

Invasive Non-native Species Survey



Radcliffe, Battery Energy Storage System (BESS), At land to the east of Shore Top Farm, Kearsley Road, Radcliffe, Manchester (M26 1FA)

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(Hons)

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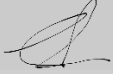
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The information which ADAS has prepared and provided is true and has been prepared and provided in accordance with the CIEEM's Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions.

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Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work.

This work has been undertaken in accordance with the quality management system of RSK ADAS Ltd.

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1 Introduction

1.1 Background and Survey Objectives

ADAS Ecology was commissioned by TAIYO Power and Storage, to undertake an assessment of the extent of invasive non-native plant species (INNS) present on a pre-existing path and associated modified grassland parcel, located off Wood Street, Radcliffe, M26 1DN (OS Grid reference: SD774060), hereafter referred to as 'the site', to support a planning application for a proposed battery energy storage system (BESS) and associated HV cable route.

Previous ecological assessments have been undertaken on the site including a Preliminary Ecological Appraisal (PEA) which was undertaken on the 8th of February 2023 by ADAS. However, the survey was undertaken outside of the optimal period for botanical identification and therefore presence of invasive non-native species on site could not be fully discounted. Since then, ADAS have undertaken an updated PEA survey on the 15 May 2024 (ADAS 2025).

This document sets out the findings of a walkover survey undertaken by ADAS on the 04 April 2024 to confirm and map the distribution of INNS present and inform recommendations for management.

1.2 Site Description

The site, located off Wood Street in Radcliffe, covered approximately 1.39 ha and comprised mostly of modified grassland with lowland mixed deciduous woodland and other developed land. The site was bounded to the south by Ringley Road (A667), to the north and east by Outwood Country Park and to the west by pasture fields for horses. A pre-existing footpath runs from Wood Street, leading up to the substation, and traverses' part of the land within the redline boundary. The footpath also interlinks with paths leading into Oakwood Country Park. Two ponds and the River Irwell are located within 250 m of the site boundary. The site in context of the wider landscape can be seen in Figure 1 below and the indicative BESS footprint can be seen in Appendix 1.



Figure 1. Approximate Survey Area (indicated by the red line). Imagery taken from QGIS (April 2024).

1.3 Description of the Proposed Development

The proposal is for a Battery Energy Storage System (BESS) with a HV cable connecting to an existing substation to the north. The plan provided by the client (Radcliffe BESS Proposed Site Layout 01.04.pdf) proposes a temporary 4 m wide access route for construction purposes, from Wood Street to the construction compound within the pasture. The operational access route to the site is proposed via a public right of way 9SS, to the west of Wood Street. An ecological enhancement area has also been proposed to surround the BESS.

1.4 Legislation

Section 14(2) of the Wildlife and Countryside Act 1981 (WCA 1981) states that “if any person plants or otherwise causes to grow in the wild any plant which is included in Part II of Schedule 9, he shall be guilty of an offence.”

Furthermore, any excavated spoil containing Japanese Knotweed root material and any plant material from Giant Hogweed, is classed as ‘controlled waste’ under the Environmental Protection Act 1990 and must not be removed from the site without a permit.

2 Methodology

The site was systematically-searched for INNS and where found, the extents of these species mapped. Where possible, land immediately adjacent to the site boundary was also visually searched for the presence of INNS.

2.1 Limitations

Although carefully surveyed, the mapped stands of Himalayan Balsam should not be interpreted to show the precise location of this species, given the prolific nature of it across the entire area and the number of single plants present. More so, given the extent of Himalayan Balsam within the redline boundary, it is highly likely that this species will be present in high levels across the landscape, outside of the surveyed area.

2.1.1 Results

2.2 Survey Findings

Himalayan Balsam (*Impatiens glandulifera*) was recorded to be prevalent throughout the lowland mixed deciduous woodland adjacent to and on site, forming dense carpets of young leaflets. A stand of Japanese Knotweed (*Fallopia japonica*) was also identified, close to the northern end of the existing substation, just outside the site boundary. In addition, Giant Hogweed (*Heracleum mantegazzianum*) was also present in three locations, all within the lowland mixed deciduous woodland adjacent to the site (outside of the red line boundary). Himalayan Balsam was the most prolific of the species with this also being present within much of the wider area and along the banking of the River Irwell.

A map displaying the extent and distribution of INNS on and adjacent to the site is shown in Appendix 2 and Photographs can be found in Appendix 3.

3 Management Plan

3.1 Site Management Objections

Himalayan Balsam, Japanese Knotweed and Giant Hogweed on / adjacent to the site should be managed so that site clearance, construction and ongoing management of the site may proceed in line with current legislative requirements and good practice. The Management Plan, set out below, aims to achieve the following objectives:

- Eradicate any Himalayan Balsam, Japanese Knotweed or Giant Hogweed from the site prior to site clearance and construction;
- Prevent spread of the Himalayan Balsam, Japanese Knotweed and Giant Hogweed on- and off-site during the clearance and construction phases;
- Use eradication methods which protect existing features of ecological value on site; and
- Ensure Himalayan Balsam, Japanese Knotweed and Giant Hogweed does not re-establish on site in the years after construction.

3.2 Limitations and Threats to Site Management Objectives

3.2.1 Japanese Knotweed

Japanese Knotweed is an aggressive non-native species which spreads through transfer of root material, which may be present up to 3 m deep and 7 m away from the visible (above ground) portion of the plant. A root fragment the size of a fingernail moved to a new location can be enough to cause a new plant to establish. A mature plant can cause damage to buildings and foundations.

3.2.2 Giant Hogweed

Giant Hogweed is a highly invasive plant that can grow up to 5 m tall, the sap of the plant can cause blistering of the skin. The plant is spread by seed transportation, by both wind and water. As such this plant is typically found by watercourses and roadsides. The plant is a biannual or short-lived perennial, forming a rosette of leaves in the first year and flowering in the second year onwards. Small plants may stay as rosettes of leaves for up to 4 years. The plant dies back in the autumn and survives over winter as a large fleshy tap root. The plant produces around 50,000 seeds each year which can remain viable for up to 15 years.

3.2.3 Himalayan Balsam

Himalayan Balsam produces explosive seed heads, capable of propelling seeds long distances when disturbed. If it is not eradicated from site before flowering, works which affect stands of Himalayan Balsam during its seed-bearing period (June – October) will cause the release of seeds, and therefore the spread of the species. Himalayan Balsam seeds are readily carried by water. The close proximity of proposed

works to the River Irwell increases the risk of spreading the species off site, with saplings already confirmed along the bankings of the waterbody. Himalayan Balsam seeds may remain viable in the soil for up to 2 years and therefore, inclusion in this management plan is considered appropriate.

Further spread of any INNS species could arise through excavation if material is moved on site, or particularly if transported off site, during the construction phase or unintentionally through transportation of seeds on clothing, equipment, or machinery.

Any INNS remaining on site has the potential to re-establish dense stands of the species over successive seasons if on-going control measures are not adopted.

Monitoring of the site will therefore be required after development to ensure continued eradication is successful.

3.3 Responsibilities

The management plan has been prepared by ADAS on behalf of their client, TAIYO Power and Storage Limited.

Responsibility for providing advice to TAIYO Power and Storage Limited, and for identifying the presence and extent of the INNS lies with ADAS.

Responsibility for the execution of the plan, briefing of construction staff and commissioning of any monitoring or additional control measures that may be required will remain with TAIYO Power and Storage Limited.

A copy of this management plan and any supplement shall be retained by TAIYO Power and Storage Limited and provided to the site manager (who will be responsible for any INNS management required during construction), and to the end user responsible for overseeing the development post construction.

3.4 Management Priorities

- Prevent further spread of Himalayan Balsam, Japanese Knotweed and Giant Hogweed on site;
- Prevent spread of Himalayan Balsam, Japanese Knotweed and Giant Hogweed to off-site land;
and
- Devise and agree an on-going monitoring programme for Himalayan Balsam, Japanese Knotweed and Giant Hogweed to eradicate new young plants on site before they can spread / flower.

3.5 Management Options and Proposed Methodology

3.5.1 Japanese Knotweed

From proposed plans, it appears that the area containing Japanese Knotweed should not be within the site boundary / works area. Therefore, a 7 m buffer (secure fencing and appropriate signage) should be established beyond the visible extent of the stand.

Should proposed work areas change, or, new Japanese Knotweed stands appear within the works area, the Japanese Knotweed vegetation should be sprayed with a hazard free formulation of glyphosate (e.g. Roundup Biactive) and then left undisturbed for at least 7 days to allow the herbicide to translocate to the plant roots. The following measures should be followed when working in areas known to support Japanese Knotweed;

- A quarantine area, with secure fencing and appropriate signage will be set up and maintained during the works, to include a 7m radius beyond the visible extent of the stand. Vegetation clearance will not be undertaken within this area until immediately prior to excavation (if required).
- Work on the quarantine section (if required) will be left until the end of the project. The excavation should be carried out in accordance with the Environment Agency Code of Practice – “Managing Japanese Knotweed on Development Sites”. Work will be carried out by an excavator (preferably wheeled rather than tracked) standing on a suitable membrane.
- Areas infested by Japanese knotweed that are not going to be excavated will be protected by root barrier membrane if they are likely to be traversed by vehicles. The membrane should itself be protected from damage by a layer of sand and geotextile, sectional trackway or boarding depending on the size and nature of vehicles likely to use the route.
- Work within the quarantine area should be completed in a single stage. Machinery, tools, and footwear used within the quarantine area should be thoroughly cleaned before leaving the quarantine area. In dry conditions scraping and the use of a stiff brush is advised. Mud adhering to tracks and buckets should be washed off within an undisturbed part of the quarantine area. A log of machines and personnel working within the quarantine area should be kept, and subsequent decontamination should be registered and signed off.
- Any excavated material should be stored on geotextile or membrane alongside the excavation to ensure that it is contained, and the risk of spread is kept to a minimum. Soil will be returned to the trench within the fenced area or removed to a suitably licensed landfill site. The geotextile / barrier membrane should be rolled up, double bagged and disposed of at a suitably licensed facility.

3.5.2 Giant Hogweed

Giant Hogweed is a threat to human health. Stands of this species should be fenced off (at least 4 m radius around stands) and appropriate signage put up. All Giant Hogweed identified during the INNS survey was present outside of the proposed development boundary. If proposed work areas change to include known Giant Hogweed areas, or, new Giant Hogweed plants are found on site, the following measures should be employed to eradicate the species effectively:

- Chemical methods of control include spraying plants with a glyphosphate-based herbicide, when plants are less than 1 m high. Spraying must be carried out before the plant flowers and sets seed. It is also important that native vegetation should be reestablished, as this will help to slow the rate of re-colonisation by Giant Hogweed seeds.
- Mechanical Control should be undertaken with full PPE on to prevent skin contamination from the sap. Similarly, machine operators should also take care as sap can be spread from machinery to skin. Plants can be cut prior to flowering but is only a temporary measure as the plant will proliferate again next season. Cutting after flowering is not recommended, unless to clear dying vegetation. Seed heads must be contained prior to cutting to reduce dispersal.
- Smaller infestations can be controlled via digging. This should be undertaken in April or May; the plant should be cut at a 45-degree angle below ground. This will ensure the roots are damaged and will prevent root regrowth from the base of the plant.

3.5.3 Himalayan Balsam

Himalayan Balsam was prevalent throughout the lowland mixed deciduous woodland adjacent to the site. A section of the red line boundary does cut through the woodland (Himalayan Balsam area) to connect the high voltage cable from the BESS to the existing substation to the north. However, it is proposed that the works in this area are to be horizontal directional drilled to protect the woodland habitat, and avoid impacting Himalayan Balsam. Stands of this species should be fenced off (at least 10 m radius around stands) and appropriate signage put up. Should access (foot or vehicle) be required within 10 m of Himalayan Balsam, appropriate biosecurity measures should be implemented. This would include a boot wash station and / or a bowser and jetwash (for vehicles) upon leaving the 10 m buffer zone, to ensure no seeds / plant material is spread by works activities.

If proposed work areas change to include impacts to known Himalayan Balsam areas, or, new Himalayan Balsam plants are found on site, the following measures should be employed to eradicate the species effectively. Himalayan Balsam is readily controllable providing plants are eradicated before they are able to reach maturity and bear seeds. The methods commonly used for the control of Himalayan Balsam are often a combined approach using topsoil removal, strimming/cutting, and pulling, complemented by ongoing monitoring.

1. Himalayan Balsam on site can be managed effectively through topsoil removal (the top 50 mm of soil on site within 10 m of Himalayan Balsam stands should be regarded as having the potential to contain viable seeds). The topsoil should be stored in a designated area of the site and regrowth cut / trimmed in the growing season. The method will ensure management is simpler and more

contained. Treatment should be repeated in the following year, and the site checked in year 3 by which time the seed bank should be exhausted.

2. Where smaller, less dense, and sporadic stands of Himalayan Balsam occur, strimming and cutting alone will be more appropriate and should be sufficient to contain and eradicate this species.
3. Movement of this soil off site should be avoided. If it is removed excavated topsoil with potential to contain Himalayan Balsam seeds should be buried at a depth of 0.5 m.

As the proposed development is within 150 m of the River Irwell, the top layer of soil should be removed from the contaminated areas (identified stands and surrounding 10 m zone) and buried at a depth of 0.5m. This will minimise the risk of the seeds entering the watercourse and spreading to locations downstream. The majority of the seed bank will therefore be contained into one area and subsequent cutting / strimming of the regrowth can be undertaken in May. Cutting / strimming or hand pulling should be undertaken where sporadic and small stands or individual plants occur.

3.6 Timing of Works

3.6.1 Japanese Knotweed

Application of herbicide must be applied in late summer / autumn, after the plant has flowered, application earlier than this may stunt the growth but not kill the plant. Mature stands of Japanese Knotweed will need to be repeatedly treated two to three years to ensure eradication.

3.6.2 Giant Hogweed

Herbicides can be applied to the plant foliage between late April and early June and again in July or August. Spray is usually directed on to the leaves of the plant and the sites are revisited annually to check for regrowth of old plants or new plants from seed. Triclopyr is the preferred product early in the season as it is selective (does not kill grasses) and has an effect for 6 weeks after application. Glyphosate is also used at a similar timing, but it is non-selective so will kill all other vegetation. Both herbicides are taken into the plant via the leaves and stems and moved to the roots (translocated).

In the early spring (April/May) before the leaves are too large, the whole plant can be completely removed by digging the tap root or by cutting the tap root approximately 15 cm below ground using a sharp object such as a spade to separate the root from the stem. As long as the upper 15 cm of root is removed the plant will not regrow. The site should be checked again in the mid-summer for regrowth and the process repeated. The root sections should be left to dry out in a secure location exposed to direct sunlight for two weeks to ensure the root sections are dead. Once the root sections are dead, they can be burnt or left to rot.

The plant can be mowed when it is small and continue to mow throughout the growing season. Do not mow the plant if it is larger than your mower and never mow if there is a flower or seed head. Plants must be cut at least three times during the growing season for several years. Mowing will eventually kill the plants by exhausting the energy in the tap root.

3.6.3 Himalayan Balsam

To control the Himalayan Balsam (if on site) in the long term, each new generation of plants must be eradicated before they reach maturity and produce seeds. Eradication of plants should therefore be carried out in both late spring and late summer. Although, topsoil removal can be undertaken at any time of the year, it is advised this is undertaken prior to the breeding bird season (March – September inclusive). The site should be monitored for Himalayan Balsam and the eradication programme continued until there are no signs of regrowth on site. Himalayan Balsam seeds may remain viable in the soil for up to 2 years. A suggested programme of works is indicated in Table 1 below.

Table 1: Recommended Timing of Eradication Programme.

Activity	Jan-Apr		May		June		July		Aug		Sept		Oct		Nov - Dec	
Top soil removal	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Strimming/cutting				✓					✓							
Pulling				✓					✓							
Monitoring		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		

☒ Indicates recommended period for implementation of control measures.

In addition to the two main periods of eradication shown in Table 1, the monitoring programme should be used to identify if and when additional control is required, in response to any new Himalayan Balsam growth and establishment. Himalayan Balsam plants encountered during construction, landscaping or management work on the site should be uprooted on a routine basis wherever they are encountered.

3.7 Criteria for Success

The eradication programme may be considered successful when:

- The cycle of eradication and monitoring action for INNS on site prevents plants reaching the mature stage where root systems are fully established.
- No increase in spread or abundance of INNS occurs within the recorded areas labelled in Appendix 1.

- Long-term success will be achieved when no new INNS grow on site and when all established root systems (if present on site) are fully removed.

Monitoring of the wider site should be carried out on a monthly basis during the construction period, either by a suitably qualified ecologist or by the site manager. Results of monitoring should be recorded and included within the recording sheet in Appendix 4.

4 Control Methods During Construction

4.1 Japanese Knotweed and Giant Hogweed

- All site operatives should receive a toolbox talk so they can confidently identify the INNS and are aware of the legislation that prohibits the spread of these species.
- All stands of invasive species should be clearly demarcated by installing a fence preventing pedestrian or vehicular access (i.e. Heras fencing). Areas of stockpiles of contaminated soil and vegetative material should be stored within exclusion zone. Signage should be fixed to the fencing to ensure anybody entering the area of infestation is aware of the presence of Japanese Knotweed and Giant Hogweed, and the risk of spreading.
- All equipment and machinery working within proximity to the INNS should be jet washed and disinfected, in a designated area, before leaving site and provision for cleaning footwear should be provided.
- Any equipment, machinery and footwear used when working with Japanese Knotweed and Giant Hogweed, needs to be checked and cleaned of plant material, followed by sterilisation, and drying of the equipment before the next usage.
- Waste material and water left after vehicles have been pressure-washed should be stored and disposed of correctly.
- Any excavated materials within the invasive species buffer zones should be placed on suitable boards (e.g. double strength plywood) or matting directly adjacent to the excavations. This will ensure that all excavated material can be backfilled to minimise the risk of spreading roots or rhizome fragments of Japanese Knotweed.

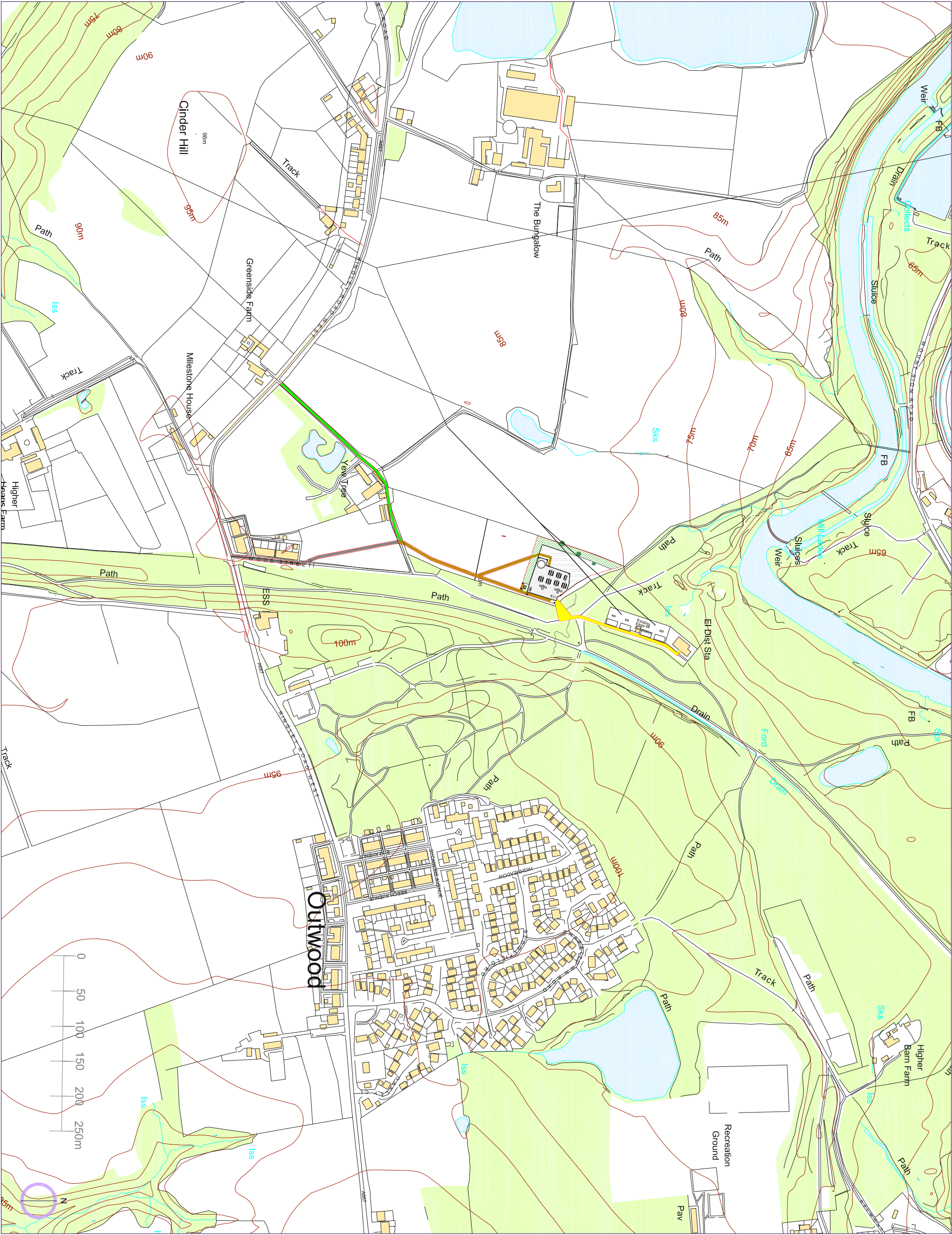
4.2 Himalayan Balsam

- Areas of Himalayan Balsam should be clearly demarcated by installing a fence preventing pedestrian or vehicular access (i.e. Heras fencing). Signage should be fixed to the fencing to ensure anybody entering the area of infestation is aware of the presence of Himalayan Balsam and the risk of spreading.
- No material should be disturbed or removed from the exclusion zone unless it forms part of the targeted removal of Himalayan Balsam.

- Any equipment, machinery and footwear used when working with Himalayan Balsam needs to be checked and cleaned of plant material, followed by sterilisation and drying of the equipment before the next usage.
- All site workers should be briefed as to the presence of Himalayan Balsam and the risks associated with its spreading.

Appendix 1: Proposed Site boundary, BESS and HV cable route

See following page.



Notes

1. If no comment is received against the submitted document within 10 working days from the date of issue, the client is deemed to have approved.

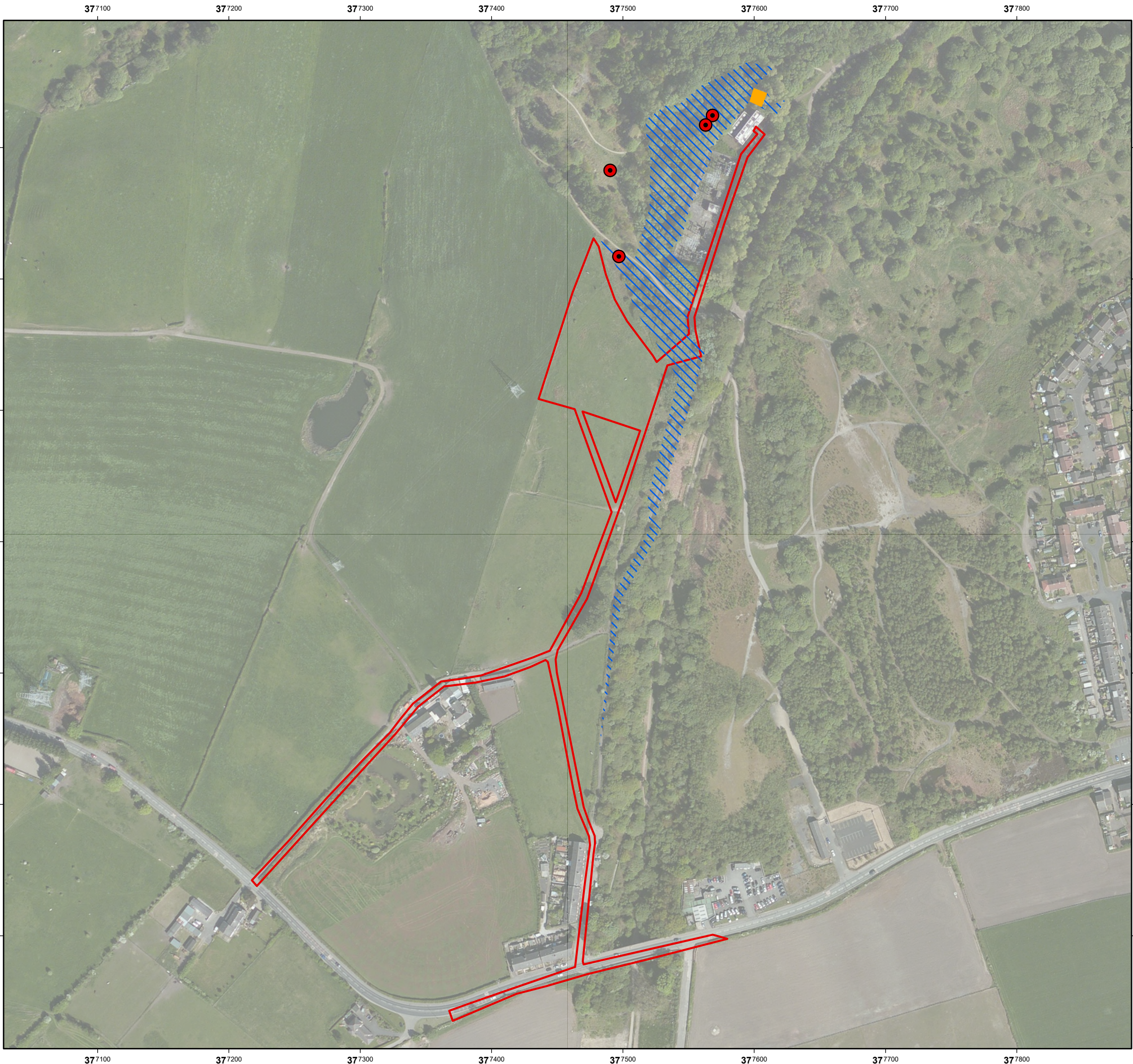
THIS DRAWING IS NOT FOR CONSTRUCTION

- Red Line Boundary
- Security Fence
- Cable Route/ Corridor
- Access Track
- Temporary Access Track
- Maintenance Access
- Overhead Line
- Compound Area Hardcore
- Landscape Buffer
- Tree
- Battery Container
- Transformer/ Inverters
- Storage
- Customer Substation
- DNO Substation
- CCTV
- Gate
- Water Tank

Drawn By	Checked By	REV	015
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Date	Approved By		
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TITLE		Proposed Site Layout	
CLIENT		Taiyo Power & Storage Ltd.	
STATUS			
Sheet No	Overall Plan	Sheet Size	A3
ENTERSHEETNO	1		
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Appendix 2: Invasive Species Distribution Map

Please see following page



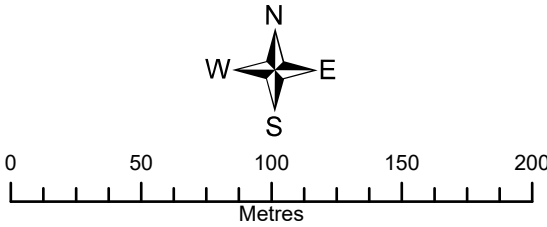
Taiyo Power and Storage

Radcliffe BESS,
Kearlsey Road, Radcliffe,
Greater Manchester

Invasive Non-Native Species Map

-  Site Boundary
-  Himalayan Balsam
-  Japanese Knotweed
-  Giant Hogweed

Drawn by Lewis Palmer 04/04/2025, Verified by Seb Phelan 04/04/2025



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Appendix 3: Site Photographs



Photograph 1: Himalayan Balsam shoots along proposed access track. Both sides feature shoots.



Photograph 2: Himalayan Balsam shoots along public footpath running adjacent to south of substation.



Giant Hogweed and Himalayan Balsam shoots adjacent to south of substation. Modified grassland in background where BESS is proposed.



Giant Hogweed and Himalayan Balsam shoots adjacent to west of substation.



Giant Hogweed and Himalayan Balsam. Substation in background.



Japanese Knotweed shoots.



Stand of dead Japanese Knotweed stems. New growth seen at base.



Dead stem of last year's Giant Hogweed.

Appendix 4: Recording Sheet Example

Site Name	
Site Address	
Inspection Date	
Inspector name	
Area inspected	
Observations/ activity and recommendations	
Print Name	
Signature	
Date	