

Antarctic Construction Partnership – Rothera Modernisation 

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Rothera Runway Surfacing and Lighting Biosecurity Plan

Reference Sheet

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	BAS Biosecurity Regulations 2021

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P-02		Provisions for sand for sand replacement tests

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NDG	DRO	MSI
Author	Project	Corporate / Area Process Owner
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1. Introduction

Many plant and animal species have been moved around the world through human activities to areas they would not reach naturally. Once in a new location, these 'non-native' species may establish, with potentially severe impacts on local species and ecosystems. The Antarctic continent currently has few confirmed non-native species, but numbers are increasing. Future increases in human presence in the Antarctic region, either through tourism, governmental operators or other commercial activities, will increase the risk of further non-native species introductions. At the same time, climate change may increase the chances of non-native species establishment and range expansion.

The Antarctic Act (1994, amended 2013) legislates to minimise the risk of non-native species introductions in the Antarctic, and BAM is obliged to conform to this legislation. BAM are also obliged to follow the BAS Biosecurity Regulations and the Biosecurity Policy with Contractors.

BAMs projects in the Antarctic cover several locations of distinct biological diversity. It is essential that all necessary precautions are taken to prevent the introduction of non-native species to Rothera Point and the surrounding area from other locations, including Europe, South America or any of the other BAS Research Stations or logistics hubs.

This document provides guidance to BAM personnel on the measures to be taken when moving plant, materials or personnel to Rothera Research Station.

1.1. Prohibited Items

No BAM personnel or their subcontractors will be permitted to take any of the items below to the Antarctic:

- Any living plant, animal or microorganism.
- Non-sterile soil or compost.
- Any plant propagules (e.g. seeds, bulbs, cuttings) or invertebrate eggs (e.g. brine shrimp or sea monkey eggs).
- Untreated wood where bark remains attached.
- Any perishable foods including fruit, vegetables, cheese, fish or meat in personal cargo (no personal foods are allowed but fresh foods as part of the construction team food supply will be arranged).
- Packing materials of used sacking, hay, straw, chaff or wood shavings. Polystyrene beads or chips should also be avoided for waste management purposes.

1.2. Roles & Responsibilities

- Environmental Lead – Neil Goulding, neil.goulding@bam.com - 07770 223441
 - Overall responsibility for environmental management of the project.
 - Ensuring that the designers, buyers and construction team are aware of the biosecurity issues covered in this document.
 - Nominating and training of biosecurity inspectors.
 - Training of the Environmental Engineer
 - Answer any queries or questions from BAM staff on environmental or biosecurity issues.

- Project Manager – Billy Thursfield, billy.thursfield@bam.com – 07825 853975

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- Responsible for all construction works including mobilisation and demobilisation
 - Appointing an Environmental Engineer from within the site team.
 - Ensuring cargo is biosecure before off loading at Rothera

 - BAM Environmental Engineer: TBC (appointed from within the Rothera construction team on site)
 - Responsible for managing and monitoring the environmental performance and biosecurity measures on site.
 - Responsible for managing the Biosecurity Inspectors on site.
 - Carries out all final biosecurity inspections before cargo is offloaded from the ship to Rothera
 - Completes the relevant biosecurity checklists (Checklists 2, 3, 4, 5 and Form 1)
 - Reports to the BAM Environmental Lead

 - BAM Biosecurity Inspectors: TBC (at least one member of the Rothera construction team and at least one BAM staff member responsible for checking cargo at packing and loading stages in the UK)
 - Responsible for ensuring that all plant and materials are thoroughly inspected and pose no biosecurity risk.
 - Responsible for completing the relevant biosecurity checklists (Checklists 2, 3, 4, 5)
 - Inspections will be required at the port where materials are loaded
 - Report to the BAM Environmental Lead unless at Rothera in which case reports to the Environmental Engineer

 - All BAM Personnel
 - Personnel will be responsible for ensuring that their personal belongings are biosecure and do not contain any prohibited items.

2. Inspection Procedure

To ensure all plant and materials required for the Runway Surfacing and Lighting are biosecure, inspections will be undertaken at various stages of manufacture and transportation and at a number of different locations.

Inspections will be scheduled according to the biosecurity risk presented by the item.

For example

Plant poses a high biosecurity risk and is hard to clean and inspect and will therefore be inspected wherever possible by a trained BAM Biosecurity Inspector at the supplier's premises.

Pre-cast concrete elements pose a lower risk and are easier to clean and will therefore not be inspected before arrival at the port.

The following biosecurity inspections will be carried out

Location	Inspection	Inspector	Requirement
Supplier Premises	Manufacturing, storage and packing areas	Trained Supplier Biosecurity Inspector BAM Biosecurity Inspector	According to RA
Supplier Premises	Plant and materials before packing or transportation	Trained Supplier Biosecurity Inspector BAM Inspector	According to RA
Logistics Hub	Storage and packing areas	LV Shipping Biosecurity Inspector BAM Biosecurity Inspector	Compulsory
Logistics Hub	Plant, materials and ISO containers on arrival	LV Shipping Biosecurity Inspector BAM Biosecurity Inspector	Compulsory
Logistics Hub	Materials before packing	LV Shipping Biosecurity Inspector BAM Biosecurity Inspector	Compulsory
Logistics Hub	All cargo before loading onto vessel	LV Shipping Biosecurity Inspector BAM Biosecurity Inspector	Compulsory
Logistics Hub	Vessel	LV Shipping Biosecurity Inspector BAM Biosecurity Inspector	Compulsory

3. Pre-departure Biosecurity

3.1. Biosecurity Training

Prior to departure, all construction team members will receive a project specific briefing (in addition to the general environmental pre-departure briefing) to ensure that they are aware of the specific biosecurity requirements of the project's EIA and any associated permit.

Construction team members will sign a register to confirm that they have attended the briefing and understood the biosecurity requirements of the EIA and permit.

Additionally, selected members of the construction team will be trained as biosecurity inspectors to assist in inspections at the port of departure and more specifically on arrival at Rothera.

3.2. Personal Biosecurity

- Immediately before leaving home for Rothera, BAM personnel should ensure that all outer clothing has been washed, at the hottest temperature suitable for the garment, to remove seeds, soil and other propagules. Particular attention should be paid to Velcro, gaiters, pockets, turn-ups in trousers and hoods of jackets. ([Please see Appendix A. Checklist 1](#)).
- Footwear should be cleaned (inside and out) to remove soil, seeds or any other plant material.
- Personal clothing and equipment shall also be checked on the ship prior to arrival in Antarctica.
- Avoid picking up soil, seeds and other propagules on your clothing during travel to Antarctica (i.e. be careful to ensure clothing is clean after walking in the countryside in any South American countries or South Atlantic gateways prior to departure)
- If possible, before entering Antarctica wear new items of outer clothing which will be free of non-native species and propagules.
- If moving between BAS stations please check clothing and personal belongings to prevent transport of biological material between sites (especially from South Georgia station to Antarctic locations).
- Ensure all clothing and personal effects are packed indoors in a clean environment.
- Before handing in any personal items to the BAM Logistics Stores in the UK, Netherlands or Chile for transportation to Antarctica, ensure that they are clean and free of soil and propagules.

3.3. Supplier/Partner Biosecurity

Limited materials are required for the Runway Resurfacing and Lighting project. These can be classified into the following groups:

- Pre-cast concrete chambers, pipes and ducting.
- Plastic ducting and accessories
- M&E equipment
- Aggregate
- Plant

Of these, plant items carry the highest biosecurity risk and currently the only supplier visits envisaged as required are to the plant suppliers.

Containers for M&E components will be packed at our M&E Partner, GA Barnies establishment in Inverness. Inspections of GA Barnies premises will be carried out when containers are being packed.

3.4. Cargo Packing Areas

Materials bound for the Rothera Runway Resurfacing and Lighting project will be inspected for biosecurity and loaded into containers at either LV Shipping in Middlesbrough or GA Barnie in Inverness. The following biosecurity measures, where reasonably practical, will be adopted for all cargo packing areas ([Please see Appendix A. Checklist 2](#)).

- Cargo is to be packed in an indoor area.
- Cargo packing and storage areas shall be deep cleaned prior to the commencement of use by BAM and, thereafter, at least once per year or as deemed necessary. The area must be kept clean (which means free from soil, dirt, litter, weeds, plants, etc.).
- There must be no weeds or plants within 10m of doors to the packing area, except doors used purely as fire exits. Any plants within 10m are to be eradicated prior to use for packing.
- All doors and window must remain closed as far as possible. This is particularly important if packing after the hours of darkness, when insects will be attracted to light.
- A Rodent Control Plan will be produced for the facility indicating location and monitoring frequency of bait stations.
- UV fly killers must be installed, one for every 50 m² of internal floor space, and they should be serviced once a year with UV tubes replaced. Insect sticky traps should be installed, one for every 25 m² of internal floor space. These must be inspected once every three months, replaced as necessary, and a record of the check made for auditing purposes

3.5. Cargo Storage Areas

Plant and materials will need to be stored either before packing or after at both suppliers' premises or close to the cargo packing area. Wherever possible, plant and material are to be stored in an indoor area conforming to the requirements of packing areas. Where indoor storage areas are not available, external storage will be used and the following biosecurity measures will be adopted.

- Stored plant and equipment should be stored on concrete surfaces (as opposed to bare earth). When containers cannot be stored on concrete, they will be raised above the ground on batons of, either timber, concrete or steel, and additional checks shall be made to ensure they are free from soil and biological material prior to onward transportation.
- External cargo storage and packing areas shall be free of weeds, plants and invertebrate infestations. (i.e. regular spraying of weeds that emerge on hard standing).
- Any pallets stored outside shall be checked for bird nests before use, and if found should be removed and the pallet cleaned.
- A Rodent Control Plan will be produced for the facility indicating location and monitoring frequency of bait stations.

3.6. Packaging

Wherever possible plant and materials will be packed into ISO containers. This improves the efficiency of the logistics operation and increases biosecurity due to the ability to fumigate containers.

- All crates are to be lined with plastic sheeting
- Wood packaging (such as cases, crates, dunnage, pallets and timbers for the purpose of bracing, separating, protecting or securing cargo) are to be new and comply with the International Standards for Phytosanitary Measures No. 15 (ISPM 15).
- Packaging and filling materials may include shredded paper, vermiculite, bubble wrap and other air-filled cushioning materials.

- Where other cost-effective options exist, use of corrugated cardboard and plastic boxes should be minimized, as they may carry non-native invertebrates within the corrugations.

The following packaging materials are prohibited:

- No soil, moss, used sacking, hay, straw, chaff or wood shavings will be used. Polystyrene beads or chips should also be avoided to help waste management.

3.7. Break Bulk Cargo

Break bulk cargo may present a more substantial biosecurity risk than containerised cargo, therefore, it is important that the amount of break bulk cargo generated is kept to a minimum. Break bulk cargo can vary greatly in shape, size and type (e.g. construction materials, timber, scaffolding poles, etc.). All break bulk cargo must be clean and free of soil and biological material before loading on the ship. All items of break bulk cargo, including packaging, shall be visually inspected for signs of rodent gnawing or rodent ingress. Cargo shall also be checked for any soil or biological material and if found the item shall be cleaned.

3.8. Small Plant & Tools

Prior to packing any previously used small tools or small plant items for transport to, or between, Antarctic Research Stations, the following procedure is to be followed. The high levels of cleanliness apply to all mechanical plant and tools, irrespective of size; however, individual hand tools do not need to be listed separately in the [Appendix A. Biosecurity Checklist 3 Small Plant and Tools](#).

- Plant items are to be placed on a clean concrete or asphalt hard standing.
- Where practical, plant is to be cleaned externally using a high pressure jet wash to ensure that no soil, mud or biological material is left on the items. Where the use of water is not possible, the item will be cleaned using a combination of hard and soft brushes and/or a damp cloth.
- Following cleaning, small tools and plant are to be inspected by a nominated Biosecurity Inspector to ensure that they are free of visible soil and biological material (e.g. plant fragments, seeds and insects) This information is to be recorded for auditing purposes ([Please see section Appendix A. Checklist 3](#))
- Care should be taken not to contaminate the small tools and plant prior to loading onto the ship or aircraft. Plant storage facilities should minimise the potential for recontamination of cleaned small plant and tools to transport and, if necessary, arrangements should be made to thoroughly clean the small plant and tools at the ship or aircraft loading site.
- Immediately before being loaded onto the ship or aircraft for transportation, all small tools and plant should be checked by a nominated Biosecurity Inspector to ensure they are free of soil and biological material. If any soil or biological material is found, the contaminated item should be cleaned and re-inspected before being transported.

3.9. Vehicles & Large Mechanical Plant

Mechanical plant (particularly tracked vehicles) pose a high risk to biosecurity. The undercarriage of wheeled or tracked plant can pick up soil which could contain plant fragments, seeds, invertebrates or invertebrate eggs.

Prior to loading any item of large mechanical plant for transport to or between Antarctic Research Stations, the following procedure is to be followed ([Please see Appendix A. Checklist 4](#)):

- Plant items are to be placed on a clean concrete or asphalt hard standing.

- Where practical, plant is to be cleaned externally using a high pressure jet wash to ensure that no soil, mud or biological material is left on the vehicle, including the wheels, wheel arches, tracks and areas underneath the vehicle. Plant accessories, such as forks and buckets, should be cleaned in a similar manner.
- To the maximum degree feasible, panels should be removed to ensure there is no entrapment of soil and mud within internal vehicle compartments.
- Engine and hydraulic control compartments are to be thoroughly cleaned. Manufacturers' guidance may be required with respect to cleaning methodology to ensure no damage is done to the engine electronics or hydraulic systems.
- Where the plant has a cab, upholstery and mats should be brushed and/or vacuum cleaned to remove any soil or biological material.
- Following cleaning, plant is to be inspected by a nominated Biosecurity Inspector to ensure that they are free of visible soil and biological material (e.g. plant fragments, seeds and insects).
- Care should be taken not to contaminate the plant prior to loading onto the ship or aircraft. Plant storage facilities should minimise the potential for recontamination of cleaned vehicles prior to transport and, if necessary, arrangements should be made to thoroughly clean the vehicles at the ship or aircraft loading site.
- Immediately before being loaded onto the ship or aircraft for transportation, all vehicles should be checked by a nominated Biosecurity Inspector to ensure they are free of soil and biological material. If any soil or biological material is found, the contaminated vehicle should be cleaned and re-inspected before being transported.
- Motorised plant is to have its engines started before loading, to ensure rats and mice are not living in the engine compartments.

3.10. Construction Materials

The following section does not constitute a complete list of the construction materials but simply identifies the materials considered to pose the highest biosecurity risk and details the specific measures to be taken.

3.10.1. Aggregates

Aggregate is defined as any coarse particulate material used in construction, including sand, gravel, crushed stone, boulders, pebbles or slag. It presents a biosecurity risk because biological material such as seeds, soil and invertebrates can easily become entrained during production and transport.

The only aggregate identified as being required to be exported to Rothera is sand for the sand replacement density testing of the runway. The measures below should be followed if imported aggregate is required.

- Aggregate must be kiln dried or if this is not possible, obtained from marine sources.
- To prevent seed contamination during storage and transport aggregate must be contained in clean sealed packaging (such as FIBCs).
- Packaged aggregate will be transported in clean ISO containers.
- Aggregate must be carefully handled to prevent damage to the packaging.
- Only the minimum amount of aggregate needed for the project will be sent to the site.
- All aggregate will be used as quickly as possible after delivery to the site to reduce the risk of establishment of any non-native species present in the aggregate.

- Bulk aggregates must be stored in a defined area at the construction site. Any spilled aggregate must be cleaned up immediately and contained within packaging, until used.
- Aggregate will be stored in its sealed packaging at the site and will not be left open to the environment.
- When aggregate is removed from its packaging for use, it must be used as soon as possible.

In the event that one or more of these management steps are not possible, further consultation with the BAS Environment Office must take place. Consultation with the BAS Environment Office must occur prior to any aggregate being purchased from suppliers.

3.10.2. Timber

Timber will be required for packaging materials. Due to the risk of infestation by pests the following precautions must be observed before timber can be imported to Antarctica:

- Timber materials must be heated in accordance with a specific time–temperature schedule that achieves a minimum temperature of 56 °C for a minimum duration of 30 continuous minutes throughout the entire profile of the wood (including at its core).
- All timber products are to be inspected for signs of wood borrowing animals such as wood boring beetles and woodworm (a beetle larvae) before being shipped.
- If any evidence wood burrowing animals is discovered the timber must be treated with a pesticide or fumigated in a sealed container.
- All packaging timber should conform to the requirements of International Standards for Phytosanitary Measures No. 15 (ISPM 15) and be stamped with IPPC logo, country of origin and method of treatment.

3.10.3. Mechanical and Electrical (M&E) Fittings

M&E equipment will be required within the lighting of the runway. This equipment will mostly consist of luminaires. This equipment will be received by our M&E partner GA Barnies and packed into containers in their premises. All items will be stored in an area conforming to the requirements of storage areas (section 3.5) and checked for biosecurity prior to loading into containers.

3.10.4. Ducting

Ducting forms an ideal place for invertebrates to hide from predation. Scaffold tubes shall be thoroughly inspected and if necessary, cleaned using a pressure washer or compressed air. Ideally, ducting will be transported in sealed containers, but where this is not possible, ducting ends are to be sealed after inspection/cleaning with duct tape or end caps to prevent the future ingress of biosecurity threats.

3.11. ISO Containers

Prior to loading any ISO or other sealed container for transport to or between Antarctic Research Stations, the following procedure is to be followed.

- Shipping containers are to be stored on concrete surfaces (as opposed to bare earth).
- Shipping containers are to be kept clean and free of soil, mud, spiders' webs, invertebrates, debris, wood fragments (e.g. from pallets), plant material or mould. A record shall be kept of this inspection for auditing purposes ([Please see Appendix A. Checklist 5](#)).

- Prior to loading, if deemed necessary by the nominated Biosecurity Inspector, the inside of the container is to be washed
- Air vents and drainage holes (if any) are sealed before loading the container with cargo. As condensation will be created without ventilation during the voyage, suitable desiccants, such as 'ProDriPole' are to be provided to ensure the cargo remains dry. 4-6 ProDriPoles are required per 20ft ISO container.

During loading any ISO or other sealed container for transport to or between Antarctic Research Stations, the following procedure is to be followed

- If possible, containers should be loaded within a warehouse/closed environment. If a container must be loaded outside, then it should be placed on a hard standing with a minimum of 2 metres all around it that is free of soil and vegetation
- During loading, vigilance must be exercised in respect of rodents, birds, insects and airborne seeds or leaves. An insecticide aerosol is to be available to eradicate any insects entering the container. Dead insects are to be removed.
- If loading outdoors, the container doors area must be continually attended. If loading is suspended, even temporarily, the doors to the container must be closed. Container doors are to be closed overnight, even if loading indoors.

Once the loading of the container is complete, the following procedure is to be followed

- For all containers, the following must be installed:
 - One pre-baited mouse box - to be placed inside the container as close to the doors as practicable.
 - One pre-baited rat box - to be placed inside the container as close to the doors as practicable.
 - Two crawling insect traps - to be positioned parallel and adjacent to the container walls or doors, and as close to the doors as practicable.
- The container should be fumigated using a permethrin smoke bomb or permethrin fogger. Use one 'DigraIn One Shot 300 ml 1.46% Permethrin' (or similar) total release aerosol per 20' container or according to manufacturer's instructions. The container should be shut and sealed immediately. This should be undertaken by an appropriately trained person where practical. Container doors must have an appropriate label showing the date and time of fumigation.
- The outside of the container, including the underside and lifting points are inspected to ensure they are free of soil, mud, spiders' webs, invertebrates and bird droppings. If deemed necessary by the nominated Biosecurity Inspector, the outside of the container is to be washed using a high pressure washer.

3.12. Fresh foods

Provisions for biosecurity measures associated with fresh foods have not be detailed in this document, as all fresh foods for BAM personnel will be supplied by BAS

4. In-transit Biosecurity

4.1. Ships

It is not envisaged that cargo for the Runway Surfacing and Lighting project will be transported on a chartered vessel. Instead cargo will be transported on available commercial lines to the Falkland and/or the SDA to Rothera. If a chartered vessel is required, the following measures will be followed

Any ship chartered by BAM for the transport of cargo and personnel must meet the following biosecurity measures and evidence needs to be provided to BAS that the following biosecurity requirements are included in the contract:

- All ships must have a Ship Sanitation Certificate (SSC).
- All ships must conform with Resolution MEPC.163(56) Guidelines For Ballast Water Exchange In The Antarctic Treaty Area.
- All ships shall have rodent boxes with poison bait that are inspected before, during and after each port visit.
- Insect sticky traps should be placed in food storage areas, and replaced when necessary.
- Electric UV insect killers shall be used in food storage areas.
- Biosecurity inspections of all ship and Antarctic station cargo shall be undertaken prior to loading and off-loading. (Please see checklists 3, 4, and 5)

4.1.1. When in Port

- Ships must have rat guards on the mooring lines.
- The gangway shall be lifted at night, or if lowered, lit with flood lights. An ultrasonic rat deterrent must be available and switched on.
- External doors and windows should be closed, wherever possible, to minimise the attraction of insects onto the ship.
- Boot/shoe washing facilities must be made available at the gangway to allow boot/shoe washing ON and OFF the ship.
- The inside of the tenders shall be cleaned between each landing to remove soil and other biological material knocked off passengers' boots.
- It is important that the boots and clothing of those arriving in Antarctica by ship is adequately cleaned before disembarkation. At a suitable interval before the arrival date, BAM should inform landing personnel and crew that clothing must be cleaned to remove soil, seed and other propagules. Spot check shall be undertaken to ensure compliance.
- Just prior to disembarkation at locations in Antarctica, all footwear must be cleaned in disinfectant (e.g. Virkon S).
- Disinfectants can become ineffective over time, or if contaminated excessively with soil or organic material. Therefore, disinfectant solutions provided for footwear cleaning shall be changed regularly (at least once per week), and a specific individual assigned this task as part of their duties.

4.2. Cargo Inspection Pre-offload

Where possible, biosecurity inspection of cargo should be carried out aboard the vessel before the cargo is unloaded. Time constraints and quarantine measure may render inspections aboard the vessel impossible. In these circumstances, an area of the wharf should be allocated as a quarantine area where all cargo can be inspected before transferring to another area of the station.

4.2.1. Cargo Boxes and Break Bulk

All items of break bulk cargo, including packaging, shall be visually inspected by the Biosecurity Inspector for signs of rodent gnawing or rodent ingress. If signs of rodents are detected, The BAS environment office is informed immediately and off-loading of any cargo halted until the presence of rodents has been investigated and the BAS Environmental office permits the continued off-loading. Cargo will also be checked for any soil or biological material. If soil or biological material is found the BAS Environment Office will be informed and the item shall be cleaned. Once these checks are complete and the item is biosecure, a nominated BAM staff member will check the item against the manifest and then allow it to be transported to the station. If any biosecurity issue is noted, the cargo shall not be off-loaded until this issue is resolved.

4.2.2. Vehicles and Large Mechanical Plant

All vehicles must be inspected before off-loading and a record of this made ([Please see Appendix A. Checklist 4](#)). If contamination is found, further cleaning must be done before off-loading. The BAS environment office should be informed of the intention to off-load plant and be given the opportunity to witness the inspection.

4.2.1. ISO Containers

ISO containers shall be inspected externally for soil, plant material and invertebrates prior to off-loading. Details of the check shall be kept for auditing purposes ([Please see Appendix A. Checklist 5](#))

5. Biosecurity on Arrival at Rothera

5.1. Personnel Disembarkation

- Personnel disembarking at Rothera Point or elsewhere in Antarctica or South Georgia must adequately clean their clothing, personal belongings and boots before they leave the ship and upon returning to the ship ([see Appendix A: Biosecurity Checklist 1. Personal Biosecurity](#)).
- Clothing and personal belongings (such as bags, camera cases etc.) must be checked for biological material at a suitable time before arrival - remove any seeds, soil and other propagules found whilst still on the ship. Check Velcro, gaiters, pockets, turn-ups in trousers and hoods of jackets.
- Boots must be inspected and cleaned and any soil or seeds removed before arrival at Rothera Point.
- All personnel must use the boot washing facilities (provided by the vessel) at the gangway to disinfect their footwear before disembarkation.

5.2. Inspection of Cargo

External surfaces shall be checked to ensure cargo items are free of soil, biological material and signs of gnawing, or other routes of rat ingress. Those opening ISO containers upon arrival, should stay vigilant for signs of live rats, mice or invertebrates. The rodent bait boxes are to be inspected for any signs of gnawing, and if found, the container door should be shut, and the BAS Environment Office informed immediately. If invertebrates are found, they should be eradicated immediately (physically or using an insecticide spray) and the BAS Environment Office informed.

When opening cargo boxes, remain vigilant for imported soil or biological material.

5.3. Aggregate

On arrival at Rothera, aggregate should be contained in sealed packaging and stored in a demarked area (preferably hard standing/concrete or on a tarpaulin).

5.4. General Awareness

When on station all personnel shall remain vigilant for any indications of:

- biosecurity breaches
- evidence of non-Antarctic soil importation
- non-native species colonisation, including within buildings
- rats or rodents

If in doubt, personnel should report any potential issues to the BAM Environmental Lead, who will assess the situation and, as appropriate, take any immediate action and complete and submit a MAXIMO report.

6. Recording Biosecurity Inspections

A number of different methods have been adopted for recording biosecurity inspection, each suitable for a different situation. We continue to look at new and alternative Technology to improve the recording and reporting of the biosecurity inspection process.

6.1. *BIM 360 Field*

BIM 360 Field is system that enables data to be collected on mobile devices such as phones and tablets. Reports are uploaded to a cloud based database. Inspections can be recorded using BIM 360 on pre prepared checksheets. Photographic evidence is attached to the checksheet to demonstrate compliance. Reports can be saved on the mobile device, where there is no internet availability, and uploaded later, but a reasonable internet connection is required to upload data. Data should be uploaded as soon as possible to prevent possible loss of data from the mobile device.

6.2. *Work Mobile*

Work Mobile is similar to BIM 360 Field in that it enables data to be collected on a mobile device, stored and uploaded to a central database. . Inspections are also recorded on pre prepared checksheets and photographic evidence attached. The main difference is that a database has been set up on the server at Rothera. This enables Work Mobile to be used with no internet requirements. All data is only accessible from within Rothera, until the end of the season.

6.3. *Paper*

If neither of the above options is available, checksheets are included as Appendix A to this document. Photographic evidence of compliance with the checklist items should be provided wherever possible.

7. Non-conformances

- All biosecurity breaches and near misses should be reported to the BAM Environmental Lead, the BAM Project Manager, the BAS Station Leader and the BAS Environment Office at the time of the incident.
- A near miss/environmental incident report must be produced and provided to the BAS Station Leader for inclusion in the MAXIMO Reporting System as soon as relevant information is available and at most within 48 hours.
- Examples of biosecurity breaches may include, but are not limited to, the following:
 - Non-Antarctic soil or biological material (e.g. weeds) found on vehicles or other plant after unloading at Rothera
 - Live insects within cargo
 - ISO containers with soil or biological material on the interior and exterior surfaces
 - Any rodent sighting or any evidence of rodents (gnawing, etc.)
 - Failure to clean items delivered to station
 - Failure for biosecurity measures to be performed at appropriate stage of the supply chain
 - Failure for personnel to adequately clean their clothing or personal equipment.
 - Unintentional or deliberate importation of soil or biological material by BAM staff.
 - Importation of wood with bark still attached.
 - Failure for appropriate biosecurity checks of cargo packing areas to be performed.

Appendix A: Biosecurity Checklists

Biosecurity Checklist 1. Personal Biosecurity

(Pre-departure and pre-arrival for individuals going to Antarctica)

This checklist will be circulated to all BAM personnel prior to their deployment to Antarctica and is intended as a guide to assist individuals in undertaking their own biosecurity checks before travelling south.

Non-native species are those species that do not occur naturally in an area, but have been introduced by human activities, either intentionally or unintentionally. Unpermitted importation of non-native species is a breach of UK legislation and is in contravention of the Environmental Protocol and could lead to serious consequences for the responsible individual and BAM, including up to two years imprisonment and/or an unlimited fine.

Use the following checklist to reduce your risk of importing non-native species:

Biosecurity Checklist 1	Personal Biosecurity	
Name		
Signature		
Date		
		Tick to confirm compliance
All clothing is either new (i.e. straight out of the packet) <u>or</u> has been washed to remove plant seeds, invertebrates and soil (<i>Tip: check any Velcro® is clean and pay particular attention to pockets!</i>)		
All footwear has been scrubbed free of all plant seeds, invertebrates and soil (<i>Tip: check under the insole and tongue too!</i>)		
All bags and personal equipment have been cleaned, washed and/or vacuumed and are free of plant seeds, invertebrates and soil.		
All personal recreational equipment (including climbing gear, walking poles, ski and snow board equipment, kiting equipment and bicycles) has been cleaned and is free of soil and biological material.		
The following items have NOT been packed:		
<ul style="list-style-type: none"> • Any living plant, animal or microorganism - unless in possession of an appropriate permit 		
<ul style="list-style-type: none"> • Non-sterile soil or compost 		
<ul style="list-style-type: none"> • Any plant propagules (e.g. seeds, bulbs, cuttings) or invertebrate eggs (e.g. brine shrimp or sea monkey eggs) - growing plants and animals in Antarctica and South Georgia is <u>NOT</u> permitted 		
<ul style="list-style-type: none"> • Untreated wood where bark remains attached 		
<ul style="list-style-type: none"> • Any perishable foods including fruit, vegetables, cheese, fish or meat. 		
You have explained the above restrictions to any person that is likely to send gifts or packages to you while in Antarctica.		

Biosecurity Checklist 2. Cargo Packing Areas

For each Cargo Packing Area that BAM utilises, a weekly checklist will be completed (for the duration of the packing period). The checklists will be stored on file and made available for auditing purposes either by BAM or by BAS personnel.

Model (model document to be made project specific)

Biosecurity Checklist 2	Cargo Packing Area	
Name of Facility Being Inspected		
Name (print) and Signature of Inspector		
Date of Inspection		
Check Items	Yes/No	Any subsequent action or other notes
Site is clean i.e. free from soil, dirt, litter, weeds, plants, etc.		
No weeds or plants within 10 m of doors ¹		
Site is free of wind-blown seeds (e.g. from dandelions)		
Site is free of invertebrate infestation		
Site is free of rodents		
Rodent bait boxes are charged with poison bait ²		
Sticky insect traps are present and effective (1 per 25m ² floor area) ³		
UV insect traps are present and effective (1 per 50m ² floor area) ³		
Storage area doors are kept closed as much as possible		
Pallets and packing materials are kept inside in a clean area		
ISO containers are stored on hard standing		

¹Regular use of herbicides may be required

²Using the MAXIMO system, provide details of any rodents caught in bait stations.

³State the date when the insect sticky traps are replaced (typically every 2 months)

Biosecurity Checklist 3. Small Plant & Tools

All small plant and tools that have been used on jobs in other parts of the world shall be cleaned and checked prior to being sent to Antarctica.

Checks prior to off-loading shall be simple visual checks as described for all general cargo. If for some reason any checks are not possible at any stage of the supply chain, please note details of the circumstances here and report using the MAXIMO system. Individual hand tools do not need to be listed separately using this checklist, but do need to be free of soil and biological material before transfer to Rothera. The checklists will be stored on file and made available for auditing purposes either by BAM or BAS personnel.

Model (model document to be made project specific)

Biosecurity Checklist 3	Small Plant and Tools				
Name (print) and Signature of Inspector					
Date of Inspection					
Location of Inspection					
Stage of Journey	Supplier	Logistics Hub	Pre Departure	Pre Offload	Post Offload
Details of journey initial and final destinations					
Transporting vessel (e.g. RRS Shackleton):					
Small plant/tools identification details:					
Check Items	Clean?	Notes (including details of any associated MAXIMO reporting)			
Exterior surfaces (top and side)					
Exterior underneath surfaces					
Interior surfaces (as possible)					
Insect spray in crevices (as possible)					

Biosecurity Checklist 4. Vehicle & Large Mechanical Plant

Mechanical plant (particularly tracked vehicles) pose a high risk to biosecurity. The undercarriage of wheeled or tracked plant can pick up soil which could contain plant fragments, seeds, invertebrates or invertebrate eggs.

The following checklist and the procedures listed in [Section 2.6](#) of this document will be followed to ensure vehicles and large mechanical plant arrive in Antarctica and/or the sub-Antarctic free of soil and biological material. If these checks are not completed at any stage of the supply chain, please note details of the circumstances here and report using the BAS MAXIMO system

A checklist for each vehicle or plant consigned to Rothera will be stored on file and made available for auditing purposes either by BAM or by BAS personnel.

Model (model document to be made project specific)

Biosecurity Checklist 4	Vehicle & Large Mechanical Plant				
Name (print) and Signature of Inspector					
Date of Inspection					
Location of Inspection					
Stage of Journey	Supplier	Logistics Hub	Pre Departure	Pre Offload	Post Offload
Details of journey initial and final destinations					
Transporting vessel (e.g. RRS Shackleton):					
Vehicle model and identification details:					
Check Items	Clean?	Notes (including details of any associated MAXIMO reporting)			
Vehicle exterior (top and sides)					
Vehicle wing mirrors and windscreen					
Vehicle exterior (underneath)					
Wheels and wheel arches					
Vehicle interior (including under floor mats, door pockets, down the sides and below the front seats, the boot/trunk, and under the spare tyre).					
Vehicle accessories (forks, buckets, etc.)					
Engine started to ensure no rodents/birds in vehicle interior					
Use insecticide spray in crevices where possible					

Biosecurity Checklist 5. ISO Containers

All ISO containers must be checked prior to loading on the ship and prior to off-loading at the stations. Appropriate cleaning equipment must be made available during checks.

For each ISO container consigned to Rothera a checklist will be completed and stored on file. The checklist will be made available for auditing purposes either by BAM or by BAS personnel.

If these checks are not completed at any stage of the supply chain, please note details of the circumstances here and report using the BAS MAXIMO system

Model (model document to be made project specific)

Biosecurity Checklist 5	ISO Containers				
Name (print) and Signature of Inspector					
Date of Inspection					
Location of Inspection					
Stage of Journey	Supplier	Logistics Hub	Pre Departure	Pre Offload	Post Offload
Details of journey initial and final destinations					
Transporting vessel (e.g. RRS Shackleton):					
ISO Container identification details:					
Check Items (as required by state of packing)	Clean?	Notes (including details of any associated MAXIMO reporting)			
Container exterior surfaces (top and sides)					
Container exterior doors and hinges					
Container exterior underneath surfaces (as possible)					
Container interior surfaces					
Container interior high and low level corners and door hinges					
Contents of container					
Baited rodent trap and two insect traps placed inside container					
Container fumigated prior to locking doors					

Model (model document to be made project specific)

Biosecurity Checklist 6.- All break-bulk items (any item which is not containerised and not covered by a specific checklist)

All breakbulk (individual boxes/crates, timber, cladding and other cargo which is not containerised) must be checked prior to loading on the ship and prior to off-loading at the stations. Appropriate cleaning equipment must be made available during checks. If these checks are not completed at any stage, please note details of the circumstances here and report using the BAS MAXIMO system.

For each break-bulk inspection a checklist will be completed and stored on file detailing the items inspected and any outcomes. The checklist will be made available for auditing purposes either by BAM or by BAS personnel.

Model (model document to be made project specific)

Biosecurity Checklist 6	Break Bulk Cargo				
Name (print) and Signature of Inspector					
Date of Inspection					
Location of Inspection					
Stage of Journey	Supplier	Logistics Hub	Pre Departure	Pre Offload	Post Offload
Details of journey initial and final destinations					
Transporting vessel (e.g. RRS Shackleton):					
Description and identification details of break bulk cargo:					
Check Items	Clean?	Notes (including details of any associated MAXIMO reporting)			
Items exterior surfaces (top and sides)					
Items exterior underneath surfaces (where possible)					
Items clean and free of soil, biological material and any signs of rodent gnawing or ingress, invertebrates such as spider webbing or cocoons.					
Insect spray in crevices (as possible)					

Biosecurity Checklist 7. Crates

All crates must be checked prior to loading on the ship and prior to off-loading at the stations. Appropriate cleaning equipment must be made available during checks.

For each crate consigned to Rothera a checklist will be completed and stored on file. The checklist will be made available for auditing purposes either by BAM or by BAS personnel.

If these checks are not completed at any stage of the supply chain, please note details of the circumstances here and report using the BAS MAXIMO system.

Model (model document to be made project specific)

Biosecurity Checklist 7	Crates				
Name (print) and Signature of Inspector					
Date of Inspection					
Location of Inspection					
Stage of Journey	Supplier	Logistics Hub	Pre Departure	Pre Offload	Post Offload
Details of journey initial and final destinations					
Transporting vessel (e.g. RRS Shackleton):					
Crate identification details:					
Check Items (as required by state of packing)	Clean?	Notes (including details of any associated MAXIMO reporting)			
Crate is unused and ISPM15 compliant					
Crate lined with polythene					
Crate exterior surfaces (top and sides)					
Crate exterior underneath surfaces (as possible)					
Crate interior surfaces					
Crate and contents clean and free of soil, biological material and any signs of rodents or invertebrates.					

Biosecurity Checklist 8.- Vessels

Any vessel used to transport materials to KEP must be inspected prior to loading any cargo. If these checks are not completed at any stage, please note details of the circumstances here and report using the BAS MAXIMO system.

For each vessel inspection a checklist will be completed and stored on file detailing the items inspected and any outcomes. The checklist will be made available for auditing purposes either by BAM or by BAS personnel.

Model (model document to be made project specific)

Biosecurity Checklist 8	Vessel Biosecurity	
Name (print) and Signature of Inspector		
Date of Inspection		
Location of Inspection		
Details of journey initial and final destinations		
Transporting vessel (e.g. RRS Shackleton):		
Check Items (as required by state of packing)	Yes/No	Notes (including details of any associated MAXIMO reporting)
Ship's hold is clean and free of soil and insect infestation		
Sticky insect traps or electric UV traps are placed in hold and food storage areas.		
Rat bait boxes with poison bait are on board.		
Rat bait box inspection regime is in place		
Mooring line rat guards are available and in place when in port.		
Ultrasonic rat deterrent available and in place.		
Floodlights available at gangway and used when the gangway is lowered in the hours of darkness.		
Boot/shoe washing facilities are available at the gangway and topped up with Virkon S or similar		
Ship sanitation certificate (SSC) is available and in date.		