



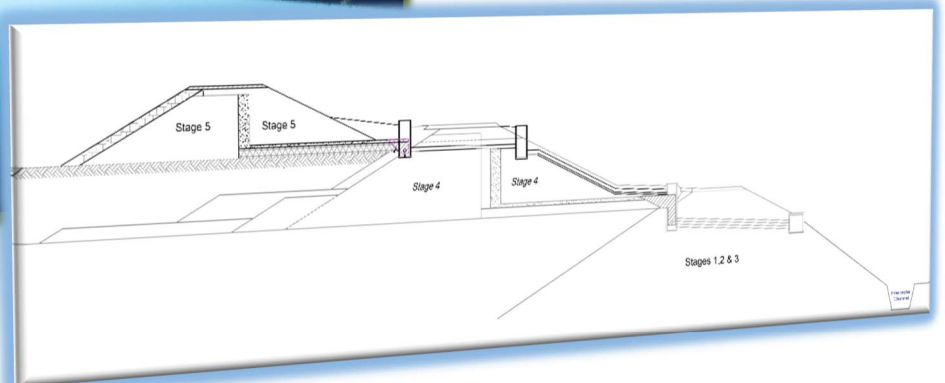
Tara Mines

# Environmental Impact Assessment Report (EIAR) Tailings Facility Embankment Buttress

## Appendix 6.B

### Invasive Alien Plant Species Management and Control Plan

Appeal Reference Number: ABP-315173-22



Submitted: February 2024

Invasive Alien Plant Species Management and Control Plan (species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) regulations 2011 (as amended), as regards proposed buttressing works at the tailings storage facility, Randalstown/Simonstown/Silloge,  
NAVAN CO MEATH  
UPDATED FEBRUARY 2024



**Updated February 2024 by:**



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## EXECUTIVE SUMMARY

*Planning permission was sought by Boliden Tara Mines DAC from Meath Co. Council (Planning Reference 22/331) as regards the construction of a reinforcement buttress to the extant wall of the Tailings Storage Facility. Meath Co. Council having granted planning permission, the decision was appealed to An Bord Pleanála. An Bord Pleanála requested further information having determined that the proposed development required the mandatory preparation of an EIAR. This document, initially prepared in September of 2022 has been updated to reflect changes associated with the biodiversity chapter of the EIAR.*

*The nature of the proposed development (import of a considerable volume of material from off-site, significant earthworks and movement of machinery throughout the proposed development footprint over an extended period of time) entails the risk of importing propagules of invasive plant species to the site and necessitates the preparation of an Invasive Species Management and Control Plan as presented here.*

*There has been no evidence for any plant species listed on Part (1) of the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations of 2011 (as amended) observed during a comprehensive flora and habitat surveys of the area of the proposed works over regular botanical surveys dating back to 2006. The primary purposes of the Alien Invasive Plant Species Management and Control Plan, therefore, are:*

- To prevent the importation to site of any propagules of such species;*
- To comprehensively monitor the site such that if any such species are imported they will be identified;*
- To ensure that populations of any such plants inadvertently imported to the site are eradicated before establishing; and*
- To ensure that any risks posed to the ecological integrity of the Natura 2000 network by the proposed development associated with the import of propagules of Alien Invasive Plant Species are reduced to negligible levels.*

*This document comprises an Alien Invasive Plant Species Management and Control Plan. It is the responsibility of Boliden Tara Mines to ensure the implementation of this Management and Control Plan, and to provide to regular reports to the Competent Authority regarding the implementation of the Management and Control Plan.*

# 1 Introduction

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## 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, holds a 1<sup>st</sup> class honours degree in Environmental Biology (UCD), a Ph.D. in Ecology (UCD), a Diploma in EIA and SEA management (UCD) a Diploma in Environmental and Planning Law (King's Inn) and a M.Sc. in Geographical Information Systems and Remote Sensing (University of Ulster, Coleraine). Patrick has in excess of 20 years of experience in carrying out ecological surveys on both an academic and a professional basis. Dr Emma Reeves, senior ecologist with FERS holds a 1<sup>st</sup> class honours degree in Botany, and a Ph.D. in Botany. Emma has in excess of 15 years of experience in undertaking ecological surveys on an academic and professional basis. Ciarán Byrne, a senior ecologist with FERS holds a 1<sup>st</sup> class honours degree in Environmental Management (DIT) and a M.Sc. in Applied Science/Ecological Assessment (UCC). Ciarán has in excess of 10 years in undertaking ecological surveys on both an academic and a professional basis.

FERS client list includes National Parks and Wildlife Service, An Bord Pleanála, various County Councils, the Heritage Council, Teagasc, University College Dublin, the Environmental Protection Agency, Inland Waterways Association of Ireland, the Department of Agriculture, the Office of Public Works and Coillte in addition to numerous private individuals and companies. FERS Ltd. FERS has a large body of experience working with Alien Invasive Plant Species, including the preparation of Alien Invasive Species Management and Control Plans.

## **1.2 The aim of this report**

The aim of this report is to present an Alien Invasive Plan Species Management and Control Plan as per item (3) of the Request for Further Information by Meath Co. Council as regards planning application 22/331.



### 1.3 Existing conditions on site

The existing walls of the embankments largely comprise semi-natural grassland of a mosaic of types, depending on the existing environmental conditions. For example, in the vicinity of the Interceptor Ditch, areas of wet grassland (GS4) occur, while on south-facing slopes the grassland could be categorised as GS1, and indeed a high number of orchids, including Common Spotted Orchid and Bee Orchid occur here.

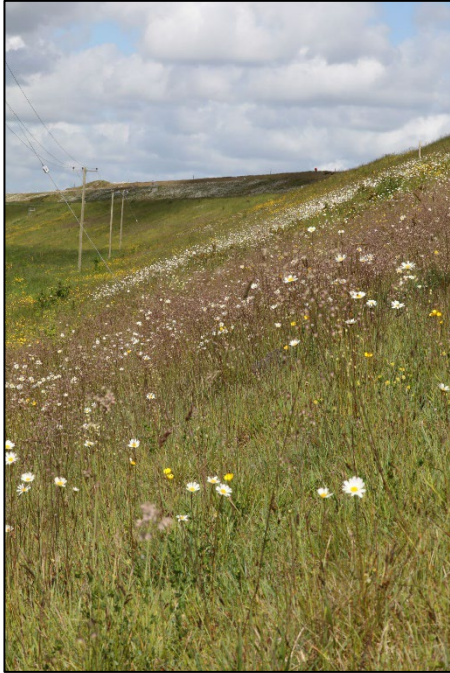


Figure 1: Slopes of the existing embankment comprise the habitat GS - semi natural grassland

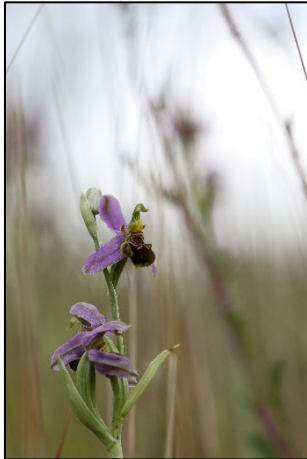


Figure 2: Bee Orchid occur in suitable habitat along the embankment of the dam

The existing semi-natural grassland habitat supports numerous species of avifauna of conservation concern, including the red-listed Meadow Pipit and Yellowhammer. There has been little human intervention in the form of insecticide/pesticide within the habitats occurring along the tailings embankments/walls and as a result the habitats provide a rich habitat assemblage for a diverse range of invertebrates, which ground/near ground nesting species such as Meadow Pipit and Yellowhammer require for successfully rearing chicks.



**Figure 3: The Red-listed Meadow Pipit breeds extensively at the Tailings Facility**



**Figure 4: Yellowhammer are also abundant within the subject area**

Grassland habitat within Ireland requires management in the form of grazing and/or mowing to maintain a sward as woodland is the climax vegetation. The existing grassland habitat is maintained by a large population of hare and rabbit (in addition to invertebrates). There are unusually large numbers of Irish Hare throughout the subject area.



**Figure 5: Irish Hare are common within the Tailings Facility, being free from persecution**

In addition, the semi-natural grassland habitat and the invertebrate population supported provides foraging for a range of bat species.

## 2 Description of proposed project

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### 2.1 Background

#### 2.1.1 Rationale

BTM has recently become a member of the International Council for Mining and Metals (ICMM) and is in the process of adopting the Global Industry Standard on Tailings Management (GISTM).

A key objective of GISTM is to address the risk of tailings embankment failure through conservative design criteria, independent of trigger mechanisms, in order to minimise potential impacts.

To this end a suitable conservative approach must be taken in terms of the factors of safety to be adopted in scenarios relating to the liquefaction / brittleness of the tailings.

The proposed buttrass will be constructed against the extant embankment walls of the Tailings Storage Facility.

- The extant embankment walls have been designed and assessed to meet a target design criterion, for long-term static slope stability, with a Factor of safety (FoS) of  $\geq 1.5$  using effective strength parameters.
- The buttrassing works will increase the Factor of Safety to
  - $\geq 1.5$  for the peak strength undrained scenario and to
  - $\geq 1.1$  for the residual strength undrained scenario which is now required

The Tailings Facility is located approximately 3 km north of the mine site in Navan. The facility is constructed as a ring-dike configuration, Stages 1 to 5 enclosed by earth fill embankment walls constructed from locally sourced natural materials. The facility encloses an area of c. 250 Hectares. It is proposed to construct a buttrass to the existing embankment walls to increase their strength thus reducing the risk of failure

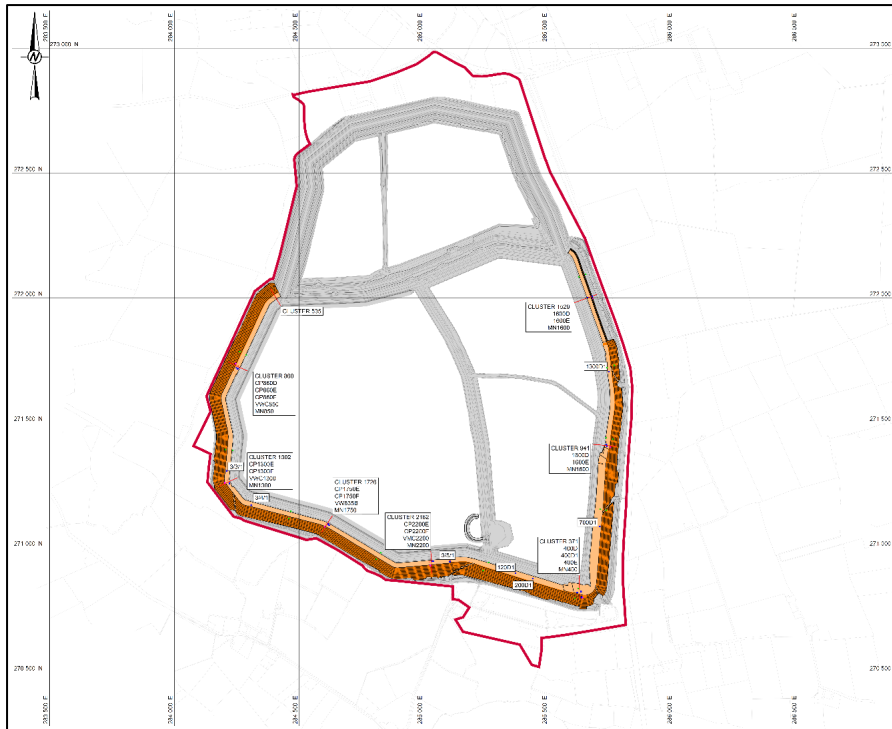


Figure 6: Tailings Facility layout plan

The TSF has been constructed in six main stages during the period from 1974 to present.

- Stages 1, 2 and 3 were built at ground level to a height of c.12 metres.
- Stages 4 and 5 were upstream vertical raises over Stages 1,2 and 3 (6m and 4m respectively).
- Stage 6 is a lateral extension to the north of stages 1,2,3,4 & 5.

Refer to Figure 7, Figure 8 and Figure 9.



Figure 7: Embankments side profile

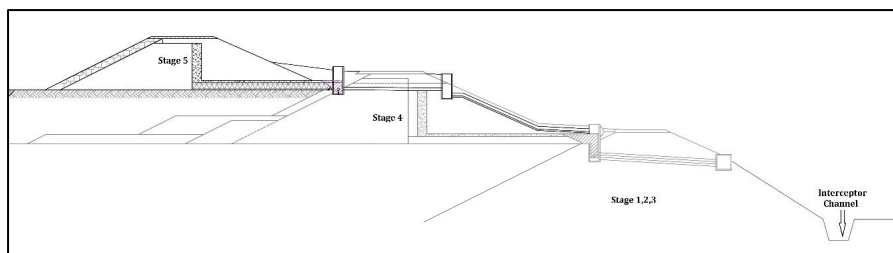


Figure 8: Cross section – extant facility embankment

The proposed buttrass, to be constructed on the downstream slope of and at the crest of the Stage 1, 2 and 3 starter Embankments, see Figure 9, will provide additional support to the Stage 4 dam embankment wall in order to increase the overall stability of the upstream raises i.e. Stage 4 and Stage 5.

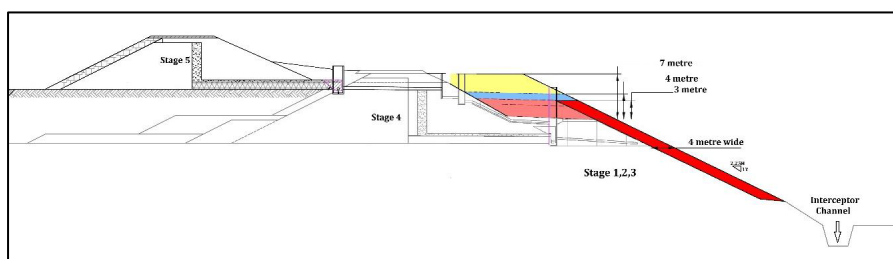


Figure 9: Cross section – facility embankment with buttrass

### 2.1.2 Factor of Safety (FoS)

BTM has undertaken a comprehensive liquefaction assessment using Cone Penetration Tests (CPT) and laboratory testing on the existing tailings.

As with all loose tailings, the tailings at Randalstown could potentially liquefy either during dynamic or static liquefaction.

- Dynamic liquefaction occurs as a result of seismic activity, the risk of which is very low in Ireland.
- Static liquefaction occurs when the dam wall has already failed for other reasons and the tailings statically liquefy under the large strains as a result of loss of confinement.

In engineering, a factor of safety (FoS) indicates how much stronger a structure actually is compared to what it needs to be for an intended load.

The original facility design and stability analyses were undertaken using effective strength parameters and monitored piezometric levels in the stack wall which is the traditional procedure. The facility was originally designed and assessed to meet a target design criterion for long-term static slope stability of  $FoS > 1.5$ .

However, current industry best practice is to evaluate the stability using peak undrained shear strengths and with further analysis using residual undrained shear strengths. Tailings undrained strength parameters simulates excess pore pressure within the tailings and is therefore, a more conservative analysis.

The undrained stability analysis indicates that a buttress is required at the toe of the Stage 4 embankment to achieve a factor of safety of 1.5 based on peak undrained shear strength of the fine tailings.

The buttress will provide additional support to the Stage 4 dam embankment wall in order to increase the overall stability of the upstream raises i.e. Stage 4 and Stage 5.

For the stability analysis based on residual undrained shear strength, the buttress size will need to be increased in height to achieve the required factor of safety of 1.1. In order to achieve this increase in height, it is necessary to construct a buttress to the starter dam to facilitate the further increase in height.

It has been determined that the addition of a rock fill buttress at the downstream toe of the Stage 4 dam would meet the necessary requirements (endorsed by Independent Tailings Review Board (ITRB)).

- The minimum required FoS of 1.5 is achievable for all static and seismic loading conditions and all failure surface locations when the peak undrained strength of the tailings was considered.
- In order to meet the FOS of 1.1 for the residual undrained strength scenario the analysis indicated that a 4 m wide buttress to the starter dam is required for the majority of the perimeter wall. At the starter dam crest level, the height of the buttress will vary between 3 and 7 m.

The proposed buttress will be approximately 12 m wide at the base and will have an outer slope of 1 V : 2.75 H. This slope will be similar to the downstream slope of the Stage 4 dam wall as well as the downstream slope of the Starter Dams (Stages 1, 2 and 3) at most locations. It should be noted that where the Starter Dam height is greater than 14 m, the slope will be 1 V : 2.5 H. In these scenarios, the outer slope of the buttress will match the more shallow slope of the Starter Dam.

The proposed buttrass would be sequenced in two phases, which may run concurrently. The works will commence at the eastern extremity of the site and proceed westward):

- Phase I will proceed on a horizontal basis along Stage 4 of the tailings dam. Works will begin at the level of the toe of the Stage 4 upstream raise against the embankment wall and will vary between 3, 4 and 7 metres in height. The material will be placed in layers along 500m sections, with each 500 m section taking approximately one month to complete. It is envisaged that the Phase I works will take approximately 30 weeks; and
- Phase 2 will proceed on a horizontal basis at ground level against the embankment wall of stages 1,2 and 3 (starter dams). The material will be placed in layers along 500m sections, with each 500 m section taking approximately one month to complete. It is envisaged that the Phase 2 works will take approximately 80 weeks.

Construction quantities:

Rock Fill (m3)	Soil (m3)	Total (m3)
265,690	295,650	561,340



## 2.2 Plan and Construction Sequence

The following items are designed and specified for the Works and are listed in order of the proposed

### 2.2.1 Sequence of Works.

- 1) Preparatory Works including cleaning the crest of the Starter Dams, removal of any topsoil, shrubs / scrub from the side-slopes over the footprint of the proposed buttress and to facilitate plant access; and
- 2) Installation of the Phase 1 Buttress (toe of stage 4)
- 3) Installation of the Phase 2 Buttress (at ground level starter embankments)

### 2.2.2 Preparatory Works

#### Accommodation of Monitoring Instrumentation

The construction of the buttress will require the extension or otherwise accommodation of a number of geotechnical instruments which will be impacted by the works. These instruments include Casagrande standpipes, environmental monitoring wells, vibrating wire piezometers and flow measurement weirs.

### 2.2.3 Clearance of Work Areas

The proposed Phase 1 buttress overlies the crest of the Starter Dams, (Stages 1, 2 and 3). The crest of this road includes a layer of rockfill material as capping and surface dressing. It is proposed that this material be salvaged where possible and where the quality of the material permits. This shall be done by either stockpiling the material temporarily for re-use or preferably, through the re-use of the material as a capping layer on a section where the buttress works have already been completed.

Removal of topsoil from the footprint of the area adjacent to the crest road, i.e. the area above the Stage 4 toe drain and the Stage 4 slope shall be completed prior to commencement of the buttressing works.

For the Phase 2 buttress, it will be necessary to remove the topsoil from the entirety of the starter dam perimeter slope as well as the footprint of the buttress at the toe.

Topsoil shall be either stockpiled temporarily for re-use or preferably, through the direct re-use of the topsoil on sections where the buttressing works have already been completed. Following excavation

to the Formation Level, the footprint will require trimming, grading and compaction prior to the placement of the compacted fill. The final excavated surfaces shall be trimmed and rolled to provide a clean, even and firm foundation to permit the movement of construction vehicles without causing rutting or other deleterious effects. Benching will be employed where buttriss materials are being placed onto slopes to ensure that a sufficient key-in is achieved between the buttriss and the dam walls.

A specified number of passes of a suitable vibratory roller will be required for the underlying soils. Soft spots and areas of unsuitable materials identified shall be excavated and replaced with suitable material placed and compacted and / or shall be improved *in-situ* via compaction or the installation of appropriate geosynthetics as approved by the engineer.

As part of the Phase 1 buttriss construction works, the material which overlies the Stage 1,2 and 3 chimney drains shall be removed intermittently. This will allow sub-surface water drainage in the section to drain into the Stage 1, 2 and 3 chimney drain. This water will then report into the Perimeter Interceptor Channel (PIC) and from there will be returned back to the tailings facility.

## 2.3 Alien Invasive Plant Species – Background

The human introduction of alien plant species into ecosystems (intentionally or unintentionally) is historically a common-place occurrence. The vast majority of these alien plant species, when introduced into a foreign ecosystem for which they are not adapted, will die without specific care. In a small number of cases, however, these plants can come to dominate the ecosystem into which they have been introduced and become “Invasive”. There is presently a great deal of concern regarding the potential for invasive plant species to threaten the species composition, community structure and overall biodiversity of native Irish habitats. Invasive species can change the character and/or condition of an ecosystem over an extensive area through several mechanisms, depending on the species of plant and the nature of the habitat.

## 3 Legislation – Biodiversity and Invasive Species

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### 3.1 Irish Law – The Wildlife (Amendment) Act 1976 (as amended)

The primary domestic legislation providing for the protection of wildlife in general, and the control of some activities adversely impacting upon wildlife is the Wildlife Act of 1976. The aims of the wildlife act according to the National Parks and Wildlife Service are “... to provide for the protection and conservation of wild fauna and flora, to conserve a representative sample of important ecosystems, to provide for the development and protection of game resources and to regulate their exploitation, and to provide the services necessary to accomplish such aims.” All bird species are protected under the Act. The original Act has been amended on several occasions to improve the effectiveness of the Act to achieve its aims. The main objectives of the Act are:

- Provide a mechanism to give statutory protection to NHAs;
- Provide for statutory protection for important geological and geomorphological sites, including fossil sites by designation as NHAs;
- Improve some existing measures, and introduce new ones, to enhance the conservation of wildlife species and their habitats;
- Enhance a number of existing controls in respect of hunting, which are designed to serve the interests of wildlife conservation;
- Broaden the scope of the Wildlife Acts to include most species, including the majority of fish and aquatic invertebrate species which were excluded from the 1976 Act;
- Introduce new provisions to enable regulation of the business of commercial shoot operators;
- Ensure or strengthen compliance with international agreements and, in particular, enable Ireland to ratify the Convention on International Trade in Endangered Species (CITES) and the African-Eurasian Migratory Waterbirds Agreement (AEWA).
- Increase substantially the level of fines for contravention of the Wildlife Acts and to allow for the imposition of prison sentences;
- Provide mechanisms to allow the Minister to act independently of forestry legislation, for example, in relation to the acquisition of land by agreement;
- Strengthen the provisions relating to the cutting of hedgerows during the critical bird-nesting period and include a requirement that hedgerows may only be cut during that period by public bodies, including local authorities, for reasons of public health or safety;
- Strengthen the protective regime for Special Areas of Conservation (SACs) by removing any doubt that protection will in all cases apply from the time of notification of proposed sites;

- Give specific statutory recognition to the Minister's responsibilities in regard to promoting the conservation of biological diversity, in light of Ireland's commitment to the UN Convention on Biological Diversity.

## 3.2 European Law – The Birds Directive and the Habitats Directive

### 3.2.1 Habitats Directive

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 Habitats Directive sets out the protocol for the protection and management of SACs.

### 3.2.2 Birds 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 (Annex I species). A Special Protection Area, or SPA, is a designation under The Birds Directive.

### 3.2.3 European Communities (Birds and Natural Habitats) Regulations 2011 (as amended)

With the introduction of the Birds Directive and the Habitats Directive, came the obligation to establish the Natura 2000 network. In 1997, the Habitats Directive was transposed into Irish national law. The relevant Regulations, the European Communities (Natural Habitats) Regulations 1997, SI 94/1997 represent a fundamental shift in nature conservation policy and law. The European Communities (Birds and Natural Habitats) Regulations 2011 (as amended) consolidate the European Communities (Natural Habitats) Regulations 1997 to 2005 and the European Communities (Birds and Natural Habitats)(Control of Recreational Activities) Regulations 2010, as well as addressing transposition failures identified in judgments of the Court of Justice of the European Union (CJEU).

## 4 Species of plant listed in Part (1) of the Third Schedule

There are more than 30 species listed in Part (1) of the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations of 2011, which states (49) “...Save in accordance with a licence granted under paragraph (7), any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow in any place specified in relation to such plant in the third column of Part 1 of the Third Schedule, any plant which is included in Part 1 of the Third Schedule, shall be guilty of an offence...” The species listed on Part (1) the Third Schedule (as amended) are listed in Table 1.

**Table 1: List of plant species appearing on the Third Schedule**

Common Name	Latin Name	Associated with freshwater habitats
American skunk-cabbage	<i>Lysichiton americanus</i>	Yes
Red alga	<i>Grateloupia doryphora</i>	No
Brazilian giant-rhubarb	<i>Gunnera manicata</i>	Yes
Broad-leaved rush	<i>Juncus planifolius</i>	Yes
Cape pondweed	<i>Aponogeton distachyos</i>	Yes
Cord-grasses	<i>Spartina (all species hybrids)</i>	No
Curly waterweed	<i>Lagarosiphon major</i>	Yes
Dwarf eel-grass	<i>Zostera japonica</i>	No
Fanwort	<i>Cabomba caroliniana</i>	Yes
Floating pennywort	<i>Hydrocotyle ranunculoides</i>	Yes
Fringed water-lily	<i>Nymphoides peltata</i>	Yes
Giant hogweed	<i>Heracleum mantegazzianum</i>	Yes
Giant knotweed	<i>Fallopia sachalinensis</i>	Yes
Giant-rhubarb	<i>Gunnera tinctoria</i>	Yes
Giant salvinia	<i>Salvinia molesta</i>	Yes
Himalayan balsam	<i>Impatiens glandulifera</i>	Yes
Himalayan knotweed	<i>Persicaria wallichii</i>	Yes
Hottentot-fig	<i>Carpobrotus edulis</i>	No
Japanese knotweed	<i>Fallopia japonica</i>	Yes
Large-flowered waterweed	<i>Egeria densa</i>	Yes
Mile-a-minute weed	<i>Persicaria perfoliata</i>	Yes
New Zealand pigmyweed	<i>Crassula helmsii</i>	Yes
Parrot's feather	<i>Myriophyllum aquaticum</i>	Yes
Rhododendron	<i>Rhododendron ponticum</i>	No
Salmonberry	<i>Rubus spectabilis</i>	Yes
Sea-buckthorn	<i>Hippophae rhamnoides</i>	No
Spanish bluebell	<i>Hyacinthoides hispanica</i>	No
Three-cornered leek	<i>Allium triquetrum</i>	No
Wakame	<i>Undaria pinnatifida</i>	No
Water chestnut	<i>Trapa natans</i>	Yes
Water fern	<i>Azolla filiculoides</i>	Yes
Water-primrose	<i>Ludwigia (all species)</i>	Yes
Waterweeds	<i>Eoldea (all species except E. canadensis)</i>	Yes
Wireweed	<i>Sargassum muticum</i>	Marine/transition

The majority of the species listed on Part (1) of the Third Schedule are particularly problematic within riparian habitats, with constant disturbance and the presence of a medium for spread. In the case of works/developments adjacent to water-courses, therefore, there is a particular threat posed by many of these plants. In the event of the presence of a Source-Pathway-Receptor linkage between a proposed development and a Natura 2000 site, in particular a riparian site, a very significant threat is posed to the ecological integrity of that site in the event of the spread of an Alien Invasive Plant Species to that site.

## 5 Description of S-P-R linkages

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The basis for identifying potential impacts/significance thereof and defining the zone of influence is the “Source-Pathway-Receptor” (S-P-R) model. This model underpins all water-protection schemes in Ireland, as well as the EU Water Framework Directive on which both surface water and groundwater regulations are based. When examining S-P-R relationships in regard to impacts on Natura 2000 sites, the main questions to be considered are:

- 1) Source characterisation – Identification of potential source(s) of the impact(s);
- 2) Pathway’s analysis – Identification of means through which potential impacts could take place, for example is there a hydrogeological or hydrological link that can deliver a pollutant source to a nearby receptor; and
- 3) Receptor identification – identification of Natura 2000 sites/qualifying interests potentially affected.

The River Boyne and River Blackwater SAC/SPA is approximately 1,500 metres from the proposed development. The conservation objectives of the qualifying interests of the River Boyne and River Blackwater SAC and River Boyne and River Blackwater SPA (and indeed those species for which the sites are not designated, but which are key to the ecological integrity of the sites) are directly or indirectly dependent on water quality and disturbance levels.

One of the sources of impact most likely to impact on these Natura 2000 sites concerns the spread of any plant species listed in Part (1) of the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations of 2011 (as amended) must be considered owing to the nature of the proposed development.

Therefore, the key questions to be considered are:

- 1) Is there any source/potential for import/spread of Third Schedule-listed species?
- 2) Is there a pathway present between the source of impact and a Natura 2000 site?; and
- 3) What are the Natura 2000 sites/qualifying interests potentially impacted upon?

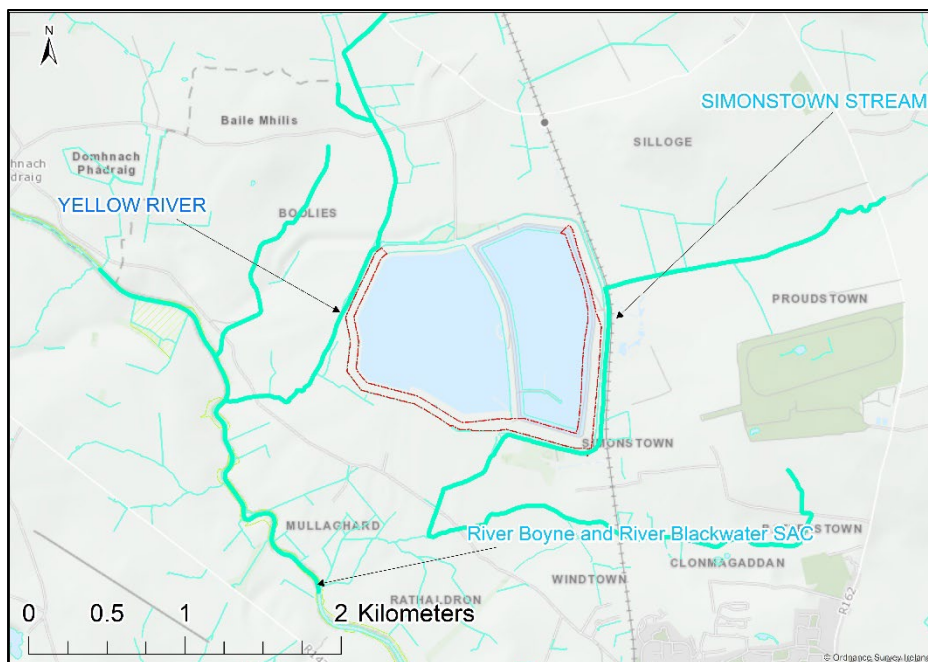


### 5.1.1 Sources of potential impacts

Given the nature of the proposed works, there is potential for the introduction and/or spread of Alien Invasive Plant Species listed on Part (1) of the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations of 2011 (as amended). Such species could be introduced to the site through imported material and/or vehicles, etc.

### 5.1.2 Presence of pathway and receptor

The primary receptor of concern is the River Blackwater and associated ecological corridor (a primary component of both the River Boyne and River Blackwater SAC and the River Boyne and River Blackwater SPA). There are two water-courses occurring on the western (Yellow River) and eastern (Simonstown stream) edge of the proposed works that discharge to the River Blackwater (River Boyne and River Blackwater SAC/SPA) – see Figure 10. There is no direct pathway between the proposed works and the Girley (Drewstown) Bog SAC.



**Figure 10:** Map illustrating connectivity between the site of the proposed works and the River Boyne and River Blackwater SAC (and SPA)

### 5.1.3 Natura 2000 site(s) with potential to be impacted upon and Zone of Influence

There is potential for negative impacts on both the River Boyne and River Blackwater SAC and River Boyne and River Blackwater SPA through several impacts and pathways. The “Zone of Influence”

should include these Natura 2000 sites. Girley (Drewstown) Bog SAC is not considered to be within the Zone of Influence.

## 6 Requirement of Alien Invasive Plant Species Management and Control Plan

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The proposed works include a provision for material being imported to the site from several external sites, there is potential for the importation of propagules of several Alien Invasive Plant Species, which thrive under conditions of disturbance. There are three primary species of concern as regards the proposed development:

- Japanese Knotweed;
- Himalayan Balsam; and
- Giant Hogweed

These three species are listed in Part (1) of the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended)

Given the nature of the proposed development, the volume of material to be imported, the potential number of different source sites (some of which have yet to be confirmed), the extended time-period of works and the known presence of Japanese Knotweed, Himalayan Balsam and Giant Hogweed in County Meath, there is a significant risk of the importation of these (and other) species posed by the proposed development in the absence of an Invasive Alien Plant Species Management and Control Plan. Through the implementation of such a plan, however, the risk of import/dispersal/spread can be reduced to negligible levels.

## 7 Alien Invasive Plant Species Management and Control Plan

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The proposed works footprint has been comprehensively surveyed over a number of years and there have been no observations of any Alien Invasive Plant Species listed on Part (1) of the Third Schedule present within the proposed works footprint (or indeed, the entire Tailings Management Facility). The primary goal of the Alien Invasive Plant Species Management and Control Plan, therefore, is to prevent the introduction to the proposed development footprint of any such species.

The objectives of the Alien Invasive Plant Species Management and Control Plan are:

- To ensure that any material imported to the proposed development footprint is free of propagules of any species listed on Part (1) of the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations of 2011 (as amended);
- To ensure that propagules of any species listed on Part (1) of the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations of 2011 (as amended) are not inadvertently imported on the wheels of vehicles, etc. during the works;
- To implement a monitoring program to ensure no species listed on Part (1) of the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations of 2011 (as amended) can establish a population within the proposed works footprint;
- To prevent the movement and spread of any alien invasive plant species to/within the site; and
- To eradicate any populations of Alien Invasive Plant Species discovered on site.

The Invasive Species Management and Control Plan will achieve these objectives through:

- 1) Assessment of plant species listed on Part (1) of the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations of 2011 most likely to be transported to the proposed site through imported material;
- 2) The surveying of all sites from which material is to be sourced for evidence of any plant species listed on Part (1) of the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations of 2011 (as amended);
- 3) Annual monitoring of the proposed works footprint post-works for any evidence of plant species listed on Part (1) of the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations of 2011.; and
- 4) The implementation of strict on-site Biosecurity Measures.

The intent of the implementation of the Invasive Plant Species Management and Control Plan is that all equipment and material must arrive at the site free of any alien invasive plant species propagules

and that all equipment and material leaving the site must be free of any alien invasive plant species propagules. It will be the responsibility of Boliden (New Tara) Mines Ltd. to ensure that this Alien Invasive Species Management and Control Plan is implemented in full.

## 7.1 Assessment of species likely to be transported

Of the 30 plus species listed in the Third Schedule, three terrestrial species in particular are problematic under conditions of disturbance, and particularly problematic in riparian systems. All three species are known to occur within Co. Meath. These species have the potential to spread very aggressively, establish sizeable populations very quickly, and are capable of inflicting a high degree of ecological damage within short spaces of time. These species are:

- Japanese Knotweed (*Fallopia japonica*);
- Himalayan Balsam (*Impatiens glandulifera*); and
- Giant Hogweed (*Heracleum mantegazzianum*).

### 7.1.1 Japanese Knotweed

This plant is a rhizomatous perennial, capable of reaching 2m in height. This plant spreads exclusively by vegetative means, spreading very aggressively under disturbed conditions. The plant is capable of forming extensive monoculture stands. There is a negative impact on ecosystem function and biodiversity through a number of mechanisms – primarily through the shading-out of native plants due to the rapidity with which large stands of the plant can form. In addition, this plant has a deleterious effect on the banks of waterways owing to the fact that during the winter, when *F. japonica* dies back, there is little or no vegetation growing underneath, and hence nothing to prevent erosion of the bank. This species is well established in Ireland and is rapidly spreading throughout the country, especially by roadsides and along watercourses.



Figure 11: Established population of Japanese Knotweed occurring at a quarrying operation

### 7.1.2 Himalayan Balsam

*Impatiens glandulifera* is one of the tallest annuals occurring in Europe, growing up to 150 cm. It is a native of the Himalayas and has rapidly become one of the most problematic of invasive species in Europe, particularly along watercourses. The dominance of large stands of *I. glandulifera* along watercourses causes problems for stream management in addition to the negative impact on native flora due to the formation of large monoculture stands. The massive production of nectar to induce pollinators, in addition to the “explosive” means by which seeds are spread (pods explode on contact, hurling seeds away from the parent plant) contribute to the ability of this plant to out-compete native species. This plant is rapidly becoming a serious threat to biodiversity along Ireland’s waterways.



Figure 12: Himalayan Balsam, which is known to occur along the River Boyne

### 7.1.3 Heracleum mantegazzianum, Giant Hogweed.

Giant Hogweed, as its name suggests, can reach heights of 5m. This perennial reproduces exclusively by seed, but can produce up to 100,000 seeds per individual, with up to 90% germination rate. In addition to this, this plant is capable of self-fertilisation, which means that one plant is capable of resulting in the invasion of a new habitat. Like *F. japonica*, and *I. glandulifera*, it is the tendency of Giant Hogweed to grow very tall very quickly, forming a monospecific stand that results in the negative

impact of this species on native biodiversity. It is, however, the phototoxic sap of this species, and the increasing number of human injuries associated with this sap that has made *H. mantegazzianum* one of the most problematic alien invasive plant species throughout Europe.



Figure 13: Giant Hogweed occurring along the banks of the River Boyne

## 7.2 Surveying of all sites from which material is to be sourced

All source sites must be surveyed (within the appropriate ecological window – April – September) prior to any extraction of material commencing. If any evidence of a species listed on Part (1) of the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations of 2011 (as amended) is discovered at a source site, that site is no longer a viable source of material for the proposed works. If the material is to be exported from the source site over an extended period of time (more than 3 months), the source site must be subject to surveys for Alien Invasive Plant Species on a biannual (Late April/early May and September) basis to ensure the continued status of the source as free from any such species.

## 7.3 Annual Monitoring of the site post-works

The proposed works footprint must be surveyed for any species listed on Part (1) of the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations of 2011 (as amended) on an annual basis (during the period May – June) in order to ensure that the site remains free from Alien Invasive Plant Species. If, during this time any evidence of such plants is observed, the immediate eradication of those plants must be undertaken (following best practice management as outlined by Invasive Species Ireland/NPWS).



## 7.4 Biosecurity measures – incoming and outgoing vehicles

One of the primary sources of the spread of propagules of Alien Invasive Plant Species (aside from contaminated material) is the wheels/body of vehicles moving between sites. All incoming vehicles must be subject to a wheel-wash prior to entering the proposed works footprint, and prior to leaving the proposed works footprint. The discharge from this wheel-wash must not be discharged from site, but allowed percolate to ground within a quarantine zone, in order to avoid the inadvertent spread of any propagules of invasive alien plant species that may become dislodged during the wheel-wash process. This quarantine area must be subject to inspection during the annual monitoring.

## 8 Conclusions of the Invasive Species Management and Control Plan

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The proposed works will entail the importation to site of a considerable quantity of material, sourced from a number of areas. There is potential for importation of propagules of Alien Invasive Plant Species, primarily through:

- Importation of material contaminated with propagules;
- Importation of propagules on the tyres/body of vehicles.

The risks regarding the facilitation of the importation, spread or dispersal of potential propagules of Alien Invasive Plant Species to/within the proposed development site (and in particular Japanese Knotweed, Himalayan Balsam and Giant Hogweed) have been taken into account in this Alien Invasive Plant Species Management and Control Plan.

Having implemented the measures as outlined in this report, the risks regarding importation, spread or dispersal of Alien Invasive Plant Species (and in particular any species listed on Part (1) of the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations of 2011 (as amended) during the proposed works will be reduced to negligible levels.

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[www.biodiversityireland.ie](http://www.biodiversityireland.ie) – website of the National Biodiversity Data Centre

[www.npws.ie](http://www.npws.ie) – website of the National Parks and Wildlife Service, source of information for data regarding Natura 2000 sites and Article 17 Conservation Assessments.

[www.europa.eu](http://www.europa.eu) – official website of the European Union, source of information on EU Directives.