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**ROYALORDNANCE BISHOPTON  
Remediation and Bulk Earthworks Planning Consent**

## **LANDSCAPE MANUAL (REVISION B)**

on behalf of

**BAE SYSTEMS**

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# 1 Introduction

- 1.1 Planning permission has been granted for Remediation and Bulk Earthworks at the Royal Ordnance site at Bishopton (reference 09/0527/PP). A number of conditions are attached to the planning permission. This manual provides the BAE SYSTEMS response to the conditions relating to landscape. Cass Associates has prepared the Landscape Manual on behalf of BAE SYSTEMS.
- 1.2 The planning conditions addressed in the manual are:

Condition number	Summary Of Requirement
5	Bird Hazard Management Plan
6	Soft and Water Landscape Works
17	Details for Landscape Mounds
18	Details for the Borrow Area
19	Details for Boghall and Central Meadows

*Table 1: Summary of planning conditions relating to landscape*

## 2 Bird Hazard Management Plan

- 2.1 Planning condition 5 requires the preparation of a Bird Hazard Management Plan.
- 2.2 A Bird Management Plan (BMP) has been approved as part of a separate planning permission for the site (reference 06/0602/PP) relating to the extension to Bishopton Community Growth Area and including the Sustainable Drainage System (SUDS). The BMP for the Remediation and Bulk Earthworks (Appendix 1) is based on the approved BMP for the village extension. The BMP provides all the information requested in condition 5.
- 2.3 The nature of the water-bodies is very different in the two planning permissions. The Remediation and Bulk Earthworks permission includes the creation of temporary settlement ponds as located on drawing number 905/35. A number of smaller supplementary temporary settlement ponds will be required to capture local surface water run-off from smaller areas of the site particularly where gradients are significant. There will be no more than 15 of these ponds at any one time, their surface area will not exceed 800m<sup>2</sup> and they will be linear in shape with a maximum width of 20m. These supplementary temporary settlement ponds will be subject to the management strategy set out in this document.
- 2.4 The function of these water-bodies is to facilitate the removal of sediment from the water running off the areas undergoing remediation and bulk earthworks engineering operations. By contrast, the SUDS ponds will be permanent landscape features and contain a wider range of habitats including open water and various types of aquatic planting making them generally more attractive to birds.
- 2.5 The temporary settlement ponds will be in existence for a number of years while the remediation and bulk earthwork engineering works are carried out. The temporary settlement ponds will be located where the SUDS ponds are to be created. The temporary settlement ponds will provide the bulk earthworks operations for the SUDS ponds.
- 2.6 Therefore, no aquatic planting will take place under the Remediation and Bulk Earthworks consent as the aquatic planting forms part of the SUDS package. This has the general effect of reducing the attractiveness of the temporary settlement ponds to hazardous bird species in comparison to the SUDS ponds. Consequentially there will be a reduction in the severity of the potential bird hazard to aircraft created by the temporary settlement ponds (in comparison to the SUDS ponds).
- 2.7 However, the potential for hazardous birds to use the site during the Remediation and Bulk Earthworks operations remains. The water bird management strategy provided in the BMP (Appendix 1) describes how hazardous bird species on the site will be monitored, deterred, harassed and dispersed. Renfrewshire Council, BAA/Glasgow Airport and the site operator/owner will review the BMP regularly.

### 3 Soft and Water Landscape Works

- 3.1 Planning condition 6 requires the provision of full details of soft and water landscape works. BAA were consulted during the preparation of the planning application to ensure that the soft and water landscape works were acceptable to them. A number of revisions were made to the proposals as a result of the consultation process particularly in relation to the design of the ponds and the species and density of the woodland mixes. The information below starts from this baseline and provides additional detail.
- 3.2 The finished levels, ponds, grass and woodland planting proposals are shown on the accompanying drawings (numbers 905/35 to 905/51). The general approach taken towards the key elements of the soft and water landscape works are set out below. The way in which these elements are applied to the individual landscape areas is set out in sections 4 to 6.

#### Earthworks

- 3.3 The finished levels have remained substantially as set out in the planning consent with refinements made to accommodate elements such as footpaths. A 500mm margin has been provided to either side of footpaths on steep slopes to facilitate their construction and safe use.

#### Drainage

- 3.4 Drainage in and out of the temporary settlement ponds (drawing numbers 905/35 to 905/44) is addressed in the engineer's temporary works package.
- 3.5 The structural landscape areas (drawing numbers 905/45 to 905/51) will form part of the Community Woodland Park created under a separate planning consent. The structural landscape areas are informal soft areas of landscape predominantly covered with trees and grass. Rainwater will infiltrate into the ground and migrate into the wider drainage network as is the current situation. Localised drainage solutions will be adopted on the upper edge of footpaths on slopes, etc. as necessary to minimise run-off eroding paths. These measures will be implemented on site following the creation of the final landscape to ensure that there are no unwanted areas of erosion or standing water.

#### Grassed Areas

- 3.6 The whole area of the Landscape Mounds, Boghall and Central Meadows will be hydro-seeded with the following grass mix:

SPECIES	%
Aniset Strong Creeping Red Fescue	35
Cadix Perennial Ryegrass	20
Highland Bent Grass	17.5
Southlands Crested Dogstail	15
Calliope Chewings Fescue	10
Aberace Mini Leaved White Clover	2.5
Sowing Rate: 10g/m <sup>2</sup> (10kg/ha)	

*Table 2: General purpose grass seed mix*

- 3.7 The landscape areas will be hydro-seeded incrementally as the earthworks operations are completed. This will help to reduce soil erosion. This grass mix has been selected, as it will establish on a wide range of soils, give a good overall green cover and yet will not be too vigorous. This will maximise the prevention of soil erosion, provide good amenity qualities, facilitate opportunities for local grasses and herbs to establish and not compete vigorously with the woodland planting.

- 3.8 The amenity and ecological value of the grasslands on the mounds and meadows will be enhanced by the over-sowing of the following wildflower seed mix which contains a range of seeds found growing across Scotland. The mix is diverse but also suited to the soil type at Bishopton.

SPECIES	COMMON NAME
<i>Achillea millefolium</i>	Yarrow
<i>Anthyllis vulneria</i>	Kidney Vetch
<i>Centaurea nigra</i>	Common Knapweed
<i>Chrysanthemum segetum</i>	Corn Marigold
<i>Daucus carota</i>	Wild Carrot
<i>Digitalis purpurea</i>	Foxglove
<i>Galium verum</i>	Lady's Bedstraw
<i>Geranium pratense</i>	Meadow Cranesbill
<i>Hypochoeris radicata</i>	Cat's Ear
<i>Knautia arvensis</i>	Field Scabious
<i>Leucanthemum vulgare</i>	Ox-eye Daisy
<i>Lotus corniculatus</i>	Birdsfoot Trefoil
<i>Papaver rhoeas</i>	Corn Poppy
<i>Plantago lanceolata</i>	Ribwort Plantain
<i>Prunella vulgaris</i>	Self-Heal
<i>Ranunculus bulbosus</i>	Bulbous Buttercup
<i>Rhinanthus minor</i>	Yellow Rattle
<i>Rumex acetosa</i>	Common Sorrel
<i>Silene dioica</i>	Red Campion
<i>Stachys officinalis</i>	Betony
<i>Vicia cracca</i>	Tufted Vetch
<i>Cynosurus cristatus</i>	Crested Dogstail
<i>Festuca rubra</i> ssp <i>litoralis</i>	Slender Creeping Red Fescue
<i>Festuca arundinacea</i>	Tall Fescue
Sowing rate: 3g/m <sup>2</sup> (3kg/ha)	

Table 3: Wildflower seed mix

- 3.9 The Borrow Area will be incrementally hydro-seeded with the following grass mix as which resembles the existing grass and is suited to grazing:

SPECIES	%
Aniset Strong Creeping Red Fescue	35
Cadix Perennial Ryegrass	20
Southlands Crested Dogstail	15
Highland Bent Grass	12.5
Calliope Chewings Fescue	10
Anthoxanthum odoratum Sweet Vernal Grass	3.5
Aberace Mini Leaved White Clover	2.5
Briza media Quaking Grass	1.5
Sowing Rate: 10g/m <sup>2</sup> (10kg/ha)	

Table 4: Grass seed mix for Borrow Area

### Species number and spacing of trees and shrubs

- 3.10 The species, number and spacing of the woodland planting mixes were agreed in the planning consent. The woodland planting is located on the three Landscape Mounds and shown on drawing numbers 905/46 to 905/48. These drawings provide additional detail about the woodland planting. The supplementary detail includes defining the location of the larger (standard) trees on the plans. These trees will enhance the amenity value of the woodland areas in the initial years after planting. The larger trees are located in groups along the footpaths and on the lower slopes. They are not planted on the upper slopes as their establishment will benefit from being in more sheltered locations. Views of the landscape mounds from key viewpoints have also been taken into consideration when locating the larger trees with the aim of softening the view of the mounds in the early years while the vegetation establishes.

### Topsoil

- 3.11 Topsoil will be spread over all areas to be soft landscaped. The specification and handling of the topsoil will be in accordance with British Standard 3882, 'Specification for Topsoil and Requirements for Use'. The topsoil will be manufactured from materials on site as far as possible and, if necessary, supplemented using imported material.
- 3.12 The depths of topsoil to be used are:
- 100mm depth on areas to become grassland;
  - 350mm depth on areas to receive woodland planting;
  - the full depth of the pits for standard trees (800 x 800 x 600mm deep).
- 3.13 The topsoil is to be placed on a free draining sub-soil/base. Therefore, prior to the placement of any topsoil on compacted ground or hard surfaces, the areas will be ripped or broken up to facilitate free drainage.

### Planting of 'SUDS'\* ponds

\* wording used in condition 6

- 3.14 As described in Section 2, the temporary settlement ponds (drawing number 905/35) will not be planted. The planting of these ponds will take place under a separate planning consent when they will be made into SUDS ponds. The temporary settlement ponds will be kept clear of aquatic vegetation during the remediation and bulk earthworks operations as set out in the Bird Management Plan in Appendix 1.
- 3.15 The detailed design of the temporary settlement ponds is shown in drawings 905/36 to 905/44. The parameters for the location and design of the SUDS ponds are defined in the planning consent relating to the Bishopton Community Growth Area (reference 06/0602/PP); these include the natural topography, surface area required for attenuating run-off from the proposed development, habitat creation, bird management and safety issues. These design issues are generally not considered in further detail in this planning consent due to the bulk nature of the earthwork operations.
- 3.16 The landscape design issues relating to the temporary settlement ponds generally arise from requirements set out in the BMP (Appendix 1). Most of these design principles have been agreed under the separate planning consent for the Bishopton Community Growth Area (reference 06/0602/PP). The additional detailed design features arising from the BMP in relation to the remediation and bulk earthworks operations are:
- ***Maintaining the water-bodies without aquatic vegetation***

An assessment of the need to carry out vegetation clearance will be made on a regular basis. Vegetation will be removed as frequently as necessary in order to prevent any significant habitat creation for bird species in the target group.

- ***Bird deterrent fencing***

A 1 metre high, high visibility fence will be installed around each temporary settlement pond. This will restrict the bird's view of the water or view out of the water. This will deter species which prefer to use a shallow angle (i.e. 13-14°) to fly out of a water body. The fence will be located 1 metre from the edge of the pond so that there is space left for people to get out of the water in the event of an accident.

## 4 Details of Landscape Mounds

4.1 Planning condition 17 requires the provision of details for the three Landscape Mounds. The location of the mounds is shown on drawing number 905/45 and the proposals for their landscape treatment are shown on drawing numbers 905/46 to 905/48. Supplementary information to that already provided in section 3 is provided below.

### Levels

4.2.1 The finished levels of Landscape Mound 1 and 2 have been refined to accommodate the footpath network as described below. The finished levels of Landscape Mound 3 remain as proposed in the planning consent.

### Soft Landscape Treatment

4.3 The drawings provide detailed information relating to the soft landscape treatment.

4.4 The mounds are seeded with grass. Some areas on Mounds 1 and 2 are to be over-seeded with a wildflower seed mix to augment the amenity and ecological value of the grassland. These areas are located along footpaths, at entrances to the mounds and on banks to maximise the value of their role in the landscape. The species in the grass and wildflower mixes are provided on the drawings and described in section 3.

4.5 The locations of the woodland planting on Mounds 1 and 2 have been refined to reflect alterations made to the levels and footpaths. The location of the woodland planting on Mound 3 remains as set out in the planning consent. The location of the larger tree planting (standard trees) is identified on the drawings.

### Footpaths

4.6 The footpaths on Mounds 1 and 2 have been refined so that they are at gradients which maximise the accessibility of the area. Stepped ramps are used for alternative routes to enable the steeper slopes to be explored. The gentle gradients of Mound 3 mean that stepped ramps are not required at this location. Further details of the self-binding gravel footpath and stepped ramp are provided in drawing numbers 905/52 and 905/53.

4.7 The footpaths will be created shortly before the areas are opened to the public as the footpaths are not required before this point.

## 5 Details of the Borrow Area

- 5.1 Planning condition 18 requires the provision of details for the Borrow Area. The location of the Borrow Area is shown on drawing number 905/45 and the proposals for its landscape treatment and phasing stages are shown on drawing number 905/49. Supplementary information to that already provided in section 3 is provided below.

### Phasing stages

- 5.2 The area will receive its final landscape treatment in three phases as the works progress. The phasing stages move from east to west across the Borrow Area. The first stage is 0.38ha of the eastern part of the Borrow Area; the second stage in the central part of the Borrow Area is 0.35ha; and the final stage to the west, and including the access road along the southern boundary, is 1.41ha.

### Levels

- 5.3 Finished levels of the Borrow Area are to be the same as the existing levels. The area is a steep south facing slope with gradients ranging from 1:4 to 1:15. The area rises 25 metres from 19 metres AOD in the eastern corner to 44 metres AOD in the north western part of the area.

### Soft Landscape Treatment

- 5.4 The area will be seeded, in a phased manner, with a grass seed mix which is suitable for pasture and resembles the existing grassland. The grass will be cut until it is returned to agricultural use.

### Footpaths

- 5.6 The public will be able to walk across the grass field giving them access from the surrounding country lanes to the crest of the Borrow Area.

## 6 Details for Boghall and Central Meadows

6.1 Planning condition 19 requires the provision of details for Boghall Meadow and Central Meadow. The locations of Boghall and Central Meadows are shown on drawing number 905/45 and the proposals for their landscape treatment are shown on drawing numbers 905/50 and 904/51 respectively. Supplementary information to that already provided in section 3 is provided below.

### Levels

6.2 Boghall and Central Meadows are slightly raised areas of grassland. They are approximately 1 metre above existing ground levels. The proposed levels generally reflect the underlying terrain. Localised regrading of the existing ground levels will take place as the remediation operations remove engineered slopes. The landscape proposals further reduce some of the gradients and minimise opportunities for standing water to occur. The landscape proposals for Boghall Meadow have been extended further south to ensure the tip is comprehensively covered.

### Soft Landscape Treatment

6.3 The areas will be seeded with a grass seed mix which will be maintained as meadow grass with two cuts a year. Some areas are to be over-seeded with a wildflower seed mix to augment the amenity and ecological value of the grassland. These areas are located along footpaths, at entrances to the areas and on banks to maximise the value of their role in the landscape. The species in the grass and wildflower mixes are provided on the drawings and described in section 3.

### Footpaths

- 6.4 At Boghall and Central Meadows there are two types of footpaths. The main footpaths are reinforced with self-binding gravel and are 1.8 metres wide. The secondary footpaths are tracks of short grass mown through the meadows.
- 6.5 At Boghall Meadow the main footpath forms an arch around the site linking into the adjacent road. A secondary footpath meanders through the meadow to facilitate exploration of the area by the public.
- 6.6 At Central Meadow the main footpaths provide access across the site linking opposite corners and exploring the gentle ridge of the area. These footpaths provide reasonably direct routes across the area, gently meandering to explore the subtle topography of the site. A secondary footpath forms a loop within Central Meadow to allow people to explore the area.
- 6.7 The footpaths will be created shortly before the areas are opened to the public as the footpaths are not required before this point.

Appendix 1  
Bird Management Plan

# **ROYAL ORDANANCE BISHOPTON**

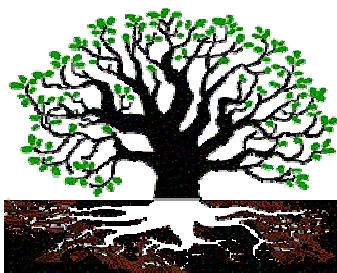
## **Remediation and Bulk Earthworks Planning Consent (Reference 09/0527/PP)**

Bird Management Plan  
(Revision B)

On behalf of

**BAE SYSTEMS**

## Ecological Restoration Consultants



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# List of Drawings

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# 1 Introduction

- 1.1 Detailed planning consent has been granted for the Remediation and Bulk Earthworks of the Royal Ordnance site at Bishopton, Renfrewshire (planning application reference 09/0527/PP). A number of planning conditions are attached to the consent including one relating to the need to provide a Bird Management Plan (BMP). The requirement for a BMP arises from the need to control the numbers of certain types of birds which could cause a hazard to aircraft using Glasgow Airport.
- 1.2 The planning consent includes the creation of temporary settlement ponds to trap silt generated from the remediation and bulk earthworks engineering processes. The location of the key temporary settlement ponds are shown on drawing 905/35. These temporary settlement ponds will form the bulk cut of the sustainable drainage system (SUDS) detailed in a separate planning consent (06/0602/PP). The detailed grading and aquatic planting associated with the SUDS will be carried out under planning consent 06/0602/PP.
- 1.3 A number of supplementary temporary settlement ponds will be required to capture local surface water run-off from smaller areas of the site particularly where gradients are significant. There will be no more than 15 of these ponds at any one time, their surface area will not exceed 800m<sup>2</sup> and they will be linear in shape with a maximum width of 20m. These supplementary temporary settlement ponds will be subject to the management strategy set out in this document.
- 1.4 Separate BMP's are required for other planning consents pertaining to the site as set out below:
- Outline planning consent 06/0602/PP dealing with the expansion of Bishopton Community Growth Area and including the SUDS.
  - Detailed planning consent 06/09/0456/PP relating to the construction of a landfill facility.
- 1.5 A suite of water bird species has been identified, based on local records and observations and consultation with CSL (advisor to BAA), which are regarded as having potential to present a hazard to aircraft operating in and out of Glasgow Airport. The suite of species 'the water bird target group' are listed below.

Gulls	<i>Larus spp</i>
Canada Goose	<i>Branta canadensis</i>
Greylag Goose	<i>Anser anser</i>
Mute Swan	<i>Cygnus olar</i>
Cormorant	<i>Phalacrocorax cinerea</i>
Grey Heron	<i>Ardea cinerea</i>
Mallard	<i>Anas platyrhyncos</i>
Tufted duck	<i>Aythya fuligula</i>
Goldeneye	<i>Bucephala cangula</i>

- 1.6 Other species of dabbling and diving ducks, Coot and Moorhen may also present a less significant hazard although they are less numerous at Royal Ordnance Bishopton, or in the case of diving ducks Coot and Moorhen are more sedentary, and thus are less likely to cause an unacceptable risk. However, the main objective is to keep the number of water birds to the minimum wherever possible and because small numbers of less hazardous birds may attract other more hazardous species, the overall objective is to minimise the populations of all species of water bird.
- 1.7 The temporary settlement ponds have been designed in a way to make them as unattractive as possible to hazardous species of birds that threaten aircraft flight safety. These design principles are described below:

- Water bodies are either small or linear and no wider than 30m (WWT Wetland Advisory Service). Linear water bodies are much less attractive to gulls, swans and geese.
  - The perimeter of the water body will have a minimal number of bays, indentations and promontories which could provide sheltered refuges for water birds.
  - There are no islands because these would be used as refuge sites as they are protected from predators.
  - Water bodies will be maintained without fish and aquatic vegetation.
  - Any areas of grassland within 20m of the ponds will be managed as areas of long meadow grassland left uncut (except twice a year). This will reduce the attractiveness of these areas for feeding for swans, geese and ducks such as widgeon.
  - 1m high, high visibility fencing will be installed around each pond. This will be to restrict the bird's view of the water or view out of the water. This will deter species which prefer to use a shallow angle (i.e. 13-14°) to fly out of a water body (e.g. swans and several species of geese including Canada Geese). The fence will be located 1m from the edge of the pond so that there is space left for people to get out of the water in the event of an accident.
- 1.7 The implementation of the design principles may not completely deter the high risk 'target group' species and therefore it may be necessary to implement the following procedures. First to harass and scare away unwanted birds using regular and intensive disturbance, second to prevent the breeding of high risk species, and as a final resort to kill high risk birds by shooting. These techniques, particularly the latter ones, are unlikely to need to be deployed frequently due to the implementation of the design principles.
- 1.8 The specific objectives of the BMP are therefore, as follows;
- To minimise the population and where reasonably possible exclude birds belonging to the 'water bird target group' from the temporary settlement ponds and adjacent areas;
  - To minimise the numbers of other less hazardous species of water bird;
  - To conduct any other bird management operations which may be agreed with the BAA and the local management of Glasgow Airport, if any new hazard were to arise, not encompassed by the present BMP;
  - To regularly monitor bird populations, keep detailed records, provide a quarterly report and undertake an annual review and consequently amend the management strategy drawing on advice provided by the site owner's (or site operator's) consultant and the BAA.
- 1.9 A key principle of the BMP is that there should be no increase in the background population of the 'target group' species. Existing semi-natural aquatic habitats will not compromise this principle providing that they are kept mainly in their present condition. Failure criteria for each species (or group of species) are specified trigger level population numbers coupled with failure to reduce the population by normal dispersal procedures. A specific objective is to implement remedial action in the event of a failure and to deploy additional resources when required. The BMP is adaptive and flexible so that new or intractable bird problems can be managed successfully. Likewise birds that are shown to present a negligible risk over a period of time can be dropped from the species 'target group'.
- 1.10 The BMP has been prepared by Ecological Restoration Consultants with supporting advice on planning and landscape issued from Cass Associates.

## 2 Water Bird Management Strategy

- 2.1 Three phases of site development are recognised where the overall strategy and the tactics of bird dispersal will evolve as the physical characteristics of the site change and the bird habitats change. The three phases are described below. This BMP addressed the first stage only. The subsequent two phases are considered under the separate planning consent relating to the Bishopton Community Growth Area (reference 06/0602/PP).
- a) bird management during site clearance, site demolition and creation of landforms;
  - b) bird management during construction of residential areas and commercial buildings and following construction of SUDS ponds and reed beds in the period until the ponds are at hydrological equilibrium (full) and the reed beds have become fully vegetated with > 95% vegetation cover;
  - c) bird management post-completion, encompassing residential, commercial and public amenity areas including parkland and sports pitches.

### Bird Deterrent Techniques for the First Phase

- 2.2 A variety of bird deterrent techniques will be selected depending on the bird species to be dispersed. During site clearance, site decontamination and site formation including the creation of new landforms, there will be substantial regular disturbance which will deter most species of birds from using the site although gulls may be attracted to transient flashes and pools and open wet areas.
- 2.3 Once the temporary settlement ponds have been excavated and have filled with water they will be immediately attractive the 'target group' of water birds. The ponds could attract gulls, geese, dabbling and diving ducks, grey heron, and possibly cormorant. The full spectrum of dispersal techniques should be undertaken according to which techniques are more appropriate for any water birds which become present.
- 2.4 A fishery management policy will be necessary and will have to be agreed and undertaken in collaboration with SEPA. The objective will be to ensure that fish populations do not build up so that they attract Heron, Cormorant and Grebe. Heron are likely to be attracted from the nearby heronry and any increase in flights would be an increased hazard. If fish do colonise any of the temporary settlement ponds they will have to be removed, whether by draining the ponds or using electric fishing.
- 2.5 Measures may be required to prevent breeding of water birds at the ponds. A specific spring survey will be undertaken to detect nesting birds. Target species will be feral geese, swans and dabbling ducks. Eggs can be coated in liquid paraffin oil or given a lethal injection. This is preferable to destruction of nests because birds will often rebuild nests and lay another clutch of eggs. Physical removal of some birds such as feral geese can also be undertaken although public perception could be an issue.
- 2.6 Hand held laser equipment could be used to disperse water birds at dusk. Where there are views into the site, public perception could be a problem in the use of this technique. Shotgun, noise making devices or loud distress calls could also be used as a method of dispersal.

### Available Techniques for Bird Harassment and Dispersal

- 2.7 A range of harassment and dispersal techniques should be utilised. These rely mainly on visual or acoustic devices. Techniques which can be used by subcontractors are listed below. Appropriate advice on the correct use of the technique should be sought where necessary from experts (Food Environment Research Agency).
- Portable (hand held or vehicle mounted) distress call broadcasting units which are equipped with a standard set of calls (as used routinely at airports) will assist in the dispersal of Gulls, Corvids, Starlings, and Ducks.

- Eyespot balloons flutter tape, flags and streamers will give threatening visual stimuli over small areas. Birds such as geese quickly learn to ignore these devices so that their use is temporary. The devices should be moved daily to maintain their effectiveness.
- Noisemaking devices such as propane gas cannons, pyrotechnic pistols which fire shell crackers, whistle bombs or blanks will disperse geese, swan, ducks and gulls. However if these devices are used regularly birds become accustomed to the fear provoking stimuli.
- Low power long wavelength lasers (hand held models are available) may be used for dispersing roosting birds in low light (dusk). The spot of laser light is disliked by birds and elicits an avoidance response. Although the use of lasers is a relatively new technique which requires additional research, there is sufficient evidence available to demonstrate that the equipment is capable of dispersing gulls, Canada Geese, Mallard and Cormorant.
- If available properly trained dogs directed by a handler are an effective method of bird dispersal in large open areas. Border Collie is a useful breed for effective bird dispersal and regular harassment several times a day for one or two weeks causes water birds to move elsewhere.
- A shotgun with cartridges carrying shot suitable for humanely killing large birds such as Canada Geese and Greylag Geese, ducks or cormorant can be used outside operational hours (e.g. dawn/dusk) but during operational hours the firing of blank cartridges could be undertaken to reinforce lethal control measures.
- At certain times of the year it would be possible to catch feral geese and remove them from the site. Canada Geese moult every year during July and early August and at this stage have lost their flight feathers and thus would be easier to catch. Once caught the birds can be taken a substantial distance (>200km) before release or can be given a lethal injection by a qualified veterinary practitioner.

2.8 No single technique of bird dispersal will remain effective indefinitely. A combination of appropriate techniques which are rotated or varied in duration and timing will be required to prevent birds becoming habituated and then not responding to the harassment stimuli. It is recognised that static and automated delivery of dispersal mechanisms will only be effective for limited periods of time to disperse birds from relatively small areas and that the most effective bird dispersal and management will be achieved by human intervention.

### **Patrolling and Monitoring Bird Presence and Activity**

- 2.9 As soon as site works commence a competent ornithologist will be employed to undertake regular patrolling and monitoring of the entire site. Observations of adult birds will be undertaken regularly once per week. During the breeding season for each species in the 'target group' a check will be made at all the temporary settlement ponds to determine if breeding is occurring (nest building and egg laying). The monitoring ornithologist will inform the site operator and bird control contractors in order to undertake measures to prevent breeding of water birds or if the monitoring ornithologist possesses the relevant license they may undertake the appropriate control measures.
- 2.10 The frequency of patrolling may be reviewed formally following an annual report and adjusted to lesser or greater frequency depending on the evidence of bird occupancy, roosting, breeding or feeding activity and the assessment of significant bird strike risk.

### **Monitoring, Recording and Reporting Bird Numbers**

- 2.11 The numbers of each species or group (e.g. gulls) should be recorded on each bird patrol. The species included will be the 'water bird target group' listed under 1.4 plus other less hazardous dabbling and diving ducks, Coot and Moorhen (1.5). Notes on direction of movement of birds which fly in or out of the site should be made. Attempts to breed by target group species will be recorded and notified to the site operator so that

action to prevent breeding (e.g. coating eggs in paraffin oil) can be undertaken by the bird management contractor. Also recorded on each bird patrol will be date, time and duration, weather conditions, including wind speed and direction. Management actions to disperse birds will be recorded with details of bird species present, dispersal technique(s) used, success or failure of the bird dispersal action and action to prevent breeding plus number and location of nests. All bird count and other data will be regularly updated and available to Renfrewshire Council and Glasgow Airport Airside Operation showing bird counts, dispersal activities carried out and other bird management actions undertaken.

### **Licensing of Control Operations**

- 2.12 All of the bird species that may require dispersal action (the 'target group') are fully protected under the Wildlife and Countryside Act 1981, with the exception of water-fowl during the open season. For the purpose of protecting air safety, providing that they are not nesting or rearing young, they can be harassed by non-lethal methods at all times. However when it is necessary to undertake lethal control, destruction of nests and the taking or destruction of eggs, a special license is required. The relevant license, General License is granted by the Scottish Executive (after consultation with the Scottish Natural Heritage). The appropriate license(s) will be obtained before any new water bodies are created. It is expected that BAE Systems would be the licensee and would delegate to a subcontractor. Alternatively an appointed subcontractor can apply directly to the Scottish Executive. It will be necessary to obtain written evidence from any contracted bird control company that their staff have the necessary expertise to accurately identify the relevant specific bird species, have the necessary skill in the use of firearms and also full certification for their usage and have the appropriate Health and Safety policy.

### **Threshold Criteria which Trigger Management Action and Application of Failure Criteria**

- 2.13 Criteria are defined against which achievement of the objectives of the BMP can be judged. Threshold criteria are defined for particular species or species group covered by the 'target group' of water birds. Threshold criteria include bird numbers which will trigger a dispersal and deterrence response and commencement of breeding (nest building and egg laying) which will trigger actions to prevent breeding. Failure criteria are defined as a failure to disperse or remove birds belonging to the 'target group' or failure to prevent breeding.

#### ***Species Criteria***

##### **a) Gulls**

There will be zero tolerance of roosting, feeding or loafing by gulls (all species) at temporary settlement ponds. A group of more than 20 should be dispersed.

##### **b) Cormorant**

If more than 5 Cormorants are observed during a single patrolling episode on the temporary settlement ponds they will be dispersed.

##### **c) Canada Geese, Greylag Geese and Mute Swan**

There will be zero tolerance of breeding by feral geese and mute swan. Eggs will be oiled and/or nests destroyed. When the number of geese on the site exceeds 20, action will be taken to remove them from the site or to disperse them. This is particularly relevant to winter flocks which may arrive at the site suddenly and without warning, as well as sedentary geese which potentially occupy the site throughout the year.

##### **d) Grey Heron**

If more than 8 grey herons are observed during a patrol, action will be taken to disperse them.

### **e) Dabbling Ducks**

Based on existing knowledge there will be mainly Mallard, Tufted duck and Goldeneye but may include other species. There should be zero tolerance of breeding by all species of dabbling ducks which are present on the temporary settlement ponds. Dispersal would be necessary if the total number on the site were observed to exceed 50 during a patrol episode.

#### **Failure Criteria and Remedial Action**

- 2.14 Efforts to disperse birds may not always be effective using a single technique or a single (or several) attempt to disperse birds. Therefore criteria are given below which define when a failure occurs and when remedial action is required:
- Any failure to disperse or remove 'target group' birds when a period of 4 hours has elapsed after commencement of actions to disperse the birds;
  - When an average of more than 5 separate dispersal actions have been required against any particular 'target group' species (or species group) per period of 24 hours in any month.
- 2.15 In the event of a 'failure' as defined above, Renfrewshire Council and Glasgow Airport Airside Operations will be consulted and informed in writing within 7 days.
- 2.16 Remedial action in the event of 'failure' will depend on the individual circumstances of the failure event. This might involve investment in additional deterrent effort or if a particular temporary settlement pond was so attractive to water birds, then additional modification and management may be required.

#### **Liaison and Inspection**

- 2.17 The site owner/operator will allow access to nominated representatives of Renfrewshire Council and BAA to inspect bird management operations. Whilst the site is open, no notice will be required for visits. At other times, when the site is closed an agreed period of appropriate notice will be provided, to allow access.
- 2.18 The site operator/owner will meet with Renfrewshire Council annually to review the efficacy of the BMP and to make necessary changes. Renfrewshire Council may invite representatives of BAA/Glasgow Airport to attend the annual meeting. The BMP is adaptable and flexible and changes in target species, trigger thresholds, habitat management or use of deterrent techniques are all possible following assessment and annual review (or more frequently if required by the planning authority).

### **3 Conclusion**

- 3.1 The temporary settlement ponds have been designed to reduce their attractiveness to water birds to the maximum possible extent taking into consideration engineering requirements and human Health and Safety issues. It has not been possible to completely design out attractiveness to water birds and therefore this BMP will be implemented as soon as work commences on site and construction of the ponds is underway. The combination of the pond design and the BMP will ensure that there is no additional risk of bird strikes at Glasgow Airport created by the works associated with the remediation and bulk earthworks.