the Planning Authority prior to those changes being made.

(b) Any material changes in the properties of the ore shall be notified to the Planning Authority.

**Reason:** In the interest of development management and protection of the environment.

7. (a) The Closure and Reclamation of the tailings facility as set out in the Closure and Reclamation Management Plan submitted to the Planning Authority on 27th April 2016 shall be carried out as proposed unless stated otherwise below.

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(b) Within twelve months of the commencement of development an evidence-based conservation management plan shall be developed and agreed in writing following consultation with National Parks & Wildlife Service, Meath County Council and all relevant stakeholders, to address the future management of Tara Mines Tailing Facility in respect of these species of high conservation value. Proposals shall be incorporated into a revised Closure Remediation and Aftercare Management Plan (CRAMP) as appropriate.

(c) Notwithstanding the provisions of (a) and (b) above the final details of the Closure Plan and of its operation after the cessation of tailings deposition shall be subject to an approval of the Planning Authority. An application for such an approval shall be made to the Planning Authority not later than two years prior to the predicted cessation of tailings deposition as reviewed under the provisions of condition number 12 below.

**Reason:** In the interest of the proper and ordered rehabilitation of the site to a "passive care" and "walk away" state in the interest of the long term environmental protection of the area.

8. Where the Planning Authority considers that the deposition of tailings has ceased for a period of in excess of six months and where the developer can offer no reasonable grounds to disputer this opinion, then the Planning Authority shall be empowered to notify the developer of their intention to activate the appropriate "Closure, recreation and management Plan" and of their intention to call upon the financial guarantees offered within sixty days.

**Reason:** In the interest of orderly development.

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**9.** (a) The Applicant shall build the embankment using soils/rock as detailed within the Golders report submitted to the Planning Authority on the 16th September 2016. All soils/rock shall conform to the engineering parameters as set out in the aforementioned report.

(b) Prior to the commencement of development the applicant shall submit details of a completed slope stability report for the written agreement of the Planning Authority and prepared by a competent charted geotechnical engineer detailing but not limited to site characterisation, groundwater conditions, geotechnical parameters (for all proposed materials), mechanisms of movement and external influences. The report should address a number of scenarios regarding potential failures and also include details of proposed slope stability monitoring for Phases 1 and 2.

(c) The Applicant shall employ, at a minimum, the Construction Quality Assurance team as detailed in the Golder report, Section 2.7 submitted to the Planning authority on the 16th September 2016.

(d) The Applicant shall take account of the installation of the permanent ramp and installation and removal of any temporary ramps in embankment design and slope stability calculations.

(e) The Applicant shall retain the services of a Geotechnical Engineer for the duration of the project who shall submit a monthly geotechnical report on the embankment construction and a final report on completion to the Planning Authority.

(f) The Applicant shall provide to the Planning Authority a yearly integrity and stability report of the embankment, this shall be undertaken by a Geotechnical Engineer.

(g) The Applicant shall maintain a soils testing regime to ensure compliance with the parameters of the stability analysis and adopt and communicate to relevant personnel a method statement detailing the placing of the various materials within the embankment structure.

(h) The Applicant shall retain the services of a Geotechnical Engineer for the duration of the project who shall provide a monthly geotechnical report on the embankment construction and a final report on completion and these shall be furnished for the written agreement of the Planning Authority within one month of their completion.

(i) The Applicant shall submit to the Planning Authority a yearly integrity and stability report of the embankment, this shall be undertaken by a Geotechnical Engineer.

(j) The Applicant shall provide details of a completed slope stability report by a competent charted geotechnical engineer for the written agreement of the Planning Authority detailing but not limited to site characterisation, groundwater conditions, geotechnical parameters (for all proposed materials), mechanisms of movement and external influences. The report should address a number of scenarios regarding potential failures and also include details of proposed slope stability monitoring for Phases 1 and 2.

(k)Prior to the commissioning of the Stage 6 lateral extension development a certificate from a suitably qualified independent consultant engaged by the developers confirming the structural soundness and stability of the extended tailings dam, the subject of this permission shall be furnished to the Planning Authority. This certificate shall be based on an independent audit of the design, construction and operation of the proposed tailings dam. This audit shall be carried out in line with the procedures included in the UK Reservoirs Act 1975 or other equivalent and the appointed consultant shall be a member of the UK reservoir panel or other equivalent with proven experience in the design, operation and inspection of tailings dams.

**Reason:** To provide for independent certification of the proposed dam in the interest of public safety and public health.

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**10.** (a) Within three months of the completion of each phase of the proposed tailings facility extension development the developer shall submit to the Planning Authority a certificate from an independent consultant confirming that the works have been satisfactorily completed and are structurally sound and suitable for the purpose for which they were designed i.e to retain tailings from the mine operation. Annual inspection and certification of the continued operations of the tailings dam shall be carried out by the developer's Engineer who shall be a member of the UK Reservoir Panel or equivalent and submitted to the Planning Authority. This certificate shall be based on an independent audit of the design, construction and operation of the proposed tailings dam. This audit shall be carried out in line with the procedures included in the UK Reservoirs Act 1975 or other equivalent and the appointed consultant shall be a member of the UK reservoir panel or other equivalent with proven experience in the design, operation and inspection of tailings dams.

(b) On each twelve month anniversary of the date of certification referred to in (a) above, a further certificate from an independent consultant engaged by the developer certifying the continued structural stability and suitability for the purpose of the Tailings Storage facility shall be furnished to the Planning Authority. This certification shall be based on an independent audit of the design, construction and operation of the proposed tailings dam. This audit shall be carried out in line with the procedures included in the UK Reservoirs Act 1975 or other equivalent and the appointed consultant shall be a member of the UK reservoir panel or other equivalent with proven experience in the design, operation and inspection of tailings dams.

(c) In the event of any of the above certificates not being provided within the time specified or such extension thereof as may be permitted by the Planning Authority the developer shall cease the discharge of tailings to the dam pending receipt by the Planning Authority of the appropriate certificate.

**Reason:** To provide for independent certification of the proposed dam in the interest of public safety and public health

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**11.** (a) Prior to the commencement of development the developer shall submit to the Planning Authority a programme for the construction of the dam extension which shall include details of the proposed timing of each element and phase of the construction process.

(b) The developer shall submit to the Planning Authority at six monthly intervals a schedule of production output for the previous six months and projected production output for the following two years. The schedules shall include as a minimum, value for ore mined, total lead and zinc concentrate produced and total tailings generated.

**Reason:** To provide assistance to the Planning Authority in planning for management and monitoring resources and for likely changes in physical and environmental impacts.

**12.** (a) The Applicant shall install and test the lining system components as detailed in Golder Report, Section 2.6 and Appendix B as submitted to the Planning authority on the 16th September 2016.
(b)The Applicant shall ensure that all personnel involved in the welding of the HDPE liner shall hold a certificate for welding and installation of flexible membrane liners to third party accreditation such as the British Geomembrane Association or the Thermal Welding Institute.

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(c) The applicant comply with the Quality Control Assurance Measures and protocols as detailed in the Golder report, Section 2.7 and Appendix C as submitted to the Planning Authority on the 16th September 2016.
(d) The Applicant shall comply with the leak detection survey detailed in the Golder Report Section 2.8 as submitted to the Planning Authority on the 16th September 2016 and remedy any defects found in accordance with Section 2.6 of the said report.

**Reason:** In the interest of public safety and protection of the environment.

**13.** Prior to the commencement of development the developer shall establish a fund dedicated to providing for the full costs of the Closure, Reclamation and Management Plan as set out in this planning application and as modified by these conditions.

This fund shall include but shall not be limited to, provision for:

(a) the closure and rehabilitation of the tailings facility and the site in the event of any of the enforced closure scenarios as set out in the Closure, Reclamation and Management Plan.
(b) The planned final closure and rehabilitation of the tailings facility as set out in the Closure, Reclamation and Management Plan which shall be amended to comply with the provisions of condition no 7 above.

The amount of the fund shall, at all times, be sufficient to meet the costs of rehabilitation of all extant works and impacts (whether existing or predicted) to the satisfaction of the Planning Authority.
The fund shall be sufficient without reliance on the value of plant, equipment or other such assets.

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The developer shall provide security in order to guarantee the availability of the fund in the event of financial failure or any other default. The type of security and its means of release/recovery shall be agreed with the Planning Authority in consultation with the Environmental Protection Agency and the Department of Communications, Climate Action and Environment. It shall be irrevocable and it shall be expressly designate to the Planning Authority as beneficiaries in the event of the developer being unable to implement the Closure, Recreation and management Plan or any of the enforced early closure plans envisaged therein. The security shall be maintained for the duration of the development including final rehabilitation and closure of the site as certified in writing by the Planning Authority.

The amount of the fund shall be agreed in writing with the Planning Authority in consultation with the Environmental Protection Agency and the Department of Communications, Climate Action and Environment within six months of the final date of this grant of planning permission. And it shall be indexed in accordance with the Wholesale price Index-Building and Construction (capital Goods) as published by the Central statistics Office.

In default of agreement with regard to the amount of the fund the amount of the fund same shall be determined by An Bord Pleanala.

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No development shall commence on the Stage 6 extension until agreement in writing is reached on the amount of this fund with the lead agencies of the Environmental Protection Agency, Meath County Council and the Department of Communications, Climate Action and the Environment.

**Reason:** To ensure satisfactory completion of the development and to provide for the proper rehabilitation of the site in the event of early closure and in the long term.

**14.** (a) Prior to the commencement of development, the developer shall pay to the Planning Authority €100,000 as a special contribution towards the expenditure to be incurred by Meath County Council in respect of the cost of implementing safety measures at Kilberry Cross to facilitate the proposed development. The charge herein referred to shall apply for the period from the date of this permission to the 31st December 2016 and will be subject to review on that date and to annual review thereafter unless previously paid.

(b)Prior to the commencement of development, the developer shall pay to the Planning Authority a sum of money to be agreed in writing with the Planning Authority following a structural assessment to be conducted by the Pavement Management Services group as a special contribution towards the expenditure to be incurred by Meath County Council in respect of the cost of works necessary for the overlaying of the Milestown Road and regional roads, the R162, R163 and R147 as well as the N51 to facilitate the proposed development. The charge herein referred to shall apply for the period from the date of this permission to the 31st December 2016 and will be subject to review on that date and to annual review thereafter unless previously paid.

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In the case of expenditure that is proposed to be incurred, the requirement to pay these contribution is subject to the provisions of Section 48 (2) of the Planning and Development Act 2000 as amended.

**Reason:** The provision of such roads and public transport infrastructure in the area by the Council will facilitate the proposed development. It is considered reasonable that the developer should contribute towards the cost of providing these services.

**15.** (a)The Applicants shall bear full responsibility for the costs associated with overlays due to damage to the R163, R162, R147 and N51 and additional safety measures to be carried out at Kilberry Cross arising from traffic associated with this development. This will be based on the structural assessment carried out by Pavement Management Systems Ltd before and after the development to be carried out in conjunction with the Local Authority.

(b)The applicants shall be responsible for the cost of repairing any structural road defects arising from the development by the applicant.

(c) The applicants shall meet with Transportation Department of Meath County Council annually to monitor and address progress and issues in relation to traffic and road safety which may arise during the year.

(d) The applicant shall establish a liaison committee with local resident's groups to address roads and mobility issues which may arise over the 5 year construction term. Details of same shall be submitted for the written agreement of the Planning Authority prior to the commencement of development.

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(e) The applicant shall apply for road opening license for all works on the public road prior to the commencement of development.

**Reason:** In the interest of traffic and pedestrian safety

**16.** Prior to the commencement of development the applicants shall develop a site specific Construction and Environmental Management Plan (CEMP) and as a minimum shall include the items included within Appendix D of the Golder report, submitted to the Planning Authority on the 16th September 2016. This report shall be submitted for the written agreement of the Planning Authority. This report shall include a detailed groundwater/surface water management plan for the duration of the works and with particular reference to the installation of the lining system. The CEMP shall be treated as live document and updated as necessary. It shall be communicated to all personnel involved in the construction of the tailings pond.

**Reason:** In the interest of orderly development.

**17.** (a) All temporary stockpiles of overburden materials which are to remain intact for periods of greater than six months shall be graded, top soiled and grass seed as soon as practicable after being constructed. Dust suppression sprays shall be used during periods of dry weather until a stable grass covering has been established.

(b) All permanent embankment side slopes shall, unless otherwise agreed with the Planning Authority be top soiled and grass seeded as soon as practicable after their construction. Dust suppression sprays shall be used during periods of dry weather until a stable grass covering has been established.

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**Reason:** To minimize nuisance to the public from dust

**18.** (a) An effective water spray system for the control of dust blow from the tailings storage facility shall be provided, details of which shall be agreed in writing with the Planning Authority prior to the commencement of development.

(b) The extent and details of wind break fencing to be provided to control the emission of dust during the dewatering of Stage 6 and while unvegetated tailings are exposed shall be agreed in writing with the Planning Authority prior to the commencement of development.

**Reason:** To minimize nuisance to the public from dust and to minimize the risk of pollution to the environment.

**19.** In the event of the quantities of seepage escaping to the environment exceed those predicated in the Environmental Impact Statement to the extent that in the opinion of the Planning Authority remedial measures are necessary, such measures shall be implemented without delay as shall be agreed in writing with the Planning authority.

Within three months of the commencement of development the developer shall submit to the Planning Authority for written agreement an action plan to be implemented in the event of

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excessive seepage. Such a plan shall include but shall not be limited to proposals for an alarm system to alert the developer of seepage, deepening or lining of the interceptor channel, construction of a grout curtain and the installation of scavenger wells.

**Reason:** In the interest of prevention of pollution.

**20.** The developer is required to engage the services of a suitably qualified archaeologist (licensed under the National Monuments Acts 1930 – 2004) to carry out a programme of pre-development archaeological test-trenching, taking into account the results of the geophysical survey to assess the nature and extent of the material found.

No further work should take place which would affect the existing archaeological sites in the Northern Borrow Area or their buffer zones.

The archaeologist is required to notify the Department of the Arts, Heritage, Regional, Rural and Gaeltacht Affairs in writing at least 4 weeks prior to the commencement of site preparations. This will allow the archaeologist sufficient time to obtain a licence to carry out the work.

Having completed the work, the archaeologist should submit a written report to the Planning Authority and to the Department of the Arts, Heritage, Regional, Rural and Gaeltacht Affairs for consideration.

No site preparation or construction work shall be carried out until after the Archaeologist's report has been submitted and permission to proceed has been received in writing from the Planning Authority in consultation with the Department of the Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

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The applicant is required to employ a qualified archaeologist under licence to monitor all ground works associated with the development.

Should archaeological material be found during the course of monitoring, the archaeologist may have work on the site stopped, pending a decision as to how best to deal with the archaeology. The developer shall be prepared to be advised by this office with regard to any necessary mitigating action (e.g. preservation in situ or excavation) and should facilitate the archaeologist in recording any material found.

The Planning Authority and the Department of the Arts, Heritage, Regional, Rural and Gaeltacht Affairs shall be furnished with a report describing the results of the monitoring. .

**Reason:** To ensure the continued preservation (either in situ or by record) of places, caves, sites, features or other objects of archaeological interest.

**21.** All service lines and cables servicing the proposed development shall be located underground except where otherwise agreed in writing with the Planning Authority.

**Reason:** In the interest of orderly development and visual amenity.

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**22.** The developer shall make such provision as is necessary to ensure immediate mitigation of impacts to water supplies which are adversely affected by the development during all stages of the development with the full cost of such measures being borne by the developer. In the event of disruptions of water supply any operation (s) causing such disruption shall be immediately reduced or ceased, as appropriate, until the affected water supply has been restored or replaced.

**Reason:** To ensure the maintenance of continuous adequate potable water supply and in the interest of public health.

**23.** Maintenance strips of minimum width ten metres shall be maintained along the Duog stream, Simonstown Stream, the Yellow River and the diverted Blakes Stream and any other drainage channels on site both during and after construction. The drainage channels shall be maintained in accordance with the "Guidelines on Protection of Fisheries during construction works in and adjacent to waters" published by Fisheries Ireland in 2016 by the contractor during the construction works.

**Reason:** In the interest of water quality.

**24.** Prior to the commencement of development the applicants shall submit details of all oil and fuel storage tanks, hydrocarbons, chemicals and all other materials that pose a risk to waters if spilled for the written agreement of the Planning Authority. These shall be stored in designated storage areas, which shall be bunded to a volume of 110% of the capacity of the largest tank or container within the bunded area(s). Filling and draw-off points shall be located entirely within the bunded area(s). Drainage from the bunded area(s) shall be diverted for collection and safe disposal. The use of bunded pallets for storage of drums etc is acceptable.

**Reason:** In the interest of public safety.

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**25.** The developer shall prepare a waste management plan <u>for the construction phase</u>, to maximise reuse or recycling of waste and minimise the amount of waste consigned to landfill. Priority shall be given to re-use or recovery of waste in preference to disposal. This shall be submitted for the written agreement of the Planning Authority.

The plan shall as a minimum address the following:

- All demolition and construction waste arising on the site shall be segregated into different clearly marked skips (such as canteen waste, timber, plastics, plaster board, waste solvent tubes, blocks, etc).
- All surplus demolition waste, construction waste and clean soil to be removed off-site shall be brought to a permitted site or facility.
- A register shall be maintained of the movement of waste off-site, to include an estimation of the quantities of waste removed, name and waste collection permit number of the Contractor/s engaged to collect the waste, details of the recovery or disposal facility or facilities used. The developer shall retain all recovery or disposal receipts.
- A prohibition on the burning or burying of waste on the site.

**Reason:** In the interest of proper planning and sustainable development.

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**26.** (a) Prior to the commencement of development the developer shall submit precise details of design/location for the wheelwash to be agreed in writing with the Planning Authority. The wheelwash shall be of suitable design and fit for purpose and shall include an unobstructed drive through bath with sumps and shaker bars on the entrance and exit ramps, or such other design as shall be agreed with the Planning Authority. Shaker bars shall not be placed in the wheelwash sump. The access road from the wheelwash to the site entrance shall be surfaced with concrete or bituminous macadam and maintained to a suitable standard to prevent mud gathering again on the wheels of trucks as they exit the site after using the wheelwash.

(b) All vehicles carrying inert material, rubble or soil on the public roads shall be suitably covered.

**Reason:** In the interest of amenity and traffic safety.

**27.** The Tara Mines Emergency Response Plan shall be updated to include the tailings pond extension.

**Reason:** In the interest of proper planning and sustainable development.

**28.** Prior to the commencement of development the applicants shall submit a revised landscaping plan including proposals for landscaping along the western site boundary and along the Milestown road for the written agreement of the Planning Authority.

**Reason:** In the interest of visual amenity.

**Advice Note**
The applicants shall liaise with Irish Water in respect of all matters relating to connection to the public watermains.

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## Appendix B.6 -3

## Planners Final Grant for each planning permission granted since last Licence Review Application in 2010 as listed in Table B.6 (d):

- **Erection of 1.5 megawatt electricity generating wind turbine**
- **Excavation of materials in Simonstown Borrow Area**
- **Construct mine fresh air intake shaft, FAR 5**
- **Develop mine return air shaft, RAR 5N**
- **Mining of orebody into Liscartan and Rathaldron**

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**TO:** Boliden Tara Mines Limited
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Navan
Co. Meath.

PLANNING REGISTER NUMBER: NA/151405
APPLICATION RECEIPT DATE: 23/12/2015
FURTHER INFORMATION DATE: 13/06/2016

In pursuance of the powers conferred upon them by the above-mentioned Act, Meath County Council has by Order dated 07.07.16 decided to **GRANT** PERMISSION to the above named for development of land, in accordance with the documents submitted namely:- the development consists of the erection of one 1.5 megawatt electricity generating wind turbine with a hub height of up to 60m, a rotar diameter of up to 66m (a total overall height of up to 93m), a tower base, a crane hardstanding area, underground cabling to onsite electrical substation and all ancillary site development-works. The electricity generated will be utilised on site. The wind turbine will be an upwind, horizontal axis turbine. The visible components will include a cylindrical tower, nacelle and three blades. Access to the site will be from the existing site entrance along the R147. A Natura Impact Statement has been prepared and is submitted with this application. at Knockumber, Navan. Co. Meath., subject to the 13 conditions set out in the Schedule attached.

DATE: 07.07.16

On behalf of MEATH COUNTY COUNCIL

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Provided there is no appeal against this DECISION a grant of planning permission will issue at the end of four weeks.

**THIS NOTICE IS NOT A GRANT OF PERMISSION AND WORK SHOULD NOT COMMENCE UNTIL GRANT OF PLANNING PERMISSION HAS ISSUED**

NOTE:

1. Any appeal against a decision of a Planning Authority under Section 34 of the Planning and Development Act, of 2000-2015 may be made to An Bord Pleanala. Any person may appeal WITHIN FOUR WEEKS beginning on the date of the decision.

2. Appeals should be addressed to An Bord Pleanala, 64 Marlborough Street, Dublin 1. An appeal by the applicant should be accompanied by this form. **In the case of a third party appeal, the acknowledgement from the Planning Authority of receipt of the submission or observation made by the person to the Planning Authority at application stage should be submitted and the name of the person, particulars of the proposed development and the date of the decision of the Planning Authority should be stated.**

GRANTED

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## Schedule of Conditions

1. The development shall be constructed in accordance with the plans and particulars lodged with the application on the 23rd December 2015 and on the 13th June 2016, except as may otherwise be required in order to comply with the following conditions. Where such conditions require details to be agreed with the planning authority, the developer shall agree such details in writing with the planning authority prior to commencement of development and the development shall be carried out and completed in accordance with the agreed particulars.

**Reason:** In the interest of proper planning and sustainable development.

2. This permission shall not be construed as any form of consent or agreement to a connection to the national grid or to the routing or nature of any such connection.

**Reason:** In the interest of clarity.

3. This permission shall be for a period of 25 years from the date of commissioning of the turbine or the closure of the mine whichever event may occur first. Upon ceasation of the use of the turbine, the turbine and associated infrastructure shall be dismantled and all above ground elements removed from the site and the site shall be restored to its existing condition.

**Reason:** To enable the planning authority to review its operation in the light of the circumstances then prevailing.

4. The permitted turbine shall have a maximum hub height of 60m and a maximum tip height of 66m. Final details of the turbine model, design, height and colour shall be submitted to, and agreed in writing with the Planning Authority, prior to commencement of the development. Cables from the turbine to the substation shall be run underground within the site.

**Reason:** In the interest of the amenities of the area.

5. The developer shall ensure that all construction methods and environmental mitigation measure set out in the environmental report submitted to the Planning Authority on 23rd December 2015 and associated documentation are implemented in full, save as may be required by conditions set out below.

**Reason:** In the interest of protection of the environment.

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6. Upon erection of the turbine, details of 'as constructed' co-ordinates and elevations of the turbine shall be submitted to the Irish Aviation Authority. If required, warning lights shall be affixed to the turbine, at the developer's expense, in accordance with the requirements of the Irish Aviation Authority.

**Reason:** In the interest of aviation safety

7. (a) Wind turbine noise (measured as LAeq) at dwellings or other sensitive receptors shall not exceed 45 dB(A) LA90 externally Daytime noise at nearby noise sensitive locations shall not exceed 45dB(A) or a maximum increase of 5dB(A) above background noise. Night time noise shall not exceed 43dB(A) at the nearby noise sensitive locations.

(b) Prior to commencement of development, the developer shall agree a noise compliance monitoring programme for the operational turbine with the Planning Authority. All noise measurements shall be carried out in accordance with ISO Recommendation R1996 "Assessment of Noise with Respect to Community Response", as amended by ISO Recommendations R 1996 – 1. The results of the noise compliance monitoring shall be submitted to, and agreed in writing with, the Planning Authority within six months of commissioning of the turbine.

(c) The Applicant shall maintain and make available for inspection to members of the public a complaints register in relation to noise complaints.

(d) The construction works shall be carried out in accordance with the noise guidance set out by BS 5228-1:2009 Code of Practice for Noise and Vibration Control on Construction and Open Sites and the NRA Guidelines for the treatment of Noise and Vibration in National Roads Schemes and the Construction Environmental Management Plan. The Applicant shall agree with the Planning Authority permitted working hours for the construction period.

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**Reason:** In the interest of residential amenity.

8 (a) Shadow flicker associated with the proposed turbine shall not exceed 30 hours per year or 30 minutes per day for any of the dwellings located within 500m from the turbine.
(b) The Applicant shall ensure that if shadow flicker does occur the turbine(s) are immediately shut down for the duration of affected shadow flicker. Suitably appropriate equipment and software shall be utilised to facilitate shutdown, details of same shall be agreed, in writing, with the Local Authority prior to commencement.

(c) The Applicant shall maintain and make available for inspection to members of the public a complaints register in relation to shadow flicker complaints.

(d) The Applicant shall, on an annual basis, submit a report, prepared by a suitably qualified person detailing the number and frequency of shadow flicker incidents and shut downs and detail compliance with the aforementioned conditions.

**Reason:** In the interest of residential amenity.

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9. (a) All oils and fuels shall be stored in an area bunded to 110% of the total volume of stored oils and fuels.
(b) Re-fuelling shall take place only within designated bunded area, which shall be drained through an oil interceptor.
**Reason:** In the interest of maintaining water quality.

10. Soil, rock or peat excavated during construction shall not be left stockpiled on-site following completion of works. Details of treatment of stockpiled materials shall be submitted to, and agreed in writing with, the planning authority prior to commencement of development.

**Reason:** In the interest of environmental amenity.

11. Prior to commencement of development, a detailed environmental management plan for the construction stage shall be submitted, for the written agreement of the planning authority.

The environmental management plan shall incorporate the following:

a) A detailed construction programme, developed in consultation with the Inland Fisheries Ireland.

b) A detailed method statement for construction.

c) A site drainage management plan, in accordance with the submissions, incorporating a detailed silt management plan and pollution prevention plan, and including appropriately-sized silt trap and / or settlement ponds as required, to be prepared by a suitably qualified drainage engineer or equivalent professional, to the satisfaction of the Planning Authority.

d) The site drainage system to be installed to the satisfaction of the Planning Authority, prior to the commencement of construction works on site.

e) A construction waste management plan, prepared in accordance with the "Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects", published by the Department of the Environment, Heritage and Local Government in July, 2006; the plan shall include details of waste to be generated during site clearance and construction phases, and details of the methods and locations to be employed for the prevention, minimisation, recovery and disposal of this material.

**Reason:** In the interests of health and safety, protection of the environment and sustainable waste management.

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12. All mitigation measures and recommendations as contained within the Natura Impact Statement submitted to the Planning Authority on the 23rd December 2015 and the Ecological Impact Statement submitted to the Planning Authority on the 23rd December 2015 and as amended on the 13th June 2016 shall be implemented in full. Written confirmation that all mitigation measures and recommendations have been implemented in full shall be submitted to the Planning authority in advance of the commissioning of the proposed wind turbine.

**Reason:** In the interest of protection of the environment and habitats.

13. The Applicant shall ensure all waste materials generated as part of the construction works are transported, disposed of or recovered in compliance with the Waste Management (Collection Permit) Regulations 2007, as amended and the Waste Management (Facility Permit and Registration) Regulations 2007, as amended.

**Reason:** In the interest of protection of the environment.

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**Meath County Council**
**Planning Department**
**Buvinda House**
**Dublin Road**
**Navan**
**Co. Meath**
**Phone: 046 909 7000 Fax: 046 909 7001**

**Planning & Development Act 2000 – 2014**
**NOTIFICATION OF DECISION**

**TO**: Boliden Tara Mines Limited,
Knockumber House
Navan
County Meath

PLANNING REGISTER NUMBER: na/140382
APPLICATION RECEIPT DATE: 09/05/2014
FURTHER INFORMATION DATE: 11/07/2014

In pursuance of the powers conferred upon them by the above-mentioned Act, Meath County Council has by Order dated 31.07.14 decided to **GRANT** PERMISSION to the above named for development of land, in accordance with the documents submitted namely:- development will consist of excavating material present in the Simonstown Borrow area to use in the construction of Stage 5B embankment wall rise of the Randalstown Tailings Storage Facility (TSF). It is proposed to excavate the material present in two mounds (2.0 ha and 1.1 ha in size) down to the surrounding ground level giving a uniform surface profile to the entire Simonstown Borrow area. This will yield an approximate volume of 110,000m3 of material. Excavation of this material will be undertaken using a mechanical excavator and transported by dump truck for use in the construction of the tailings facility embankment raise. No materials excavated will be transported on public roads. No additional drainage, beyond that provided by the existing field drainage system will be required at Simonstown, Navan, County Meath, subject to the 11 conditions set out in the Schedule attached.

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DATE: 31.07.14

On behalf of MEATH COUNTY COUNCIL

Provided there is no appeal against this DECISION a grant of planning permission will issue at the end of four weeks.

**THIS NOTICE IS NOT A GRANT OF PERMISSION AND WORK SHOULD NOT COMMENCE UNTIL GRANT OF PLANNING PERMISSION HAS ISSUED**

NOTE:

1. Any appeal against a decision of a Planning Authority under Section 34 of the Planning and Development Act, of 2000-2014 may be made to An Bord Pleanala. Any person may appeal WITHIN FOUR WEEKS beginning on the date of the decision.

2. Appeals should be addressed to An Bord Pleanala, 64 Marlborough Street, Dublin 1. An appeal by the applicant should be accompanied by this form. **In the case of a third party appeal, the acknowledgement from the Planning Authority of receipt of the submission or observation made by the person to the Planning Authority at application stage should be submitted and the name of the person, particulars of the proposed development and the date of the decision of the Planning Authority should be stated.**

GRANT

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## Guide to Fees payable to the Board

a. Appeal against a decision of a planning authority on a planning application relating to commercial development[1] made by the person by whom the planning application was made, where the application included the retention of development is € 4,500 or € 9,000 if EIS/ NIS involved[2].

b. Appeal against a decision of a planning authority on a planning application relating to commercial development[1], made by the person by whom the planning application was made, other than an appeal mentioned at (a) is € 1,500 or € 3,000 if EIS / NIS involved[2].

c. Appeal against a decision of a planning authority on a planning application made by the person by whom the planning application was made, where the application included the retention of development, other than an appeal mentioned at (a) or (b) is € 660.

d. Appeal other than an appeal mentioned at (a), (b), (c) or (f)[3] is € 220

e. Application for leave to appeal is € 110.

f. Appeal following a grant of leave to appeal € 110

g. Any first party appeal solely against contribution conditions under section 48 or 49 of the 2000 Acts, as amended, attracts a fee of €220 irrespective of the nature of the application

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**An appeal will be invalid unless accompanied by the appropriate fee and evidence of payment of submission fee to the Planning Authority.**

Submissions or observations to An Bord Pleanala by or on behalf of a person (other than the applicant) as regards an appeal made by another person must be submitted within four weeks of receipt of the appeal by An Bord Pleanala and must be accompanied by a fee of € 50.

Footnote

[1] Commercial development includes 2 or more dwellings. See Board's order determining fees and its appeal guide.

[2] The higher fee applies where an Environmental Impact Statement (EIS) or Natura Impact Statement (NIS) was submitted to the planning authority under section 172(1) and / or 177T of the 2000 - 2014 Planning Act or article 103(1) of the 2001-2013 Planning Regulations, as amended except where the appeal relates solely to a section 48 / 49 development / supplementary development contribution scheme and/or a special financial contribution. (refer to (g) above.

[3] Applies to:- (i) All third party appeals except where the appeal follows a grant of leave to appeal; (ii) First party normal planning appeals (section 37) not involving commercial or unauthorised development, or an EIS; (iii) All other appeals (non-section 37).

**While every care has been taken to ensure the accuracy and completeness of this information, it is the responsibility of any person / body making an appeal to ensure that their appeal is accompanied by the correct fee.**

**For more information on Appeals you can contact An Bord Pleanala at:**
Tel: 01 - 8588100 or LoCall: 1890 275 175

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NA/140382

## Schedule of Conditions

1. The development shall be carried out and completed in accordance with the plans and particulars lodged with the application 9th day of May 2014 and 11th day of July 2014 except as may otherwise be required in order to comply with the following conditions. Where such conditions require details to be agreed with the Planning Authority the developer shall agree such details in writing with the Planning Authority prior to commencement of development and the development shall be carried out and completed in accordance with the agreed particulars.

   **Reason:** In the interest of clarity.

2. This permission shall be for a period of twenty years from the date of the order unless, prior to the end of the period, planning permission for retention shall have been granted.

   **Reason:** In the interest of clarity and proper planning and sustainable development.

3. All of the environmental, construction and ecological mitigation measures set out in the Environmental Report of 9th day of May 2014 shall be implemented in conjunction with the timelines set out, except as may otherwise be required in order to comply with the conditions hereunder.

   **Reason:** In the interest of orderly development and environmental protection.

4. The excavations, and all activities occurring therein, shall only operate between 0800 hours and 2000 hours, Monday to Friday and between 0800 hours and 1400 hours on Saturdays. No activity shall take place outside these hours or on Sundays or public holidays.

   **Reason:** In order to protect the [residential] amenities of property in the vicinity.

5. The development shall be operated and managed in accordance with an Environmental Management System (EMS), which shall be submitted by the developer to, and agreed in writing with, the planning authority prior to commencement of development. This shall include the following:
   (a) Proposals for the suppression of on-site noise.
   (b) Proposals for the on-going monitoring of sound emissions
   (c) Proposals for the suppression of dust on site.
   (d) Proposals for the bunding of fuel and lubrication storage areas and details of emergency action in the event of accidental spillage.
   (e) Details of safety measures for the land above the quarry, to include warning signs and stock proof fencing.

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(f) Management of all landscaping.
(g) Specification of limits in relation to parameters to be agreed with the planning authority.
(h) Monitoring of ground and surface water quality, levels and discharges.
(i) Details of site manager, contact numbers (including out of hours) and public information signs at the entrance to the facility.

**Reason:** In order to safeguard local amenities.

6. During the operational phase of the proposed development, the noise level from within the boundaries of the site measured at noise sensitive locations in the vicinity, shall not exceed
(a) an LArT value of 55 dB(A) during the period 0800 to 2000 hours. The T value shall be [one hour],
(b) an LAeqT value of 45 dB(A) at any other time. The T value shall be [15 minutes] Night time emissions shall have no tonal component.

**Reason:** In order to protect the amenities of property in the vicinity.

7. (a) Dust levels at the site boundary shall not exceed 350 milligrams per square metre per day averaged over a continuous period of 30 days (Bergerhoff Gauge). Details of a monitoring programme for dust shall be submitted to, and agreed in writing with, the planning authority prior to commencement of development. Details to be submitted shall include monitoring locations, commencement date and the frequency of monitoring results, and details of all dust suppression measures.
(b) A monthly survey and monitoring programme of dust and particulate emissions shall be undertaken to provide for compliance with these limits. Details of this programme, including the location of dust monitoring stations, and details of dust suppression measures to be carried out within the site, shall be submitted to, and agreed in writing with, the planning authority prior to commencement of any quarrying works on the site. This programme shall include an annual review of all dust monitoring data, to be undertaken by a suitably qualified person acceptable to the planning authority. The results of the reviews shall be submitted to the planning authority within two weeks of completion. The developer shall carry out any amendments to the programme required by the planning authority following this annual review.

**Reason:** To control dust emissions arising from the development and in the interest of the amenity of the area.

8. A comprehensive plan for the restoration of the site following the cessation of excavation works shall be submitted to, and agreed in writing with, the planning authority prior to commencement of development. This plan shall include proposals for re-use of the lands and measures to ensure public safety therein. The developer shall commence implementation of the agreed site restoration plan within the area of the site within one month of cessation of

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extraction in this area and shall have completed this part of the plan within 12 months of commencement.

**Reason:** In the interest of public amenity and public safety.

9. The developer shall facilitate the preservation, recording and protection of archaeological materials or features that may exist within the site. In this regard, the developer shall –
(a) notify the planning authority in writing at least four weeks prior to the commencement of any site operation (including hydrological and geotechnical investigations) relating to the proposed development,
(b) employ a suitably-qualified archaeologist who shall monitor all site investigations and other excavation works, and
(c) provide arrangements, acceptable to the planning authority, for the recording and for the removal of any archaeological material which the authority considers appropriate to remove.
**Reason:** In order to conserve the archaeological heritage of the site and to secure the preservation and protection of any remains that may exist within the site.

10. Road & Infrastructure
The developer shall pay the sum of **€61,163** to the Planning Authority as a contribution towards expenditure that is proposed to be incurred by the Planning Authority in the provision, refurbishment, upgrading, enlargement or replacement of public roads and public transport infrastructure by the Council benefiting development in the area of the Authority, as provided for in the Contribution Scheme of Meath County Council adopted in accordance with the provisions of Section 48 of the Planning & Development Act 2000 – 2013. Payment of this sum shall be made prior to commencement of development.

The above sum shall apply until 31st December, 2014 and shall be subject to review on that date and to annual review thereafter unless previously paid. The contribution rates shall be updated effective from January 1st each year during the lifetime of the Development Contribution Scheme in accordance with the Wholesale Price Indices – Building and Construction (Capital Goods) published by the Central Statistics Office.
**Reason:** The provision of such roads and public transport infrastructure in the area by the Council will facilitate the proposed development. It is considered reasonable that the developer should contribute towards the cost of providing these services.

11. Social Infrastructure
The developer shall pay the sum of €15,314 to the Planning Authority as a contribution towards expenditure that is proposed to be incurred by the Planning Authority in the provision and extension of social infrastructure (open spaces, recreational and community facilities, amenities and landscaping works) by the Council benefiting development in the area of the Authority, as

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provided for in the Contribution Scheme of Meath County Council adopted in accordance with the provisions of Section 48 of the Planning & Development Act 2000 – 2013. Payment of this sum shall be made prior to commencement of development.

The above sum shall apply until 31st December, 2014 and shall be subject to review on that date and to annual review thereafter unless previously paid. The contribution rates shall be updated effective from January 1st each year during the lifetime of the Development Contribution Scheme in accordance with the Wholesale Price Indices – Building and Construction (Capital Goods) published by the Central Statistics Office.
**Reason:** The provision of such social infrastructure in the area by the Council will facilitate the proposed development. It is considered reasonable that the developer should contribute towards the cost of providing these services.

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**Meath County Council**
**Planning Department**
**Abbey Mall**
**Abbey Road**
**Navan**
**Co. Meath**
**Phone: 046 909 7000 Fax: 046 909 7001**

**Planning & Development Act 2000 – 2012**
**NOTIFICATION OF FINAL GRANT**

**TO**: Boliden Tara Mines Limited,
Mr Brendan O'Reilly
Boliden Tara Mines Limited
Knockumber House
Navan Co Meath

**Planning Register Number:** NA/120917
**Application Receipt Date:** 17/10/2012
**Further Information Received Date:**

**In pursuance of the powers conferred upon them by the above-mentioned Act, Meath County Council has by Order dated 04/12/2012 GRANTED PERMISSION to the above named for the development of land in accordance with the documents submitted namely:-** to construct a mine fresh air intake shaft and will be known as Fresh Air Raise 5 (FAR 5) and will consist of a single 4.0 metre diameter vertical raise-bore shaft drilled from a depth of 855 metres in the underground mine to surface. The shaft will connect to existing underground tunnels and will increase the volume of fresh air drawn into the southwest (SWEX) working area of the mine. There are no fans or motors connected to the fresh air intake system. The only surface structure will be a 1m high concrete ring surrounding the 4.0m diameter intake shaft and a 2m high boundary fence. The shaft opening will be covered with a protective mesh screen upon completion of construction at Ardbraccan, Navan, Co Meath, **subject to the 8 conditions set out in the Schedule attached.**

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Signed on behalf of Meath County Council

Administrative Officer

DATE: **25/01/2013**

**NOTE: (Outline Permission Applications Only)**

OUTLINE PERMISSION is subject to the subsequent Application for Permission consequent on the grant of Outline Permission of the Planning Authority. Until such has been obtained to detailed plans of the development proposed, the development is NOT AUTHORISED.

NOTE:

The permission herein granted shall, on the expiration of 5 years beginning on the date of the granting of permission, cease to have effect as regards: -

(1) In case the development to which the permission relates is not commenced during the period, the entire development and

(2) In case such development is so commenced, so much thereof as is not completed within that period.

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NA120917

## Schedule of Conditions

1. The development shall be carried out in accordance with the plans and particulars lodged with the application on 17th day of October 2012, except as may otherwise be required in order to comply with the following conditions.

   **Reason:** In the interest of proper planning and development.

2. Surface water from the site shall be prevented from running onto the surface of public road by provision of a safety kerb or a concrete grid with sump drained to a local drain or soakaway.

   **Reason:** To prevent flooding of site

3. All surface water run-off from roofs, entrances and parking areas shall be collected and disposed of within the site to soakpits/adjacent watercourses. It shall not be discharged to septic tank or percolation area or future public sewer.

   **Reason:** In the interest of proper development

4. Existing hedgerows, trees and shrubs on site shall be preserved.

   **Reason:** To protect the rural character of the area

5. (a) The applicant is required to engage the services of a suitably qualified archaeologist (licensed under the National Monuments Acts 1930-2004) to monitor all groundworks associated with the development
   (b) Should archaeological material be found during the course of monitoring, the archaeologist may have work on the site stopped, pending a decision as to how best to deal with the archaeology. The developer shall be prepared to be advised by the Heritage and Planning Division of the Department of the Environment, Heritage and Local Government with regard to any necessary mitigating action (e.g. preservation in situ, or excavation) and should facilitate the archaeologist in recording any material found.
   (c) The Planning Authority and the Heritage and Planning Division of the Department of Environment Heritage and Local Government shall be furnished with a report describing the results of the monitoring.

   **Reason:** To ensure the continued preservation (either in situ or by record) of places, caves, sites, features or other objects of archaeological interest.

6. (a)During the construction period, BATNEEC shall be employed by the developer to minimize noise from construction operations and shall have regard to BS 5228:1997 "Noise Control on Open and Construction Sites". Site noise, as defined in BS 5228 1997 shall not exceed , during the construction period , the following criteria:

| LAeq (1hour) | Time period. | |
|---|---|---|
| | 55 dB(A) | 0800 hours- 2000 hours |

Monday - Saturdays inclusive and excluding public holidays and Sundays.

| | | |
|---|---|---|
| | 45dB(A) | At all other times. |

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(b) There shall be no clearly audible tonal component or impulsive component in the noise emission from the activity.

**Reason:** In the interests of residential and general amenity.

7. All mitigation measures as proposed within the Environmental Report submitted to the Planning Authority on 17th day of October 2012 regarding the proposed development both during the construction and operation periods shall be fully implemented.

**Reason:** To minimize nuisance to the public and to minimize the risk of pollution to the environment.

8. All permanent embankment side slopes shall, unless otherwise agreed with the Planning Authority be top soiled and grass seeded as soon as practicable after their construction. Dust suppression sprays shall be used during periods of dry weather until a stable grass covering has been established.

**Reason:** To minimize nuisance to the public from dust

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**Meath County Council**
**Planning Department**
**Abbey Mall**
**Abbey Road**
**Navan**
**Co. Meath**
**Phone: 046 909 7000 Fax: 046 909 7001**

**Planning & Development Act 2000 – 2011**
**NOTIFICATION OF DECISION**

**TO**: Boliden Tara Mines Limited
Knockumber House,
Navan,
Co. Meath

PLANNING REGISTER NUMBER: NA/111149
APPLICATION RECEIPT DATE: 16/12/2011
FURTHER INFORMATION DATE:

In pursuance of the powers conferred upon them by the above-mentioned Act, Meath County Council has by Order dated 09/02/12 decided to **GRANT** PERMISSION to the above named for development of land, in accordance with the documents submitted namely:- develop a new mine return air shaft in the townland of Ardbraccan. The development will be known as Return Air Raise 5 North (RAR 5N) and will provide additional ventilation to the southwest area of the mine. The development will consist of a single 4.5 metre diameter vertical raise-bore shaft drilled from a depth of 690 metres in the mine to surface. The shaft will connect to the existing underground fan station and will be fitted with a deflection hood at surface at Ardbraccan, Navan, Co. Meath, subject to the 8 conditions set out in the Schedule attached.

Signed on behalf of MEATH COUNTY COUNCIL

DATE: 09/02/12

Alison Lynch
Administrative Officer

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Provided there is no appeal against this DECISION a grant of planning permission will issue at the end of four weeks.

**THIS NOTICE IS NOT A GRANT OF PERMISSION AND WORK SHOULD NOT COMMENCE UNTIL GRANT OF PLANNING PERMISSION HAS ISSUED**

NOTE:

1. Any appeal against a decision of a Planning Authority under Section 34 of the Planning and Development Act, of 2000-2011 may be made to An Bord Pleanala. Any person may appeal WITHIN FOUR WEEKS beginning on the date of the decision.

2. Appeals should be addressed to An Bord Pleanala, 64 Marlborough Street, Dublin 1. An appeal by the applicant should be accompanied by this form. **In the case of a third party appeal, the acknowledgement from the Planning Authority of receipt of the submission or observation made by the person to the Planning Authority at application stage should be submitted and the name of the person, particulars of the proposed development and the date of the decision of the Planning Authority should be stated.**

GRANT

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## Guide to Fees payable to the Board

a. Appeal against a decision of a planning authority on a planning application relating to commercial development[1] made by the person by whom the planning application was made, where the application included the retention of development is € 4,500 or € 9,000 if EIS/ NIS involved[2].

b. Appeal against a decision of a planning authority on a planning application relating to commercial development[1], made by the person by whom the planning application was made, other than an appeal mentioned at (a) is € 1,500 or € 3,000 if EIS / NIS involved[2].

c. Appeal against a decision of a planning authority on a planning application made by the person by whom the planning application was made, where the application included the retention of development, other than an appeal mentioned at (a) or (b) is € 660.

d. Appeal other than an appeal mentioned at (a), (b), (c) or (f)[3] is € 220

e. Application for leave to appeal is € 110.

f. Appeal following a grant of leave to appeal € 110.

g. Any first party appeal solely against contribution conditions under section 48 or 49 of the 2000 Acts, as amended, attracts a fee of €220 irrespective of the nature of the application

**An appeal will be invalid unless accompanied by the appropriate fee and evidence of payment of submission fee to the Planning Authority.**

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Submissions or observations to An Bord Pleanala by or on behalf of a person (other than the applicant) as regards an appeal made by another person must be submitted within four weeks of receipt of the appeal by An Bord Pleanala and must be accompanied by a fee of € 50.

Footnote

[1] Commercial development includes 2 or more dwellings. See Board's order determining fees and its appeal guide.

[2] The higher fee applies where an Environmental Impact Statement (EIS) or Natura Impact Statement (NIS) was submitted to the planning authority under section 172(1) and / or 177T of the 2000 - 2011 Planning Act or article 103(1) of the 2001-2010 Planning Regulations, as amended except where the appeal relates solely to a section 48 / 49 development / supplementary development contribution scheme and/or a special financial contribution. (refer to (g) above.

[3] Applies to:- (i) All third party appeals except where the appeal follows a grant of leave to appeal; (ii) First party normal planning appeals (section 37) not involving commercial or unauthorised development, or an EIS; (iii) All other appeals (non-section 37).

**While every care has been taken to ensure the accuracy and completeness of this information, it is the responsibility of any person / body making an appeal to ensure that their appeal is accompanied by the correct fee.**

**For more information on Appeals you can contact An Bord Pleanala at:**
Tel: 01 - 8588100 or LoCall: 1890 275 175
Fax: 01 – 8722684
E-mail: bord@pleanala.ie
Web: www.pleanala.ie

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## Schedule of Conditions

1. The development shall be carried out in accordance with the plans and particulars lodged with the application on 16th day of December 2011, except as may otherwise be required in order to comply with the following conditions.

   **Reason:** In the interest of proper planning and development.

2. Surface water from the site shall be prevented from running onto the surface of public road by provision of a safety kerb or a concrete grid with sump drained to a local drain or soakaway.

   **Reason:** To prevent flooding of site

3. All surface water run-off from roofs, entrances and parking areas shall be collected and disposed of within the site to soakpits/adjacent watercourses. It shall not be discharged to septic tank or percolation area or future public sewer.

   **Reason:** In the interest of proper development

4. Existing hedgerows, trees and shrubs on site shall be preserved.

   **Reason:** To protect the rural character of the area

5. (a) The applicant is required to engage the services of a suitably qualified archaeologist (licensed under the National Monuments Acts 1930-2004) to monitor all groundworks associated with the development.
   (b) Should archaeological material be found during the course of monitoring, the archaeologist may have work on the site stopped, pending a decision as to how best to deal with the archaeology. The developer shall be prepared to be advised by the Heritage and Planning Division of the Department of the Environment, Heritage and Local Government with regard to any necessary mitigating action (e.g. preservation in situ, or excavation) and should facilitate the archaeologist in recording any material found.
   (c) The Planning Authority and the Heritage and Planning Division of the Department of Environment Heritage and Local Government shall be furnished with a report describing the results of the monitoring

   **Reason:** To ensure the continued preservation (either in situ or by record) of places, caves, sites, features or other objects of archaeological interest.

6. (a)During the construction period, BATNEEC shall be employed by the developer to minimize noise from construction operations and shall have regard to BS 5228:1997 "Noise Control on Open and Construction Sites". Site noise, as defined in BS 5228 1997 shall not exceed , during the construction period , the following criteria:

   | LAeq (1hour) | Time period. |
   |---|---|
   | 55 dB(A) | 0800 hours- 2000 hours |

   Monday - Saturdays inclusive and excluding public holidays and Sundays.

   | | |
   |---|---|
   | 45dB(A) | At all other times. |

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**Meath County Council**
**Planning Department**
**Abbey Mall**
**Abbey Road**
**Navan**
**Co. Meath**
**Phone: 046 909 7000 Fax: 046 909 7001**

**Planning & Development Act 2000 - 2008**
**NOTIFICATION OF FINAL GRANT**

**TO**: Boliden Tara Mines Limited
Mr Brendan O'Reilly
Knockumber House
Navan Co Meath

**Planning Register Number**: NA/101054
**Application Receipt Date**: 16/09/2010
**Further Information Received Date**: 06/05/2011

**In pursuance of the powers conferred upon them by the above-mentioned Act, Meath County Council has by Order dated 29/06/2011 GRANTED PERMISSION to the above named for the development of land in accordance with the documents submitted namely:-** involves the mining of the current uninterrupted orebody into a new area of Liscartan and Rathaldron solely by underground means. The development would use similar mining methods to those currently being employed. The proposed extension of the underground mining operations into the application area, located to the northwest of the main orebody would be accessed from the existing underground workings. The suface characteristics and features of the application area will not be altered by mining activity and there will be no surface development associated with this proposal. The necessary mining infrastructure for its operation is already in place. This includes administration, processing, tailings storage, ventilation, effluent discharge and road/rail links to Dublin Port. An Environmental Impact Statement (EIS) will accompany the Planning Application. All operations will be carried out under the existing conditions of the Company's Integrated Pollution Prevention Control License (IPPCL No.P0516-01) issued by the Environmental Protection Agency (EPA) at Liscartan & Rathaldron, Navan Co Meath, **subject to the 31 conditions set out in the Schedule attached.**

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Signed on behalf of Meath County Council

Administrative Officer

DATE: **05/08/2011**

**NOTE: (Outline Permission Applications Only)**

OUTLINE PERMISSION is subject to the subsequent Application for Permission consequent on the grant of Outline Permission of the Planning Authority. Until such has been obtained to detailed plans of the development proposed, the development is NOT AUTHORISED.

NOTE:

The permission herein granted shall, on the expiration of 5 years beginning on the date of the granting of permission, cease to have effect as regards: -

(1) In case the development to which the permission relates is not commenced during the period, the entire development and

(2) In case such development is so commenced, so much thereof as is not completed within that period.

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NA/101054

**Schedule of Conditions**

1 The proposed development shall be constructed, operated, decommissioned, rehabilitated and closed in accordance with the complete documentation submitted as part of the planning application including drawings together with the contents of the Environmental Impact Statement as submitted 16th September 2010 and 6th May 2011, except as otherwise required by conditions hereunder.

**Reason:** To clarify the detailed development proposals, methods of operation and proposals for final closure authorised by this permission.

2. This grant of planning permission provides for mining and all associated activities limited to the Liscartan and Rathaldron areas identified within Figure 1.1 of the Environmental Impact Statement and within the plans, particulars and Environmental Impact Statement as submitted to the Planning Authority on 16th September 2010 and 6th May 2011

**Reason:** To clarify the extent of permission.

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3. Prior to the commencement of operations on site the developer shall draw up and submit for the written agreement of the Planning Authority an updated Closure Restoration and Aftercare Management Plan for the Liscartan and Rathaldron Extension Area;

a) In respect of closure of the mine, the following shall apply:

i) The developer shall notify the Planning Authority when closure is imminent (within 12 months) and when it has commenced.

ii) Within 12 months of closure and for every 12 month period thereafter, until otherwise agreed in writing with the Planning Authority, the developer shall submit a report to the Planning Authority containing the following information:

- The nature and extent of rehabilitation work carried out during the past year
- The nature and extent of the rehabilitation work to be carried out during the coming year
- Any changes in conditions of the project that may affect the closure plan during the next three years.
- The results of all monitoring described in the closure plan

b) Arising from the reports and monitoring, in the event of the licensing authorities deeming that the mine closure plan, including the financial assurance requirement, is inadequate to properly rehabilitate the site due to changed conditions, then the Planning Authority shall direct the developer to submit proposals for an increase in the amount of financial assurance as appropriate, for the agreement of the said Planning Authority, or in default of agreement, shall be as determined by An Bord Pleanala.

c) In the event of the developer wishing to amend and/or alter the mine closure plan, then the developer shall formally submit complete details of such proposed amendments / alterations for the agreement of the licensing agencies, or in default of agreement as shall be determined by An Bord Pleanala. The licensing agencies shall be empowered to require changes to the proposed amendments / alterations. The mine closure plan shall not be deemed to be altered until the Planning Authority formally notifies the developer in writing of the acceptability of the alterations / amendments.

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**Reason:** In the interest of proper planning and sustainable development and in the interest of good mining practice, that phased, satisfactory closure, and rehabilitation of the underground mine workings within the Liscartan and Rathaldron Extension area, should take place on completion of ore extraction there.

4. The developer shall furnish the Planning Authority with an independent annual groundwater monitoring report for the life of the development, which shall detail changes in groundwater level over the year and trends over time. The report shall also include details of the following:

(i) Water levels in the monitoring wells shall be measured at monthly intervals for the first twelve months after completion; thereafter, monitoring shall take place at least two monthly intervals.

(ii) A map showing the extent of the Cone of Drawdown for the Liscartan and Rathaldron ore bodies shall be drawn up, based on data collected, at the end of January and August for two years from the date of this grant of permission. Thereafter, it shall be drawn up at the end of August each year.

(iii) Groundwater samples for analysis shall be taken from at least nine of the wells in the monitoring network to characterise groundwater chemistry of the site. Sampling shall take place on stabilisation of the wells after completion. The samples shall be analysed for PH, electrical conductivity, suspended solids, the major anions and cations, ammonia, iron, manganese, lead and zinc. The analyses shall be repeated every five years.

(iv) The developer shall record the daily volume of water abstracted from the Liscartan and Rathaldron extension. That volume shall be differentiated from the abstraction for the existing mine at Tara.

(iv) The geological logs and completion details of the wells drilled for the groundwater monitoring network,

(v) The results of the monitoring of underground flows and quality.

(vi) The results of the groundwater modeling

(vii) The results of the annual water balance.

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Subsequent reports on groundwater monitoring shall be produced every two years after the initial report. A groundwater model of the Liscartan and Rathaldron areas shall be developed in order to be better able to predict the amount of dewatering required, the resulting increase in the size of the cone of drawdown over the life of the proposed ore extraction and any potential impacts. The model shall cover the full extent of the Liscartan and Rathaldron areas and include the following information:

(viii) Geological and hydrogeological information from the boreholes drilled for the groundwater monitoring network shall be included as part of the input to the model.

(ix) The groundwater modeling study shall be completed within one year from the date of this grant of permission. The model shall be revised every five years. The model output in time shall form an integral part of the closure plan for the Liscartan and Rathaldron orebodies.

(x) A comprehensive mine water balance shall be computed for present and future operations. The computation shall be done on a monthly basis.

The report shall be interpretative and provide a non-technical summary of the data and trends, to the satisfaction of the Planning Authority. This condition together with others under the heading of groundwater may be combined in to a single annual report.

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**Reason:** To provide comprehensive base data on groundwater within and in the vicinity of the development site and to provide prediction of the future core of draw down and any related impacts which may occur.

5 The developer shall furnish the Planning Authority with an independent annual water balance report for the site and its operations for the life of the development. The reported data should include, but not be limited to, the following: rainfall; daily estimated infiltration; daily estimated surface water run off; daily estimated evapo-transpiration; daily records of abstraction from and discharge to the river; daily records of river flow upstream of the site abstraction; daily water pumped from the mine and estimated contribution of various sources including river water, groundwater storage, groundwater transmitted and river leakage to the site water budget. The report shall be interpretative and provide a non-technical summary of the data and trends, to the satisfaction of the Authority. This condition together with others under the heading of groundwater may be combined in to a single annual report.

**Reason:** In the interests of proper planning and sustainable development and to facilitate on going monitoring of the development

6. The developer shall furnish the Planning Authority with an independent annual groundwater quality report for the life of the development, which shall detail changes in groundwater quality over the year and trends over time in the mine workings and adjacent areas. The report should provide details of the quality assurance and sampling methodologies. The report shall be interpretative and provide a non-technical summary of the data and trends, to the satisfaction of the Authority. This condition together with others under the heading of groundwater may be combined in to a single annual report.

**Reason:** In the interests of proper planning and sustainable development and to facilitate ongoing monitoring of the development

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7. The developer shall make such provision as is necessary to ensure immediate mitigation of any water supplies that may be adversely affected during all stages of the development, with the full cost of all such measures to be borne by the developer. In the event of disruption all operations causing such disruption shall be immediately reduced or ceased as appropriate until the water supply affected has been restored or replaced.

**Reason:** To ensure the maintenance of continuous adequate potable water supply in the interests of public health and agricultural land use.

8. Prior to commencement of operations at Liscartan and Rathaldron, the developer shall, in association with its consultants, carry out a range of verifiable tests to determine laboratory and insitu strength of the backfill as a function of its ordinary Portland cement content, relevant sand size, water content and curing time for the range of stope backfill heights and imposed loads projected for Liscartan and Rathaldron. The insitu tests shall be carried out on

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extracted core samples of appropriate age. The results of such tests shall be notified to the Planning Authority via a detailed report including non technical summary.

**Reason:** In the interest of proper planning and sustainable development and ensuring short and long term surface stability and safety of mine backfill structures.

9. Prior to the commencement of development the developer shall establish a fund dedicated to providing for the full costs of the Closure, Restoration and Aftercare Management Plan as set out in the existing CRAMP or any updated version thereof.

This fund shall include but shall not be limited to, provision for:

(a) The closure and rehabilitation of the entire mine site in the event of any of the enforced closure scenarios as set out in the Closure, Reclamation and Management Plan.
(b) The planned final closure and restoration of the entire mine site as set out in the Closure, Restoration and Aftercare Management Plan.

The amount of the fund shall, at all times, be sufficient to meet the costs of rehabilitation of all extant works and impacts (whether existing or predicted) to the satisfaction of the licensing agencies, being the Planning Authority, the Environmental Protection Agency and the Department of Communications, Energy and Natural Resources.

The fund shall be sufficient without reliance on the value of plant, equipment or other such assets.

The developer shall provide security in order to guarantee the availability of the fund in the event of financial failure or any other default. The type of security and its means of release/recovery shall be agreed with the Planning Authority in consultation with the Environmental Protection Agency and the Department of the Communications, Energy and Natural Resources. It shall be irrevocable and it shall be expressly designate to the Planning Authority as beneficiaries in the event of the developer being unable to implement the Closure Restoration and Aftercare Management Plan or any of the enforced early closure plans envisaged therein. The security shall be maintained for the duration of the development including final rehabilitation and closure of the site as certified in writing by the Planning Authority, in consultation with the Environmental Protection Agency and the Department of Communications, Energy and Natural Resources.

The amount of the fund shall be agreed in writing with the Planning Authority in consultation with the Environmental Protection Agency and the Department of Communications, Energy and Natural Resources and updated in line with the financial provisions in the CRAMP or any revision thereof.

In default of agreement with regard to the amount of the fund the amount of the fund same shall be determined by An Bord Pleanala.

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**Reason:** To ensure satisfactory completion of the development and to provide for the proper rehabilitation of the site in the event of early closure and in the long term.

10. (a) Slimes arising from the processing of tailings at Liscartan and Rathaldron shall be disposed of and managed within the Randalstown Tailings Management Facility, permission for which was granted by An Bord Pleanala under Planning 17. 104373.

(b) The developer shall within one year of commencement of development at Liscartan & Rathaldron and thereafter over the life of the proposed development submit for the written agreement of the Planning Authority annual returns showing:

(i) The volumes of slimes arising from processing of tailings from Liscartan & Rathaldron which have been disposed of to the Tailings Management Facility.

(ii) cumulative volumes of slimes arising from the processing of tailings from Liscartan & Rathaldron and other Tara Mine areas which have been disposed of to the Tailings Management Facility.

**Reason:** To ensure proper disposal and management of slimes arising from tailings associated with the proposed development and to ensure that ongoing capacity for disposal of slimes at the Tailings Management Facility can be provided over the life of the development.

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11. Any changes in the characteristics of the slimes associated with the processing of tailings from Liscartan & Rathaldron which results in those characteristics being materially different from those described in the Environmental Impact Statement and which are likely to impact on the drainage/structural stability of the Tailings Management Facility and on the deposition rates shall be the subject of a further application for permission to the Planning Authority.

**Reason:** To enable the Planning Authority to reassess and control any material changes in the predicted impact of the development and to reassess the Closure Plan for the Tailings Management Facility.

12. The proposed development shall take place in accordance with a Mine Design & Development Plan which shall be submitted for the written agreement of the Planning Authority and consist of the following:

(a) Initial Phase: Within 3 months from the date of this grant of permission the Developer shall prepare and submit to the Planning Authority, the following information:

i) The mine design criteria to be adopted for detailed mine planning and design (to ensure stability during mine development, ore extraction and post-closure). These criteria shall include provisions for surface crown pillars; stopes and backfilling operations (to include proposed type(s) of backfill material).

ii) A geotechnical risk assessment of potential water and mud inflows into the mine and the mitigation measures to be implemented, if any, arising from this assessment.

iii) Confirmation of the strength and stiffness of the proposed backfill materials, including the results of laboratory and insitu tests on the type(s) of proposed backfill materials. The report submitted shall include details of the proposed backfill materials; the testing methods adopted for the strength and stiffness measurements; the accredited laboratory used to carry out the testing; the testing certificates;

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(b) Initial Phase: Within 6 months from date of grant of this permission, and before commencement of extraction of ore, the Developer shall submit to the Planning Authority the following investigation results; the results shall also be incorporated into the review of the mine design. .

i) A detailed investigation of the potential occurrence of cavities in the Pale Beds and the Upper Dark Limestone Formations; (The scope and extent of this investigation shall be agreed in advance with the Planning Authority); related issues of surface stability, sinkhole development groundwater inflows and expansion of the cone of drawdown shall also be addressed.

(c) Initial Phase: Within 3 months from date of grant of this permission the Developer shall submit detailed proposals to the Planning Authority for surface and underground monitoring of the proposed mine extension. *These proposals shall shall also include but not be limited to:*

i) Surface precise leveling: station locations, base station locations, survey methodology (accuracy and frequency).

ii) Displacement monitoring across significant fault structures: locations, methodology (accuracy and frequency).

iii) Stress measurements at a number of selected pillars: locations, methodology (accuracy and frequency).

iv) Displacement measurements within the hanging walls of selected stopes, and convergence measurements within selected stopes: locations, methodology (accuracy and frequency)..

(d) Detailed Review Process: First Year: Within one year from the date of grant of this permission, the Developer shall submit to the Planning Authority (in an agreed format) a detailed review of the mine design criteria; the geotechnical risk assessment; surface subsidence; and surface and underground monitoring. This review shall present proposed modifications, if any, to the design and monitoring of the workings, and the basis for such modifications, and shall include:

i) Copy of a mine plan at an agreed scale, showing the extent of the mine workings, backfill areas, surface features and all geotechnical monitoring locations.

ii) Precise leveling results for each survey station

iii) Displacement and stress monitoring results

iv) Results of strength and stiffness tests carried out on backfill materials, referenced to backfill locations.

v) Plan showing a comparison of the predicted vs. measured surface subsidence.

vi) Review of the mine design criteria

vii) Review of the geotechnical risk assessment

viii) An outline mine development plan for the subsequent two years (to include inter alia plans and sections (at an agreed scale) of the mine development infrastructure; the pillar and stope layout, and backfill areas.)

(e) Rolling Review: Every two years, from the date of the first review, the Developer shall submit updated information, as outlined at (d) above, for review by the Planning Authority. Submissions by the Developer shall include proposed modifications, if any, to the design and monitoring of the workings, and the basis for such modifications.

**Reason:** It is considered reasonable in the interests of proper planning and sustainable development that the developer shall provide a Mine Design and Development Plan which shall incorporate Mine Design and Development parameters, details of surface and

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underground monitoring infrastructure, results of monitoring and provision for a detailed review process to facilitate modifications to the mine design and monitoring infrastructure, over the life of the proposed development.

13 The developer shall facilitate the Planning Authority in preserving, recording or otherwise protecting archaeological materials or features that may exist within the site. In this regard, the developer shall -

(a) Notify the Planning Authority in writing at least four weeks prior to the commencement of any site operation (including hydrological and geotechnical investigations) relating to the proposed development,

(b) Employ a suitably-qualified archaeologist who shall monitor all site investigations and other excavation works, and

(c) Provide satisfactory arrangements for the recording and removal of any archaeological material which may be considered appropriate to remove.

(d) The developer shall be prepared to be advised by the Development Applications Unit with regard to any necessary mitigating action (e.g. preservation in situ or excavation) and should facilitate the archaeologist in recording any material found.

(e) The Planning Authority and the Development Applications Unit shall be furnished with a report describing the results of the monitoring. .

**Reason:** To ensure the continued conservation/preservation (either in situ or by record) of places, caves, sites, features or other objects of archaeological interest.

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14 (a) Any changes to the method of mineral extraction and processing which result in a material change to the characteristics of the tailings shall be subject to an approval of the Planning Authority prior to those changes being made.

(b) Any material changes in the properties of the ore shall be notified to the Planning Authority.

**Reason:** In the interest of development management and protection of the environment.

15. Where the Planning Authority considers that mining within the main mine and/or proposed extension within Liscartan and Rathaldron has ceased for a period of in excess of six months and where the developer can offer no reasonable grounds to dispute this opinion, then the Planning Authority shall be empowered to notify the developer of their intention to activate the appropriate Closure, Restoration and Aftercare Management Plan and of their intention to call upon the financial guarantees offered within sixty days.

**Reason:** In the interest of orderly development.

16. Prior to the commencement of development a certificate from a suitably qualified independent consultant engaged by the developers confirming the structural soundness and stability of the proposed mine extension at Liscartan and Rathaldron, the subject of this permission shall be furnished to the Planning Authority. This certificate shall be based on an independent audit of the design, construction and operation of the proposed mine extension. This audit shall be carried out in line with best practice procedures for mining.

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**Reason:** To provide for independent certification of the proposed dam in the interest of public safety and public health.

17 The developer shall submit to the Planning Authority at six monthly intervals a schedule of production output for the previous six months and projected production output for the following two years. The schedules shall include as a minimum, value for ore mined, total lead and zinc concentrate produced and total tailings generated.

**Reason:** To provide assistance to the Planning Authority in planning for management and monitoring resources and for likely changes in physical and environmental impacts.

18 Prior to the commencement of development, the developer shall pay to the Planning Authority the sum of 50,000 Euro as a special contribution towards the expenditure to be incurred by Meath County Council in respect of the cost of works necessary for the maintenance of the local road infrastructure approaching the mine which allow for deliveries, machine transfer and maintenance off site to/from the main mine site.. The charge herein referred to shall apply for the period from the date of this permission to the 31st December 2011 and will be subject to review on that date and to annual review thereafter unless previously paid.

In the case of expenditure that is proposed to be incurred, the requirement to pay this contribution is subject to the provisions of Section 48 (2) of the Planning and Development Act 2000 as amended.

**Reason:** It is considered that the developer should contribute towards the expenditure that was and/or that is proposed to be incurred by the Council in respect of the provision of road improvement works facilitating the proposed development.

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19 (a) All monitoring shall be undertaken in accordance with the most up to date international scientific methods and to the satisfaction of the Planning Authority

(b) The developer shall keep records of all monitoring carried out on foot of this permission of all relevant permits/licences under other statutory instruments until final closure and restoration of the tailings facility and mine site has been achieved. These records shall be submitted to the Planning Authority on a quarterly basis and as soon as is practicable after the relevant period to which they relate. All records shall be available for inspection at the offices of the Planning Authority during normal opening hours.

(c) The applicant shall submit to the Planning Authority a summary report on an annual basis of all monitoring carried out in the previous year.

(d) The developer shall pay an annual sum to be agreed in writing with the Planning Authority within three months of this grant of planning permission as a contribution towards the cost of evaluating the monitoring required under this permission. This sum shall be paid quarterly with the first payment being made not later than three months after the commencement of development. The amount of the contribution shall be reviewed annually and agreed with the Planning Authority.

**Reason:** To ensure satisfactory monitoring of the development.

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20 All mitigation measures as proposed within the Environmental Impact Statement submitted to the Planning Authority on 16/9/10 and on 6/5/2011 regarding the proposed development both during the construction, operation and closure periods shall be fully implemented.

**Reason:** To minimize nuisance to the public.

21 All temporary berms and temporary stockpiles of overburden materials which are to remain intact for periods of greater than six months shall be graded, top soiled and grass seed as soon as practicable after being constructed. Dust suppression sprays shall be used during periods of dry weather until a stable grass covering has been established.

**Reason:** To minimize nuisance to the public from dust

22. In the event of the quantities of water ingress into the proposed mine extension exceeding those predicated in the Environmental Impact Statement to the extent that in the opinion of the Planning Authority remedial measures are necessary, such measures shall be implemented without delay as shall be agreed in writing with the Planning Authority.

Within three months of the commencement of development the developer shall submit to the Planning Authority for written agreement an action plan to be implemented in the event of excessive water ingress. Such a plan shall include but shall not be limited to proposals for an alarm system to alert the developer of excessive water ingress.

**Reason**: In the interest of prevention of pollution.

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23 All vehicles carrying inert material, rubble or soil on the public roads shall be suitably covered.

**Reason:** In the interest of amenity.

24. Prior to the commencement of development the applicants shall pay to the Planning Authority the sum of 50,000 euros as a contribution towards the expenditure to be incurred by Meath County Council in respect of the cost of the provision of an art feature or other social amenities/infrastructure

**Reason:** It is considered that the developer should contribute towards the expenditure that was and/or that is proposed to be incurred by the Council in respect of the provision of social infrastructure works.

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25 All service lines and cables servicing the proposed development shall be located underground except where otherwise agreed in writing with the Planning Authority.

**Reason:** In the interest of orderly development and visual amenity.

26 In the event of the failure of any tailings retaining structure, any delivery or return pipeline, all mining operations shall cease and production shall not be recommenced until such time as satisfactory arrangements for disposal of tailings have been provided and agreed in writing with the Planning Authority.

**Reason:** To minimize the risk of pollution and in the interest of public health.

27. All oil and fuel storage tanks, chemicals and all other materials that pose a risk to waters if spilled, shall be stored in designated storage areas, which shall be bunded to a volume of 110% of the capacity of the largest tank or container within the bunded area(s). Filling and draw-off points shall be located entirely within the bunded area(s). Drainage from the bunded area(s) shall be diverted for collection and safe disposal. The use of bunded pallets for storage of drums etc is acceptable.

**Reason**: In the interest of public safety.

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28 The developer shall prepare a waste management plan for the development phase, to maximise reuse or recycling of waste and minimise the amount of waste consigned to landfill. Priority shall be given to re-use or recovery of waste in preference to disposal. This shall be submitted for the written agreement of the Planning Authority.

The plan shall as a minimum address the following:
All demolition and construction waste arising on the site shall be segregated into different clearly marked skips (such as canteen waste, timber, plastics, plaster board, waste solvent tubes, blocks, etc). All surplus demolition waste, construction waste and clean soil to be removed off-site shall be brought to permitted site or facility.
A register shall be maintained of the movement of waste off-site, to include an estimation of the quantities of waste removed, name and waste collection permit number of the Contractor/s engaged to collect the waste, details of the recovery or disposal facility or facilities used. The developer shall retain all recovery or disposal receipts. A prohibition on the burning or burying of waste on the site.

**Reason:** In the interest of proper planning and sustainable development.

29 Within 3 months of the final grant of planning permission, the applicants shall liaise with the Water Conservation Office of Meath County Council Environment & Water Services

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# Appendix B.6 - 4

# NIS - Stage 6 Development of the Tailings Storage Facility

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# BOLIDEN TARA MINES

# STAGE 6 TAILINGS MANAGMENT FACILITY

## Natura Impact Statement

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April 2016

TOBIN CONSULTING ENGINEERS

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# Natura Impact Statement

**PROJECT:**

**Boliden Tara Mines:**
**Stage 6 Tailings Facility and associated developments**
**Natura Impact Statement**

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**CLIENT:**

**Boliden Tara Mines**
Knockumber Road,
Navan,
Co. Meath

**COMPANY:**

**TOBIN Consulting Engineers**
Block 10-4
Blanchardstown Corporate Park
Dublin 15

**www.TOBIN.ie**

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## DOCUMENT AMENDMENT RECORD

**Client:** Boliden Tara Mines

**Project:** Boliden Tara Mines Stage 6 Tailings Facility Development

**Title:** Natura Impact Statement

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| PROJECT NUMBER: 7957 | | | | DOCUMENT REF: NIS 7957 | | | |
|---|---|---|---|---|---|---|---|
| Revision | Description & Rationale | Originated | Date | Checked | Date | Authorised | Date |
| A | DRAFT | DMD | 11.03.16 | | | | |
| B | | JH | 18.04.16 | DMD | 20.04.2016 | | |
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| TOBIN Consulting Engineers | | | | | | | |

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# 1 INTRODUCTION

This report forms a Natura Impact Statement (NIS) for the proposed Stage 6 Tailings Storage Facility (TSF) at Boliden Tara Mines Ltd. (Tara Mines). The purpose of this Natura Impact Statement is to inform the Appropriate Assessment process which is carried out by the appropriate planning Authority.

An Appropriate Assessment is a requirement of Article 6 of the Council Directive 92/43/EEC of 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora (as amended) (hereafter referred to as the "Habitats Directive"). The overall aim of the Habitats Directive is to maintain or restore the "Favourable Conservation Status" of habitats and species of European Community Interest. These habitats and species are listed in the Habitats and Birds Directives (Council Directive 2009/147/EC on the conservation of wild birds) with Special Areas of Conservation and Special Protection Areas designated to afford protection to the most vulnerable of them. These two designations are collectively known as European Sites.

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European and national legislation places a collective obligation on Ireland and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation condition. The Government and its agencies are responsible for the implementation and enforcement of regulations (in particular Part XAB of the Planning and Development (Amendment) Act 2010 and the European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. 477) (often referred to as the Habitats Regulations) to ensure the ecological integrity of these sites.

Appropriate Assessment (AA) is an assessment of whether a plan or project, alone and in combination with other plans or projects, could have significant effects on a European site in view of the site's conservation objectives. An EIS has also been submitted for this development and this NIS forms an Appendix to provide detailed consideration of European Sites and their conservation objectives, which are the primary consideration for AA.

The project design to date has been an iterative approach which has sought to, as far as possible; avoid impacts to European Sites. This report considers the proposed design. It determines if direct, indirect and in-combination effects arose; or if there were uncertainty regarding potential effects. Given the "precautionary principle" requirements of Appropriate Assessment, mitigation is detailed to reduce/ remove potential impacts; or possible uncertainty regarding potential impacts.

Screening for Appropriate Assessment implemented for the project determined that the development required Stage 2 of the Appropriate Assessment process to be undertaken. This



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report therefore takes the forms of a Natura Impact Statement (NIS) as required by the Birds and Natural Habitats Regulations (2011). The NIS has been prepared by an experienced and appropriately qualified TOBIN ecologist. An experienced TOBIN hydrogeologist, with a scientific background in determining potential water quality risk sources provided additional input to potential impacts affecting hydrology and aquatic-dependant ecological receptors. This report was produced with specific reference to the existing environmental and ecological data available for the site. The current assessment makes reference to the project description, survey data and impact assessment reporting prepared for the project including the following documents:

- Design for the Stage 6 Tailingg Facility (Golder, 2016);
- TSF Stage 6 Extension: Hydrology and Hydrogeology Environmental Impact Assessment (AECOM, 2015);
- Statement for Appropriate Assessment (Biosphere Environmental Services, 2010); and
- Natura Impact Statement for the discharge of groundwater (2010, TOBIN Consulting Engineers).

## 1.1 LEGISLATIVE CONTEXT

The Appropriate Assessment process (AA) is an assessment of the potential for adverse or negative effects of a plan or project, in combination with other plans or projects, on the conservation objectives of a European Site. These sites consist of Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) and provide for the protection and long-term survival of Europe's most valuable and threatened species and habitats.

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Council Directive 92/43/EEC of 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora - 'The Habitats Directive', has been transposed into Irish law by The European Community (Natural Habitats) Regulations 2011 (S.I. No. 477). The Birds Directive, Directive 2009/147/EC of the European Parliament and of the Council, seeks to protect birds of special importance by the designation of Special Protection Areas (SPAs) whereas the Habitats Directive does the same for habitats and other species groups with Special Areas of Conservation (SACs). The requirement of AA is outlined in Article 6(3) and 6(4) of the *EU Habitats Directive*. Article 6(3) of the Habitats Directive requires that:

> *"Any plan or project not directly connected with or necessary to the management of the site but likely to have 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."*



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Furthermore, Article 6(4) of the Habitats Directive requires that:

> *"If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted."*

If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project may nevertheless be carried out for "Imperative Reasons Of Overriding Public Interest", including those of a social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 network is protected. It shall inform the Commission of the compensatory measures adopted. Where the site concerned hosts a priority natural habitat type and/or a priority species, the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest.

Appropriate Assessment should be based on best scientific knowledge and Planning Authorities should ensure that scientific data (ecological and hydrological expertise) is utilised. This report details a Natura Impact Statement to inform the AA process which is finalised by the statutory authority.

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## 1.2 SOURCE-PATHWAY-RECEPTOR MODEL

Ecological impact assessment of potential indirect impacts on European Sites is conducted utilising a standard 'Source-Pathway-Receptor' model, where, in order for an indirect impact to be established all three elements of this mechanism must be in place. The absence or removal of one of the elements of the mechanism is sufficient to conclude that a potential effect is not of any relevance or significance. This report determines if direct, indirect and cumulative adverse effects will arise from the proposed development.

- Source(s) – e.g. pollutant run-off from proposed works.
- Pathway(s) – e.g. groundwater connecting to nearby qualifying wetland habitats.
- Receptor(s) – Qualifying aquatic habitats and species of European sites.

## 1.3 GUIDANCE

This report has been carried out using the following guidance:

- Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities. Circular NPW 1/10 & PSSP 2/10.



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- Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities. (Department of Environment, Heritage and Local Government, 2010).
- Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg (EC 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, Office for Official Publications of the European Communities, Luxembourg (EC 2001);
- Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission. Office for Official Publications of the European Communities, Luxembourg (EC 2007).
- Flora (Protection) Order, 1999 (As amended 2016)

In addition, a detailed online review of published scientific literature and 'grey' literature was conducted. This included a detailed review of the National Parks and Wildlife Website including mapping and available reports for relevant sites and in particular sensitive qualifying interests described and their conservation objectives. The EPA Envision Map-viewer (www.epa.ie) and available reports were also reviewed.

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Definitions of conservation status, integrity and significance used in this assessment are defined in accordance with 'Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC' (EC, 2000).

- The conservation status of a natural habitat is defined as the sum of the influences acting on a natural habitat and its typical species that may affect its long-term natural distribution, structure and functions as well as the long-term survival of its typical species;
- The conservation status of a species is defined as the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its population;
- The integrity of a European Site is defined as the coherence of the site's ecological structure and function, across its whole area, or the habitats, complex of habitats and/or populations of species for which the site is or will be classified;
- Significant effect should be determined in relation to the specific features and environmental conditions of the protected site concerned by the plan or project, taking particular account of the site's conservation objectives.



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## 1.4 APPROACH

As previously mentioned, there are four main stages in the AA process; the requirements for each depending on likely impacts to European Sites (cSAC/ SPA).

- **Stage One: Screening** – the process which identifies the likely impacts upon a European site. Its purpose is to determine, on the basis of a preliminary assessment and objective criteria, whether a plan or project which is not directly connected with or necessary to the management of the site as a European Site, individually or in combination with other plans or projects is likely to have a significant effect on the European site.
- **Stage Two: Appropriate Assessment** – consideration is given if the impact of the project or plan would adversely affect the integrity of surrounding European Sites, either alone or in combination with other projects or plans, with respect to the site's structure and function and its conservation objectives. Additionally, where adverse impacts have been identified, an assessment of the potential mitigation to reduce/minimise/avoid such impacts is required. This stage is the responsibility of the planning authority which is informed by a Natura Impact Statement. This stage is required where uncertainty of effect arises or a potential effect has been defined which requires further procedures/ mitigation to remove uncertainty of a defined impact.

  This NIS report considers likely impacts on European Sites of the project either alone or in combination with other plans and/or projects and considers whether these effects are likely to be significant. Based on the outcomes of the ecology assessments including those undertaken as part of the EIS, detailed precautionary mitigation may be required.
- **Stage Three: Assessment of Alternative Solutions** – the process which examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the European Site; and
- **Stage Four: Assessment Where Adverse Impacts Remain** – an assessment of compensatory measures where, in the light of an assessment of Imperative Reasons of Overriding Public Interest (IROPI), it is deemed that the project or plan should proceed.

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# 2 DESCRIPTION OF PROJECT AND RECEIVING ENVIRONMENT

## 2.1 CURRENT OPERATION

Boliden Tara Mines Limited, the largest operating zinc and lead mine in Europe, is located at Knockumber, 2 km west of Navan in County Meath. Orebody development at this mine commenced in 1973, with production beginning in 1977.

Mining continues today at a rate of between 2.3 and 2.6 million tonnes of ore per year. Ore production encompasses the drilling, blasting and removal of the ore from underground deposits. Broken ore is delivered to one of five underground primary crushers and reduced in size to less than 150 millimeters before being hoisted to the surface. Ore is then fed to an autogenous grinding mill which grinds the ore to a fine powder which is then pumped as aqueous slurry to metallurgic flotation cells.

Within the flotation cells, galena (Lead sulphide) and sphalerite (Zinc sulphide) are differentially separated, while undesirable minerals such as pyrite are depressed. Differential flotation and selective depression of minerals are enhanced by chemical additives to the flotation chamber feed.

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Once the target minerals have been extracted, the tailings stream is cycloned to separate the coarse sand fraction from the finer slimes fraction. The coarse fraction of tailings is pumped, to the underground mined out areas. In so doing, approximately 50% of the tailings are used underground to backfill mined voids. The tailings used for backfilling is stabilised, chemically and physically, by mixing with Portland cement.

The remaining fines fraction tailings is pumped as an aqueous slime to the Tailings Storage Facility (TSF) located some 2.5 km north of the processing plant in the townland of Randalstown. On an annual basis approximately 1.2 million tonnes of tailings are deposited for permanent storage in the TSF.

Since its inception the tailings facility has been constructed and operated in seven stages, Stages 1, 2, 3 ( lateral extensions) and the more recent Stage 4A, 4B, 5A and 5B ( upstream vertical extensions ), using combinations of temporary and permanent embankment walls.

The TSF is constructed as a ring-dike configuration, enclosed by earth-fill embankment walls. The embankment walls are constructed of low permeable glacial clay till and armoured with a layer of coarse material on the upstream slope.



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The existing TSF, enclosing a footprint area of approximately 171 ha, serves as containment for tailings to settle and consolidate, as well as a storage area for water that is circulated back to the processing plant at Knockumber for reuse in the processing plant or for eventual discharge to the River Boyne.

**Proposal**

- It is proposed to extend the existing TSF laterally in a northerly direction.
    - Here after the proposed facility will be referred to as TSF Stage 6.
    - The proposal facility will cover a footprint area of c. 58 hectares, extend to a height of 22 m above ground level and will provide a potential a storage volume of approximately 9.6 million cubic metres [13.6 million tonnes].

- The second part of the proposed development is the construction of an Integrated Constructed wetland (ICW). The proposal facility will cover a footprint area of c. 12 hectares. The function of the wetland is to provide a passive treatment system to treat water runoff in the post closure phase of the TSF lifecycle.
    - Treated water will discharge from the ICW to the river Blackwater via a buried HDPE pipeline.

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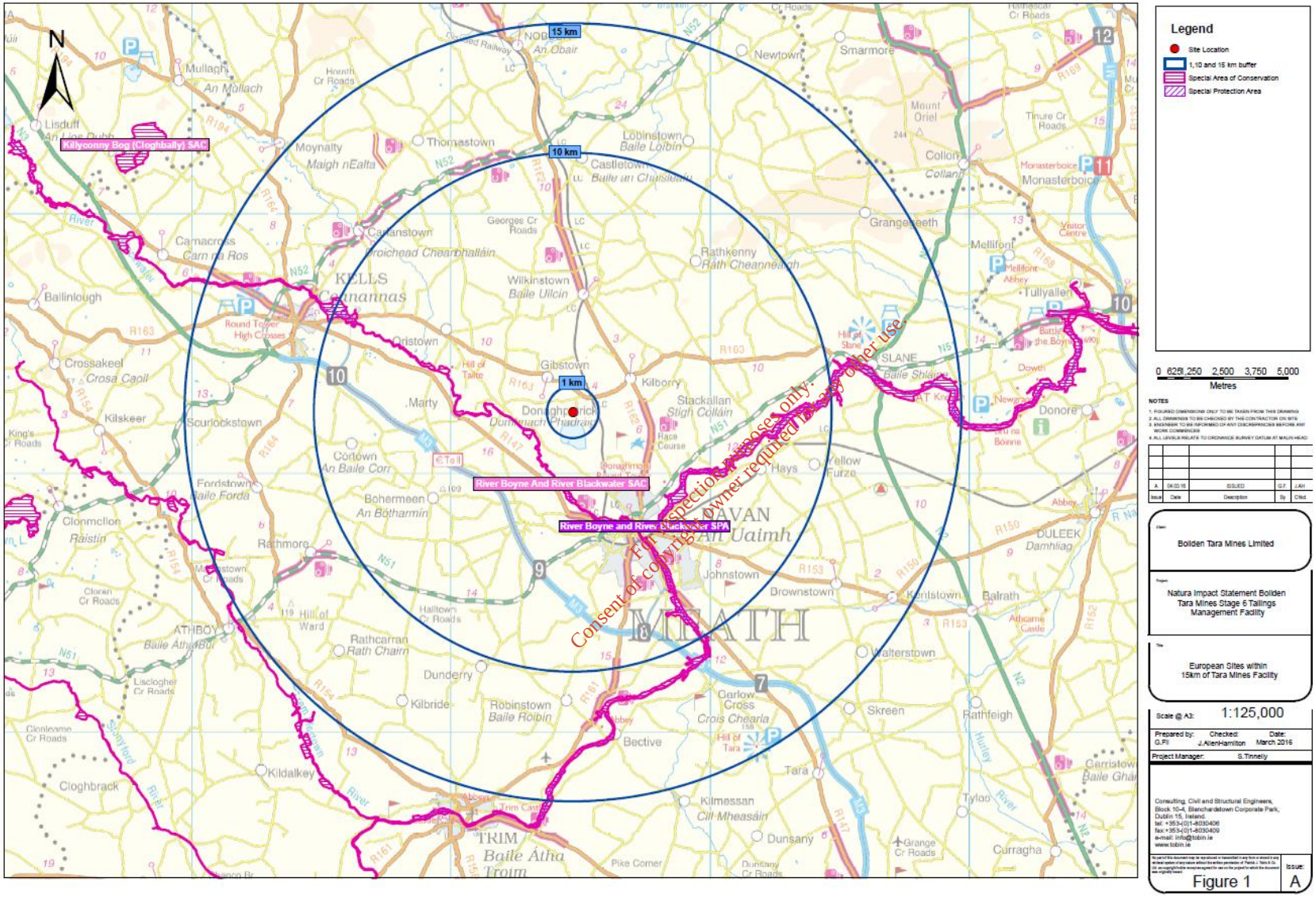


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**Figure 1. Location of the Tara Mines Stage 6 TSF site, with Natura 2000 sites in the wider study area shown.**



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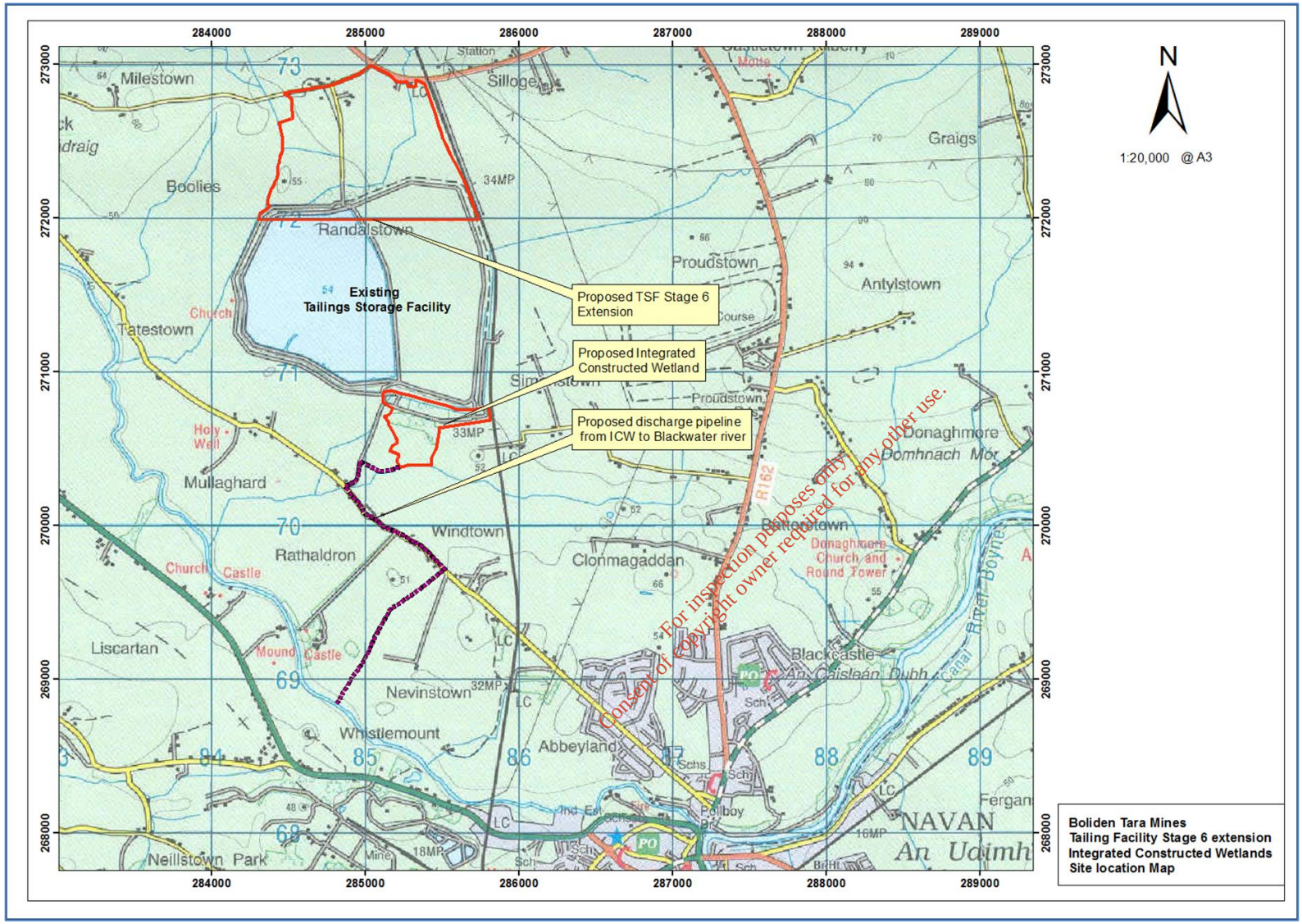


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Figure 2. Site location



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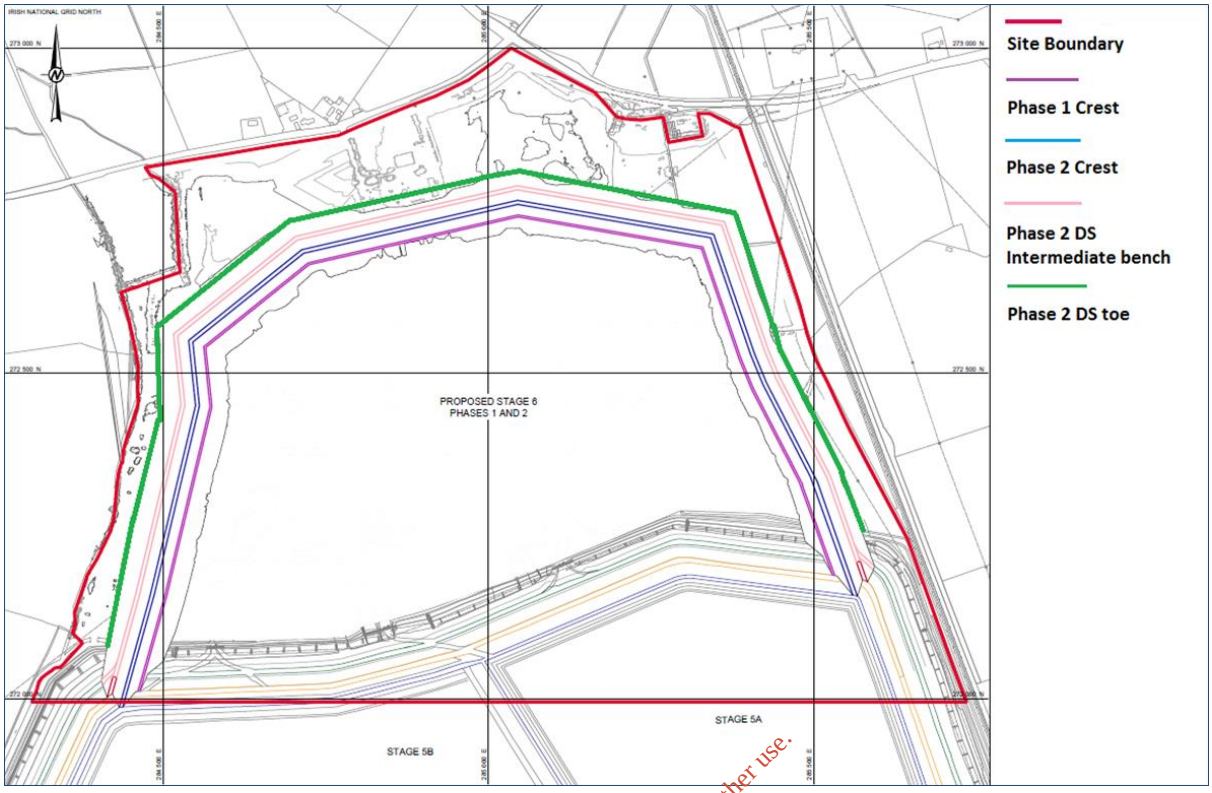


**Figure 3. Proposed TSF extension**

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## 2.2 OVERVIEW OF THE PROPOSED DEVELOPMENT

### *2.2.1 Stage 6 Design, construction and operation*

The conceptual design for the Stage 6 TSF has been carried out by Golder Associates and is described in detail in the design report (Golder Associates, 2016). The proposed TSF Stage 6 extension will be located along the northern sector of the existing tailings facility (Figure 3.2 and 3.3) and will be confined within the worked out 'borrow areas' to the north.

It is proposed to construct the Stage 6 embankment in two phases

- The first phase, PHASE 1 to a crest elevation of 59.29m AOD[1] and
- The second phase, PHASE 2 to a crest elevation of 67.29m AOD.

External ramps will provide access from the main haul roads.

The total construction volumes and storage volumes for the two phase development are presented in table 3.1.

[1] AOD Elevation **A**bove **O**rdnance survey **D**atum



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**Table 3.1 Struck Storage and Construction Volumes at given Crest Elvs.**

| Phases | Crest Elevation m AOD | Tailings Struck Storage Acc. Vol. $m^3$ | Life in years |
|---|---|---|---|
| 1 | 59.29 | 5,300,000 | 6.5 |
| 2 | 67.29 | 4,280,000 | 5.0 |

***Note**

- The 'life in years' has been based on a tailings discharge into the TSF of 1.1Mt/y tailings to TSF, a 0.5% beach slope and an average dry density of 1.42 $t/m^3$.
- Projected TSF operational life of 11.5 years

The main benefit of two phase development is that the maximum amount of fill can be sourced from the basin area of the site to use in construction.

Once the first phase is complete, the basin area will be in accessible to any future borrowing by the placement of the lining system.

The floor plan area of the TSF basin is approximately 43 Ha.

Key aspects of the Stage 6 design are as follows:

- The Blakes Stream would be redirected c, 400 – 600m north of its current location and still within the seven fields and northern borrow areas
- A composite lining system would be in place which consists of a high density polyethylene (HDPE) geomembrane over a geosynthetic clay liner (GCL). The lining system would be placed on the upstream slopes of the dam wall and basin area.

The existing drainage system within the TSF will be modified to accommodate the extra storage capacity provided by Stage 6, but the previous system would still operate as designed for the Stage 5 raise. The TSF perimeter dam used for tailings storage is operated without spillways. At closure, Stage 6 closure spillways would be required to control water levels and discharges. The proposed design for water management would be similar to that proposed for Stage 5 closure which involves the use of a spillway system connected to the interceptor channel. This would divert water to a wetland area for water treatment prior to discharge into the Blackwater River.

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The existing tailing capacity will be reached by 2019 therefore the construction of Stage 6 should be completed by the end of 2018. Stage 5A will be filled by the beginning/middle of 2016 and therefore allowing for a minimum of 1 year exposure, capping is unlikely to proceed until the spring of 2017.

The existing TSF is constructed as a ring-dike configuration, enclosed by earth-fill embankment walls. The embankment walls are constructed of low permeable glacial clay till and armoured with a layer of coarse material on the upstream slope.
Since its inception the tailings facility has been constructed and operated in seven stages.
Stages 1, 2, 3 were constructed to cover an area of approximately 171 hectares to a height above ground level of c. 12 metres.

The Stage 4 extension was constructed as an 'upstream raise'[2] in the 1990. This 6 meter vertical extension took the height of the facility to 18 metres

The Stage 5 extension was a further upstream extension. This 4 meter vertical raise too the overall height of the facility to C 22 metres.

The proposed Stage 6 extension will be constructed in two phases.

- Phase 1 will be a later extension to the north of the existing facility and will extend to a height of 14 metres and will tie in to the northern wall of the existing dam.

- Phase 2 will be a 'downstream raise'[3] extension to Phase 1. It will extend to a height of 22 metres and tie into the northern wall of the existing dam.

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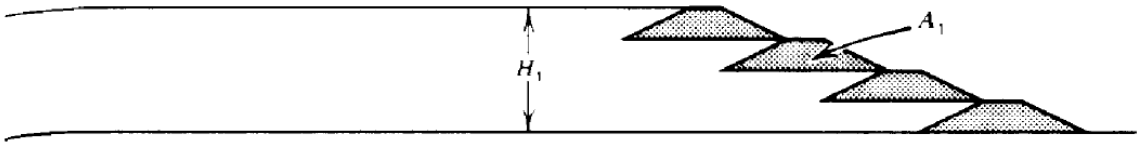
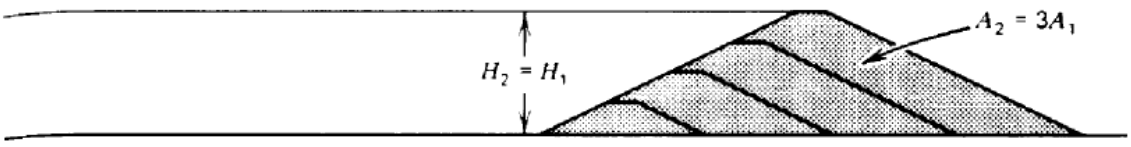
[2] Schematic: Typical upstream embankment raise: Construction inward and upward.




[3] Schematic: Typical downstream embankment raise: Construction outward and upward.



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### 3.1.2 CONSTRUCTION METHODOLOGY

The construction of the embankment walls will be different from all previous TSF embankment walls forming the existing facility because of the inclusion of a composite lining on the upstream face of the embankment walls and basin area.

The upstream slope of phase 1 will be constructed with a slope of 2H:1V and will be keyed into the northern embankment wall of the existing facility. The crest elevation will be 59.29 m AOD (14 metres above ground level[4] ).

The upstream slope of phase 2 will be constructed with a slope of 2H:1V and will be keyed into the northern embankment wall of the existing facility. The crest elevation will be 67.29 m AOD (22 metres above ground level).

The overall downstream slope will be approximately 2.25H:1V consisting of two 2H:1V slopes with a 6m bench at 59.29 m AOD for the second phase.

The crest width of the dam walls for all phases is 6 m and the maximum wall height will be approximately 22 m.

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Sections through the dam wall are presented in Drawing 6.5 and the section locations are shown in Drawing 6.6. Much of the dam wall footprint is within the existing areas which have been previously borrowed for Stage 5.

The upstream sector of the proposed dam, Figure 3.4, will consist of a 6m wide unit of clayey glacial till (Type A1 and/or Type A2). The footprint of the dam wall will be constructed with a 1m minimum thickness of Type D2 rock which acts as a drainage blanket.

This material will also be placed below an elevation of 44.29 m AOD across the dam wall footprint. To bring the dam wall up to an elevation of 44.29 m AOD will require approximately 2,500 $m^3$ of Type D2 material. On the lower parts of the downstream sector of the dam wall, a 6 m width of Type A2 glacial till will be placed. Between the upstream Type A1/A2 zone and the downstream Type A2 zone is a random fill zone which would include Type A2 and A3 as well as Type D2 material.

[4] The current ground level is variable and generally lies between elevations of 43.29m AOD and 53.29 m AOD.



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The northern embankment wall of the existing TSF, perimeter interceptor channel and finger drain channels will be stripped of topsoil and vegetation prior to receiving the protection material and lining system forming Stage 6.

A 100 mm layer of processed rock-fill Type C material would be placed over the Type A materials on the upstream side of the new Stage 6 dam walls and on the northern face of the existing embankment wall (Dwg.6.7) to provide protection for the lining system. The maximum particle size of the Type C would be 20 mm and the material would be well graded.

A 1,000 g/m$^2$ non-woven geotextile will be placed on top of the Type C material prior to placement of the lining system. The adjoining wall would be cleaned of vegetation, trimmed to receive the 100 mm layer of Type C followed by the 1,000 g/m$^2$ non-woven geotextile. The Type C material on the dam walls would continue over the backfilled finger channels and backfilled perimeter interceptor channel.

The Type C will intercept any seepage at the downstream toe of the northern dam wall and into the perimeter interceptor channel. Where Type C is placed on the Type E material backfill it will be separated by *Terram 1000 geotextile* or equivalent. *Terram geotextile* may also be required in soft areas on the borrow area floor and downstream toe of the existing northern dam wall. Once the Type C material is placed, the composite lining would be formed along the base, up the slope and anchored on the crest.

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A perimeter roadway will be constructed and merge with the roads around the existing TSF. A new security fence is required along the north perimeter access road, and tied into the existing fences on the eastern and western site boundaries; Figure 3.5.
A road surfacing material Type B, 200 mm thick would be required at the top of the dam crest and the lower perimeter road, intermediate bench at 59.29 m AOD and any permanent ramps.

It is anticipated that at least 3 external ramps will be installed along the northern wall of Stage 6. The first ramp would be in a central location (Dwg.6.2) and be accessed via the main tarmac road from the site offices. Two other ramps would be located opposite the east and west sectors of the northern borrow area. These ramp would allow access to the remaining borrow materials and stockpiles to complete the second phase of Stage 6, the capping of Stage 5B and the eventual capping of Stage 6.
Temporary internal ramps will also be required but these would be removed systematically as the lining system is installed.



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## 2.3 CONSTRUCTION MATERIALS

Construction materials will be sourced for a number of potential sources, including:

- On site 'borrow pits'
- Onsite stockpiles
- Third party licenced facilities
- The main mine site at Knockumber ( surplus mine rock)

### *2.3.1 Stage 6 Decommissioning*

Upon completion of the Stage 5 section, Boliden Tara Mines propose to cover the this section of the TSF with a 350 mm thick layer of soil placed on top of the tailings and drained using a combination of rockfill access roads, perforated pipe and geosynthetic drains. The surface will be profiled so that water decants from a structure at the south east corner of Stage 5B into a receiving area. Pumping will cease at closure and water in the interceptor channel will pass by gravity to the south east of the channel. It will then discharge through a passive treatment system (PTS), consisting of a retention pond, sulphate reducing bioreactor (SBSR), and Free Flow Cell (constructed wetland), to the Blackwater River downstream of the Liscartan water treatment works. There will be an overflow route to the Simonstown Stream at times of high flow when dilution is adequate for discharge without treatment. The location for the proposed constructed wetland, in relation to the existing TSF is presented in Figure 4, while the proposed outline design is presented in Figure 5.

Both the quality and volume of flow will be monitored following capping of Stage 5A (during operation of Stage 5B) and subsequent capping of 5B, so that the design of the closure treatment system can be finalised.

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The designs will be such that impacts on surface water will be minor due to treatment and dilution. Water collected in the interceptor channel will discharge by gravity to a passive treatment works. The treatment system will reduce concentrations of sulphate and metals to acceptable levels for discharge to the Blackwater River, in compliance with the Surface Water Regulations (2009) and limits set out in relevant licensing. The existing water treatment methods which are currently in place have been monitored since 2004. The water contamination levels and treatment levels are evaluated as equal for the material within the Stage 5 TSF and the material within the proposed Stage 6 TSF; this is based on the identical source and processes involved. Therefore the monitoring data and water quality record has been utilised in preparing estimates of potential inputs and effects. The finalised design of the proposed treatment works will, by necessity, be effective in managing and limiting the residual impact of the post-closure discharge on the River Blackwater in terms of flow and water quality. Discharge of storm water will be direct to the Simonstown Stream. There are proposals to allow dilution of seepage with surface water runoff. However this may result in excess flow at low concentration to the



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treatment system, as well as the possibility of unacceptable discharge of dilute seepage to the Simonstown Stream.

Taking account of the designation of the Blackwater within the River Boyne and River Blackwater SAC, it is proposed that the PTS (Passive Treatment System) will be tested and proven to work effectively. It is planned to have the system in place by in approximately 10 years. In the intervening period, the existing water reticulation system will continue to operate, i.e. water will be pumped back to the mine and subsequently discharged to the River Boyne, under the existing IPPC licence, as is the case for the current system in operation for the Stage 5 TSF.

In summary, the key elements of the proposed development are as follows:

- Tara mines has been operational for 37 years. Currently tailings are stored in a licensed Tailings Mine Facility (TSF). Discharges from this facility are recirculated under an existing drainage system whereby water is recirculated back to the Tara Mines for discharge under an existing IPCC license.
- There are five key stages in the operation of the existing TSF within two areas: 5A and 5B. At present the Stage 5A area will be filled by 2016 and capped by 2017. The Stage 5B area has storage capacity until 2020, following which the Stage 5B Area will then be capped. The Stage 5A and 5B areas are operating under existing licenses which include permission for the capping and decomissioning of the Stage 5 area.
- Planning permission and EPA licensing is being sought for the development of a new area for the storage of tailings: Stage 6.
- The Stage 6 area will be located within the northern borrow area and seven fields borrow area, directly adjacent to and north of the existing TSF (Stage 5 area) and will cover an area of 36ha.
- Construction and operation of the stage 6 area will firstly require lowering the current elevation of the development site.
- Excavated materials from lowering the elevation will be used to cap the Stage 5B area and to construct the dam for the Stage 6 area. 1,900,000m$^3$ of material will be required in the construction of the Stage 6 area (dam walls) and five sources have been identified from which to gain this material (development footprint and adjacent borrow areas, newly identified borrow area and off site construction activity sources).
- Once the Stage 6 area has reached capacity, approximately mid 2030, it will be capped and decomissioned, as for Stage 5.
- During operation the Stage 6 area will initially discharge into the existing water reticulation and treatment system for the Stage 5 area (existing TSF). All existing licenses will apply and discharges will be within licensed limits.

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- A passive treatment system (Integrated Constructed Wetland) has been designed and will be constructed (approximately 10 years) to take discharge from the capped stage 5 area and the operational Stage 6 area. The ICW will be in place during operation of the Stage 6 area and throughout the decomissioning phase of the Stage 5 and Stage 6 areas.
- Monitoring data from the current TSF facility shows compliance with the relevant discharge limits. Tara Mines has a record of long term compliance with regulatory limits. The operation of the Stage 6 area will initially discharge into the existing TSF drainage system which will be adapted to take the additional discharge and will continue to operate with regulatory limits.
  The final design of the ICW will be finalised based on data from the final operation and capping stages of the Stage 5 area.

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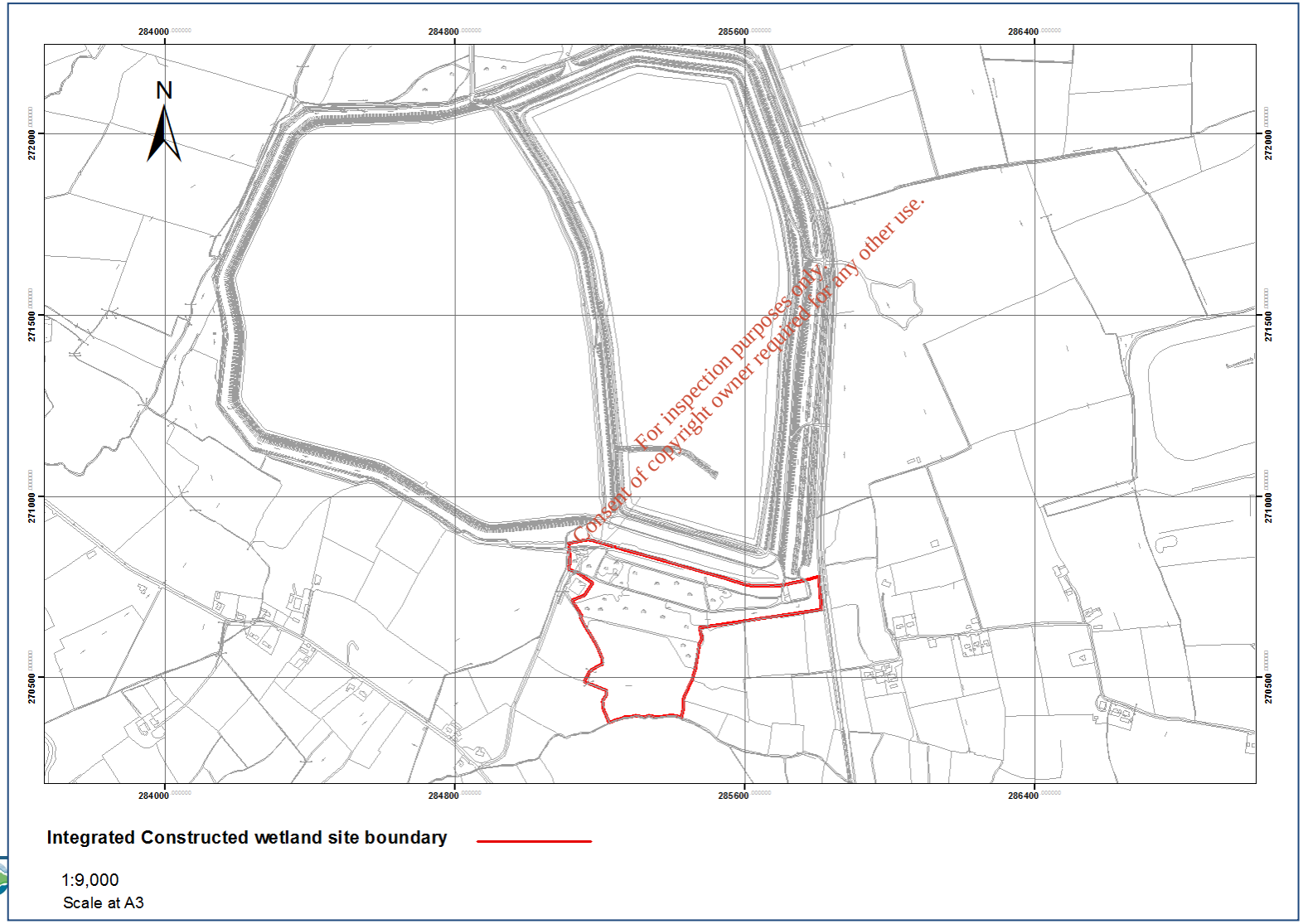


**Figure 4. Proposed location of the constructed wetland treatment facility (red outline), to the south of the existing Stage 5 TSF.**

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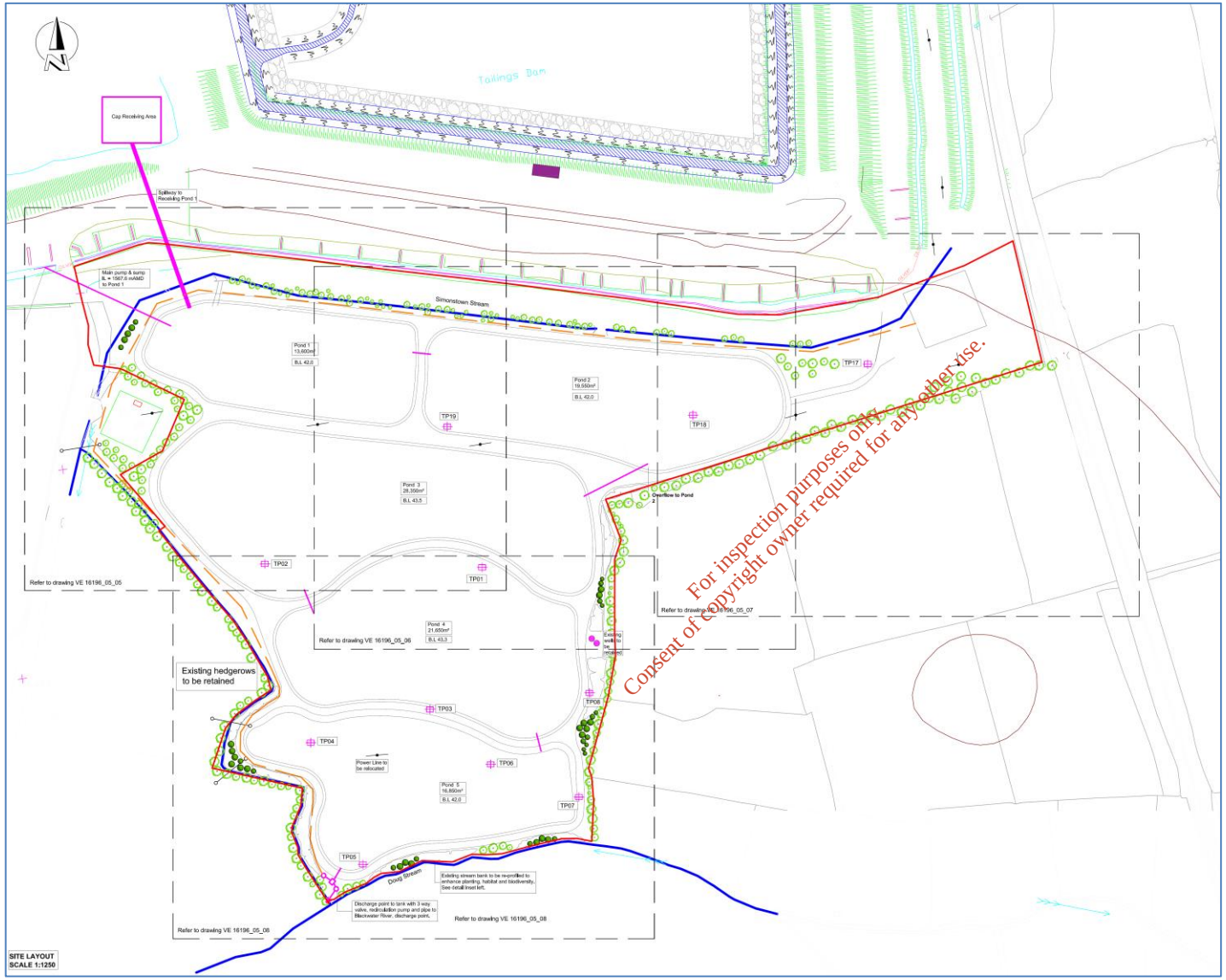


**Figure 5. Proposed outline design for the constructed wetland treatment system at the Tara Mines site.**



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## 2.4 DESCRIPTION OF EXISTING ENVIRONMENT

The following description of the existing environment is based on a review of reports associated with the current planning application and on field survey results undertaken on lands within and adjacent to the proposed development site. For the current application reports of relevance to the preparation of the NIS have been reviewed in relation to the hydrology and hydrogeology and geology of the site (AECOM, 2015; Golder, 2016). Field surveys of the site, surrounding habitats and watercourses have been conducted on a number of occasions over the period from 2007 to 2015 by Forest, Environmental Research and Services Ltd. (FERS, 2015); Biosphere Environmental Services (Biosphere 2010); and TOBIN Engineering Consultants (2010 and current planning application). These surveys were to inform the proposed development and also historical variations. During field surveys the study area was assessed specifically for protected species, with specific reference to the qualifying interests of the designated European sites in the surrounding area.

### *2.4.1 Geology*

Tara Mine was developed approximately 2km west of Navan town, County Meath. The region around Tara Mine comprises flat to gently undulating farmland, with recent residential development along the public road network. The River Blackwater flows from north to south in the environs of Tara Mines, to converge with the River Boyne in Navan Town. The River Boyne and the River Blackwater are designated as Special Areas of Conservation. The site location is presented in Figure 1 above.

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The footprint of the Stage 6 facility is confined to the existing northern and seven fields borrow areas. Virtually all the area is exposed indicating rock or glacial till over the site. Some locations within the Northern Borrow area have been restored using topsoil or ameliorated soil and these materials will be removed and stockpiled within the mine boundary and outside the footprint of the facility or used directly for capping of Stage 5A. Topsoil stockpiles are also present mainly around the perimeter of the borrow area and they will remain in place if outside the Stage 6 footprint. Any topsoil stockpiles within the basin area will be moved to outside the dam, or used for capping Stage 5A. A number of site investigations have been undertaken to evaluate the extent and suitability of the glacial till for construction of Stage 5B in the northern and seven fields borrow areas and for the Simonstown borrow area used in the construction of Stage 4. The depth and relative strength condition of the underlying bedrock was also investigated by geophysics in the northern and seven fields borrow area together with a limited amount in the Simonstown borrow area. Ground surface elevation along the River Blackwater is approximately 60m OD. The elevation of the land rises away from the river valley, attaining approximately 90m OD at the mine site.



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### *2.4.2 Hydrology*

The Tara Mines TSF study area is located in a topographically flat area at approximately 50 m above sea level. There are four main drainage regimes in the vicinity. Blakes Stream runs through the Stage 6 area on the site and connects to the Yellow River. The Yellow River borders the site to the west, with the Simonstown Stream to the east and the Blackwater River to the south. There are also two smaller streams, the Duog to the south east and Blake's stream to the north, which currently flows through the site. A summary of the hydrological character of the study area is presented below, taken from the hydrological assessment prepared by AECOM (2015).

The River Blackwater is a major tributary of the River Boyne, within Hydrological Area 07. The Boyne catchment, including the Blackwater sub-catchment, are dominated by agricultural land use (89%). The rivers and streams surrounding the TSF at Randalstown have been classified overall as ‘at risk’ of pollution from various sources, along with most of the Boyne catchment, with water quality evaluated as generally at poor to moderate status, i.e. unsatisfactory.

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The watercourses draining the Tara Mines TSF study area are tributaries of the Yellow River, which itself is a tributary of the River Blackwater. Downstream of inflow from the Yellow River the Blackwater drains a total catchment area of 717 $km^2$ and follows a south easterly course to its confluence with the River Boyne east of Navan. The River Blackwater within and downstream of the study area has a moderate status due to ecological and general physico-chemical status. The WFD objective for this river is to restore the protected areas to a ‘good status’ by 2021.

The Yellow River is evaluated as being of Poor status due to depleted macroinvertebrate (Q-value) and ecological status. The general physico-chemical status of the river is good. The WFD objective for this river is to achieve a ‘good status’ by 2021. The Simonstown stream, to the east, has a smaller catchment area and was diverted around the historical Tailings Management Facilities with a new trapezoidal channel excavated. This watercourse now flows parallel to the interceptor channel around the south eastern corner of the TSF. The Simonstown Stream returns to its original course near the TSF access road to the south before combining with the Duog and continuing westward toward the confluence with the Blackwater River. Blake's Stream, to the north of the Stage 5 TSF, is a minor, heavily drained tributary of the Yellow River. This watercourse currently drains the proposed Stage 6 TSF Site; it is proposed to divert this watercourse to the north of its current location (c. 400-600m). The new route will run through the northern section of the northern borrow area. Its existing confluence with the Yellow River will be moved 600m north.



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### 2.4.3 Ground Water

Two hydrogeological units exist at the site:

- Quaternary sands, gravels and clays with an average thickness of 8 m beneath the tailings pond; and
- Lower Palaeozoic greywacke and Lower Carboniferous limestone bedrock.

The units are expected to be in hydraulic connection naturally. Hydraulic conductivity for Quaternary sands and gravels is likely to be of the order of 1E-4 m/s and 1E-5 m/s. Areas of high clay content are expected to have significantly lower hydraulic conductivity as represented for the clayey glacial till materials and as low as 1E-9 m/s. The hydraulic conductivity range for the bedrock hydrogeological unit is likely to be 1E-4 m/s and 1E-5 m/s although results obtained from the two deep borehole investigations, indicated lower permeability at around 1E-6 m/s. The permeability of the rock will be dependent on frequency of fissuring and fissure infilling.

Groundwater flow in the Quaternary hydrogeological unit is expected to be restricted by the laterally discontinuous nature of the high hydraulic conductivity lenses. Groundwater flow in the bedrock is expected to be locally very fast through faults, fissures and solution features in the limestone. High flows have been recorded from the fissured bedrock. Local groundwater flow is to the south west towards the Yellow River. Both hydrogeological units are expected to be in hydraulic connection with the Yellow River. A bedrock spring flows into the river near the north western edge of the Stage III tailings facility. Groundwater is already encountered in the borrow area and drainage measures have been installed to drain the site. During the summer season, the groundwater drops and rises in winter time. It is expected that over much of the basin area, rock will be exposed and therefore it will be prudent to place the lining system during late summer and early autumn. There are two private wells which draw water from bedrock in the study area of Randalstown and make contact with the Quaternary hydrogeological unit. Groundwater flow is expected to be to the south and southwest across the region, towards the Yellow River, the Blackwater, and the Boyne.

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### 2.4.4 Terrestrial Ecology

Ecological surveys of the Stage 6 development site were undertaken on a number of occasions between 2007 and 2015. The 2015 surveys were completed and presented in impact assessment reporting by FERS (2016) as part of the current planning application.

Habitat surveys undertaken throughout the site identified no protected habitats or any alignment with Annex I habitat classifications. Habitats within the development site were evaluated as not being of any significant ecological value. Apart from the mining facility the surrounding study area is predominantly agricultural land, with both pastoral and arable farming practices, that are



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characterised as intensive in nature. Habitat types/mosaics identified within the development site are summarised below:

- FL8 – Man-made Pond
- ED2 – Exposed Bare Ground
- ED3 – Recolonised Bare Ground
- WD1 – Mixed Broadleaf Woodland
- WD1/2 – Hedgerow (Mixed)
- WS1 – Scrub
- FW1 – Blakes Stream
- FW4 – Drainage Ditches
- GA1 – Improved Agricultural Grassland
- ED – Disturbed Ground Habitat
- GS1 – Semi-Improved Dry Calcareous Grassland

The proposed development site has a diversity of fauna recorded including raptors such as common buzzards (*Buteo buteo*) and sparrowhawks (*Accipiter nisus*); mammals such as the pygmy shrew (*Sorex minutus*); and bat species such as Leisler's (*Nyctalus leisleri*) and Daubenton's bat (*Myotis daubentonii*).

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The landscape surrounding the Stage 6 area is dominated by agricultural grassland, with streams, an old railway line and some areas of woodland and hedgerow. There are few open wetland areas aside from the artificial wetland which has been created as a result of the tailings pond facility.

The existing Stage 5 TSF, directly adjacent to the proposed Stage 6 TSF site, regularly supports open water during the winter months. The open water is used by wintering waterfowl including Whooper Swan and areas without water are used by roosting waders. Field surveys were completed by FERS (Flora and Fauna Section of EIS) between October 2015 and March 2016 to determine the importance of the TSF as a day time roost (for Golden Plover and Lapwing in particular) and as a night time roost (for Whooper Swan). Both Golden Plover and Whooper Swan are Annex I species under the EU Birds Directive (2009). Results from the FERS surveys (FERS, 2016), with regard to Lapwing, Golden Plover and Whooper Swan, are as follows:

- The TSF is utilised as a day roost by both Lapwing and Golden Plover (but in particular the latter).
- Golden Plover flocks were observed to roost during the day on the Stage 5b TSF and to depart as a single flock approximately 30 minutes after sunset. Flocks were generally observed returning toward the end of the pre-dawn surveys.



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- Numbers of Lapwing were greatest in the early winter months, while numbers of Golden Plover (flocks of which regularly numbered in excess of 2,000 – up to approximately 2,600 recorded on the 18th of February 2016) were greatest in latter months.
- Whooper Swan regularly roost at the Stage 5 TSF overnight, in particular during the early months of the winter season (with significant numbers observed during the period October – December). A peak of 118 Whooper Swan was recorded during the dusk survey on the 30th of November 2015.
- Flocks of Whooper Swan were observed to arrive at the TSF in the evenings (generally approximately 30 minutes after sunset) from the north and north-east and to depart to the north and north-west, almost certainly part of the flock utilising the Blackwater and its floodplains.
- It was observed that the extreme volumes of rain in early November resulted in a large body of water on Stage 5b of the TSF, and activity shifted from Stage 5a to 5b (with little or no roosting on 5b during October, when there was very little standing water present).

In summary, when open water is present on the TSF it provides a regionally important roost site for Whooper Swan, along with other waterbirds (duck, waders and gulls). Sections of the TSF not covered in standing water, provide day time roosting habitat for Golden Plover and Lapwing; wading birds normally associated with roosting on open grassland or intertidal habitats.

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### *2.4.5 Aquatic Ecology*

EPA biological monitoring on the River Blackwater at Donapatrick Bridge (Site 1500) in 2012 recorded biological water quality at Q3-4 (Moderate status, unsatisfactory); this comprises a deterioration from 2009 (Q4, Good Status). There is an EPA monitoring station on the Yellow River, directly downstream of the Tara Mines site, and upstream of the Blackwater confluence. This watercourse has been classified as Q3 (Poor status, unsatisfactory) for an ongoing period, including most recently in 2012. Streams flowing in the vicinity of the Tara Mines operation are already impacted by eutrophication upstream and downstream of the facility tailings facility as evidenced by the low Q-values.

Blake's Stream passes through the site and continues west along the southern margin of the Northern Borrow Area to join the Yellow River further west. The Yellow River is a tributary of the River Blackwater. The River Blackwater forms part of the River Boyne and River Blackwater SAC and River Boyne and River Blackwater SPA. Watercourses within the study area are presented in Figure 6. A site walkover and aquatic ecological survey was undertaken by a TOBIN ecologist on two occasions, on the 10th and 19th of November, 2015. The minor drains within the proposed Stage 6 area (borrow areas) were found to be of low ecological significance, supporting a very low macroinvertebrate diversity which was dominated by *Gammarus* sp. These drains contained



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no suitable habitat to support protected aquatic invertebrates or fisheries of ecological importance. The Blake's Stream, Simonstown Stream and Doug Stream were all found to be heavily modified and channelised with significant siltation. Slow flows predominated and no evidence of suitable salmonid habitat was recorded in these watercourses. Macroinvertebrate diversity was low, dominated by an assemblage indicative of slow flow conditions and siltation (*Gammarus* sp., snails and cased caddis). The Yellow River was surveyed upstream and downstream of the Simonstown Stream confluence which drains the TSF study area, with an additional survey site upstream of its confluence with the River Blackwater. Flows were high on the day of survey; however, suitable habitat for juvenile lamprey was recorded along the bank margins. No impediments to salmonid passage from the Blackwater were recorded and despite drainage and channelisation works, some cobble and gravel substrates were noted. The macroinvertebrate community was again dominated by *Gammarus* sp., with a low diversity of cased caddis present.

Salmon (fry and parr) and trout have been recorded at the two sites on the Yellow river. In terms of the fish the Simonstown Stream has only recorded salmonids in 1999. A variety of other species have been captured in the Yellow River over the years including minnow *Phoxinus phoxinus* L., gudgeon *Gobio gobio* L., stoneloach (*Barbatula barbatulus* L.), stickleback (*Gasterosteus aculeatus* L.), eel (*Anguilla anguilla* L.) and lamprey (*Lampetra* sp.). Sticklebacks have been recorded in the Simonstown Stream (Biosphere, 2010).

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Sampling of sediments, invertebrates and fish have been undertaken for heavy metals over a prolonged period downstream of the Tara Mines TSF discharge. Based on the conclusions of the Biosphere (2010) study there is no evidence to show that heavy metals concentrations (lead and zinc) in sediment are affected by the project. Similarly, there was no indication of an increase in heavy metals in fish tissue downstream of the TSF, with no concentrations in fish muscle tissue exceeding guidance values.

In summary the aquatic ecological environment is described as follows:

- The TSF is drained by: Blake's Stream which flows through the proposed Stage 6 Area; Simonstown Stream which was previously redirected and flows along the eastern side of the Stage 5 Area and south of the TSF; and the Doug Stream which flows south of the TSF. Blake's Stream flows into the Yellow River which flows into the River Blackwater, a designated SAC. The Simonstown Stream and Duog Stream flow into one, before joining the River Blackwater, south of the Yellow River confluence.
- Existing water quality (biological) status for the Blackwater River is moderate; the Yellow River is poor (physico chemical status is good) and the streams (Blake's, Duog, Simonstown) also have poor biological status. The poor biological status of the Yellow River and streams



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(Blake's, Duog, Simonstown) is reflected in field survey results, showing low macroinvertebrate diversity. Despite this, lamprey and salmon habitats were identified in Yellow River.

- Monitoring for heavy metal in watercourses downstream of the TSF has found no significant heavy metal effects in sediments, fish, fish muscle tissue and gammarids.

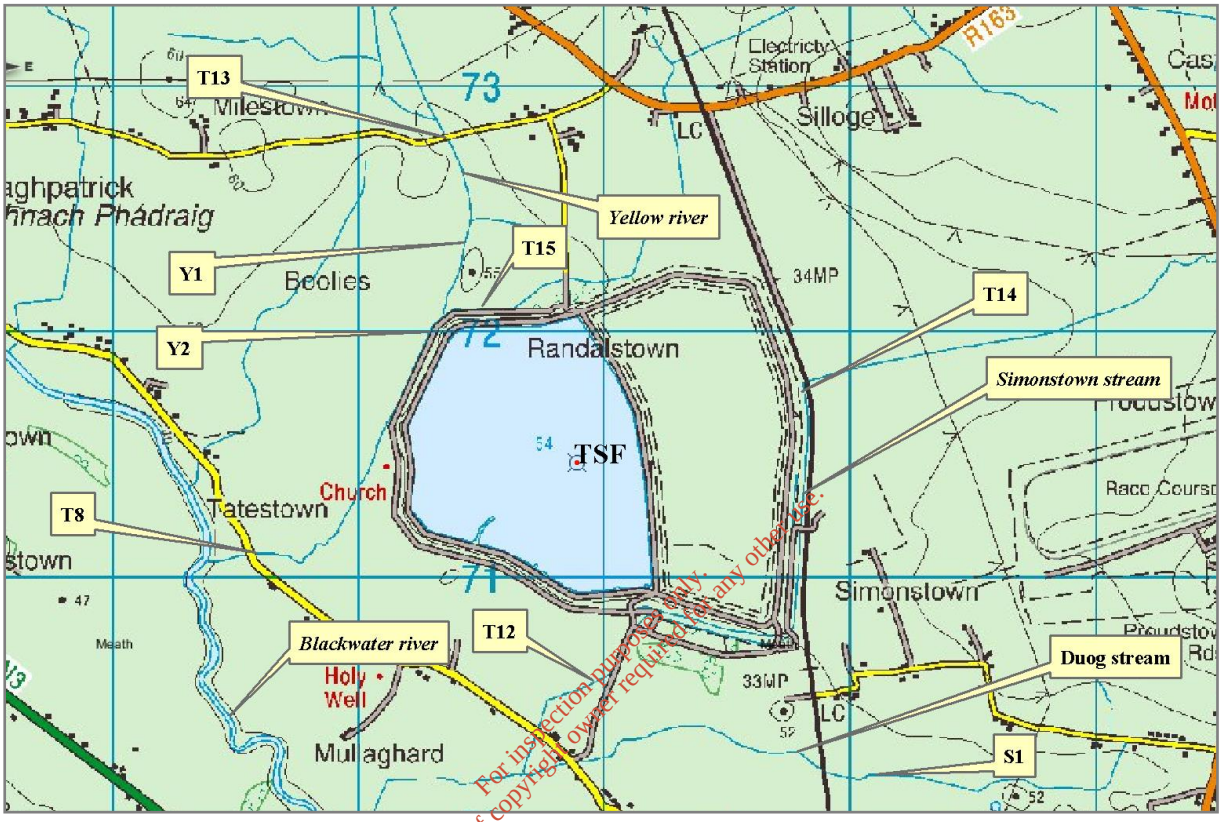


**Figure 6 Location of the watercourses and surface water sampling sites within the study area of the Tara Mines TSF.**

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# 3 STAGE 1 SCREENING FOR APPROPRIATE ASSESSMENT

## 3.1 INTRODUCTION TO SCREENING

This stage of the process identifies whether there is the potential for significant impacts upon European Sites from the proposed project, either alone or in combination with other projects or plans. The screening phase was progressed in the following stages. A series of questions are asked during the Screening Stage of the AA process in order to determine:

- Whether the project can be excluded from AA requirements because it is directly connected with or necessary to the management of a European Site.
- Whether the project will have a potentially significant effect on a European Site, either alone or in combination with other projects or plans, in view of the site's conservation objectives or if residual uncertainty exists regarding potential impacts.

An important element of the AA process is the identification of the "Qualifying Interests" of European Sites requiring assessment. Qualifying Interests are the habitats and species for which each European Site has been designated and afforded protection. It is also vital that the threats to the ecological / environmental conditions that are required to support Qualifying Interests are considered as part of the assessment. Site specific conservation objectives have been designed to define favourable conservation status for a particular habitat or species at that site. According to the European Commission interpretation document 'Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC', paragraph 4.6(3) states:

> "The integrity of a site involves its ecological functions. The decision as to whether it is adversely affected should focus on and be limited to the site's conservation objectives."

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Favourable conservation status of a habitat is achieved when:

- Its natural range, and area it covers within that range, are stable or increasing,
- The specific structure and functions which are necessary for its long term maintenance exist and are likely to continue to exist for the foreseeable future, and
- The conservation status of its typical species is favourable.

The favourable conservation status of a species is achieved when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats,
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long term basis.



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### *3.1.1 Desktop Studies*

The ecological desktop study completed for the proposed development comprised the following elements:

- Identification of European Sites within 15km with identification of potential pathways links for specific sites (if relevant) greater than 15km from the proposed development study area.
- Review of the NPWS site synopsis and conservation objectives for European Sites with identification of potential pathways from the proposed development; and
- A series of ecological desk and field studies were undertaken between 2007 and 2015. The results of these studies were reviewed in the context of the Assessment for Screening.

## 3.2 IDENTIFICATION OF RELEVANT EUROPEAN SITES

An initial distance of 15km from the proposed site boundary was used for consideration of European Sites in accordance with the Department of Environment, Heritage and Local Government guidance (DoEHLG, 2010). Figure 1 identifies two European Sites that lie within 15km of the proposed development and they are listed as follows:

- River Boyne and River Blackwater SAC ( Site Code: 002299)
- River Boyne and Blackwater SPA (Site Code: 004232)

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In addition to the 15km buffer, European Sites in excess of 15km buffer with potential linkages to the proposed development were screened for potential impacts using the source-pathway-receptor model. Two additional Natura 2000 designations were identified following this process, with reference to connectivity to the proposed development due to their location within the estuary of the River Boyne and their water-dependant qualifying interests:

- River Boyne Coast and Estuary SAC (Site Code: 001957)
- Boyne Estuary SPA. (Site Code: 004080)

Designated Natura 2000 sites within the zone of influence of the proposed development, including the Qualifying Interests of each site, are detailed below in Table 1. Threats and pressures affecting the Qualifying Interests of these sites were obtained from the NPWS website database (www.npws.ie) and the Article 17 reporting ‘Status of EU Protected Habitats and Species in Ireland’ (NPWS, 2013). Table 1 presents the distance of each designated site from the proposed development boundary and the Conservation Status of each Qualifying Interests in an Irish context. None of the European Sites listed below are within, or directly adjacent to, the boundary of the proposed development site.



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**Table 1. European Sites and their Qualifying Interests, Conservation Objectives and Threats and Pressures**

| European Site (including distance from proposed development) | Qualifying Interest(s) and Conservation Status[5] | Conservation Objective[6] | Threats and Pressures[7] |
|---|---|---|---|
| River Boyne and River Blackwater SAC Site Code: 002299<br><br>1.25km from Tara Mines | Alkaline Fens<br>Alluvial Forests*<br>River Lamprey (*Lampetra fluviatilis*)<br>Atlantic Salmon (*Salmo salar*)<br>Otter (*Lutra lutra*) | To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the N2000 site has been selected:<br>This is a generic conservation objective, available online at:<br>http://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002299.pdf. | Forestry (Afforestation)<br>Grazing, Human induced change in hydraulic conditions, Cultivation<br>Fertilisation, Leisure fishing<br>Discharge, Urbanisation<br>Roads & Motorways<br>Walking, horse riding & non motorised vehicles.<br>Mining<br>Spread of invasive non native plant species. |
| River Boyne and River Blackwater SPA Site Code: 004232<br><br>1.25km from Tara Mines | Kingfisher (*Alcedo atthis*) | To maintain or restore the favourable conservation condition of the Annex I bird species (Kingfisher). This objective aim to maintain the favourable conservation condition of Kingfishers in River Boyne and River Blackwater based on a detailed list of attributes and targets. See online at:<br>http://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004232.pdf. | Urbanisation, Roads & Motorways<br>Human induced change in hydraulic conditions<br>Mining<br>Spread of invasive alien plant species |

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[5] The Status of EU Protected Habitats and Species in Ireland (Vol II & III), NPWS, 2013. http://www.npws.ie/publications/article17assessments/article172013assessmentdocuments/Article_17_Web_report_habitats_v1.pdf and http://www.npws.ie/publications/article17assessments/article172013assessmentdocuments/Article_17_Web_report_species_v1.pdf

[6] Sourced from NPWS website – Conservation Objective Documents http://www.npws.ie/protectedsites/

[7] Sourced from Natura 2000 Standard Data Forms (NPWS, November 2013) and/or professional judgement.



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| European Site (including distance from proposed development) | Qualifying Interest(s) and Conservation Status[5] | Conservation Objective[6] | Threats and Pressures[7] |
|---|---|---|---|
| Boyne Estuary SPA<br>Site Code: 004080<br><br>c.30km from Tara Mines | Shelduck *Tadorna tadorna*<br>Oystercatcher *Haematopus ostralegus*<br>Golden Plover *Pluvialis apricaria*<br>Grey Plover *Pluvialis squatarola*<br>Lapwing *Vanellus vanellus*<br>Knot *Calidris canutus*<br>Sanderling *Calidris alba*<br>Black-tailed Godwit *Limosa limosa*<br>Redshank *Tringa totanus*<br>Turnstone *Arenaria interpres*<br>Little Tern *Sterna albifrons*<br>Wetlands | To maintain or restore the favourable conservation condition of the Annex I bird species for which the N2000 site has been selected. This is a generic conservation objective, see online at: http://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004080.pdf. | Urbanisation<br>Siltation, dumping<br>Reclamation<br>Hydrographic changes<br>Golf course<br>Recreation<br>Invasive alien species |
| Boyne Coast and Estuary SAC<br>Site Code: 001957<br><br>c.30km from Tara Mines | Estuaries<br>Mudflats and sandflats not covered by seawater at low tide<br>Salicornia and other annuals colonizing mud and sand<br>Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)<br>Mediterranean salt meadows (*Juncetalia maritimi*)<br>Embryonic shifting dunes<br>Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes')<br>*Fixed coastal dunes with herbaceous vegetation ('grey dunes') | To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the N2000 site has been selected. This is a generic conservation objective, which aims to maintain the favourable conservation condition of coastal and marine habitats and species based on a detailed list of attributes and targets. See online at: http://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO001957.pdf. | Golf course<br>Urbanisation<br>Household waste disposal<br>Reclamation<br>Recreation<br>Industrial waste disposal |

* with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)

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## 3.3 POTENTIAL ADVERSE EFFECTS ON EUROPEAN SITES

This section documents the final stage of the screening process. It is vital that an assessment of potential source-pathway-receptor links is undertaken to assess potential impact links between the receptor (European Sites) and source (proposed development) to establish the risk of any likely significant effects. It used the information collected on the sensitivity of the Qualifying Interests of each European Site and describes any likely significant effects from the construction, operation and decommissioning stages of the proposed development. This assumes the absence of mitigation measures with the exception of those incorporated in the design stage as good practice such as avoidance.

The Screening Stage identified likely significant effects of the proposed development both in isolation and potentially in combination with other plans or projects (Table 2). These potential impacts are summarised below and have been addressed in more detail in Stage 2 of the NIS for those sites where the potential for significant adverse effects have been identified.

### *3.3.1 Potential for direct impacts*

Taking account of the separation distance between the proposed development and the River Boyne and Blackwater SAC and SPA complex (approximately 1.25 km), there is no potential for direct impacts affecting either designation. Neither is there the potential for direct impacts on the Boyne Estuary SPA and the Boyne Coast and Estuary SAC, located approximately 30 km from the proposed development site.

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### *3.3.2 Potential for indirect impacts*

*Water quality*

There is a hydrological connection from the site to the Blackwater River via Blake's Stream and the Yellow River, which is a tributary of the Blackwater. This surface water pathway gives rise to the potential for water quality impacts arising from the construction and operation phase of the proposed development to affect the qualifying interests and their conservation objectives within the River Boyne and River Blackwater SAC and SPA complex. The following are identified as potentially giving rise to water quality effects:

- Initial and subsequent construction works within Stage 6 area;
- The operation of the Stage 6 area;
- The decommissioning of the Stage 6 area.

Based on the proposed development, with regard to the existing operations and the records of monitoring data detailing the performance of the Tara Mines facility, any water quality impacts are evaluated as being limited in scale such that impacts would not have any implications for



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terrestrial or riparian habitats for which the SAC is designated i.e. Alkaline Fen and Alluvial Forest, which are not subject to hydrological pathways for effects and are sufficiently removed from the proposed development to preclude indirect effects by way of other pathways. Potential water quality impacts arising during both the construction and operation phase include: increased sedimentation, changes to hydrology and flow, contamination including hydrocarbons, increased heavy metals. A negative impact on water quality is likely to affect invertebrates, aquatic fish including Atlantic Salmon and River Lamprey and top predators including Otter and Kingfisher.

*Non-native invasive species*

There is the potential for introduction and spread of non-native invasive species, both terrestrial flora and aquatic flora and fauan, during initial construction and ongoing monitoring and maintenance works within the Stage 6 area. Construction works will involve the transportation of material from ex situ locations. In this situation there is potential for the introduction of invasive species. The spread of such species within and along river banks has the potential to negatively impact habitats used by aquatic species including River Lamprey, Salmon, Otter and Kingfisher, owing to shading, alteration of the riparian and river bed habitat with effects on the invertebrate and fish communities.

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On the basis of the indirect impacts identified above, pathways for potential significant adverse effects on otter, Atlantic Salmon and River Lamprey within the River Boyne and River Blackwater SAC, and Kingfisher within the River Boyne SPA, have been identified.

*Disturbance to wintering birds including Golden Plover and Whooper Swan which regularly roost on the existing TSF*

Construction works may cause disturbance to winter roosting birds on the existing TSF. Whooper Swan roost at the TSF during the night and thus are unlikely to be impacted during day time construction activities. Day time roosting Golden Plover and Lapwing may be disturbed causing displacement from suitable roosting habitat adjacent to Stage 6 area. This impact is not likely to be significant as suitable roosting habitat within the Stage 5 area is currently variable depending on rainfall and standing water coverage. Roosting habitat next to the development site will likewise become unsuitable and birds will move to more suitable areas of the TSF.

### *3.3.3 Potential in-combination effects*

*Impacts arising from the decommissioning of the proposed development*

During decommissioning there is potential for water quality impacts associated with ground and surface water discharge from the capped and decommissioned facility.



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*Impacts in combination with the rest of the Tara Mines operation*

The proposed development is an additional component of the existing and ongoing industrial complex at the Tara Mines site, incorporating both the working mine and the existing Stage 5 TSF. Water quality and discharges from this developed are routinely monitoring for compliance with regulatory limits as part of the existing IPC licensing requirements. The mine and TSF has a record of historical and ongoing compliance with regulatory limits.

*Impacts arising from the sourcing of material for the construction of dam walls*

There is potential for construction phase activities to create disturbance impacts, including the elevation of which could affect water quality receptors in the River Blackwater. However, given the distance of approximately 1.25 km, it is considered that the works required for the creation of the berm walls around the Stage 6 area would not be likely to give rise to significant adverse effects on the qualifying interests of the Boyne and Blackwater SAC and SPA complex via this areal pathway.

*Impacts for other similar developments*

The proposed Stage 6 TSF is located within an agricultural area, with the town of Navan 2-3 kilometres to the south/south-east. There are no other existing or planned industrial facilities in the immediate area which are licensed to discharge to the Blackwater system for which cumulative impacts may occur over and above the identified baseline condition, as recorded in the ongoing water quality monitoring data.

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*Impacts on water quality from other sources*

Water quality in the study area is currently impacted by eutrophication, principally due to agricultural run-off, evident in the Q-values (mostly Q3 or Q3-4) for the Yellow River, Simonstown Stream and Blake's Stream. Chemical water quality testing from the existing and historical TSF sites for the Tara Mines project have demonstrated that any increases in metal contaminants (such as lead (Pb), Iron (Fe), and Calcium Carbonate ($CaCO_3$) are very low and within guideline values (Biosphere 2010). The proposed Stage 6 area, construction, operation and decommissioning will operate within required guideline values. Tara Mines has operated within these limits consistently. Proposals for the stage 6 area have been designed to mitigate water quality impacts at the same time as implementing a comprehensive monitoring programme.

*Loss of artificial wetland habitat (tailings pond) created by the Stage 6 area and potential use by displaced wintering birds from the capped Stage 5 area.*

Golden Plover and Whooper Swan are both Annex I species, with potential connections to the Natura 2000 network. Direct links between populations roosting at the TSF and individual SPA sites have not been established. Surveys for this project (FERS 2016) indicate that the Whooper



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Swan which roost on the TSF feed on grasslands within the Blackwater River valley to the east of the proposed development. There is a possibility that the TSF is used as a staging site by Whooper Swans from SPA's further south, during migration. The potential significance of this connection is examined further below. There is the potential that Golden Plover which roost on the TSF may have population level linkages to the Boyne Estuary SPA, located approximately 30km to the east.

Construction of the Stage 6 TSF has the potential to increase the volume and also the location of activity of machinery traffic leading to disturbance to winter roosting birds on the existing ponds within the Stage 5 TSF. Whooper Swan roost at the TSF during the night and are thus unlikely to be impacted by construction activity. Day time roosting Golden Plover and Lapwing may be disturbed, causing displacement from suitable roosting habitat adjacent to Stage 6 area. This impact is not likely to be significant as suitable roosting habitat within the Stage 5 area is currently variable depending on rainfall and standing water coverage. Roosting habitat next to the development site will likewise become unsuitable over time and birds will move to more suitable areas of the TSF.

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The capping of the Stage 5 tailings pond area (160ha) is already consented as part of the decommissioning phase of this facility. This will remove the existing wetland habitats at this site (i.e. the Tara Mines Tailing Pond). This will displace all winter roosting birds due to disturbance and loss of open water. This habitat loss is identified with respect to the creation of the wetland area as a function of the Stage 5 TSF (construction, operation and decommissioning) for which planning has been granted impact separate to this application. The availability of this area for wintering birds is purely a function of the standing water within the industrial landscape of the tailings ponds, which are not identified for conservation in terms of any designation. It is possible that subsequent to capping and revegetation the Stage 5 area may again be suitable for roosting waders (Golden Plover and Lapwing). In addition, there will be some replacement of open water habitat with the construction of the proposed integrated constructed wetland (ICW) to the south of the Stage 5 TSF. However the potential availability of standing water and the area available to roosting and resting waterbirds is pending the availability of finalised designs. The Stage 6 TSF, once operational, may also provide some open water, similar to that in the existing TSF. This will be available over a period of approximately 15 years, prior to this area also being capped and decommissioned.

The wetland habitat area proposed in the north western corner of the Stage 6 TSF, referred to in the FERS (2016) report comprises a wildlife area of 36 ha approximately. Finalised designs for this habitat area are in development and are expected to be used as an ecological set-aside for wildlife value, aside from any connectivity to the aquatic ecological interests of the River Boyne



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and River Blackwater SAC or SPA designations. This wildlife area is small in extent, in comparison to 160 ha and is not proposed as a compensation area with respect to any Natura 2000 site with cognisance of the implications and restrictions of Article 6(4) of the Habitats Directive. The Stage 6 area will also be subject to disturbance works at regular intervals over the 15 years of its operation, with the construction of dam walls to facilitate the phased elevations over the course of development.

The most significant impact on Whooper Swans is likely to be the loss of the open water with the capping of the Stage 5 area. This will be a result of the Stage 5 development which has already been consented and is separate to the current application. The decommissioning of the Stage 6 area is not likely to be a significant cumulative impact on roosting Whooper Swan; numbers using the Stage 6 area cannot be predicted but are likely to be smaller than those currently using the Stage 5 area, given the difference in size of wetland habitat which will be available and disturbance effects. The Whooper swan population that uses Tara mines as a roost site has been identified as being connected to locally important flocks which feed in the local areas of the Blackwater valley in Co. Meath. They area therefore not connected with any designated SPA population. Within this context and given the evidence available regarding connection of the Whooper Swans in this area to the Blackwater valley rather than to an SPA, cumulative impacts on the N2000 network are not predicted.

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With regard to Golden Plover, it is likely that in the long term, the Stage 5 and Stage 6 areas may again be suitable for roosting Golden Plover (and Lapwing). During the transition period, Golden Plover are likely to be displaced to other roosting sites.

Golden Plover are known to occur widely over grassland habitat of inland Ireland. Studies in the UK have found that Golden Plover have wintering flock ranges (Fuller & Youngman, 1979) and tend to be faithful to these areas. They tend to use large open fields and will move around fields within these ranges depending on prey availability and field management. While a number of fields may be available to Golden Plover, only a few may be suitable and regularly used (Gillings & Fuller, 1999). Research into flock movements (Gillings & Fuller, 1999) found flocks can move between fields up to 12km apart. There is limited research into the movements of wintering golden plover flocks in Ireland. There is also little data on the numbers of wintering golden plover at inland sites, given the difficulties in surveying dispersed species. However, it is likely that their behaviour is similar to that in the UK.

Surveys completed over one year at the existing TSF found nationally important numbers of Golden Plover between January and March. The closure of the Stage 5 area (existing TSF) will initially make this area unavailable to roosting Golden Plover and Lapwing. The Stage 6 area



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may offer suitable alternative habitat, though numbers using the Stage 6 area cannot be predicted and are likely to be lower than those using the TSF, given difference in size and disturbance. The TSF is not an SPA and no link between the Golden Plover using this site and the SPA network has been identified. Given the distance involved it seems unlikely that Golden Plover range between the TSF and the Boyne Estuary SPA, 30 km away. It is more likely that they range between fields within the River Blackwater valley. Within this context, impacts on the SPA network are not considered likely.

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**Table 2. Screening Assessment of European Sites and their Qualifying Interests with potential to be significantly impacted by the proposed development.**

| European Site | Qualifying Interest | Description of potential impacts from the proposed development | Potential for significant adverse Project effects? | Potential for significant adverse in-combination effects? |
|---|---|---|---|---|
| Boyne and Blackwater SAC | Alkaline Fens | The SAC boundary is located c. 1.25km to the west of the mining site. The mine and resultant groundwater discharge have the potential to alter the water table; however, there are no groundwater-fed Annex I fen habitats within the zone of influence of the project. | No pathways for potential significant adverse effects | No pathways for potential significant adverse effects |
| | Alluvial Forests | There are no alluvial woodland habitats within the site, outside of the SAC designation; nor are there any pathways for impacts on the alluvial woodland within the Blackwater catchment for which the SAC is designated. | No pathways for potential significant adverse effects | No pathways for potential significant adverse effects |
| | River Lamprey (*Lampetra fluviatilis*) | The project requires instream works at construction stage within the Yellow River catchment, which is a tributary of the River Blackwater. There is the potential for water pollution events during construction, including but not limited to suspended solids discharges.<br>Operational water discharges from the tailings ponds have the potential to affect water quality in the Yellow River and in the River Blackwater downstream, within the SAC boundary.<br>During construction the introduction of alien invasive plant species has the potential to damage riparian and aquatic habitats.<br>River lamprey occurring in the River Blackwater main channel downstream of the development site may potentially be affected. | Potential exists | Potential exists with reference to cumulative effects due to water quality pressures in the Blackwater catchment. |
| | Atlantic Salmon (*Salmo salar*) | The project requires instream works at construction stage within the Yellow River catchment, which is a tributary of the River Blackwater. There is the potential for water pollution events during construction, including but not limited to suspended solids discharges.<br>Operational water discharges from the tailings ponds have the potential to affect water quality in the Yellow River and in the River Blackwater downstream, within the SAC boundary.<br>During construction the introduction of alien invasive plant species has the potential to damage riparian and aquatic habitats.<br>Atlantic salmon occurring in the River Blackwater main channel downstream of the proposed development site may potentially be affected by the proposed development. | Potential exists | Potential exists with reference to existing water quality pressures in the Blackwater catchment. |

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| European Site | Qualifying Interest | Description of potential impacts from the proposed development | Potential for significant adverse Project effects? | Potential for significant adverse in-combination effects? |
|---|---|---|---|---|
| | Otter (*Lutra lutra*) | The River Blackwater is located c. 1.25km to the west of the proposed TSF site. There were no signs of otter activity recorded within or adjacent to the watercourses affected by the development site. Construction phase activities at the site are unlikely to result in disturbance of otter[8], considering the distance of separation to the SAC.<br>Water quality impacts arising from construction and operation of the Stage 6 area and subsequent decommissioning may affect salmon and other prey fish of otter. This in turn may affect the otter population, for which fish is a principal prey item.<br>During construction the introduction of alien invasive plant species has the potential to damage riparian and aquatic habitats.<br>Otter occurring in the River Blackwater main channel downstream of the proposed development site may potentially be affected due to water quality effects, with reference to foraging and prey abundance. | Potential exists | Potential exists with reference to existing water quality pressures in the Blackwater catchment. |
| Boyne and Blackwater SPA | Kingfisher (*Alcedo atthis*) | The River Blackwater is located c. 1.25km to the west of the mining site. No recent evidence of Kingfisher within or adjacent to the development site was recorded, despite specific field survey.<br>Water quality impacts arising from construction and operation of the Stage 6 area and subsequent decommissioning may affect fish and invertebrate populations in the River Blackwater. This in turn may effect Kingfisher populations in the Blackwater River, which forage on fish. Kingfisher nest on the Blackwater and availability of prey to feed young is critical to their survival.<br>Cumulative impacts affecting water quality<br>Kingfisher occurring in the River Blackwater main channel downstream of the proposed development site may potentially be affected due to water quality effects, with reference to foraging and prey abundance. | Potential exists | Potential exists with reference to existing water quality pressures in the Blackwater catchment. |
| Boyne Coast and Estuary SAC | Estuaries<br>Mudflats and sandflats not covered by seawater at low tide | Water quality impacts arising from construction and operation of the Stage 6 area and subsequent decommissioning has the potential to affect fish and invertebrate populations in the River Blackwater. The River Blackwater is a tributary of the River Boyne which flows into the Boyne estuary. Given the dilution effect and distance involved (30km) it is considered that | Pathway present, but significant adverse | No pathways for potential significant adverse effects |

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[8] Bailey, M. and Rochford J. (2006) Otter Survey of Ireland 2004/2005. *Irish Wildlife Manuals*, No. 23. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.



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| European Site | Qualifying Interest | Description of potential impacts from the proposed development | Potential for significant adverse Project effects? | Potential for significant adverse in-combination effects? |
|---|---|---|---|---|
| Site Code: 001957 | Salicornia and other annuals colonizing mud and sand<br>Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)<br>Mediterranean salt meadows (*Juncetalia maritimi*) | there is no potential for suspended solids, pollutants (hydrocarbon and heavy metal contaminants, etc.) and other water quality impacts to give rise to significant adverse effects. This is based on the ongoing compliance with discharge standards within the site and the existing water quality processes and monitoring protocols in place. There is no potential for significant adverse effects on estuaries, mudflats and associated habitats in the Boyne estuary. | effect not considered likely. | |
| | Embryonic shifting dunes<br>Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes')<br>*Fixed coastal dunes with herbaceous vegetation ('grey dunes') | There is no pathway for effects which would have the potential for significant adverse impacts on these habitats arising from the proposed development, taking account of the separation distance and the character of the proposed development. | No pathways for potential significant adverse effects | No pathways for potential significant adverse effects |
| Boyne Estuary SPA | Shelduck *Tadorna tadorna*<br>Oystercatcher *Haematopus ostralegus*<br>Golden Plover *Pluvialis apricaria*<br>Grey Plover *Pluvialis squatarola*<br>Lapwing *Vanellus vanellus*<br>Knot *Calidris canutus*<br>Sanderling *Calidris alba*<br>Black-tailed Godwit *Limosa limosa*<br>Redshank *Tringa totanus*<br>Turnstone *Arenaria interpres*<br>Little Tern *Sterna albifrons*<br>Wetlands | This SPA site is hydrologically connected to the River Boyne and Blackwater SAC. However, given the dilution effect and distance involved (30km) it is considered that there is no potential for suspended solids, pollutants (hydrocarbon and heavy metal contaminants, etc.) and other water quality impacts to give rise to significant adverse effects. This is based on the ongoing compliance with discharge standards within the site and the existing water quality processes and monitoring protocols in place. There are no significant adverse effects identified with regard to the wetlands and invertebrate communities that support the SPA bird populations.<br><br>The Stage 5 TSF currently supports roosting Golden Plover; standing water within the Stage 6 area will potentially provide a similar function. This area will be considerably smaller (36ha) than that currently available to wintering birds (160 ha) in the Stage 5 area. Data for foraging range in Ireland is limited; however a range of 12km has been estimated for an inland flock of Golden Plover in the UK. Based on the available data a connection between the local population at the Tara Mines TSF ponds and the Boyne Estuary SPA population is considered unlikely. Significant adverse effects on the wintering bird populations of this SPA, arising from displacement of Golden Plover following decommissioning of the Stage 6 area, is therefore considered unlikely. It is also possible that following re-vegetation of the Stage 5 area, this will provide suitable roosting habitat for Golden Plover. | Pathway present but no significant adverse effect considered likely. | No pathways for potential significant adverse effects |

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## 3.4 SCREENING CONCLUSION

The proposed development, the Tara Mines Stage 6 Tailings Storage Facility (TSF), is not located within or directly adjacent to any Natura 2000 site. The Appropriate Assessment screening process identified potential impacts arising during the construction and operational phases of the proposed development which would have the potential for indirect adverse effects on the qualifying interests of the River Boyne and River Blackwater SAC and the River Boyne and River Blackwater SPA. These potential indirect impacts are identified with regard to the surface water pathways and are limited to:

- Water quality impacts which may be transported from the site via Blake's Stream and the Yellow River, which is a tributary of the River Blackwater. The River Blackwater within the study area is designated within the SAC complex. These potential impacts arise via the proposed diversion of the Blake's Stream during the construction phase and with the operational phase discharge of treated tailings from the Stage 6 facility to the Yellow River.
- Water quality and riparian habitat impacts which may arise through the spread of invasive species introduced to the site during construction works.

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Water quality and invasive species impacts are evaluated as having the potential for significant adverse effects on the Annex II listed Atlantic salmon, River lamprey and Otter; included as qualifying interests of the River Boyne and Blackwater SAC and the Annex I species, Kingfisher; included as qualifying interests of the River Boyne and Blackwater SPA.

Any water quality impacts would be limited in scale such that impacts would not have any implications for terrestrial or riparian habitats for which the SAC is designated (Alkaline Fen, Alluvial Forest).

Through an assessment of the pathways for effects and an evaluation of the project, taking account of the processes involved and the distance of separation between other Natura 2000 designations in the wider study area, it has been evaluated that there are no likely significant adverse effects on the qualifying interests of any other designated European Site.

The potential for water quality impacts to adversely affect Atlantic salmon, River lamprey, Otter and Kingfisher results in the requirement for the progression to Stage 2 of Appropriate Assessment reporting. The effects of the proposed development in combination, or cumulatively, with other plans and proposals affecting water quality within the River Blackwater will require evaluation as part of the NIS process.



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# 4 STAGE 2: NIS ASSESSMENT

## 4.1 INTRODUCTION

This stage of the AA process, often referred to as Stage 2, assesses potential impacts of the proposed development on the integrity of designated Natura 2000 sites, with respect to their conservation objectives i.e. structure and function. Where required, mitigation measures are applied in order to avoid or minimise the risk. The AA Screening identified designated sites within the wider study area and concluded that the potential for significant adverse effects was limited to the River Boyne and Blackwater SAC (Site Code: 002299), and the River Boyne and Blackwater SPA (Site code: 004232) both of which are at a distance of approximately 1.25 km from the site.

## 4.2 CHARACTERISATION OF EUROPEAN SITES POTENTIALLY AFFECTED

### *4.2.1 The River Boyne and River Blackwater SAC*

The River Boyne and the River Blackwater is designated as a Special Area of Conservation (Site Code: 002299). The riverine stretches are designated for alkaline fen and alluvial woodland, both of which are listed in Annex I of the EU Habitats Directive. The site is also selected for the following species listed in Annex II of the EU Habitats Directive, namely Atlantic Salmon, Otter and River Lamprey.

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This site comprises most of the freshwater element of the River Boyne from upriver of the Boyne Aqueduct at Drogheda, the Blackwater River, as far as Lough Ramor, and the principal Boyne tributaries, notably the Deel, Stoneyford and Tremblestown Rivers. This system drains a considerable area of Counties Meath and Westmeath and smaller areas of Cavan and Louth. The underlying geology is Carboniferous Limestone for the most part with areas of Upper, Lower and Middle well represented. In the vicinity of Kells Silurian Quartzite is present while close to Trim are Carboniferous Shales and Sandstones. The rivers flow through a landscape dominated by intensive agriculture, mostly of improved grassland but also cereals. Much of the river channels were subject to arterial drainage schemes in the past. Natural flood-plains now exist along only limited stretches of river, though often there is a fringe of reed swamp, freshwater marsh, wet grassland or deciduous wet woodland. Along some parts, notably between Drogheda and Slane, are stands of tall, mature mixed woodland. Substantial areas of improved grassland and arable land are included in site for water quality reasons. There are many medium to large sized towns adjacent to but not within the site.

The main channel of the Boyne contains a good example of alluvial woodland of the *Salicetum albo-fragilis* type which has developed on three alluvium islands. Alkaline fen vegetation is well



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represented at Lough Shesk, where there is a very fine example of habitat succession from open water to raised bog. The Boyne and its tributaries is one of Ireland's premier game fisheries and offers a wide range of angling, from fishing for spring salmon and grilse to sea trout fishing and extensive brown trout fishing. The site is one of the most important in eastern Ireland for *Salmo salar* and has very extensive spawning grounds. The site also has an important population of *Lampetra fluviatilis*, though the distribution or abundance of this species is not well known and is in. *Lutra lutra* is widespread throughout the site. Some of the grassland areas along the Boyne and Blackwater are used by a nationally important winter flock of *Cygnus cygnus*. Several Red Data Book plants occur within the site, with *Pyrola rotundifolia*, *Poa palustris* and *Juncus compressus*. Also occurring are a number of Red Data Book animals, notably *Meles meles*, *Martes martes* and *Rana temporaria*. The River Boyne is a designated Salmonid Water under the EU Freshwater Fish Directive (1978).

The characterisation of the River Boyne, under the Eastern River Basin District (ERBD) Project, indicates that the primary environmental driving force in the Boyne Catchment is considered to be agricultural production. The water quality information suggests that the lengths of unpolluted (Class A) and moderately polluted (Class C) channels have declined, while there is a slight increase in channels classified as slightly polluted (Class B). Impacted river channels were typically located in areas with pasture, arable land, peat bogs and downstream of municipal waste water treatment plant (WwTP) outfalls.

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4.2.1.1.1 River Lamprey [1099]

The River lamprey (*Lampetra fluviatilis*) breeds in freshwater rivers and streams. Adults spawn in spring, excavating shallow nests in gravels and stones. After hatching, the larvae called ammocoetes drift or swim downstream to areas of river bed with a fine silt composition. They burrow into this bed material and live as filter feeders over a period of years before transforming into young adult fish. As adults they are parasitic, attaching to and feeding on larger fish in coastal waters. They can grow to 30cm at maturity at which stage they re-enter freshwater to spawn. The adult fish die after spawning. River and brook lamprey are indistinguishable as larvae, living as filter feeders in sediment. The mature adult forms are clearly distinguishable on the basis of body size. The two types of lamprey are considered by many in the same context as the brown trout / sea trout pairing, with a similar absence of genetic discriminators. Lamprey surveys in Ireland have necessarily focussed on juvenile lamprey. Consequently, the vast majority of available data relates to “Lampetra sp.” and cannot be assigned to one species or the other. For the above reasons the brook lamprey and the river lamprey are assessed jointly. There are extensive areas of suitable habitat and no significant pressures impacting these species. The overall status is therefore assessed as favourable (NPWS, 2013).



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According to the 2006 study on juvenile lamprey populations in the River Blackwater (O'Connor, 2006) lamprey populations in the Blackwater were considered to be limited by depleted water quality, high levels of siltation (affecting adult spawning habitat) and ongoing drainage maintenance. Brook lamprey are evaluated as being the dominant species, but River lamprey may potential occur in lower densities. Overall lamprey populations in the Blackwater, within the SAC, were evaluated as being of favourable conservation status (O'Connor, 2006).

#### 4.2.1.1.2 Atlantic salmon [1106]

The range of the Atlantic salmon (*Salmo salar*) extends in an arc from northern Portugal in the east, to New England, United States in the west. Salmon use rivers to reproduce and as nursery areas. The Irish population generally comprises fish that spend two winters (small numbers spend one or three winters) in freshwater before going to sea, in spring, as smolts at around 10-25cm in length. Adults spend one to three years at sea where growth rates are much greater. The majority of Irish fish spend one winter at sea before returning to their natal rivers, mainly during the summer, as grilse. There has been a recent stabilisation of the numbers of salmon spawning in Ireland and an increasing number of salmon rivers meeting their conservation limits; however low rates of marine survival are of concern. Threats to the freshwater habitat includes drainage and drainage maintenance, water quality deterioration (eutrophication and suspended solids), sedimentation of river substrates, and passage constraints. The salmon population is still low in comparison to previous decades, therefore the Overall conservation status is evaluated as Inadequate (NPWS, 2013). Salmon occur throughout the River Blackwater, recorded in low numbers above Lough Ramor, Virginia, Co. Cavan by Inland Fisheries Ireland (Kelly *et al*., 2014).

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#### 4.2.1.1.3 Otter

The Eurasian Otter (*Lutra lutra*) is listed as near threatened by the IUCN. The last national survey (Reid *et al.*, 2013) found the Irish otter population to be stable. While no data exists on the number of otters that use the River Boyne and Blackwater, signs of their presence were observed at 11 out of 18 sites surveyed in the 2004/05 National Otter survey (Bailey & Rochford, 2005). Reid *et al*. (2013) found otter signs at 51 out of 76 sites surveyed on the Boyne river, comparing favourably to results from the 2004/05 survey for the River Boyne (signs recorded at 7/12 sites surveyed). While otter incidence on the Boyne was found to decrease between 1980 and 2004/05 and increase (not significant) was recorded between 2004/04 and 2010.

Otters feed on both coastal and marine habitats, but require freshwater for drinking and bathing. They also require safe and undisturbed sites with suitable habitat (reedbed, bramble, underground tree root system), for dens, holts and couching sites. Holts are below ground resting sites and couches are above ground resting sites. A key habitat requirement is access to



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sufficient prey (Chanin, 2003). The main prey species of otter is fish. Bailey and Rochford found that the diet of otter in southern Ireland was broadly similar to that reported from Northern Ireland, with a dominance of fish, and a high proportion of salmonids, eels and sticklebacks. Declines the Otter population have been linked, at least anecdotally, to the removal of bankside vegetation, increased disturbance, lower water quality and pollution, particularly with organochlorine residues (Bailey and Rochford, 2005). The NPWS Threat Response Plan for otters (2009) categorises three principal threats to Otters in Ireland: habitat destruction and degradation; water pollution; and accidental death and/or persecution.

### *4.2.2 The River Boyne and Blackwater SPA*

The River Boyne and River Blackwater SPA is a long, linear site that comprises stretches of the River Boyne and several of its tributaries; most of the site is in Co. Meath, but it extends also into Cos Cavan, Louth and Westmeath. It includes the following river sections: the River Boyne from the M1 motorway bridge, west of Drogheda, to the junction with the Royal Canal, west of Longwood, Co Meath; the River Blackwater from its junction with the River Boyne in Navan to the junction with Lough Ramor in Co. Cavan; the Tremblestown River/Athboy River from the junction with the River Boyne at Kilnagross Bridge west of Trim to the bridge in Athboy, Co. Meath; the Stoneyford River from its junction with the River Boyne to Stonestown Bridge in Co. Westmeath; the River Deel from its junction with the River Boyne to Cummer Bridge, Co. Westmeath. The site includes the river channel and marginal vegetation. Most of the site is underlain by Carboniferous limestone but Silurian quartzite also occurs in the vicinity of Kells and Carboniferous shales and sandstones close to Trim. The site is a Special Protection Area (SPA) under the E.U. Birds Directive (2009) of special conservation interest for the following species: Kingfisher.

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#### 4.2.2.1.1 Kingfisher

A survey in 2010 recorded 19 pairs of Kingfisher (based on 15 probable and 4 possible territories) in the River Boyne and River Blackwater SPA (Cummins *et al*., 2010). A survey conducted in 2008 recorded 20-22 Kingfisher territories within the SPA (Crowe *et al.*, 2008). Kingfisher territories (probable and possible) recorded during the 2010 survey were present both upstream and downstream of the TSF on both the Blackwater and the Boyne Rivers. Cummins (2010) identified a number of key factors likely to determine the abundance of breeding Kingfisher within a river system:

- Availability of suitable banks for nesting.
- Water quality,
- Availability of suitable perches and,
- Adequate fish populations



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## 4.3 IMPACT CHARACTERISTICS AND EVALUATION

Potential impacts arising from the proposed development, alone or in combination with other plans or project, are evaluated with respect to the Qualifying Interests of the River Boyne and River Blackwater SAC, i.e. River lamprey, Atlantic salmon and Otter, the River Boyne and River Blackwater SPA, ie Kingfisher. The ecological impact assessment of potential impacts on European Sites is conducted utilising a standard Source-Receptor-Pathway model; where, all three elements of this mechanism must be in place to establish an impact arising. In addition, in line with the Appropriate Assessment process (EC, 2001; DOEHLG, 2010) mitigation has been discussed and applied to each potential impact in order to ensure that the proposed development, individually or in combination with other plans or projects, will not have a significant effect on, or adversely affect the integrity of any European Site. The following parameters are described when characterising ecological impacts:

- Direct and Indirect Impacts - An impact can be caused either as a direct or as an indirect consequence of a proposed development.
- Magnitude - Magnitude measures the size of an impact, which is described as high, medium, low, very low or negligible.
- Extent - The area over which the impact occurs – this should be predicted in a quantified manner.
- Duration - The time for which the effect is expected to last prior to recovery or replacement of the resource or feature.
    - Temporary: Up to 1 Year;
    - Short Term: The effects would take 1-7 years to be mitigated;
    - Medium Term: The effects would take 7-15 years to be mitigated;
    - Long Term: The effects would take 15-60 years to be mitigated;
    - Permanent: The effects would take 60+ years to be mitigated.
- Likelihood:
    - Certain/Near Certain: >95% chance of occurring as predicted;
    - Probable: 50-95% chance as occurring as predicted;
    - Unlikely: 5-50% chance as occurring as predicted;
    - Extremely Unlikely: <5% chance as occurring as predicted.

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## 4.4 IDENTIFICATION OF POTENTIAL IMPACTS

### *4.4.1 Direct Effects*

The proposed development site at the Stage 6 TSF is located approximately 1.25 km from the River Boyne and River Blackwater SAC, the closest Natura 2000 designation. There are



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therefore no direct pathways for impacts affecting any Qualifying Interests for the European Sites identified.

### *4.4.2 Indirect Effects*

Indirect effects potentially affecting the Qualifying Interests of the River Boyne and River Blackwater SAC and the River Boyne SPA, are limited to those effects which may impact on River Lamprey, Atlantic salmon, Otter and Kingfisher. Effects may occur via alteration of the hydrology of the area and as a result of water quality impacts and changes to riparian habitats. Potential indirect impacts affecting the qualifying interests of the SAC and SPA sites include the potential for effects on the conservation status of River lamprey, Atlantic Salmon, Otter and Kingfisher. These potential effects are described in the following subsections and are summarised in Table 3.

#### 4.4.2.1 Construction Phase Impacts

*Potential Impacts on water quality with direct effects on Salmon and Lamprey and indirect impacts on Kingfisher and Otter:*

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Surface water impacts: The proposed development will require significant, prolonged earthworks within the existing TSF lands (capping of Stage area 5) and within the proposed Stage 6 area (excavation, construction of dams, pipework and drainage system). The development will also require the diversion of Blake's Stream, a minor watercourse of low local ecological significance and no fisheries value, which occurs within the site. The stream will be re-directed to a route 400-600 m north of its current location. The confluence of Blake's Stream with the Yellow River will be moved c.600m north of its current location. As identified in the hydrological impact assessment prepared by AECOM (2015) construction impacts on surface water quality may arise from increased suspended solids and contamination owing to spillages.

Surface run-off from the borrow areas is likely to contain elevated concentrations of suspended solids during the construction period. This has the potential to cause the siltation of downstream fish habitats. Siltation of salmonid gravel beds can affect spawning. Siltation of spawning gravels is a particular risk to salmon. Increase in suspended solids can cause choking of fish and disrupt feeding behaviour. Fine sediments can smother eggs and affect survival (Hendry and Cragg-Hine, 2003). Changes in siltation patterns is identified as a key pressure on lamprey habitat (NPWS, 2013). For example, maintenance of Lamprey habitat requires that channels must have the capacity to deposit fine sediments along its margins. In the event of accidents or spillages, surface run-off from borrow areas may contain concentrations of hydrocarbons.



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The predicted long-term increase in concentrations of suspended solids, and the possible occurrence of hydrocarbons, in surface run-off, unless mitigated, could affect the quality of the receiving watercourses (the Simonstown Stream, Blake's Stream and the Yellow River). Additional drainage ditches excavated during construction may create pathways to these watercourses. Taking account of the prolonged construction period proposed for the Stage 6 TSF development (approximately 15 years, Section 2.2.1), there is the potential for long-term, sub-acute and/or chronic water quality impacts which may potentially affect local water quality in the receiving waters and the River Blackwater downstream. Such water quality effects, particularly with regard to suspended solids discharges, heavy metals, or releases of standing water with depleted oxygen or elevated nutrients have the potential to adversely affect Atlantic salmon in the Yellow River and in the River Blackwater downstream. In relation to suspended solids it is noted that long term monitoring of water quality from the existing TSF has identified elevated siltation within the receiving waters; however, persistent siltation has not been recorded in the River Blackwater downstream.

*Potential Impacts on riparian habitats with indirect impacts on aquatic habitats and species including Salmon, Lamprey, Otter and Kingfisher.*

Introduction and spread of non-native, invasive species: The scale, extent and duration of the proposed construction works gives rise to the potential for the introduction and spread of non-native, invasive species within the site boundary and also along the riparian corridors of the watercourses within the study area. The spread of species such as Japanese knotweed, Giant Hogweed and Himalayan balsam would have long-term adverse implications for the riparian quality and instream habitat, including fish habitat productivity in the Yellow River and the River Blackwater within the SAC / SPA designation. Such changes have the potential to indirectly affect Otter and Kingfisher which depend on fish prey and on the presence of riparian habitats for shading, perching and other functions.

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#### 4.4.2.2 Operational Phase Impacts

*Potential Impacts on water quality with direct effects on Salmon and Lamprey and indirect impacts on Kingfisher and Otter:*

The AECOM report (2015) identified potential sources of water quality impacts during operation being seepage to groundwater and surface water run-off.

*Seepage*

Continued monitoring of the existing TSF since operation of the Stage 5 extension has shown that the interceptor channel is effectively capturing almost all seepage from the tailings storage facility through the embankment walls. As this water is then recycled back to the TSF, a closed



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water cycle system is operating. This system of capturing seepage will also be used to capture seepage from the Stage 6 area, until the ICW is in place.

AECOM carried out a risk screening exercise on the TSF in March 2015 (AECOM, 2015). Modelling was undertaken to assess the risk to the receptors in the area. For the purposes of the modelling the worst case scenario was assumed. A summary of the findings of the risk modelling is listed below and provides the baseline against which the proposed Stage 6 extension is assessed (AECOM, 2015):

- The risk screening suggests that seepage inputs from the TSF and interceptor channel pose a moderate risk to the surrounding environment, specifically groundwater quality;
- The exceedances with regard to sulphate concentrations within the superficial deposits may pose a risk to the future WFD status of the Navan Tailings groundwater body and associated surface water bodies;
- A technical assessment, carried out using a mass balance approach, suggests that sulphate-rich seepage inputs to groundwater pose a low risk to the Yellow River. A mass balance predicts that an annual average sulphate concentration of 2,200mg/l in seeps from the western bank of the TSF would result in non-compliance in groundwater immediately adjacent to the Yellow River, under exceptionally dry conditions;
- A technical assessment, carried out using a remedial targets assessment, suggests that sulphate-rich seepage inputs to the superficial deposits pose a low risk to the River Blackwater. A remedial targets assessment predicts that an annual average sulphate concentration of 2,750mg/l at monitoring borehole OB13 would result in non-compliance in groundwater immediately adjacent to the River Blackwater. The TSF site is considered to be compliant with the "prevent" and "limit" objectives of the WFD.

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The quality of the treated water output from the Stage 6 TSF is expected to be similar to that of the existing outputs from the Stage 5A facility, taking account of the construction design and operational processes. Ongoing water quality monitoring at the existing facility has not identified persistent adverse trends in chemical or biological water quality arising from the site. Background chemical water quality in the River Blackwater, and the tributaries affected by the proposal are currently affected by elevated nutrients (Ammonia, Nitrate and Phosphate) suggesting an impact from agricultural and or human effluent sources. The proposed discharge of the groundwater from the mine site to the TSF is not predicted to result in any appreciable background concentrations of nutrients.

The assimilation capacity of the River Blackwater has been modelled for groundwater discharge from the tailings facility (TOBIN, 2010). These results indicate that there is virtually no change in the surface water quality during high or median flow conditions. There is a very slight increase in



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physio-chemical concentrations during low flow conditions; however, all parameters remain within acceptable ranges (TOBIN, 2010). The concentration of Manganese and Zinc is slightly elevated above background levels during low flow conditions. However, the assimilated concentration of zinc at 0.014mg/l is an order of magnitude below the salmonid threshold of 0.3mg/l (for a hardness of 214.49mg/l $CaCO_3$) and is an order of magnitude lower than the Surface Water Regulations (2009) of 0.1mg/l (for a hardness of 214.49mg/l $CaCO_3$). The concentration of Manganese is well below the maximum permissible concentration for drinking water. At the assimilated concentration of 0.035mg/l Mn the water will not be toxic to either aquatic life, livestock or humans. The assimilation capacity calculations presented above predict in quantitative terms the potential impact on the physico-chemical quality of the River Blackwater. Based on the results of the calculations the physico-chemical quality of the water will not be impacted and the water will remain within acceptable ranges for aquatic, livestock and human use.

The suspended solid loading of the discharge water is very low. Therefore, there is a very low risk of river bed sedimentation. This indicates that the discharge of the groundwater will not impact on the potential of the substrates to support aquatic life. It is essential that discharges of groundwater are kept isolated from spoil or fine sediments at discharge, with sufficient settlement to allow turbidity levels in the receiving waters of the Yellow River and/or the Blackwater to remain within compliance limits of the Salmonid Regulations (1988), i.e. <25 mg/l.

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*Impacts on Surface Water Hydrology and Quality*

During operation there would be no direct discharge to surface water from the TSF, although surplus supernatant water would continue to be treated at the mine site and discharged to the River Boyne. Potential impacts, therefore, would be confined to the contribution of seepage to groundwater which may pass as base flow to surface watercourses. Compliance points and trigger values at the TSF have been put in place to protect the Yellow River and Blackwater River (AECOM, 2015). Trigger values have been set at these compliance points for sulphate and magnesium at 1000 mg/l and 50 mg/l respectively. These concentrations would be used as an alert of a potential future non-compliance at the compliance points and hence at the receptors. The section of the River Blackwater used for potable water supply is at approximately 2.4km south of the TSF and forms the southernmost boundary of the groundwater body. The Yellow River has been receiving base flow with elevated sulphate concentrations for some time, however the impact on the Yellow River, and the River Blackwater downstream of the confluence, has been insignificant (AECOM, 2015).

*Heavy metal contamination.*



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The potential for significant heavy metal contamination which may lead to sub-acute bioaccumulation in fish populations has been subject to ongoing monitoring at the existing TSF (Biosphere, 2010). Results indicate that the facility is not leading to elevated lead or zinc levels in fish muscle tissue (Brown trout samples below EPA guidelines).

*Potential impacts arising from catastrophic events*

Catastrophic events, such as the breaching of a dam wall and release of untreated water and material would have the potential to cause significant adverse water quality impacts with significant implications for the aquatic species designated as qualifying interests of the River Blackwater and River Boyne SAC and SPA complex. The likelihood of such an event is considered imperceptible based on the information provided by the proponent, with no record of any such event, or even minor failures recorded throughout the monitoring period for the existing and ongoing Stage 5 and historical TSF installations managed by Tara Mines.

### *4.4.3 Cumulative and In-combination Effects*

*Operation of the TSF and of the Tara Mine site to date*

Operation of the existing TSF and on-going mining at Tara both have the potential to impact on water quality in the River Blackwater and River Boyne. Both the mine site and the TSF operate under IPCC license conditions to ensure compliance with salmonid, surface and drinking water Regulations. Tara mines have a long history of compliance with these Regulations and impacts on ground and surface water linked to the mining operations have not been detected. Cumulative impacts arising from the construction and operation of the Stage 6 area together with existing mining operations are not predicted, where both discharges will require compliance with discharge licensing standards and will comply with the Surface Water Regulations (2009).

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*Other quarrying operations*

There are no pending plans or project proposals within the immediate vicinity or zone of combined influence of the proposal which would have the potential to give rise to in-combination effects on water quality within the River Blackwater, with reference to the Annex II aquatic species listed as qualifying interests of the River Boyne and River Blackwater SAC, i.e. Atlantic salmon and River lamprey.

*Channelisation and siltation of minor tributaries.*

The background water quality in the River Blackwater, and the tributaries including the Yellow River, Blake's Stream, and Simonstown Stream are evaluated as being of moderate to poor ecological status, with compromised chemical and biological water quality. The proposed development has the potential to contribute to cumulative adverse effects on these minor tributaries with respect to channelisation and siltation during the construction phase and on-going



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sedimentation effects downstream during construction and operation. Cumulative effects with regard to suspended solids, sedimentation of salmonid habitat, and long-term chemical water quality effects (including heavy metals) will be mitigated through effective site management and monitoring protocols to ensure compliance. The potential for cumulative effects with respect to heavy metals is considered slight and not significant, based on the results of monitoring at the site. Similarly the low levels of nutrient discharge negate the potential for the development to cumulatively contribute to eutrophication within the River Blackwater sub-catchment, where agriculture and wastewater treatment discharges are contributing to elevated loadings to the receiving waters.

*Extraction of material for construction of Stage Area 6 (dam walls)*

The extraction of material for the construction of the dam walls will cause dust and disturbance at the source location (borrow pits within and adjacent to the development site, newly located borrow pits, suitable construction activity locations). Dust can settle on the foliage of vegetation, slowing down the rate of photosynthesis, suppressing growth and impacting on invertebrate, mammals, bats and birds. The proposed extraction sites for fill material are located more than 1 km from the River Blackwater. Dust effects on the foliage of habitats within the SAC are not considered likely at this distance. Nonetheless without mitigation impacts on local habitats are likely. Good practice for quarrying activity includes mitigation measures to prevent excessive dust effects.

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Disturbance impacts owing to noise and vibration during the extraction process may affect mammal populations, including otter. Otter (presence or signs) have not been recorded within or directly adjacent to the development site, but may forage along local watercourses opportunistically, especially the Yellow River which supports suitable prey fish. Noise and vibration impacts may cause displacement of foraging otter, however the Yellow River provides sub-optimal foraging habitat, is located outside of the SAC boudnary and impacts are not likely to be significant.

Artificial light disturbance arising during winter time extraction may use night lighting when extraction begins early and continues to dusk. This may have localised wildlife impacts, but will not impact on the River Blackwater and River Boyne SAC, or its qualifying interests 1.25 km distant.

*Decommissioning of the existing Stage 5 area and the proposed Stage 6 area*

Once the Stage 5 and Stage 6 areas have been capped, there is potential for groundwater seepage and surface water run-off to carry heavy metals, suspended solids and other contaminants to the River Blackwater.



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**Table 3. Potential Impacts and Significance of Effects on the Qualifying Interests of the River Boyne and River Blackwater SAC.**

| Qualifying Interests | Summary Impact Description | Significance of Potential Impacts Without Mitigation |
|---|---|---|
| River Lamprey (*Lampetra fluviatilis*)<br>Atlantic Salmon (*Salmo salar*) | *Construction Phase Impacts:*<br>Long term suspended solids discharges.<br>Siltation downstream affecting fish habitat.<br>Potential heavy metals, hydrocarbon, or pollution discharges.<br>Modification of minor watercourses and tributaries of the Blackwater.<br>Introduction and spread of alien invasive species.<br>Risk of catastrophic events (e.g. breach of dam wall)<br>*Operation Phase Impacts:*<br>Long term suspended solids discharges.<br>Siltation downstream affecting fish habitat.<br>Heavy metal bioaccumulation in salmon and lamprey.<br>Risk of catastrophic events (breach of dam wall) | Suspended solids releases, without mitigation, have the potential for significant adverse effects on Atlantic salmon; physically in terms of gill abrasion, as well as sedimentation of gravels and fish habitat. Pollution events may lead to significant fish kills. Modification of channels is in line with background channelization and ongoing loss of fish habitat diversity within the sub-catchment. Operational heavy metals may result in sub-acute bio-accumulation effects on both Atlantic salmon and juvenile River lamprey which use river bank sediments. However, ongoing monitoring has shown that the TSF discharge does not give rise to any perceptible bio-accumulation in fish species studied in the River Blackwater, precluding the potential for significant effects on the conservation status of these species. |
| Otter | *Construction and Operation Phase Impacts*<br>Changes in availability of prey (fish) as a result of water quality impacts and changes in riparian habitat.<br>Changes in riparian habitat as a result of invasive species spread. | The main prey species of otter are fish. A reduction in the number of fish may affect the otter population in the SAC.<br>The presence of heavy metals in fish could have indirect adverse effects the health of the otter population owing to bio-accumulation effects. However, ongoing monitoring has shown that bio-accumulation is not a feature of the TSF discharge in the fish population in the Blackwater.<br>The spread of invasive species may affect access to and availability of otter holt and couch sites as well as having wider ecological impacts affecting prey availability. |
| Kingfisher | *Construction and Operation Phase Impacts*<br>Changes in availability of prey (fish) as a result of water quality impacts and changes in riparian habitat.<br>Changes in riparian habitat as a result of invasive species spread. | The main prey species of Kingfisher are fish. A reduction in the number of fish may affect the Kingfisher population in the SAC.<br>The presence of heavy metals in fish may have indirect adverse effects the health of the Kingfisher population owing to bio-accumulation effects and changes prey availability. However, ongoing monitoring has shown that bio-accumulation is not a feature of the TSF discharge in the fish population in the Blackwater.<br>The spread of invasive species may affect access to and availability of nest site, perch sites as well as having wider ecological impacts affecting prey availability. |

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## 4.5 PIPELINE INSTALLATION

Much of the pipeline will run through area not considered environmentally these sections are relating to the pipeline origin and mid-section. However as the pipeline enters the Nevinstown area and nears the Blackwater the potential for environmental impact increases.

The proposed works will take place proximate to and along the bank of the river Blackwater, one of the primary constituents of the River Boyne and River Blackwater SAC/SPA. The proposed works will involve excavation of material and moving of said material within the SAC and immediately adjacent to/within the SPA, and therefore has the potential to impact on both of these Natura 2000 sites.

### *4.5.1Potential Direct, Indirect or Secondary Impacts*

The proposed works are located immediately within the River Boyne and River Blackwater SAC/SPA, and there potential for direct impacts upon these Natura 2000 sites associated with the proposed works. The primary source of impacts are:

- Impacts on any Annex I habitat occurring within the footprint of the works;
- Impacts on any Annex II/IV species (EU Habitats Directive) within and or immediately adjacent to the proposed works;
- Impacts on any Annex I bird species (EU Birds Directive) occurring within or immediately adjacent to the proposed works;
- The proposed works entail excavations immediately adjacent to the River Blackwater, which may impact upon the water quality of the water course;
- The works will involve the use of heavy machinery, with the potential for contamination of the River Blackwater by associated hydrocarbons, etc;

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There is also the possibility of secondary impacts, with any of the impacts listed above having an impact on any sites/species linked physically or ecologically to these Natura 2000 sites.

Many of the habitats and species for which the Natura 2000 sites occurring within 15 km of the proposed development are designated, are directly or indirectly dependent on water quality/hydrology. A reduction in water quality, or changes to local hydrology could negatively impact upon the conservation status of these sites with regard to habitat quality and size, and with regard to the ecological integrity of those species occurring within the sites.
The potential for impacts upon Natura 2000 sites within 15 km of the development is summarized in table 4.10. The potential impact upon the site in the event of negative impacts is summarized in table 4.11.

*Sources and significance of impacts*



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The primary sources of concern with regard to potential impacts of the proposed works on the Natura 2000 network, and their significance are:

- The works will take place within the River Boyne and River Blackwater SAC and within/adjacent to the River Boyne and River Blackwater SPA. Given that there was no Annex I habitat present at the site, and no suitable Otter Holt/Kingfisher nesting sites along the bank where the works are to be carried out, however, it is considered that the risk of direct impacts is negligible;
- The potential for impacts on ground water/surface water/hydrology during excavation and infilling, leading to impacts on the quality of the River Boyne and River Blackwater SAC/SPA. It is considered, however, that the risk of contamination can be reduced to a negligible level through the implementation of suitable mitigation/preventative measures;
- The potential for increased disturbance to species of conservation concern dependent on the Natura 2000 sites and the immediate environs. In particular, there is a potential for impact on Otter and Kingfisher through disturbance. It is considered, however, that the risk of disturbance can be reduced to a negligible level through the implementation of suitable mitigation/preventative measures.

In addition, it should be noted that the proposed development is located immediately adjacent to a major bat commuting/foraging corridor in the form of the River Blackwater and that any stretches of hedgerow or single trees, are likely to be utilised by several species of bat, during foraging, commuting and possibly even roosting.

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## 4.6 MITIGATION MEASURES

### *4.6.1 Construction phase*

Potential indirect impacts affecting the Qualifying Interests of the River Boyne and River Blackwater SAC (Atlantic salmon, River lamprey, Otter and Kingfisher) have been identified. Mitigation measures proposed to inform the Appropriate Assessment include those measures outlined in the hydrology impact assessment prepared by AECOM (2015), in addition to specific measures for the avoidance of impacts affecting the conservation status of the Qualifying Interests, i.e. Atlantic salmon, River lamprey and Otter within the River Boyne and Blackwater SAC and Kingfisher within the River Boyne and Blackwater SPA.

**Potential Impact:** Increased levels of suspended solids

**Proposed mitigation**: The proposed construction works for the Stage 6 TSF will be undertaken over a prolonged period (approximately 15 years). Surface run-off and dewatering discharges from the borrow areas would be routed through temporary settling ponds to promote the settling of suspended solids. The precise location and size of the settling ponds would vary in response to the changing extent of borrow area working and restoration.

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**Potential Impact:** Fuel spillages

**Proposed mitigation**: The possibility of significant quantities of fuel or oils entering the surface run-off would be minimised by the construction of bunds around the fuel/oil storage facility located within the compound and the use of double skinned fuel tanks. Any spillage would be contained within this bund, which would also have a compacted till floor to prevent infiltration of spilt liquids. An oil absorbent boom and oil interceptor would be installed at the discharge from the temporary settling pond to remove oil contaminants in the surface run-off which might arise from normal operation of the mechanical plant (AECOM, 2015).

**Potential Impact**: Water quality discharge limits exceeded.

**Proposed Mitigation**: In order to ensure water quality parameters within the site are managed effectively throughout the construction period it is proposed that prior to construction, the applicant will develop and implement a comprehensive Construction Environmental Management Plan to be adhered to by any sub-contractors. This will incorporate all elements of the proposed works over the construction period. With reference to aquatic receptors detailed above (and including the sensitive Qualifying Interests of the River Boyne and River Blackwater SAC), the following components will be developed, with input from a suitably qualified aquatic ecologist:



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- A Surface Water Management Plan: This will be iterative and will follow an adaptive management structure to ensure its effectiveness in delivery of the surface water quality requirements set out in the Surface Water Regulations (2009) and the Salmonid Regulations (1988). Long term dose-duration calculations and site-specific monitoring criteria will be required to ensure that the construction works are managed within the effective parameters to ensure that discharges from the site will not adversely affect Atlantic Salmon or adult River lamprey, with reference to physiological impacts (particularly on ova, and rearing fry) and siltation and habitat impacts; with implications for populations of both species occurring in natal streams outside of the SAC boundary, i.e. within the Yellow River and potentially within the Simonstown Stream. These measures will also benefit other aquatic species, including Eel and Brown Trout.
- An Erosion and Sediment Control Plan: This will provide for the effective management and limitation of sediment run-off and siltation in the tributaries and drains across the site and also provide for long term protection of the Yellow River and the River Blackwater downstream. This Plan will require input from geotechnical engineers, hydrologists, hydrogeologists and aquatic ecologists.

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The provision and implementation of these plans will ensure that the mitigation measures proposed in this document, and the parameters for the avoidance of significance adverse effects on the Natura 2000 sites within the zone of influence are carried through into the construction phase.

**Potential Impact**: Introduction and spread of alien invasive species.
**Proposed mitigation**: The significant earthworks and movement of machinery throughout the construction site over an extended period, taking account of connectivity to the River Boyne and River Blackwater SAC necessitates the preparation and implementation of identification and management protocols for invasive species throughout the site. The potential for the spread of species such as Japanese knotweed or Himalayan balsam is considered high, and thus effective measures for identification and control will be required. A risk assessment, together with preventative and control measures will be contained in an Invasive Species Management Plan.

**Potential Impact**: Increased levels of suspended solids arising from diversion of Blake's Stream.
**Proposed mitigation**: The diversion of Blake's stream presents the opportunity for the implementation of instream enhancement works to improve the ecological structure both in the riparian and instream habitats. The proposed diversion works and associated instream works will be designed with input from a qualified aquatic ecologist in order to maximise design features for biodiversity (with cognisance of required flow conveyance) within the newly constructed Blake's



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Stream diversion corridor. It is imperative that the default trapezoidal channelized corridors are not utilised in any future instream engineering.

### *4.6.2 Operation Phase*

Operational phase impacts arising from the proposed Stage 6 TSF are identified with regard to water quality impacts arising from groundwater seepage and the long-term discharge from the passive discharge from the proposed constructed wetland treatment complex.

**Potential Impact**: Seepage from Stage 6 area liner (affecting Yellow River and Blackwater River)
**Proposed mitigation**: The lining system would be put in place to reduce seepage from the TSF. Groundwater and surface water monitoring would continue to be carried out in accordance with permits.

**Potential Impact**: Discharge from the constructed wetland complex (ICW).
**Proposed Mitigation**: Mitigation is expected to come into effect in the future (>10 years time) and focuses on the delivery of effective compliance monitoring. The client will be required to develop an Operational Water Quality Management and Monitoring Plan, in line with any future IPPC licensing, with reference to the existing water quality monitoring and management undertaken for the Stage 5 TSF. The success and effectiveness of the existing water quality management and associated monitoring programme, with reference to the existing IPPC licence, provides assurance that a similar level of implementation and compliance will be achieved in future operations.

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**Operational Water Quality Management Plan**

The water quality commitments set out in this document, and included in the project description, planning application documents, and which may be subject to any future design specifications will be encapsulated in a Water Quality Management Plan for the operational phase. This plan will be iterative, taking account of all surface water quality criteria, including future legislative requirements which may come into effect in the intervening period between the issuing of project approval and the operational phase of the development. An adaptive management framework is required, such that ineffective management procedures are amended and updated to ensure best practice and compliance with licence requirements.

**Water Quality Monitoring Plan**

Monitoring of metals and suspended solids at reference (control) and receptor sites, including bioaccumulation, will be required to ascertain the ongoing null effect of the project on aquatic ecological receptors and on the qualifying interests of the SAC. This sampling should be



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expanded to include monitoring of juvenile River lamprey populations and the long-term effects of bio-accumulation on this species, where ammocetes live within silt sediments and are filter-feeding.

### *4.6.3 Decommissioning Phase*

**Potential Impact**: Discharge from the Stage 5 and Stage 6 areas, once capped.

**Proposed mitigation**: During the decommissioning phase of the development Stage 6 Area will be capped (as for Stage 5). AECOM (2015) state that impacts post closure will depend on the effectiveness of the interceptor channel and the passive treatment works (PTS) / integrated constructed wetland (ICW). Design work for the ICW will be finalised following capping of Stage 5, when flows and water quality can be fully determined. The current proposal is an outline plan, with cognisance of the discharge standards, compliance parameters and mitigation commitments set out in the project application.

The construction of the ICW will come after the closure of Stage 6 and will include a retention pond, sulphate reducing bioreactor (SRBR) and free water cell (FWC), which will reduce maintenance requirements and enable water to be stored until discharge is appropriate, thus avoiding significantly higher flows in the river. Discharge from the ICW will be to the Blackwater River, downstream of Liscartan. An overflow system will operate during peak rainfall events, whereby diluted water is discharged to the Simonstown Stream and may subsequently be used by livestock. To meet the requirements for passive treatment works the Integrated Constructed Wetland has been designed as identified in Figure 5 (Vesi, 2016). Assimilative capacity calculations for the proposed ICW show that after treatment discharged waters will meet the necessary regulatory limits for surface waters (Appendix 1, Table A1). All surface water run-off from the Stage 5 and Stage 6 areas will be captured by the IWC (Appendix 1, Table A2 and Table A3). The design standards for the construction of the Stage 6 TSF to avoid seepage in addition to the adequate passive treatment of surface water run-off will ensure water quality downstream of the ICW will not give rise to adverse effects on the Blackwater River, in view of the qualifying interests and the conservation objectives of the SAC and SPA designations.

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### *4.6.4 Groundwater Monitoring*

The existing and ongoing groundwater monitoring programme at the Tara Mines Stage 5A&B TSF will be continued throughout the Stage 6 construction and operation phases, with additional monitoring stations included or modified due to alterations within the development site. This monitoring programme will be designed and managed by a qualified and experience hydrogeologist. All monitoring wells will be located beyond the downstream toe and adjacent to the perimeter access road but subject to any anomalies indicated by the resistivity and microgravity survey which would indicate the presence of any water bearing fissures. The



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piezometers would be installed into the base of the dam fill from the 63.29 m AOD crest and 59.29 m AOD for the first stage of Stage 6. These would then be replaced during the construction of the second stage of Stage 6. The water level and water quality sampling will be undertaken in accordance with the IPPC license.

### *4.6.5 Surface Water Monitoring*

Surface water quality monitoring during the construction stage of the proposed development will be required, at the existing monitoring stations, in order to avoid downstream siltation effects. Discharges from the site, including run-off (i.e. suspended solids / turbidity) must comply with the terms of the IPC licence and also with the Salmonid Regulations (1998); i.e. <25 mg/l. The proponent will be required to develop a Surface Water Quality Management Plan which will set out the measures proposed to limit discharges from the site during the construction phase to within the above Regulations, with reference to the potential for ongoing exposure of River lamprey and Atlantic salmon to prolonged suspended solids discharges. The duration of the proposed works and the management of such discharge volumes over time will be developed to comply with the parameters of the above Regulations.

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The surface water monitoring programme for the operational stage of the Stage 6 TSF will incorporate monitoring of the point source outputs on an ongoing basis, as per the ongoing surface water monitoring programme being undertaken for the existing Stage 5 A&B TSF. The chemical, physical, and biological characteristics of the discharge will be assessed in accordance to the IPPC licence, as well as all elements of the licence requirements such as discharge volume, flow details, etc.

The proposed constructed wetland treatment complex will require testing and phased roll-out upon determination that compliance with the IPPC licence can be achieved. It will be necessary for the proponent to undertake additional water quality monitoring, over and above the current programme in order to determine the quality of the discharge from the constructed wetland complex. Monitoring will be necessary under a full range of discharge volumes, corresponding to a full range of annual and predicted flows in the receiving watercourses, including modelled low and high flow conditions. This is necessary to evaluate performance of the wetland system discharge standards with respect to the assimilative capacity of the receiving water.

Any exceedances identified during the monitoring will be recorded and reported to the EPA, as part of the IPC licence requirements. In the event of exceedances recorded the proponent will be required to take immediate action (notwithstanding reporting, direction or requirements issued by the EPA) in order to prevent further contamination of water quality potentially reaching the River Boyne and River Blackwater SAC and SPA complex. It will be necessary to undertake post-event



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follow-up monitoring, to include a full suite of chemical and biological sampling in affected watercourses, in order to establish the significance of exceedance events and implications for the qualifying interests of the SAC or SPA, in terms of their resiliency to such effects. This monitoring data will inform future compliance limits and thresholds as part of an ongoing adaptive management protocol for the site.

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# 5 CONCLUSION OF STAGE 2 OF APPROPRIATE ASSESSMENT

The proposed development of the Tara Mines Stage 6 TSF has been evaluated with regard to the designated Natura 2000 sites within the wider study area. Potential impacts affecting the Qualifying Interests of the River Boyne and River Blackwater SAC and the River Boyne and River Blackwater SPA have been evaluated, with specific reference to water quality impacts affecting Annex II listed River lamprey, Atlantic salmon and indirectly the Annex II listed species otter and the Annex I listed (Birds Directive) Kingfisher. With the successful implementation of mitigation and monitoring measures described above, the proposed development, either alone or in-combination with other plans or projects will not result in significant adverse effects to the integrity of any European Sites, in view of their conservation objectives.

Potential impacts will be avoided through design stage avoidance at construction and via operational stage water quality management and a programme of ongoing monitoring. The mitigation measures set out in the current assessment, in addition to commitments from the Application Documents will be incorporated into a Construction Environmental Management Plan, to include a Sediment and Erosion Control Plan. This will ensure that the parameters for compliance and water quality management as stipulated will be achieved during the construction phase of the development. Operational stage water quality management will follow the existing, ongoing and effective measures in place for the Stage 5 TSF. This will include the development of an Operational Water Quality Management Plan, which will incorporate all requirements of the IPC licence, in addition to commitments and mitigations set out in the current planning application documents for the avoidance of impacts on the qualifying interests of the River Boyne and River Blackwater SAC and SPA complex; i.e. the integrity of these designations.

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Following the closure of the Stage 6 TSF, the effectiveness of the proposed constructed wetland (ICW) complex will be subject to ongoing monitoring and adaptive management to ensure compliance with water quality standards, and in order to avoid water quality impacts downstream, with reference to the qualifying interests of the River Boyne and River Blackwater SAC and SPA complex. The implementation of these measures will successfully avoid the potential for downstream water quality impacts within the River Blackwater, a designated Natura 2000 site. The proponent and their contractors will be bound to incorporate these measures into the project proposal; effective implementation on site will ensure that there will be no significant effects, either individually or in combination with other plans or projects affecting the conservation interests or conservation objectives of the River Boyne and River Blackwater SAC and the River Boyne and River Blackwater SPA, i.e. the integrity of this Natura 2000 site. It is therefore concluded that the proposed development will not, beyond reasonable scientific doubt, adversely affect the integrity of any European Site (Natura 2000 site); whether directly, indirectly or cumulatively.



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# APPENDIX 1

**Table A1. Assimilative Capacity Calculations for the proposed Integrated Constructed Wetland.**

| F rec (flow 50%ile) $m^3/h$ (Blackwater) | F dis (Max discharge) $m^3/h$ (Output from ICW ) | F total (River at 50%ile + ICW discharge) $m^3/h$ | Parameter | *Units* | Conc receiving water (Blackwater) | Conc discharge (Output from ICW) | C downstream = (F river 50* C back) + (F effluent * C effluent) / (F river 50 + F effluent) | Limit Drinking water mg/l | Surface water Limit mg/l | Compliance |
|---|---|---|---|---|---|---|---|---|---|---|
| 31,000 | 7,000 | 38,000 | Sulphate as SO4 | mg/l | 26 | 500 | 113.3 | 187.5 | - | **YES** |
| 31,000 | 7,000 | 38,000 | Chloride as Cl | mg/l | 15 | 40 | 19.6 | 250 | - | **YES** |
| 31,000 | 7,000 | 38,000 | Sodium, Filtered as Na | mg/l | 9.8 | 53 | 17.8 | 200.00 | - | **YES** |
| 31,000 | 7,000 | 38,000 | Nitrate as N | mg/l | 10 | 1.0 | 8.34 | 11.3 | - | **YES** |
| 31,000 | 7,000 | 38,000 | Dissolved Oxygen, Unfixed | mg/l | 9.5 | 9.4 | 9.48 | 9.5 | - | **YES** |
| 31,000 | 7,000 | 38,000 | Magnesium, Total as Mg | mg/l | 9.0 | 55 | 17.5 | - | - | **-** |
| 31,000 | 7,000 | 38,000 | Potassium, Filtered as K | mg/l | 3.4 | 2.9 | 3.30 | - | - | **-** |
| 31,000 | 7,000 | 38,000 | Nitrite as N | mg/l | 2.0 | 0.080 | 1.65 | 0.15 | - | ** |
| 31,000 | 7,000 | 38,000 | Iron, Filtered as Fe | mg/l | 0.10 | 0.23 | 0.124 | 0.20 | | **YES** |
| 31,000 | 7,000 | 38,000 | Aluminium, Filtered as Al | mg/l | 0.09 | 0.10 | 0.092 | 0.20 | - | **YES** |
| 31,000 | 7,000 | 38,000 | Manganese, Filtered as Mn | mg/l | 0.03 | 0.06 | 0.035 | 0.05 | - | **YES** |
| 31,000 | 7,000 | 38,000 | Zinc, Filtered as Zn | mg/l | 0.02 | 0.035 | 0.023 | 0.50 | 0.1 | **YES** |
| 31,000 | 7,000 | 38,000 | Cyanide, Total as CN | mg/l | 0.02 | 0.009 | 0.018 | 0.05 | 0.01 | **YES** |
| | | | Antimony, Filtered as | mg/l | 0.01 | 0.001 | 0.008 | 0.005 | - | **Reduce LOD** |

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| F rec (flow 50%ile) $m^3/h$ (Blackwater) | F dis (Max discharge) $m^3/h$ (Output from ICW ) | F total (River at 50%ile + ICW discharge) $m^3/h$ | Parameter | *Units* | Conc receiving water (Blackwater) | Conc discharge (Output from ICW) | C downstream = (F river 50* C back) + (F effluent * C effluent) / (F river 50 + F effluent) | Limit Drinking water mg/l | Surface water Limit mg/l | Compliance |
|---|---|---|---|---|---|---|---|---|---|---|
| 31,000 | 7,000 | 38,000 | Sb | | | | | | | **in river** |
| 31,000 | 7,000 | 38,000 | Arsenic, Filtered as As | mg/l | 0.01 | 0.008 | 0.010 | 0.01 | 0.025 | **YES** |
| 31,000 | 7,000 | 38,000 | Copper, Filtered as Cu | mg/l | 0.002 | 0.009 | 0.003 | 2.0 | 0.03 | **YES** |
| 31,000 | 7,000 | 38,000 | Lead, Filtered as Pb | mg/l | 0.002 | 0.003 | 0.002 | 0.01 | 0.007 | **YES** |
| 31,000 | 7,000 | 38,000 | Chromium, Filtered as Cr | mg/l | 0.002 | 0.002 | 0.002 | 0.050 | 0.003 | **YES** |
| 31,000 | 7,000 | 38,000 | Cadmium, Filtered as Cd | mg/l | 0.002 | 0.001 | 0.002 | 0.005 | 0.00025 | **Reduce LOD in river** |
| 31,000 | 7,000 | 38,000 | Mercury, Total as Hg | mg/l | 0.001 | 0.0001 | 0.001 | 0.001 | 0.0001 | **YES** |

LOD Limit of detection

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**Table A2. Surface Water run-off from Stage 5 and Stage 6 through proposed ICW**

| Month | Volume through ICW per hectare per hour |
|---|---|
| January | 213 |
| February | 158 |
| March | 90 |
| April | 8 |
| May | -27 |
| June | -43 |
| July | -27 |
| August | 37 |
| September | 84 |
| October | 192 |
| November | 214 |
| December | 192 |

**Table A3. 10Ha ICW Water Balance calculations for proposed ICW**

| | **Tara Mines** | 100,000m$^2$ | | | | |
|---|---|---|---|---|---|---|
| | | 194 ha. Drainage area | | | | |
| | **Season** | **Spring** | **Summer** | **Autumn** | **Winter** | **Total** |
| **1** | Effluent Discharge m³ | 170138 | -74258 | 221742 | 462108 | **779,730** |
| **2** | Rainfall m | 0.1822 | 0.189 | 0.2363 | 0.2527 | |
| **2.1** | Rainfall m³ | 18230 | 18930 | 23630 | 25270 | **86,050** |
| **3** | Infiltration rate m | 0.0001 | 0.0001 | 0.0001 | 0.0001 | |
| **3.1** | Infiltration m³ | 900 | 900 | 900 | 900 | **3,600** |
| **4** | Transpiration rate m | 0.3 | 0.6 | 0.4 | 0.1 | |
| **4.1** | Transpiration m³ | 30000 | 60000 | 40000 | 10000 | **140,000** |
| **5** | Interception rate (% of Rainfall) | 15% | 50% | 25% | 5% | |
| **5.1** | Interception | 2733 | 9465 | 5907 | 1263 | **19,368** |
| **6** | Discharge m³ | 154725 | -51435 | 198565 | 475215 | |
| | | Total annual water budget 702,812m$^3$ 10% annual reduction | | | | |
| **6** | Daily average m³ | 1719 | 0 | 2206 | 5280 | |
| | **Total water flow to ICW /yr 779,730 m³** | | | | | |

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# Appendix B.6 - 5

# NIS – Development of Wind Turbine at Knockumber

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# NATURA IMPACT STATEMENT
# IN SUPPORT OF THE
# APPROPRIATE ASSESSMENT
# OF
# a proposed development at Knockumber, Navan, Co. Meath

In accordance with the requirements of Article 6(3) of the Habitats Directive (Council Directive 92/43/EEC)

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Prepared January 2015 by:

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## Executive Summary

*Boliden Tara Mines is seeking planning permission for the development of a single wind turbine on the industrial mine site at Knockumber, Navan. As the largest operating zinc-lead mine in Europe, producing 2.5 million tonnes of ore annually, Tara Mines is one of the country's largest energy users.*

*The proposed development will involve the installation of single 900 kilo watt wind turbine with a hub height not to exceed 60 metres and a rotor diameter not to exceed 66 metres. The electricity generated will be utilised onsite and will go towards offsetting the c. 180,000 megawatt hours annual electricity usage. No additional infrastructure will be necessary to export power to the national electricity grid network.*

*The location of the site is proximate to the River Boyne and River Blackwater SAC and the River Boyne and River Blackwater SPA, and thus the proposed development requires Appropriate Assessment according to article 6(3) of the Habitats Directive. In January of 2015, FERS Ltd. was commissioned to carry out an Appropriate Assessment on the impact of the proposed development on the Natura 2000 network. Screening having identified potential impacts, a Natura Impact Statement (NIS) was prepared. This NIS indicates that given the implementation of appropriate mitigation and precautionary measures, the proposed development will have no significant impact upon the Natura 2000 network.*

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# Table of Contents




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# 1 Introduction

## 1.1 FERS Ltd. company background

Forest, Environmental Research and Services have been conducting ecological surveys and research since the company's formation in 2005 by Dr Patrick Moran and Dr Kevin Black. Dr. Moran, the principal ecologist with FERS, has a 1st class honours degree in Environmental Biology (UCD), a Ph.D. in Ecology (UCD), a Diploma in EIA and SEA management (UCD) and a M.Sc. in GIS (University of Ulster, Coleraine). He has in excess of 15 years of experience in carrying out ecological surveys on both an academic and a professional basis. Dr Emma Reeves, senior ecologist with FERS Ltd. has a 1st class honours degree in Botany (UCD), and a Ph.D. in Botany (UCD). Dr Sarah Ryan, also a senior ecologist with FERS has a B.Sc. (double Hons) in Biology and Statistics (NUI Maynooth), a Diploma in EIA and SEA Management (UCD) and a Ph.D. in botany (UCD). Dr Ryan has almost 10 years of experience in undertaking ecological surveys on an academic and professional basis.

FERS client list includes National Parks and Wildlife Service, Meath County Council, the Heritage Council, University College Dublin, the Environmental Protection Agency, Inland Waterways Association of Ireland, the Department of Agriculture, the OPW, Coillte and Drogheda Port Company in addition to numerous private individuals and companies. Work has included many Ecological Impact Assessments and Appropriate Assessments.

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## 1.2 The aim of this report

This report has been prepared in compliance with Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities (DoEHLG 2009, February 2010) and the European Communities (Birds and Natural Habitats) Regulations 2011 (DoEHLG 2011) in support of the Appropriate Assessment of an application for planning permission to Meath Council for a proposed development at Knockumber, Navan, Co. Meath. The proposed development is proximate to the River Boyne, the primary component of the River Boyne and River Blackwater SAC and the River Boyne and River Blackwater SPA. The proposed development, therefore, requires Appropriate Assessment under article 6(3) of the Habitats Directive. This report provides the information required in order to establish whether or not the proposed development is likely to have a significant ecological impact on any Natura 2000 sites, in the context of their conservation objectives and specifically on the habitats and species for which the sites have been designated.



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## 1.3 An outline of the Appropriate Assessment process

The "Habitats Directive" (Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna) is the main legislative instrument for the protection and conservation of biodiversity within the European Union and lists certain habitats and species that must be protected within wildlife conservation areas, considered to be important at a European as well as at a national level. A "Special Conservation Area" or SAC is a designation under the Habitats Directive.

The "Birds Directive" (Council Directive 2009/147/EC on the Conservation of Wild Birds) provides for a network of sites in all member states to protect birds at their breeding, feeding, roosting and wintering areas. This directive identifies species that are rare, in danger of extinction or vulnerable to changes in habitat and which need protection. A "Special Protection Area" or SPA, is a designation under The Birds Directive.

Special Areas of Conservation and Special Protection Areas form a pan-European network of protected sites known as Natura 2000 sites.

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The Habitats Directive sets out the protocol for the protection and management of SACs. The Directive sets out key elements of the system of protection including the requirement for Appropriate Assessment of plans and projects. The requirements for an Appropriate Assessment are set out in the EU Habitats Directive. Articles 6(3) and 6(4) of the Directive state:

(3) "Any plan or project not directly connected with or necessary to the management of the site but likely to have 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."

(4) "If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of over-riding public interest, including those of social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted."



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## 1.4 Methodology for Appropriate Assessment

A number of guidance documents on the appropriate assessment process have been referred to during the preparation of this NIS. These are:

- Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (DoEHLG 2009, Revised February 2010);
- EU Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC (2007);
- 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 (Nov. 2001 – published 2002); and
- Managing Natura 2000 Sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (2000).
- European Communities (Birds and Natural Habitats) Regulations 2011 (DoEHLG 2011).

The assessment requirements of Article 6 are generally dealt with in a stage by stage approach. The stages as outlined in "Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities" are outlined below.

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### 1.4.1 Stage (1) Screening

This initial process identifies the likely impacts of a proposed project or plan upon a Natura 2000 site, either alone, or in combination with other projects or plans and considers whether these impacts are likely to be significant.

### 1.4.2 Stage (2) Appropriate Assessment

The consideration of the impact of the project or plan on the integrity of the Natura 2000 Site, either alone or in combination with other projects or plans to the sites structure and function and its conservation objectives. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts.

### 1.4.3 Stage (3) Assessment of Alternative Solutions

The process which examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the Natura 2000 site.



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### 1.4.4 Stage (4) Assessment where Adverse Impacts Remain

An assessment of compensatory measures where, in the light of an assessment of Imperative Reasons of Overriding Public Interest (IROPI), it is deemed that the project or plan should proceed.

At each stage, there is a determination as to whether a further stage in the Appropriate Assessment process is required. If, for example, the conclusions of the Screening stage indicate that there will be no significant impacts on the Natura 2000 site, there is no requirement to proceed further. Stages 1 and 2 deal with the main requirements for assessment under Article 6.3. Stage 3 may be part of Article 6(3) or a necessary precursor for Stage 4. This report is comprised of the ecological impact assessment and testing required under the provisions of Article 6(3) by means of the first stage of Appropriate Assessment, the screening process (as set out in the EU Guidance documents).

EU guidance states:

"This stage examines the likely effects of a project or plan, either alone or in combination with other projects or plans, upon a Natura 2000 site and considers whether it can be objectively concluded that

these effects will not be significant.

The report also provides the information required for the Competent Authority to complete the Appropriate Assessment (Stage 2) should this be necessary and appropriate in the opinion of the competent Authority. Screening has been undertaken in accordance with the European Commission's Guidance on Appropriate Assessment (European Commission, 2001) which comprises the following:

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1. Description of the Plan.
2. Identification of Natura 2000 sites potentially affected by the Plan.
3. Identification and description of individual and cumulative impacts likely to result from the Plan.
4. Assessment of the significance of the impacts identified on the conservation objectives of the site(s).
5. Exclusion of sites where it can be objectively concluded that there will be no significant impacts on conservation objectives.



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## 1.5 Consultations

The primary body consulted with regard to matters involving Natura 2000 sites is the National Parks and Wildlife Service (NPWS). The role of the NPWS is:

- To secure the conservation of a representative range of ecosystems and maintain and enhance populations of flora and fauna in Ireland.
- To implement the EU Habitats and Birds Directives.
- To designate and advise on the protection of Natural Heritage Areas (NHA) having particular regard to the need to consult with interested parties.
- To make the necessary arrangements for the implementation of National and EU legislation and policies and for the ratification and implementation of the range of international Conventions and Agreements relating to the natural heritage.
- To manage, maintain and develop State-owned National Parks and Nature Reserves.

Information pertaining to Natura 2000 sites within the Republic of Ireland is typically held by NPWS and is publically accessible through their on-line database at www.npws.ie. Consultations carried out involved searching through the NPWS database for information pertaining to the potential impact of the proposed development on Natura 2000 sites within 15 km of the proposed development.

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# 2 Screening

Following the guidelines set out by NPWS (2009), Appropriate Assessment Screening (Phase I Appropriate Assessment) is the process that addresses and records the reasoning and conclusions in relation to the first two tests of Article 6(3) of the EU Habitats Directive. According to the guidelines as laid by NPWS (2009), Appropriate Assessment Screening is the process that addresses and records the reasoning and conclusions in relation to the first two tests of Article 6(3):

(1) Is the plan or project directly connected to or necessary for the management of the site?

(2) Is the plan or project, alone or in combination with other such plans or projects likely to have significant negative effects on a Natura 2000 site(s) in view of the conservation objectives of that site(s)?

The proposed development does not comply with the first screening test (i.e. the proposed development is not directly connected to, or necessary for the management of any Natura 2000 site). The screening exercise will therefore inform the Appropriate Assessment process in determining whether the proposed works, alone or in combination with other plans and projects, is likely to have significant effects on the Natura 2000 sites within the study area (and in particular on the River Boyne and River Blackwater SAC and the River Boyne and River Blackwater SAC). If the effects are deemed to be significant, potentially significant, or uncertain, or it the screening process becomes overly complicated, then the Appropriate Assessment process must proceed to Stage II Appropriate Assessment and the preparation of a Natura Impact Statement (NIS).

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## 2.1 Description

### 2.1.1 Description of proposed development

Boliden Tara Mines is seeking planning permission for the development of a single wind turbine on the industrial mine site at Knockumber, Navan. As the largest operating zinc-lead mine in Europe, producing 2.5 million tonnes of ore annually, Tara Mines is one of the country's largest energy users.

The proposed development will involve the installation of single 1.5 megawatt wind turbine with a hub height not to exceed 60 metres and a rotor diameter not to exceed 66 metres. The electricity generated will be utilised onsite and will go towards offsetting the c. 180,000 megawatt hours annual electricity usage. No additional infrastructure will be necessary to export power to the national electricity grid network. The location of the proposed development is indicated in Figure 1, Figure 2, and Figure 3.



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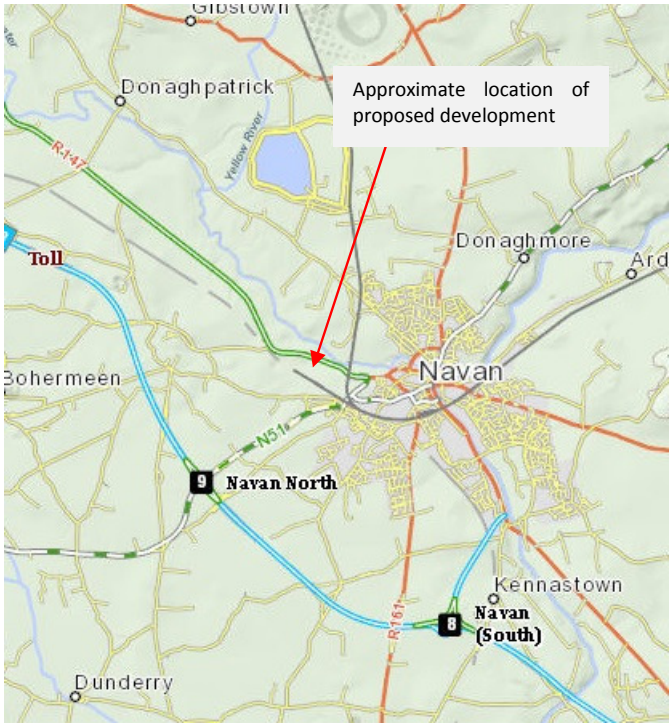


Figure 1: Map indicating approximate location of the proposed development (scale 1:100,000).

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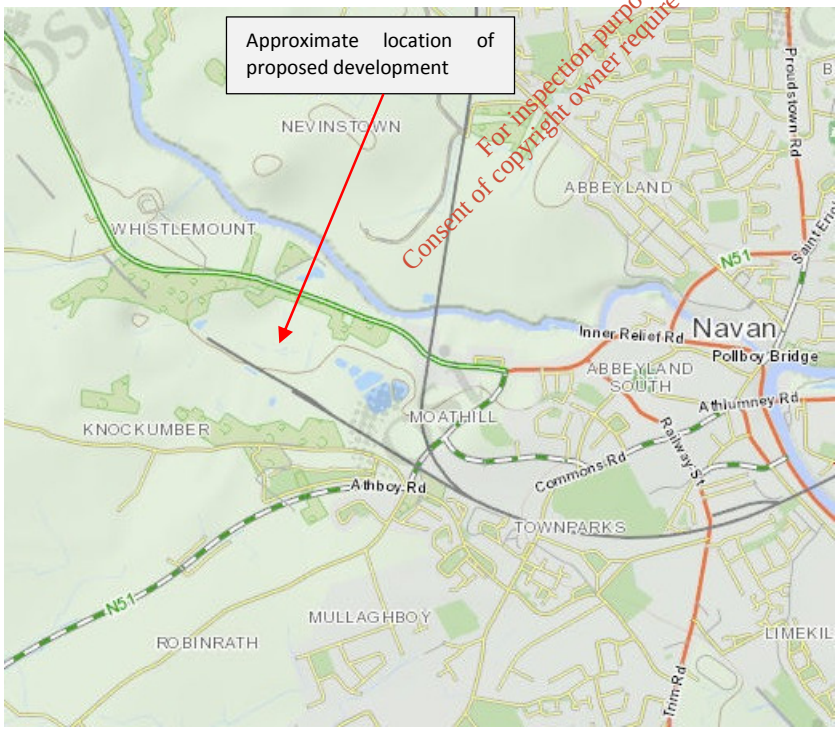


Figure 2: Approximate location of the proposed development (scale 1:25,000).



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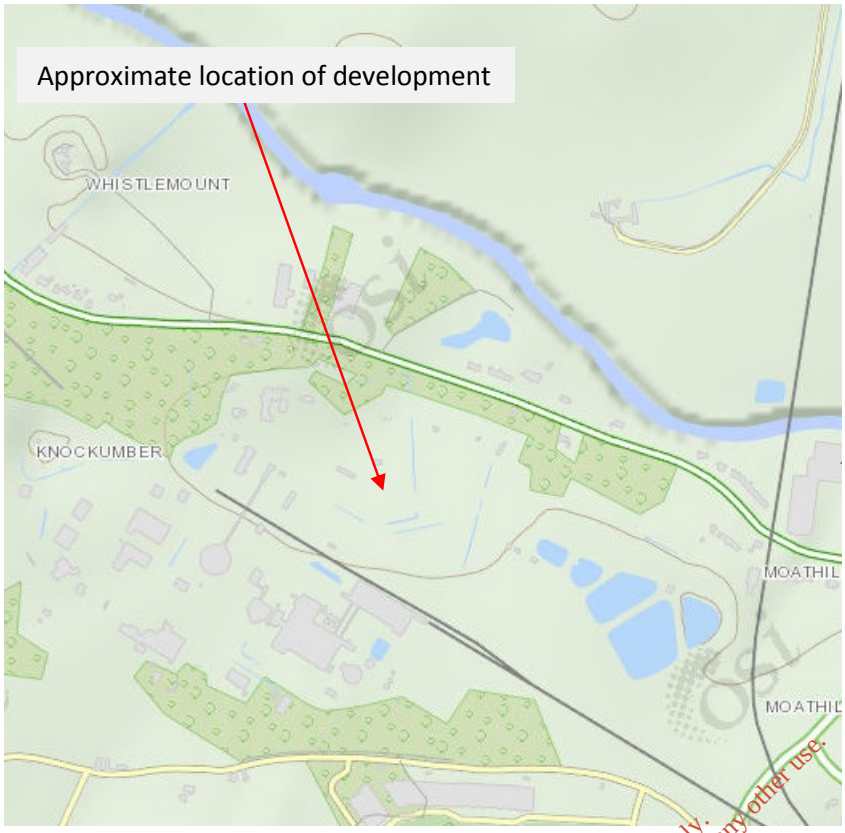


**Figure 3: Map illustrating approximate location of proposed development (scale 1:10000)**

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### 2.1.2 Description of existing conditions at site

A site visit was carried out by Dr Patrick Moran on January 13th, 2015 in order to assess the habitats present at the proposed development site, and to identify potential impacts of the proposed development on the conservation objectives of any Natura sites identified in section 2.2.

The development site is within the Industrial complex of New Boliden (TARA) Mines at Knockumber, outside the town of Navan. The exact siting location is yet to be decided, but it is within an area of approximately 100m X 100m within the brown-field site. Much of this site is covered in hard-core. The nature of the site is entirely anthropogenic and owing to the industrial nature of the site, is undergoing constant disturbance and change (see Figure 4 and Figure 5). There are small areas of scrub present, but these are transitory and pockets of the habitat come and go over time as works move from one area to the next. There are a number of ponds present proximate to the proposed development (see Figure 6). These ponds are entirely anthropogenic, with little or no vegetation (see Figure 7). No rare, protected or Annex species/habitats were observed to occur within the footprint of the proposed works during the field survey. The footprint of the development itself is of very limited ecological value, consisting of Buildings and Artificial Surfaces (BL3), primarily hard-core. Adjacent to the development site, however are numerous significant areas of woodland, which are of significant ecological value, particularly in this industrial setting. Of note, the proposed development approximately 300m from the River Blackwater, an important ecological corridor and one of the primary constituents of the River Boyne and River Blackwater SAC and the River Boyne and River Blackwater SPA (see Figure 9).

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**Figure 4: Panoramic view of habitat on site**



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**Figure 5: Panoramic view of habitat on site**

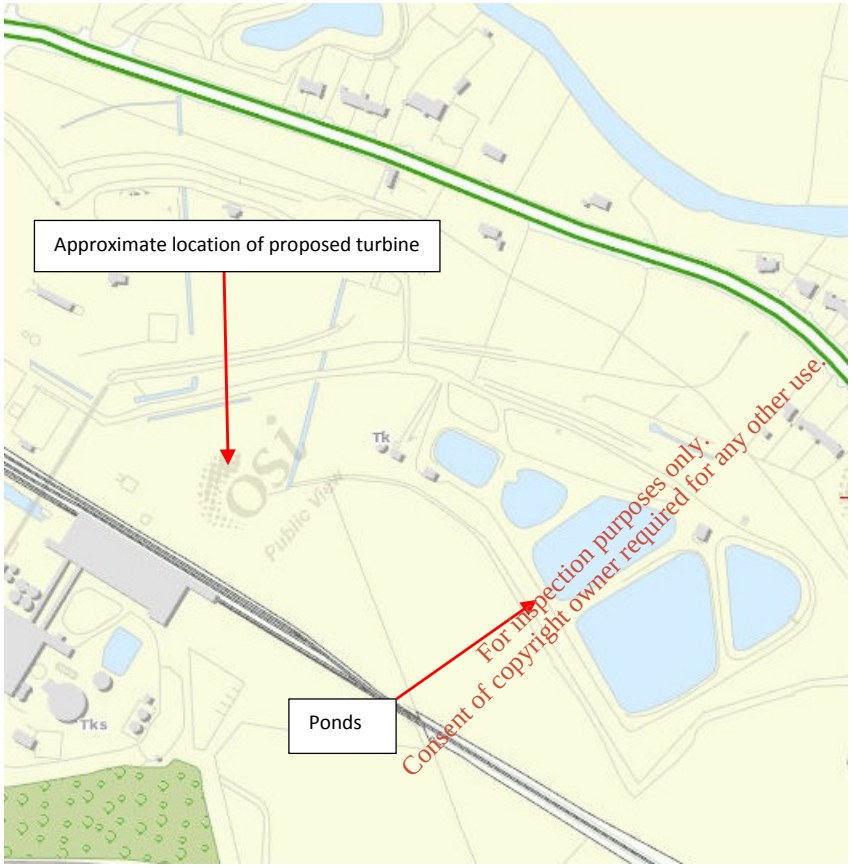


**Figure 6: Map indicating location of ponds relative to the approximate location of the proposed development**



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**Figure 7: Photograph illustrating one of the ponds existing on site**

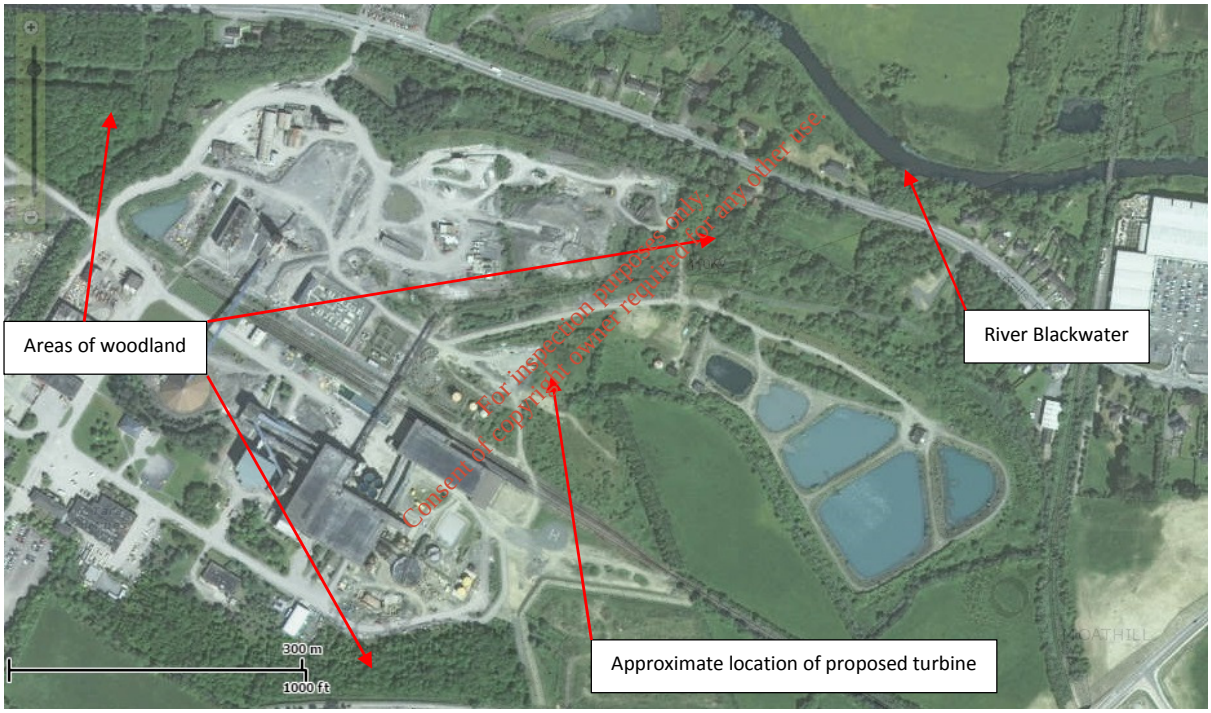


**Figure 8: Aerial photograph illustrating surrounding habitat**

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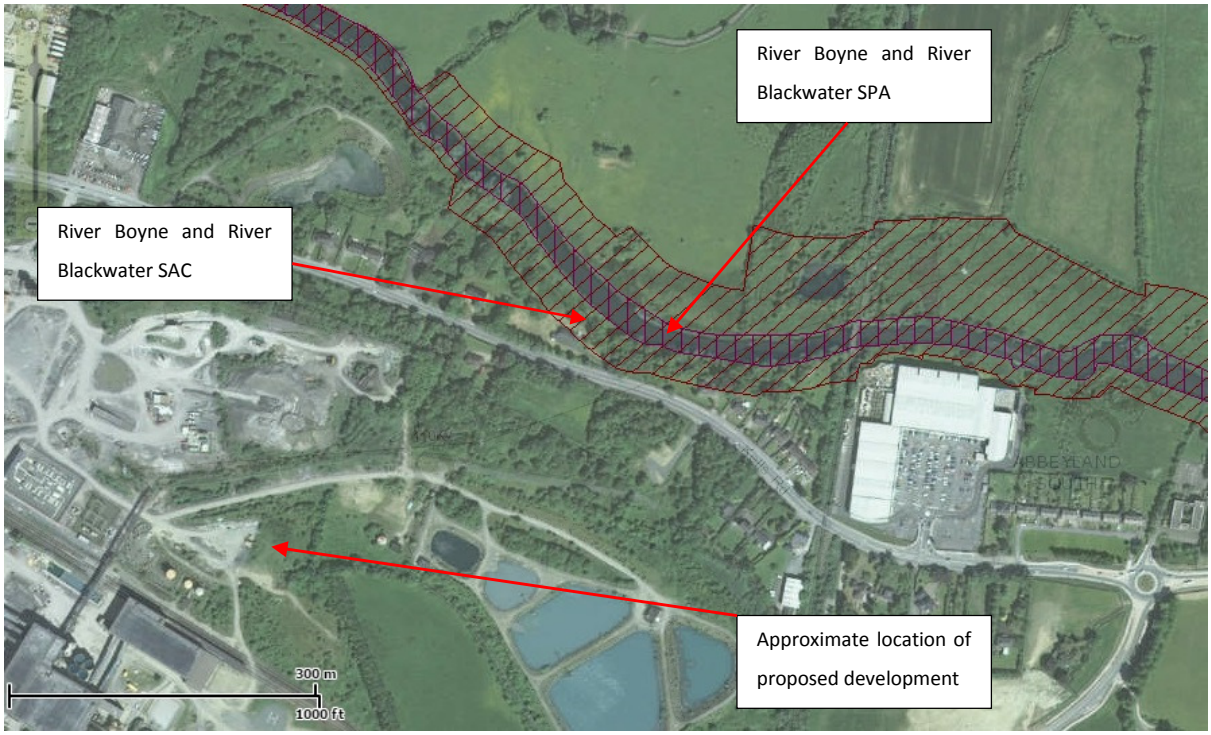


**Figure 9: Location of proposed wind turbine relative to the River Boyne and River Blackwater SAC/SPA**

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No Annex habitats or species were observed utilising the area within the footprint of the site. It is of importance to note, however, that the woodland habitat in the immediate vicinity of the development is of good quality for a number of bat species and given the proximity of the site to an important ecological corridor in the form of the River Blackwater, there is a possibility that this woodland habitat could be utilised as a roost by a number of bat species. All Irish species of bat are listed on Annex IV of the EU Habitats Directive and must be protected wherever they occur.

### 2.1.3 Description of scope

Baseline conditions at the site were ascertained by carrying out a site visit on January 12th, 2015. Although not the optimal time of year for carrying out a flora and fauna survey, given the primary habitat present at the subject site (BL3), a site visit at this time of year is sufficient.

NPWS identify numerous records of species of conservation interest within the 10 km squares in and around the development site (N75, N85, N95, N76, N86, N96, N77, N87 and N97 - source NPWS) including Otter (*Lutra lutra*), Pygmy Shrew (*Sorex minutus*), Red Squirrel (*Sciurus vulgaris*), Meadow Barley (*Hordeum secalinum*), Meadow Saxifrage (*Saxifraga granulata*), Red Hemp Nettle (*Galeopsis angustifolia*) and Hairy St John's Wort (*Hypericum hirsutum)*.



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The nature of habitats, species, and necessary ecological features present within the footprint of the development is entirely anthropogenic. No Annex habitats or species were observed. There are significant areas of woodland in the vicinity of the proposed development, which is approximately 300m from an important ecological corridor in the form of the River Blackwater. It is highly likely that these areas of woodland are used for both foraging and roosting by several species of bat, and it is possible that these bats may pass adjacent to the proposed development site while commuting and/or foraging. Rabbits (*Oryctolagus cunniculus*) were observed in the vicinity of the site, and it is likely that species such as Badger (*Meles meles*), Fox (*Vulpes Vulpes*), Hedgehog (*Erinaceus europaeus*), Pygmy Shrew (*Sorex minutus*) and Stoat (*Mustela erminea*), which are ubiquitous in suitable habitat, may occur in the vicinity of the proposed development. It is unlikely, however, that the proposed development would impact on these species.

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## 2.2 Identification of Natura 2000 sites potentially impacted upon by the development

It is general practice, when screening a plan or project for compliance with the Habitats Directive, to identify all Natura 2000 sites within the functional area of the plan/project itself and within 15 km of the boundaries of the area the plan/project applies to. This approach is currently recommended in the Department of the Environmental, Heritage and Local Government's document Guidance for Planning Authorities and as a precautionary measure, to ensure that all potentially affected Natura 2000 sites are included in the screening process.

The maintenance of habitats and species within individual Natura 2000 sites at favourable conservation condition contributes to the overall maintenance of favourable conservation status of those habitats and species at a national level. It is therefore necessary to identify any potential impacts of the proposed development on the conservation status of Natura 2000 sites.

The National Parks and Wildlife Service deem that the favourable conservation status of a habitat is achieved when:

- Its natural range, and area it covers within that range, is stable or increasing.
- The ecological factors that are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future.
- The conservation status of its typical species is favourable.

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The National Parks and Wildlife Service deem that the favourable conservation status of a species is achieved when:

- Population data on the species concerned indicate that it is maintaining itself.
- The natural range of the species is neither being reduced, or likely to be reduced in the foreseeable future.
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

There is one area designated as a special area of conservation (SAC), and one area designated as a special protection areas within 15 km of the proposed development site (see Table 1, Figure 10 and Figure 11).

**Table 1: Natura 2000 sites within 15 km of the proposed development**

| N2K Site Code | Designation | Site Name |
|---|---|---|
| IE0002299 | SAC | River Boyne and River Blackwater |
| IE0004232 | SPA | River Boyne and River Blackwater |



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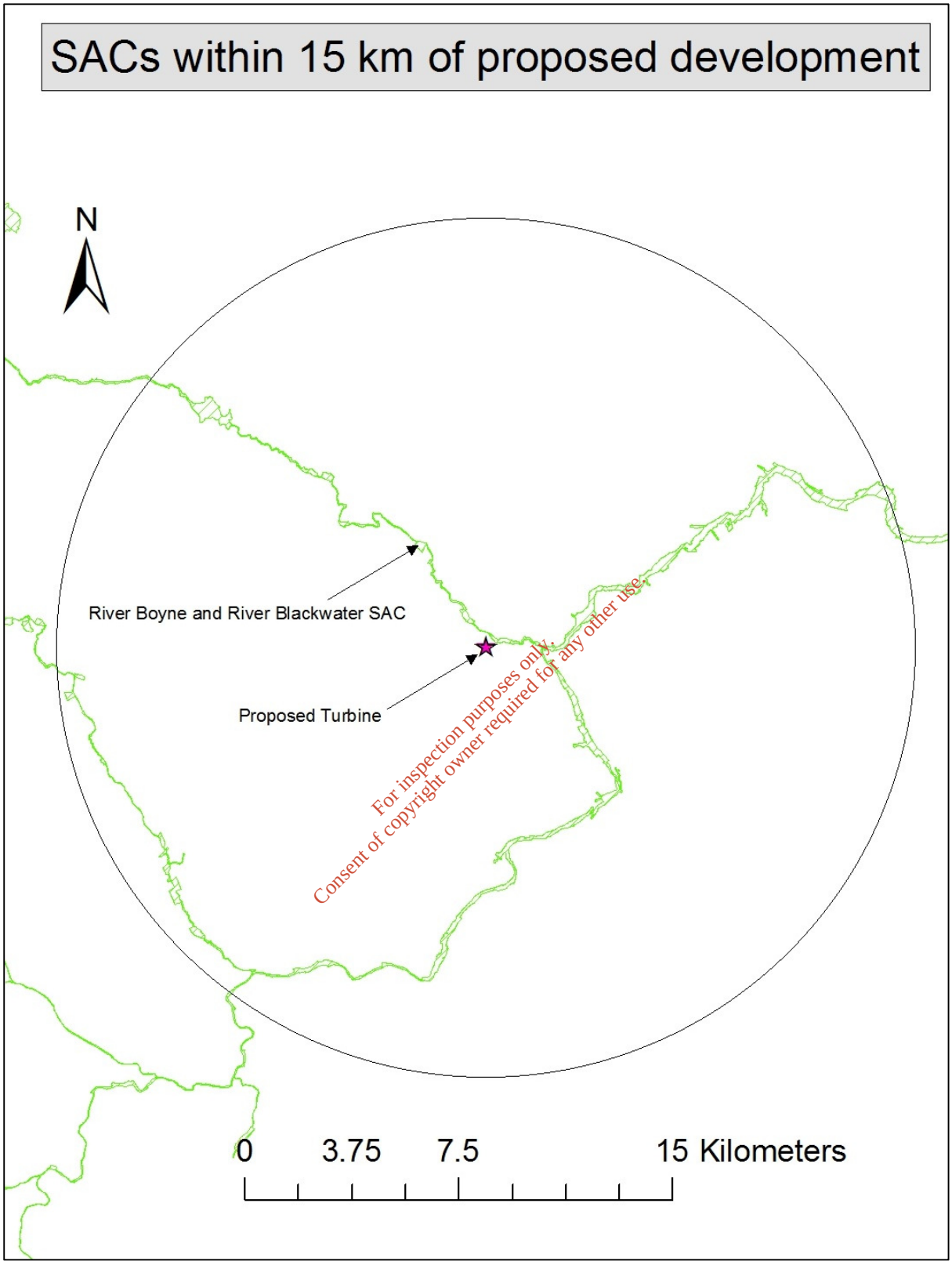


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**Figure 10:** **Map indicating location of Special Areas of Conservation relative to the proposed development**



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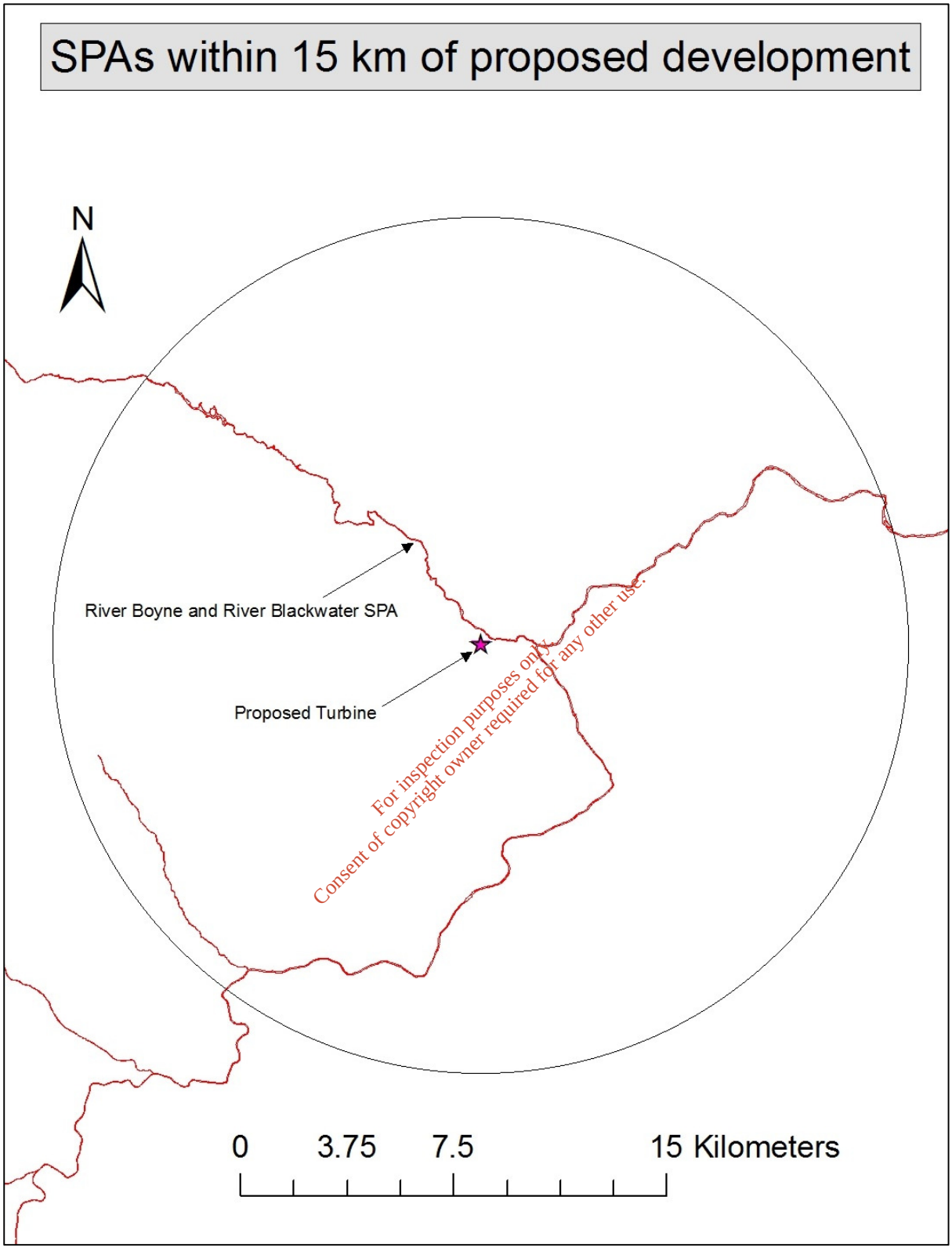


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**Figure 11:** **Map indicating location of Special Protection Areas relative to the proposed development**



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## 2.3 Description of Natura 2000 sites potentially impacted upon

Please note that conservation objectives, qualifying interests, vulnerability and conservation status of individual sites is provided in section 3.2.

### 2.3.1 River Boyne and River Blackwater SAC

The River Boyne and River Blackwater SAC comprises the freshwater element of the River Boyne as far as the Boyne Aqueduct, the Blackwater as far as Lough Ramor and the Boyne tributaries including the Deel, Stoneyford and Tremblestown Rivers and occupies approximately 2320.86 Ha. The site is a candidate SAC selected for alkaline fen and alluvial woodlands, both habitats listed on Annex I of the E.U. Habitats Directive. The site is also selected for the following species listed on Annex II of the same directive – Atlantic Salmon, Otter and River Lamprey.

### 2.3.2 The River Boyne and River Blackwater SPA

The River Boyne and River Blackwater SPA is a long, linear site that comprises stretches of the River Boyne and several of its tributaries; most of the site is in Co. Meath, but it extends also into Counties Cavan, Louth and Westmeath. It includes the following river sections: the River Boyne from the M1 motorway bridge, west of Drogheda, to the junction with the Royal Canal, west of Longwood, Co Meath; the River Blackwater from its junction with the River Boyne in Navan to the junction with Lough Ramor in Co. Cavan; the Tremblestown River/Athboy River from the junction with the River Boyne at Kilnagross Bridge west of Trim to the bridge in Athboy, Co. Meath; the Stoneyford River from its junction with the River Boyne to Stonestown Bridge in Co. Westmeath; the River Deel from its junction with the River Boyne to Cummer Bridge, Co. Westmeath. The site includes the river channel and marginal vegetation. This site is a Special Protection Area, selected for Kingfisher.

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## 2.4 Identification and evaluation of likely significant effect

### 2.4.1 Description of source-pathway-receptor (S-P-R) linkages.

The proposed development site is within 500 m of the River Blackwater, one of the primary constituents of the River Boyne and River Blackwater SAC and the River Boyne and River Blackwater SPA. The development will consist of a wind turbine in close proximity to both an SAC and an SPA. The primary sources of concern with any wind turbine development in such close proximity to an important ecological corridor are potential impacts on birds and potential impacts on bats. The proximity of the proposed development to the SAC and SPA boundaries is illustrated in Figure 12.

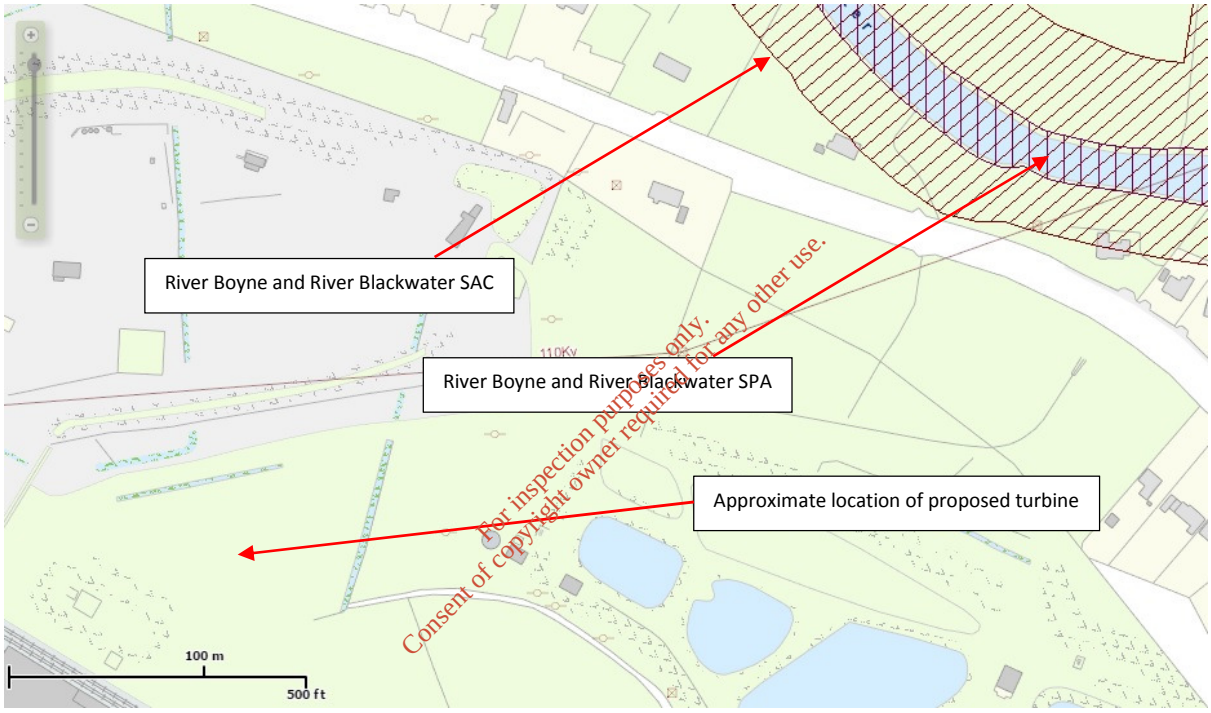


**Figure 12: Map indicating proximity of proposed development to SAC/SPA boundary**



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### 2.4.2 Potential Direct, Indirect or Secondary Impacts

#### *2.4.2.1 Potential Direct Impacts*

The proposed turbine will be located approximately 300 – 400 m from the SAC/SPA boundary. There will be no direct impact on designated conservation concerns of either the SAC or the SPA.

#### *2.4.2.2 Potential Indirect/Secondary Impacts*

The potential impact of wind turbines on birds has been an issue with many recent proposals world-wide and in Ireland. In order to help address this issue, Dr Steve Percival drafted the document "Birds and wind farms in Ireland: A review of potential issues and impact assessment" for the purpose of presenting a methodology, the key aims of which was to establish a process by which wind farm developers and conservation agencies could work together to:

- Ensure that wind farm development does not occur in inappropriate locations where important bird populations may be affected.
- Ensure that bird issues do not hinder the development of wind farms at sites where they are not significant.
- Identify where appropriate mitigation measures should be undertaken and where developments may be able to deliver a conservation gain to the area's ornithological interest.

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Several key pieces of legislation/guidance are utilised to inform the process:

- Habitats Directive
- Birds Directive
- Wildlife act (1976), Wildlife (Amendment) Act (2000) and European Communities (Birds and Natural Habitats) Regulations 2011
- BWI/RSPB NI guidance

The qualifying interest of the River Boyne and River Blackwater SPA is Kingfisher (*Alcedo atthis*). There are several species of conservation concern that occur along the Rivers Blackwater and Boyne, however, including an important population of Whooper Swan. While this species is not a qualifying interest of the River Boyne and River Blackwater SPA, it is a qualifying interest for several SPAs in this region of the country, for example Lough Derravarragh. Impacts on this species in the vicinity of the proposed development could have secondary impacts on populations of Whooper Swan occurring at other Natura 2000 sites.



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The potential for impacts upon Natura 2000 sites within 15 km of the development is summarized in table 2. The potential impact upon the site in the event of negative impacts is summarized in table 3. The potential impacts on qualifying interests of Natura 2000 sites within the 15 km study area identified as potentially at risk are summarised in

Table 4.

**Table 2: The potential for impacts upon Natura 2000 sites within 15 km**

| Site Name | Direct Impacts | Indirect/ Secondary Impacts | Resource requirements (water abstraction etc.) | Emissions (to land, water or air) | Excavation requirements | Duration of construction and operation |
|---|---|---|---|---|---|---|
| River Boyne and River Blackwater SAC | None predicted | None predicted | None predicted | None predicted | None predicted | None predicted |
| River Boyne and River Blackwater SPA | None predicted | Potential secondary impacts regarding *Cygnus cygnus* | None predicted | None predicted | None predicted | None predicted |

**Table 3: Potential changes to Natura 2000 sites within 15 km of the proposed development**

| Site Name | Reduction of habitat area | Disturbance to key species | Habitat/species fragmentation | Reduction in species density | Changes in Key Indicators of Conservation Value | Climate change |
|---|---|---|---|---|---|---|
| River Boyne and River Blackwater | None predicted | None predicted | None predicted | None predicted | None predicted | None predicted |
| River Boyne and River Blackwater SPA | None predicted | Potential secondary impacts on *Cygnus cygnus* | None predicted | None predicted | None predicted | None predicted |

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**Table 4: Potential impacts on Qualifying Interests of Natura 2000 sites identified as at risk of impact**

| Site name | Qualifying Interest | Potential Impact |
|---|---|---|
| River Boyne and River Blackwater SAC | [1099] *Lampetra fluviatilis* | None predicted |
| | [1106] *Salmo salar* (only in fresh water) | None predicted |
| | [1355] *Lutra lutra* | None predicted |
| | [7230] Alkaline Fens | None predicted |
| | [91E0] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Priority habitat) | None predicted |
| River Boyne and River Blackwater SPA | *Alcedo atthis* [Breeding} | None predicted |



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### 2.4.3 Potential cumulative impacts in association with other plans

Article 6(3) of the Habitats Directive requires an assessment of a plan/project to consider other plans/projects that might, in combination with the proposed plan/project, have the potential to adversely impact upon Natura 2000 sites. A list of plans and projects relevant to the proposed development is listed in Table 5, in addition to the potential for cumulative impacts.

**Table 5: Potential cumulative impacts**

| Plan | Purpose | Cumulative impact |
|---|---|---|
| EU Water framework Directive | Maintain and enhance water quality within the EU | None predicted |
| EU Freshwater Fish Directive | Protect freshwater bodies within the EU suitable for sustaining fish populations | None predicted |
| EU Groundwater Directive | Maintain and enhance the quality of groundwater within the EU | None predicted |
| EU Floods Directive | The Floods Directive applies to river basins and coastal areas at risk of flooding | None predicted |
| Nitrates Directive | Reducing water pollution within the EU | None predicted |
| Urban Waste-water treatment Directive | Protecting the environment from adverse impacts of waste-water discharge | None predicted |
| Sewage Sludge Directive | Regulate the use of sewage sludge | None predicted |
| The IPPC Directive | To achieve a high level of environmental protection | None predicted |
| National Development Plan | To promote more balanced spatial and economic development | None predicted |
| National Spatial Strategy | To achieve a better balance of social, economic and physical development across Ireland | None predicted |
| Meath Co. Development Plans | Sustainable development of Co. Meath | Potential in-combination impacts with other developments comprising wind turbines |
| Local Area Development Plans | Various | None predicted |
| Current and future wind turbine installations | Miscellaneous | Potential in-combination impacts on *Cygnus cygnus* in the locality |

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There is a potential for cumulative impacts as described in Table 5. Given the scale and location of the works, however, there will be no cumulative impact on the Natura 2000 network associated with the proposed development.



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### 2.4.4 "Do nothing scenario"

In the event of the "Do nothing scenario", any potential impacts will be avoided. It is important to note, however, that the proposed wind turbine will provide a significant percentage of the electricity supply required by New Boliden (TARA) Mines from a renewable source.

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## 2.5 Conclusions of screening

According to the guidance published by the NPWS (DoEHLG, 2009), Screening for Appropriate Assessment can either identify that a Natura Impact Statement (NIS) is not required where:

(1) A project/proposal is directly related to the management of the site.

(2) There is no potential for significant effects affecting the Natura 2000 network

Where the screening process identifies that significant effects are certain, likely or uncertain the project must either proceed to Stage II Appropriate Assessment or be rejected.

The likely impacts that will arise from the proposed development have been examined in the context of a number of factors that could potentially impact upon the integrity of the Natura 2000 network. On the basis of the findings of this Screening for Appropriate Assessment, it is concluded that the development:

(1) Is not directly connected with or necessary to the management of a Natura 2000 site and

(2) May have secondary impacts on one or more Natura 2000 sites.

Screening has identified potential impacts upon a Natura 2000 site(s) associated with the proposed development - therefore, applying the Precautionary Principle and in accordance with Article 6(3) of the Habitats Directive, a Stage 2 Appropriate Assessment is required, i.e., "*The consideration of the impact of the project or plan on the integrity of the Natura 2000 Site, either alone or in combination with other projects or plans to the sites structure and function and its conservation objectives. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts.*"

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# 3 Appropriate Assessment

## 3.1 Stage II Appropriate Assessment background

Screening having identified potential impacts, stage II Appropriate Assessment is carried out to determine if the plan will adversely affect the integrity of the Natura 2000 network, i.e. any of those sites outlined in section 2.2. This involves the identification of potentially affected sites and their location in relation to the development. It involves the identification of the habitats and species within the site, and an assessment of the significance of impacts on their conservation status. An assessment of impacts is carried out, and mitigation measures proposed for potential impacts. Any negative impacts on the integrity of structure, function or conservation objectives of these sites will require the implementation of avoidance or mitigation measures to avoid progression to Stages 3 and 4 of the Appropriate Assessment process.

## 3.2 Description of the qualifying interests, vulnerabilities and conservation status of Natura 2000 sites potentially impacted upon by the proposed development

Please note that it is the goal of NPWS to draw up conservation plans for all areas designated for nature conservation, and that these plans will, among other things, set clear objectives for the conservation of the features of interest within a site. At present, for the majority of sites, a Management Plan is not yet available. NPWS have provided a site synopsis, generic Conservation Objectives and a Natura 2000 data form for these sites from which information is sourced. In addition to a description of the qualifying interests of the individual sites and their vulnerabilities, a synopsis of the conservation status of qualifying interests will be presented in table form for each site, as recorded in the Natura 2000 Data Form for each site. The codes utilized within these forms are available from http://bd.eionet.europa.eu/activities/Natura_2000/reference_portal

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The descriptions and conservation status of individual qualifying interest is taken from the 2013 NPWS Conservation Status of EU-protected habitats and species report, available from the Natura 2000 section of the EU website.

A description of the Natura 2000 sites potentially impacted upon by the proposed works including conservation objectives, qualifying interests, vulnerability and conservation status of habitats/species within individual sites and conservation status of qualifying interests on a national basis, is provided as follows.



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### 3.2.1 River Boyne and River Blackwater SAC

This site comprises most of the freshwater element of the River Boyne from upriver of the Boyne Aqueduct at Drogheda, the Blackwater River as far as Lough Ramor and the principal Boyne tributaries, notably the Deel, Stoneyford and Tremblestown Rivers. This system drains a considerable area of Cos. Meath and Westmeath and smaller areas of Cavan and Louth. The underlying geology is Carboniferous Limestone for the most part with areas of Upper, Lower and Middle well represented. In the vicinity of Kells Silurian Quartzite is present while close to Trim are Carboniferous Shales and Sandstones. The rivers flow through a landscape dominated by intensive agriculture, mostly of improved grassland but also cereals. Much of the river channels were subject to arterial drainage schemes in the past. Natural flood-plains now exist along only limited stretches of river, though often there is a fringe of reed swamp, freshwater marsh, wet grassland or deciduous wet woodland. Along some parts, notably between Drogheda and Slane, are stands of tall, mature mixed woodland. Substantial areas of improved grassland and arable land are included in site for water quality reasons. There are many medium to large sized towns adjacent to but not within the site.

The main channel of the Boyne contains a good example of alluvial woodland of the *Salicetum albo-fragilis* type which has developed on three alluvium islands. Alkaline fen vegetation is well represented at Lough Shesk, where there is a very fine example of habitat succession from open water to raised bog. The Boyne and its tributaries is one of Ireland's premier game fisheries and offers a wide range of angling, from fishing for spring salmon and grilse to sea trout fishing and extensive brown trout fishing. The site is one of the most important in eastern Ireland for *Salmo salar* and has very extensive spawning grounds. The site also has an important population of *Lampetra fluviatilis*, though the distribution or abundance of this species is not well known. *Lutra lutra* is widespread throughout the site. Some of the grassland areas along the Boyne and Blackwater are used by a nationally important winter flock of *Cygnus cygnus*. Several Red Data Book plants occur within the site, with *Pyrola rotundifolia*, *Poa palustris* and *Juncus compressus*. Also occurring are a number of Red Data Book animals, notably *Meles meles*, *Martes martes* and *Rana temporaria*. The River Boyne is a designated Salmonid Water under the EU Freshwater Fish Directive.

A synopsis of the threats and pressures associated with the site (as indicated in the Natura 2000 form) is presented in Table 6.

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**Table 6: Impacts and activities with high impact on this site**

| Negative Impacts | | | |
|---|---|---|---|
| Rank | Threats and pressures [code] | Pollution (optional) [code] | inside/outside [i\|o\|b] |
| H | A04 | | i |
| H | B | | i |
| M | J02 | | i |
| H | A01 | | o |
| H | A08 | | i |
| H | A08 | | o |
| H | A01 | | i |
| H | F02.03 | | i |
| M | G01.01 | | i |
| M | B | | o |
| M | E03 | | i |
| H | E01.03 | | o |
| H | E01 | | o |
| H | D01.02 | | i |
| H | A04 | | o |
| H | D01.02 | | o |
| M | G01.02 | | i |

Rank: H = high, M = medium, L = low

| Positive Impacts | | | |
|---|---|---|---|
| Rank | Activities, management [code] | Pollution (optional) [code] | inside/outside [i\|o\|b] |
| H | F02.03 | | i |
| M | G01.02 | | i |
| M | G01.01 | | i |

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The primary conservation objective of this site is 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:

**[7230] Alkaline Fens**

Alkaline fens are typically calcareous basin or flush fen systems with extensive areas of species-rich small sedge communities. These fen systems are often a complex mosaic of habitats, with co-occurring tall sedge beds, reedbeds, wet grasslands, springs and open-water. The habitat is characterised by a broad range of small to medium Carex spp., carpets of brown mosses and high species diversity including black bog-rush (*Schoenus nigricans*), blunt-flowered rush (*Juncus subnodulous*), devil's bit scabious (*Succisa pratensis*), hemp agrimony (*Eupatorium cannabinum*) and purple moor-grass (*Molinia caerulea*). This habitat requires a high water table, a calcareous, low nutrient water supply and minimal water level fluctuation. Low intensity mowing and/or grazing are also very important for maintaining species richness. In Ireland, the most extensive areas of alkaline fens are thought to occur in lowland basins underlain by limestone groundwater bodies with a karstic or poorly productive flow regime. Alkaline fens within upland and lowland flushes, along the fringes of calcareous lakes (e.g. Lough Corrib) and within turloughs, dune slacks and machair are thought to be more limited in local extent but more widespread. The current distribution and range maps provide a more refined estimate of the national habitat extent since 2007, but further survey is needed. Some losses of fen habitat are considered to have occurred since the Directive came into



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force, though the magnitude of the loss is unknown. The main pressures were identified as peat extraction, wetland reclamation and infilling. Wetland habitats are afforded additional protection under recent Agriculture Environmental Impact Assessment Regulations, however the Overall Status is considered to be Bad due to the pressures outlined; the overall trend is Unknown due to the absence of a national survey for this habitat. It is not foreseen that the proposed development will have any impact on this habitat within the SAC.

**[91EO] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)**

Riparian forests of ash (*Fraxinus excelsior*) and alder (*Alnus glutinosa*) occurs on heavy soils which are periodically inundated by the annual rise of river levels, but which are otherwise well drained and aerated during low water. The herbaceous layer includes many tall species such as remote sedge (*Carex remota*), gypsywort (*Lycopus europaeus*), common nettle (*Urtica dioica*) and water avens (*Geum rivale*). In addition there are gallery forests of tall willows alongside river channels and occasionally on river islands, where the tree roots are almost continuously submerged. They are dominated by white willow (*Salix alba*), common osier (*S. viminalis*) and almond willow (*S. triandra*), sometimes with grey willow (*S. cinerea*) but alder is relatively rare. This habitat has suffered considerable historic losses and is highly fragmented. Non-native and invasive species especially sycamore (*Acer pseudoplatanus*) and beech (*Fagus sylvatica*), and problematic native species such as bramble (*Rubus fruticosus*) and common nettle (*Urtica dioica*) (a consequence of under grazing) are regarded as the main pressures impacting this habitat. The Overall Status is assessed as Bad due to these ongoing pressures and highly fragmented nature of this habitat. There have been national efforts to remove non-native and invasive plant species reinstate correct hydrological regimes and generally to improve the conservation status of alluvial woodlands. Some substantial areas have been rehabilitated, and this is the main reason for the improving trend reported since the 2007 assessment. It is not foreseen that the proposed development will have any impact on this habitat within the SAC.

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**[1099] *Lampetra fluviatilis***

The river lamprey (*Lampetra fluviatilis*) breeds in freshwater rivers and streams. Adults spawn in spring, excavating shallow nests in gravels and stones. After hatching, the larvae called ammocoetes drift or swim downstream to areas of river bed with a fine silt composition. They burrow into this bed material and live as filter feeders over a period of years before transforming into young adult fish. As adults they are parasitic, attaching to and feeding on larger fish in coastal waters. They can



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grow to 30cm at maturity at which stage they re-enter freshwater to spawn. The adult fish die after spawning. River and brook lamprey are indistinguishable as larvae, living as filter feeders in sediment. The mature adult forms are clearly distinguishable on the basis of body size. The two types of lamprey are considered by many in the same context as the brown trout / sea trout pairing, with a similar absence of genetic discriminators. Lamprey surveys in Ireland have necessarily focussed on juvenile lamprey. Consequently, the vast majority of available data relates to "Lampetra sp." and cannot be assigned to one species or the other. For the above reasons the brook lamprey and the river lamprey are assessed jointly. There are extensive areas of suitable habitat and no significant pressures impacting these species. The Overall Status is therefore assessed as Favourable. It is not foreseen that the proposed development will have any impact on this species within the SAC.

**[1106] *Salmo salar***

The range of the Atlantic salmon (*Salmo salar*) extends in an arc from northern Portugal in the east, to New England, United States in the west. Salmon use rivers to reproduce and as nursery areas. Eggs are deposited during the winter in a depression, called a redd, excavated in river gravels. The eggs develop protected within the substrate and during spring hatch into alevins, which in turn develop into fry. The fry feed for the summer and over the autumn, gradually becoming parr. Fry and parr feed primarily upon invertebrates. The Irish population generally comprises fish that spend two winters (small numbers spend one or three winters) in freshwater before going to sea, in spring, as smolts at around 10-25cm in length. Adults spend one to three years at sea where growth rates are much greater. They feed upon crustaceans and fish (e.g. capelin and sandeels) as they migrate to feeding grounds in the North Atlantic. The majority of Irish fish spend one winter at sea before returning to their natal rivers, mainly during the summer, as grilse. Smaller numbers spend two or even three winters at sea, returning mainly in spring, hence "spring" salmon. There has been a recent stabilisation of the numbers of salmon spawning in Ireland and an increasing number of salmon rivers meeting their conservation limits, however low rates of marine survival are of concern. Different units were used to measure population size in 2007; there is no genuine change in the overall population estimate. There are numerous threats to the freshwater habitat and vigilance is required to ensure the maintenance of good quality habitat which salmon require to thrive. The salmon population is still low in comparison to previous decades and so, in the absence of a recovery, the Overall Status is assessed as Inadequate. It is not foreseen that the proposed development will have any impact on this species within the SAC.

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**[1355] *Lutra lutra***

Dramatic declines, leading in some cases to extinctions, occurred in many European otter (*Lutra lutra*) populations during the latter half of the 20th Century, however, Ireland has remained a stronghold for the species. Otters have two basic requirements: aquatic prey and safe refuges where they can rest. In Ireland, otter populations are found along rivers, lakes and coasts, where fish and other prey are abundant, and where the bank-side habitat offers plenty of cover. The otter is an opportunistic predator with a broad and varied diet. In coastal areas fish, crabs and molluscs are known to be eaten. In freshwater areas a variety of fish from sticklebacks to salmon and eels will be taken, while crayfish and frogs can be important locally or seasonally. The main threats to the otter include habitat destruction (including river drainage and the clearance of bank-side vegetation); pollution, particularly organic pollution resulting in fish kills; and accidental deaths (road traffic and fishing gear). The otter is currently widespread throughout Ireland and present in a wide variety of habitat types. Previous concerns about population decline have been allayed and the latest estimate puts the population at approximately 15-20,000 animals. Therefore the Overall Status is assessed as Favourable. It is not foreseen that the proposed development will have any impact on this species within the SAC.

A synopsis of the conservation status of this site is provided in Table 7 and Table 8.

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Table 7: Conservation assessment of Annex I habitat occurring at the site

| Annex I Habitat types | | | | | | Site assessment | | | |
|---|---|---|---|---|---|---|---|---|---|
| Code | PF | NP | Cover [ha] | Cave [number] | Data quality | A\|B\|C\|D | A\|B\|C | | |
| | | | | | | Representativity | Relative Surface | Conservation | Global |
| 7230 | | | 23.21 | | M | B | C | B | B |
| 91E0 | | | 23.21 | | M | B | B | B | B |



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Table 8: Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

| Species | | | | | Population in the site | | | | | | Site assessment | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| G | Code | Scientific Name | S | NP | T | Size | | Unit | Cat. | D.qual. | A\|B\|C\|D | A\|B\|C | | |
| | | | | | | Min | Max | | | | Pop. | Con. | Iso. | Glo. |
| B | A038 | Cygnus cygnus | | | w | 50 | 200 | i | | G | C | B | C | B |
| F | 1099 | Lampetra fluviatilis | | | r | | | | P | M | C | B | C | B |
| M | 1355 | Lutra lutra | | | p | | | | P | M | C | A | C | A |
| F | 1106 | Salmo salar | | | r | | | | C | M | C | B | C | B |

### 3.2.2 River Boyne and River Blackwater SPA

The River Boyne and River Blackwater SPA is a long linear site that comprises stretches of the River Boyne and several of its tributaries: most of the site is in Co Meath but it extends also into Counties Cavan, Louth and Westmeath. It includes the following river sections: The River Boyne from the M1 motorway bridge, west of Drogheda, to the junction with the Royal Canal, west of Longwood, Co Meath; the River Blackwater from its junction with the River Boyne in Navan to the junction with Lough Ramor in Co Cavan; the Tremblestown River (and Athboy River) from the junction with the River Boyne at Kilnagross Bridge to the bridge in Athboy, Co Meath; the Stoneyford River from its junction with the River Boyne to Stonestone Bridge in Co. Westmeath; the River Deel from its junction with the River Boyne to Cummer Bridge, Co.Westmeath. The site includes the river channel and marginal vegetation.

The River Boyne and River Blackwater SPA supports nationally important numbers of *Alcedo atthis*. Other species which occur within the site include *Cygnus olor*, *Anas crecca*, *Anas platyrhynchos*, *Phalacrocorax carbo*, *Ardea cinerea*, *Gallinula chloropus*, *Gallinago gallinago* and *Riparia riparia*.

A synopsis of the threats and pressures associated with the site (as indicated in the Natura 2000 form) is presented in Table 9.

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Table 9: Impacts and activities with high impact on this site

| Negative Impacts | | | |
|---|---|---|---|
| Rank | Threats and pressures [code] | Pollution (optional) [code] | inside/outside [i\|o\|b] |
| H | D01.02 | | o |
| M | J02 | | i |
| H | D01.02 | | i |
| H | E01 | | o |
| H | E01.03 | | o |

| Positive Impacts | | | |
|---|---|---|---|
| Rank | Activities, management [code] | Pollution (optional) [code] | inside/outside [i\|o\|b] |
| L | X | | i |

Rank: H = high, M = medium, L = low
Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification, T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
i = inside, o = outside, b = both

The primary conservation objective of this site is to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:

- Kingfisher (*Alcedo atthis*)

It is not foreseen that the proposed development will have any impact on this species within the SPA.

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A synopsis of the conservation status of this site is provided in Table 10.

Table 10: Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

| Species | | | | | Population in the site | | | | | | Site assessment | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| G | Code | Scientific Name | S | NP | T | Size | | Unit | Cat. | D.qual. | A\|B\|C\|D | A\|B\|C | | |
| | | | | | | Min | Max | | | | Pop. | Con. | Iso. | Glo. |
| B | A229 | Alcedo atthis | | | r | 19 | 19 | p | | G | C | B | C | B |
| B | A052 | Anas crecca | | | w | 166 | 166 | i | | G | C | B | C | C |
| B | A053 | Anas platyrhynchos | | | w | 219 | 219 | i | | G | C | B | C | C |
| B | A028 | Ardea cinerea | | | w | 44 | 44 | i | | G | C | B | C | C |
| B | A017 | Phalacrocorax carbo | | | w | 36 | 36 | i | | G | C | B | C | C |



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## 3.3 Impact assessment

### 3.3.1 Identified Pathways

The proposed wind turbine is located within 500m of a sensitive ecological receptor in the form of the River Blackwater, one of the primary constituents of the River Boyne and River Blackwater SAC and River Boyne and River Blackwater SPA.

### 3.3.2 Identified Impacts

It must be noted that there will be no direct impacts of the proposed development on the qualifying interests of any Natura 2000 sites within 15 km of the development, and any potential impacts will be secondary, or on Annex IV species. There are two primary concerns regarding the proposed wind turbine:

- Impacts on the Annex I Whooper Swan through collision and/or disturbance.
- Impacts on one or more bat species, primarily through barotrauma.

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### 3.3.3 Gauging of Impacts on Natura 2000 sites – Integrity of site checklist

The potential impacts of the proposed development on Natura 2000 sites are gauged using a checklist, which aids in determining whether the development has the potential to have a significant negative impact on any Natura 2000 site. This checklist consists of a number of pertinent questions as set out in Table 11.

**Table 11: Potential of the proposed development to impact upon Natura 2000 sites in the absence of any mitigation/ precautionary measures.**

| **Does the Plan have the potential to:** | **Yes/No** |
|---|---|
| Cause delays in progress towards achieving the conservation objectives of the Natura 2000 site? | NO |
| Interrupt progress toward achieving the conservation objectives of the Natura 2000 site? | NO |
| Disrupt those factors helping to maintain the favourable conditions at the Natura 2000 site? | NO |
| Interfere with the balance, distribution and density of key species that are the indicators of the favourable condition of the Natura 2000 site? | YES |
| Cause changes to the vital defining aspects (e.g. nutrient balance) that determine how the Natura 2000 site functions as a habitat or | NO |
| Change the dynamics of the relationships (between, for example, soil and water or plants and animals) that define the structure | NO |
| Interfere with predicted or expected natural changes to the Natura 2000 site (such as water dynamics or chemical composition)? | NO |
| Reduce the area of key habitats within the Natura 2000 site? | NO |
| Reduce the population of key species of the Natura 2000 site? | NO |
| Alter the balance between key species of the Natura 2000 site? | NO |
| Reduce the biodiversity of the Natura 2000 site? | NO |
| Result in disturbance that could affect population size or density or the balance between key species within the Natura 2000 site? | NO |
| Result in fragmentation? | NO |
| Result in the loss or reduction of key features of Natura 2000 sites? | NO |

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### 3.3.4 Sources and significance of impacts

The primary sources of concern with regard to the proposed works, and their significance are:

- There is potential for impacts on Whooper Swan, a species listed on Annex I of the EU Birds Directive. It is generally accepted that Whooper Swan is a species particularly at risk from collision owing to biometrics and foraging/roosting behaviour (travelling between foraging and roosting sites in formation in large numbers, at low altitude, under conditions of poor visibility. However, research indicates that collision events are relatively rare (Still et al 1996, Langston and Pullan 2003, Drewitt and Langston 2006) and that the majority of birds actively avoid flying into turbines. It must be noted that the overhead cables often associated with wind-turbines may pose a greater threat that the turbines themselves. It is considered, given the scale of the proposed development (1 turbine with nacelle height of 60m) and the location of the turbine within a heavily disturbed, industrial complex, that the risk posed to Whooper Swan can be reduced to negligible levels by implementing some very basic mitigation measures;
- There is potential for impacts on species of bat (all Irish species of bat are listed on Annex IV of the EU Habitats Directive). The majority of bat species found in Ireland typically fly at low altitude and are at relatively low risk from wind turbine installations. Leisler's bat, however, is classified as a high risk species in relation to wind turbines as it is a high flier (Carlin and Mitchell-Jones 2009) and travels considerable distances (up to 13.4 km has been recorded in Ireland, Shiel *et al.* 1999) between roosts and foraging areas. The species has evolved for fast flight in excess of 40km/h (Dietz *et al.* 2007) and is less manoeuvrable as a consequence. It therefore avoids cluttered environments by keeping above the tree canopy normally flying between 10m and 70m above the ground (Russ 1999). Flying at such heights potentially brings it into direct risk of collision with wind turbines. It is considered, however, that given the location and scale of the proposed wind turbine that with the implementation of suitable mitigation/preventative measures, the risk of impact can be reduced to negligible levels.

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# 4 Mitigation/Preventative measures

The main potential concerns regarding the proposed works are:

- Impacts on Whooper Swan.

The risk of impacts on over-wintering Whooper Swan are very low, given the location of the development within an existing brown-field site, with numerous tall structures and no habitat suitable for feeding or roosting sites. Whooper Swan generally commute at low altitude (5 – 20m) and even if they pass directly through the area of the proposed turbine, are unlikely to fly within the rotor envelope (30 – 90m). The largest threat in the landscape with regards to Whooper Swan and collision is overhead cables. It is therefore recommended that any cables connecting the wind turbine to substations, etc. be underground as opposed to over-ground.

- Impacts on local bat populations.

Wind turbines are a known risk to bats. EUROBATS Secretariat has published guidelines on bats and wind farm projects (Rodrigues et al. 2008) to ensure bats are considered as part of development proposals. The Irish Government has yet to produce national guidelines as has been done in the UK and Northern Ireland but, following discussions with numerous interested parties, Bat Conservation Ireland published wind turbine/wind farm development bat survey guidelines in December 2012.

A study in 2008 by Baerwald *et al*. showed that bats do not have to make contact with the blades of a wind turbine to be killed as the change in atmospheric pressure resulting from the rotating rotor causes bats' lungs to haemorrhage leading to the animal's death (barotrauma). While most Irish species of bat fly below the rotor envelope of wind turbines, Leisler's bat flies at higher altitudes (Carlin and Mitchell-Jones 2009) and travels considerable distances (up to 13.4 km has been recorded in Ireland, Shiel *et al.* 1999) between roosts and foraging areas. The species has evolved for fast flight in excess of 40km/h (Dietz *et al.* 2007) and is less manoeuvrable as a consequence. It therefore avoids cluttered environments by keeping above the tree canopy normally flying between 10m and 70m above the ground (Russ 1999). Flying at such heights potentially brings Leisler's Bat into direct risk of collision with wind turbines. It is unlikely, given the heavily industrialised habitat present, that the footprint of the development will be heavily utilised by any bat species. It is, however, recommended that a comprehensive bat survey of the area be undertaken to verify this.

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# 5 General Ecological Recommendations

Hedgerows/scrubland provide essential ecological corridors and habitat throughout the Irish landscape. It is recommended that all hedgerows/scrubland be retained intact in the vicinity of the development site (not including any areas to be removed during the construction process).

If trees or sections of hedgerow are to be removed, mitigation measures will be required:

(1) Given the habitats present, hedgerows/trees may provide important commuting and foraging corridors, in addition to providing potential roosting sites for bats. All Irish bat species are protected under European and Domestic legislation. All bats occurring in Ireland are on Annex IV of the EU Habitats Directive. Plants and animals listed on Annex IV of the Habitats Directive are strictly protected wherever they occur. Under Irish Law (Irish Wildlife Act 1976 and Wildlife (Amendment) Act 2000) it is a criminal offence to intentionally harm or disturb a bat in its place of rest. It is recommended that all hedgerows be retained, but if any sections of hedgerow or trees are to be removed, a comprehensive survey of the usage of any hedgerow/trees by bats, which are to be removed must be undertaken.

(2) According to section 46 of the Wildlife (Amendment) Act 2000, it is an offence to cut, grub or otherwise destroy any vegetation growing in any hedge or ditch during the period beginning on March 1st and ending on August 31st inclusive owing to the impact upon breeding birds. If there is to be disturbance/clearance of any areas of scrub/hedges/trees adjacent to the site, works must be carried out outside of this period.

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# 6 Conclusions

Following the identification of a potential impact upon a Natura 2000 site through an Appropriate Assessment Screening exercise, a Stage 2 Appropriate Assessment of the proposed development has been carried out in accordance with the requirements of Article 6(3) of the Habitats Directive (Council Directive 92/43/EEC).

The risks to the safeguarding and integrity of the qualifying interests and conservation objectives of the Natura sites described herein have been addressed by the inclusion of a number of mitigation and preventative measures to ensure that the proposed development should have no significant impact on the Natura 2000 network.

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www.npws.ie – website of the National Parks and Wildlife Service, source of information for data regarding Natura 2000 sites.

www.europa.eu – official website of the European Union, source of information on EU Directives.

www.meath.ie – official website of Meath Co. Council, source of information regarding Co. Meath Development Plan and Local Area Plans within Co. Meath.

www.epa.ie – official website of the Environmental Protection Agency.

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# Appendix B.6 - 6

# NIS – Discharge to River Blackwater

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NEW BOLIDEN
TARA MINES

# NATURA IMPACT STATEMENT
# of
# PROPOSED DISCHARGE OF GROUNDWATER TO RIVER BLACKWATER

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September 2010

TOBIN CONSULTING ENGINEERS

TOBIN
Patrick J. Tobin & Co. Ltd.

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# REPORT

**PROJECT:**

**Natura Impact Statement**
**Proposed Discharge of Groundwater to River Blackwater**

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**CLIENT:**

**Boliden Tara Mines Limited**
Knockumber House
Navan
County Meath

**COMPANY:**

**TOBIN Consulting Engineers**
Unit 10-4
Blanchardstown Corporate Park
Dublin 15

www.tobin.ie

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## DOCUMENT AMENDMENT RECORD

| | |
|---|---|
| **Client:** | **Boliden Tara Mines Limited** |
| **Project:** | **Proposed Discharge of Groundwater to River Blackwater** |
| **Title:** | **Natura Impact Statement** |

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| | |
|---|---|
| **PROJECT NUMBER: 6270** | **DOCUMENT REF: DR01** |

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| | | | | | | | |
| A | Final Issue to Client | MC/ST | 09/09/10 | CK | 16/09/10 | DG | |
| **Revision** | **Description & Rationale** | **Originated** | **Date** | **Checked** | **Date** | **Authorised** | **Date** |
| **TOBIN Consulting Engineers** | | | | | | | |

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# EXECUTIVE SUMMARY

*This report presents the findings of a quantitative assessment of the potential impact of discharging clean groundwater directly to the River Blackwater. This proposal is a change to the existing water management system, however the proposal is in accordance with IPPC requirements for other similar mining facilities.*

*The volume of groundwater ingress to the mine workings has increased significantly over the lifetime of the mine. The increased volume of clean groundwater has had the effect of reducing the retention time in the treatment system thereby reducing the effectiveness of treatment. The diversion of clean groundwater to a new discharge system will reduce the volumetric loading on the existing treatment system thus ensuring continued effective water treatment and discharge.*

*The discharge of clean groundwater to the River Blackwater will prove an environmental improvement measure, resulting in an overall benefit to the receiving waters.*

*The biological quality of the River Boyne has remained consistent both upstream and downstream of the existing discharge point over the past 35 years. The biological quality of the River Blackwater has remained stable over the past 25-30 years.*

*This report provides details and calculation to demonstrate that discharge of groundwater to the River Blackwater will not result is any negative impact, both in terms of overall biological quality or physico-chemical quality. The discharge will not pose a risk to aquatic, animal or human life.*

*The proposed groundwater abstraction is of a high standard and the groundwater analysis indicates that there the concentration of nutrients is very low. Therefore, the discharge of clean groundwater to the River Blackwater will dilute and reduce the concentration of nutrient load in the surface water and ultimately improve the surface water chemistry*

*In terms of abstraction design, the groundwater from the Nevinstown groundwater inflow area will be completely isolated and pumped directly to the River Blackwater from underground, via a diffuser tube across the water channel. The discharge arrangements are proposed to minimise ground disturbance within the River Blackwater.*

*Tara Mines will continue to operate an extensive water-monitoring programme to ensure all discharges from the site are in compliance with the emission limits of its IPPC Licence.*

*Tara Mines seek that the discharge of groundwater to the River Blackwater be assessed and regulated under Condition 9 of its IPPC Licence. Any existing discharges of treated process water would continue to be regulated under Condition 6 of the IPPC Licence. A review of the current IPPC Licence is requested to amend the current Condition 9 to incorporate such a discharge and requirements for monitoring of such discharge.*

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# 1 INTRODUCTION

In 2008, TOBIN Consulting Engineers were engaged by Boliden Tara Mines Limited to undertake an environmental study of their water treatment and discharge arrangements at their facility in Navan County Meath. A report, based on this study, was submitted to the Office of Climate Change, Licensing & Resource Use of the Environmental Protection Agency (EPA) in February 2009 entitled "An Appropriate Assessment of Proposed Discharge of Groundwater to River Blackwater". The following is an update of that report which includes recent monitoring data and reference to regulations that have been introduced since the previous report. Note: Due to recent regulations, the Appropriate Assessment is now a Natura Impact Statement (NIS)

The Tara Mines operation is licensed (IPPC Licence No. P0516-01) by the EPA under Section 83(1) of the Environmental Protection Act (1992), to carry out *"the extraction and processing (including size reduction and grading) of minerals within the meaning of the Minerals Development Acts, 1940 and 1979, and the storage of related mineral waste"*. The license is issued subject to 15 No. Conditions.

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At present, all groundwater pumped from underground mine workings is treated and discharged to the River Boyne. Such discharge is regulated under Condition 6 of the IPPC Licence (Process Effluent Emissions to Water). The volume of groundwater ingress to the mine workings has increased significantly over the lifetime of the mine. The increased volume of clean groundwater has had the effect of reducing the retention time in the treatment system thereby reducing the effectiveness of treatment. The diversion of clean groundwater to a new discharge system will reduce the volumetric loading on the existing treatment system thus ensuring continued effective water treatment and discharge.

This report is prepared to assess the potential for diverting clean groundwater from a discrete area of the underground mine working within the Nevinstown Area (from a depth of approximately 200m below ground level (mbgl)) and discharging this water to the River Blackwater.

This examination of the feasibility and potential impact of such water discharge reorganisation will be submitted to the EPA for amendment of the IPPC Licence. Tara Mines are seeking to have the management and discharge of clean groundwater to the River Blackwater regulated under Condition 9 of the IPPC Licence, which regulates Non-Process Water.

The proposal examined in this report and the NIS assessment is to determine the potential for an operational change to the discharge of groundwater from a discrete inflow to the mine, occurring at 200m bgl in the Nevinstown Area. The feasibility and potential impact of such an alteration in water management is also examined.



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The overground infrastructure associated with Tara Mines is located to the south of the River Blackwater, although underground workings extended under the River Blackwater and into the area referred to as the Nevinstown orebody.

The location of the site is shown on Figure 1 in relation to its surrounding geographic environment.

The River Blackwater is designated as a Special Area of Conservation (Site Code 002299). The river channel is designated for species listed under Annex II of the EU Habitats Directive 92/43/EEC, namely Atlantic Salmon, Otter and River Lamprey. The riverine floodplains are designated under the EU Habitats Directive for alkaline fen and alluvial woodlands.

Under the requirements of the EU Habitats Directive, any project likely or potentially likely to have a significant effect on a designated site shall be subject to an Appropriate Assessment or Natura Impact Statement. Also this environmental assessment would be required in support of the review of the IPPC Licence to regulate any changes to the water discharge arrangements.

In summary, this study has undertaken to quantify the potential impact of a proposal which will isolate and contain the groundwater inflow in a discrete mine area and pump this clean groundwater, through a closed pipework system, to a new discharge point to the River Blackwater.

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In net terms the volume of groundwater pumped form the mine workings will remain constant. However, instead of diverting clean groundwater through the water treatment system, mixing it with process effluent and adding unnecessary burden on the water treatment system, Tara Mines is seeking this reorganisation of water discharge regime.

The objective of Tara Mines is to ensure that all discharge from the site is of appropriate quality prior to discharge so that they continue to operate in full compliance with their IPPC Licence emission limits.

The objectives of the study are:

- To describe the existing setting of the site and the current workings with respect to the water management system;
- To review the IPPCL to determine how this water management arrangement could be incorporated into the Licence.
- To determine the possible impact of collecting and diverting clean groundwater (captured as a result of inflows to the mine workings) away from the process water stream;
- To assess the impact of such discharge on the receiving waters, both in terms of quantitative and qualitative assimilation;
- To propose any additional infrastructure required to monitor and demonstrate that the discharge is not impacting on receiving water;



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- To prepare a technical report outlining the findings of the study with a view to liaising with the relevant regulatory authorities.

The Appropriate Assessment was undertaken by TOBIN Consulting Engineers between April and May 2008. All available ecological, hydrological and hydrogeological data and reports from Tara Mines were made available for the purpose of assessment. All additional monitoring data up to August 2010 has been provided by Tara Mines and reviewed as part of this revised Natura Impact Statement report.

This report is considered to fulfil the requirements of the EU Habitats Directive, in terms of assessment of possible impacts of the reorganisation of the water management system on the designated Special Area of Conservation (SAC) on the River Blackwater. The report also presents the technical assessment and impact assessment for the purpose of allowing an amendment of the IPPC Licence for Tara Mines.

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# 2 PROPOSAL OUTLINE

## 2.1 CURRENT OPERATION

During its development and production history, over 35 years, Tara Mines has required a controlled discharge of water to allow mineral extraction in a safe working environment. Water from a number of sources is collected and treated within the site. Further to treatment in primary settlement, secondary settlement and storage in a clear water pond, water is discharged to the River Boyne at a controlled rate. The IPPCL (as adopted from the original IPC Licence) has specified the dilution rates and emission quality of treated water to the River Boyne.

Since commencement of operations, essentially the same water treatment systems have been utilised at Tara Mines. Over time, the lateral extent of the mine workings has increased considerably, relative to the initial understanding of the dimensions of the orebody. The plan area of the workings is approximately 6km in length and 1.5km in width. Consequently, the enlargement of extraction area has resulted in a larger surface area with which water can enter the mine workings.

Notwithstanding the enlargement of the mine workings to current extents, the underground pumping stations and main pumping station has, to date, effectively managed the volumes of groundwater ingress and transmitted this water to the surface for treatment and ultimate discharge to the surface water environment.

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Tara Mines operate an extensive water monitoring programme to ensure all discharges from the site are in compliance with the emission limits specified in the IPPC licence. The monitoring programme analyses a wide range of parameters on a continuous, daily, weekly, monthly and quarterly basis. To date, apart from exceptional circumstances, the water monitoring programme demonstrates full compliance with the Emission Limits for the IPPC Licence.

## 2.2 NEVINSTOWN GROUNDWATER INFLOW

Within the Nevinstown area, a groundwater inflow was encountered during mine development works at 200m bgl in the 1390 N3CHLG development drift. This inflow is considered to be relatively discrete and localised. Site investigations were undertaken, in the form of radial advance water testholes drilled in the vicinity of the initial inflows, prior to the mine development works and no further significant inflows were encountered.

This study was undertaken to assess the feasibility to dewater from this area of the Nevinstown area and discharge this water to a new outfall point on the River Blackwater.

The proposal seeks an alteration of the water management system. At present all water, regardless of quality, is managed as process water and discharged to the River Boyne following treatment. Owing to the high quality of the groundwater inflow at Nevinstown, it is considered



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appropriate to keep this clean water separate from other mine water. This will divide out clean groundwater from other process waters that do require treatment prior to discharge.

This report assesses the potential impact of the proposal in terms of quantity and quality of the groundwater inflow to the mine and the receiving River Blackwater.

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# 3 REGULATION AND PERMITTING

The operations and activities undertaken within Tara Mines are regulated by the Planning and Development Act of 1963 and the Environmental Protection Agency Acts of 1992 and 2003.

Meath County Council granted planning permission to Tara Mines Ltd. on 6th July 1973 for construction of facilities for mining. This permission was upheld by An Bord Pleanála on 12th March 1974. The planning permission granted for the facility and permits by Meath County Council specified emission and quality limits for water discharges from the mine facility.

Since the issue of planning permission for the Tara Mines development, Meath County Council has issued Discharge Licences to regulate the discharge of trade effluent to waters, under the Local Government (Water Pollution) Act 1977. The discharge licences were granted for the existing single point discharge immediately upstream of the Navan Rail Bridge in 1982 (Ref. W82/3) and subsequently reviewed in 1985 (W85/5) and 1990 (W.P. 90/1).

Since its establishment, the EPA has been licensing certain large-scale industrial and agriculture activities (i.e. since 1994). The Environmental Protection Agency granted an Integrate Pollution Control (IPC) Licence for the mining and processing facility in May 2001 (Ref No. 516). The Environmental Protection Agency Act 1992 was amended in 2003 by the Protection of the Environment Act 2003, which gave effect to the Integrated Pollution Prevention Control Directive (EU Council Directive 96/61/EC).

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IPPC licences aim to prevent or reduce emissions to air, water and land, reduce waste and use energy/resources efficiently. An IPPC licence is a single integrated licence which covers all emissions from the facility and its environmental management. All related operations that the licence holder conducts in connection with the activity are controlled by this licence. Before a licence is granted, one must satisfy the Environmental Protection Agency that emissions from the activity do not cause a significant adverse environmental impact.

Further to review of the original IPC Licence No. 516, the EPA determined that the licence could be brought into conformity with the requirements of the IPPC licence Directive, subject to amendments of the IPC Licence 516 and compliance with emission limits imposed.

Tara Mines has established an Environment Department, which is charged with ensuring compliance of operation and emissions with the IPPC Licence. Extensive environmental monitoring is conducted to comply with the IPPCL emission limits.

As part of this proposal, TOBIN Consulting Engineers and Tara Mines have consulted and reviewed other IPPC Licences for similar mining facilities in Ireland. As such, it is noted that dewatering of groundwater is currently regulated by Condition 6 of the Tara Mines IPPC Licence,



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dealing with process water. However, the dewatering of groundwater at Lisheen (Licence Number 550) is regulated under Condition 9, dealing with Non-Process Water.

Owing to the quality of the groundwater inflow at Nevinstown and the proposal to create a closed system to reduce risks of contamination with any other water, it is submitted that the dewatering at Nevinstown could reasonably be accommodated under Condition 9 of the current IPPC Licence. Tara Mines will adhere to all required monitoring and sampling schedules and emission limits to demonstrate that such groundwater discharge will not impact on the quality of the receiving water.

As this proposal seeks alteration of the existing IPPC Licence this report is submitted in support of an amendment of the Licence. Tara Mines seeks authorisation from the EPA to dewater groundwater inflows from Nevinstown directly to the River Blackwater. Tara Mines suggest that the dewatering operations be included and regulated under the current IPPC Licence through amendment of Condition 9.

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# 4 GEOLOGICAL SITE SETTING

Tara Mine was developed approximately 2km west of Navan town, County Meath. The region around Tara Mine comprises flat to gently undulating farmland, with recent residential development along the public road network. The River Blackwater flows from north to south in the environs of Tara Mines, to converge with the River Boyne in Navan Town. The River Boyne and the River Blackwater are designated as Special Areas of Conservation. The site is outlined on Figure 1 of this report.

Ground surface elevation along the River Blackwater is approximately 60m OD. The elevation of the land rises away from the river valley, attaining approximately 90m OD at the mine site.

Mine development works commenced in 1973, with the commencement of production occurring in 1977 for extraction and processing of zinc and lead. The mine is operated by Boliden Tara Mines Limited. The projected mine life extends beyond 2015.

Tara Mines exploits the Navan Zinc and Lead deposits. It is the most productive zinc mine in Europe and the fifth most productive in the world. Up to end of 2007 approximately 68 million tonnes (Mt) of ore (@ 8.5% Zn and 2.1% Pb) has been hoisted. Ore production is currently at approximately 2.7 Mt per annum.

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The Zn-Pb deposit is hosted in limestones and dolomites of Lower Carboniferous age, referred to as Pale Beds. The Pale Beds are often permeable, with cavities present in some areas. The Upper Dark Limestones (UDL) overlies the Pale Beds. This UDL is a well bedded muddy limestone with shale horizons. The UDL forms a low permeability/poor groundwater flow conduit over the Pale Beds.

The mining operation is carried out between 50m and 900m below the surface. The ore zone dips gently to the southwest and varies in thickness from <10m to 80m.

The Tara Mine is divided into the following sub-areas for management and planning.

- The Main Mine was the first area to be mined. The ore in this area has largely been mined.
- The South West Extension (SWEX), to the southwest of the Main Mine.
- Nevinstown, to the north of the Main Mine.
- SWEX and Nevinstown are currently being developed and mined.
- Access to the SWEX and Nevinstown area is from the main mine decline at the Main Mine Site.

Under the current IPPC Licence, Tara Mines are permitted to discharge treated process water to the River Boyne. All discharge from the site is regulated under Condition 6 of the IPPC Licence.



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# 5 ECOLOGICAL STATUS OF RIVER BLACKWATER

Tara Mines is located within the catchment of the River Boyne (Hydrometric Area 7) which is part of the Eastern River Basin District, under the Water Framework Directive.

The River Boyne and the River Blackwater is designated as a Special Area of Conservation (Site Code 002299). The riverine stretches are designated for alkaline fen and alluvial woodland, both of which are listed in Annex I of the EU Habitats Directive. The site is also selected for the following species listed in Annex II of the EU Habitats Directive, namely Atlantic Salmon, Otter and River Lamprey.

The EPA water monitoring data indicates that the biotic index of the River Boyne is consistent at Q3-4 both upstream and downstream of the Navan urban area. This indicates that the quality is of moderate status. The Yellow River joins the River Blackwater approximately 3km upstream of Navan town centre and the EPA classified the status of water quality at this location as “Poor” in 2009.

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The characterisation of the River Boyne, under the Eastern River Basin District (ERBD) Project, indicates that the primary environmental driving force in the Boyne Catchment is considered to be agricultural production. The water quality information suggests that the lengths of unpolluted (Class A) and moderately polluted (Class C) channels have declined, while there is a slight increase in channels classified as slightly polluted (Class B). Impacted river channels were typically located in areas with pasture, arable land, peat bogs and downstream of MWWTP outfalls.

The River Boyne and the River Blackwater are classified as “At Risk” water bodies due to the potential for diffuse agricultural pollution and because the River Boyne has been extensively drained in the 1970s and 1980s. The ERDB has not fully assessed the ecological effect of the drainage works, with respect to the aim of achieving “good ecological status”.

Since the early 1970’s Tara Mines have conducted biological assessments of the water channels in the environs of the site.

With reference to the River Boyne, the biological quality rating is consistent upstream and downstream of the Tara Mines discharge point, with Q-rating varying over time between Q4-5 and Q3-4 (1990 to 2009 results are consistently reported as 3-4 with the exception of the 1997 result (3) upstream of the urban centre). The results strongly suggest that the Tara Mines discharge does not alter the Biological Quality of the River Boyne. The lower quality rating on the River Boyne downstream of Navan is attributable to discharge of domestic effluent from the town.



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In compliance with a condition of the IPPC Licence, in 2002 Tara Mines engaged Aquens Ltd. (a campus company associated with the Zoology Dept. of UCD) to conduct an electro-fishing survey upstream and downstream of the discharge point on the River Boyne. Lateral muscle tissues were dissected from salmon and brown trout and macroinvertebrate crustacean freshwater shrimp (Gammarus duebeni) specimens were also obtained for analysis to determine any bio-accumulation of lead and zinc. The findings of the survey indicate that the current discharge to the River Boyne does not impact on the local aquatic habitat, with lead and zinc concentrations in the fish tissue below the strictest standard value.

With particular reference to the River Blackwater, Tara Mines also engaged Aquens Ltd. to assess the biological status of the River Blackwater in the Nevinstown area. Aquatic surveys of the River Blackwater were undertaken in September 2001 and May 2002. The objective of the study was to assess the status of the aquatic faunal community.

Based on the findings of the studies, the River Blackwater at Nevinstown is assigned a Q rating of 3-4, which is considered indicative of slight organic pollution from upstream of the Nevinstown. The findings of this study are consistent with both the EPA data and the ERBD findings that diffuse agricultural contamination impacts the water quality. The report concludes that the aquatic microinvertebrate fauna in the River Blackwater has remained stable over a 25-30 year timeframe. The only apparent aquatic damage is from more intensive agricultural practices leading to increased leaching of phosphorus and nitrate to the water channels.

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# 6 EXISTING HYDROMETRIC DATA

The Office of Public Works maintains a number of hydrometric stations in the environs of Navan town. There are 3 No. hydrometric stations which are pertinent to this study. Information on the location of the hydrometric stations is provided in Table 6.1 below.

Table 6.1: Location and Catchment Data for Hydrometric Stations in Navan Area

| Station No. | Waterbody | Location | Easting | Northing | Catchment Area ($km^2$) | 5% Flow ($m^3$/sec) | 95% Flow ($m^3$/sec) |
|---|---|---|---|---|---|---|---|
| 07009 | Boyne | Navan Weir | 287905 | 266761 | 1684 | 64.5 | 2.5 |
| 07010 | Blackwater | Liscarton | 284624 | 268941 | 700 | 36.5 | 0.9 |
| 07037 | Boyne | Blackcastle | 287194 | 268035 | - | - | 3.4 |

The hydrometric station information provides highly beneficial information regarding the hydrological conditions on both the River Boyne and the River Blackwater. A high level of information is available for Station Number 07009 (River Boyne) and 07010 (River Blackwater), however the level of data for Station Number 07037 (downstream of River Boyne/River Blackwater confluence) is relatively poor.

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The hydrometric station at Navan Weir is immediately upstream of the existing discharge of treated water from Tara Mines. The flow in the River Boyne is recorded continuously and the discharge from the Tara Mines site is adjusted accordingly, to ensure the dilution rate is maintained within permitted rates. Discharges from the Clear Water Pond within Tara Mines to the River Boyne is limited to a dilution rate of 100:1 under IPPC Licence Conditions.

The hydrometric station on the River Blackwater is located at Liscarton, downstream of the water abstraction and treatment plant operated by Meath County Council. Water for Navan town and surrounds is abstracted at this location (Liscarton Water Treatment Works). The proposed discharge point for groundwater from the Nevinstown Area is located approximately 700m downstream of the current water abstraction point.

There is one further hydrometric station on the River Boyne at Blackcastle, which is immediately downstream of the confluence of the River Blackwater with the River Boyne.

From simple interrogation of the hydrometric data, the following is provided:

1. The River Blackwater catchment is approximately 41.5% the aerial extent of the River Boyne at Navan.
2. The 5% flow (i.e. where the flow is exceeded 5% of the time, usually occurring during winter conditions) of the River Blackwater is higher than that of the River Boyne (pro-rata to the aerial extent of the catchments). While rainfall patterns may differ slightly over the different catchments, that data suggests a higher surface run-off/lower water infiltration to



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ground component to the River Blackwater in comparison to the River Boyne. This high run-off rate/lower water infiltration to ground is consistent with the higher land coverage of gley soils within the Blackwater catchment.

3. The 95% flow (i.e. where flow is exceeded 95% of the time, usually occurring during summer conditions) of the River Blackwater is lower than that of the River Boyne (pro-rata to the aerial extent of the catchments) which suggests a higher groundwater baseflow contribution to the River Boyne in comparison to the River Blackwater.

The hydrometric information from the hydrometric stations is highly significant in determining the potential for discharge of clean groundwater from Tara Mines and in assessing its impact on the receiving River Blackwater. Based on an amalgam of hydrometric information available from the Office of Public Works and the EPA Register of Hydrometric Stations, Table 6.2 displays the flow characteristics of the River Blackwater at Liscarton, which is close to the proposed point of discharge.

Table 6.2: Flow Characteristics of the River Blackwater at Liscarton

| Flow | 1% Flow | 5% Flow | 10% Flow | 50% Flow | 80% Flow | 90% Flow | 95% Flow | Dry Weather Flow |
|---|---|---|---|---|---|---|---|---|
| cu.m/sec | 50.7 | 36.5 | 28.6 | 10.4 | 3.98 | 2.16 | 0.9 | 0.3 |
| cu.m/day | 4,380,480 | 3,153,600 | 2,471,040 | 898,560 | 343,872 | 186,624 | 77,760 | 25,920 |

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# 7. MINEWATER / GROUNDWATER INFLOWS

## 7.1 INTRODUCTION

Tara Mines undertakes significant groundwater monitoring both within the mine working and from surface boreholes throughout their property. This information is periodically collated and presented regularly to regulatory authorities for review under regulatory requirements.

The underground groundwater inflows are monitored for changes in flow rates on a weekly basis and hydrochemistry of these inflows are monitored on a monthly basis. The total volume of groundwater pumped from the mine is measured on a daily basis.

The standing water level, from a selection of 43 No. surface boreholes, are monitored monthly around the Nevinstown area.

The information presented below is extracted from information collected by Tara Mines in relation to the discrete groundwater inflow from the fracture zone encountered at location 1390 N3 in the Nevinstown area, which is within mine working approximately 200m bgl.

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## 7.2 SOURCES OF GROUNDWATER INFLOW TO NEVINSTOWN MINE WORKINGS

During development work in the Nevinstown orebody, groundwater gain increased in a relatively constant manner from 164cu.m/day in late 2002 to 2,147cu.m/day in early 2004. The groundwater gain from early 2004 through to early 2007 has been relatively low, with a recorded increase from 2,147cu.m/day to 2,422cu.m/day.

The main inflows to the Nevinstown mine openings are associated with northwest trending joint sets in the Pale Beds that are connected to a fault zone (F1 fault zone). The F1 fault zone is the main groundwater flow conduit in the Pale Beds. The inflows to the mine works appear to be derived from the Pale Beds only, as there is no evidence of significant downward flow of groundwater from the overlying UDL unit.

In April/May 2006, as underground drifts were being developed, a discrete groundwater fracture zone was encountered at 200m bgl in the environs of location 1390 N3CHLG. A relatively steady inflow of 655m3/day (100gpm) was recorded at this location. Water inflows at this location were controlled by pumping and drift development continued.

A similar discrete fracture zone at 1390 N303CA, approximately 20-30m lateral distance from 1390CHLG and at a depth of approximately 200m bgl was also recorded. However, during development works at 1390 N303CA from end May 2007 through to end September 2007 groundwater inflows increased from 40cu.m/day (6gpm) to 525cu.m/day (80gpm) after the intersection of water bearing joint. Subsequent development work from October to November



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2007 resulted in further groundwater gain at 1390 N303CA, with inflows increasing from 525cu.m/day (80gpm) to 4090cu.m/day (625gpm). The significant increase in groundwater gain at 1390 N303CA corresponded with a decrease in groundwater gain at 1390 N3CHLG (which had previously been relatively steady), suggesting a hydraulic link between the two.

The significant increase in groundwater at 1390 N303CA has resulted in an overall groundwater gain at Nevinstown. As per the groundwater report prepared by Tara Mines in October 2007, the total groundwater gain in Nevinstown in October 2007 was 5845cu.m/day (893gpm), which represents 45% of the total water make for the entire mine (13040cu.m/day, 1992gpm). The single inflow from 1390 N303CA of 4090cu.m/day (625gpm) represents on its own 31% of the total water make. This provides an indication of the higher loading imposed on the water treatment system currently operating within Tara Mines. The diversion of this clean groundwater to the water treatment system significantly increases inflow, thereby increasing flow velocities through the system and reducing retention times.

From November 2007 to January 2008 the natural rate of inflow gradually reduced to approximately 3273cu.m/day (500gpm) due to the plugging of three dewatering diamond drill holes. Further engineering works were undertaken in mid December 2007 to plug inflows to this area. Following completion of this work, the current inflow is gauged at approximately 1309cu.m/day (200gpm).

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To date, the engineering measures employed to minimise inflows, together with pumping from the mine working are controlling the water inflows, however mining in this area is effectively stalled. Until significant further work is complete to manage this groundwater, the area is considered an unsuitable environment for mining.

## 7.3 GROUNDWATER QUALITY OF NEVINSTOWN 1390N3 GROUNDWATER INFLOW

Groundwater samples have been obtained of the groundwater inflows from the fracture zones at 1390 N3CHLG (Samples between May and July 06) and 1390 N303CA (Samples between February 2008 and August 2010). The purpose of obtaining these samples is to determine the hydrochemistry and the relative quality of the groundwater. This groundwater quality control is continuing on a weekly basis.

The results of the analysis are provided in Appendix A, with a brief discussion of the hydrochemistry provided below. In general terms, the groundwater quality from the fracture zone inflows are a very good natural standard.



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The BOD of the groundwater is low, although slightly elevated concentrations of BOD were detected in samples obtained from 1390 N3CHLG. The COD concentration is consistently below detection limit.

The concentration of Ammonia, Nitrate, Nitrite and Phosphorus are generally very low and usually below the detection limit of the laboratory. This indicates that the groundwater is not impacted from nutrient leaching from the surface due to agricultural activity. The discrete nature of the inflows and the depth of inflow (200m bgl) is suggestive that the groundwater is not hydraulically linked with land surface activities and is confined groundwater.

The suspended solid loading of the groundwater is very low and below the detection limit of the laboratory. This indicates that the groundwater inflows are not sediment laden and the groundwater flow is through clean fracture conduits.

The Chloride concentration is low and considered to represent a background level similar to Irish groundwater. The Sulphate concentration however is higher than would normally be found in Irish groundwater. Sulphate concentrations are generally slightly elevated above normal Irish background levels and recorded within the range 71-142mg/l $SO_4$. The slight elevation in Sulphate concentration is directly attributed to mineralisation of the groundwater flowing though the orebody. The concentration of Sulphate although elevated above normal Irish background levels is within permissible levels for drinking water as per the EU Drinking Water Regulations.

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The Hardness, Calcium and Magnesium concentrations of the groundwater are not considered significantly elevated, especially for such a deep groundwater flowing in a limestone/dolomite bedrock.

The Sodium, Potassium and Iron concentrations are considered within normal ranges for Irish groundwater.

The concentration of Manganese is generally elevated above permissible levels for drinking water. The concentration of Zinc is also elevated and above the threshold for Salmonid Waters. The origin of the elevated concentration of Manganese and Zinc is attributed to natural groundwater mineralisation from flow through the orebody. The concentration of all other metals and trace metals is low and commonly below the detection limit of the laboratory.

Manganese is not a toxic parameter in drinking water, rather the problems with Manganese are aesthetic. Elevated manganese in drinking water can taste metallic and cause staining to laundry and enamel.

The elevated concentration of Zinc is above the threshold indicated in the Salmonid Regulation. The thresholds specified in the Salmonid Regulations differ depending on the hardness of the



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water, with toxicity to aquatic life decreasing as the water hardness increases. Therefore, the zinc thresholds vary depending on the hardness concentration, with thresholds prescribed as 0.03mg/l Zn with Hardness of 10mg/l, 0.3mg/l Zn for hardness of 100mg./l and 0.5mg/l Zn for hardness of 500mg/l.

The recent EU Surface Water Regulations (SI No. 272 of 2009) have limited the Annual Average (AA) Zinc concentration in Inland Surface Waters to 8/50/100ug/l as determined by hardness of 10mg/l-<100mg/l or >100mg/l respectively. Converted to mg/l the limits for annual average zinc are:

- ≤10mg/l $CaCO_3$ = 8µg/l or 0.008mg/l
- 100mg/l ≤ $CaCO_3$ ≥10mg/l = 50 µg/l or 0.05mg/l
- >100mg/l $CaCO_3$ = 100µg/l or 0.1mg/l

Annual Average limits have also been set for Lead (0.0072mg/l), Mercury (0.00005mg/l or 0.00007 Maximum Allowable Concentration (MAC)), Nickel (0.02mg/l) and Cadmium (which varies from an annual average of 0.00008mg/l to 0.0025mg/l depending on $CaC0_3$).

The natural groundwater quality is very good and of a higher overall quality than the surface water quality of the River Blackwater. The quality of the River Blackwater is discussed in more detail in Section 8. It should also be noted that the proposed discharge point for groundwater is downstream of a water abstraction scheme (Liscarton) operated by Meath County Council. The outfall of good quality groundwater to the River Blackwater may represent a positive benefit to surface water flows during low flow conditions to compensate for the volume of water abstracted for public supply.

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## 7.4 WATER LEVEL MONITORING IN SURFACE BOREHOLES

Tara Mines monitor the water level in groundwater monitoring boreholes on a monthly basis in piezometers positioned in the Overburden material, the UDL unit and the Pale Beds.

Groundwater Monitoring data for the period March 2007 to May 2008 was reviewed and interpreted to assess the hydrogeological setting of the site.

The groundwater monitoring concluded the following in relation to the geological strata existing within the Nevinstown area:

- The groundwater monitoring for overburden piezometers indicates that water level variations in the overburden reflect seasonal variations.

- The overburden monitoring suggests that the shallow groundwater in the overburden is not impacted by dewatering in the underlying mine workings;

- The groundwater monitoring for piezometers positioned in the Upper Dark Limestones (UDL) does not register any systematic decrease in water elevations and have generally remained consistent with previous monitoring. Observed variations are considered to be attributable to seasonal fluctuations. The magnitude of the fluctuation varies across the UDL unit and most likely reflects difference in aquifer hydraulics/storage.

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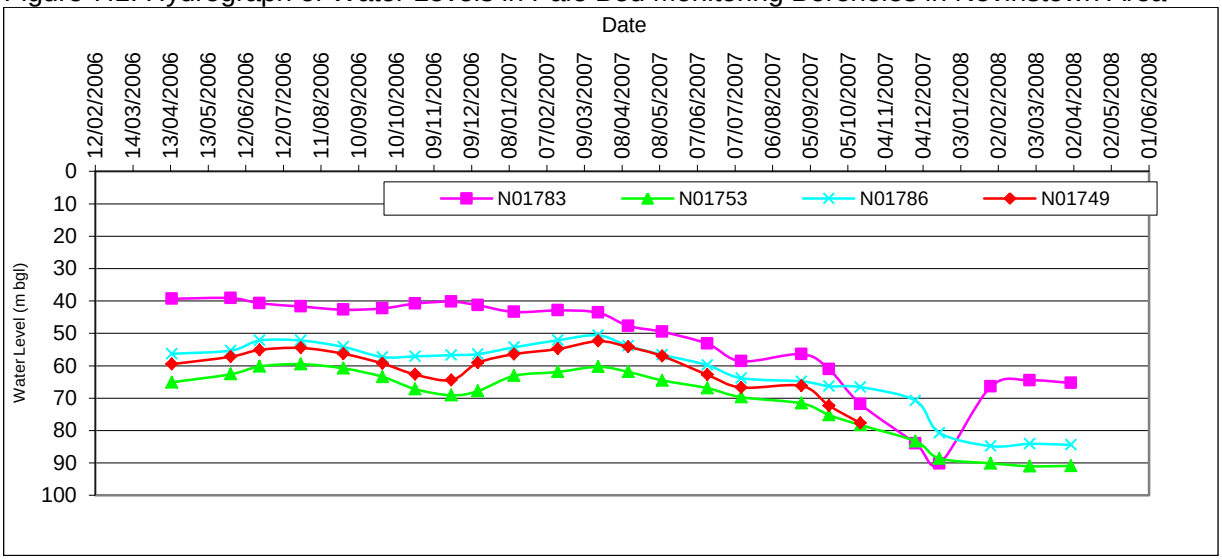
The water level monitoring of piezometers positioned in the Pale Beds display a different trend. Water level monitoring from boreholes N01783, N01753, N01786 and N01749 is displayed in Figure 7.1 below.

Figure 7.1: Hydrograph of Water Levels in Pale Bed Monitoring Boreholes in Nevinstown Area



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The water level appeared to be consistent with seasonal variations in all boreholes from April 2006 through to May/June 2007. However, thereafter a significant decline trend is noted in all boreholes. The declining trend continued up until December 2007 and January 2008.

The onset of the declining trend in groundwater levels is consistent with the timing of development works and increasing groundwater inflows at 1390 N303CA. Borehole N01783 is 90m north of 1390 N303CA and this borehole exhibits the most significant impact. The other boreholes are further away but all are within approximately 350m from 1390 N303CA.

The impact of dewatering from 1390 N303CA is impacting the water levels in the Pale Beds. The magnitude of the impact suggests that the fracture connectivity is not highly extensive, as water level drawdowns of over 50m are capable in borehole N01783.

A programme of diamond drill hole and blasthole plugging was undertaken at 1390 N303CA in mid December 2007. Subsequent groundwater monitoring indicates that the water level stabilised (borehole N01753 and N01786) or recovered (borehole N01783) when groundwater inflow was stemmed and dewatering rate decreased accordingly.

During the operating life of the mine, most inflows have been recorded via discrete and rock-fracture related zones. The location, spacing and density is determined by a combination of geological structure, jointing and lithology.

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## 7.5 CURRENT MINE DEWATERING AND DISCHARGE REGIME

There are three sources of water that are considered process water under the IPPC Licence for the Mine. These are as follows:

- Water ingress to the mine, that is pumped out to maintain a suitable dry working environment;
- Surface run-off; and
- Water from processing plant.

Water from these three sources is collected, pumped and treated prior to discharge to the River Boyne.

All water from the process plant is pumped to the tailings facility for treatment prior to return of treated water to the reclaim pond. Minewater and surface run-off, representing a low risk effluent are treated in the on site water treatment system.

The water treatment system comprises three stages of clarification in sediment-aeration ponds prior to discharge to the River Boyne.



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At present, all minewater is pumped and collected at a central underground pumping station. The water enters a large settling sump where suspended solids settle out. The water is pumped to the surface via rising pipework infrastructure within the production shaft.

The pumped water is directed from underground outfalls to a minewater pond, acting as a primary settlement pond. Overflow from this minewater pond decants by controlled overflow to a secondary stage of settlement/clarification in the Reclaim Water Ponds. Water from the Reclaim Water Pond decants, via a controlled overflow, to a Clear Water Pond (Discharge pond).

The discharge from the Clear Water Pond to the River Boyne is via a weir structure, which measures and controls the discharge. The rate of discharge from the Clear Water Pond is dictated by the flow in the River Boyne, as a minimum dilution rate of 100:1 is required under licence conditions.

An automatic hydrometric gauging station has been installed on the River Boyne. This gauging station provides a real time record of water levels and flow in the River Boyne. Discharge from the site is controlled based on River Boyne flows.

As stated previously, as of October 2007, potential groundwater inflow at Nevinstown represents 45% of the total water make for the entire mine. The single inflow from 1390 N303CA represents 31% of the total water make. The diversion of this increased volume of water through the existing water treatment system creates unnecessary pressure on the treatment efficiency. The required dilution rate is also a significant constraint on the ability to discharge from site. Therefore, some amendment is required to manage groundwater more effectively. The isolation and diversion of clean groundwater away from other mine and process water is proposed as the most appropriate means of ensuring the emissions from Tara Mines are maintained within the emission limits of the IPPC Licence.

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# 8 SURFACE WATER QUALITY

Tara Mines conduct monthly sampling of the River Boyne and the River Blackwater to determine general surface water quality. In specific reference to the River Blackwater, Tara Mines obtain samples at two locations, upstream of all workings at Liscarton (T11) and downstream of all working (T4 –immediately before confluence of Blackwater with River Boyne).

The results of the monthly monitoring from January 2006 to August 2010 are provided in Appendix A as well as a full dataset of monitoring data, dating back to August 1998.

The chemistry and quality of the River Blackwater is consistent upstream and downstream of Tara Mines. The physico-chemical quality of the water is quite good over the 2006-20010 monitoring period.

The surface water is slightly alkaline, with the pH recorded generally within the range for Salmonid Water and Drinking Water. The hardness of the surface water is not excessive and considered normal for a surface water flowing through a catchment of predominant limestone provenance.

Based on the monitoring results, the Dissolved Oxygen concentration exceeds 9mg/l over 50%, which is in accordance with the Salmonid Regulations. The average DO between 1999 and 2010 is 9.5mg/l.

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The suspended solid loading in the surface water is generally low and below the threshold indicated in the Salmonid Regulations.

The concentration of Ammonia is generally low and well within the threshold of the Salmonid regulations. The concentration of Nitrate is also not excessive, albeit the impact of nutrient leaching is evident (average Nitrate concentration of approximately 10mg/l). The Phosphorous concentration is also slightly elevated and again indicative of nutrient leaching from within the catchment.

The concentration of Chloride and Sulphate are considered normal for Irish surface waters. The sulphate concentration is significantly lower than the sulphate concentration of the deep groundwater and there is no indication of mineralisation in the surface water.

The Sodium:Potassium ratio is generally 0.3-0.4, which suggests that agricultural effluent within the catchment is entering the watercourse. Iron, Manganese, Copper and Zinc concentrations are generally low and often below the detection limit of the laboratory. Isolated elevated concentrations of Aluminium are recorded in the surface water. The source of this aluminium is not determined, but it may be attributable to mobilisation of clay platelets in the water column.



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The concentration of all trace metals is very low and generally below the detection limit of the laboratory.

In summary, the River Blackwater is generally of a high physico-chemical quality. Apart from isolated deviations, the quality is generally consistent with a low but determinable impact of agricultural activity within the catchment. The River Blackwater is of sufficient quality to adhere to the Quality for Salmonid Rivers.

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# 9 ASSIMILATIVE CAPACITY OF RIVER BLACKWATER

## 9.1 INTRODUCTION

This section of the report provides an indication of the potential impact of discharging the groundwater intercepted within the Nevinstown fracture zone (at location 1390 N303CA) and discharging to the River Blackwater. The method of impact analysis is a quantitative method of analysis.

The analysis of the Nevinstown groundwater, as detailed in Section 7.3 of this report, highlights that it is of a natural high quality. However, certain parameters are considered elevated above normal background concentrations and it is these parameters which are analysed. The quality of the River Blackwater is also of a good physico-chemical quality, although the analyses do display an impact of nutrient enrichment, most likely attributable to agricultural activity and/or domestic effluent leaching within the catchment.

In order to provide an impact assessment of such a proposed discharge, assimilative capacity calculations are provided for key parameters. The purpose of conducting assimilative capacity calculations is to determine predicted combined concentrations in the River Blackwater following outfall of the groundwater to the surface water. Detailed information of the existing quality of the River Blackwater and the hydrometric conditions at the proposed outfall point are available which allows for a robust estimation. This information is necessary for conducting the assimilative capacity calculations.

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The Assimilative Capacity of a watercourse is defined as the ability of a body of water to cleanse itself, its ability to receive waste waters or toxic materials, without deleterious effects and without damage to the aquatic life or humans who consume the water.

The Assimilative Capacity is calculated as follows:

$$Q_{(rec)}C_{(rec)} + Q_{(dis)}C_{(dis)} = Q_{(tot)}C_{(tot)}$$

Where: Q is the volume of flow/discharge
C is the concentration of indicator chemical parameters
(rec) is the receiving watercourse
(dis) is the discharge liquid
(tot) is the mixed total.

The Volume of Flow in the receiving watercourse is calculated for the following scenarios:

- Assimilation Capacity During 5% Flow Conditions (i.e. High Flow Conditions);
- Assimilative Capacity during 50% Flow Conditions (i.e. Median Flow Conditions); and
- Assimilative Capacity during 95% Flow Conditions (i.e. Low Flow Conditions).



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The above scenarios provide an assessment of the potential impact of the discharge ranging from low, medium and high risk conditions.

In terms of discharge, it is anticipated that the dewatering rates from the Nevinstown fracture zone will be maintained at approximately 3,500cu.m/day in the short term. However, for precautionary purposes a discharge rate 4,500cu.m/day is simulated to stress test the discharge impact.

In the medium to long term, it is estimated that once the fracture storage has been depleted, dewatering rates will decrease to less than 1,250cu.m/day. As demonstrated from the groundwater monitoring data obtained by Tara Mines, the intensity of fracture network decreases radially from 1390N303CA. This is evident from the limited response in monitoring boreholes positioned in the Pale Beds relatively close to the discrete inflow (with exception of borehole N01673). Therefore, the significant drawdown in groundwater levels in the Nevinstown area will occur over a relatively short timeframe and is required to reduce the groundwater storage in this fracture zone. Once such aquifer storage is depleted, the rate of groundwater inflow will decrease to a rate dictated by the fracture opening in the pale beds. This fracture opening is demonstrated to be limited and effectively retards groundwater flow.

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Therefore the three scenarios calculated are as follows:

1. Anticipated short term discharge: 3,500cu.m/day
2. Anticipated short term discharge, plus inflation volume: 4,500cu.m/day
3. Anticipated medium to long term discharge: 1,125cu.m/day

The quantitative and qualitative assessment is calculated for each of these scenarios. The calculations presented herein are representative of the hydrometric conditions downstream of the surface water abstraction scheme at the Liscarton Water Treatment Works (operated by Meath County Council).

It should be noted that under proposals prepared by Meath Council Council, the Liscarton Water Treatment Works is planned for replacement by the Dowdstown Water Treatment Works. The closure of the Liscarton Works will ultimately increase flows on the lower reaches of the River Blackwater by 8,000-12,000cu.m/day (333.3-500cu.m/hr or 0.093-0.139cu.m/sec). The additional flows in the River Blackwater following cessation of surface water abstraction at Liscarton would not be significant during high flow conditions (i.e. during 5% flow conditions, the flow volume in the River Blackwater will increase by 2.5-3.8%). However, during summer low flow conditions, the additional flows are highly significant (i.e. during 95% flow conditions, the flow volume in the River Blackwater will increase by 30.9-46.3%).

However, in order to provide the assimilative capacity calculations at current hydrometric conditions, the simulations are calculated to account for the surface water abstraction at Liscarton.



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Therefore the calculations presented represent the worst case scenario and are considered a robust and conservative impact assessment.

In terms of qualitative assessment, the assimilation capacity of the River Blackwater is calculated for the following key parameters: pH, Conductivity, Hardness, Sulphate, Manganese and Zinc.

The quality of the groundwater for all other parameters is higher than that of the River Blackwater, therefore discharge of groundwater with no nutrient loading will lead to an overall improvement in water quality. The calculation of the improvement on water quality (i.e. the degree of nutirent decrease) is not possible to calculate as the nutrient concentration of Ammonia, Nitrate, and Nitrite and Phosphorus in the groundwater is below the detection limit of the laboratory.

The assimilative capacity of the temperature was not calculated because temperature in the River Blackwater ranges from winter temperatures of 6-7$^0$C to summer temperatures of 15-20$^0$C.The temperature of the groundwater is relatively steady at 13-13.5$^0$C. The discharge of the groundwater at this temperature range would not result in significant temperature gradient in the surface water either during winter (lower temperature range) or summer (higher temperature range).

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The concentration of each parameter calculated in the receiving water is taken as the medium term average (2006-2010) of the two sampling stations in the River Blackwater, T11 upstream and T4 downstream. The chemistry of the water is relatively consistent over this timeframe and therefore provide a good indication of the surface water quality in the River Blackwater.

The concentration of the Nevinstown groundwater is taken as the average from water samples obtained from 1390N3CHLG and 1390N303CA. Again, the chemistry of the water is relatively consistent and therefore provides a good indication of the groundwater quality.

Table 9.1 below provides the concentration of the receiving water (River Blackwater) and the discharge waters (i.e. groundwater) used in the assimilative capacity calculations.

Table 9.1: Concentration of Key Parameters for Surface Water and Groundwater

| **Parameter** | **Receiving Water (Crec) (River Blackwater)** | **Discharge Water (Cdis) (Nevinstown Groundwater)** |
|---|---|---|
| pH | 8.01 | 7.65 |
| Conductivity | 447.7uS/cm | 835uS/cm |
| Hardness | 211.98mg/l $CaCO_3$ | 388 mg/l $CaCO_3$ |
| Sulphate | 26.42mg/l $SO_4$ | 94.10 mg/l $SO_4$ |
| Manganese | 0.0224mg/l Mn | 0.903 mg/l Mn |
| Zinc | 0.0082mg/l Zn | 0.436mg/l Zn |



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The assimilation calculations for the various scenarios are presented below in terms of both quantitative dilution rates and qualitative assimilation capacity.

## 9.2 ANTICIPATED SHORT TERM DISCHARGE OF 3,500CU.M/DAY TO RIVER BLACKWATER

In terms of quantitiative discharge rates, the outfall of 3,500cu.m/day to the River Blackwater represents the following dilution:

- 900:1 dilution rate during high winter flows (i.e. based on 5% flow rates);
- 256:1 dilution rate during median flows (i.e. based on 50% flow rates); and
- 22:1 dilution rate during low summer flows (i.e. based on 95% flow rates).

In terms of qualitative assessment, the results of the assimilative calculation are provided below for the 5% flow, the 50% flow and the 95% flow

Table 9.2: 5% Flow Assimilative Capacity (Assimilation during high flow conditions)

| | Q(rec) | C(rec) | Q(dis) | C(dis) | Q(tot) | C(tot) |
|---|---|---|---|---|---|---|
| pH | 3153600 | 8.01 | 3500 | 7.65 | 3157100 | 8.01 |
| Conductivity | 3153600 | 447.7 | 3500 | 835 | 3157100 | 448.13 |
| Hardness | 3153600 | 211.98 | 3500 | 388 | 3157100 | 212.18 |
| Sulphate | 3153600 | 26.42 | 3500 | 94.1 | 3157100 | 26.5 |
| Manganese | 3153600 | 0.0224 | 3500 | 0.903 | 3157100 | 0.023 |
| Zinc | 3153600 | 0.0082 | 3500 | 0.436 | 3157100 | 0.01 |

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Table 9.3: 50% Flow Assimilative Capacity (Assimilation during median flow condtions)

| | Q(rec) | C(rec) | Q(dis) | C(dis) | Q(tot) | C(tot) |
|---|---|---|---|---|---|---|
| pH | 898560 | 8.01 | 3500 | 7.65 | 902060 | 8.01 |
| Conductivity | 898560 | 447.7 | 3500 | 835 | 902060 | 449.2 |
| Hardness | 898560 | 211.98 | 3500 | 388 | 902060 | 212.66 |
| Sulphate | 898560 | 26.42 | 3500 | 94.1 | 902060 | 26.68 |
| Manganese | 898560 | 0.0224 | 3500 | 0.903 | 902060 | 0.026 |
| Zinc | 898560 | 0.0082 | 3500 | 0.436 | 902060 | 0.01 |

Table 9.4: 95% Flow Assimilative Capacity (Assimilation during low flow conditions)

| | Q(rec) | C(rec) | Q(dis) | C(dis) | Q(tot) | C(tot) |
|---|---|---|---|---|---|---|
| pH | 77760 | 8.01 | 3500 | 7.65 | 81260 | 7.99 |
| Conductivity | 77760 | 447.7 | 3500 | 835 | 81260 | 464.38 |
| Hardness | 77760 | 211.98 | 3500 | 388 | 81260 | 219.56 |
| Sulphate | 77760 | 26.42 | 3500 | 94.1 | 81260 | 29.34 |
| Manganese | 77760 | 0.0224 | 3500 | 0.903 | 81260 | 0.06 |
| Zinc | 77760 | 0.0082 | 3500 | 0.436 | 81260 | 0.03 |



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The assimilative capacity results demonstrate that there is vitually no change in the surface water quality during high or median flow conditions. There are slightly higher concentrations during low flow conditions, however all parameters remain within acceptable ranges to maintain the physico-chemical quality of the River Blackwater.

During all stages of flow (i.e. high, median and low flow conditions), there is no appreciable change in pH, Conducitivty or Hardness, therefore there will be no appreciable change to aquatic conditions of the River Blackwater as a result of groundwater discharge.

The increase in the concentration of Sulphate is almost inperceptible during high and median flow conditions. During low flow conditions, the increase is slight, (i.e. increasing from 26.42mg/l to 29.34mg/l). However, the assimilated concentration remains within normal levels and will not impact on the broad quality of the River Blackwater.

The concentration of Manganese and Zinc is elevated during low flow conditions. However, the assimilated concentration of zinc at 0.03mg/l is an order of magnitude below the Salmonid threshold of 0.3mg/l (for a hardness of 219.56mg/l $CaCO_3$) and is approximately an order of magnitude lower than the Surface Water Regulations (2009) of 0.1mg/l (for a hardness of 219.56mg/l $CaCO_3$). The concentration of Manganese is just slightly above the maximum permissible concentration for drinking water (0.05mg/l). However, as discussed earlier, at the assimilated concentration of 0.06mg/l Mn the water will not be toxic to either aquatic life, livestock or humans.

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It is suggested based on the assimilation capacity results presented above that the outfall of 3,500cu.m/day of groundwater will not result in any perceptible impact on the physico-chemical or biological quality of the River Blackwater.

## 9.3 ANTICIPATED SHORT TERM DISCHARGE OF 3,500CU.M/DAY, PLUS ADDITONAL 1,000CU.M/DAY TO RIVER BLACKWATER

In terms of quantitiative discharge rates, the outfall of 4,500cu.m/day to the River Blackwater represents the following dilution:

- 700:1 dilution rate during high winter flows (i.e. based on 5% flow rates);
- 200:1 dilution rate during median flows (i.e. based on 50% flow rates); and
- 17:1 dilution rate during low summer flows (i.e. based on 95% flow rates).

In terms of qualitative assessment, the results of the assimilative calculation are provided below for the 5% flow, the 50% flow and the 95% flow



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Table 9.5: 5% Flow Assimilative Capacity (Assimilation during high flow conditions)

| | Q(rec) | C(rec) | Q(dis) | C(dis) | Q(tot) | C(tot) |
|---|---|---|---|---|---|---|
| PH | 3153600 | 8.01 | 4500 | 7.65 | 3158100 | 8.01 |
| Conductivity | 3153600 | 447.7 | 4500 | 835 | 3158100 | 448.25 |
| Hardness | 3153600 | 211.98 | 4500 | 388 | 3158100 | 212.23 |
| Sulphate | 3153600 | 26.42 | 4500 | 94.1 | 3158100 | 26.52 |
| Manganese | 3153600 | 0.0224 | 4500 | 0.903 | 3158100 | 0.024 |
| Zinc | 3153600 | 0.0082 | 4500 | 0.436 | 3158100 | 0.01 |

Table 9.6: 50% Flow Assimilative Capacity (Assimilation during median flow conditions)

| | Q(rec) | C(rec) | Q(dis) | C(dis) | Q(tot) | C(tot) |
|---|---|---|---|---|---|---|
| pH | 898560 | 8.01 | 4500 | 7.65 | 903060 | 8.01 |
| Conductivity | 898560 | 447.7 | 4500 | 835 | 903060 | 449.63 |
| Hardness | 898560 | 211.98 | 4500 | 388 | 903060 | 212.86 |
| Sulphate | 898560 | 26.42 | 4500 | 94.1 | 903060 | 26.76 |
| Manganese | 898560 | 0.0224 | 4500 | 0.903 | 903060 | 0.027 |
| Zinc | 898560 | 0.0082 | 4500 | 0.436 | 903060 | 0.01 |

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Table 9.7: 95% Flow Assimilative Capacity (Assimilation during low flow conditions)

| | Q(rec) | C(rec) | Q(dis) | C(dis) | Q(tot) | C(tot) |
|---|---|---|---|---|---|---|
| pH | 77760 | 8.01 | 4500 | 7.65 | 82260 | 7.99 |
| Conductivity | 77760 | 447.7 | 4500 | 835 | 82260 | 468.89 |
| Hardness | 77760 | 211.98 | 4500 | 388 | 82260 | 221.61 |
| Sulphate | 77760 | 26.42 | 4500 | 94.1 | 82260 | 30.12 |
| Manganese | 77760 | 0.0224 | 4500 | 0.903 | 82260 | 0.071 |
| Zinc | 77760 | 0.0082 | 4500 | 0.436 | 82260 | 0.03 |

This scenario is run to stress test the proposal. The volume of 4,500cu.m/day represents an additional 30% discharge to the maximum anticipated short term discharge to the River Blackwater.

The assimilative capacity results demonstrate that there is vitually no change in the surface water quality during high or median flow conditions. There are slightly higher concentrations recorded during low flow conditions, however the broad physico-chemical quality of the River Blackwater is maintained.

During all stages of flow (i.e. high, median and low flow conditions), there is no appreciable change in pH, Conductivity or Hardness, therefore there will be no appreciable change to aquatic conditions.



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The increase in the concentration of Sulphate is almost inperceptible during high and median flow conditions. During low flow conditions the increase is slighly more pronounced, with an increase from 26.42mg/l to 30.12mg/l predicted. The predicted Sulphate concentration after discharge is not significantly different to background level and will not impact on the quality of the River Blackwater.

The concentration of Manganese and Zinc is elevated during low flow conditions. However, the assimilated concentration of zinc at 0.03mg/l is an order of magnitude below the Salmonid threshold of 0.3mg/l for a hardness of 221.83mg/l $CaCO_3$ and is approximately an order of magnitude lower than the Surface Water Regulations (2009) of 0.1mg/l (for a hardness of 221.61mg/l $CaCO_3$). The concentration of Manganese is just slightly above the maximum permissible concentration for drinking water. However, as discussed earlier, at the assimilated concentration of 0.071mg/l Mn the water will not be toxic to either aquatic life, livestock or humans.

It is suggested based on the assimilation capacity results presented above that the outfall of 4,500cu.m/day of groundwater will not result in any perceptible impact on the physico-chemical or biological quality of the River Blackwater.

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## 9.4 ANTICIPATED MEDIUM TO LONG TERM DISCHARGE OF 1,125CU.M/DAY TOP RIVER BLACKWATER

In terms of quantitiative discharge rates, the outfall of 1,125cu.m/day to the River Blackwater represents the following dilutions:

- 2800:1 dilution rate during high winter flows (i.e. based on 5% flow rates);
- 800:1 dilution rate during median flows (i.e. based on 50% flow rates); and
- 70:1 dilution rate during low summer flows (i.e. based on 95% flow rates).

In terms of qualitative assessment, the results of the assimilative calculation are provided below for the 5% flow, the 50% flow and the 95% flow

Table 9.8: 5% Flow Assimilative Capacity (Assimilation during high flow conditions)

| | Q(rec) | C(rec) | Q(dis) | C(dis) | Q(tot) | C(tot) |
|---|---|---|---|---|---|---|
| pH | 3153600 | 8.01 | 1125 | 7.65 | 3154725 | 8.01 |
| Conductivity | 3153600 | 447.7 | 1125 | 835 | 3154725 | 447.84 |
| Hardness | 3153600 | 211.98 | 1125 | 388 | 3154725 | 212.04 |
| Sulphate | 3153600 | 26.42 | 1125 | 94.1 | 3154725 | 26.44 |
| Manganese | 3153600 | 0.0224 | 1125 | 0.903 | 3154725 | 0.023 |
| Zinc | 3153600 | 0.0082 | 1125 | 0.436 | 3154725 | 0.0083 |



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Table 9.9 50% Flow Assimilative Capacity (Assimilation during median flow conditions)

| | Q(rec) | C(rev) | Q(dis) | C(dis) | Q(tot) | C(tot) |
|---|---|---|---|---|---|---|
| pH | 898560 | 8.01 | 1125 | 7.65 | 899685 | 8.01 |
| Conductivity | 898560 | 447.7 | 1125 | 835 | 899685 | 448.18 |
| Hardness | 898560 | 211.98 | 1125 | 388 | 899685 | 212.2 |
| Sulphate | 898560 | 26.42 | 1125 | 94.1 | 899685 | 26.50 |
| Manganese | 898560 | 0.0224 | 1125 | 0.903 | 899685 | 0.024 |
| Zinc | 898560 | 0.0082 | 1125 | 0.436 | 899685 | 0.009 |

Table 9.10: 95% Flow Assimilative Capacity (Assimilation during low flow conditions)

| | Q(rec) | C(rev) | Q(dis) | C(dis) | Q(tot) | C(tot) |
|---|---|---|---|---|---|---|
| pH | 77760 | 8.01 | 1125 | 7.65 | 78885 | 8.00 |
| Conductivity | 77760 | 447.7 | 1125 | 835 | 78885 | 453.22 |
| Hardness | 77760 | 211.98 | 1125 | 388 | 78885 | 214.49 |
| Sulphate | 77760 | 26.42 | 1125 | 94.1 | 78885 | 27.39 |
| Manganese | 77760 | 0.0224 | 1125 | 0.903 | 78885 | 0.035 |
| Zinc | 77760 | 0.0082 | 1125 | 0.436 | 78885 | 0.014 |

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The assimilative capacity results demonstrate that there is vitually no change in the surface water quality during high or median flow conditions. There is a very slight increase in the concentrations during low flow conditions, however all parameters remain within acceptable ranges to maintain the physico-chemcial quality of the River Blackwater.

During all stages of flow (i.e. high, median and low flow conditions), there is no appreciable change in pH, Conducitivty or Hardness. Therefore there will be no appreciable change to aquatic conditions.

The increase in the concentration of Sulphate is almost inperceptible during high and median flow conditions. During low flow conditions, the increase is very slight (i.e increasing from 26.42mg/l to 27.39mg/l). The assimilated concentration remains within normal levels and will not imapct on the broad quality of the River Blackwater.

The concentration of Manganese and Zinc is slightly elevated above background levels during low flow conditions. However, the assimilated concentration of zinc at 0.014mg/l is an order of magnitude below the Salmonid threshold of 0.3mg/l for a hardness of 214.49mg/l $CaCO_3$ and is an order of magnitude lower than the Surface Water Regulations (2009) of 0.1mg/l (for a hardness of 214.49mg/l $CaCO_3$). The concentration of Manganese is well below the maximum permissible concentration for drinking water. At the assimilated concentration of 0.035mg/l Mn the water will not be toxic to either aquatic life, livestock or humans.



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It is suggested based on the assimilation capacity results presented above that the outfall of 1,125cu.m/day of groundwater will not result in any perceptible impact on the physico-chemical or biological quality of the River Blackwater.

## 9.5 CONCLUSION

The assimilation capacity calculations presented above predict in quantitative terms the potential impact on the physico-chemical quality of the River Blackwater. Based on the results of the calculations the physico-chemical quality of the water will not be impacted and the water will remain within acceptable ranges for aquatic, livestock and human use.

The suspended solid loading of the discharge water is very low. Therefore, there is a very low risk of river bed sedimentation. This indicates that the discharge of the groundwater will not impact on the potential of the Riverbed to support aquatic life.

The overall quality of the River Blackwater is very good. However, background levels of nutrients (Ammonia, Nitrate and Phosphate) suggest an impact from agricultural and or human effluent sources. The discharge of the groundwater, which has no appreciable background concentrations of nutrient will result in a beneficial impact on the surface water quality, especially during low flow conditions.

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The assimilative capacity study highlights that there will be no impact on the zinc and manganese concentrations of the River Blackwater (and the overall quality of the River Blackwater) on a medium to long term basis as a result of the proposed discharge. The assimilated concentration of zinc is an order of magnitude below the Salmonid Regulations and the Surface Water Regulations(2009) thresholds. The concentration of Manganese is well below the maximum permissible concentration for drinking water. On a short term basis, the assimilated concentration of zinc is also an order of magnitude below the Salmonid Regulations and the Surface Water Regulations (2009) threshold. Short term, the concentration of Manganese is just slightly above the maximum permissible concentration for drinking water. However, the assimilated concentration of Mn will not be toxic to either aquatic life, livestock or humans.

The quantitative predictions suggest that the discharge of groundwater poses a very low risk to the surface water environment and, therefore, should be considered in terms of overall improvement of water management within the overall mine workings.



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# 10 DISCHARGE DESIGN

As detailed in Section 9, the predictive modelling of proposed short term (3,500cu.m/day) and medium to long term (1,125cu.m/day) discharge of groundwater to the River Blackwater suggests that there will be no appreciable deviation in water quality from background levels.

The proposed alteration to the water management system to address collection of clean groundwater ingress in the Nevinstown mine area at approximately 200mbgl and direct discharge to the River Blackwater will create a new discharge point to the receiving environment on the River Blackwater.

The diversion of clean groundwater away from the existing water management system will assist and help to maintain the high level of treatment afforded other process water streams prior to discharge to the River Boyne. As such Tara Mines will continue to operate in compliance with the IPPC licence requirements.

In net terms there will be no change to the volume of water managed by Tara Mines. At present the groundwater is mixed with other process water and discharged at the existing regulated outfall point to the River Boyne. However based on the assessment of potential impact and owing to the high quality of the Nevinstown groundwater, the isolation and diversion of the groundwater away from other process water streams is considered beneficial both in environmental and operational terms.

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Further to review of the proposed alteration and in line with other IPPC licences for similar mining activities, Tara Mines consider that the discharge of clean groundwater from the mine should be regulated under Condition 9 of the IPPC Licence, dealing with Non-Process Water. This would require an amendment of the existing IPPC Licence.

The proposal seeks to create an isolated and closed system for groundwater ingress at the Nevinstown fracture zone to the discharge point to the River Blackwater, without interaction with any other process water streams. This is proposed to eliminate the risk of contamination of the pure groundwater ingress from other streams. Tara Mines will adhere to all required monitoring and sampling schedules and emission limits specified in the existing IPPC Licence and any additional requirements specified by the EPA (or other statutory bodies) to demonstrate that such groundwater discharge will not impact on the quality of the receiving water.

Only clean groundwater from the Nevinstown Area will be discharged to the River Blackwater. It is proposed to isolate and contain the groundwater inflow from the fracture zone in a dead-end tunnel. Water will be contained by constructing a 2m high concrete wall. Water will be pumped from this section, via a dedicated pipeline to a main storage area and then to the surface via a



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cased drill hole. Indicative layouts for water control arrangements are shown on Figure A.1 and Figure A.2 in Appendix B to show how water will be managed underground.

Only the clean groundwater ingress from the rock strata, will be contained in the underground pump reservoirs and associated pipelines. No other water stream, from any source, will be permitted to mix or enter this separated system.

The water pumped from the main underground reservoir will be contained within a closed pipeline system. Once pumped to the surface, the proposal seeks to gravity drain the water through an inclined pipeline. The pipework will be laid above ground and suitably insulated. The design of the overground pipeline was considered to minimise for any ground disturbance on the River Blackwater SAC. All outlet measures required by the regulatory authorities or interested parties will be fully installed and maintained by the mine operators. It is proposed that the discharge to the River Blackwater will be via diffuser pipework laid across the bed of the River Blackwater. This will provide a more passive discharge mechanism than a single bankside point outfall from the discharge pipework.

Tara Mines will continue to operate an extensive water monitoring programme to ensure all discharges from the site are in compliance with the emission limits specified in the IPPC licence. The monitoring programme analyses a wide range of parameters on a continuous, daily, weekly, monthly and quarterly basis.

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# 11 CONCLUSIONS

This report has been prepared to provide a quantitative impact assessment for the discharge of clean groundwater to the surface water environment. The groundwater is from a discrete area of the mine (Nevinstown orebody) at a depth of approximately 200m bgl.

The volume of groundwater ingress to the mine workings has increased significantly in recent years. The increased volume of clean groundwater has had the effect of reducing the retention time in the treatment system thereby reducing the effectiveness of treatment. To date, the engineering measures employed to minimise inflows, together with pumping from the mine working are controlling the water inflows, however mining in this area of the Nevinstown orebody is effectively stalled. Until significant further work is complete to manage this groundwater, the area is considered an unsuitable environment for mining.

The diversion of clean groundwater to a new discharge system will reduce the volumetric loading on the existing treatment system thus ensuring continued effective water treatment and discharge.

The discharge of clean groundwater to the River Blackwater is proposed as an environmental improvement measure as it is not considered beneficial to soil the clean groundwater and then divert the water through a cleansing process if it is not required. The proposed new outfall point is to the River Blackwater, in close proximity to the Nevinstown area and the groundwater inflow. Extensive hydrometric and water quality baseline data exists for this area of the River Blackwater.

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In quantitative terms, the clean groundwater encountered in Nevinstown represents 31% of the total water generated from all sources within Tara Mines. Owing to the high water quality and its low risk of contamination to receiving waters, it is considered of environmental benefit to isolate this water and divert directly to a new discharge point.

The groundwater is of a high standard and the groundwater analysis indicates that the concentration of nutrients are very low (below the detection limit of analysis) suggesting that this groundwater not impacted by diffuse sources of pollution. Therefore, the discharge of clean groundwater to the River Blackwater will dilute and reduce the concentration of nutrient load in the surface water and ultimately improve the surface water chemistry

Certain parameters of the groundwater are different to the surface water and the study focused on the potential impact on the surface water as a result of these parameters. Assimilative capacity calculations were undertaken to determine the ability of the River Blackwater to accept the proposed discharge without deleterious effects.



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The discharge of groundwater to the River Blackwater will not result is any foreseeable impact, both in terms of overall biological quality or physico-chemical quality. The discharge will not pose a risk to aquatic, animal or human life.

In terms of abstraction design, the groundwater will be completely isolated from all other water sources and pumped directly to the River Blackwater from underground, via a diffuser tube across the water channel. The discharge arrangements are proposed to minimise disturbance within the River Blackwater.

Tara Mines will continue to operate an extensive water monitoring programme to ensure all discharges from the site are in compliance with the emission limits of the IPPC Licence.

Tara Mines seek that the discharge of groundwater to the River Blackwater would be assessed and regulated under Condition 9 of the IPPC Licence. An amendment of the current IPPC Licence is required to regulate the discharge of groundwater under Condition 9 and to impose a schedule for monitoring of such discharge.

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# Appendix B.6 - 7

# NIS – Excavation of Material in Simonstown Borrow Area

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**NATURA IMPACT STATEMENT**

IN SUPPORT OF THE

**APPROPRIATE ASSESSMENT**

OF

Proposed works at Simonstown Borrow Area, Navan, Co. Meath

**In accordance with the requirements of *Article 6(3) of the Habitats Directive (Council Directive 92/43/EEC)***


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**Prepared February 2014 by:**

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## *Executive Summary*

*Boliden Tara Mines is seeking planning permission from Meath Co. Council to re-enter the Simonstown Borrow area and excavate material (~110,000 $m^3$) to use in the construction of Stage 5B embankment raise of the Randalstown Tailings Storage Facility (TSF). The Simonstown borrow area (35 ha in total) is located in the townland of Simonstown, Navan, Co. Meath. The predominant land-use in and around the borrow area and the Tailings Facility is agricultural. Small patches of woodland exist immediately to the north and south of the Tailings Facility. Material from the Simonstown borrow area was extensively used in the construction of Stage 4A and 4B raises (under planning permission reference number P. 96/919). However during test excavations of material in 1998 some areas were sterilised after material of potential archaeological interest was revealed.*

*In 2012 Tara re-visited these sterilised areas of archaeological features noted in 1998. The material was analysed and found to be of natural origin, a natural mix of broken red sandstone with fine granular grey sandstone which occurs in the undisturbed boulder clay. All work was archaeologically supervised. The proposed works are located proximate to the river Blackwater, one of the primary constituents of the River Boyne and River Blackwater SAC, and the River Boyne and River Blackwater SPA. The proposed development, therefore, requires an Appropriate Assessment to be carried out under article 6(3) of the Habitats Directive. In February of 2014, FERS Ltd. was commissioned to carry out an Appropriate Assessment on the impact of the proposed development on the Natura 2000 network. Screening having identified potential impacts, an NIS was prepared. This NIS indicates that given the implementation of appropriate mitigation and precautionary measures, the proposed development will have no significant impact upon the Natura 2000 network.*

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# 1 Introduction

## 1.1 FERS Ltd. company background

Forest, Environmental Research and Services have been conducting ecological surveys and research since the company's formation in 2005 by Dr Patrick Moran and Dr Kevin Black. Dr. Moran, the principal ecologist with FERS, has a 1st class honours degree in Environmental Biology (UCD), a Ph.D. in Ecology (UCD), a Diploma in EIA and SEA management (UCD) and a M.Sc. in GIS (University of Ulster, Coleraine). He has in excess of 15 years of experience in carrying out ecological surveys on both an academic and a professional basis. Dr Emma Reeves, senior ecologist with FERS Ltd. has a 1st class honours degree in Botany (UCD), and a Ph.D. in Botany (UCD). Dr Sarah Ryan, also a senior ecologist with FERS has a B.Sc. (double Hons) in Biology and Statistics (NUI Maynooth), a Diploma in EIA and SEA Management (UCD) and a Ph.D. in botany (UCD). Dr Ryan has almost 10 years of experience in undertaking ecological surveys on an academic and professional basis.

FERS client list includes National Parks and Wildlife Service, Meath County Council, the Heritage Council, University College Dublin, the Environmental Protection Agency, Inland Waterways Association of Ireland, the Department of Agriculture, the OPW, Coillte and Drogheda Port Company in addition to numerous private individuals and companies. Work has included many Ecological Impact Assessments and Appropriate Assessments.

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## 1.2 The aim of this report

This report has been prepared in compliance with Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities (DoEHLG 2009, February 2010) and the European Communities (Birds and Natural Habitats) Regulations 2011 (DoEHLG 2011) in support of the Appropriate Assessment of an application for planning permission by Boliden Tara Mines to Meath Co. Council for proposed works at Simonstown Borrow Area, Simonstown, Navan, Co. Meath. The works are proximate to the River Blackwater, one of the primary constituents of the River Boyne and River Blackwater SAC and the River Boyne and River Blackwater SPA.



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## 1.3 An outline of the Appropriate Assessment process

The "Habitats Directive" (Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna) is the main legislative instrument for the protection and conservation of biodiversity within the European Union and lists certain habitats and species that must be protected within wildlife conservation areas, considered to be important at a European as well as at a national level. A "Special Conservation Area" or SAC is a designation under the Habitats Directive.

The "Birds Directive" (Council Directive 2009/147/EC on the Conservation of Wild Birds) provides for a network of sites in all member states to protect birds at their breeding, feeding, roosting and wintering areas. This directive identifies species that are rare, in danger of extinction or vulnerable to changes in habitat and which need protection. A "Special Protection Area" or SPA, is a designation under The Birds Directive.

Special Areas of Conservation and Special Protection Areas form a pan-European network of protected sites known as Natura 2000 sites.

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The Habitats Directive sets out the protocol for the protection and management of SACs. The Directive sets out key elements of the system of protection including the requirement for Appropriate Assessment of plans and projects. The requirements for an Appropriate Assessment are set out in the EU Habitats Directive. Articles 6(3) and 6(4) of the Directive state:

(3) *"Any plan or project not directly connected with or necessary to the management of the site but likely to have 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."*

(4) *"If, in sareae of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of over-riding public interest, including those of social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted."*



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## 1.4 Methodology for Appropriate Assessment

A number of guidance documents on the appropriate assessment process have been referred to during the preparation of this NIS. These are:

- Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (DoEHLG 2009, Revised February 2010);
- EU Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC (2007);
- 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 (Nov. 2001 – published 2002); and
- Managing Natura 2000 Sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (2000).
- European Communities (Birds and Natural Habitats) Regulations 2011 (DoEHLG 2011).

The assessment requirements of Article 6 are generally dealt with in a stage by stage approach. The stages as outlined in "Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities" are outlined below.

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### 1.4.1 Stage (1) Screening

This initial process identifies the likely impacts of a proposed project or plan upon a Natura 2000 site, either alone, or in combination with other projects or plans and considers whether these impacts are likely to be significant.

### 1.4.2 Stage (2) Appropriate Assessment

The consideration of the impact of the project or plan on the integrity of the Natura 2000 Site, either alone or in combination with other projects or plans to the sites structure and function and its conservation objectives. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts.

### 1.4.3 Stage (3) Assessment of Alternative Solutions

The process which examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the Natura 2000 site.



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### 1.4.4 Stage (4) Assessment where Adverse Impacts Remain

An assessment of compensatory measures where, in the light of an assessment of Imperative Reasons of Overriding Public Interest (IROPI), it is deemed that the project or plan should proceed.

At each stage, there is a determination as to whether a further stage in the Appropriate Assessment process is required. If, for example, the conclusions of the Screening stage indicate that there will be no significant impacts on the Natura 2000 site, there is no requirement to proceed further. Stages 1 and 2 deal with the main requirements for assessment under Article 6.3. Stage 3 may be part of Article 6(3) or a necessary precursor for Stage 4. This report is comprised of the ecological impact assessment and testing required under the provisions of Article 6(3) by means of the first stage of Appropriate Assessment, the screening process (as set out in the EU Guidance documents).

EU guidance states:

*"This stage examines the likely effects of a project or plan, either alone or in combination with other projects or plans, upon a Natura 2000 site and considers whether it can be objectively concluded that these effects will not be significant.*

The report also provides the information required for the Competent Authority to complete the Appropriate Assessment (Stage 2) should this be necessary and appropriate in the opinion of the competent Authority. Screening has been undertaken in accordance with the European Commission's Guidance on Appropriate Assessment (European Commission, 2001) which comprises the following:

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1. Description of the Plan.
2. Identification of Natura 2000 sites potentially affected by the Plan.
3. Identification and description of individual and cumulative impacts likely to result from the Plan.
4. Assessment of the significance of the impacts identified on the conservation objectives of the site(s).
5. Exclusion of sites where it can be objectively concluded that there will be no significant impacts on conservation objectives.



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## 1.5 Consultations

The primary body consulted with regard to matters involving Natura 2000 sites is the National Parks and Wildlife Service (NPWS). The role of the NPWS is:

- To secure the conservation of a representative range of ecosystems and maintain and enhance populations of flora and fauna in Ireland.
- To implement the EU Habitats and Birds Directives.
- To designate and advise on the protection of Natural Heritage Areas (NHA) having particular regard to the need to consult with interested parties.
- To make the necessary arrangements for the implementation of National and EU legislation and policies and for the ratification and implementation of the range of international Conventions and Agreements relating to the natural heritage.
- To manage, maintain and develop State-owned National Parks and Nature Reserves.

Information pertaining to Natura 2000 sites within the Republic of Ireland is typically held by NPWS and is publically accessible through their on-line database at www.npws.ie. Consultations carried out involved searching through the NPWS database for information pertaining to the potential impact of the proposed development on Natura 2000 sites within 15 km of the proposed development.

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# 2 Screening

Following the guidelines set out by NPWS (2009), Appropriate Assessment Screening (Phase I Appropriate Assessment) is the process that addresses and records the reasoning and conclusions in relation to the first two tests of Article 6(3) of the EU Habitats Directive. According to the guidelines as laid by NPWS (2009), Appropriate Assessment Screening is the process that addresses and records the reasoning and conclusions in relation to the first two tests of Article 6(3):

(1) Is the plan or project directly connected to or necessary for the management of the site?
(2) Is the plan or project, alone or in combination with other such plans or projects likely to have significant negative effects on a Natura 2000 site(s) in view of the conservation objectives of that site(s)?

The proposed works do not comply with the first screening test (i.e. the proposed development is not directly connected to, or necessary for the management of any Natura 2000 site). The screening exercise will therefore inform the Appropriate Assessment process in determining whether the proposed works, alone or in combination with other plans and projects, is likely to have significant effects on the Natura 2000 sites within the study area (and in particular on the River Boyne and River Blackwater SAC/SPA). If the effects are deemed to be significant, potentially significant, or uncertain, or it the screening process becomes overly complicated, then the Appropriate Assessment process must proceed to Stage II Appropriate Assessment and the preparation of a Natura Impact Statement (NIS).

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## 2.1 Description

### 2.1.1 Description of works

#### *2.1.1.1 General*

Boliden Tara Mines is seeking planning permission to re-enter the Simonstown Borrow area and excavate material (~110,000 $m^3$) to use in the construction of Stage 5B raise of the Randalstown Tailings Pond. The Simonstown borrow area (35 ha in total) in located in the townland of Simonstown. The predominant land-use in and around the borrow area and the Tailings Facility is agricultural. Small patches of woodland exist immediately to the north and south of the Tailings Facility.

Historically, material from the Simonstown borrow area was extensively used in the construction of Stage 4A and 4B raises (under planning permission reference number P. 96/919). However during test excavations of material in 1998 some areas were sterilised after material of archaeological interest was revealed. In 2012 Tara re-visited these sterilised areas of archaeological features noted in 1998. The material was analysed and found to be of natural origin, a natural mix of broken red



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sandstone with fine granular grey sandstone which occurs in the undisturbed boulder clay. All work was archaeologically supervised. Access to the Simonstown Borrow Area will be from the Tailings Facility itself only.

It should be noted that the Simonstown Borrow Areas is totally enclosed with a security fence erected along the site boundary.

The works will comprise:

- Excavation of the material will be undertaken using a mechanical excavator and transported by dump truck along existing haul roads in the borrow area;
- This material will then be transported to the raise via external ramps already constructed adjacent to the existing perimeter embankment;
- No materials excavated from the borrow areas will be transported on public roads.

#### *2.1.1.2 Working the Borrow area*

The area of active working at any one time will be minimal and surface run-off from these areas will be captured in the existing field drainage ditches. The surface elevation will be a minimum of 0.3m above winter water table.

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#### *2.1.1.3 Surface water*

A near surface drainage system is in place. The ditches will discharge, via a 20 metre long sump (already in place since the previous development works in Simonstown borrow area) to the Simonstown Stream. No additional drainage, beyond that provided by the existing field drainage system, is required.

#### *2.1.1.4 Dust*

All construction activity involving the placement of fill materials has the potential to generate an amount of dust. The principal materials to be excavated in the Simonstown borrow area are materials which, by virtue of their moisture content and particle size, are not particularly prone to dusting.

#### *2.1.1.5 After-use of Simonstown Borrow Area*

The final use pattern of both the Simonstown borrow areas shall be subject to the agreement of the planning authority. It has been suggested in the EcIA of the proposed works that the area might be



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re-profiled to create an artificial wetland habitat, which could, following the decommissioning of the Tailings Facility itself, provide alternate habitat for the plethora of wetland-associated species that currently occur within the *environs* of the Tailings facility.

### *2.1.1.6 Location*

The location of the proposed development is indicated in Figure 1, Figure 2, Figure 3 and Figure 4.

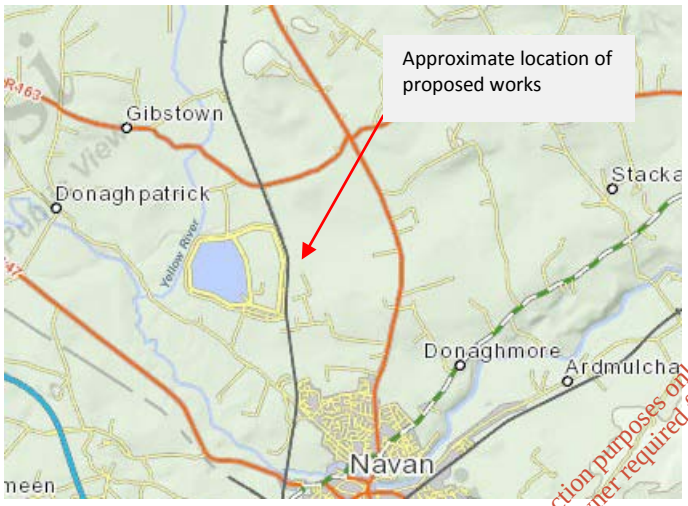


**Figure 1: Map indicating general location of the proposed works (scale 1:100,000).**

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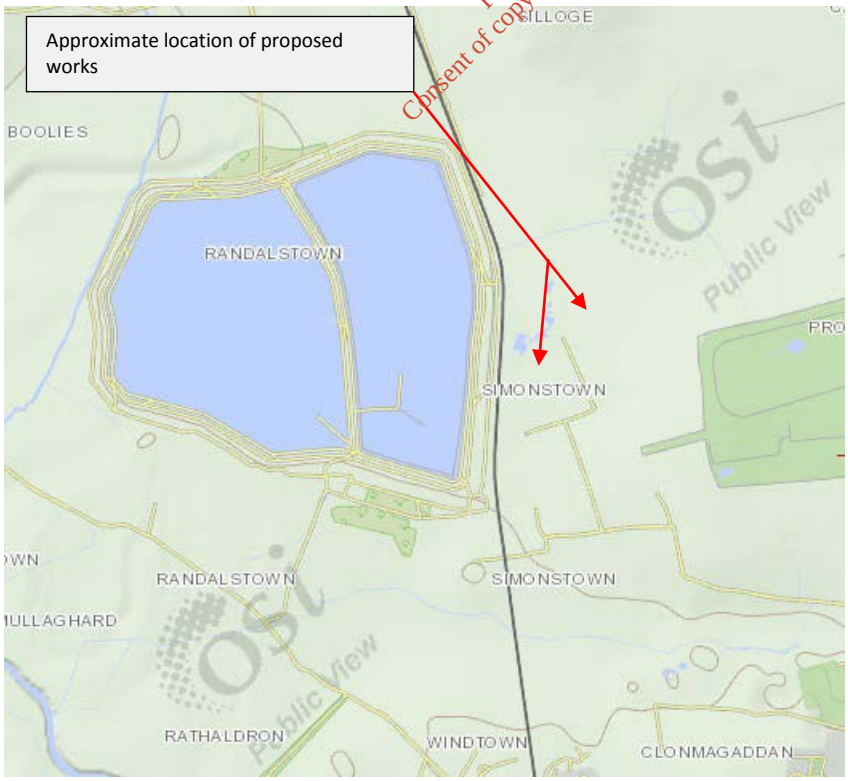


**Figure 2: Approximate location of proposed works (scale 1:25,000).**



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**Figure 3: Map illustrating approximate location of site boundary of proposed works (scale 1:5,000)**

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**Figure 4: Aerial photograph indicating location of Mound 1 and Mound 2 (scale 1:1000)**



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### 2.1.2 Description of existing conditions at site

A site visit was carried out on February 3rd 2014 in order to assess the habitats present at the proposed development site, and to identify potential impacts of the proposed development on the conservation objectives of any Natura sites identified in section 2.2. The Plots of land (Mound 1 – 2.85 Ha and Mound 2 – 1.3 Ha) are present in fields comprised largely of Improved Grassland (GA1) although the plots do not appear to have been fertilised or reseeded recently. The plots comprise areas of material that were not removed during previous works, and are significantly elevated, with steeply sloping sides, relative to the surrounding fields. There is a large percentage of moss cover, and in some areas both fields are extremely wet underfoot. The field in which Mound 1 occurs is particularly wet, with up to 40 cm of surface water in some areas (there had been a large number of extremely heavy rainfall events immediately preceding the field visit. The fields are located proximate to the Tara (New Boliden) Mines Tailings facility at Randalstown. Associated with the boundary of the Simonstown Borrow area is a hedgerow (WL1). Of note, there are present within the immediate vicinity of the proposed works several small wetland areas with well-established wetland vegetation.

Mound 1 is larger in nature and would appear to have been fertilised and/or reseeded at some point in the past, as the habitat is dominated by *Lolium perenne*. There is evidence of recent cattle and sheep grazing. There are small areas, particularly along the sloping edges of both Plots where small thickets of *Ulex europaeus* occur. Of note, there is present a known Badger sett (*Meles meles*) within the hedgerow to the south east of Mound 2. Irish Hare (*Lepus timidus hibernicus*) were also observed within the immediate vicinity of both Mound 1 and Mound 2. There are a number of water bodies/courses in the immediate vicinity of the proposed works.

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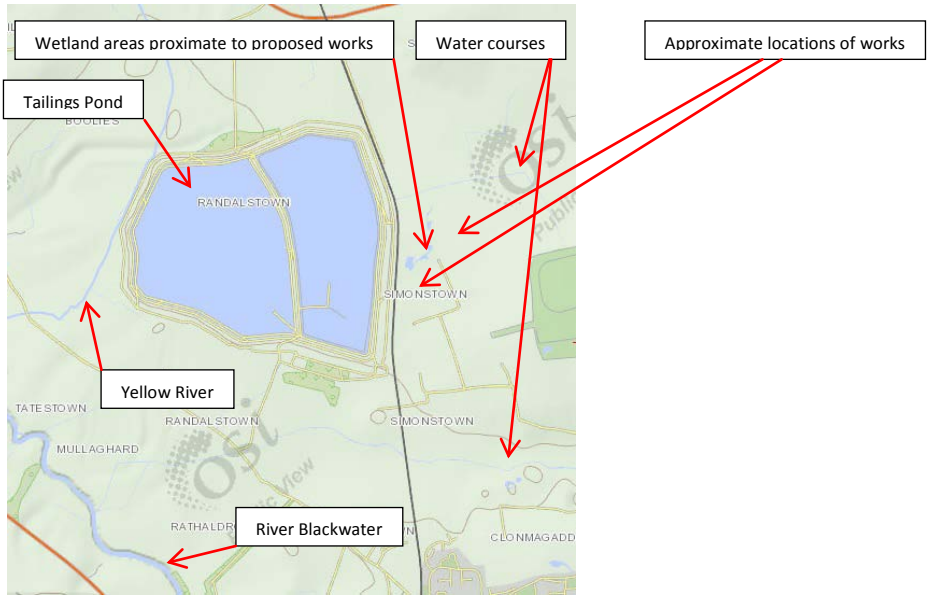


**Figure 5: Map indicating location proposed works relative to water bodies/courses**



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The proposed works will take place proximate to the river Blackwater, one of the primary constituents of the River Boyne and River Blackwater SAC and the River Boyne and River Blackwater SPA. An aerial photograph illustrating the site location in relation to the surrounding land uses is shown in Figure 6. The river Blackwater can clearly be seen to the west, with the Tailings Pond immediately adjacent to the west. The town of Navan is located to the south, just outside the frame of the aerial. The majority of the land in the immediate vicinity of the proposed works is agricultural. Photographs of the site are presented in Figure 7, Figure 9, Figure 10, Figure 11 and Figure 12.

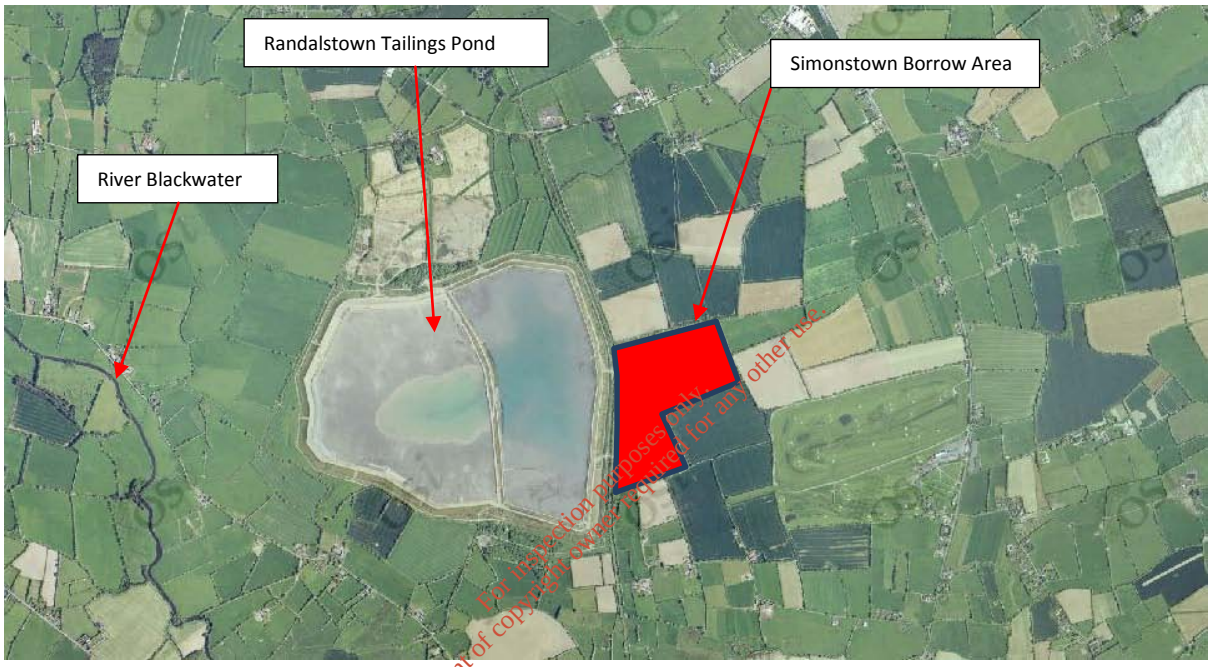


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**Figure 6: Aerial (scale 1:25,000) illustrating the location of the borrow area relative to surrounding land use.**

**Figure 7: Photograph illustrating the primary habitat present at the site (GA1).**



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**Figure 8: Photograph illustrating Mound 1 (raised area in mid-background)**

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**Figure 9: Photograph illustrating habitat present within Mound 2 facing west with Tailings Pond in background.**



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**Figure 10: Photograph illustrating hedgerow to south east of Mound 2 in which a known badger set is located**

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**Figure 11: Photograph of raptor pellet found on site at Mound 2, likely Sparrowhawk based on pellet contents**



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**Figure 12: Photograph illustrating wetland habitat to the north west of Mound 2**

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### 2.1.3 Description of scope

Baseline conditions at the site were ascertained by carrying out a site visit on February 3rd 2014. Although this is not the optimal time of year for carrying out a flora and fauna survey, given the primary habitat present at the subject site (GA1), a site visit at this time of year is sufficient. While both Mound 1 and Mound 2 have broadly the same species present within them, Mound 1 is largely dominated by *Lolium perenne*, with Mound 2 less dominated by *Lolium perenne*, with a greater coverage of other species of grass. These included *Cynosurus cristatus*, *Agrostis stolonifera, Holcus lonatus, Festuca rubra* and *Anthoxanthum odoratum.* Similarly, the herb layer component within Mound 2 had a higher coverage relative to Mound 1, although species composition was similar. The herb layer included *Achillea millefolium, Hypochaeris radicata, Plantago lanceolata, Cerastium fontanum, Cirsium arvense, Cirsium officinalis and Senecio jacobaea*. There was significant areas of Gorse present, in particular on the slopes of both Mound 1 and Mound 2. There was significant moss cover in both Plots, although coverage was considerably higher in Mound 2. Species included *Kindsbergia praelonga, Pseudoschleropodium purum* and *Brachethecium rutubalum.*

There is a hedgerow associated with several of the boundaries of the fields in which Mound 1 and Mound 2 are located. These hedgerows are mature, containing numerous mature trees. The hedgerows have a typical species composition for this part of Co. Meath, comprised largely of *Crataegus monogyna, Fraxinus excelsior* and *Sambucus nigra*. There are several wetland areas of note in the immediate vicinity of both mounds, with fringe vegetation of *Typha latifolia* and *Phragmites australis*. These areas have been created through previous removal operations.

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There are numerous records of species of conservation interest within the 10 km squares in and around the development site (N76, N77, N78, N86, N87, N88, N96, N97 and N98 - source NPWS) including Otter (*Lutra lutra*), Red Squirrel (*Sciurius vulgaris*), Betony (*Stachys officinalis*), Annual Knawel (*Schleranthus annuus*), Meadow Saxifrage (*Saxifraga granulata*), Meadow Barley (*Hordeum secalinum*) and Hairy St. John's Wort (*Hypericum hirsutum*). There was no evidence for any of these species within the foot print of the proposed works and it is highly unlikely that any of these species of conservation concern are likely to occur within the immediate vicinity of the works given the habitat present (GA1).

The wetland habitat adjacent does provide potentially suitable habitat for several species of conservation value. It should be noted that the habitat adjacent to Mound 1 and Mound 2 is suitable for foraging Whooper Swan (a species present on Annex I of the EU Birds Directive), and that this species has been observed within this area in the past (personal observation).



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The hedgerows present around the boundary of the fields in which the plots are located, and several stand-alone trees in the vicinity of the Plots potentially provide foraging, commuting and roosting opportunities for a number of bat species (all of which are listed on Annex IV of the EU Habitats Directive).

Although the nature of habitats and necessary ecological features present within the footprint of the proposed works and immediate *environs* are entirely anthropogenic, it must be noted that it is possible that several species of conservation concern may utilize the habitat adjacent to the proposed works for foraging, commuting and/or roosting.

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## 2.2 Identification of Natura 2000 sites potentially impacted upon by the development

It is general practice, when screening a plan or project for compliance with the Habitats Directive, to identify all Natura 2000 sites within the functional area of the plan/project itself and within 15 km of the boundaries of the area the plan/project applies to. This approach is currently recommended in the Department of the Environmental, Heritage and Local Government's document Guidance for Planning Authorities and as a precautionary measure, to ensure that all potentially affected Natura 2000 sites are included in the screening process.

The maintenance of habitats and species within individual Natura 2000 sites at favourable conservation condition contributes to the overall maintenance of favourable conservation status of those habitats and species at a national level. It is therefore necessary to identify any potential impacts of the proposed development on the conservation status of Natura 2000 sites.

The National Parks and Wildlife Service deem that the favourable conservation status of a habitat is achieved when:

- Its natural range, and area it covers within that range, is stable or increasing.
- The ecological factors that are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future.
- The conservation status of its typical species is favourable.

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The National Parks and Wildlife Service deem that the favourable conservation status of a species is achieved when:

- Population data on the species concerned indicate that it is maintaining itself.
- The natural range of the species is neither being reduced, or likely to be reduced in the foreseeable future.
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

There is one designated as a special area of conservation (SAC) and one area designated as a special protection area (SPA) within 15 km of the proposed development site (see Table 1, Figure 13 and Figure 14).

**Table 1: Natura 2000 sites within 15 km of the proposed development**

| Site Code | Designation | Site Name |
|---|---|---|
| 002299 | SAC | River Boyne and River Blackwater |
| 004232 | SPA | River Boyne and River Blackwater |



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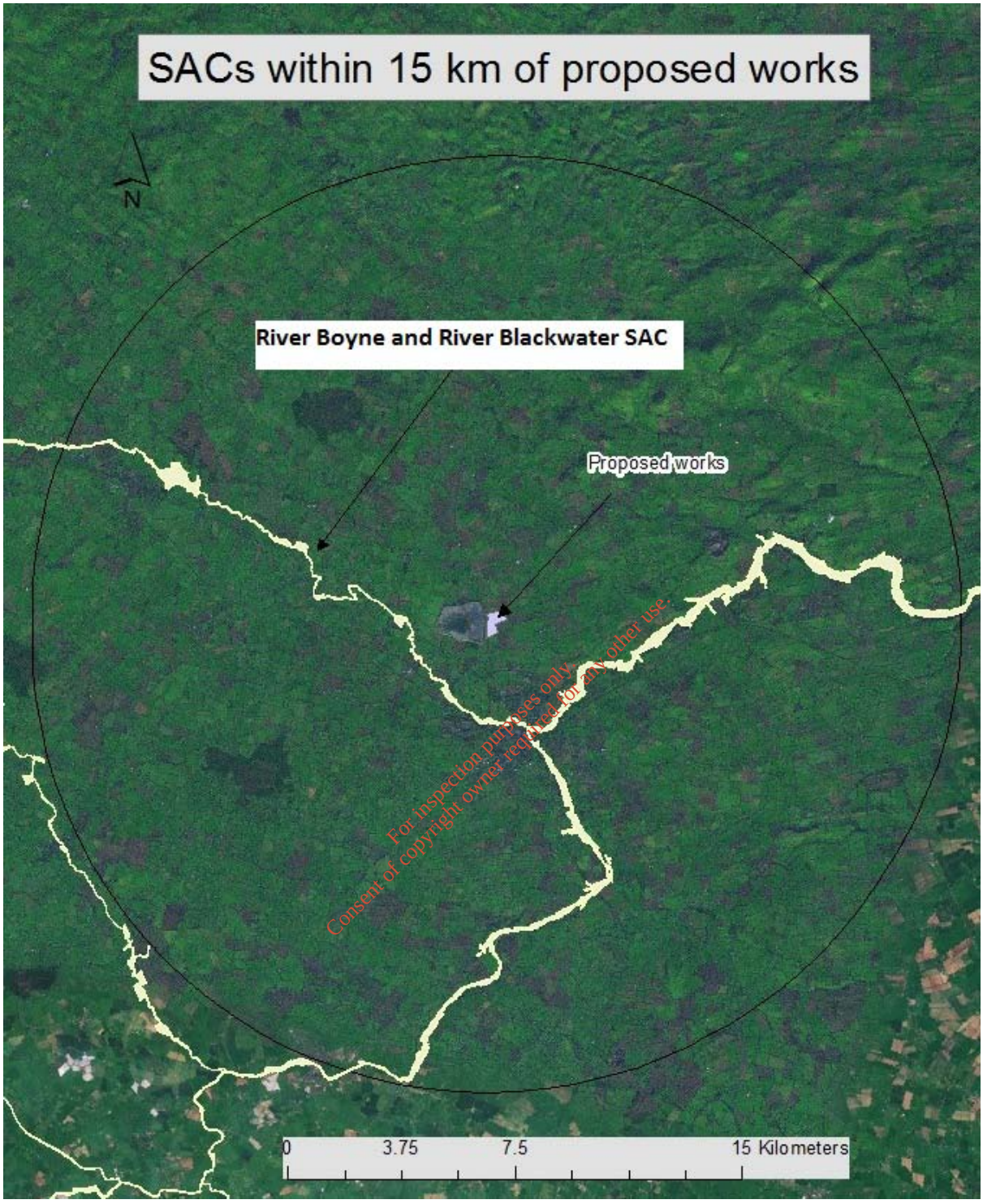


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**Figure 13:** **Map indicating location of Special Areas of Conservation relative to the proposed development**



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**Figure 14:** **Map indicating location of Special Areas of Protection relative to the proposed development**



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## 2.3 Description of Natura 2000 sites potentially impacted upon by the proposed development

Please note that conservation objectives, qualifying interests, vulnerability and conservation status of individual sites is provided in section 3.2.

### 2.3.1 River Boyne and River Blackwater SAC

The River Boyne and River Blackwater SAC comprises the freshwater element of the River Boyne as far as the Boyne Aqueduct, the Blackwater as far as Lough Ramor and the Boyne tributaries including the Deel, Stoneyford and Tremblestown Rivers and occupies approximately 2320.86 Ha. The site is a candidate SAC selected for alkaline fen and alluvial woodlands, both habitats listed on Annex I of the E.U. Habitats Directive. The site is also selected for the following species listed on Annex II of the same directive – Atlantic Salmon, Otter and River Lamprey.

### 2.3.2 The River Boyne and River Blackwater SPA

The River Boyne and River Blackwater SPA is a long, linear site that comprises stretches of the River Boyne and several of its tributaries; most of the site is in Co. Meath, but it extends also into Counties Cavan, Louth and Westmeath. It includes the following river sections: the River Boyne from the M1 motorway bridge, west of Drogheda, to the junction with the Royal Canal, west of Longwood, Co Meath; the River Blackwater from its junction with the River Boyne in Navan to the junction with Lough Ramor in Co. Cavan; the Tremblestown River/Athboy River from the junction with the River Boyne at Kilnagross Bridge west of Trim to the bridge in Athboy, Co. Meath; the Stoneyford River from its junction with the River Boyne to Stonestown Bridge in Co. Westmeath; the River Deel from its junction with the River Boyne to Cummer Bridge, Co. Westmeath. The site includes the river channel and marginal vegetation. This site is a Special Protection Area, selected for Kingfisher.

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## 2.4 Identification and evaluation of likely significant effect

### 2.4.1 Description of source-pathway-receptor linkages.

The proposed works will take place proximate to the river Blackwater, one of the primary constituents of the River Boyne and River Blackwater SAC/SPA (see Figure 15). There are a number of water-courses in the vicinity of the proposed works that form a drainage network between the proposed works and the River Boyne and River Blackwater SAC/SPA:

- There is a water course less than 1 km south of the proposed extraction works that discharges to the River Blackwater;
- The existence of watercourses that may now be piped underground, and as such are not visible on the current OSI maps, cannot be discounted. For instance, the historic 6" map indicates a water course flowing immediately to the north of the proposed works, which goes on to flow through the townlands of Rathcoon, Causetown and Stackallen before discharging to the River Boyne. The part of this water course flowing to the north of the proposed works is no longer indicated on the OSI maps, although the downstream component of the water-course is still apparent. Any hydrological study of the impact of the proposed works must take into account any such water-courses.
- The proposed works will involve extensive excavation of material and moving of said material, which may impact upon local hydrology, potentially providing indirect S-P-R linkages between the development and the River Boyne and River Blackwater SAC/SPA.

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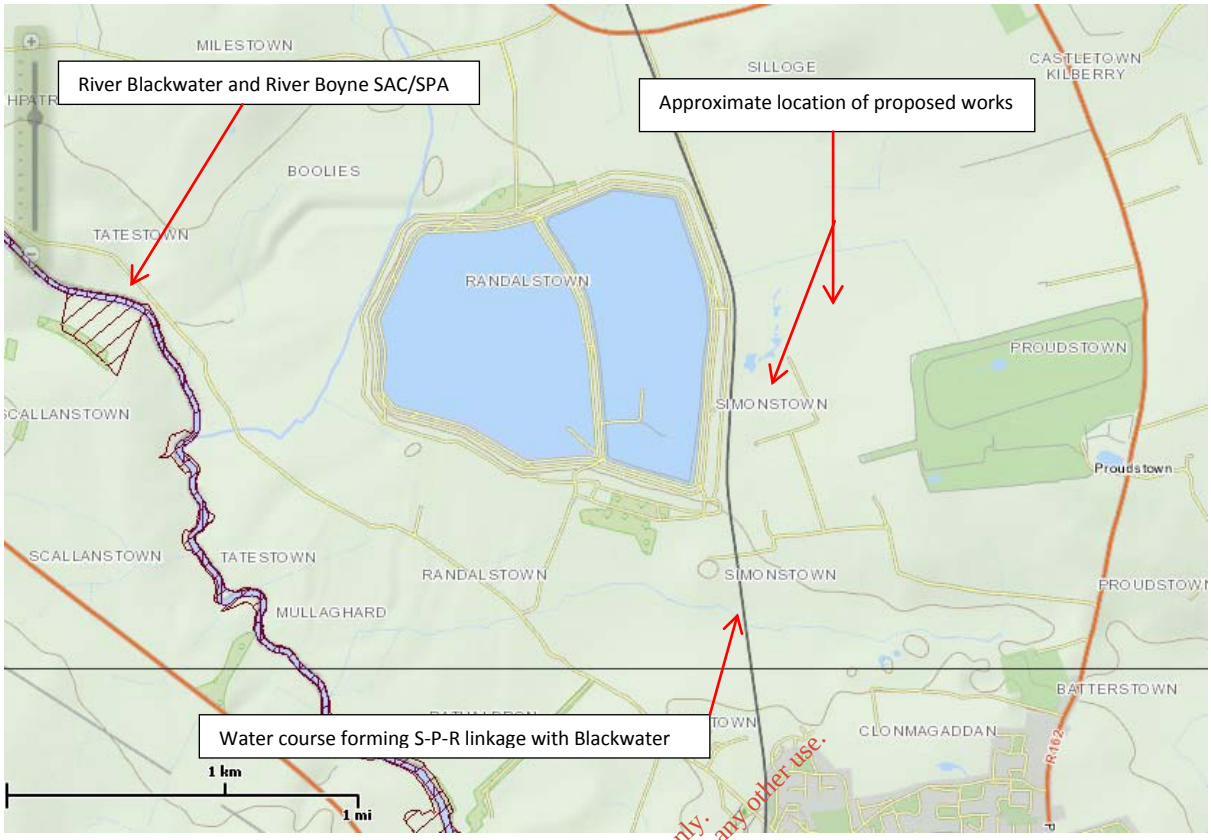


**Figure 15:** **Map indicating location of proposed works relative to the River Boyne and River Blackwater SAC/SPA**

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### 2.4.2 Potential Direct, Indirect or Secondary Impacts

The proposed works are not located immediately within any designated areas, and as such there will be no direct impacts upon any Natura 2000 sites associated with the development. There is a potential for impacts, however through Source-Pathway-Receptor (S-P-R) linkages:

- The proposed works entail extensive excavations, which may potentially impact upon local hydrology, thereby potentially impacting upon the River Blackwater;
- There are a number of S-P-R linkages between the proposed works and the River Boyne and River Blackwater SAC/SPA. Contamination of any of these water courses has the potential to impact upon the Natura 2000 sites;
- There is potential for disturbance of species of conservation concern utilizing habitat within/adjacent to the SAC/SPA associated with the proposed works, primarily Whooper Swan, which, while not a qualifying interest of the SAC/SPA are mentioned in the site synopses.

There is also the possibility of secondary impacts, with any of the impacts listed above having an impact on any sites/species linked physically or ecologically to these Natura 2000 sites (for example, the Annex I species (EU Birds Directive) Whooper Swan is known to utilise habitat in the locality – disturbance of this species may result in changes in migration/commuting/foraging corridors).

It must also be noted that the extracted material is being moved to a site (the Tailings Pond) adjacent to a water course (the Yellow River), which forms a S-P-R with the River Blackwater. This must be taken into account with regards cumulative impacts

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Many of the habitats and species for which the Natura 2000 sites occurring within 15 km of the proposed development are designated, are directly or indirectly dependent on water quality/hydrology. A reduction in water quality, or changes to local hydrology could negatively impact upon the conservation status of these sites with regard to habitat quality and size, and with regard to the ecological integrity of those species occurring within the sites. The potential for impacts upon Natura 2000 sites within 15 km of the development is summarized in table 2. The potential impact upon the site in the event of negative impacts is summarized in table 3. The potential impacts on qualifying interests of Natura 2000 sites within the 15 km study area identified as potentially at risk are summarised in Table 4.



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**Table 2: The potential for impacts upon Natura 2000 sites within 15 km**

| Site Name | Direct Impacts | Indirect/ Secondary Impacts | Resource requirements (water abstraction etc.) | Emissions (to land, water or air) | Excavation requirements | Duration of construction and operation |
|---|---|---|---|---|---|---|
| River Boyne and River Blackwater SAC | None predicted | • Potential indirect impacts on local water quality/hydrology.<br>• Potential disturbance of species of conservation concern<br>• Potential 2° impacts on Annex I bird species | None predicted | Potential indirect impacts on the River Blackwater through changes in water quality/ hydrology | • Potential indirect impacts on local water quality/hydrology.<br>• Potential disturbance of species of conservation concern<br>• Potential 2° impacts on Annex I bird species | • Potential indirect impacts on local water quality/hydrology.<br>• Potential disturbance of species of conservation concern<br>• Potential 2° impacts on Annex I bird species |
| River Boyne and River Blackwater SPA | None predicted | • Potential indirect impacts on local water quality/hydrology.<br>• Potential disturbance of species of conservation concern<br>• Potential 2° impacts on Annex I bird species | None predicted | Potential indirect impacts on the River Blackwater through changes in water quality/ hydrology | • Potential indirect impacts on local water quality/hydrology.<br>• Potential disturbance of species of conservation concern<br>• Potential 2° impacts on Annex I bird species | • Potential indirect impacts on local water quality/hydrology.<br>• Potential disturbance of species of conservation concern<br>• Potential 2° impacts on Annex I bird species |

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**Table 3: Potential changes to Natura 2000 sites within 15 km of the proposed development**

| Site Name | Reduction of habitat area | Disturbance to key species | Habitat/species fragmentation | Reduction in species density | Changes in Key Indicators of Conservation Value | Climate change |
|---|---|---|---|---|---|---|
| River Boyne and River Blackwater SAC | Potential indirect impacts on water quality/hydrology Potential disturbance of species of conservation concern Potential secondary impacts on Annex I bird species | Potential indirect impacts on water quality/hydrology Potential disturbance of species of conservation concern Potential secondary impacts on Annex I bird species | Potential indirect impacts on water quality/hydrology Potential disturbance of species of conservation concern Potential secondary impacts on Annex I bird species | Potential indirect impacts on water quality/hydrology Potential disturbance of species of conservation concern Potential secondary impacts on Annex I bird species | Potential indirect impacts on water quality/hydrology Potential disturbance of species of conservation concern Potential secondary impacts on Annex I bird species | None Predicted |
| River Boyne and River Blackwater SPA | Potential indirect impacts on water quality/hydrology Potential disturbance of species of conservation concern Potential secondary impacts on Annex I bird species | Potential indirect impacts on water quality/hydrology Potential disturbance of species of conservation concern Potential secondary impacts on Annex I bird species | Potential indirect impacts on water quality/hydrology Potential disturbance of species of conservation concern Potential secondary impacts on Annex I bird species | Potential indirect impacts on water quality/hydrology Potential disturbance of species of conservation concern Potential secondary impacts on Annex I bird species | Potential indirect impacts on water quality/hydrology Potential disturbance of species of conservation concern Potential secondary impacts on Annex I bird species | None Predicted |



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**Table 4: Potential impacts on Qualifying Interests of Natura 2000 sites identified as at risk of impact**

| Site name | Qualifying Interest | Potential Impact |
|---|---|---|
| River Boyne and River Blackwater SAC | [1099] *Lampetra fluviatilis* | Potential impacts through changes in water quality and hydrology |
| | [1106] *Salmo salar* (only on fresh water) | Potential impacts through changes in water quality and hydrology |
| | [1355] *Lutra lutra* | Potential impacts through changes in water quality and hydrology |
| | [7230] Alkaline Fens | Potential impacts through changes in water quality and hydrology |
| | [91E0] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* – Priority Habitat | Potential impacts through changes in water quality and hydrology |
| River Boyne and River Blackwater SPA | *Alcedo atthis [breeding]* | Potential 2° impacts |

It is important to note that although not qualifying interests of either Natura 2000 site, the proposed works do have the potential to impact upon Whooper Swan (through disturbance), a species listed on Annex I of the EU Birds Directive.

In addition, although not a qualifying interest, [7220] petrifying springs with tufa formation (*Cratoneurion*), a priority habitat listed on Annex I of the EU Habitats Directive, do occur along the River Boyne and River Blackwater SAC and are particularly vulnerable to any changes in hydrology or water quality.

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### 2.4.3 Potential cumulative impacts in association with other plans

Article 6(3) of the Habitats Directive requires an assessment of a plan/project to consider other plans/projects that might, in combination with the proposed plan/project, have the potential to adversely impact upon Natura 2000 sites. A list of plans and projects relevant to the proposed development is listed in Table 5 in addition to the potential for cumulative impacts.

**Table 5: Potential cumulative impacts**

| Plan | Purpose | Cumulative impact |
|---|---|---|
| EU Water framework Directive | Maintain and enhance water quality within the EU | None predicted |
| EU Freshwater Fish Directive | Protect freshwater bodies within the EU suitable for sustaining fish populations | None predicted |
| EU Groundwater Directive | Maintain and enhance the quality of groundwater within the EU | None predicted |
| EU Floods Directive | The Floods Directive applies to river basins and coastal areas at risk of flooding | None predicted |
| Nitrates Directive | Reducing water pollution within the EU | None predicted |
| Urban Waste-water treatment Directive | Protecting the environment from adverse impacts of waste-water discharge | None predicted |
| Sewage Sludge Directive | Regulate the use of sewage sludge | None predicted |
| The IPPC Directive | To achieve a high level of environmental protection | None predicted |
| National Development Plan | To promote more balanced spatial and economic development | Potential in-combination impacts on water quality and increased disturbance may arise where there is a requirement to provide for new infrastructure. |
| National Spatial Strategy | To achieve a better balance of social, economic and physical development across Ireland | Potential in-combination impacts on water quality and increased disturbance may arise where there is a requirement to provide for new infrastructure. |
| Meath County Development Plan 2007 – 2013 (and the updated CDP) | Sustainable development of Co. Meath | Potential in-combination impacts on water quality and increased disturbance may arise where there is a requirement to provide for new infrastructure. |
| Kells Development Plan 2013 – 2019 | Sustainable development within Plan Area | Potential in-combination impacts on water quality and increased disturbance may arise where there is a requirement to provide for new infrastructure. |
| Construction of Stage 5B of the Randalstown Tailings Facility | Provision of sufficient capacity to accommodate tailings that will be generated post 2013 going forward | Potential in-combination impacts on water quality and increased disturbance. The material excavated will be moved to a location immediately proximate to a S-P-R linking to the River Blackwater |
| Current and future planning permission applications for new developments associated with operations at Boliden Tara Mines. | Miscellaneous | Potential in-combination impacts on water quality and increased disturbance. |
| Land spreading of organic waste by farmers in the locality | Fertilising land, disposing of organic waste | Potential in combination impacts on water quality. |

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There is a potential for cumulative impacts as described above given the nature and location of the development. The most likely source of cumulative impact is deemed to be in association with the



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planned construction of Stage 5B embankment of the Randalstown Tailings Facility. The materials being excavated under the proposed works will be utilised in the construction process and thus the two are linked. This NIS, regarding the extraction of material from the Simonstown Borrow Area, must be read in conjunction with the EIS and NIS prepared for the Stage 5B construction.

### 2.4.4 "Do nothing scenario"

In the event of the "Do nothing scenario", any potential impacts will be avoided.

### 2.4.5 Alternatives

Boliden Tara Mines requires material such as that present within the confines of the borrow area at Simonstown for the construction of the Tailings Pond at Randalstown. The borrow area at Simonstown is immediately adjacent to the Tailings Pond and will be accessed directly from the Tailings Pond. No alien invasive species were observed within the proposed foot-print of the works or immediate vicinity. To source the material required from elsewhere would involve considerable risk of the importation of alien invasive species. It is therefore considered that excavating the material present at Simonstown is the best option for sourcing material.

The alternatives with regard to the receiving environment of the excavated material (Stage 5B of the Tailings Pond facility at Randalstown) are outlined in the relevant reports.

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## 2.5 Conclusions of screening

According to the guidance published by the NPWS (DoEHLG, 2009), Screening for Appropriate Assessment can either identify that a Natura Impact Statement (NIS) is not required where:

(1) A project/proposal is directly related to the management of the site.

(2) There is no potential for significant effects affecting the Natura 2000 network

Where the screening process identifies that significant effects are certain, likely or uncertain the project must either proceed to Stage II Appropriate Assessment or be rejected.

The likely impacts that will arise from the proposed development have been examined in the context of a number of factors that could potentially impact upon the integrity of the Natura 2000 network. On the basis of the findings of this Screening for Appropriate Assessment, it is concluded that the development:

(1) Is not directly connected with or necessary to the management of a Natura 2000 site and

(2) May have significant impacts on one or more Natura 2000 sites.

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Screening has identified potential impacts upon a Natura 2000 site associated with the proposed development - therefore, applying the Precautionary Principle and in accordance with Article 6(3) of the Habitats Directive, a Stage 2 Appropriate Assessment is required, i.e., "*The consideration of the impact of the project or plan on the integrity of the Natura 2000 Site, either alone or in combination with other projects or plans to the sites structure and function and its conservation objectives. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts.*"



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# 3 Appropriate Assessment

## 3.1 Stage II Appropriate Assessment background

Screening having identified potential impacts, stage II Appropriate Assessment is carried out to determine if the plan will adversely affect the integrity of the Natura 2000 network, i.e. any of those sites outlined in section 2.2. This involves the identification of potentially affected sites and their location in relation to the development. It involves the identification of the habitats and species within the site, and an assessment of the significance of impacts on their conservation status. An assessment of impacts is carried out, and mitigation measures proposed for potential impacts. Any negative impacts on the integrity of structure, function or conservation objectives of these sites will require the implementation of avoidance or mitigation measures to avoid progression to Stages 3 and 4 of the Appropriate Assessment process.

## 3.2 Description of the qualifying interests, vulnerabilities and conservation status of Natura 2000 sites potentially impacted upon by the proposed development

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Please note that it is the goal of NPWS to draw up conservation plans for all areas designated for nature conservation, and that these plans will, among other things, set clear objectives for the conservation of the features of interest within a site. At present, for the majority of sites, a Management Plan is not yet available. NPWS have provided a site synopsis, generic Conservation Objectives and a Natura 2000 data form for these sites, from which information is sourced. The overall conservation status of EU protected habitats and species in Ireland is taken from the NPWS publication (2008) "Conservation Status in Ireland of Habitats and Species listed in the EC Directive on the Conservation of Habitats, Flora and Fauna 92/43/EEC".

In addition to a description of the qualifying interests of the individual sites and their vulnerabilities, a synopsis of the conservation status of qualifying interests will be presented in table form for each site, as recorded in the relevant Natura 2000 Data Form. The codes utilized within these forms are outlined below for the readers benefit:

For Special Areas of Conservation, this table will take the form of:

**Code**
Site code.

**% Cover**
Percentage cover of annex habitat out of total area of site.



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**Representativity**
The degree of representativity of the natural habitat type on site – three ranks:
A = Excellent representativity.
B = Good representativity.
C = Significant representativity.

**Relative Surface**
The area of the site covered by the natural habitat type in relation to the total area covered by that natural habitat type within the national territory – three ranks where 'p' is the value of the relative surface:
A: 100% ≥ p > 15%
B: 15% ≥ p> 2%
C: 2% ≥ p > 0%

**Conservation Status**
Degree of the conservation of the structure and functions of the natural habitat type concerned, and restoration possibilities. There are three sub-criteria (degree of conservation of structure, degree of conservation of function, restoration possibilities), which are evaluated individually, but combined to categorize the conservation status of the site. Conservation status has three ranks:
A = Excellent conservation.
B = Good conservation.
C = Average or reduced conservation.

**Global Assessment**
A global assessment of the site for conservation of the habitat type concerned – three ranks:
A = Excellent value.
B = Good value.
C = Significant value.

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For Special Protection Areas, this table will take the form of:

**Code**
Species code.

**Species Name**
Species name – in latin, removes any confusion owing to the use of different local names for species.

**Population – with four sub-categories**
**Resident:** To be found throughout the year on the site.
**Breeding/Reproducing:** Uses the site to nest and raise young.
**Staging:** Site used on migration or for moulting outside of breeding grounds.
**Wintering:** Uses the site during the winter.

Numbers indicate an exact number where known, or a range. A suffix of (i) indicates individuals observed, while a suffix of (p) indicates pairs observed. For some species, it may be necessary to distinguish between males (m) and females (f) also. If, in the absence of any population data a site is still known to be of community importance for a species, describe the character of the population in the site description text field 'Quality' outlining the nature of the population (e.g. dense, dispersed or isolated).



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**Site Assessment – with four sub-categories**

**Population:** Size and density of the population of the species present on the site in relation to the populations present within national territory. Four ranks;
A: 100% ≥ p > 15%
B: 15% ≥ p> 2%
C: 2% ≥ p > 0%
D: Present on site in a non-significant manner

**Conservation:** Degree of conservation of the features of the habitat which are important for the species concerned and possibilities for restoration. There are two subcriteria –
(a)Degree of conservation of the features of the habitat important for the species.
(b)Restoration possibilities. There are three ranks;
A: Conservation excellent.
B: Good conservation.
C: Average or reduced conservation.

**Isolation:** Degree of isolation of the population present on the site in relation to the natural range of the species. This criterion may be interpreted as an approximate measure ` of the contribution of a given population to the genetic diversity of the species on the one hand and of the fragility of this specific population on the other hand. Using a simplistic approach one may say that the more a population is isolated (in relation to its natural range), the greater is its contribution to the genetic diversity of the species. Consequently the term "isolation" should be considered in a wider context, applying equally to strict endemics, to sub-species/varieties/races as well as sub-populations of a meta-population. In this context the following grading should be used:
A: Population (almost) isolated.
B: Population not isolated, but on the margins of the area of distribution.
C: Population not isolated within extended distribution range.

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**Global:** Global assessment of the value of the site for conservation of the species concerned. This criterion refers to the global assessment of the value of the site for the conservation of the species concerned. It may be used to sum up the previous criteria and also to assess other features of the site thought to be relevant for a given species. These features may vary from one species to another and might include human activities on the site or in nearby areas which are capable of influencing the conservation status of the species, land management, the statutory protection of the site, ecological relations between the different types of habitats and species, etc.
A 'best expert judgment' may be used for this global evaluation, using the following ranking system:
A : excellent value
B : good value
C : significant value



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### 3.2.1 River Boyne and River Blackwater SAC

The main channel of the Boyne contains a good example of alluvial woodland of the *Salicetum albo-fragilis* type which has developed on three alluvium islands. Alkaline fen vegetation is well represented at Lough Shesk, where there is a very fine example of habitat succession from open water to raised bog. The Boyne and its tributaries is one of Ireland's premier game fisheries and offers a wide range of angling, from fishing for spring salmon and grilse to sea trout fishing and extensive brown trout fishing. The site is one of the most important in eastern Ireland for *Salmo salar* and has very extensive spawning grounds. The site also has an important population of *Lampetra fluviatilis*, though the distribution or abundance of this species is not well known. *Lutra lutra* is widespread throughout the site. Some of the grassland areas along the Boyne and Blackwater are used by a nationally important winter flock of *Cygnus cygnus*. The main threats to the ecological integrity of this site are drainage schemes and water pollution. Water quality is impaired in areas of this site owing to runoff from and inputs from agricultural, domestic and industrial sources. A reduction in the input of pollutants to this system is required to preserve the important aquatic interests of this site.

The conservation objective of the River Boyne and River Blackwater SAC (site code 002299) is to maintain or restore the favourable conservation condition of the Annex I habitat(s) and or Annex II species for which the SAC has been designated:

- **[1099] *Lampetra fluviatilis***

  The river lamprey grows to 30cm and has a similar life history to the sea lamprey. The brook lamprey is the smallest of the three lampreys native to Ireland at 15 to 20cm. It is also the only one of the three which is non-parasitic and spends all its life in freshwater. Desareae the difference in ecology, brook and river lamprey are very similar genetically and cannot be distinguished by visual means. As a result, for the purposes of this assessment, the brook and river lampreys have been treated together. Records of adult lampreys are sparse, with most fieldwork aimed at juveniles. Recent field surveys point to a widespread distribution of juvenile river/brook lamprey, throughout the country. They tend to be patchily distributed within catchments, but can occur in high densities (100/m2) where habitat and flow regimes are suitable. While recognising the difficulties distinguishing the smaller lamprey species in the field, it would appear that the brook lamprey is certainly widespread throughout the country and that the river lamprey is not as restricted by weirs as the sea lamprey. The current status and future prospects of these species appears to be good.

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- **[1106] *Salmo salar* (only in fresh water)**

  The salmon breeds in freshwater, but spends much of its life at sea. The salmon population in Ireland has declined by 75% in recent decades and although salmon still occur in 148 Irish rivers only 43 of these have healthy populations. There are numerous factors which impact negatively on salmon, the most important of which are reduced marine survival (probably as a result of climate change), poor river water quality (resulting from factors such as inadequate sewage treatment, agricultural enrichment, acidification, erosion and siltation), forestry-related pressures and over-fishing. The current estimates suggest that less than 10% of the wild smolts that go to sea from Irish rivers are surviving. There are real concerns relating to factors causing mortality at sea such as diseases, parasites and marine pollution; however there is insufficient information on all factors at this stage.

- **[1355] *Lutra lutra***

  The otter is widespread in Irish freshwater and coastal habitats. Its main prey includes sticklebacks, salmonids, frogs, crayfish and eels. While there has been some localised reduction in otter habitat quality, due mainly to water pollution and clearance of riparian vegetation, this has been balanced by the reduced occurrence of severe water pollution episodes and reduced river corridor disturbance. The otter population in Ireland is estimated to be in the region of 10,000 to 20,000 adults. Between the first national survey in 1980/81 and the most recent survey in 2004/05, a net population loss of 23.7% has been estimated, with the majority of this decline occurring in the first ten years. Many otters are killed on the roads each year; a smaller number are killed in fishing nets and lobster pots. Although the otter has remained widespread in Ireland, national surveys suggest that otter densities have declined since 1980 and consequently conservation status is considered poor.

- **[7230] Alkaline fens**

  Alkaline fens are peat-forming wetlands that receive mineral nutrients from sources other than preciareaation. Fens differ from bogs because they are less acidic and have relatively higher mineral levels. They are therefore able to support a much more diverse plant and animal community. In Ireland, alkaline fens are fed by calcium-rich groundwater. They occur in a variety of situations including valleys or depressions, valley head fens, within transition mire and tall reed beds, on the landward side of hard-water oligotrophic lakeshore communities, calcium-rich flush areas in blanket bogs, dune slack areas, fens adjacent to raised and blanket bogs, in turlough sites, depressions in limestone pavement and wet hollows in machair, and spring fed habitats including cliffs, and even saltmarsh. Alkaline fen may also occur as a secondary habitat on mined out bog sites which have been excavated to

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the Like most peatland types in Ireland, fens have experienced a decline in quality, mostly as a result of activities such as peat mining, draining for cropland, infilling, and fertiliser pollution and eutrophication. Only limited measures have been introduced to address these damaging activities, which are likely to have increased in severity since the 1990's. The overall conservation status for alkaline fen habitat is bad.

- **[91E0] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Priority Habitat)**

  Alluvial Forests are typically woodlands of alder (*Alnus glutinosa*) and ash (*Fraxinus excelsior*), often with willows (*Salix* spp.) and sometimes oak (*Quercus robur*). This habitat occurs in areas subject to periodic flooding along rivers and on lake shores. A species-rich and often luxuriant flora is associated with these woodlands, including creeping bent (*Agrostis stolonifera*), remote sedge (*Carex remota*), meadow-sweet (*Filipendula ulmaria*), reed-grass (*Phalaris arundinacea*) and water mint (*Mentha aquatica*). They occur widely throughout the country usually as small and isolated stands with the most extensive areas in the south-west. The area of alluvial forests has declined and this, together with their fragmented nature, abundance of alien invasive species and sub-optimal grazing regimes and drainage, gives them a bad overall conservation status.

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A synopsis of the conservation status of the habitat(s) is presented in Table 6, Table 7, Table 8 and Table 9.

**Table 6: The conservation status of Annex I Habitats occurring within this site.**

| CODE | % COVER | REPRESENTATIVITY | RELATIVE SURFACE | CONSERVATION STATUS | GLOBAL ASSESSMENT |
|---|---|---|---|---|---|
| 7230 | 1.00 | B | C | B | B |
| 91e0 | 1.00 | B | B | B | B |

**Table 7: The conservation status of Annex I (EU Birds Directive) bird species occurring within this site.**

| CODE | NAME | POPULATION | | | | SITE ASSESSMENT | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Resident | Migratory | | | Population | Conservation | Isolation | Global |
| | | | Breed | Winter | Stage | | | | |
| A038 | Cygnus cygnus | | | 50-200+ i | | C | B | C | B |

**Table 8: The conservation status of Annex II (EU Habitats Directive) mammal species occurring within this site.**

| CODE | NAME | POPULATION | | | | SITE ASSESSMENT | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Resident | Migratory | | | Population | Conservation | Isolation | Global |
| | | | Breed | Winter | Stage | | | | |
| 1355 | Lutra lutra | p | | | | C | A | C | A |



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**Table 9: The conservation status of Annex II (EU Habitats Directive) Fish species occurring within this site.**

| CODE | NAME | POPULATION | | | | SITE ASSESSMENT | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Resident | Migratory | | | Population | Conservation | Isolation | Global |
| | | | Breed | Winter | Stage | | | | |
| 1099 | Lampetra fluviatilis | | p | | | C | B | C | B |
| 1106 | Salmo salar | | c | | | C | B | C | B |

### 3.2.2 The River Boyne and River Blackwater SPA

The River Boyne and River Blackwater SPA is a long, linear site that comprises stretches of the River Boyne and several of its tributaries; most of the site is in Co. Meath, but it extends also into Counties Cavan, Louth and Westmeath. The River Boyne and River Blackwater SPA supports nationally important numbers of *Alcedo atthis*. Other species which occur within the site include *Cygnus olor, Anas crecca, Anas platyrhynchos, Phalacrocorax carbo, Ardea cinerea, Gallinula chloropus, Gallinago gallinago* and *Riparia riparia*. The NPWS Natura 2000 data form for this site indicates that NPWS currently recognize no threats to this site.

The conservation objective of this site is to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:

- *Alcedo atthis* [breeding]

A synopsis of the conservation status of this site is provided in Table 10 and Table 11.

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**Table 10: Conservation status of Annex I bird species occurring within this site.**

| CODE | NAME | POPULATION | | | | SITE ASSESSMENT | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Resident | Migratory | | | Population | Conservation | Isolation | Global |
| | | | Breed | Winter | Stage | | | | |
| A229 | Alcedo atthis | | 19 p | | | C | B | C | B |

**Table 11: Conservation status of regularly occurring migratory non-Annex I bird species occurring at this site.**

| CODE | NAME | POPULATION | | | | SITE ASSESSMENT | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Resident | Migratory | | | Population | Conservation | Isolation | Global |
| | | | Breed | Winter | Stage | | | | |
| A051 | Anas crecca | | | 166 i | | C | B | C | C |
| A053 | Anas platyrhynchos | | | 219 i | | C | B | C | C |
| A028 | Ardea cinerea | | | 44 i | | C | B | C | C |
| A391 | Phalacrocorax carbo | | | 36 i | | C | B | C | C |



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## 3.3 Impact assessment

### 3.3.1 Identified Pathways

The proposed works are not located immediately within any designated areas, and as such there will be no direct impacts upon any Natura 2000 sites associated with the development. The proposed works will take place proximate to the river Blackwater, one of the primary constituents of the River Boyne and River Blackwater SAC/SPA. There are a number of water-courses in the vicinity of the proposed works that form a drainage network between the proposed works and the River Boyne and River Blackwater SAC/SPA.

There is a potential for impacts through a number of identified pathways:

- The proposed works entail excavations, which may potentially impact upon local water quality/hydrology, thereby potentially impacting upon the River Boyne and River Blackwater SAC/SPA;
- There are potential cumulative impacts regarding the use of extracted material in the construction of Stage 5B embankment of the Randalstown Tailings Facility.
- There is potential for disturbance of species of conservation concern utilizing habitat within/adjacent to the SAC/SPA associated with the proposed works, primarily Whooper Swan.

There is also the possibility of secondary impacts, with any of the impacts listed above having an impact on any sites/species linked physically or ecologically to these Natura 2000 sites (for example, the Annex I species (EU Birds Directive) Whooper Swan is known to utilise habitat in the locality – disturbance of this species may result in changes in migration/commuting/foraging corridors).

Many of the habitats and species for the River Boyne and River Blackwater SAC/SPA are designated, are directly or indirectly dependent on water quality/hydrology. A reduction in water quality, or changes to local hydrology could negatively impact upon the conservation status of these sites with regard to habitat quality and size, and with regard to the ecological integrity of those species occurring within, and adjacent to the sites.

The nearest (with active Q-monitoring) EPA water-quality monitoring station (according to the online database) to the proposed works site is a river station upstream of the confluence of the Yellow River with the River Blackwater (RS07Y011100). According to the EPA water quality database, the water quality (Q value) at this site is Q3 (see Figure 16), indicating that the water quality at this sampling point on the Yellow River is of poor quality with regard to its Water Framework Directive status, is moderately polluted and is of overall unsatisfactory condition.

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This status is relatively current, as the last year on which the Q value was determined was 2012. Improving the water quality of this water courses, which forms a physical and ecological link with the River Blackwater is key to conserving the ecological integrity of the river Blackwater, the Natura 2000 sites of which it is a component, and to achieving the conservation objectives of those sites. It is therefore imperative that there be no negative impact on water quality as a result of the proposed works.

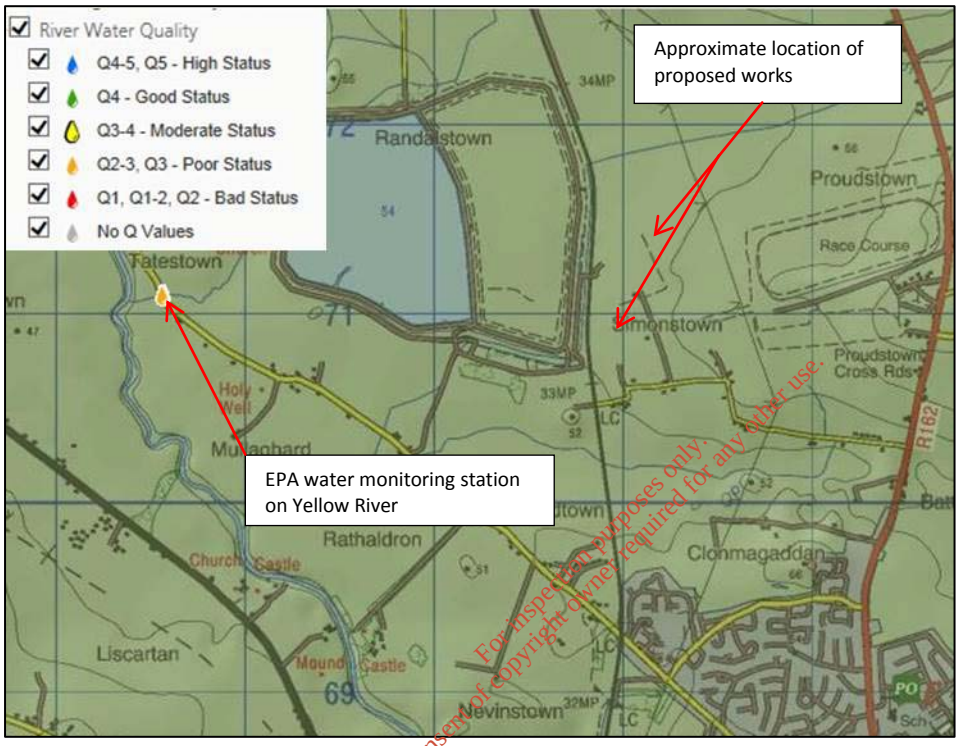


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**Figure 16: Map indicating location of EPA Q-value monitoring station on the Yellow River (source EPA).**



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### 3.3.2 Gauging of Impacts on Natura 2000 sites – Integrity of site checklist

The potential impacts of the proposed development on Natura 2000 sites are gauged using a checklist, which aids in determining whether the development has the potential to have a significant negative impact on any Natura 2000 site. This checklist consists of a number of pertinent questions as set out in Table 12.

**Table 12:Potential of the proposed development to impact upon Natura 2000 sites in the absence of any mitigation/ precautionary measures.**

| **Does the Plan have the potential to:** | **Yes/No** |
|---|---|
| Cause delays in progress towards achieving the conservation objectives of the Natura 2000 site? | YES |
| Interrupt progress toward achieving the conservation objectives of the Natura 2000 site? | YES |
| Disrupt those factors helping to maintain the favourable conditions at the Natura 2000 site? | YES |
| Interfere with the balance, distribution and density of key species that are the indicators of the favourable condition of the Natura | YES |
| Cause changes to the vital defining aspects (e.g. nutrient balance) that determine how the Natura 2000 site functions as a habitat or | YES |
| Change the dynamics of the relationships (between, for example, soil and water or plants and animals) that define the structure | YES |
| Interfere with predicted or expected natural changes to the Natura 2000 site (such as water dynamics or chemical composition)? | YES |
| Reduce the area of key habitats within the Natura 2000 site? | YES |
| Reduce the population of key species of the Natura 2000 site? | YES |
| Alter the balance between key species of the Natura 2000 site? | YES |
| Reduce the biodiversity of the Natura 2000 site? | YES |
| Result in disturbance that could affect population size or density or the balance between key species within the Natura 2000 site? | YES |
| Result in fragmentation? | YES |
| Result in the loss or reduction of key features of Natura 2000 sites? | YES |

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### 3.3.3 Sources and significance of impacts

The primary sources of concern with regard to potential impacts of the proposed works on the Natura 2000 network, and their significance are:

- The potential for impacts on ground water/surface water/hydrology during excavation and transport of material at Simonstown borrow area, leading to impacts on the quality of the River Boyne and River Blackwater SAC/SPA. It is considered, however, that the risk of contamination can be reduced to a negligible level through the implementation of suitable mitigation/preventative measures;
- The potential for increased disturbance to species of conservation concern dependent on the Natura 2000 sites and the immediate environs. In particular, the potential impact on over-wintering Whooper Swan is a concern, as site at which works are proposed is immediately adjacent to habitat suitable for foraging swans. Indeed, Whooper Swans have been observed in the vicinity (personal observation). It is considered, however, that the risk of disturbance can be reduced to a negligible level through the implementation of suitable mitigation/preventative measures.
- The potential for cumulative impacts associated with the construction of Stage 5B embankment of the Tailings Pond. It is considered, however, that the risk of disturbance can be reduced to a negligible level through the implementation of suitable mitigation/preventative measures.

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In addition, it should be noted that the proposed development is located immediately adjacent to a hedgerow, a habitat suitable for several species of bat, for use during foraging, commuting and possibly even roosting. Disturbance caused during both the construction may have a negative impact on any bat species utilizing the habitat. It is considered, however, that the risk of disturbance can be reduced to a negligible level through the implementation of suitable mitigation/preventative measures.



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# 4 Mitigation/Preventative measures

The main concerns regarding the potential impacts of the proposed works on the Natura 2000 network are:

- Impacts on water quality and/or hydrology
- Impacts through disturbance on Whooper Swan
- Cumulative impacts regarding the construction of Stage 5B embankment of the Tailings Pond

There is potential for impacts on water quality and/or hydrology during the excavation of the material. The following mitigation measures should be implemented to mitigate against these potential impacts. For the most part, it will be the responsibility of the site engineer and foreman to ensure that the mitigation measures are put in place.

1) A written statement from a qualified and indemnified hydrologist should verify that there will be no impact of the proposed works on local hydrology.
2) Haulage pathways/roads should be as regulated as possible in order to keep compaction to a minimum.
3) A vegetated buffer zone of a minimum of 10 m should be kept in place adjacent to any water body/water course, in which no construction traffic will be permitted. This buffer zone should be taped off. Vegetation is one of the primary means by which the movement of suspended solids in run-off can be reduced. All vegetation should be retained where possible and areas in which vegetation has been removed during construction should be replanted as quickly as is practical.
4) Hedgerows provide essential ecological corridors throughout the agricultural landscape. It is recommended that all hedgerow habitat adjacent to the works be retained intact. It is further recommended that a buffer zone of a minimum of 10 m be put in place adjacent to hedgerows such as to protect roots from damage during construction works. This buffer zone should be taped off, and the importance of the buffer zone should be pointed out during all site inductions.
5) It is imperative that at no time should any material or effluent associated with the proposed works enter any water-course providing an S-P-R linkage between the proposed development and the River Boyne and River Blackwater SAC/SPA. A detailed description of the treatment of any water course within/adjacent to the proposed development should be provided within the planning permission application.

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6) All construction should be timed to minimise risk of potential erosion by planning construction activities during drier months, halting construction during periods of heavy rain to minimise soil compaction/disturbance, and restricting vehicular and equipment access or provide working surfaces/pads.
7) All potentially hazardous materials on site (including fuels, lubricants and hydraulic fluids, solvents, oils, paints, etc.) must be stored a minimum of 50 m from any water course/water body and should be carefully handled to avoid spillage. Material of this nature must be properly secured against unauthorised access or vandalism, and provided with spill containment according to codes of practice. All machinery/equipment used on site must be fully services and maintained in such a way as to minimise the potential for any leaks/spillage of diesel, oil, etc. Any spillages must immediately be reported to the site foreman, who should act appropriately to prevent any potential contamination of local water courses.
8) Human waste, from any site portaloos etc. should be removed to a suitable treatment facility or charged to a septic tank system constructed in accordance with EPA guidelines.
9) Meath County Council has committed policies supporting Sustainable Urban Drainage Systems (SUDS). The potential for contamination of any water course forming an S-P-R, and the river Blackwater itself, through run-off of polluted surface water must be addressed in any SUDS for the works, with measures to ensure that no contamination occurs outlined.

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There is potential for the proposed works to disturb Whooper Swan, a species listed on Annex I of the EU Birds Directive. In order to minimise the potential for any impacts, works should be carried out between April and September inclusive.

There is potential for cumulative impacts with the construction of Stage 5B embankment of the Tailings Pond. All mitigation measures as outlined in the EIS and NIS for this project should be considered in conjunction with this NIS.

It is also considered that there is potential for negative impacts on several bat species, all of which are listed on Annex IV of the EU Habitats Directive. Hedgerows provide essential ecological corridors throughout the agricultural landscape for bats. It is recommended that all hedgerow habitat adjacent to the works be retained intact to minimise any potential negative impacts on bats. It is further recommended that a buffer zone of a minimum of 10 m be put in place adjacent to



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hedgerows such as to protect roots from damage during construction works. This buffer zone should be taped off, and the importance of the buffer zone should be pointed out during all site inductions.

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# 5 General Ecological Recommendations

Hedgerows provide essential ecological corridors throughout the agricultural landscape. There is a recorded Badger sett occurring within the hedgerow to the south east of Mound 2. It is recommended that all hedgerows be retained intact in the vicinity of the site. It is further recommended that, where possible, a buffer zone of a minimum of 10 m be put in place adjacent to the hedgerow, along which construction traffic will not be permitted such as to protect roots from damage during works, and minimise any disturbance to the Badger Sett. This buffer zone should be taped off for the duration of the works.

If trees or sections of hedgerow are to be removed, mitigation measures will be required:

(1) The hedgerow within which the Badger Sett occurs must be retained intact.

(2) Given the habitats present, hedgerows/trees may provide important commuting and foraging corridors, in addition to providing potential roosting sites for bats. All Irish bat species are protected under European and Domestic legislation. All bats occurring in Ireland are on Annex IV of the EU Habitats Directive. Plants and animals listed on Annex IV of the Habitats Directive are strictly protected wherever they occur. Under Irish Law (Irish Wildlife Act 1976 and Wildlife (Amendment) Act 2000) it is a criminal offence to intentionally harm or disturb a bat in its place of rest. It is recommended that all hedgerows be retained, but if any sections of hedgerow or trees are to be removed, a comprehensive survey of the usage of any hedgerow/trees by bats, which are to be removed must be undertaken.

(3) According to section 46 of the Wildlife (Amendment) Act 2000, it is an offence to cut, grub or otherwise destroy any vegetation growing in any hedge or ditch during the period beginning on March 1st and ending on August 31st inclusive owing to the impact upon breeding birds. If there is to be disturbance/clearance of any areas of scrub/hedges/trees adjacent to the site, works must be carried out outside of this period.

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# 6 Conclusions

Following the identification of a potential impact upon a Natura 2000 site through an Appropriate Assessment Screening exercise, a Stage 2 Appropriate Assessment of the proposed development has been carried out in accordance with the requirements of Article 6(3) of the Habitats Directive (Council Directive 92/43/EEC).

The risks to the safeguarding and integrity of the qualifying interests and conservation objectives of the Natura sites described herein have been addressed by the inclusion of a number of mitigation and preventative measures to ensure that the proposed development should have no impact on the Natura 2000 network.

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www.europa.eu – official website of the European Union, source of information on EU Directives.

www.meath.ie – official website of Meath Co. Council, source of information regarding Co. Meath Development Plan (2007 - 2013).

www.epa.ie – official website of the Environmental Protection Agency.

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# Appendix B.6 - 8

# NIS – Construction of Mine Fresh Air Shaft, FAR 5

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Boliden Tara Mines Ltd

Upgrading SWEX FAR

# NATURA IMPACT STATEMENT

# SCREENING REPORT

SEPTEMBER 2012

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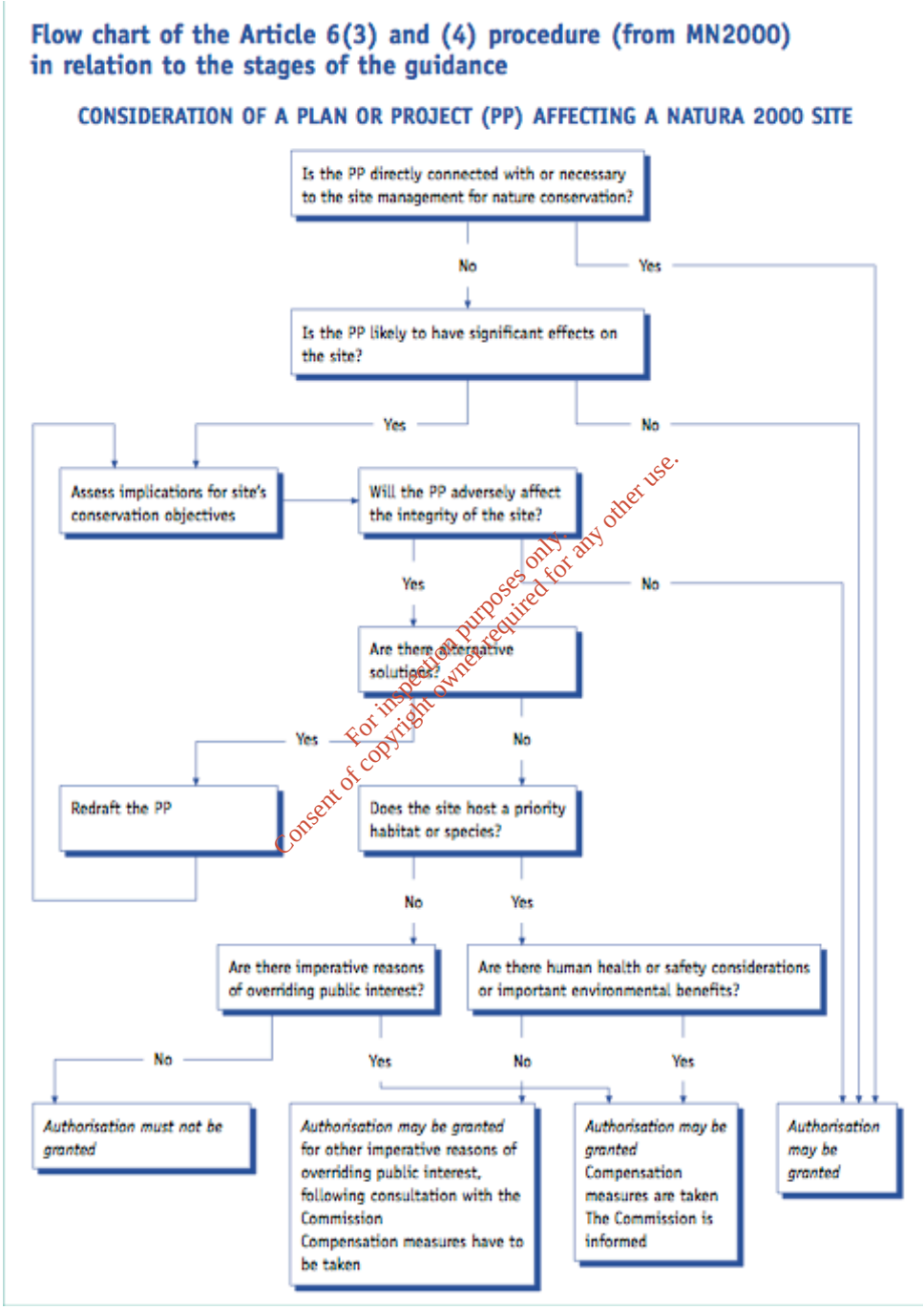
Because the proposed development site for the above project is adjacent or in the vicinity of two Natura 2000 sites a Natura Impact Assessment is required.

**Legal background**

A Natura Impact Statement is required under Article 6(3) and (4) of the Habitats Directive[1] where a project or plan may give rise to significant effects upon a Natura 2000 site[2].

The process involved is best described by the following flowcharts

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1 Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (OJ L 206, 22.7.1992, p. 7).

2 For the purposes of Article 6 assessments, Natura 2000 sites are those identified as sites of Community importance under the habitats directive or classified as special protection areas (SPAs) under the Birds Directive 79/409/EEC.



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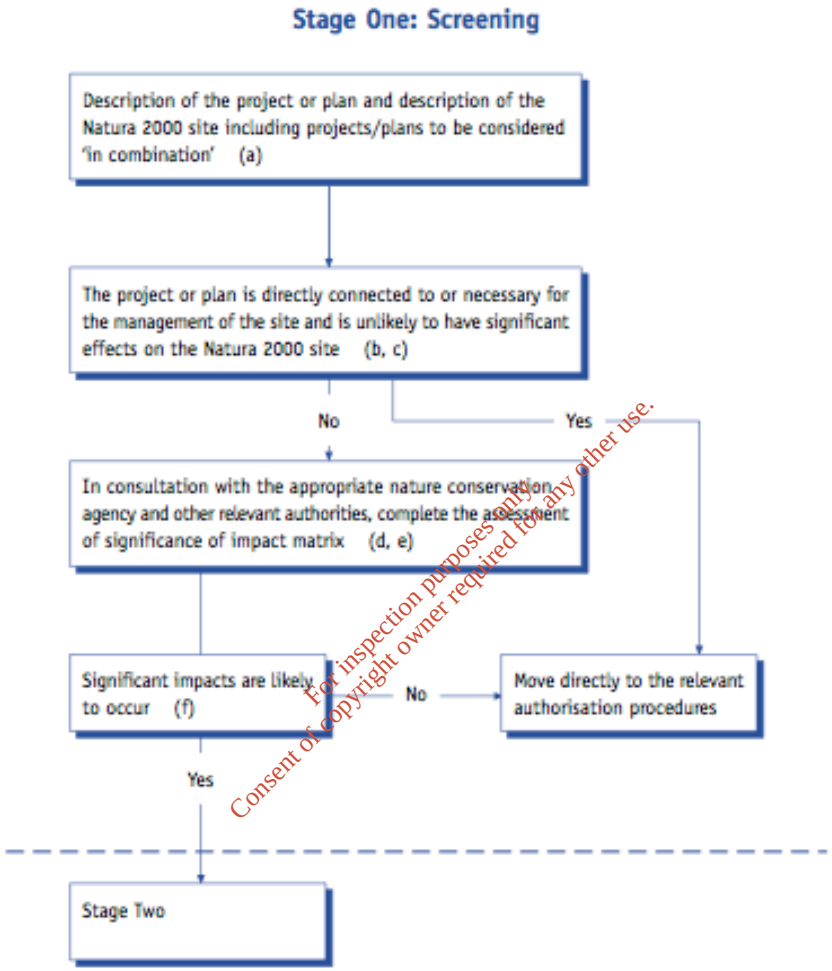
From this chart four stages can be identified:

1. *Screening*
2. *Appropriate Assessment*
3. *Assessment of Alternative Solutions (if appropriate mitigation measures proposed in 2 will not cancel or minimise the adverse impacts)*
4. *Compensatory Measures*

Stage I, **Screening**, was undertaken on the basis of the following flowchart. The process is tabulated overleaf.

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**Notes**

(a) In order to carry out an assessment of the project or plan, it is first necessary fully to characterise the project or plan and the receiving environment (see Section 3.1.4 below).

(b) The assessment must address effects from other plans/projects (existing or planned) which may act in combination with the plan/project currently under consideration and generate cumulative effects (see Section 2.5 above).

(c) Where a plan or project is directly connected to or necessary for the management of the site, and is unlikely to have significant effects on the Natura 2000 site, appropriate assessment is not required (see MN2000, paragraph 4.3.3).

(d) Institutions vary from Member State to Member State. The institution to be consulted may be the one responsible for the implementation of the habitats directive.

(e) Assessment of significance (see Section 3.1.5 below).

(f) This evaluation is made using the precautionary principle.

**Stage One outputs: Screening matrix (Figure 1)**

**Finding of no significant effects report (Figure 2)**



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## Screening Matrix

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## Brief description of the project or plan

**Proposal**

Boliden Tara Mines propose to develop a new Fresh Air Raise (FAR 5) off Boyerstown Road, Navan, Co. Meath, Map 1.

The FAR will be developed adjacent to the existing FAR 4. When completed both will be accommodated in a single, fenced compound. An existing earthen bank screening FAR 4 will be extended to screen both installations, Fig 1.

The proposed Fresh Air Raise will involve excavating a vertical, circular shaft from the surface to a tunnel below ground. The shaft will be connected to the existing underground workings and will downcast fresh air into the mine by virtue of the suction provided by existing ventilation fans.

**Construction**

The bedrock will be exposed in the area of the proposed shaft to allow construction of a concrete pad on which an electric-hydraulic rotary raise-boring drill rig will be mounted.

A pilot measuring 340mm wide will be drilled from the surface. The fines generated from this process will be collected before being tankered away to the main site facility where they will be handled as waste and treated under the conditions laid down in PPCL PO 516-01.

Approximately 8500m3 of rock will be generated during the drilling process.

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**Overburden storage**

The construction phase all soil and subsoil generated will be stock-piled. It will be used in constructing the earthen bank.

**Water storage**

Water will be required during the drilling process.



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## Brief description of the project or plan (cont)

**Work practice**

During the construction and operational phase all works will be carried out according to best practice.

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## Brief description of the Natura 2000 site

There are two Natura 2000 sites in the vicinity of the proposed development site (Map 1):

1. Natura 2000 site: River Boyne and River Blackwater, SAC no. 002299
2. Natura 2000 site: River Boyne and River Blackwater, SPA no. 004232

**1. Natura 2000 site: River Boyne and River Blackwater, SAC no. 002299**

This site comprises the freshwater element of the River Boyne as far as the Boyne Aqueduct, the Blackwater as far as Lough Ramor and the Boyne tributaries including the Deel, Stoneyford and Tremblestown Rivers. These riverine stretches drain a considerable area of Meath and Westmeath and smaller areas of Cavan and Louth. The underlying geology is Carboniferous Limestone for the most part with areas of Upper, Lower and Middle well represented. In the vicinity of Kells Silurian Quartzite is present while close to Trim are Carboniferous Shales and Sandstones. There are many large towns adjacent to but not within the site. Towns both small and large, include Slane, Navan, Kells, Trim, Athboy and Ballivor.

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The Boyne River Islands are a small chain of three islands situated 2.5 km west of Drogheda. These islands are close to the development site. The islands were formed by the build up of alluvial sediment in this part of the river where water movement is sluggish. All of the islands are covered by dense thickets of wet, Willow (*Salix spp.*) woodland, with the following species occurring: Osier (*S. viminalis*), Crack Willow (*S. fragilis*), White Willow (*S. alba*), Purple Willow (*S. purpurea*) and Grey Willow (*S. cinerea*). A small area of Alder (*Alnus glutinosa*) woodland is found on soft ground at the edge of the canal in the north-western section of the islands. Along other stretches of the rivers of the site Grey Willow scrub and pockets of wet woodland dominated by Alder have become established, particularly at the river edge of mature deciduous woodland. Ash (*Fraxinus excelsior*) and Birch (*Betula pubescens*) are common in the latter and the ground flora is typical of wet woodland with Meadowsweet (*Filipendula ulmaria*), Angelica (*Angelica sylvestris*), Yellow Iris (*Iris pseudacorus*), Horsetail (*Equisetum spp.*) and occasional tussocks of Greater Tussock- sedge (*Carex paniculata*).

The site is also important for the populations of two other species listed on Annex II of the E.U. Habitats Directive, namely River Lamprey (*Lampetra fluviatilis*) which is present in the lower reaches of the Boyne River while the Otter (*Lutra lutra*) can be found throughout the site. In addition, the site also supports many more



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## Brief description of the Natura 2000 site

**2. Natura 2000 site: River Boyne and River Blackwater, SPA no. 004232**

The River Boyne and River Blackwater SPA is a long, linear site that comprises stretches of the River Boyne and several of its tributaries; most of the site is in Co. Meath, but it extends also into Cos. Cavan, Louth and Westmeath. It is of high ornithological importance as it supports a nationally important population of Kingfisher (*Alcedo atthis*), a species listed on Annex I of the E.U. Birds Directive.

The 2010 kingfisher survey (Cummins 2010) identified 15 current nest sites and 4 possible sites in the R. Boyne and R. Blackwater. The nearest nest site to the proposed development is on the R. Blackwater near Donaghpatrick, 5.5km north of the RAR site.

**Qualifying interests**
Annex 1 species
A229 *Alcedo atthis* (Kingfisher) [breeding ]

The River Boyne and River Blackwater Special Protection Area is of high ornithological importance as it supports a nationally important population of Kingfisher, a species that is listed on Annex I of the E.U. Birds Directive.

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**Conservation objectives**
To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:

*Alcedo atthis* [breeding ]



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## Likely Impacts to Annex I habitats

| Habitat | Primary location | Sensitivities | Likely Impact |
|---|---|---|---|
| Alkaline fen | These are concentrated in the vicinity of Lough Shesk, Freehan Lough and Newtown Lough | Disruption to and/or acidification of water source feeding fen | No likely negative impacts |
| Alluvial woodlands | On the Boyne Islands 2.5km west of Drogheda including Yellow Island and Grove Island. These are a short distance upstream from the floodplain which adjoins the development site. | Significant interference with local hydrology resulting in either frequent flooding or a permanent lowering of flood waters so the islands are never inundated. Colonisation by rampant aliens e.g | No likely negative impacts |

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## Likely Impacts to Annex I species

| Species | Primary location | Sensitivities | Likely Impact |
|---|---|---|---|
| Kingfisher (*Alcedo atthias*) | All but two of the current nest sites were identified on the R. Boyne.<br><br>The nearest nest site to the proposed development is on the R. Blackwater near Donaghpatrick, 5.5km north of the FAR site. | Habitat disturbance is the principal threat to kingfisher breeding. In the case of the R. Boyne intensive stock grazing, amenity access, bankside vegetation management and pollution from agricultural/forestry were identified as being the great threats.<br><br>Stock grazing is the greatest threat to the R. Blackwater sites. | No likely negative impacts |



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## Likely Impacts to Annex II species

| Species | Primary location | Sensitivities | Likely Impact |
|---|---|---|---|
| Atlantic Salmon (*Salmo salar*) | Throughout the river and tributaries. Peak runs upstream July-September with smolts migrating downstream April-May | Illegal netting. Serious point pollution incidents | No likely negative impacts |
| River lamprey (*Lampetra fluviatilis*) | Throughout the river and tributaries. | Arterial drainage which can destroy lamprey nursery habitats | No likely negative impacts |
| Otter (*Lutra lutra*) | Result from the 2004-2005 survey show that of the 18 sites surveyed in the Natura 2000 site 12 were positive. The closest site to the proposed development is near Donaghpatrick 5.5km to the north (Bailey *et al* 2006). | Disturbance is the principle threat to the otter. This can be from works such as arterial drainage, human disturbance and hunting (which is illegal) | No likely negative impacts |

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## 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 sites.** | Potentially polluting emissions (either in water or airborne) reaching the Natura 2000 site directly or indirectly from FAR 5 during the construction phase could impact negatively on the sites if not strictly controlled. |

| **Describe any likely direct, indirect or secondary impacts of the project (either alone or in combination with other plans or projects) on the Natura 2000 sites by virtue of:** | **Likely impacts from project alone** | **Likely impacts in combination with other projects** |
|---|---|---|
| 1. Size and scale | 1. The proposed FAR will downcast fresh air at a rate of 200m3/s. The size and scale are of no relevance to either of the Natura 2000 sites. | The adjacent FAR 4 currently downcasts 200m3 of fresh air per second. Together FAR 4 and FAR 5 will have no significant impacts to either of the Natura 2000 sites as a result of scale and size as the operation of both installations is entirely benign. |
| 2. Land-take | 2. Landtake will be minimal. The FAR site will occupy 0.5ha while the final worked area will be approximately 0.25ha. | Total landtake for Fresh Air will be approximately 0.7ha. This will result in no significant negative impacts |
| 3 Distance from the Natura 2000 sites | 3. The site lies approximately 2.8km from both Natura 2000 sites. There will be no interaction between the operation of this installation and the Natura 2000 sites. It will not create a significant negative impact. | The same remarks apply as those to the proposed installation |

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| | | |
|---|---|---|
| 4 Resource requirements | 4. Water will be required during the drilling process. The water will be used to flush the pulverised rock from the shaft and will be recycled continuously. This will not impact significantly on either Natura 2000 sites. | As the existing FAR does not require water abstraction. there will be no impact |
| 5. Emissions (disposal to land, water or air) | 5. There will be no significant emissions during the construction and operation of the installation.as a result of the project. As a result there will be no significant impacts to either Natura site. | The addition of the existing FAR will have no significant impact. |
| 6. Excavation requirements | 6. An estimated maximum of 300m3 of overburden will be excavated during the construction phase. All excavated materials will be recycled for use in the construction of protective berms around the facility.<br><br>This will not result in any significant impacts to the Natura 2000 sites. | There are no excavation requirements for the existing FAR. |
| 7. Transportation requirements | 7. Approximately 3000 tonnes of stone will be required to facilitate access to the site. This will amount to approximately 150 x 20 tonne loads. | There will be no transportation requirements for the existing FAR site. |

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| | |
|---|---|
| 7. Transportation requirements cont. | Approximately 300m3 of concrete will be required to construct the concrete platform. This will require approximately 34 x 9m3 loads.<br><br>These transportation requirements will have no negative impacts on the Natura 2000 site |
| 8. Other | - |
| | - |

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| **Describe any likely changes to the site arising as a result of:** | |
|---|---|
| 1. Reduction of habitat area | There will be no reduction in the area of the Natura 2000 site. |
| 2. Disturbance to key species | The FAR site lies approximately 3km west of the Natura 2000 sites. As a result there will be no disturbance to any species in either Natura 2000 site during the construction and operation of the FAR. |
| 3. Habitat or species fragmentation | As above |
| 4. Reduction in species density | For the reasons outlined above the density of any species within the Natura 2000 site will not be effected by the development |
| 5. Changes in key indicators of conservation value (water quality etc.) | Because the operation of the FAR will be benign there will be no changes in key indicators of conservation value. |
| 6. Climate change | The Natura 2000 sites in question border the estuarine site (Boyne Estuary SPA no.004080). It is likely that the most immediate changes resulting from climate change will on this site rather than the other sites. Changes to the R. Boyne & R. Blackwater SAC are most likely to occur upstream of Drogheda where the meandering river supports extensive floodplains. Tidal surges through the estuary will be gain momentum through the constricted channel in Drogheda before inundating the low-lying areas north of the town. The proposed FAR development will have no impact on this process. |

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| | |
|---|---|
| **Describe any likely impacts on the Natura 2000 site as a whole in terms of:** | |
| 1. Interference with the key relationships that define the structure of the site | The structure of the Natura 2000 sites, particularly downstream where the Alluvial woodlands are established, determined by arterial drainage, land drainage, surface run-off, sub-surface run-off and tidal flow. Although an extensive programme of arterial drainage works was undertaken from 1969-1985 to enhance the agricultural value of the local lands it did not impact on the important alluvial islands which had built up over the previous century west of Drogheda. These were enlarged as a consequence of over-enthusiastic land drainage which led to excessive siltation in the main channel and the extension of the islands. As these islands grew the river meandered over ever wider floodplains which ultimately were drained in the late 19th century to allow farming continue as before. Although these drainage systems are of relatively recent origin they have become part of the current structure of the R.Boyne.<br><br>The development site will not add to this process and will not interfere with the structure of the Natura 2000 site. |
| **Provide indicators of significance as a result of the identification of effects set out above in terms of:** | |
| 1. Loss | No Natura 2000 site area will be lost |
| 2. Fragmentation | Neither Natura 2000 site will be fragmented as a result of this development |
| 3. Disruption | Neither Natura 2000 site will be disrupted as a result of this development |
| 4. Disturbance | Neither Natura 2000 site will be disturbed as a result of this development |

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| | |
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| 5. Change to key elements of the site (e.g. water quality etc.). | Because strict control measures will be in place during the construction phase (the operational phase will be entirely benign) there will be no changes to the key elements of either Natura 2000 site. All of these operations will be carried out under the terms of the EPA IPPCL P0 516-01 (03). |
| **Describe from the above those elements of the project or plan, or combination of elements, where the above impacts are likely to be significant or where the scale or magnitude of impacts is not known.** | Because strict control measures, including IPL P0 516-01 (03), will be in place during the construction phase (the operational phase is benign) no significant impacts are anticipated to either Natura 2000 site. |

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## Finding of no significant effects report

| | |
|---|---|
| Name and location of Natura 2000 sites | Site Name:<br>1. River Boyne and River Blackwater SAC<br>Site Code: 002299.<br>2. River Boyne and River Blackwater SPA<br>Site Code: 004232 |
| Description of the project or plan | It is proposed by Boliden Tara Mines to develop a new mine ventilation Fresh Air Raise (FAR) off Boyerstown Road, Navan, Co. Meath. |
| Is the project or plan directly connected with or necessary to the management of the site (provide details)? | No significant impact likely |
| Are there other projects or plans that together with the project or plan being assessed could affect the site (provide details)? | There is an existing Fresh Air Raise (FAR) adjacent to the proposed development. This Raise, FAR 4, downcasts approximately 200m3 of fresh air through the shaft to the underground workings with the aid of ventilation fans. When both installations are operational a total of 200m3 of fresh air will be downcast. This is an entirely benign operation and will not impact, separately or together on either Natura 2000 site. |

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**The assessment of significance of effects**

| | |
|---|---|
| Describe how the project or plan (alone or in combination) is likely to affect the Natura 2000 site | Although the proposed development site is located approximately 3km from the Natura 2000 sites there is no clear hydrological link between these sites and the development site. Nonetheless, careless work practices during the construction might possibly pose a risk to water quality within the Natura 2000 sites although in practice this would appear to be unlikely. However, because strict control measures [including obligations under P0 516-01 (03)] will be implemented the Natura 2000 sites will not be impacted negatively by the proposed development. |



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| | |
|---|---|
| Explain why these effects are not considered significant | The Natura 2000 sites will not suffer negative impacts as a result of the construction of the proposed FAR and the from the operation of both FARs |
| List of agencies consulted | DAU, GFPN request |
| Response to consultation | G Pre00306/2012 |

**Data collected to carry out the assessment**

| | |
|---|---|
| Who carried out the assessment? | Ted Walsh B.Sc., B.A(Mod) |
| Sources of data | FIELDWORK<br>Development site assessment May 24th 2012<br><br>TEXTS<br>**Online**<br>(http://www.npws.ie/protectedsites/specialareasofconservationsac/)<br><br>NPWS (2011) Conservation objectives for River Boyne and River Blackwater SAC [002299]. Generic Version 3.0. Department of Arts, Heritage & the Gaeltacht.<br><br>Conservation Objectives (accessed (01-07-12)<br>NATURA 2000 Standard Data Form (accessed (01-07-12)<br>SAC Site Synopsis (accessed (01-07-12))<br><br>http://www.npws.ie/media/npws/publications/codesofpractice/AA%20Guidance%2010-12-09.pdf<br><br>http://ec.europa.eu/environment/nature/natura2000/management/docs/art6/natura_2000_assess_en.pdf<br><br>**Reports**<br>Cummins S, Fisher J, McKeever R.G, McNaghten L, Crowe O. (2010) Assessment of the distribution and abundance of Kingfisher *Alcedo atthis* and other riparian birds on six SAC river systems in Ireland. DOE BWI.<br><br>DOE. Threat Response Plan Otter (*Lutra lutra*) 2009-2011<br><br>Bailey, M. and Rochford, J. 2006. Otter Survey of Ireland 2004/2005. DOE.<br><br>A Survey of Juvenile Lamprey Populations in the Boyne Catchment. Irish Wildlife Manuals No. 24 |

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| | |
|---|---|
| Level of assessment completed | Comprehensive |
| Where can the full results of the assessment be accessed and viewed? | Offices of Meath County Council<br>County Hall<br>Navan,<br>Co. Meath. |

**Overall conclusions**

Boliden Tara Mines are obliged to maintain the highest environmental standards. Processes are subject to regular monitoring as per their Integrated Pollution Prevention Control Licence issued by the EPA (P0 516-01 (03)]

It is encouraging to note that two important species, the Annex I species *Alcedo atthis* (kingfisher) and the Annex II species, *Lutra lutra* (otter) are both recorded from the River Blackwater within approximately 2km of the extensive tailings pond which is part of the mine complex. This suggests that the control measures in place at Boliden have been successful over the years.

Because the current proposal is also subject to these controls it can be objectively concluded that significant negative effects on the Natura 2000 sites from this development are unlikely.

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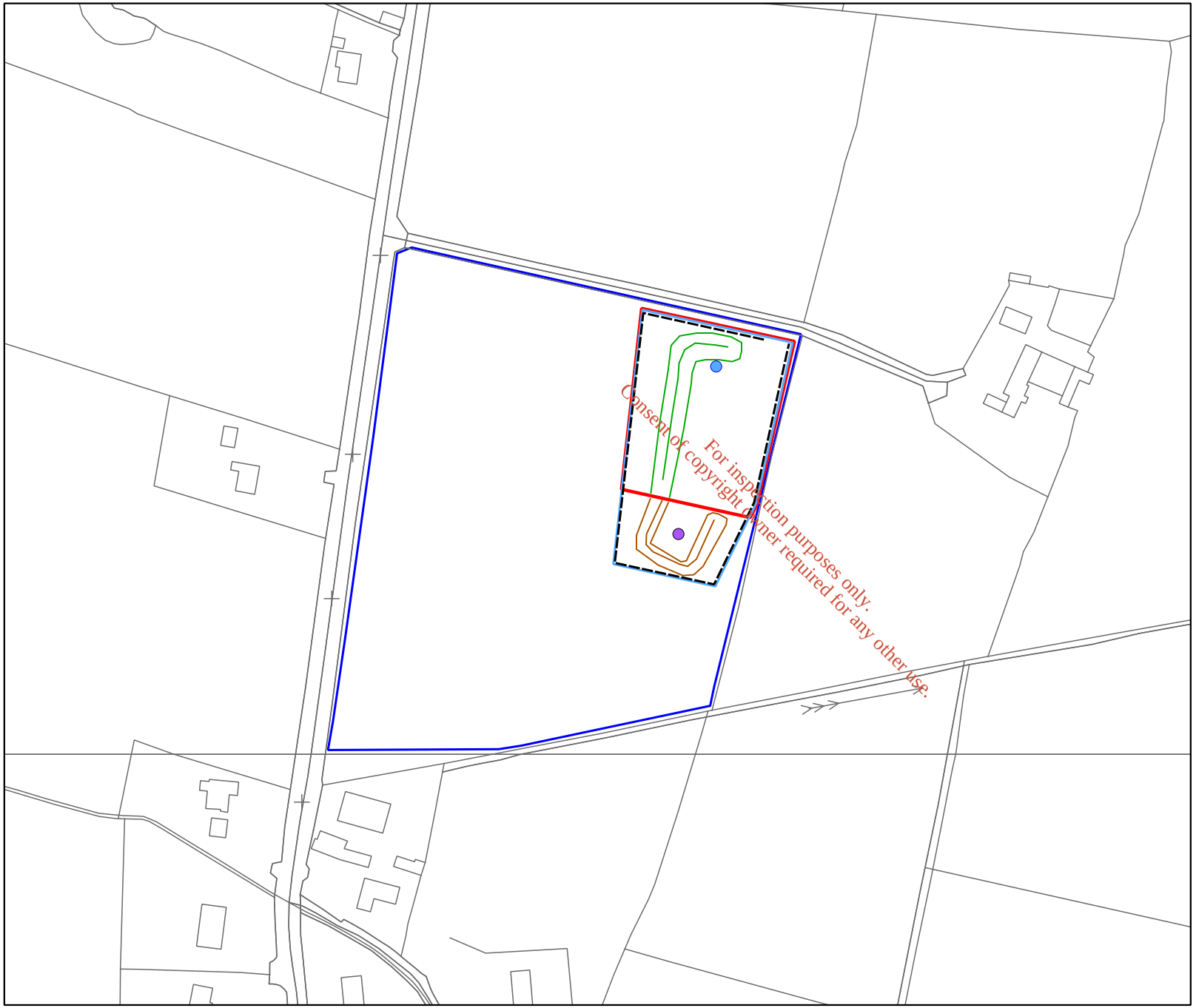


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**Fig 1. NIS Screening. Site layout showing proposed FAR 5 and existing FAR 4**

June 2012

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E

0 1000 2000

## Legend

FAR 5 site

Extended site/Study area

R. Boyne & River Blackwater SPA

R. Boyne & R. Blackwater SAC

**Map 1. NIS Screening. Site location and local Natura 2000 sites.**

June 2012

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# Appendix B.6 - 9

# NIS – Development of Mine Return Air Shaft, RAR 5N

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# Boliden Tara Mines Ltd

# Extension of Mine Return Air System - RAR 5 North

# NATURA IMPACT STATEMENT

# SCREENING REPORT

SEPTEMBER 2011

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TED WALSH & ASSOCIATES
ENVIRONMENTAL CONSULTANTS
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# Extension of Mine Return Air System - RAR 5 North

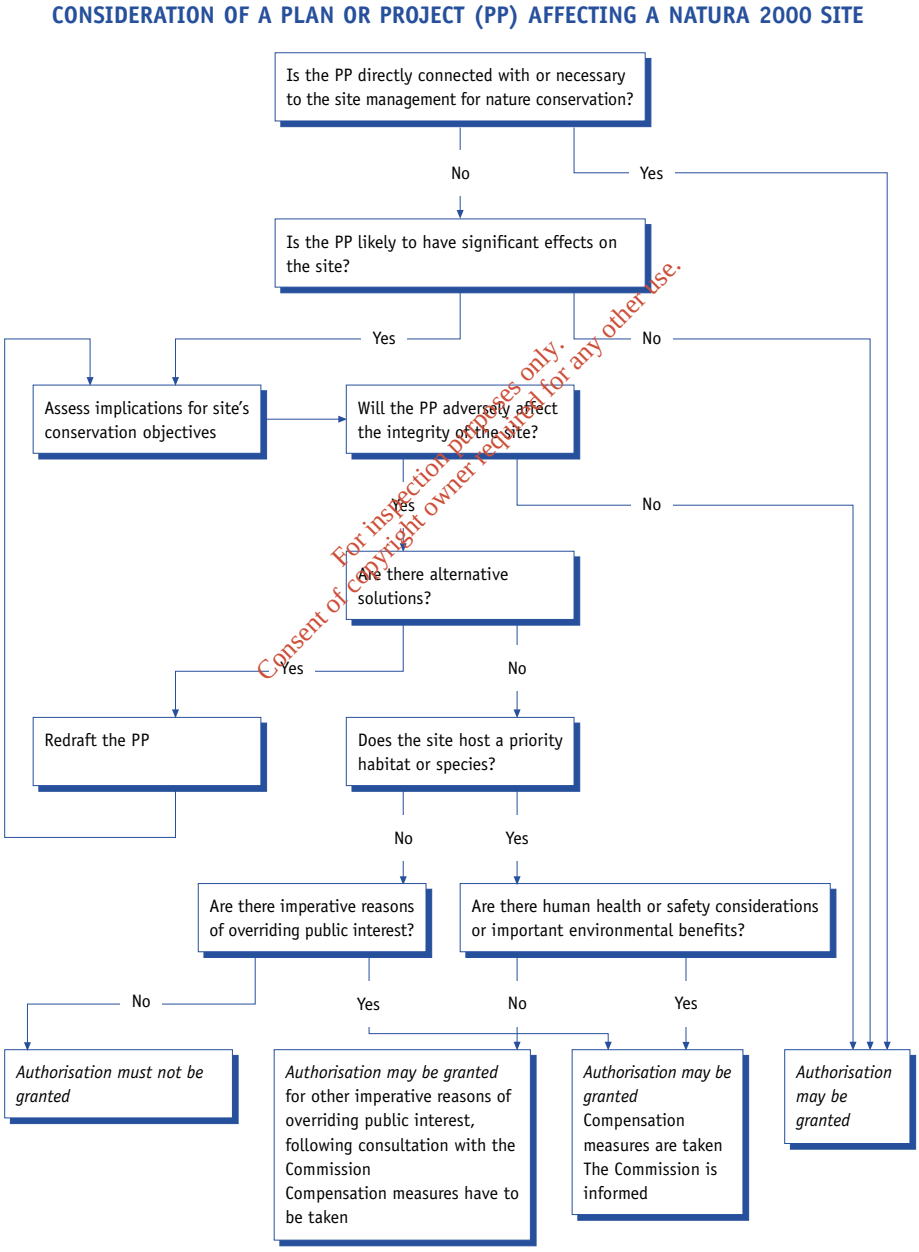
Because the proposed development site for the above project is adjacent or in the vicinity of two Natura 2000 sites a Natura Impact Assessment is required.

## Legal background

A Natura Impact Statement is required under Article 6(3) and (4) of the Habitats Directive[1] where a project or plan may give rise to significant effects upon a Natura 2000 site[2].

The process involved is best described by the following flowcharts

**Flow chart of the Article 6(3) and (4) procedure (from MN2000) in relation to the stages of the guidance**

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[1] Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (OJ L 206, 22.7.1992, p. 7).

[2] For the purposes of Article 6 assessments, Natura 2000 sites are those identified as sites of Community importance under the habitats directive or classified as special protection areas (SPAs) under the Birds Directive 79/409/EEC.



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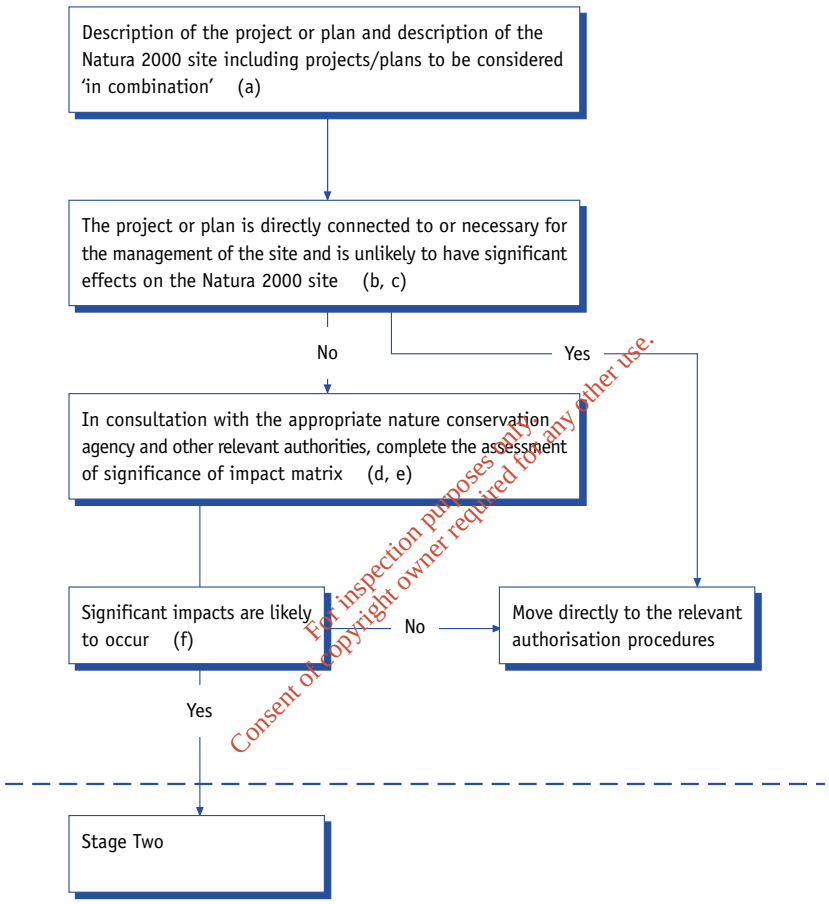
From this chart four stages can be identified:

1. *Screening*
2. *Appropriate Assessment*
3. *Assessment of Alternative Solutions (if appropriate mitigation measures proposed in 2 will not cancel or minimise the adverse impacts)*
4. *Compensatory Measures*

Stage 1, **Screening**, was undertaken on the basis of the following flowchart. The process is tabulated overleaf.

## Stage One: Screening

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**Notes**

(a) In order to carry out an assessment of the project or plan, it is first necessary fully to characterise the project or plan and the receiving environment (see Section 3.1.4 below).

(b) The assessment must address effects from other plans/projects (existing or planned) which may act in combination with the plan/project currently under consideration and generate cumulative effects (see Section 2.5 above).

(c) Where a plan or project is directly connected to or necessary for the management of the site, and is unlikely to have significant effects on the Natura 2000 site, appropriate assessment is not required (see MN2000, paragraph 4.3.3).

(d) Institutions vary from Member State to Member State. The institution to be consulted may be the one responsible for the implementation of the habitats directive.

(e) Assessment of significance (see Section 3.1.5 below).

(f) This evaluation is made using the precautionary principle.

**Stage One outputs: Screening matrix (Figure 1)**

**Finding of no significant effects report (Figure 2)**



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## Screening Matrix

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| | |
|---|---|
| *Brief description of the project or plan* | Proposal<br>It is proposed by Boliden Tara Mines to develop a new mine ventilation raise (Return Air System) at Ardbraccan, Navan, Co. Meath, Map 1 Site location. This installation will be screened by a 6.5m high embankment, Fig. 1.<br><br>The Return Air Raise (RAR) will be a vertical shaft 4.5m wide drilled from the mine shaft approximately 650m below ground. This will deliver an exhaust rate of approximately 320m3/sec.<br><br>The return is required to provide oxygen-rich air for underground operators and machines and to remove and dilute concentrations of noxious gases so as to render them harmless.<br><br>Ventilation is achieved by a pull system where fans are on the exhaust end of the system creating a negative flow. This facilitates fresh air to enter the mine through the existing Fresh Air Raises.<br><br>Construction phase<br>*Method*<br>An area of approximately 15m x 15m will be cleared of overburden and a concrete pad constructed. An electric-hydraulic rotary raise-boring drill, 4.5m wide, will be mounted on the pad.<br><br>A pilot shaft measuring 450mm wide will be drilled from the surface generating approximately 110m3 of pulverised rock which will be stored in a temporary water storage pond excavated on site. This will measure 20 x 20 x 4m. It will be restored prior to the construction of the embankment.<br><br>The RAR will be drilled upwards from the mine shaft which is being ventilated. All rock and other materials generated during this process will be gathered within the mine and recycled as appropriate.<br><br>*Overburden storage*<br>During the construction phase all soil and subsoil generated will be stock-piled on site prior to embankment construction. It is estimated that approximately 5000m3 of surface material will be excavated. No material will be taken off site.<br><br>*Work Practice*<br>Best practice work methods will be employed during construction.<br>All works will be under the supervision of the professional site engineer. |

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| | Operational Phase<br>*Surface water from from concrete*<br>All surface water falling on the concrete pad will be directed back underground via an interceptor in the concrete pad and into a 100mm borehole. (From there it will pumped to the main underground pumping station). This will include any surface water generated from the existing RAR, which will also be piped into the100mm borehole.<br><br>The anticipated quantities surface water are as follows:<br>Stormwater 14.1m3<br>RAR 5(N) (Current proposal) 10m3<br>RAR 5 (Existing RAR*) 10m3<br><br>*Surface water from outside concrete pad*<br>Surface water from the hardstanding will be piped under the embankment and into the existing drain running at the base of the field boundary.<br><br>Further Development<br>No further developments are anticipated.<br><br>*As mentioned above there is an existing Return Air System adjacent to the development site. This has been in operation for a number of years and is subject to the same strict controls as the proposed RAR. |

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|---|---|
| *Brief description of the Natura 2000 sites* | There are two Natura 2000 sites in the vicinity of the proposed development site:<br><br>1. Natura 2000 site: River Boyne and River Blackwater, SAC no. 002299<br>2. Natura 2000 site: River Boyne and River Blackwater, SPA no. 004232<br><br>1. Natura 2000 site: River Boyne and River Blackwater, SAC no. 002299<br><br>This site comprises the freshwater element of the River Boyne as far as the Boyne Aqueduct, the Blackwater as far as Lough Ramor and the Boyne tributaries including the Deel, Stoneyford and Tremblestown Rivers. These riverine stretches drain a considerable area of Meath and Westmeath and smaller areas of Cavan and Louth. The underlying geology is Carboniferous Limestone for the most part with areas of Upper, Lower and Middle well represented. In the vicinity of Kells Silurian Quartzite is present while close to Trim are Carboniferous Shales and Sandstones. There are many large towns adjacent to but not within the site. Towns both small and large, include Slane, Navan, Kells, Trim, Athboy and Ballivor.<br><br>The Boyne River Islands are a small chain of three islands situated 2.5 km west of Drogheda. These islands are close to the development site. The islands were formed by the build up of alluvial sediment in this part of the river where water movement is sluggish. All of the islands are covered by dense thickets of wet, Willow (*Salix spp.*) woodland, with the following species occurring: Osier (*S. viminalis*), Crack Willow (*S. fragilis*), White Willow (*S. alba*), Purple Willow (*S. purpurea*) and Grey Willow (*S. cinerea*). A small area of Alder (*Alnus glutinosa*) woodland is found on soft ground at the edge of the canal in the north-western section of the islands. Along other stretches of the rivers of the site Grey Willow scrub and pockets of wet woodland dominated by Alder have become established, particularly at the river edge of mature deciduous woodland. Ash (*Fraxinus excelsior*) and Birch (*Betula pubescens*) are common in the latter and the ground flora is typical of wet woodland with Meadowsweet (*Filipendula ulmaria*), Angelica (*Angelica sylvestris*), Yellow Iris (*Iris pseudacorus*), Horsetail (*Equisetum spp.*) and occasional tussocks of Greater Tussock- sedge (*Carex paniculata*).<br><br>The site is also important for the populations of two other species listed on Annex II of the E.U. Habitats Directive, namely River Lamprey (*Lampetra fluviatilis*) which is present in the lower reaches of the Boyne River while the Otter (*Lutra lutra*) can be found throughout the site. In addition, the site also supports many more of the mammal species occurring in Ireland. Those which are listed in the Irish Red Data Book include Pine Marten, Badger and Irish Hare. Common Frog, another Red Data Book species, also occurs within the site. All of these animals with the addition of the Stoat and Red Squirrel, which also occur within the site, are protected under the Wildlife Act. |

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| | |
|---|---|
| | Qualifying interests<br><br>Annex I Habitats (*Priority habitat)<br>7230 Alkaline fens<br>91E0 * Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Aln-Padion, Alnion incanae, Salicion albae) Source: (NPWS (2011) Conservation objectives for River Boyne and River Blackwater SAC [002299]. Generic Version 3.0. Department of Arts, Heritage & the Gaeltacht). http://www.npws.ie/media/npwsie/content/images/protectedsites/conservationobjectives/CO002299.pdf<br>(This is at odds with the Natura 2000 Data Form which refers to "Alluvial woodland of the Salicetum albae fragilis type" (http://www.npws.ie/media/npwsie/content/images/protectedsites/natura2000/NF002299.pdf) without reference to a priority habitat.<br><br>Annex II species<br>1106 Atlantic Salmon (*Salmo salar*) (only in fresh water)<br>1099 River Lamprey (*Lampetra fluviatilis*)<br>1355 Otter (*Lutra lutra*) |
| | *Conservation objectives*<br>*Objective 1:* To maintain the Annex I habitats for which the cSAC has been selected at favourable conservation status: alkaline fen and alluvial woodlands<br><br>*Objective 2:* To maintain the Annex II species for which the cSAC has been selected at favourable conservation status: Atlantic Salmon (*Salmo salar*), Otter (*Lutra lutra*) and River Lamprey *(Lampetra fluviatilis)* .<br><br>*Objective 3*: To maintain the extent, species richness and biodiversity of the entire site.<br><br>*Objective 4:* To establish effective liaison and co- operation with landowners, legal users and relevant authorities. |

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2. Natura 2000 site: River Boyne and River Blackwater, SPA no. 004232

The River Boyne and River Blackwater SPA is a long, linear site that comprises stretches of the River Boyne and several of its tributaries; most of the site is in Co. Meath, but it extends also into Cos Cavan, Louth and Westmeath. It is of high ornithological importance as it supports a nationally important population of Kingfisher, a species listed on Annex I of the E.U. Birds Directive.
The 2010 kingfisher survey (Cummins 2010) identified 15 current nest sites and 4 possible sites in the R. Boyne and R. Blackwater. The nearest nest site to the proposed development is on the R. Blackwater near Donaghpatrick, 5km north of the RAR site.

Qualifying interests

Annex I species
A229 *Alcedo atthis* (Kingfisher) [breeding ]

The River Boyne and River Blackwater Special Protection Area is of high ornithological importance as it supports a nationally important population of Kingfisher, a species that is listed on Annex I of the E.U. Birds Directive.

*Conservation objectives*
To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:

*Alcedo atthis* [breeding ]

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## Likely Impacts to Annex I habitats

| Habitat | Primary location | Sensitivities | Likely Impact from proposed development |
|---|---|---|---|
| Alkaline fen | These are concentrated in the vicinity of Lough Shesk, Freehan Lough and Newtown Lough | Disruption to and/or acidification of water source feeding fen | No significant impact likely |
| Alluvial woodlands | On the Boyne Islands 2.5km west of Drogheda including Yellow Island and Grove Island. These are a short distance upstream from the floodplain which adjoins the development site. | Significant interference with local hydrology resulting in either frequent flooding or a permanent lowering of flood waters so the islands are never inundated. Colonisation by rampant aliens e.g *Impatiens glandulifera* | No significant impact likely |

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## Likely Impacts to Annex I species

| Species | Primary location | Sensitivities | Likely Impact from proposed development |
|---|---|---|---|
| Kingfisher | All but two of the current nest sites were identified on the R. Boyne<br>The nearest nest site to the proposed development is on the R. Blackwater near Donaghpatrick, 5km north of the RAR site. | Habitat disturbance is the principal threat to kingfisher breeding. In the case of the R. Boyne intensive stock grazing, amenity access, bankside vegetation management and pollution from agricultural/forestry were identified as being the great threats.<br>Stock grazing is the greatest threat to the R. Blackwater sites. | No significant impact likely |



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## Likely Impacts to Annex II species

| Species | Primary location | Sensitivities | Likely Impact from proposed development |
|---|---|---|---|
| Atlantic Salmon | Throughout the river and tributaries. Peak runs upstream July-September with smolts migrating downstream April-May | Illegal netting. Serious point pollution incidents | No significant impact likely |
| River lamprey | Throughout the river and tributaries. | Arterial drainage which can destroy lamprey nursery habitats | No significant impacts are likely. |
| Otter | Result from the 2004-2005 survey show that of the 18 sites surveyed in the Natura 2000 site 12 were positive. The closest site to the proposed development is near Donaghpatrick 5km to the north (Bailey et al 2006). | Disturbance is the principle threat to the otter. This can be from works such as arterial drainage, human disturbance and hunting (which is illegal) | No significant impacts are likely. |

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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.* | Potentially polluting emissions (either in water or airborne) reaching the Natura 2000 site directly or indirectly from either RAR and if not strictly controlled could impact negatively on the site. | |
| *Describe any likely direct, indirect or secondary impacts of the project (either alone or in combination with other plans or projects) on the Natura 2000 site by virtue of:* | | |
| | Likely impacts from project alone | Likely impacts in combination with other projects |
| *1. Size and scale* | 1. Approximately 320m3/s of mine shaft air will be expelled by both RAR facilities. This is not a large volume and will be dispersed rapidly. (Odour monitoring Ireland 2011) | The only other project is the existing RAR. It is subject to the same controls as the proposed RAR. Therefore no significant negative impacts are likely. |
| *2. Land-take* | 2. Landtake will be minimal, approximately 0.4ha for the entire site. | Total landtake will be less than 1ha. This will result in no significant negative impact. |
| *3. Distance from the Natura 2000 site or key features of the site* | 3. The site lies approximately 2.5km from the Natura 2000 site. This will not create a significant negative impact. | The same remarks apply here. |
| *4. Resource requirements (water abstraction etc.)* | 4. A water storage pond with a capacity of 1600m3 will be used in drilling the pilot borehole. The water will be used to flush the pulverised rock from the shaft and will be recycled continuously. This water will be sourced directly from the main mine site. | No resources will be required for the existing RAR. |

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| | | |
|---|---|---|
| *5. Emissions (disposal to land, water or air)* | 5. There will be emissions to the atmosphere 2hr/day, 365d/yr.<br><br>They will be monitored weekly and monthly for gaseous elements and particulates respectively. All emissions will be maintained below the limits dictated by the relevant Integrated Pollution Control Licence issued by the EPA<br><br>There will be no significant negative impacts as a result of emissions. | The existing RAR is monitored as just described.<br><br>There will be no significant negative impacts as a result of emissions from both facilities |
| *6. Excavation requirements* | 6. An estimated maximum of 5000m3 of overburden will be excavated during the construction phase. All excavated materials will be recycled for use in the construction of protective berms around the facility.<br><br>This will not result in any significant impacts to the Natura 2000 site. | There are no excavation requirements for the existing RAR. |
| *7. Transportation requirements* | 7. Approximately 3000 tonnes of stone will be required to facilitate access to the site. This will amount to approximately 330 x 9 tonne loads.<br>Approximately 500m3 of concrete will be required to construct the concrete platform. This will require approximately 55 x 9m3 loads.<br><br>These transportation requirements will have no negative impacts on the Natura 2000 site. | There will be no transportation requirements for the existing RAR site. |

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| | | |
|---|---|---|
| *8. Duration of construction, operation, decommissioning, etc.* | 8. The construction phase will run for approximately 11 months. Works will take place underground for 6 months of this period.<br>This will not result in any significant impacts to the Natura 2000 site.<br><br>The RAR will be operational for the life of the mine.<br><br>Before the mine is exhausted plans will be drawn up detailing the methodology to be used in decommissioning the RARs. These will be implemented to best international practice and in accordance with EPA licensing. | Already constructed. |
| *9. Other* | 9 | |
| *Describe any likely changes to the site arising as a result of:* | | |
| *1. Reduction of habitat area* | 1. There will be no reduction in the area of the Natura 2000 site. | |
| *2. Disturbance to key species* | 2. The RAR site lies approximately 2.5m west of the Natura 2000 site. As a result there will be no disturbance to any species during the construction and operation of the RAR. | |
| *3. Habitat or species fragmentation* | 3. The same remarks apply here. | |
| *4. Reduction in species density* | 4. For the reasons outlined above the density of any species within the Natura 2000 site will not be effected by the development. | |
| *5. Changes in key indicators of conservation value (water quality etc.)* | 5. Because the emissions from both RAR will be strictly monitored and will be maintained well within IPPCL limits, water quality within and feeding into the Natura 2000 site will not be effected by the development. | |

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| | |
|---|---|
| *6. Climate change* | 6. The Natura 2000 sites in question border the estuarine site (Boyne Estuary SPA no.004080). It is likely that the most immediate changes resulting from climate change will on this site rather than the other sites. Changes to the R. Boyne & R. Blackwater SAC are most likely to occur upstream of Drogheda where the meandering river supports extensive floodplains. Tidal surges through the estuary will be gain momentum through the constricted channel in Drogheda before inundating the low-lying areas north of the town. The proposed RAR development will have no impact on this process. |

| | |
|---|---|
| *Describe any likely impacts on the Natura 2000 site as a whole in terms of:* | |
| *1. Interference with the key relationships that define the structure of the site* | 1. The structure of the Natura 2000 site, particularly downstream where the Alluvial woodlands are established, determined by arterial drainage, land drainage, surface run-off, sub-surface run-off and tidal flow. Although an extensive programme of arterial drainage works was undertaken from 1969-1985 to enhance the agricultural value of the local lands it did not impact on the important alluvial islands which had built up over the previous century west of Drogheda. These were enlarged as a consequence of over-enthusiastic land drainage which led to excessive siltation in the main channel and the extension of the islands. As these islands grew the river meandered over ever wider floodplains which ultimately were drained in the late 19th century to allow farming continue as before. Although these drainage systems are of relatively recent origin they have become part of the current structure of the R.Boyne.<br>The development site will not add to this process and will not interfere with the structure of the Natura 2000 site. |
| *2. Interference with key relationships that define the function of the site.* | 2. The site as whole functions as a source at its beginning and rapidly becomes a sink for an extensive catchment. This involves a range of relationships including, the retention of a unpolluted catchment providing the conditions necessary for a number of important species (detailed above), a balanced hydrological regime where critical habitats, e.g. Alluvial woodlands, can be maintained and a capacity to cope with climate change by extending active floodplains.<br>The proposed development will not impact negatively on these relationships, in particular the strict controls imposed will ensure water quality is not compromised. |

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| | |
|---|---|
| *Provide indicators of significance as a result of the identification of effects set out above in terms of:* | |
| *1. Loss* | 1. No Natura 2000 site area will be lost |
| *2. Fragmentation* | 2. The Natura 2000 site will not be fragmented as a result of this development |
| *3. Disruption* | 3. The Natura 2000 site will not be disrupted as a result of this development |
| *4. Disturbance* | 4. The Natura 2000 site will not be disturbed as a result of this development. |
| *5. Change to key elements of the site (e.g. water quality etc.).* | 5. Because strict control measures will be undertaken during the construction and operational phases there will be no changes to the key elements of the Natura 2000 site. |
| | |
| *Describe from the above those elements of the project or plan, or combination of elements, where the above impacts are likely to be significant or where the scale or magnitude of impacts is not known.* | Because strict control measures both during the construction and operation of the will be maintained and monitored the Natura 2000 site will not suffer significant negative impacts as a result of this development. |

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## Finding of no significant effects report

| | |
|---|---|
| *Name and location of Natura 2000 sites* | Site Name:<br>1. River Boyne and River Blackwater SAC<br>Site Code: 002299.<br>2. River Boyne and River Blackwater SPA<br>Site Code: 004232 |
| *Description of the project or plan* | It is proposed by Boliden Tara Mines to develop a new mine ventilation raise (Return Air System) at Ardbraccan, Navan, Co. Meath. |
| *Is the project or plan directly connected with or necessary to the management of the site (provide details)?* | No significant impact likely |
| *Are there other projects or plans that together with the project or plan being assessed could affect the site (provide details)?* | There is an existing Return Air Raise (RAR) adjacent to the proposed development. The emissions from both installations will be strictly controlled and regularly monitored.<br>No likely significant impacts to the Natura 2000 sites are likely. |

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### The assessment of significance of effects

| | |
|---|---|
| *Describe how the project or plan (alone or in combination) is likely to affect the Natura 2000 site* | Although the proposed development site is located 2.5km from the Natura 2000 sites and there is no clear hydrological link between the two, a lack of control of the emissions could pose a potential risk to the water quality of the Natura 2000 site. Because strict control measures will be implemented the Natura 2000 sites will not be impacted negatively by the proposed development. |
| *Explain why these effects are not considered significant* | The Natura 2000 sites will not suffer negative impacts as a result of the construction of the proposed RAR and the construction and operation of both RARs. |
| *List of agencies consulted* | DAU |
| *Response to consultation* | |



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| Data collected to carry out the assessment | |
|---|---|
| *Who carried out the assessment?* | Ted Walsh B.Sc., B.A(Mod) |
| *Sources of data* | FIELDWORK<br>Development site assessment March 2011<br><br>TEXTS<br>Online<br>(http://www.npws.ie/protectedsites/specialareasofconservationsac/)<br>NPWS (2011) Conservation objectives for River Boyne and River Blackwater SAC [002299]. Generic Version 3.0. Department of Arts, Heritage & the Gaeltacht.<br>Conservation Objectives (accessed 16-09-11)<br>NATURA 2000 Standard Data Form (accessed 16-09-11)<br>SAC Site Synopsis (accessed 16-09-11)<br><br>Reports<br>Cummins S, Fisher J, McKeever R.G, McNaghten L, Crowe O. (2010) Assessment of the distribution and abundance of Kingfisher *Alcedo atthis* and other riparian birds on six SAC river systems in Ireland. DOE BWI.<br>DOE. Threat Response Plan Otter (*Lutra lutra*) 2009 - 2011<br><br>Bailey, M. and Rochford, J. 2006. *Otter Survey of Ireland 2004/2005*. DOE.<br><br>*A Survey of Juvenile Lamprey Populations in the Boyne Catchment.* Irish Wildlife Manuals No. 24<br><br>Odour monitoring Ireland. *Dispersion Modelling Assessment of air Pollutants from existing RAR5 and proposed RAR 5-2 located in Boliden Tara Mines, Navan, Co. Meath.* (Internal document, 2011)<br><br>Emissions to Atmosphere Summary 2010 (IPPCL Condition 5.5) (Internal document) |
| *Level of assessment completed* | Comprehensive |
| *Where can the full results of the assessment be accessed and viewed?* | Offices of Meath County Council<br>County Hall<br>Navan,<br>Co. Meath. |

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## Overall conclusions

Boliden Tara Mines are obliged to maintain the highest environmental standards. Processes are subject to regular monitoring as per their Integrated Pollution Prevention Control Licence issued by the EPA.

It is worth noting that two important species, the Annex I species *Alcedo atthis* (kingfisher) and the Annex II species, *Lutra lutra* (otter) are both recorded from the River Blackwater within approximately 2km of the extensive tailings pond which is part of the mine complex.

Because the current proposal is subject to the above controls it can be objectively concluded that there are not likely to be significant effects on the Natura 2000 site from this development

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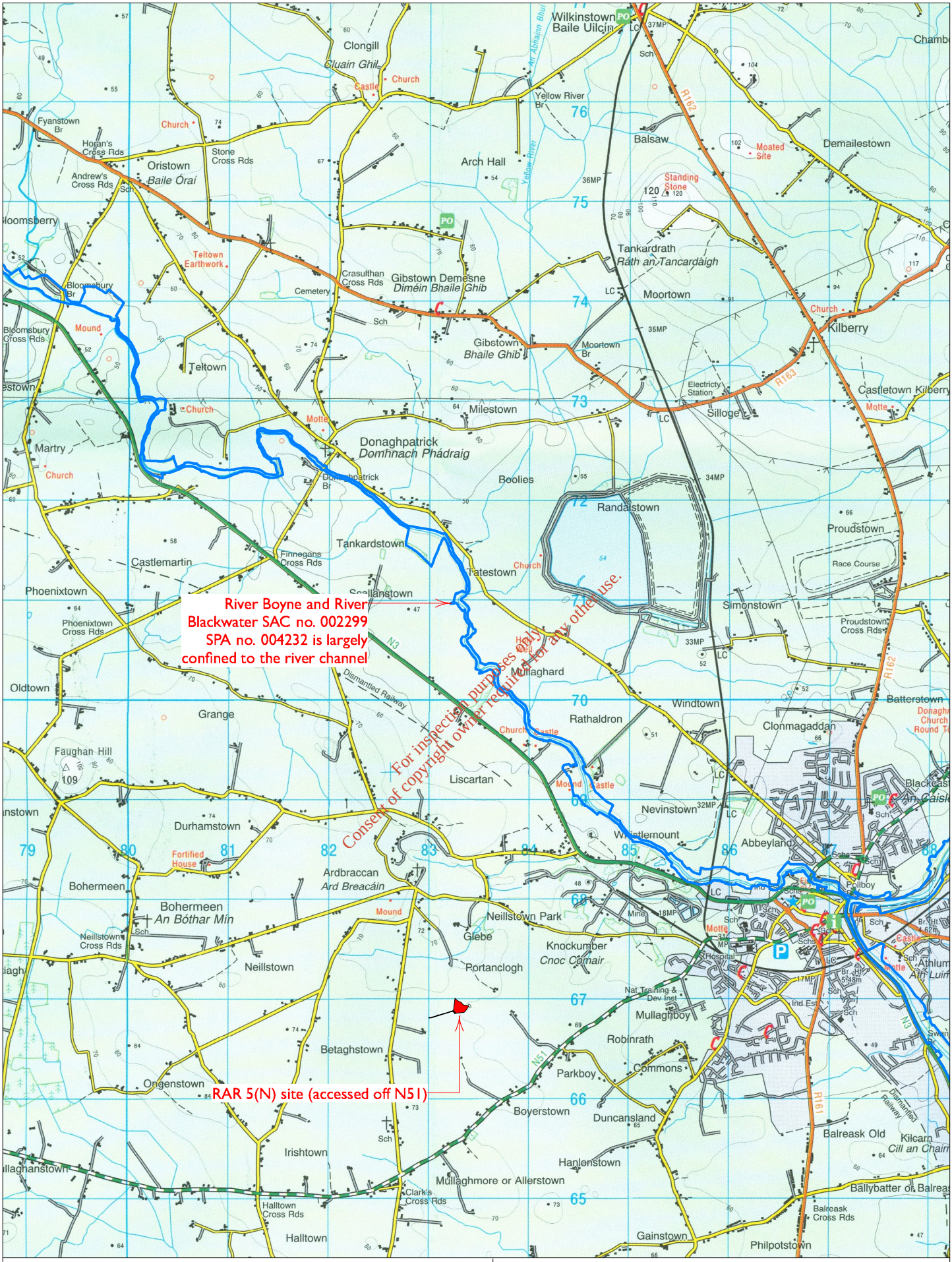


Map 7.1. Upgrading of SWEX Return Air System - RAR 5(N):

Site location and the nearest Natura 2000 sites

R. Boyne & R. Blackwater SAC no. 002299 and SPA 004232

Scale 1:50000 @ A4. Date 17-09-11 Ted Walsh & Associates Wexford

LEGEND

RAR 2 site

Site access road

N51 new alignment

R.Boyne & R. Blackwater SAC (SPA confined to central channel)

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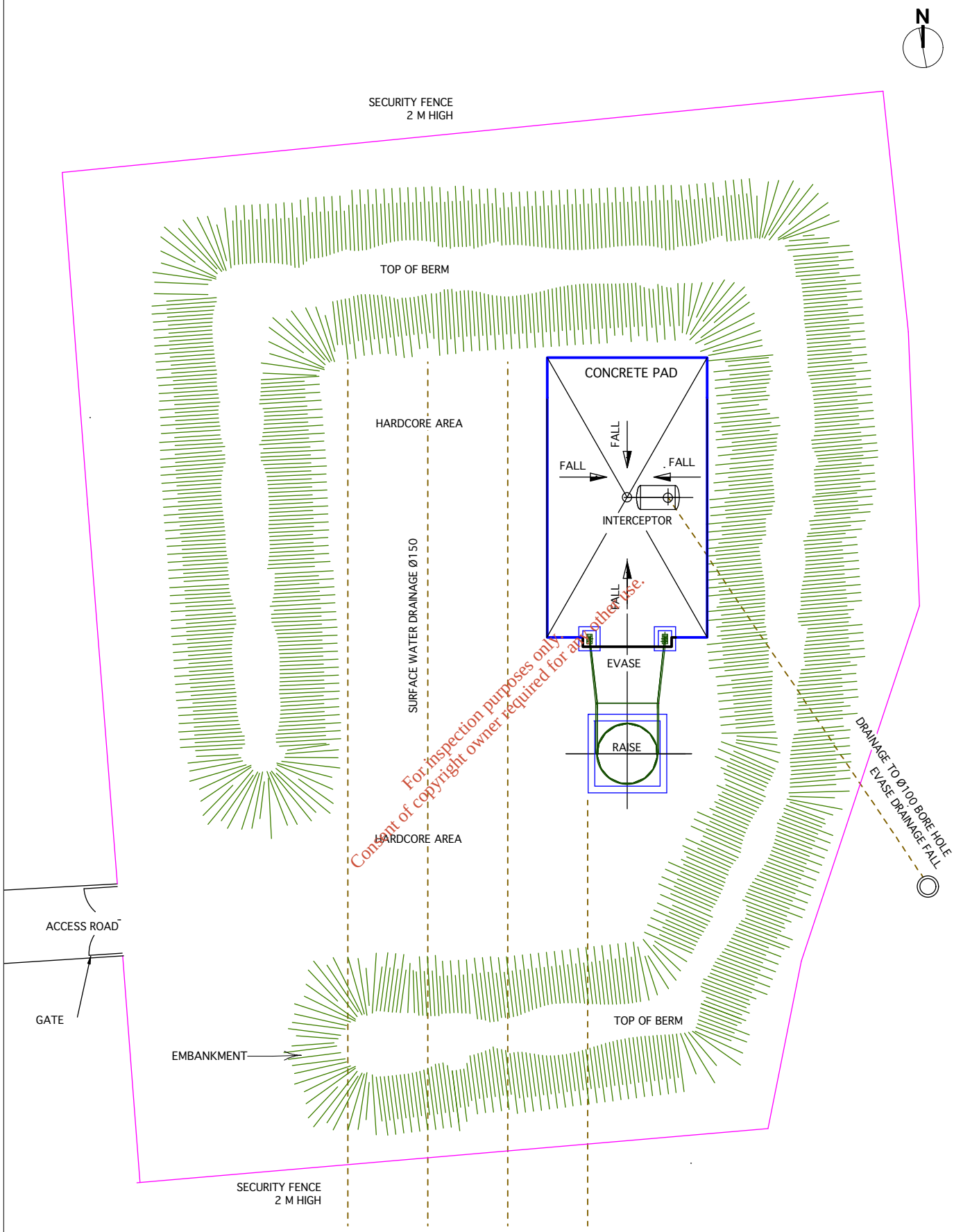


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Fig. 1 Upgrading of SWEX Return Air System - RAR 5(N): Site layout

Scale 1: 500 @ A4. Date 17-09-11 Ted Walsh & Associates

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# Appendix B.6 - 10

# NIS – Mining into Liscartan

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# BOLIDEN TARA MINES LIMITED

# EXTENSION OF MINING OPERATIONS INTO NEW AREAS IN LISCARTAN AND RATHALDRON

# SCREENING FOR NATURA IMPACT STATEMENT

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**JUNE 2010**

**Prepared**

**by**

**Biosphere Environmental Services**

**in association with**

**Boliden Tara Mines Ltd.**


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# 1. INTRODUCTION

## 1.1 Background

This report has been prepared by Dr. Brian Madden of Biosphere Environmental Services (in association with Boliden Tara Mines Ltd.) to determine the potential impacts, if any, by the plan for an extension of mining activities in the townlands of Liscartan and Rathaldron on nearby sites with European conservation designations (i.e. Natura 2000 sites). The purpose of this assessment is to determine, the appropriateness or otherwise, of the proposed project in the context of the conservation status of such sites. The report is supported by full technical details contained in the EIS for the scheme.

## 1.2 Regulatory Context

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna better known as "The Habitats Directive" provides the framework for legal protection for habitats and species of European importance. Articles 3 to 9 provide the legislative means to protect habitats and species of Community interest through the establishment and conservation of an EU-wide network of sites known as Natura 2000. These are Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Conservation of Wild Birds Directive (79/409/EEC) (better known as "The Birds Directive").

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Article 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to affect Natura 2000 sites (Annex 1.1). Article 6(3) establishes the requirement for Natura Impact Assessment (formerly referred to as Appropriate Assessment):

> "*Any plan or project not directly connected with or necessary to the management of the [Natura 2000] site but likely to have a significant effect thereon, either individually or in combination with other plans and projects, shall be subjected to appropriate assessment of its implications for the site in view of the site's conservation objectives. In light of the conclusions of the assessment of the implication 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 regulatory context is set out in the recently published document 'Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities' (Department of Environment, Heritage and Local Government 2009. www.npws.ie).



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## 1.3 Stages of the Natura Impact Statement (NIS)

This Natura Impact Statement has been undertaken in accordance with the European Commission Methodological Guidance on the provision of Article 6(3) and 6(4) of the 'Habitats' Directive 92/43/EEC (EC 2001) and the European Commission Guidance 'Managing Natura 2000 Sites'. The Guidance for Planning Authorities issued by the Department of Environment, Heritage and Local Government is also adhered to.

In complying with the obligations under Article 6(3) and following the above Guidelines, this NIS has been structured as a stage by stage approach as follows:

1) Screening stage
   - Description of the Project
   - Identification of Natura 2000 sites potentially affected
   - Identification and description of individual and cumulative impacts likely to result from the Project
   - Assessment of the significance of the impacts identified above on site integrity. Exclusion of sites where it can be objectively concluded that there will be no significant effects

2) Appropriate Assessment Stage
   - Description of the Natura 2000 sites that will be considered further in the AA.
   - Description of significant impacts on the conservation feature of these sites likely to occur from the Project
   - Recommendations

The Habitats Directive promotes a hierarchy of avoidance, mitigation and compensatory measures. First the project should aim to avoid any negative impacts on European sites by identifying possible impacts early in the planning stage, and designing the project in order to avoid such impacts. Second, mitigation measures should be applied, if necessary, during the AA process to the point, where no adverse impacts on the site(s) remain. If the project is still likely to result in adverse effects, and no further practicable mitigation is possible, then it is rejected. If no alternative solutions are identified and the project is required for imperative reasons of overriding public interest (IROPI test) under Article 6 (4) of the Habitats Directive, then compensation measures are required for any remaining adverse effect.

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# 2. SCREENING

## 2.1 Description of the Project

The proposed development involves the mining of proven ore reserves in the townlands of Liscartan and Rathaldron.

The Liscartan/Rathaldron section of the 'Navan orebody' is an uninterrupted extension of existing mine workings that are currently being mined by Boliden Tara Mines Limited (Tara Mines). The Liscartan/Rathaldron section of the orebody dips to the southwest and strikes to the northwest in common with the general characteristics of the orebody, giving a depth below surface ranging from 150m to 575m with ore thickness ranging from 4m to 12m.

Mining follows a cyclic pattern resulting in the removal of ore underground followed by the filling of the voids using cement and waste sand material that remains after the ore treatment process. The surface characteristics and features of the Liscartan / Rathaldron townlands will not be altered by mining activity and there will be no surface structure / infrastructure facilities in the area.

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**Mining and Processing Operation**

***Access***
Access to the proposed orebody will be via the existing portal access (underground road from surface) on the Knockumber Mine site. There will be no additional access to the proposed orebody.

***Underground infrastructure***
Mine services such as compressed air, water, fuel and communications cables will be carried through the existing mine into Liscartan/Rathaldron. There will be no services into the mine from outside the existing Knockumber mine site.

***Mine development***
All development work is accessed from the existing mine and all ore resulting from development will be transported to the existing mine crusher and conveyor system. Waste rock will be placed into suitable openings underground when available, or brought to surface directly by haulage, or hoisted to surface for temporary storage via the crushing system.

***Mining methods***
The selected mining method will generally be longhole open stoping where ore thickness proves to be sufficiently high (up to 12m), together with variations on room and pillar mining in areas of thinner ore (down to 4m). Cemented backfill will be used for initial primary stoping and a mixture of cemented and un-cemented backfill for later (secondary) stoping. This is the current practice in the existing mine.

***Mine production***
Mine production is the generation of large tonnages of ore from stopes and pillars. All ore produced will be transported underground by trucks to the existing mine crushing conveyor system from where it will be hoisted to surface. In a typical year,



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up to 200,000 tonnes of production ore and 60,000 tonnes of development ore will be scheduled from this area.

***Ventilation***

All ventilation requirements will be met by the existing mine ventilation system. There will be no ventilation-related connections to surface in the Liscartan/Rathaldron area.

***Backfilling***

Mined-out areas will be backfilled with sand-fraction mill tailings mixed with cement. Backfill will flow through new underground pipelines that will be connected to the existing mine backfilling facilities. Stopes and pillars will be backfilled through holes drilled down into the roof of the excavation and backfill poured down into the void over an extended period until the stope is filled. There will be no backfilling-related connections to surface in the Liscartan/Rathaldron or adjacent areas.

***Tailings management***

Processing tailings are pumped to the Randalstown Tailings Storage Facility (TSF) where aeration is provided and suspended solids are allowed to settle out to leave clear water for recirculation and reuse. In June 1998 Meath County Council granted planning permission (P96/919) for an extension of the Tailings Management Facility. The second cell of this extension project, titled Stage 4B, was completed in 2006 and the first tailings material was deposited in November 2006. Planning Permission for a further extension (Stage 5) (Ref: NA901452 Meath County Council) has been granted on 16 June 2010. .

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By the end of 2009 a total of 3.08 million tonnes of tailings had been placed in Stage 4B of the TSF leaving a remaining capacity of 3.66 million tonnes. The planned Stage 5 extension will provide capacity to accommodate an additional 7.9 million tonnes of tailings giving a total combined capacity of 11.5 million tonnes. The current Life of Mine plan requires storage capacity for up to 9 million tonnes. The 1.1 million tonnes of ore to be mined from the Liscartan / Rathaldron application area will require the deposition in the TSF of about 0.5 million tonnes of tailings for which there is adequate capacity. The orebody section under application is a continuation to the northwest of the same geological structures currently being mined at Knockumber and Nevinstown therefore the characteristics of the tailings will not change.

***Mine dewatering***

Groundwater inflowing to the mine workings will be collected at a central underground pumping station. All dewatering flows will pass through a large settling sump at this pumping station, where suspended solids settle out, prior to being pumped via the production shaft to the second stage of settlement/clarification in the Mine/Reclaim Water Ponds. There are no plans for additional water management facilities on surface.

The total pumping capacity of the mine is 21,600 $m^3$/d while the current total inflow to the mine is 11,979 $m^3$ / day.

It is anticipated that the proposed development could lead to an increase of between 15-30% of the current inflow to the mine. There is sufficient flexibility and storage in the current water management system to accommodate all additional water collected and pumped from underground.



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**Site Description**

The site area comprises largely of improved agricultural grassland (GA1) and tillage (BC1), with associated hedgerow (WL1) and treeline (WL2) habitat. The most significant ecological feature of the survey site is the corridor of the River Blackwater. Evidence of Otter (an Annex II species) was found during an ecological assessment of the site area (detailed in EIS). The river provides an invaluable ecological corridor in an otherwise intensively farmed and increasingly urbanised Co. Meath.

## 2.2 Identification of Natura 2000 Sites

In accordance with the European Commission Methodological Guidance (EC2001), a list of Natura 2000 Sites that can be potentially affected by the proposed project has been complied. Adopting the precautionary principle in identifying these sites, it has been decided to include all cSACs and SPA/Ramsar sites within a 10km radius of the proposed development site.

Only one Natura 2000 site falls within 10 km of the proposed development area:

- River Boyne and River Blackwater cSAC (code: 02299)

This very large cSAC site comprises the freshwater element of the River Boyne as far as the Boyne Aqueduct, the Blackwater as far as Lough Ramor and the Boyne tributaries including the Deel, Stoneyford and Tremblestown Rivers. These riverine stretches drain a considerable area of Meath and Westmeath and smaller areas of Cavan and Louth. The underlying geology is Carboniferous Limestone for the most part with areas of Upper, Lower and Middle well represented. In the vicinity of Kells Silurian Quartzite is present while close to Trim are Carboniferous Shales and Sandstones. There are many large towns adjacent to but not within the site. Towns both small and large, include Slane, Navan, Kells, Trim, Athboy and Ballivor.

The site supports classic riparian habitat, with high quality fringing vegetation of wet woodland, swamp, marsh, fen and wet grassland habitats in parts of the site.

The site is a candidate SAC selected for alkaline fen and alluvial woodlands, both habitats listed on Annex I of the E.U. Habitats Directive.

The site is also selected for the following species listed on Annex II of the same Directive – Atlantic Salmon, Otter and River Lamprey.

The Boyne is a designated salmonid water under the European Communities (Quality of Salmonid Waters) Regulations of 1988 (S.I. No. 293, 1988). The Boyne is one of the country's premier game fisheries, and both the Boyne and its tributaries offer a wide range of fishing for spring salmon and grilse, sea-trout and brown trout.

## 2.3 Identification of Potential Impacts

Only those features of the proposed development that have the potential to impact on features and conservation objectives of the identified Natura site are considered. A

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number of factors were examined at this stage and dismissed or carried forward for appropriate assessment as relevant.

### Direct impacts on cSAC

It is noted that the proposed development could not have any direct impacts (such as disturbance to habitats) on the interests of the cSAC as the mining activity will take place deep underground and there will be no surface structure / infrastructure facilities in the area.

### Hydrological impacts on River Blackwater and floodplain

The potential impact of hydrological changes to the Blackwater River and its floodplain due to underground mining activities is considered. The following information is taken from the detailed Hydrology section of the EIS (Section 6).

The current monitoring data indicate that drawdown in the Pale Beds unit in the vicinity of the River Blackwater at Rathaldron is of the order of 30 m. (the Pale Beds is the main groundwater bearing unit in the Main Mine, Nevinstown, and the Liscartan and Rathaldron application areas.) It is therefore expected that losses from the river and the flood plain alluvial deposits will be controlled by the permeability of the superficial deposits, rather than by ongoing drawdown in the Pale Beds.

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Observations at Nevinstown indicate that the fine-grained nature of the overburden and river-bed materials have minimised downward leakage of river water. Virtually no leakage from the shallow alluvium, the flood plain deposits or the river itself has been observed to date in response to mining beneath the river at Nevinstown. Current losses from flood plain and river are negligible (1.5 l/second or less). Except for hole N00022 (on the floodplain), and the Nevinstown exploration decline (1500NDEX2), both of which are now dry, there has been no chemical indication of river water inflow to the Main Mine or the Nevinstown workings.

Mining at Tara has been carried out close to, or beneath, the River Blackwater for over 30 years. Virtually all stope blocks located in the vicinity of the river are mined with no significant leakage of water from the river or the shallow alluvial water table of the floodplain. The main potential for increased future inflows is likely to be associated with differential movement across structural zones underlying the flood plain. At Nevinstown, this is being monitored by extensiometers placed across the main identified structures.

Given the current dataset, there is no indication that conditions beneath the river will be any different for the Liscartan/Rathaldron extension. However, it should be appreciated that mining below or adjacent to any surface water body needs to be carried out with great care. For this reason, additional monitoring holes close to the river have been recommended (as discussed in Section 4.5 of EIS). Also, as mining is extended beneath the River Blackwater, a recommendation has been made that the inflow chemistry should be monitored to detect any chemical signatures similar to river water or shallow alluvial groundwater.



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## 2.4 Analysis of 'in-combination' effects

The Habitats Directive requires that due consideration needs to be given to any plan or project which is likely to have a significant effect alone or in combination with other plans and projects.

The present project is an addition to an existing major and long established industrial complex (i.e. Tara Mines). The mines facility is located within an agricultural area, with the town of Navan immediately to the south-east. As shown in the project description, the proposed development is an uninterrupted extension of existing mine workings and will be linked to the existing mines infrastructure and services. In particular, the 1.1 million tonnes of ore to be mined from the Liscartan / Rathaldron application area will require the deposition in the Randalstown Tailings Storage Facility of about 0.5 million tonnes of tailings for which there is adequate capacity. Also, in respect of mine dewatering, there is sufficient flexibility and storage in the current water management system to accommodate all additional water collected and pumped from underground (It is anticipated that the proposed development could lead to an increase of between 15-30% of the current inflow to the mine.).

There are no other existing or planned industrial facilities in the immediate area which are licenced to discharge to the Blackwater system.

However, the local watercourses show signs of eutrophication, as shown by EPA Q-values (for instance mostly Q3 or Q3-4 for the Yellow River). Run-off from agricultural activities is likely to be a main contributing factor to eutrophication.

Taking the above into account and also the details of the proposed Liscartan and Rathaldron project it is concluded that the proposed project will not contribute to the cumulative impact from past and/or ongoing projects and activities which may affect adversely the Rivers Boyne and Blackwater cSAC site.

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## 2.5 Screening Conclusion and Statement

The screening process has examined the details of the proposed project and has considered the conservation interests of the River Boyne and River Blackwater cSAC (the only Natura site in the vicinity).

As the proposed project will have no direct or indirect impacts on the overlying River Blackwater, the conclusion is that no significant impacts on the qualifying interests of the cSAC are likely. Accordingly, progression to Stage 2 of the Natura Impact Statement process is not considered necessary.



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