Appendix 18: Draft Bird Management Plan

Boffa Miskell

Smooth Hill Landfill

Bird Management Plan
Prepared for Dunedin City Council

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Cover photograph: [Smooth Hill landfill site, © BML, 2019]

Contents

1.0 Introduction

This document is a bird management plan for operation of the Smooth Hill landfill, located to the southeast of Dunedin Airport. It outlines operational procedures and bird control measures to employ at the site to reduce the attractiveness of the landfill to birds, especially black-backed gulls, and keep numbers to very low levels.

The plan is based on information provided in scientific (and unpublished) literature, landfill best practise documentation and communications had with personnel involved with other landfills in New Zealand. Adaptive management is encouraged and should be applied as necessary. For example, if a better way of undertaking a bird control technique is found, or learned through conversations had with other landfill personnel, then this should be applied so that bird control is maximised and conducted in the most effective manner.

Prior to the commencement of operation, this plan needs to be reviewed and updated as appropriate, and specific things must be organised and put in place. For example, a "bird control officer" must be assigned who is responsible for overseeing bird management at the site and is the "go to" person for people to report black-backed gull sightings and other bird-related observations to. A person must also be identified and trained who will be the marksman/shooter on site who will undertake shooting operations when black-backed gulls are observed on site (black-backed gulls are Not Threatened and are not protected under the Wildlife Act). This person must be trained in bird identification, have a gun license and must be registered with the Department of Conservation (DOC; among other things outlined in Section 3.1). Poison and other items required for bird control must also be sourced and ready for use on site. Health and safety documentation must also be prepared for specific activities that relate to bird control on site (e.g. shooting gulls, poison use, etc).

1.1 Background Information

1.1.1 Attraction of birds to landfills and bird strike risk with aircraft

A number of bird species are attracted to landfill sites, particularly scavenging species such as gulls. This is because landfills can provide a foraging opportunity for birds if waste is exposed and not managed well. Birds may also use landfill grounds for roosting and breeding (Centre for Advanced Engineering, 2000; ISWA Working Group for Landfill, 2010; Queensland Department of Environment and Resource Management, 2010; Ryder Environmental Limited, 2019; Stantec, 2019; Waste Management NZ Ltd, 2018). It is important that these bird foraging, roosting and breeding opportunities are reduced as much as possible at landfill sites as birds can be a nuisance to people in neighbouring properties (e.g. noise, fouling), can present a potential health risk (via the transfer of pathogens and contaminants) (Cook et al., 2008; Ryder Environmental Limited, 2019; Waste Management Institute New Zealand, 2018) and can increase bird strike risk with aircraft if the landfill is located near an airport (Belant et al., 1995; Cook et al., 2008; Ryder Environmental Limited, 2019).

Given the isolated, rural location of the Smooth Hill landfill, public nuisance and contamination effects are not of concern[1], however the risk of bird strike with aircraft is, given that the landfill is

[1] This is because there are few houses in close proximity to the landfill as a result of the rural context of the area, and bird control management and methods will minimise attractiveness of the landfill to birds and thereby further minimise potential nuisance and contamination effects.

approximately 4.5 km from Dunedin Airport and is within the Airport's flight fan (see Figure 1). It is therefore important to keep bird numbers to very low levels at the landfill. The species of most concern at the landfill is black-backed gull. This is because they are large, common birds that fly to and from the coast and Taieri Plains, including over and in the vicinity of the landfill site. They are also the species most attracted to landfills and are at risk from strike with aircraft. This plan, therefore, focuses on black-backed gulls and procedures/control methods to manage them at the site (refer to Appendix 1 for a gull species identification guide). With the implementation of good landfill operational techniques, bird management, monitoring and control, black-backed gull numbers can be kept to very low numbers[2] and therefore be subject to a negligible strike risk with aircraft (as concluded by Boffa Miskell (2020)).

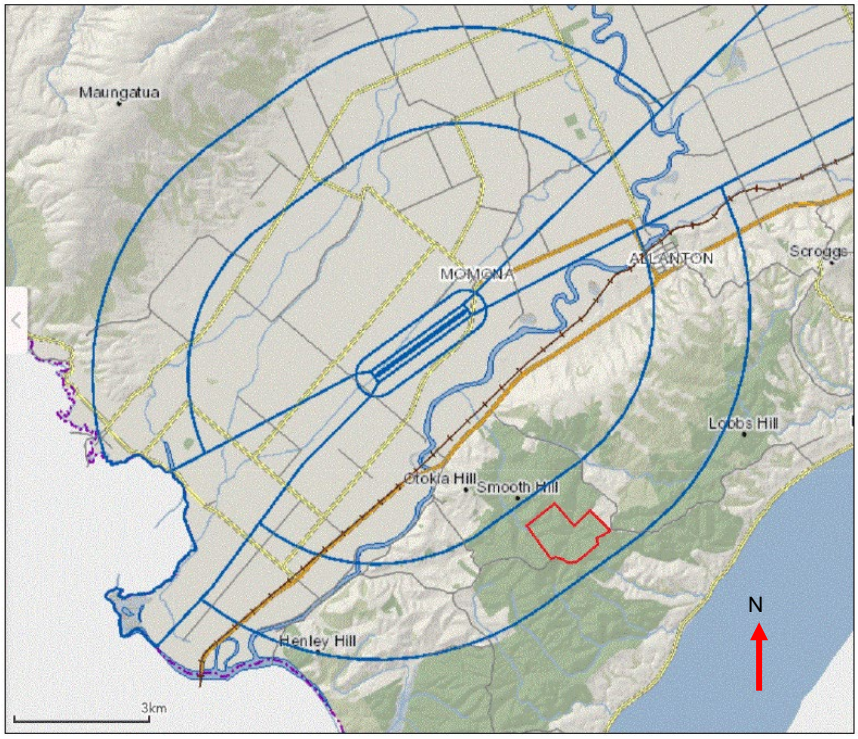

Figure 1. Dunedin Airport's flight fan (blue ovals) in relation to Smooth Hill landfill (red polygon). The two outer ovals are approximately 4 km and 6.2 km from the outer edge of the Airport's runway (blue rectangle).

1.1.2 Importance of this plan

It is critical that the operational procedures and bird control measures discussed in this document are applied well so that bird numbers are kept low at the landfill. This will require a high standard of operation, control, discipline and vigilance that needs to be maintained throughout the lifespan of the landfill. These standards must be applied by all people working on site and it is everyone's responsibility to keep an eye out for gulls at and around the landfill and to report observations to the Bird Control Officer. This unified and disciplined approach will reduce the attractiveness of the Smooth Hill landfill to birds and therefore keep gull numbers low. Furthermore, there will be regular communication with Dunedin International Airport to discuss bird numbers and coordinate management methods.

[2] Operational measures to reduce and manage black-backed gull numbers at the landfill will also be effective for other bird species that are attracted to landfills.

2.0 Operational Procedures

It is very important to establish and maintain effective operational procedures at Smooth Hill. If operational procedures are not conducted adequately, birds may become resident at the landfill and once birds are established and resident at a landfill, they are very difficult to get rid of. Therefore, the procedures outlined below must be executed to a high standard, and from the outset of operation of the landfill, and sustained throughout operation of the landfill.

2.1 Good daily cover

Providing good daily cover of the active tip face is the **most important operational procedure** to reduce the attractiveness of the landfill to birds as a food supply. Good cover results in no food being exposed, thereby denying birds a food source and minimising bird numbers at the site (Centre for Advanced Engineering, 2000; Environmental Protection Agency, 1997; ISWA Working Group on Landfill 2019, 2019; Queensland Department of Environment and Resource Management, 2010; Waste Management NZ Ltd, 2018).

The guidelines for daily cover provided in the Smooth Hill landfill management plan should be adhered to. In brief, daily cover involves spreading/grading and thorough compaction of waste at the tip face at the end of operation each day (Environmental Protection Agency, 1997; ISWA Working Group on Landfill 2019, 2019; Waste Management NZ Ltd, 2018). The entire active tip face is then covered with at least a 150 mm layer of soil that is compacted to seal and stabilise it (Waste Management NZ Ltd, 2018)[3]. The guidelines in the landfill management plan for intermediate and final cover must also be adhered to in order to reduce bird numbers at the landfill.

In addition to waste compaction and cover at the end of the day, if possible, all waste that could provide a food source to birds should be compacted and covered with soil on an ongoing basis throughout the day, particularly at areas where no more waste will be received that day (ISWA Working Group on Landfill 2019, 2019; Waste Management NZ Ltd, 2018). This will reduce the amount of time food is exposed to birds.

If black-backed gulls are observed at the landfill, extra vigilance and care must be taken when covering the tip face to make sure that it is thoroughly and evenly covered and is also well compacted.

If black-backed gulls persist at the site, cover thickness should be increased ((Centre for Advanced Engineering, 2000) and observations of the tip face must be made to see if/where birds are foraging. These areas can be then be targeted for additional compaction and soil coverage.

It is very important that the landfill's soil cover plan is abided by to ensure that an adequate supply of soil cover is always available and accessible on site (Waste Management NZ Ltd, 2018). Personnel involved in applying daily cover should also be made aware of the importance of this task, with respect to bird management and reducing strike risk with aircraft.

[3] Thorough waste compaction is very important as it makes the process of covering the waste quicker and is a more conservative use of soil as it reduces the total area over which soil needs to be spread. Grading the waste is also important. This is because it reduces the number of ruts and depressions in the tip face and therefore also reduces the amount of soil required for daily cover and the time required for this task.

2.2 Minimising the extent of the active tip face

The active tip face should be kept as small as is practicable to reduce the area where food may be available to birds (Centre for Advanced Engineering, 2000; Waste Management NZ Ltd, 2018). At Kate Valley landfill the active tip face is moved daily so that waste does not have to be pushed very far (R. Ward, pers. comm., February 24, 2020)[4]. This minimises open exposure to waste material and thereby reduces foraging opportunities for birds. If practicable, this practise should be employed at the Smooth Hill landfill.

2.3 Minimising open earthworks and pools of water

It is important to minimise open areas of earthworks around the landfill and to make sure that there are no hollows or depressions where water can pool as birds will use these areas to drink and clean themselves (ISWA Working Group on Landfill 2019, 2019; Waste Management NZ Ltd, 2018)[5]. Restored and non-operational areas of the landfill must also be checked regularly to make sure that there are no areas of exposed waste, or areas where water can pool. If detected, there areas must be graded, covered with soil, compacted and grassed.

2.4 Reducing barren areas

Barren areas around the landfill should be minimised by planting grass. The grass should be maintained at a minimum sward length of 200 mm, but preferably at approximately 300 mm. This will reduce the attractiveness of the area to birds for roosting and nesting and make it more difficult for birds to land and take off. Birds may also be fearful of predators where long grass is present (ISWA Working Group on Landfill 2019, 2019).

3.0 Bird Control Methods

In addition to operational control procedures, a number of bird control measures can also be employed to reduce bird numbers on site.

Based on conversations had with personnel involved with other landfills in New Zealand, **the two most effective bird control measures are shooting/scaring birds and setting out poison**. However, there are a number of other control measures that can also be used on site.

The most effective control strategy primarily involves shooting and poisoning birds, with occasional use of other control methods (Centre for Advanced Engineering, 2000; ISWA Working Group on Landfill 2019, 2019; Waste Management NZ Ltd, 2018)[6]. These methods should be used randomly so that birds are continually unsure of the type of danger they are being exposed to and may react by relocating away from the area. It is important that these alternative control methods are not used all the time but sparingly, randomly and only as needed (i.e. if birds persist at the site after poisoning and shooting operations) (Cook et al.,

[4] Some landfills only have one tip for up to one to two years. This results in waste being pushed large distances and increases exposure to birds.

[5] The stormwater attenuation basin on site will be dry most of the time.

[6] This method was also endorsed by a conversation had with the regional manager of Canterbury Waste Services (R. Lord, pers. comm., February 24, 2020).

2008; ISWA Working Group for Landfill, 2010; Waste Management Institute New Zealand, 2018). This will increase their effectiveness as they will present a more novel danger to birds in the area and should increase the chance of birds leaving the area and seeking safer foraging sites. The longer a technique is used the less successful it generally becomes because birds can become habituated to it.

Birds cannot be allowed to establish at the site, as once resident at a site it can be very difficult to get rid of them (R. Ward, pers. comm., February 24, 2020; P. Withers, pers. comm., February 19, 2020). Therefore, the key to bird control is being vigilant, disciplined and proactive with regards to control, so that appropriate control actions can be implemented or changed in response to changes in bird numbers. Vigilance is particularly important during the egg laying stage of the black-backed gull breeding season (egg laying broadly occurs between the start of October and end of January) as this is the time when they are looking for nesting sites and laying eggs. Bird control responsibility needs to be assigned to someone on site (i.e. a "Bird Control Officer") and it will be their responsibility to manage the control response. However, everyone on site must work as a team and immediately alert the Bird Control Officer when black-backed gulls are observed on site and if observations are made of birds becoming habituated to a control technique.

3.1 Shooting

Shooting is an effective measure to scare birds from landfills (Centre for Advanced Engineering, 2000; ISWA Working Group on Landfill 2019, 2019; Waste Management NZ Ltd, 2018).

Whenever black-backed gulls are observed at the landfill, operators must report the number of birds seen and their location to the Bird Control Officer. Based on the numbers observed and how frequent recent gull sightings and shooting operations have been, the Bird Control Officer will determine if a shooting operation is required[7]. If required, the landfill's designated shooter/marksman will be contacted to undertake the shooting operation[8]. This is time sensitive and must be conducted at the earliest opportunity it is safe to do so. It is recommended that a high-powered .22 gun is used during these operations (R. Ward, pers. comm., February 24, 2020).

Prior to an operation commencing, a positive identification that the birds are black-backed gulls must be made. This is critical because black-billed gulls (a protected Threatened species) and red-billed gulls (a protected At Risk species) look superficially similar to black-backed gulls and it is possible that these species may be incorrectly identified as black-backed gulls. It is unlikely these species will be present at the site (as concluded by Boffa Miskell (2020)), but nonetheless species identification must be confirmed before a shooting operation is initiated. A species identification guide is provided in Appendix 1.

During a shooting operation, bird strike rates are likely to be low, but nonetheless the shots fired should scare birds away from the area. If birds are killed, the number shot (and date of kill) must be recorded in a register of birds killed (see Section 4.0).

Anecdotal evidence from Kate Valley landfill suggests that hanging up bird carcasses in strategic places around the landfill may deter other black-backed gulls from the area (R. Ward,

[7] Given that strike rates are likely to be low during a shooting operation, if such operations are conducted too frequently, birds may become habituated to this control method. If only a few birds are sighted and a shooting operation hasn't been conducted recently, then an operation should proceed. However, if there are many birds and a number of operations have been conducted recently, then it may be more effective to use a different bird control technique.

[8] Black-backed gulls are a native species that have threat status of Not Threatened. They are not a protected species.

pers. comm., February 24, 2020). It is recommended that this is attempted at the Smooth Hill landfill.

Although black-backed gulls are not protected under the Wildlife Act, it is recommended that before commencement of operation of the landfill, conversations are had with the Department of Conservation about the intention to shoot black-backed gulls observed at the site. People who own properties in the vicinity of the Smooth Hill landfill should also be informed that shooting may occur from time to time at the landfill, so they are not alarmed when they hear shots.

It is critical that a comprehensive health and safety plan is prepared and abided by that documents the procedure to follow when undertaking shooting operations during operational hours. There must also be appropriate documentation about gun security, maintenance and safe use of firearms. The shooter must have a valid firearms licence and must also be a licensed shooter registered with the Department of Conservation.

3.2 Poisoning

If black-backed gulls remain at the landfill after a shooting operation, or they are too far away to shoot, then poison should be set. This involves putting out plain bread where the birds are observed for three to four days, then applying an appropriate bird poison to the bread (R. Ward, pers. comm., February 24, 2020). The baited bread must not be set by water and it should only be laid during calm weather, as windy conditions may blow poisoned gulls away from the area into neighbouring properties (Bell & Harborne, 2018).

A recommended poison is Pestoff Bird Control Paste (it is also known as Alpha Bird Paste)[9]. This product is supplied by Animal Control Products Ltd and can be bought from rural merchants. The paste needs to be liberally applied to the bread and then set in the areas frequented by the gulls. The poison is more effective at lower temperatures, therefore, the baited bread should be laid out as close to dusk as possible (particularly in summer; this is less important in winter) (Bell & Harborne, 2018). For birds the LD_{50} (lethal dose) is 32-56 mg/kg B/W[10]. This poison does not kill the birds but renders then incapacitated, therefore following a poisoning operation regular checks need to be made for incapacitated birds and they need to be humanely dispatched. Poison should only be set if no black-billed gulls and red-billed gulls have been observed at the landfill for the past three to four days.

The paste is a harmful substance, therefore a health and safety plan must be prepared and abided by when using this substance. The chemical safety datasheet for this product is provided in Appendix 2.

Alphachloralose, the active ingredient of the paste, can persist in the tissue of poisoned birds which can result in secondary poisoning of scavenging birds such as hawks. Therefore, after a poisoning exercise, dispatched birds must be collected and appropriately disposed of.

It is recommended that prior to conducting a poisoning operation that discussions are had with the Department of Conservation regarding this control method as well as adjacent landowners in case any poisoned birds end up on their properties. Appropriate signage should also be installed on site and should remain in place until toxic baits and poisoned gulls are retrieved. Appropriate approvals and Approved Handler Test Certificates must also be gained for the operation and poison handling (Bell & Harborne, 2018).

[9] This poison is used at Kate Valley landfill.

[10] The average weight of a black-backed gull is approximately 1 kg, therefore to be conservative, 56 mg should be used per piece of bread to achieve the LD_{50}.

3.3 Anti-roosting strips on buildings

To prevent birds landing and roosting on buildings at the landfill, anti-roosting strips/bird spikes should be fixed to the rooves of the buildings prior to the commencement of operation of the landfill (Queensland Department of Environment and Resource Management, 2010; Waste Management NZ Ltd, 2018). Appropriately sized spikes should be installed to deter gulls[11].

3.4 Other potential control options

3.4.1 Use of special kites / predator decoys

At some landfills, special kites are used that are realistic models of birds' natural predators (Centre for Advanced Engineering, 2000; Environmental Protection Agency, 1997; ISWA Working Group on Landfill 2019, 2019; Queensland Department of Environment and Resource Management, 2010; Waste Management NZ Ltd, 2018). Given that eastern falcon, an avian predator, uses habitats at and around the Smooth Hill landfill site, kites should not be used. This is because falcon are a natural avian predator and because the use of kites that resemble falcon may disturb the falcon and cause them undue stress. However, if operation of the landfill disturbs falcon and displaces them from the landfill site (which represents a small component of their extensive home range and as such would have a negligible effect on the birds), then the use of kites that resemble falcon could be investigated and implemented at the landfill. Prior to this occurring, falcon monitoring would need to be conducted at the site (refer to Section 5.0) and the use of falcon kites must be discussed with a suitably qualified and experienced ornithologist with local and falcon-specific knowledge, and the Department of Conservation to determine if it is a suitable control method to employ at Smooth Hill[12].

3.4.2 Sonic bird scaring devices

Sonic bird scaring devices use bird's own alarm and distress calls, as well as bird predator sounds, to deter birds from an area (Centre for Advanced Engineering, 2000; Environmental Protection Agency, 1997; ISWA Working Group on Landfill 2019, 2019; Queensland Department of Environment and Resource Management, 2010). Such devices can be used occasionally and for short periods of time at the landfill to project audios of black-backed gull alarm and distress calls; it is important that only these call types are played as other calls may attract birds to the area. It is not necessary to play predator calls (falcon) as falcon are already present in the surrounding area.

3.5 Colony Control

Black-backed gull colony control is occasionally conducted at some airports and by DOC to manage bird populations. If black-backed gull numbers at the landfill are increasing, despite the implementation of operational and control procedures, then colony control is something that could be investigated and potentially implemented. This would involve locating black-backed gull colonies closest to the landfill and culling birds and/or breaking or pricking eggs. Prior to this occurring, discussions would need to be had with DOC, and possibly the Otago branch of the

[11] The following website has an example of anti-roosting strips that are appropriate to deter gulls, https://www.pestrol.co.nz/buy-online/pestrol-bird-spikes/.

[12] The use of falcon kites should also be discussed in the Falcon Management Plan.

Ornithological Society of New Zealand, to determine their receptiveness to this activity and potentially for help locating colonies and assisting in undertaking this control. It must be noted that culling black-backed gulls may not be perceived favourably by some members of the public, however it is an effective control method. Note that culling is only appropriate for black-backed gulls; it is not appropriate for the protected red-billed gulls or black-billed gulls that are At Risk and Threatened species, respectively. These species, however, are unlikely to utilise the Smooth Hill landfill.

4.0 Bird Management and Control Registers

During operation, a number of registers should be kept updated regarding the use of bird control measures and their effectiveness. Black-backed gull observations at the landfill should be recorded as well as the numbers shot and poisoned. The following registers are recommended:

- The number of black-backed gulls observed at the landfill;
- The number of black-backed gulls killed by shooting;
- The number of black-backed gulls killed by poison;
- The date/s bird control measures are implemented and the duration of implementation;
- A success register that documents how effective bird control measures are/were; and
- Sightings of falcon at or near the landfill (this will help inform if it is appropriate to use falcon decoys as a potential bird control option).

These registers, which can be combined into one spreadsheet, will help keep track of what bird control methods have been used at the site (including their frequency) and how successful they have been. This information can be used to inform what techniques to use at the site to maximise the effectiveness of bird control and keep bird numbers, and thereby strike risk, to very low levels.

5.0 Bird Monitoring

5.1 Biannual bird surveys

In addition to daily observations for gulls at the landfill, formal biannual bird surveys should also be conducted at the landfill, one in summer and one in winter. It is recommended that these surveys should be 30-minute point count bird surveys conducted at one nearby vantage point overlooking the landfill. Each survey should be conducted by an ornithologist (bird expert) and should be conducted over two consecutive days (once in the morning and once in the afternoon to capture temporal variation in bird activities). During the surveys, data should be collected for each bird, or flock of birds observed, and should include the following:

- Species;

- Number of birds;
- Distance from the observer (m);
- Direction of bird movement;
- Maximum flight height (m);
- Average flight height (m);
- Minimum flight height (m);
- Behaviour displayed (e.g. traversing the site, roosting, short flight, etc);
- Time of observation;
- Location (e.g. pine forest, native gully, landfill area); and
- Any other observations of interest.

Weather conditions should also be noted at the start and end of each survey and should include:

- Visibility (e.g. sunny, partly cloudy, overcast, etc);
- Cloud cover (as a percentage of the sky);
- Precipitation (e.g. none, drizzle, light, heavy etc);
- Temperature (°C);
- Wind strength; and
- Wind direction.

An example of a point-count datasheet that includes all of these data fields is provided in Appendix 3.

Binoculars should be used during these surveys to enhance vision and aid species identification.

This survey data will provide information on bird species diversity and abundance at the landfill site during operation. These data can be compared to the baseline/pre-construction data collected for the landfill as part of the consent application, to determine whether the avifauna community assemblage and abundance has changed since operation of the landfill. If so, appropriate bird control measures can be implemented accordingly.

6.0 Review and Updating of the Plan

This bird management plan is a dynamic document that is to be prepared and reviewed biannually (halfway through the year and at the end of the year) for the first few years of operation and then annually thereafter if birds are successfully kept at low numbers. The plan should be prepared by the Bird Control Officer and reviewed by the Landfill Environmental Officer (or another equivalent person).

The plan is to be updated based on lessons learned on site, bird numbers at the site, and new information available in landfill bird management literature. It is also recommended that regular communication is had with other landfills to get up-to-date information about what techniques they are using and which bird control techniques they are having most success with. Regular communication should also be had with the Wildlife Officer (or equivalent person) at Dunedin Airport to remain informed on bird numbers and trends at the Airport and what bird deterrence and control mechanisms are most effective. Information collated from these communications should be incorporated into the bird management plan during the biannual reviews.

During operation, this bird management plan should include a section on bird monitoring results, the number of black-backed gulls observed on site, control methods employed and how successful they have been. This should be updated during each plan review so that it can be determined which control methods are the best at reducing bird numbers; these methods can then be employed thereafter to maximise control.

7.0 Summary of Key Messages

- A Bird Control Officer must be appointed by the landfill operator to oversee bird management at the landfill.
- It is critical that good operational procedures and bird control measures are used during operation of the Smooth Hill landfill (right from the onset of operation) to reduce the attractiveness of the site to birds. This will keep bird numbers to very low levels and thereby reduce the risk of bird strike with aircraft. There will also be regular communication with Dunedin International Airport to discuss bird numbers and the coordination of bird management methods.
- The most important operational procedure is good daily cover of the active tip face.
- The most important bird control measures are shooting and poisoning of birds. Note that shooting is only appropriate for black-backed gulls and requires positive species identification before being conducted. Before both of these control methods are implemented, discussions should be had with the Department of Conservation.
- All staff on site must be familiar with the contents of this Bird Management Plan, their responsibilities with regards to reporting bird sightings and undertaking good operational procedures, and how to accurately identify black-backed gulls, red-billed gulls and black-billed gulls.
- Other operational procedures must also be implemented, and other bird control measures should be implemented randomly and occasionally to maximise effectiveness of the bird control strategy.
- It is crucial that birds are not allowed to become resident at the site. To prevent this from occurring, the operational procedures outlined in this plan must be executed to a high standard. This requires discipline and vigilance throughout the lifespan of the landfill. Furthermore, when implementing bird control methods, a proactive and responsive approach is required so that appropriate and effective methods are employed if and when needed.

- Bird management and control registers must be maintained that document observations of gulls at the site, bird control methods used and their success at reducing bird numbers.
- Formal biannual bird surveys must be conducted during operation of the landfill so that data on bird species diversity and abundance can be compared to baseline (pre-operation) data. This will help inform if the assemblage and number of birds has changed since operation of the landfill and will aid with the implementation of appropriate bird control methods.
- This plan must be reviewed and updated biannually so that it remains current and has the most up-to-date information about bird control options, and their relative effectiveness, so that the best bird management approach can be applied at the landfill.
- With implementation of the operational procedures and bird control methods outlined in this plan, black-backed gulls can be kept to very low numbers and therefore be subject to a negligible strike risk with aircraft.

8.0 References

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Appendices

Appendix 1. Gull Species Identification Guide

<table>
<tr><td colspan="2">Black-backed gull (Larus dominicanus)</td></tr>
<tr><td>Adult
 
Juvenile
  </td><td>The black-backed gull is a native, Not Threatened species.

They are large gulls that are ~60 cm in length and weigh ~1 kg.

Adults are black and white with a white head and underparts, a yellow bill and a distinctive black back.

Juveniles look different to adults. They are a mottled dull brown colour with dark brown eyes and bill.</td></tr>
<tr><td colspan="2">Red-billed gull (Larus novaehollandiae)</td></tr>
<tr><td>  </td><td>The red-billed gull is a native species that has a threat status of At Risk, Declining.

They are medium sized gulls with a pale grey mantle, back and wing coverts. They have a red bill, red legs (adults) and a white iris with a red eye-ring. Their main flight feathers are black with white tips.

The main way to distinguish them from black-backed gulls is their much smaller size. Red-billed gulls are ~37 cm in length, whereas black-backed gulls are ~60 cm in length. Red-billed gulls weigh ~240-320 g, whereas black-backed gulls are much heavier and weigh ~ 1000 g.</td></tr>
</table>

Black-billed gull (*Larus bulleri*)	
	The black-billed gull is a native species that has a threat status of Threatened, Nationally Critical. They are medium sized gulls with a pale back and grey wings, black legs and a black beak. Their flight feathers have white-tipped black margins and they have a white iris with a red eye-ring. They can be identified from black-backed gulls by their much smaller size. Black-billed gulls are ~35-38 cm in length, whereas black-backed gulls are ~60 cm in length. Black-billed gulls weigh ~230g, whereas black-backed gulls are much heavier and weigh ~ 1000 g.

Appendix 2. Chemical Safety Datasheet for Pestoff Bird Control Paste

Animal Control Products Ltd

Bird Paste

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SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name:	**PESTOFF BIRD CONTROL PASTE**
Synonyms:	Alpha Bird Paste
Supplier 1:	Animal Control Products Ltd
Street Address:	408 Heads Road Whanganui 4501 New Zealand
Telephone:	64 (0) 6 344 5302
Web site:	www.pestoff.co.nz
Emergency Telephone No:	021 919 624
National Poisons Centre:	0800 764 766

2. COMPOSITION / INFORMATION ON INGREDIENTS

Active Ingredient:	Alphachloralose 2.5% w/w
Other Ingredients:	Icing sugar, red fleck, oil, petrolatum
Active constituent:	2.5% (R)-1,2-O-(2,2,2,-Trichloroethylidene)-α-D-glucofuranose
Active Cas Number:	15879-93-3
Molecular Weight:	309.5
Molecular Formula:	$C_8H_{11}Cl_30_6$
Recommended use:	For the control of birds
Appearance:	A thick white paste with red aluminium fleck

3. HAZARDS IDENTIFICATION

This product is classified as a **HARMFUL SUBSTANCE.**

HSNO Approval Code: HSR001600

HAZARD IDENTIFIERS:	**Priority Identifiers** - Harmful. Keep out of reach of children. Ecotoxic. **Secondary Identifiers** - Warning. May be harmful if swallowed, inhaled or absorbed through the skin. When handling open containers or baits, wear protective gloves and overalls. Harmful to terrestrial vertebrates. Ensure domestic birds and animals and cannot be exposed to the toxin either through eating baits or through eating the carcasses of poisoned birds.
DANGEROUS GOODS CLASS:	Not classified as dangerous goods.
GENERAL REQUIREMENTS:	No special requirements. The product may be used only in accordance with label directions.

NOT CLASSIFIED AS DANGEROUS GOODS FOR TRANSPORT PURPOSES

4. FIRST AID MEASURES

Ingestion: If eaten, call a doctor. Keep patient awake and warm. Give patient stimulants if possible. Large doses may reduce body temperature to a fatal level.

Eye Contact: Wash eyes with copious amounts of water.

Skin Contact: Wash exposed area with soap and water.

Inhalation: Remove the person to fresh air and seek immediate medical attention. Signs of pulmonary oedema may be delayed for up to 48 hours after exposure. Give oxygen or artificial respiration if the patient has laboured or shallow breathing. Use mouth to nose rather than mouth to mouth.

Notes to Physician: Symptoms of poisoning are dilation of eye pupils, hallucination, possible trembling and involuntary muscle spasms.

5. FIRE FIGHTING MEASURES

Paste may be flammable if ignited. Use foam or dry powder to extinguish.

6. ACCIDENTAL RELEASE MEASURES

In the event of a spill, isolate the spill area and exclude all bystanders. Take all practicable steps to manage any harmful effects of a spillage including preventing paste from entering streams or waterways. Scoop spilled paste into secure containers. Recover any undamaged paste for later use by placing in appropriately labeled containers and dispose of spoiled paste as directed below. Use a broom with water and detergent to wash down the spill area after all spilled paste has been removed.

7. HANDLING AND STORAGE

When handling and laying baits, wear overalls and impervious rubber or PVC gloves. Do not eat, drink or smoke when using the product or handling open containers. Wash protective clothing and equipment daily after work. Remove protective clothing and wash hands and exposed skin thoroughly before meals and after any contact.

Store in original container, tightly closed, under lock and key and away from feed or foodstuffs. Keep out of reach of children.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Tolerable exposure limits (TELs) and environmental exposure limits (EELs) do not apply to these products.

Engineering Measures: Decontaminants are sluicing with large volumes of water.

Personal Protection Equipment: Operators using or handling the product in open containers must wear gloves and overalls. Do not smoke, drink or eat while handling the product. Wash hands, face and any exposed areas after use. Wash protective equipment after use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form / Colour / Odour: Thick white paste with red fleck.

Solubility in Water (g/L)	Not applicable
Decomposition Point (°C)	Not applicable

10. STABILITY AND REACTIVITY

Pestoff Bird Control Paste is stable and non-reactive under normal storage and use conditions.

11. TOXICOLOGICAL INFORMATION

Alphachloralose has an LD_{50} value of:

Rats and mice	300 - 400 mg/kg B/W.
Birds (various).	32 - 56 mg/kg B/W
Dogs	650 mg/kg B/W
Cats	70 mg/kg B/W

12. ECOLOGICAL INFORMATION

Use Pestoff Bird Control Paste only for the purpose indicated and in the manner prescribed by the label.

Alphachloralose may persist in the tissue of poisoned birds; thus presenting a secondary poisoning danger to carnivorous birds and mammals. Take steps to mitigate any potential non-target exposure by wildlife or domestic animals.

Improper disposal of excess pesticide is unlawful. If wastes cannot be disposed of by use according to label instructions, contact local Regional Council or the Hazardous Waste Consultant for guidance.

13. DISPOSAL CONSIDERATIONS

Container disposal: Dispose of empty containers by burning or burying. Bury unwanted or spoiled paste no less than 60cm deep.

14. TRANSPORT INFORMATION

Not classified as Dangerous Goods for Transport purposes. No maximum transport quantity.

15. REGULATORY INFORMATION

Registered Pesticide: V004001 (Pestoff Bird Control Paste)
HSNO Approval Code: HSR001600

16. OTHER INFORMATION

SPECIAL PRECAUTIONS & OTHER COMMENTS:

Wash hands after handling baits or animals that have been contaminated with Pestoff Bird Control Paste. Do not use poisoned or contaminated animals for food or feed.

This product is toxic to most wildlife. Birds and mammals feeding on carcasses of poisoned birds or animals may be killed. Take measures to minimise the chance of baits entering any body of water. Apply the product only as specified by its label directions.

Where practicable, the exposed bodies of all poisoned animals should be collected and destroyed by complete burning or deep burial

CONSULT NEAREST POISON CONTROL CENTER FOR CURRENT INFORMATION.

All information contained in this Data Sheet is as accurate and up-to-date as possible. Since Animal Control Products Ltd. cannot anticipate or control the conditions under which this information may be used, each user should review the information in the specific context of the intended application.

Revised by: AD Courtney
20 March 2019

Appendix 3. Example of a Point-Count Datasheet

Smooth Hill

POINT COUNTS

Site:..... **Date:**..... **Page Number:** .....

Observer: ..... **Start Time:**..... **Finish Time:**.....

Weather	Visibility	Cloud Cover	Precipitation	Temperature	Wind Strength	Wind Direction
	0. Fine / sunny **3.** Heavy cloud **1.** Partly cloudy **4.** Mist / fog **2.** Overcast **5.** Rain	(as % of sky)	**0.** None **3.** Light **1.** Dripping foliage **4.** Moderate **2.** Drizzle **5.** Heavy	**0.** Freezing (<0^0C) **3.** Mild (11-16) **1.** Cold (0-5) **4.** Warm (16-22) **2.** Cool (5-11) **5.** Hot (>22^0C)	**0.** Calm **3.** Fresh wind **1.** Light breeze **4.** Strong wind **2.** Moderate breeze **5.** Near gale	(N, S, E, W, NE, SE, NW, SW)
Start						
Finish						

	Species	Number of birds	Distance from observer	Direction from observer	Direction of bird movement	Maximum Height	Average Height	Minimum Height	Behaviour (see codes)	Time	Location	Crossed site? Y/N	Notes
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													

Behaviour 1= Traverse; 2= Depart; 3=Arrive; 4=/short flight; 5=Feeding (ground); 6= Feeding (air); 7=Feeding (canopy); 8=Heard not seen; 9= Swimming; 10= Other discuss; 11= Resting; 12= singing/calling

Location P=Paddocks/Pasture; R=River; PF=Pine Forest; NF=Native Forest; Other=Discuss

 # PTO for notes on other birds

Notes on other birds

Site: ..... **Date:** …… **Page Number:** .....

General notes	Behaviour codes

About Boffa Miskell

Boffa Miskell is a leading New Zealand professional services consultancy with offices in Auckland, Hamilton, Tauranga, Wellington, Christchurch, Dunedin and Queenstown. We work with a wide range of local and international private and public sector clients in the areas of planning, urban design, landscape architecture, landscape planning, ecology, biosecurity, cultural heritage, graphics and mapping. Over the past four decades we have built a reputation for professionalism, innovation and excellence. During this time we have been associated with a significant number of projects that have shaped New Zealand's environment.

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