



GUIDING SOLUTIONS IN THE
NATURAL ENVIRONMENT

Integrated Gull Management Plan Waste Management of Canada Corporation West Carleton Environmental Centre

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Table of Contents

	page
1. Background	1
2. Goal and Objectives	2
3. Methods.....	2
4. Existing Conditions.....	3
4.1 Ottawa Waste Management Facility	3
4.2 Gull Use of Adjacent Sites	5
4.3 Annual Gull Movements	7
4.4 Ottawa Gull Movements.....	7
5. Approach to Wildlife Management.....	8
6. Design and Operation	9
6.1 Active Tipping Face.....	9
6.2 Surface Water	9
6.3 Other Landscaped Areas and Litter Management	10
6.4 Compost Facility.....	10
6.5 Buildings.....	11
7. Deterrents	11
7.1 Pyrotechnics.....	11
7.2 Propane Cannons	13
7.3 Lethal Reinforcement.....	13
8. Staffing and Communication.....	14
9. Training Program	15
9.1 Responsibilities	16
9.2 Training	16
10. Monitoring and Review	17
11. Permit Requirements	18
12. Performance Criteria and Contingency.....	19
13. Summary	20
14. Disclaimer	22
15. Cited References	22

Tables

Table 1. Gull Numbers at Carp Road Waste Management Facility	4
Table 2. Total Numbers of Gulls at Survey Sites.....	6
Table 3. Summary of the IGMP	20

1. Background

A baseline study was conducted in 2006 for the Ottawa Waste Management facility (Ottawa WMF) to establish if a hazard to air traffic is created by birds that are attracted to the facility. These investigations were undertaken in preparation for an upcoming Environmental Assessment (EA) for the proposed expansion of the landfill facility. That study found that based on gull activity at the facility, local gull movements and aircraft flight patterns observed created a potential hazard to safe aircraft operations at the Carp airport (located to the north of the landfill). The extent to which the landfill was solely responsible for gull numbers in the area was considered to be debatable. However, based on the gulls observed on the landfill, the study established the site as a significant gull attractant. In 2006, Beacon Environmental Limited (Beacon) was retained to monitor gull use of the landfill, to review the gull management program that is in place and to discuss its effectiveness and to identify gull management opportunities at the site that should be considered for an Integrated Gull Management Plan.

In 2007, Beacon was retained to prepare an Integrated Gull Management Plan (IGMP) for the Ottawa WMF based on the information previously compiled by Gartner Lee Limited and additional field data collected by Beacon staff. Although gull management measures were being implemented, a formal management plan was required to ensure the continuance and effectiveness of the management program.

Beacon prepared a plan which integrated data previously compiled in earlier stages of this project on gull activities by season and time of day. The IGMP included recommendations for facility design and operational activities as well as passive and active management techniques to be employed at the landfill. This plan was implemented in 2009 and was ongoing until the facility closed in September 2011. Prior to 2009 the facility's wildlife management consisted of active management using scare tactics on an as needed basis. The wildlife management was reactive to bird activity on the site.

The facility, now the West Carleton Environmental Centre (WCEC), is undergoing a provincial process to develop a new landfill footprint to provide waste disposal capacity at the WCEC. At the new facility the operator anticipates receiving an average of 400,000 t/yr of waste over a ten year period. This will consist primarily of Institutional, Commercial, and Industrial (ICI) waste, as well as residential waste and 'special' waste. Special waste consists primarily of soils that may be used for daily cover or interim cover. The putrescible waste that is being brought to the landfill will be mixed-in with waste picked-up from ICI customers, and will not be brought to the facility as part of a separate waste stream (AECOM 2012).

The proposed facility is not planned to initially accept any residential or household putrescible waste, although this may occur in the future.

In terms of the organics processing facility proposed as part of the WCEC, this will only be leaf and yard waste, not putrescible food wastes.

Due to the changes at the site, including reduced tipping levels, altered waste stream, implementation of the Gull Management plan, changes to facility design, and reduced gull use of the site as a result of these changes, the original plan has been reviewed and amended and this document is the result of

that review. Wildlife management requires ongoing monitoring and adaptation to changing conditions to ensure the success of the program.

2. Goal and Objectives

In 2009, an IGMP was implemented at the Ottawa WMF (now closed). The Plan included both active and passive management techniques that were employed by the operator, Waste Management (WM), on a daily basis in order to reduce the number of gulls using the facility.

A full-time wildlife management officer was employed who was responsible for minimizing the number of loafing and feeding gulls at the facility. Through the implementation of the recommendations contained in the IGMP, the landfill was able to successfully reduce the birds using the facility. Data recorded by the Wildlife Management Officer at the landfill, and correspondence with management at the Carp airport indicate that there was a drop in gull use at the landfill after the program was initiated.

The goal of this project is to provide an updated IGMP for the WCEC that addresses the changes to facility design and waste stream at the facility and ensures the continued effectiveness of the program. This will help to ensure that the bird strike hazard for aircraft using the nearby airport will not increase as a direct result of the WCEC and associated activities at the subject property.

The objectives of this study are to:

1. Prepare an updated Integrated Gull Management Plan that includes the new facility design and operational activities, as well as active wildlife management techniques, that will be employed to manage gull use;
2. Ensure that the persistent specific use of the site by large numbers of gulls for feeding and loafing does not occur;
3. Ensure that hazardous overland flightlines to roost sites, or other gull attractants in local environment to and from the landfill do not persist; and
4. Establish performance criteria following the implementation of the IGMP.

3. Methods

The following section details the primary sources of background material. The literature review focused on documents that provided information on the occurrence and movements of gulls in the study area, as well as those that documented methods of gull management. Data consulted included a review of current gull control methods used at Canadian landfills; a review of operations and management plans for the landfill area, including sites plans, daily operations, staffing and long-term site management; and information from nearby gull attractants (e.g., Trail Road waste management facility, agricultural land uses).

Studies previously completed by Gartner Lee Limited and AECOM formed the basis for background research in addition the report entitled *Carp Gulls – Ottawa Waste Management Facility Gulls* (Beacon Environmental 2006).

This review also involved consultation with landfill management personnel and Carp Airport operators to gain additional relevant information. This will assist with developing the plan and will help with the design, the monitoring and control programs.

A single field visit was conducted in November 2011 in order to identify any changes to the landfill operations and to record observation of gull activity at and in the immediate vicinity of the site. This was a confirmatory visit and no detailed or seasonal field investigations were undertaken as part of this update. Given the level of field surveys conducted previously at the Ottawa WMF and in the surrounding area, a single visit was sufficient to confirm movement patterns and feeding, and roosting sites remain unchanged in the surrounding environment. Given that the Ottawa WMF is currently closed, counts would not accurately reflect gull use at the site.

4. Existing Conditions

The following sections detail the existing gull movements and behaviours documented to occur in the Ottawa area based on existing information and field reconnaissance visits.

4.1 Ottawa Waste Management Facility

The Ottawa WMF (now part of the WCEC) was visited on 11 dates between March 28th and October 23rd 2006 (**Table 1**). Numbers of gulls varied widely depending on factors such as season and management activity (see discussion). The highest single occasion number recorded was 1,000 (on October 21, 2006) and the lowest was zero (on April 29, 2006). Generally, higher total numbers of Ring-billed Gulls were recorded in the spring and higher numbers of Herring Gulls in the late fall. **Table 1** provides a summary of sample gull numbers on the landfill during the time of field investigations. Given that the WCEC will be receiving IC&I waste mixed with some putrescibles, we have made the conservative assumption that the gull numbers at the new facility will be similar to those recorded at the Ottawa WMF prior to the implementation of a management plan.

A confirmatory site visit was conducted on November 22nd, 2007, Carp Road waste management facility (WCEC) staff responsible for gull management were not aware that counts were being undertaken on this day. Beacon Environmental staff did not record any gulls on the landfill at the time of the visit. At this time the amount of waste being transferred to the facility had been reduced to 150 tonnes per day from 1,600 tonnes per day and was largely non-residential in nature. In addition the Ottawa WMF was implementing *ad hoc* active management of the gulls on site including the use of propane cannons.

Table 1. Gull Numbers at Carp Road Waste Management Facility

Date	Total Gulls	Ring-billed Gull			Herring Gulls			Other Gull Species		
		Adult	Juvenile	Immature	Adult	Juvenile	Immature	Adult	Juvenile	Immature
March 28, 2006	500	500								
April 2, 2006	700	500			160		40			
April 3, 2006	470	400			60		10			
April 29, 2006	0									
April 30, 2006	201	40			70		90			1
July 19, 2006	8	4			3		1			
August 1, 2006	50	50*								
October 2, 2006	60	40*			20*					
October 21, 2006	1,000				1,000*					
October 22, 2006	626	1			515	60	30	14	0	6
October 23, 2006	85	0			70	5	10			
November 22, 2007	0									

Note: *Gulls were not aged, all were counted as adults.



Photograph 1. Tipping face April 3, 2006; propane cannon visible in upper right

4.2 Gull Use of Adjacent Sites

Table 2 presents a sample of the gull numbers observed at nearby sites including the Trail Road waste management facility, the Carp Airport, the adjacent fields, waste transfer station and quarry for comparison. Surveys were not conducted on nearby waterbodies; however with the abundance of open water in the vicinity of the Ottawa WMF it is expected that the baseline number of birds in the area would be high. For practical purposes, it is assumed that most of the gulls in the other survey locations are probably loosely associated with the subject property.

In general there were very low numbers of gulls at the airport. Gulls were generally not observed on the ground at the airport. A discussion with Ray Kachariuk, Airport Manager, at the Carp Airport (November 24, 2011) indicated that gulls are not a problem for the airport. Ray indicated that gull numbers in the airport environment decreased about four years ago, which roughly coincides with the implementation of the IGMP. The airport further indicated that they do not have any specific concerns with the proposed landfill re-opening with respect to bird hazards.

During the site visit on November 24, 2011, a transfer station, operated by Goldburn Waste Services located just north of the subject property, was noted to have hundreds of gulls using that site. That facility is operated as a transfer station for ICI waste and has increased the amount of waste it accepts in recent years. It was noted that the Goldburn site is attracting gulls to the local environment to feed and loaf and is located not far from the airport. At the time of the site visit there was no management of the gulls using this facility. This site is not operated by Waste Management of Canada Corporation (WMCC).

Four comparative counts were made at the City of Ottawa's Trail Road waste management facility. With the exception of the October 23, 2006 count, the gull numbers for Trail Road are approximations made from outside of the facility. It should be noted that when the gulls were not present at the Carp Road waste management facility, high numbers of gulls were always observed at the Trail Road facility. We are not aware of the gull management occurring at the Trail Road facility at the time of these surveys. It is likely that the decrease in food supply at the Ottawa WMF coupled with the active management (scare/kill) activities, that the gulls have moved to the Trail Road site.



Photograph 2. Gulls at Trail Road Waste Management Facility, October 2006

Gull counts were also undertaken at the quarry site located on the opposite site of Carp Road to the Ottawa WMF. The quarry is an attractant to gulls for both loafing and watering. Gulls appear to be using standing water on the quarry for feeding and bathing as opposed to using the landfill for these purposes. The open space and open water provided by the quarry also makes this area an attractive loafing site.

Table 2. Total Numbers of Gulls at Survey Sites

Date	Landfill	Other Survey Locations				
		Quarry	Adj. fields	Shell star	Carp Airport	Trail Road Landfill
March 28, 2006	500		30			
April 2, 2006	700	750	305			
April 3, 2006	470	750	250			
April 29, 2006	0		0			
April 30, 2006	201		0			
July 19, 2006	8				0	4,200
August 1, 2006	0?	50				6,000
October 2, 2006	60	200				
October 21, 2006	1,000					
October 22, 2006	626	280		1,418	92	
October 23, 2006	85	310		398		10,020
November 22, 2007	0					7,000

4.3 Annual Gull Movements

In a typical year, adult Ring-billed Gulls arrive in the Ottawa area by mid-March. They often feed on earthworms, in urban areas, and at waste management facilities until they move to breeding colonies on the Ottawa River in early April. There is an influx of one-year-old non-breeding birds into the province from the south during May.

Breeding birds are strongly colonial. Foraging is dependent on the kinds of food that is available locally. Generally they feed their young on fish, invertebrates and small mammals. However, landfill foraging by breeding birds has also been recorded and garbage can appear as a food item for nestlings (Gauthier and Aubry 1996). Colonies are usually vacated at the end of July and the birds disperse throughout the landscape, feeding on a wide range of foods (e.g., invertebrates, fish, crustaceans, garbage, crops and hand-outs from humans). Ring-billed Gulls generally migrate south of Ontario once freezing conditions become established. In a typical year, this southward movement occurs in early November, but may be delayed into early December.

The larger and less numerous Herring Gulls have a somewhat different annual cycle. Herring Gulls will frequently over-winter in the province, especially if winter conditions are not overly severe. Correspondingly, they are also more likely to establish night roosts on large flat rooftops (or perhaps rocky islands in the Ottawa River) or on wind-blown ice (they generally avoid snow). Herring Gulls that have not over-wintered arrive in the province in late February, moving to breeding areas by late-March. Herring Gulls are less prone to feeding on invertebrates and are seldom numerous on agricultural fields. In the spring these gulls regularly visit landfills. In the breeding season they feed on fish and crustaceans and anything they can overpower. In the fall, Herring Gulls generally migrate southwards during November, with varying numbers staying north where food supplies permit (primarily at landfills or other reliable sources of food such as the Niagara River).

Both Ring-billed Gulls and Herring Gulls, if not feeding during the day, will often congregate together and loaf. Loafing sites include almost any open often flat areas, where they can avoid disturbance and easily see potential predators.

4.4 Ottawa Gull Movements

The movement patterns discussed in the following paragraphs are based on empirical observations and on the anticipated behaviour of gulls in the Ottawa area. For clarity, they have been divided into the three primary periods in a gull year: spring, breeding, and fall/winter.

In the short spring season (roughly March), the gulls tend not to follow defined pathways. They can be found throughout agricultural and urban landscapes, as well as at landfills and they quickly move to the breeding colonies.

There are two nesting colonies of gulls in the City of Ottawa. They are at sites on the Ottawa River – on Lemieux Island in Nepean Bay and Deschenes Rapids, both located to the southeast of the landfill. During the breeding season (i.e., April through July), the gulls travel from the breeding colonies to feeding locations. Flight lines have been noted between the Deschenes Rapids and the landfill in the early morning and departing the landfill in the direction of the breeding colony near sunset. Although

some younger non-breeding birds are feeding at the landfill, there are insufficient numbers to support a summer flight line.

During the post-breeding fall and winter seasons (September through February), when Lac Dechenes (night roost) is frozen, the relatively smaller numbers of gulls still present roost on the Ottawa River in either the Dechenes Rapids or the Remic Rapids.

Very low numbers of gulls have also been observed arriving and leaving in the direction of the Trail Road landfill. At all times local gulls move between large pools of open water (including the nearby quarries), loafing areas on fields and quarry material piles.

As noted earlier, when commuting to and from preferred locations, gulls typically fly between 70 m and 100 m AGL (above ground level), except when towering above the landfill on thermals (columns of warm rising air), when gulls can exceed 705 m AGL.

5. Approach to Wildlife Management

The WCEC represents a unique challenge in gull management at waste disposal facilities. The established flightline, the presence of the Ottawa River, various open water bodies and the high natural numbers of gulls all work together to make this a most challenging site. In our opinion and based on previous success, it is possible to solve this challenge. However, the success of the IGMP will depend largely on the training, commitment and dedication of wildlife management staff and the provision of adequate resources. The support of senior management within WMCC has set the tone for the success of the program.

The presence of large numbers of gulls can be undesirable for several reasons, including human sensitization to large gull numbers and the fouling of rooftops, playing fields, water supply reservoirs and other human use areas in the vicinity of a waste disposal facility.

From an aviation industry safety perspective, waste management facilities that support large numbers of gulls can increase the potential for bird/aircraft interactions. Due to the large size and flocking behaviour which could result in high impact multiple strikes, gulls have been identified as one of the major hazards for aircraft at Canadian airports (Transport Canada 1993; 1994; 2002).

In order to effectively manage gulls it is recommended that a fully integrated management approach be continued at the WCEC. This plan is written to provide gull management under the current site conditions and will require an update should the landfill design or waste stream change in the future.

The IGMP will consist of a four key components. These are:

1. Design suggestions to minimize attractiveness of the site to gulls;
2. Bird deterrent methods, reinforced with lethal control in a manner to eliminate gull habituation;
3. A contingency method will be discussed for consideration if monitoring indicates that this will be necessary; and
4. Recommendations for staff training.

The following section of this report provides a detailed account of each of the four components of the IGMP.

6. Design and Operation

These recommendations are related to the current day-to-day operations and the future design of the facility. They can be generally referred to as passive measures and measures related to the standard operating procedures of the facility.

6.1 Active Tipping Face

The tipping face should be kept to a minimal size and the tipping of waste that includes putrescibles waste mixed in with IC&I waste should be in one area. Cover is to be applied evenly on a daily basis, and food waste is not left available for extended periods of time.

Managers of the active area of the facility should continue to ensure that there is only one active tipping face for materials that may contain edible waste. In addition, the physical area of the active tipping face should remain minimized to the extent possible. Careful management of daily cover and the containment of food scraps in the active zone is also important.

The following recommendations apply:

- Nightly cover should be applied with diligence to the active face;
- During the daily cover process efforts should be made to minimize the amount of waste that protrudes through the cover or is exposed such that it attracts gulls;
- Cover operations must be monitored daily and especially prior to weekends for exposed waste and additional cover placed over areas where food waste is at the surface;
- Food waste and waste containers should be inaccessible to gulls during daylight hours;
- Cover must be of a type that does not limit the use of pyrotechnics (due to fire risk).

6.2 Surface Water

Standing fresh water is known to attract gulls, which use it for drinking and bathing purposes and to avoid ground predators.

The WCEC is surrounded by numerous small bodies of fresh water. In addition, there are four existing stormwater ponds and new stormwater ponds located on the property located east of Carp Road, north and south of the maintenance road that may be used as wildlife habitat. Field investigations do not indicate that the standing water on the landfill is acting as an attractant to gulls. It is recommended that the seven ponds located on the landfill be monitored regularly to ensure that they are not attracting gulls to the site.

The following recommendations can be used to eliminate use of open fresh water on the subject property by gulls, in the event that they should become an attractant in the future:

- Drainage features in low grade areas should be permitted (where feasible) to in-fill with a moderate amount of emergent vegetation (i.e., cattails);
- Storm water management ponds should, where feasible, be elongated and all should have deep, steep banks (3:1) that will discourage bird use by blocking their line of site and making them feel threatened by possible predators. This will also prevent birds from walking into the ponds;
- Vegetation around the ponds should be unmown or long grass at a length of at least 10 cm; and
- Should existing ponds on the site begin to regularly attract numbers of gulls it may be necessary to overwire the water areas (using engineered posts and independently attached aircraft wire at 10 m intervals).

6.3 Other Landscaped Areas and Litter Management

Staff may use landscaped areas, such as those associated with the main entrance areas to the property for outdoor lunches. These short-grass areas also have the potential to attract gulls for handouts provided by staff or to forage for worms during wet weather.

Wind-blown waste can also attract gulls that are not familiar with the property. The following recommendations apply:

- Measures should be taken to minimize the tracking of garbage with food scraps by waste haulers traveling on the site and exiting from the site;
- Wildlife-proof outdoor litter containers should be placed near the buildings;
- Conifer shrub landscaping should be at an increased density around the buildings; and
- Regular litter management procedures and techniques should be applied to reduce the presence of blown litter across the site (when necessary).

6.4 Compost Facility

The new on site compost facility will be an outdoor location that will be used only for leaf and yard organic wastes. No food waste will be accepted at the compost facility.

Any proposed changes to the compost facility will require an update to this plan. Critically, no putrescible waste should be left outdoors late in the day or over weekends.

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6.5 Buildings

Existing and any new buildings that are constructed on the subject property could attract loafing gulls, especially along the ridge point of the structures. Buildings over one storey in height should have bird spikes (i.e., needle or porcupine wire) affixed to the ridge lines of the structures. These can also be affixed to the top of lighting structures or other hardware that gulls use for resting or loafing.

7. Deterrents

The management of wildlife generally, and especially gulls, at outdoor facilities that handle food waste inevitably requires the use of active management and deterrents. The diligent and judicious use of active deterrents, when combined with lethal reinforcement, is a powerful and critical element of an integrated approach to gull management.

A range of deterrents are available in the bird control marketplace. Managers are faced with a wide variety of relatively complex measures (e.g., cannons, falcons, air-operated human effigies, scarecrows, chemical repellents and distress calls) that have been used for the management of nuisance birds. Generally, almost all deterrents have some merit, for some applications, for a limited period of time. However, wildlife in general, and gulls in particular, quickly habituate to deterrents that they come to associate with ***no real threat to their safety***.

Experience has demonstrated that to be effective, deterrent methods, need to be diligently and wisely applied. It is the person responsible for maintaining a near-gull free site that will determine the success or failure of any gull-deterrent program and this will be critical at the WCEC.

7.1 Pyrotechnics

All pyrotechnic products entail a user risk, and must be used with appropriate safety training, the application or use of safety rules and equipment, appropriate storage and transportation of pyrotechnics, good judgment and skill. Employers must also ensure that adequate liability insurance is held and that appropriate safety training is provided.

It is our recommendation that the primary deterrent method should be the use of a variety of pyrotechnic devices. The use of these devices should be such that gulls do not habituate to deterrents and thereby avoid them by changing their behaviour or visiting the landfill when the gulls can predictably expect no response. This can be achieved by ensuring that patterns of pyrotechnic use do not become established, by mixing up the use of different kinds of pyrotechnic employed and by integrating lethal reinforcement in an unpredictable manner. In addition, the wildlife management officer must “out-think” the collective intelligence of the gulls. For example, gulls will quickly learn to

recognise individual vehicles and even individual personnel associated with lethal reinforcement - unless steps are taken to prevent this avoidance behaviour.

Commonly used pyrotechnics are available in 15 mm pistol-launched shots (the RG300 ten shot clip magazine launcher is recommended), which are launched with the aid of blank .22 calibre blanks (hot blanks are recommended). There are three basic forms, these are: bangers, screamers and flaming whistlers. The range of these devices is about 30 m for the bangers and up to about 90 m for the screamers and whistlers.

The 18 mm CAPA, with an integrated rocket motor, fires from a hand-held pistol and is very useful for dispersing high soaring birds or those that may otherwise be out-of reach (up to 300 m). In addition, other useful pyrotechnic shells (shell crackers) that can be launched by a 12-gauge shot gun travel further (down range for up to 100 m and 300 m) before exploding. This latter approach requires the use of a firearm (a 12-gauge shotgun), whereas the other launch devices are not considered to be firearms. Additional permits must be sought to use a firearm.

The use of pyrotechnics should carefully consider the relative position of the birds so that when firings are initiated the birds are encouraged to leave the area in the preferred direction (i.e., toward the ocean) and not move toward another part of the site. Therefore, detonation should be conducted having regard to the direction and angle of firing, and the likely response of the target gulls. This is desirable to maximize both the effectiveness of the pyrotechnics and to reduce the number of firings that must be used. This will help to reduce costs and noise emissions from the operation.

In a well-managed site, the use of pyrotechnics (and other loud deterrents) can be reduced on weekends. However, it is not possible to eliminate all weekend use without gulls adapting to that regimen.

The following recommendations apply:

- Two RG 300 launchers should be used with bangers, screamers and whistlers, launched using hot blanks with a stock of at least six months inventory, for regular use;
- One CAPA launcher and shells should be used very sparingly;
- Shell crackers and a single hinge 12-gauge shotgun can be used occasionally (requires firearm permits);
- Safety equipment (at a minimum for eyes, ears and feet) should be used in addition to standard WMCC safety equipment requirements;
- Operational safety guidelines be adhered to for all pyrotechnic and firearm use;
- Ensure that no individuals or machinery occur within range of the area where pyrotechnics are to be deployed;
- No shooting from within or on a vehicle, either stationary or moving;
- Pyrotechnics should not be launched into the working face because this increases the fire risk;
- Should a fire result from the use of pyrotechnics, fire control/emergency response procedures for the landfill should be followed by staff; and

- The wildlife management officer must incorporate a varied approach, including (but not limited to) vehicle use, timing, firing points, type of pyrotechnic used and other aspects of the program to minimize habituation.

7.2 Propane Cannons

Propane cannons annoy birds and are useful when used in conjunction with pyrotechnics and lethal reinforcement. There are two cannons available for use at the facility. Cannons can be set to timers and can be used for example in periods when supporting cover is required (e.g., weekends, evenings). This will allow the cannons to be remotely activated and will prevent a constant noise source when workers are not present. The more sporadic the use of the cannon is, the more effective it will be in deterring birds. Propane cannons should only be used as part of an integrated program and should not be relied on to take the place of the wildlife management officer otherwise, as with other deterrents, the birds will rapidly habituate.

The following recommendations apply:

- Place two propane cannons on mobile trailers and use at various locations on the subject property;
- The firing sequence and timing should be varied and long periods must occur with no firings at all;
- The cannons should be regularly moved (at least twice a month);
- Cannons should be used as part of the integrated program, not as a replacement for active management; and
- Cannons can be set for use during occasional periods when the landfill does not have staff coverage (i.e. after 5:00 pm or on Sundays)

7.3 Lethal Reinforcement

Experience has shown that deterrents for birds fail in the long-term unless a real threat to their safety is present (“a clear and present danger”). This is because birds are particularly adept at sorting out which potential threats are unlikely to result in physical harm (so-called “habituation”). This is one of the reasons why birds of prey (i.e., falconry) and trained dogs have been effectively used to manage problem wildlife (including gulls and geese) across North America and internationally. To an animal, an owl, hawk, eagle or dog represents a real threat to its survival.

In managing gulls in particular, habituation to distress calls, noise bangers, pyrotechnics, models and many other deterrents can be relatively rapid unless a clear and present danger to the gulls is incorporated into the integrated management plan. Usually, this is attained through carefully selected shooting of individual gulls (using a shotgun).

To be most effective, this selective killing should be undertaken at the same general time as the use of pyrotechnics. One or two gulls killed in view of the flock and, to the extent possible under conditions of the permit, left in clear view of other gulls for a time, can be very effective reinforcement.

The killing of migratory birds (which includes all gull species) is regulated by the *Migratory Birds Convention Act*. This is a federal Act that protects all migratory birds and requires the issuance of a kill permit prior to any lethal control, and is also be applied to harassment programs that use pyrotechnics. Therefore, permit applications will need to be made to the Canadian Wildlife Service. For the killing of birds the application needs to clearly stipulate the intended purpose of the permit (i.e., reinforcement) and the scope of killing (e.g., initially higher but levelling off to daily shootings of one to ten Ring-billed Gulls and/or Herring Gulls) as well as details of all non-lethal activities.

In addition staff training should incorporate the identification of adult or near-adult Ring-billed Gulls and Herring Gulls. The use of permanent identification flash cards has been instigated at other landfills in Canada.

The following recommendations apply:

- Appropriate ammunition (e.g., No. 4 shot, non-toxic) should be acquired for use to kill Herring Gulls or Ring-billed Gulls using the 12-gauge shotgun;
- Canadian Wildlife Service permits have been acquired for lethal control and all appropriate firearm and hunting permits must be on site;
- All safety rules must be applied including: guns and munitions must be stored in a locked storage area when not in use; no shooting from within or on a vehicle, either stationary or moving;
- A locked storage device should be installed in the Wildlife Management vehicle to ensure that the safe transfer of guns and munitions can be made to various locations on the site;
- All staff working at the landfill should be notified by radio prior to any use of firearms;
- The users of firearms should survey the site to ensure that no individuals or machinery are in the area where firearm use is to occur;
- Firearm use should be at the discretion of the wildlife management officer (subject to addressing safety issues) and the gun should be readily available. A lengthy procedural delay to use the method will reduce effectiveness; and
- All use of firearms should be recorded in the daily operations log, including the name of the individual operating the firearm, time and result of control activities, as well as the location and direction from which the shots were fired.

8. Staffing and Communication

To be effective, the IGMP should include one person on duty who is trained to deploy pyrotechnics and lethal live shot, if required, at the WCEC during hours of operation. The landfill should ensure that additional staff are trained as back-up to cover those periods when the identified employee is unavailable on his/her shift (i.e. vacation, sick days, training days etc.).

In the past, the landfill has employed one full-time person to manage wildlife at the landfill. Given that the WCEC will be receiving some putrescible waste mixed with IC&I Waste, and as gulls are abundant in the local area, it can be expected that high numbers of gulls will attempt to return to the

site when the food source becomes available. Therefore, the on duty wildlife officer will need to be prepared for this influx of gulls, until the wildlife control program becomes established again. If gull use is not adequately managed WMCC should reinstate the full-time wildlife person until the situation is resolved.

The first few months of the program will be integral in ensuring that the gulls are not permitted to become comfortable at the new facility. This diligence will need to be expanded to periods when influxes of new birds are anticipated (i.e., early spring, August and late fall). This will require diligence on behalf of the on-duty officer to apply active management at WCEC whenever the gulls come in to feed or loaf on site.

The trained employee should consult with and receive direction from WMC management who are responsible for the daily operation of the site.

Gulls can access sufficient food at an unprotected active face within about 15 to 20 minutes of foraging, two or three times per day. As a result, many hundreds of gulls can feed in a relatively short time period in an unprotected situation. It is important for the individual on duty to be aware of gull activity throughout the day and to recognize what control measures are required.

Due to the proximity of the landfill to the Carp Airport there will be a need for ongoing occasional communications between the wildlife personnel on duty at the landfill and the airport personnel. This will be in order to ensure that active management at the landfill is not creating an increased level of risk for aircraft operating in and out of the airport. This could happen for example if large numbers of gulls were moved from the landfill during a period of incoming flights.

The following recommendations apply:

- A trained employee should be on shift, and should be responsible for implementing gull deterrent techniques as required throughout their shift;
- A calendar of high risk gull periods should be prepared to inform staffing decisions;
- Additional employees should be trained in order to provide periodic coverage when the Wildlife Management Officer is not available. Initially this will require more time being spent learning the gull management program and duties; and
- Discussion should be undertaken with the Carp Airport if challenges arise that have the potential to impact the airport or its operations. Likewise, WCEC should respond promptly to any communications received from the Carp Airport with respect to unusual wildlife activity in the vicinity of the airport.

9. Training Program

Wildlife management will only succeed at WCEC if commitment to effective management is clear and unambiguous at all levels in the organization. All staff need to be empowered to participate in the program, informing managers immediately when issues arise. It needs to be made clear that the presence of gulls at the site is not acceptable and that they represent a potential threat to the continued operation of the facility and a potential liability issue for WMCC.

9.1 Responsibilities

Senior management or their designate should be responsible for the implementation of the IGMP. This includes the acquisition of the various permits, the development of training and awareness programs and the review of the annual monitoring reports. Senior management, or their designate, should also be responsible for the coordination, supervising and the overall management of the IGMP and initiating discussions with the Carp Airport. This will also include the scheduling of trained employees to cover wildlife management issues during the hours of operation, coordination of training, safety assurance and ensuring that the necessary equipment is available.

The on-duty wildlife management officer will be responsible for:

- Ensuring all activities are undertaken following standard practices and safety protocols;
- Daily maintenance of the Wildlife Management Log (e.g., including details on gull numbers and activity; IWMP measures undertaken, firearm use details; and details on the use of lethal reinforcement);
- Preparation of data for the annual monitoring report;
- Ensuring that the appropriate permits are current and present on-site;
- Undertaking deterrent activities;
- Participating in ongoing communications with airport personnel;
- Ensuring cover for gaps (i.e., early and late in the day, weekends, lunch breaks, vacation and sick days); and
- The identification of equipment, resource and training needs.

9.2 Training

An initial Tier One training program should include an introduction to bird hazards at airports and should be provided to all of the landfill staff and should also include the three Transport Canada Videos:

- Crossed Paths;
- Not In My Backyard; and
- There's Something Out There at the Airport.

An accompanying presentation should address the issue of bird hazards to aircraft, Transport Canada guidelines respecting waste management facilities near airports, and the importance of wildlife management to the continuing safe operation of the facility and the airport, and an overview of the IGMP, supported with site-specific information.

Tier Two training should also be provided at a minimum for the wildlife management officer and designated relief staff. This should be closely based on the IGMP, and it should include:

- An understanding of the need for management;
- Responsibilities;
- Operational measures;
- Deterrents;
- Safety; and
- Monitoring techniques and reporting requirements.

Unless qualified and experienced contractors (or staff) are used, specific on-site training should be incorporated for those who will be responsible for using pyrotechnics or lethal reinforcement. This will include a practical training session on the use of pyrotechnics and the shooting of gulls.

In addition to training directly associated with wildlife behaviour and the application of deterrents, it is essential that all associated safety requirements are fully reviewed and addressed. This should include at a minimum:

- The safe use and storage of pyrotechnics, firearms and ammunitions;
- A review of firearm safety (pre-requisites being the Canadian Firearms Safety Course and the provincial Hunter Education course), including equipment maintenance and storage; and
- The identification and mandatory use of safety equipment.

The following recommendations apply:

- Key and supporting staff (or contractors) should be identified for undertaking wildlife management activities;
- A Tier One training session should be developed and used to promote an awareness of bird hazard issues to all landfill-associated staff and management;
- A Tier Two training program should be developed and used for key wildlife management staff and regularly updated, especially for new employees;
- Safety requirements for firearms and pyrotechnics should be included in the Tier Two program and made available for reference by key staff; and
- Guidance for wildlife management should be integrated into the facility operations manual for staff reference.

10. Monitoring and Review

The IGMP monitoring plan will be used to determine use of the site by gulls and other wildlife, and specific areas on the site that may require adaptive management. This will result in an assessment of the efficacy of the IGMP and allow further adaptation and improvement of the plan. It will also provide a basis for determining if bird use of the area changes through time.

The Carp Airport should be considered as a partner in this review process. It is recommended that communication between WMCC and the Carp Airport, as required by either party, to review the success, or otherwise, of the programs. This will ensure that mutual concerns are properly addressed.

It is therefore proposed that the monitoring program include:

- Daily estimates of key species undertaken by the wildlife management officer;
- Maintenance of a wildlife management log with counts activities and firearm use details etc.;
- An annual summary of activities and results; and
- Annual scheduled meeting with the Carp Airport to discuss wildlife management issues.

WMCC should consider an annual review (to include two days of counts) by an external contractor to provide an independent verification of gull use, adherence to the plan and suggestions for improvement. This review should include an interview with wildlife management officers at both the airport and the landfill.

Either the annual summary or the external review can form the basis of reporting requirements under the existing permit to the Canadian Wildlife Service.

11. Permit Requirements

Various permits are required for active wildlife management activities. They are described in the following paragraphs.

Wildlife management personnel must ensure that all appropriate permits are in place and current prior to operations commencing. The following identifies standard permits that are generally required; however, it is strongly recommended that WMC contact the local offices of the Ministry of Natural Resources, Environment Canada - Canadian Wildlife Service and Municipal Government, including the local police department, on an annual basis to determine permit requirements.

Federal Regulations

Migratory Birds – Migratory Birds Convention Act

Regulations under this Act protect most bird species, including gulls (but excluding, for example, crows and blackbirds) and permits are required for active scaring and killing, including as nest removal. Ottawa WMF currently holds an active Kill/Scare Permit as issued by the Canadian Wildlife Service, 867 Lakeshore Road, P. O. Box 5050, Burlington, Ontario L7R 4A6.

Provincial Regulations

Hawks, Crows and Selected Blackbirds – Fish and Wildlife Conservation Act

A Small Game License is required to hunt these species in the Province of Ontario. This is available from the Ontario Ministry of Natural Resources, Kemptville District Office. The licensed individual will also require an Outdoors Card (hunter version) and must attend a Hunter Education Course and pass the Hunting License Examination. More information can be accessed at:

<http://www.mnr.gov.on.ca/MNR/pubs/pubmenu.html>. A Small Game License is also required for the management of blackbirds (including starlings) and crows. For contingency purposes, it is also recommended that the Wildlife Manager be in possession of a Small Game License.

Local By-Laws

Discharge of Firearms

Many urban and suburban municipalities in southern Ontario, including the City of Ottawa, have discharge of firearm By-laws in place that restrict the use of firearms in certain areas or circumstances. To apply an IGMP such as this may require an application to the local Council for an exemption from a firearm use By-law, for wildlife management purposes in relation to aviation safety.

Local Police Department

Information regarding local requirements for discharge of a firearm should be discussed with the local police department. Discussions with the local police will also provide an opportunity to make them aware that discharge of firearms with pyrotechnics and live shot is occurring at the facility for the implementation of the IGMP.

12. Performance Criteria and Contingency

Over-flying gulls will continue as the subject property is adjacent to the Ottawa River and other local gull attractants. However, loafing and feeding gulls should be kept to a minimum. The implementation of the IGMP, in 2007, helped to reduce the hazard and the associated risks with birds using the landfill in the vicinity of the Carp Airport. Since the program has been implemented and the landfill design changed, there are a relatively low number of gulls using the landfill and therefore these birds are posing a low risk to aircraft operations. It is expected that the ongoing implementation of this plan, the change in waste stream, and the upgraded design of the facility, it is expected that the low level of risk can be maintained.

If required, the following criteria are provided to determine, as needed, to amend the management efforts:

1. There are large numbers of gulls (over 200) regularly attracted to the site either feeding or loafing (more than twice per week);
2. Weekend use of the site exceeds 200 gulls;

3. Hazardous bird activity is reported by a pilot in the vicinity of the landfill; or
4. A birdstrike involving a gull or a Turkey Vulture occurs in proximity to the airport,
5. In any of these cases a three step process is recommended as follows:
 - I. The annual (or an interim) review should investigate whether the plan is being diligently and appropriately applied;
 - II. The review should identify areas for improvement in the plan and make a determination if the plan or its implementation needs adjusting (e.g., additional resources) or whether a contingency method is required;
 - III. If a contingency method is found to be necessary WMCC should return to having a full-time, dedicated wildlife management officer on duty during the hours of operation. This should be combined with occasional visits to the site on weekends, holidays and outside of normal operating hours to ensure gull activity at the site does not escalate.

13. Summary

The following table summarizes the principal components of the IGMP. This table must be used in conjunction with the preceding text, which provides critical information on the effective use of these techniques, safety, permits/licenses and staff requirements.

Table 3. Summary of the IGMP

Component	Location/ feature	Activity	Objective
Design	<ul style="list-style-type: none"> • Active tipping face 	<ul style="list-style-type: none"> • Minimize area, one face • Diligent daily cover, especially at end of day • No access to containers with food waste • Use inflammable cover 	<ul style="list-style-type: none"> • Minimize feeding opportunities
	<ul style="list-style-type: none"> • SWM Ponds 	<ul style="list-style-type: none"> • Monitor bird use of ponds • Implement measures to reduce attractiveness should ponds attract gulls • Allow wet low grade areas to regenerate with vegetation 	<ul style="list-style-type: none"> • Reduce bathing and drinking areas • Respond if behaviour changes
	<ul style="list-style-type: none"> • Other Landscaped Areas and Litter Management 	<ul style="list-style-type: none"> • Minimize tracking of garbage • Wildlife-proof litter containers • Explanatory signage and instruction forbidding feeding of wildlife • Increased shrub landscaping around buildings • Long grass policy where feasible • Signage explaining long grass policy 	<ul style="list-style-type: none"> • Reduce feeding and loafing opportunities

Component	Location/ feature	Activity	Objective
		<ul style="list-style-type: none"> Regular litter management procedures and techniques 	
	<ul style="list-style-type: none"> Buildings 	<ul style="list-style-type: none"> Apply bird spikes to any ridges where loafing is noted to regularly occur 	<ul style="list-style-type: none"> Reduce roof top loafing
Deterrents	<ul style="list-style-type: none"> Pyrotechnics 	<ul style="list-style-type: none"> Use of different pyrotechnic devices Vary approach Mix with lethal reinforcement Apply safety and other regulations, rules, guidelines 	<ul style="list-style-type: none"> Scare birds away from site
	<ul style="list-style-type: none"> Propane cannons 	<ul style="list-style-type: none"> Move regularly Mix with lethal control Vary firing sequence and timing 	<ul style="list-style-type: none"> Scare birds away
	<ul style="list-style-type: none"> Lethal Reinforcement 	<ul style="list-style-type: none"> Selective occasional killing of gulls Leaving dead gulls in view when possible Follow all safety and other rules and regulations Secure, fence and gate site Staff and airport communication 	<ul style="list-style-type: none"> Critical reinforcement of other primary deterrent methods
Staffing and Communication		<ul style="list-style-type: none"> Staff on duty during operating hours trained to deal with gulls Back-up staff trained to provide coverage during breaks, vacation, illness Develop communication strategy with airport 	<ul style="list-style-type: none"> Ensure effective, dedicated and motivated personnel Reduce conflict with airport
Training	<ul style="list-style-type: none"> On site 	<ul style="list-style-type: none"> Develop and deliver a Tier One program for management and all staff Develop and deliver a Tier Two program for key staff (and/or contractors) Integrate wildlife management procedures into facility operations manual Ensure that safety training is undertaken 	<ul style="list-style-type: none"> Ensure that dedicated trained staff have the resources, knowledge, motivation and skills necessary Ensure safety is a priority
Monitoring and Review	<ul style="list-style-type: none"> On site 	<ul style="list-style-type: none"> Daily counts of key species Maintain log Annual summary of activities Annual two day external review 	<ul style="list-style-type: none"> Tools to determine efficacy and improve plan Independent verification
Permit Requirements	<ul style="list-style-type: none"> On site 	<ul style="list-style-type: none"> Migratory Bird Convention Act – harass and kill Firearms Act – PAL, CFSC, FRC Provincial regulations – Hunter Education/OIC City By-Laws – discharge of firearm and noise exemptions 	<ul style="list-style-type: none"> Ensure compliance with law, regulations and policies
Performance	<ul style="list-style-type: none"> On-site and 	<ul style="list-style-type: none"> Immediate active response to feeding 	<ul style="list-style-type: none"> Meet objectives of the plan

Component	Location/ feature	Activity	Objective
Criteria	airport	and loafing gulls	
Contingency	<ul style="list-style-type: none"> On-site 	<ul style="list-style-type: none"> Three step process: review; identify whether improvements or a contingency method is required; full time staff 	<ul style="list-style-type: none"> Improve, correct or instigate new methods to meet plan objectives

14. Disclaimer

Wildlife hazard management serves to reduce hazards and associated risks. However, even with a fully operational and effective program in place the likelihood of bird strike cannot be entirely eliminated. Beacon Environmental Limited has prepared this plan following the standard practices of the industry adapted for site-specific conditions. Beacon Environmental Limited including its staff and Directors assume no liability whatsoever for bird strikes or accidents that may occur in the future. The implementation of this plan requires the use of firearms and pyrotechnics. Beacon Environmental Limited also assumes no responsibility or liability for accidents that may occur in the future. Training and application of safety procedures is critical to avoiding such accidents and ensuring adequate training and application of safety procedures is the responsibility of those who seek to implement the recommendations of this document.

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