



**OUTLINE INVASIVE SPECIES MANAGEMENT PLAN
LANDS ADJACENT TO THE GRANGE, BREWERY ROAD/ STILLORGAN ROAD,
STILLORGAN, BLACKROCK, CO. DUBLIN**

**Produced for KW PRS ICAV
acting for and on behalf of its sub-fund KW PRS Fund 10 (Kennedy Wilson)**

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1 Introduction

Scott Cawley was commissioned by Brock McClure Planning and Development Consultants, on behalf of KW PRS ICAV, to prepare an Invasive Species Management Plan for the prevention of spread, and the management of non-native invasive species at the proposed development site at lands adjacent to The Grange, Brewery Road/ Stillorgan Road, Stillorgan, Blackrock, Co. Dublin.

The purpose of this Outline Invasive Species Management Plan, hereafter referred to as the ISMP, is to describe the options available to manage and prevent the spread of non-native invasive plant species recorded within the proposed development site at lands adjacent to The Grange, Brewery Road/ Stillorgan Road, Stillorgan, Blackrock, Co. Dublin.

This ISMP is intended to be a working document and will be updated by the appointed contractor to form a detailed and final ISMP which will contain site specific mitigation measures. The detailed ISMP will be produced prior to any works on site commencing.

Construction (and potentially operational maintenance works) will disturb stands of non-native invasive plants and/or soils contaminated with non-native invasive plant material. Therefore, the implementation of the management measures set out in this plan is required to avoid any direct or indirect impacts to habitats and species contained within the locality.

1.1 Technical Expertise and Relevant Guidance Documents

This plan has been prepared by Scott Cawley, who have extensive experience in:

- Identification of invasive species;
- Development of risk assessments for sites with invasive species;
- Mapping of affected areas of invasive species;
- Recommendations of suitable control measures to manage and eradicate invasive species, with provision for cost or time constraints that may apply;
- Supervision of contractors treating invasive species; and,
- Independent monitoring of the results of treatment measures of invasive species.

Scott Cawley ecologists have experience in the development of large and small-scale eradication programmes for a range of invasive species, including projects near protected areas and watercourses.

1.2 Legislative Context

The *European Communities (Birds and Natural Habitats) Regulations 2011 SI 477 of 2011* (herein the Birds and Habitats Regulations) contain specific provisions that govern control of listed invasive species. It is an offence to release or allow to disperse or escape, to breed, propagate, import, transport, sell or advertise species listed on Schedule 3 of the regulations without a Licence. The two regulations that deal specifically with this scheduled list of species are:

- Regulation 49: Prohibition of introduction and dispersal of certain species; and,
- Regulation 50: Prohibition on dealing in and keeping certain species.

Hence it is necessary to highlight that the following is prohibited:

- Dumping invasive species cuttings in the countryside;
- Planting or otherwise causing to grow in the wild (hence the landowner should be careful not to cause further spread);
- Disposing of invasive species at a landfill site without first informing the landfill site that the waste contains invasive species material (this action requires an appropriate licence); and,
- Moving soil which contains specific invasive species in the Republic of Ireland unless under a licence from National Parks and Wildlife Service (NPWS).

Regulation (EU) 1143/2014 on invasive alien species (herein the “IAS Regulation”) was agreed by the European Council on 22nd October 2014 and came into force on 1st January 2015. This IAS Regulation conveys the rules to prevent, minimise and mitigate the adverse impacts of the introduction and spread (both with and without intention) of invasive alien species on biodiversity and the related ecosystem services, as well as other adverse impacts on human health or the economy (European Commission, 2017). Target 4.4 of Ireland’s *National Biodiversity Action Plan 2017-2021* (DCHG, 2017) is that “*harmful invasive alien species are controlled and there is reduced risk of introduction and/or spread of new species*”.

2 Methodology

This report and the mitigation strategies relating to invasive plant species have been prepared with regard to the following guidance documents, where relevant:

- *Guidelines on the Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads* (National Roads Authority, 2010);
- *Managing Japanese Knotweed on Development Sites (version 3, amended in 2013 and withdrawn in 2016): The Knotweed Code of Practice* (Environment Agency, 2013);
- *Managing Invasive Non-native Plants in or near Freshwater* (Environment Agency, 2010);
- *Best Practice Management Guidelines for Japanese Knotweed* (Invasive Species Ireland, 2008);

Habitat surveys were undertaken within the proposed development site during surveys carried out for the preparation of an Ecological Impact Assessment on the 6th February 2019, in dry bright conditions. A range of non-native species, including Japanese Knotweed *Fallopia japonica*, which is listed on the Third Schedule of the Birds and Habitats Regulations, were recorded.

A survey of the site to inform this ISMP was carried out by Scott Cawley ecologists on the 6th February 2019. The aim of this survey was to record the presence and extent of any invasive species which are listed on the Third Schedule of the Birds and Habitats Regulations. The exact location of any distinctive stands of invasive species was recorded on an aerial map of the site. Photographs of invasive species were also taken.

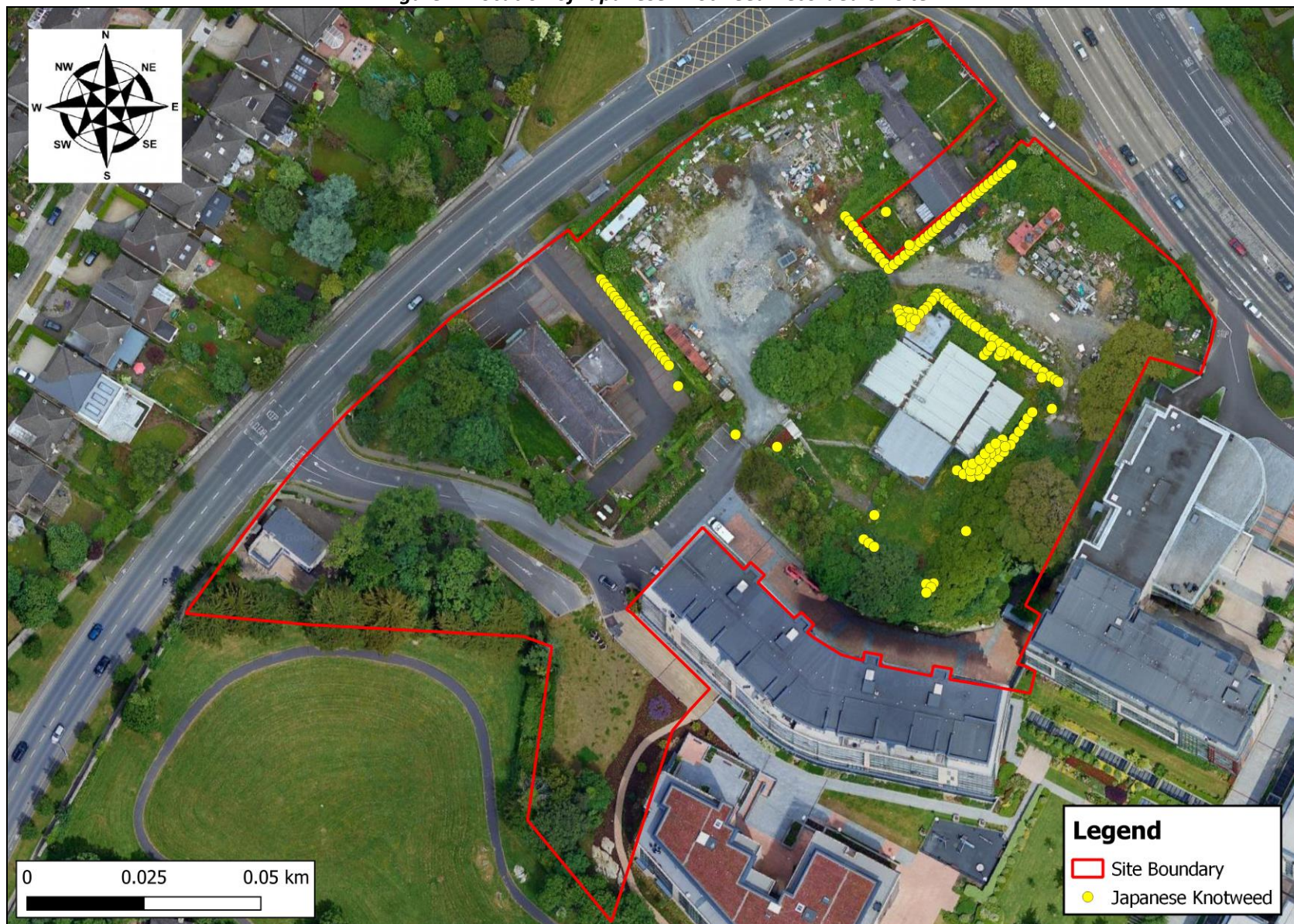
Areas of distinctive infestation were then digitized and a map showing the locations of invasive species on site was produced. This ISMP deals with Japanese Knotweed only, as the developer is legally obliged to address the presence of this species, due to its inclusion on the Third Schedule of the Birds and Habitats Regulations.

3 Results

One species which is listed on the Third Schedule of the *European Communities (Birds and Natural Habitats) Regulations, 2011*, was recorded within the proposed development site- Japanese Knotweed.

Japanese Knotweed was widespread across the proposed development site and the infestation was deemed to be vast. The distribution of Japanese Knotweed across the site, as recorded in February 2019, is displayed in Figure 1.

Figure 1: Location of Japanese Knotweed Recorded on site



Lands adjacent to The Grange,
Brewery Road/ Stillorgan Road,
Stillorgan, Blackrock, Co. Dublin

4 General Measures to Control/Prevent the Spread of Non-native Invasive Plant Species

4.1 Pre-construction Re-survey

It is possible that the existing unmanaged stands of Japanese Knotweed may spread from their current locations, as mapped on the 6th February 2019, to other areas within the proposed development site¹. A pre-construction invasive species re-survey will be undertaken by a suitably qualified specialist to confirm the extent of Japanese Knotweed on site prior to implementation of this plan. Data collected as part of this survey will also include the approximate area of the respective colonies (m²), where feasible, and a detailed description of the infestations (*e.g.* approximate total number of stems, pattern of growth and information on other vegetation present). This information will inform calculations of volumes of infested soils to be excavated, as part of the measures outlined below.

4.2 General Measures to Avoid Spreading Invasive Species during Construction or Soil Movement

Japanese Knotweed is highly invasive and can easily spread to new areas. It is particularly effective at colonising disturbed ground (*e.g.* construction sites) and can spread by the re-growth of cut fragments or root material, so if it is broken up during site clearance or other earthworks it can readily re-grow in new areas to which soil is moved.

The unintentional spread of invasive species during construction works can be a significant issue, and if not managed in the correct manner, species like Japanese Knotweed could be caused to spread to uninfested areas, which would increase the future cost and effort required to control the species and could pose further public health and safety risks (Japanese Knotweed can cause damage to buildings and infrastructure).

The most common ways that invasive species can be spread is:

- Site and vegetation clearance, mowing, hedge-cutting or other landscaping activities;
- Spread of seeds or plant fragments during the movement or transport of soil;
- Spread of seeds or plant fragments through the local surface water and drainage network;
- Contamination of vehicles or equipment with seeds or plant fragments which are then transported to other areas; and
- Importation of soil from off-site sources contaminated with invasive species plant material.

It is important that no Japanese Knotweed plants are cut prior to or during the lifetime of the treatment programme (assuming mechanical removal is not elected as the preferred option) as this invasive species regrows from cut fragments.

Depending on the timescale for the construction of the proposed residential development it may be possible to eradicate some stands prior to the onset of construction on the site; this would be preferable. However, if control programmes have not been achieved before construction begins, then the affected areas must be fenced off prior to and during construction in order to avoid spreading seeds or plant fragments around or off the construction site. Earthworks or machinery movement must be avoided in these areas until the relevant stands have been eradicated.

Given the level of infestation on site it is deemed impractical to fence off infested areas. Therefore, it is seen as imperative that Japanese Knotweed be eradicated from the proposed development site before construction or site clearance works commence.

If soil is imported to the site for landscaping, infilling or embankments, the contractor should gain documentation from suppliers that the material is free from invasive species.

¹ It is important to note that the survey on which this report is based was carried out over a single day (6th February 2019) and represents a snapshot of the invasive species recorded on the site at that time. Invasive species may spread or become established post survey and relying on the report should consider passage of time and the date survey was undertaken, with respect to the optimal survey period for higher plants.

Japanese Knotweed in particular can be spread very easily during construction works. Even if stands of Japanese Knotweed are treated using herbicide, care should still be taken regarding the future use of the soil in the relevant area. For specific measures in relation to these species, reference should be made to the UK Environment Agency document *The Knotweed Code of Practice: Managing Japanese knotweed on development sites* (UK Environment Agency, 2006) and to the *Best Practice Management Guidelines for Japanese Knotweed* (Invasive Species Ireland, 2008).

4.2.1 Disposal of Material

If any invasive species plant material is collected (e.g. by hand-pulling or mowing), it is important that its disposal does not lead to a risk of further spread. The movement of invasive plant material requires a licence from the National Parks and Wildlife Service (NPWS) under Section 49 of the European Communities (Birds and Natural Habitats) Regulations, 2011 (as amended). Invasive species (particularly roots, flower heads or seeds) must be disposed of at licensed waste facilities or composting sites, appropriately buried, or incinerated having regard to relevant legislation. For example, Section 32 of the Waste Management Act, 1996 to 2008; Section 4 of the Air Pollution Act, 1987; relevant local authority byelaws and any other relevant legislation. All disposals must be carried out in accordance with the relevant Waste Management legislation (as per guidance from NRA, 2008). It should be noted that some invasive species plant material or soil containing residual herbicides may be classified as either 'hazardous waste' or 'non-hazardous waste' under the terms of the Waste Management Acts, and both categories may require special disposal procedures or permissions. Advice should be sought from a suitably qualified waste expert regarding the classification of waste and the suitability of different disposal measures. As noted above, additional specific measures for the management of Japanese Knotweed cuttings or contaminated soil can be found in the UK Environment Agency document *The Knotweed Code of Practice: Managing Japanese knotweed on development sites* (UK Environment Agency, 2013), and further Japanese Knotweed specific measures are outlined in Sections 5.

4.2.2 Measures to be Followed During the Application of Herbicides²

Some of the control options for Japanese Knotweed will require the use of herbicides, which can pose a risk to human health, to non-target plants or to wildlife. In order to ensure the safety of herbicide applicators and of other public users of the site, a qualified and experienced contractor must be employed to carry out all work.

It is advised that the appointed contractor refer to the following documents, which provide detailed recommendations for the control of invasive species and noxious weeds:

- Chapter 7 and Appendix 3 of the NRA Publication *The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads* (NRA, 2010)
- *Invasive Species Ireland Best Practice Management Guidelines for Japanese Knotweed* [Available online at www.nonnativespecies.org/downloadDocument.cfm?id=1013]
- *The Knotweed Code of Practice: Managing Japanese knotweed on development sites* (UK Environment Agency, 2013)
- *Managing invasive non-native plants in or near fresh water* (Environment Agency, 2010)

These documents include measures to aid the identification of relevant species, with details for the timing, chemicals and methodology for chemical control, and for measures to avoid environmental damage during the use of herbicides. It is recommended that the appointed contractor prepare a site-specific plan in accordance with the relevant guidelines before commencing works.

Wherever there is a risk of contaminating a watercourse, choice of herbicide is limited to formulations of Glyphosate and 2,4-D amine that are approved for use near water. It is recommended that chemical control via the application of herbicides is not carried out within 5m of any existing surface water feature, including

² Any information provided on the use of chemicals is given on the understanding that it is a recognised treatment option, dependent on a number of criteria. Under the provisions of Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides, advice on the use of particular pesticides and their applications must only be delivered by a qualified Pesticide Advisor, appropriately trained and registered with the Department of Agriculture, Food and the Marine.

drainage infrastructure. If herbicide application is necessary within this area, then only herbicides which are approved for use near water shall be permitted.

4.2.3 Post-construction Monitoring

Following the construction of the proposed residential development, it is important that the site is systematically re-surveyed to determine the success of control measures and to identify areas where invasive plants are reinvading. This is particularly important for Japanese Knotweed as maintenance works associated with landscaping, such as mowing and hedge cutting have the potential to spread this plant via the dispersal of shredded plant material. If invasive plants are found, then they shall be treated as per the measures outlined in the plan and the species-specific guidelines below.

5 Species Specific Management Options

5.1 Japanese Knotweed *Fallopia japonica*

Japanese Knotweed is common throughout Ireland and is found in numerous different habitats from roadsides to river corridors and waste ground. It is considered a high impact invasive species and is problematic in both open and riparian environments where it spreads rapidly and forms dense stands. These stands exclude native vegetation, thereby reducing species diversity and changing habitats for local wildlife. In urban environments this plant can grow through hard surfaces such as tarmac and concrete where cracks or weaknesses are already present. Established stands of Japanese Knotweed are extremely difficult to eradicate.

5.1.2 Prevention of Further Spread of Japanese Knotweed

Japanese Knotweed can spread by the re-growth of cut plant fragments or root material. If a plant is broken up or disturbed during site clearance or other earthworks, it can readily re-grow in new areas where material is transported to. It is recommended that all stands are eradicated prior to construction works taking place as further spread to uninfested areas would increase the future cost and effort required to control the species and could pose a risk to public health and safety. As previously stated, given the level of infestation on site it is deemed impractical to fence off infested areas and it is therefore seen as imperative that Japanese Knotweed be eradicated from the proposed development site before construction or site clearance works commence.

The following measures will be implemented to prevent the further spread of Japanese knotweed within the proposed development site and/or to adjacent lands:

- A buffer of at least c. 7m³ will be applied to all stands of Japanese knotweed and this area will be clearly demarcated by fencing, prior to the implementation of the eradication program, to avoid any disturbance and to exclude access by plant and machinery. Signs will be erected on fencing to inform site personnel of any risks posed;
- Prior to any works taking place, a toolbox talk will be given to all relevant site personnel to ensure they are aware of the location of the stands of Japanese Knotweed, the impacts of this species and associated risks;
- Posters outlining the key features of this plant will be displayed in communal areas on-site to ensure all site personnel are aware of this species and the associated risks;
- Designated haul routes located on lands within the ownership of the applicant will be clearly marked up to ensure no contamination occurs. Excavated infested soils will be transported along these designated routes; and,
- If any materials are to be imported into the site, it is recommended that the contractor obtains documentation from suppliers that the material is free from Japanese knotweed and other invasive species. No new materials will be stored adjacent to the stands of Japanese Knotweed.

³ The rhizomes of Japanese knotweed are known to extend up to 7m from visible growth above ground (Environment Agency, 2013).

5.1.3 Measures to Control and Eradicate Japanese Knotweed

Option 1: Stockpile and Treatment

Soils infested with Japanese Knotweed will be excavated to a depth of at least c. 5m (or to a depth where no Japanese Knotweed root systems are visible) and stockpiled at a non-environmentally sensitive area of open space, on lands within the ownership of the applicant. If this requires transportation (e.g. using a dumper truck or digger) then this must be along a designated single haul route protected by root barrier membrane. The area for Japanese Knotweed removal shall be determined by an invasive species specialist following the results of a series of test pits examining the underground rhizome system.

Vehicles with caterpillar tracks will not be used within the infested area and vehicles leaving the area should either be confined to haulage routes protected by root barrier membranes, or be pressure washed. Root barrier membranes will need to be protected from damage by vehicles with a layer of sand above and below the root barrier membrane, topped with a layer of hard core or other suitable material as specified by an architect or engineer. Vehicles used to transport infested soils that are subject to pressure-washing must be done so in a designated wash-down area before being used for other work.

A heavy-duty root barrier will be laid out at the stockpile area and all infested material will be placed on top of it, creating a low flat-topped berm. It is recommended that material in this area is turned to encourage new growth for treatment. A buffer around the edges of the root barrier, where no material will be placed, will be provided for in order to avoid spillage of contaminated material onto unprotected soils.

No machinery used will be used for other works until they are fully cleaned down at a designated wash area, and then visually inspected by a specialist to ensure no fragments of Japanese knotweed are present. The material left after machinery has been pressure washed must be contained, collected and disposed of along with the other Japanese Knotweed material.

This stockpile area will be fenced off and sign-posted as per measures outlined in Section 4.2 above. It will then be treated using a herbicide either by stem injection or foliar application for a period of at least three years, as described in Section 4.2.2 below. A clerk of works will oversee the Japanese Knotweed management plan, including the provisions for avoiding contamination. Everyone working on site must clearly understand the role and authority of the clerk of works. After construction works are complete, follow up surveys will be conducted to survey for regrowth. If regrowth is observed, then additional treatment will be conducted.

It is considered unlikely that this would be the preferred method for treating Japanese Knotweed on site, given the length of time needed to carry out this control method to ensure eradication from site (e.g. 3 years+)

Option 2: Chemical Control- Herbicide Application⁴

A systemic herbicide (e.g. Picloram) and/or a bioactive formulation (i.e. glyphosate) may be sprayed on foliage during dry weather or injected directly into the stems of Japanese Knotweed plants identified within the proposed development site. Strong systemic herbicides are most effective at targeting the persistent roots of Japanese Knotweed, however it should be noted that they may also persist in the soil and/or kill surrounding vegetation. The length of treatment may vary depending on the type of herbicide used, i.e. highly persistent herbicides may eradicate a plant within one to two years, whereas non-persistent herbicides (such as glyphosate) may take over a period of at least three years to ensure the successful eradication of the plants.

Annual spot-checks will be conducted in May-June to identify and retreat any re-growth. Such a treatment can take up to five years to completely eradicate growth; therefore, further treatment may be required beyond the three years. This will be determined by the results of the monitoring. Japanese Knotweed does not produce viable seed in Ireland, and therefore seed germination in subsequent years will not be an issue. The

⁴ Any information provided on the use of chemicals is given on the understanding that it is a recognised treatment option, dependent on a number of criteria. Under the provisions of Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides, advice on the use of particular pesticides and their applications must only be delivered by a qualified Pesticide Advisor, appropriately trained and registered with the Department of Agriculture, Food and the Marine.

optimal time period for treatment is May-June and September-October. It should be noted that these herbicides can pose a general risk to non-target plants, to wildlife and/or human health. Chemical control using a bioactive formulation of glyphosate is the most appropriate herbicide for use in or near water (Environment agency, 2010). In order to ensure the safety of herbicide applicators and of other public users of the site, a qualified and experienced contractor should be employed to carry out all work.

Option 3: Excavation and Burial on Site

If time constraints do not allow for the herbicide treatment, infested soils of Japanese Knotweed may be excavated to a depth of at least c. 5m (or to a depth where no Japanese Knotweed root systems are visible) and then buried at a designated area within the proposed development site boundary at a minimum depth of 5m. If this requires transportation (e.g. using a dumper truck or digger) then this must be along a designated single haul route protected by root barrier membrane. Buried infested soils will be covered with a root barrier membrane layer before infilling it completely to c. 5m deep with inert fill or topsoil.

Vehicles with caterpillar tracks shall not be used within the infested area and vehicles leaving the area will either be confined to haulage routes protected by root barrier membranes, or be pressure washed. Root barrier membranes will need to be protected from damage by vehicles with a layer of sand above and below the root barrier membrane, topped with a layer of hard core or other suitable material as specified by an architect or engineer. Root barrier membranes that may have been used to protect clean ground from vehicles involved in excavating Japanese Knotweed can also be buried as this method relies on the depth of burial as the main Japanese Knotweed treatment, rather than the protection from the root barrier membrane.

No machinery used will be used for other works until they are fully cleaned down at a designated wash area and then visually inspected by a specialist to ensure no fragments of Japanese Knotweed are present. These works will be undertaken in consultation with a professional expert under licence from National Parks and Wildlife Service.

It is recommended that material is immediately buried after excavation; however, if this is not possible material shall be stored in a designated area and clearly fenced off and sign-posted. A fence that can clearly be seen shall mark out the area of infestation. Signs shall warn people working there that there is Japanese Knotweed contamination.

It is essential that the burial site is accurately mapped and that the location of the burial site is recorded to prevent any potential future disturbance and in turn re-infestation. Any future owners shall be advised of its position. Japanese Knotweed is likely to survive for many years, depending on how effective the treatment, if any, was before it was buried. It is essential that it isn't buried where landscaping, installing or access to services/utilities, erosion from a watercourse or subsequent development will disturb it.

A clerk of works shall oversee the Japanese Knotweed management plan, including the provisions for avoiding contamination. Everyone working on site must clearly understand the role and authority of the clerk of works. After construction works are complete, follow up surveys shall be conducted to survey for regrowth. If regrowth is observed, then foliar treatment will be conducted.

It is considered unlikely that this method will be appropriate for the control of Japanese Knotweed at the proposed development site, due to restrictions on space available to bury infested soils within the proposed development site boundary.

Option 4: Excavation and Disposal off Site

If time constraints do not allow for the herbicide treatment, infested soils of Japanese knotweed may be excavated to a depth of at least c. 5m (or to a depth where no Japanese Knotweed root systems are visible); and, disposed of offsite at a licenced landfill as hazardous material, under licence by National Parks and Wildlife Service. Precautions required for the handling and transport of materials as described in Options 1 and 3 above will apply.

It is considered that, while likely the most costly method described, this is the most appropriate method for the eradication of Japanese Knotweed at the proposed development site, due to restrictions on space available to bury infested soils and time pressures associated with the proposed development. Therefore, it is recommended that the Japanese Knotweed present on site be dealt with in this way.

6 Conclusion

This Invasive Species Management Plan has been prepared for a proposed development site at lands adjacent to The Grange, Brewery Road/ Stillorgan Road, Stillorgan, Blackrock, Co. Dublin.. Prior to the implementation of this plan, a pre-construction re-survey will be undertaken to confirm extent of invasive species within the proposed development site at the time. This plan provides measures to prevent the further spread of Japanese Knotweed at the proposed development site and at adjacent lands, regarding species present which are listed on the Third Schedule of the Birds and Habitats Regulations (2011) – in this case Japanese Knotweed only. It also provides measures to control and eradicate Japanese Knotweed. Numerous control measure have been put forward and this report states which option is the preferred option for this site. Control measures shall be implemented by a suitably qualified licenced specialist. The site will be monitored after control measures have been implemented and monitoring will take place again in the subsequent years following treatment. Any re-growth of Japanese Knotweed will be subsequently treated as detailed in this report.

7 References

Environment Agency (2010). *Managing invasive non-native plants in or near fresh water.*

Environment Agency (2013). *Managing Japanese knotweed on Development Sites (version 3, amended in 2013 and withdrawn in 2016): The Knotweed Code of Practice.*

Invasive Species Ireland (2008). *Best Practice Management Guidelines for Japanese Knotweed.* [Available online at www.nonnativespecies.org/downloadDocument.cfm?id=1013]

National Roads Authority (2010). *Guidelines on the Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads.*

