



# *2008 Annual Environmental Report*

*Airport Land-use & Development   Noise   Water Quality   Materials   Wildlife   Air Quality   Resource Use*

## FOREWORD

The Calgary Airport Authority's (The Authority) Environmental Management Systems (EMS) Manual is prepared by the Environmental Services Group to outline The Authority's policies, procedures and management strategies designed to address environmental issues associated with operation of Calgary International and Springbank Airports. The Authority's EMS is a continual cycle of planning, implementing, checking and reviewing the processes and actions that our organization undertakes to meet its business and environmental goals. It is from this document, that The Authority's 2008 Annual Environment Report is prepared, which outlines the programs, the successes and completed goals of 2008.

## 2008 ANNUAL ENVIRONMENT REPORT

The 2008 Annual Environmental Report (the Report) details accountabilities for environmental management initiatives within the Calgary Airport Authority (The Authority). The Report also describes environmental policies and management programs administered by The Authority's Environmental Services Group. Management programs discussed in this Report, in view of 2008, include:

- Airport Land-use & Planning
- Noise Management
- Water Quality Management
- Materials Management
- Wildlife Management
- Air Quality Management
- Resource Management

Since Calgary International Airport (YYC) is located on Federal property, Federal regulations and policy are used as the basis for environmental programs and performance. However, in the interests of responsible environmental management, The Authority works to meet or exceed additional criterion, where applicable, including appropriate provincial, municipal standards and best management practices.

To ensure that we are continually improving our environmental performance, The Authority's Environmental Management System (EMS) was developed in accordance with the principles of ISO 14001, the internationally recognized standard that outlines the structures of environmental management systems. The EMS also provides the framework by which the Authority reviews its environmental policy and establishes procedures to improve its overall environmental performance. Environmental performance is a continual cycle of planning, implementing, reviewing and improving the processes and actions that The Authority undertakes to support its goal of corporate sustainability.

Each year, The Authority's Environmental Services Group updates its EMS and Annual Work Plan to drive continual improvement and development of best management practices.

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## ENVIRONMENTAL AFFAIRS COMMITTEE

The purpose of the Environmental Advisory Standing Committee (the “Committee”) is to provide oversight of the environmental related programs and activities of The Authority and report to the Board of Directors. The Committee meets three times a year to provide insight on environmental management and industry Best Management Practices. The Committee does not have decision making authority independent from the Board, unless so designated by the Board, but may make recommendations from time to time to the Board, as required. The specific responsibilities of the committee include the following.

1. Receive reports from management and review with management the airport environmental practices and procedures.
2. Review management’s recommendations regarding significant environmental policy issues affecting the strategic plan of The Authority.
3. Review the impact of changes in environmental legislation and regulations and other issues which impact on The Authority and management’s recommendations regarding the actions necessary to respond to those changes.
4. Provide comment on environmental reporting to the Board, which includes the status of the Authority regarding legislative compliance.

# ENVIRONMENTAL MANAGEMENT PROGRAMS

# AIRPORT LAND-USE PLANNING & DEVELOPMENT

Airport land-use and planning includes four areas of interest for The Authority:

- EA;
- land-use (including tenant);
- ESA; and
- site management.

## *Environmental Site Assessment*

To integrate environmental management measures into airport land-use, planning, design, construction and operation of all new projects at YYC and Springbank Airports, all airport construction permits are subject to an EA. EA at YYC and Springbank Airports aims to meet the criterion (inclusion, exclusion comprehensive study and law lists) found under the *Canadian Environmental Assessment Act* (CEAA). At this time, airports are not included under the CEAA regulations; however, new regulations are looking to close a gap in the CEAA by requiring airport authorities to conduct EA for projects located on federal lands over which those authorities have administration, management, or other specified rights or interests.

In addition to considering environmental aspects of new projects, the review process considers any potential archeological, cultural or historical impacts. Guidelines and mitigation efforts are developed for projects to ensure compliance with regulatory and airport standards. In early 2008, a paleontological study was completed for lands purchased east of Deerfoot Trail. It was revealed that this site contained fossils of early mammals and was already of interest to the Tyrell Museum.

No major EA were completed for the year of 2008. However, sustainability workshops were conducted for International Facilities Project (IFP), which will help direct the EA process into 2009. Also workshops were held regarding the Deerfoot North project to identify appropriate mitigation associated with environmental impacts of the proposed development.

## *Land-use*

In 2004, The Authority established a Tenant Environment Committee as a forum for education and awareness. In 2008, the Tenant Environment Committee met twice to discuss airport issues tenant concerns. Topics of discussion for 2008 included the following.

- A de-icing study was completed, for The Authority, which discussed the current and future issues surrounding de-icing operations and initiatives for de-icing infrastructure
- Federal Registration of Storage Tank Systems for Petroleum Products and Allied Petroleum Products regulations for 2009
- City of Calgary sewer by-law 24M96 - rainwater and snow are the only products to be released in to the sanitary system
- The Authority provides access to a tenant extranet site for tenants to voluntarily register volume and type of their hazardous materials found on airport land

## *Environmental Site Assessment*

ESA are required when new land acquisitions occur on behalf of the airport. When an existing undeveloped property is slated for development and has not been previously subject to a study, The Authority will undertake the Phase I ESA. In the event where a tenant terminates their lease, a Phase II ESA may be requested by the Authority from the tenant based on what activities the tenant was conducting. Phase III ESA are required when contamination has been identified (Phase I ESA) then located and quantified (Phase II ESA). Guidance to Authority employees and tenants, regarding ESA, is provided through the Authority Environmental Site Assessment Policy and the Contaminated Site Remediation Policy.

In 2008, the following Phase I & II ESA were completed:

- Phase I Environmental Site Assessment and Hazardous Materials Assessment, Existing Receiver Site, Portion of SE 1/4 Section 14-025-01 WSM
- Phase I Environmental Site Assessment and Hazardous Materials Assessment, Proposed Receiver Site, Portion of NW 1/4 Section 04-025-29 W4M
- Phase II Environmental Site Assessment and Hazardous Materials Assessment, Existing Receiver Site, Portion of SE 1/4 Section 14-025-01 WSM
- Phase I & II Environmental Site Assessment, Parcel 3, Palmer Road NE

## *Site Management*

The Authority maintains and updates a Site Management Plan, which contains environmental reports pertaining to known contaminated sites, petroleum storage facilities (including underground and above ground storage tanks) and all environmental studies that have been conducted for The Authority. For 2008, the following information on airport lands and studies have been completed and added to the Site Management Plan.

- Inspection, soil sampling and testing for the Underground Storage Tank Removal Process at 2000 Aero Road NE, Calgary.
- Avis Car Rental Removal of Gasoline Underground Storage Tank, Calgary International Airport Site, 2359078 Ave NE, Calgary AB
- Preliminary Fungal Assessment – Fire Hall 13, 2021 – 78 Ave. N.E.
- Indoor Air Quality Assessment – Fire Station 13
- Preliminary Fungal Assessment – Fire Hall 27, 320 Aviation Way N.E.
- Indoor Air Quality Assessment – Fire Hall 27
- Year 2008 Tenant Environmental Auditing Program
- Riparian Health Inventory and Riparian Wildlife Survey – Final Report –Nose Creek, NW 14025-01 W5M
- Soil and Groundwater Sampling Results, McKnight Blvd. and 12 Street NE, Calgary Alberta
- South Airfield De-Icing Study
- Inspection and Testing During the Removal of the Above Ground Tank Located at 170 MacLaurin Drive SW, T3Z 3S4, Springbank Airport
- Riparian Health Inventory and Riparian Wildlife Survey – Nose Creek, NW 14-25-1 W5M



## NOISE MANAGEMENT

Noise associated with airport operations can be attributed to a number of sources or activities, including:

- Aircraft departure and arrivals
- Aircraft over-flights of residential areas
- Engine run-ups activities
- Reverse thrust, which is used to slow an aircraft when landing on the runway
- General noise from ground service equipment

The Authority has a comprehensive Noise Management Program that aims to balance the region's desire for safe, efficient and convenient 24-hour air service (travel, goods and services) with enjoyable city living.

The noise management program includes the five following important components.

- Airport Community Noise Consultative Committee (ACNCC)
- Noise Management Plan
- Airport Vicinity Protection Area (AVPA) under Alberta's Municipal Government Act
- Published noise abatement procedures
- A sophisticated Aircraft Flight Tracking Environmental Management System (AFTEMS) with fourteen Brüel & Kjær Noise Monitoring Terminals and complaint management and response capabilities

### *Airport Community Noise Consultative Committee (ACNCC)*

The ACNCC consists of community and industry stakeholders and provides a forum for the discussion of aircraft noise management issues at YYC. The committee meets biannually and is chaired by The Authority's Director of Environment. Members of the committee are independently appointed by their respective stakeholder groups, which include the following.

- Airlines
- Air Transport Association of Canada
- Citizen representatives from various communities within the 25-40 Noise Exposure Forecast (NEF) contour
- Federation of Calgary Communities
- City of Calgary (Planning Department)
- NAV Canada
- Transport Canada
- Calgary Airport Authority
  - Environmental Services Group
  - Cargo Operations
  - Land-use and Planning

The primary goal of two annual ACNCC meetings is to discuss current issues and concerns regarding airport operations and associated noise impacts. In 2008, we discussed topics, which were found to be of concern and included:

- semi-annual and annual (2007) noise statistics
- 16/10 runway operations;
- Calgary Police Service presentation on HAWCS activity;
- FedEx presentation on cargo operations; and
- Bearspaw noise study

### *Noise Management Plan*

A Noise Management Plan was developed in 2008 for The Authority's Noise Management Program. The Noise Management Plan has been developed to assist the airport community to understand noise, noise controls, regulations, procedures in place to minimise noise and community concern management at YYC. The Noise Management Plan has been developed to complement the EMS, as well as other community information documents we have available such as the Authority's Master Plan and YYC's Community Noise Brochure.

The Noise Management Plan provides detailed explanation about how noise is generated, measured and managed at YYC. It also outlines how noise concerns are managed and the Aircraft Flight Tracking Environmental Management System (AFTEMS) that is in place to track, analyse and report. Having a plan in place for management of noise demonstrates a systematic and consistent approach to airport noise management.

## *Noise Abatement Procedures (NAP) for YYC*

Under the Aeronautics Act, enforceable Noise Abatement Procedures (NAP) are a set of published rules outlining how jet aircraft are to be operated on arrival and departure. NAP are published in the Canada Air Pilot. Among the published noise abatement procedures specific to operations at Calgary International include:

- preferential use of runways to place the noisiest operations to the north of Calgary between 2300 and 0700 hours when it is safe to do so;
- jet aircraft must climb to 6500 feet Above Sea Level on runway heading before proceeding on to destination; and
- restricting times and locations that engine run-ups can be performed.

Violations to NAP are subject to investigation by Transport Canada Civil Aviation Enforcement and may result in pecuniary fines. These procedures are designed to minimize the impacts of jet aircraft noise while at the same time allow for safe departures and arrivals into the airport. The procedures outline runway use, aircraft flight-paths on departure and arrival, minimum turning altitudes and climb procedures.

## *Aircraft Flight Tracking Environmental Management System (AFTEMS)*

A successful tool in The Authority's Noise Management Program is the use and application of the AFTEMS (see Figure 1). AFTEMS consists of two main components:

- flight tracking; and
- noise monitoring.

In 2008, The Authority purchased a new advanced AFTEMS to collect and assess aircraft flight and operational impact information. AFTEMS allows The Authority to determine aircraft compliance to published NAP as well as track noise events and trends of sound data within the City of Calgary.

Fourteen NMT are located throughout the City of Calgary. Combined with a Nav Canada radar feed, the system is used to monitor and assess aircraft contribution to community noise levels by correlating the noise created by aircraft in proximity to each NMT. In 2008, all fourteen monitors were replaced. The purchase of new NMT allows for a more consistent data stream than that was employed prior. The old system had been in use for 22 years and was becoming unreliable.

## *Aircraft Compliance Concerns 2008*

Very infrequently, aircraft do not follow published NAP, resulting in a non-conformance issue. Non-conformance issues are initially addressed with the airline and Nav Canada. However, flight non-conformances can result in punitive damages through Transport Canada. In 2008, there were no aircraft non-compliance issues.

## *Concern Tracking*

The Authority offers a variety of ways for individuals to register their questions or concerns about airport and aircraft noise. The YYC Noise Concern Hotline (403.735.1408) provides callers with access to an Environmental Services Specialist capable of responding to questions or concerns regarding aircraft operations in the City of Calgary. The Hotline is available to concerned residents 24 hours a day, seven days a week. All calls are prompted to leave a detailed message and the concern is then responded to within three business days. All complaints are treated confidentially and are responded to on an individual basis. As well, all information on airlines and operators is kept in strict confidence.

Information provided by complainants is entered into a database, which is used to analyse and identify trends. This allows The Authority to better understand activities of concern and the noise impacts of airport operations. Reports on noise concerns are presented to the ACNCC at each of its biannual meetings. The ACNCC, The Authority and Nav Canada evaluate safe and sustainable NAP and recommend possible changes to minimize disturbances to the community.

In 2008, The Authority received 267 noise complaints compared with the 283 received in 2007, a change of -5.7% (Figures 2 & 3). The reason for the decrease in calls is not apparent, but concerns continue to be largely related to night-time departures with an increase in helicopter overflights of (Figure 4).

Detailed information on the results of the 2008 Noise Management Program is contained in The Authority's 2008 Airport Noise Management Report.

*Figure 1 AFTEMS and NMT locations*

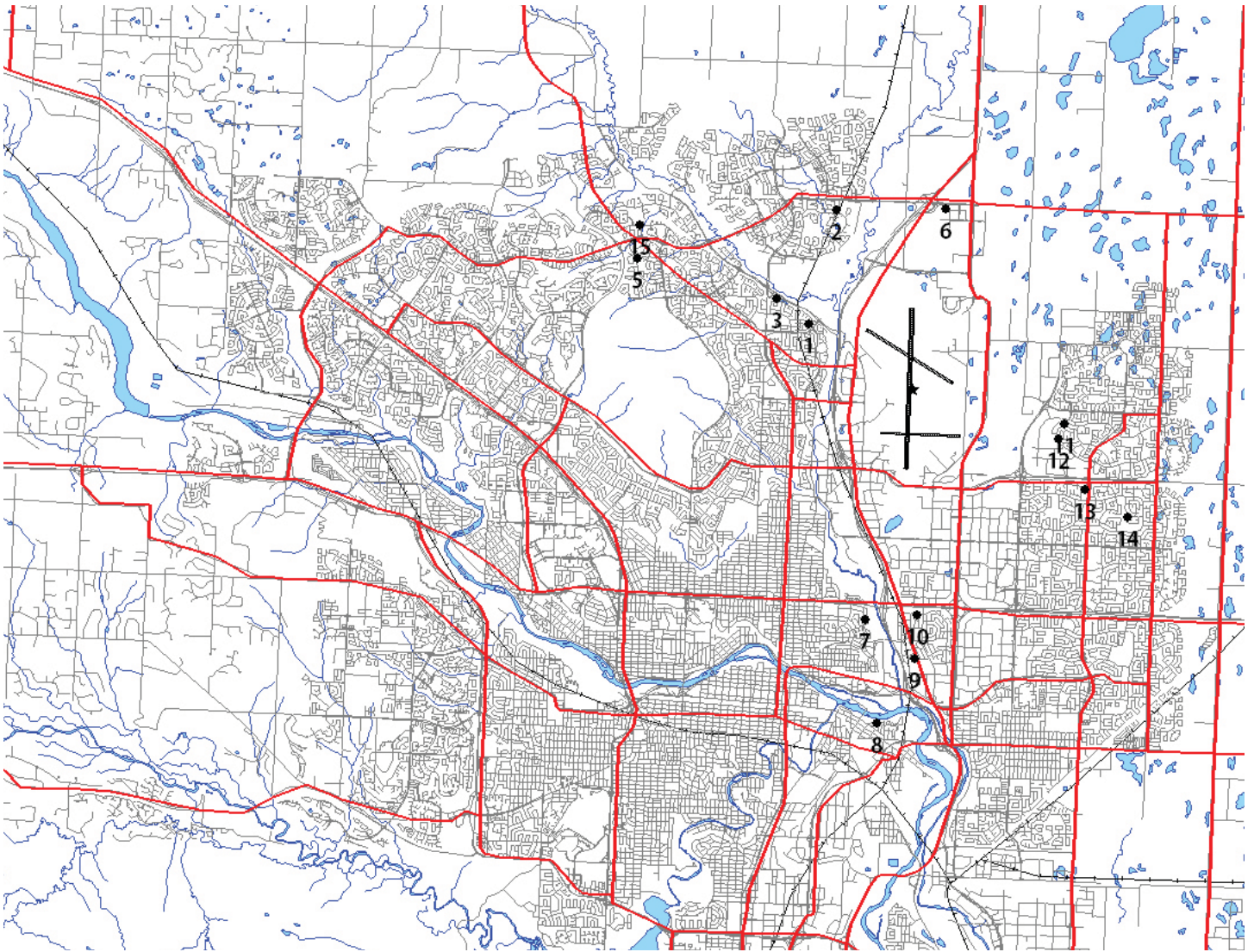


Figure 2 Total noise concerns 2004-2008

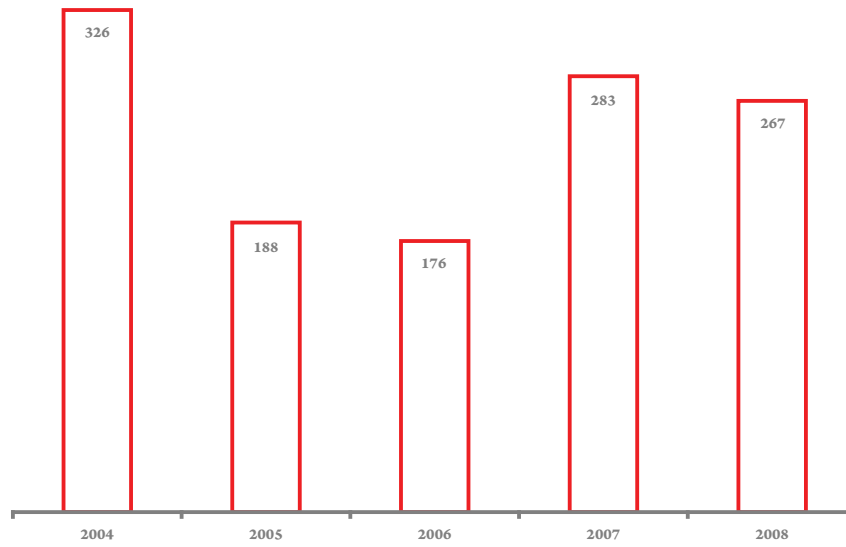


Figure 3 2008 noise concerns by month

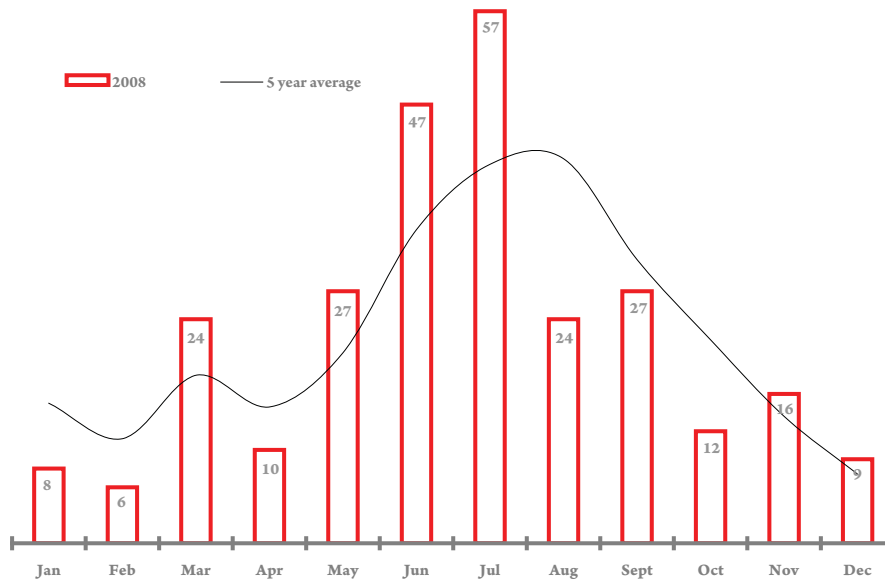
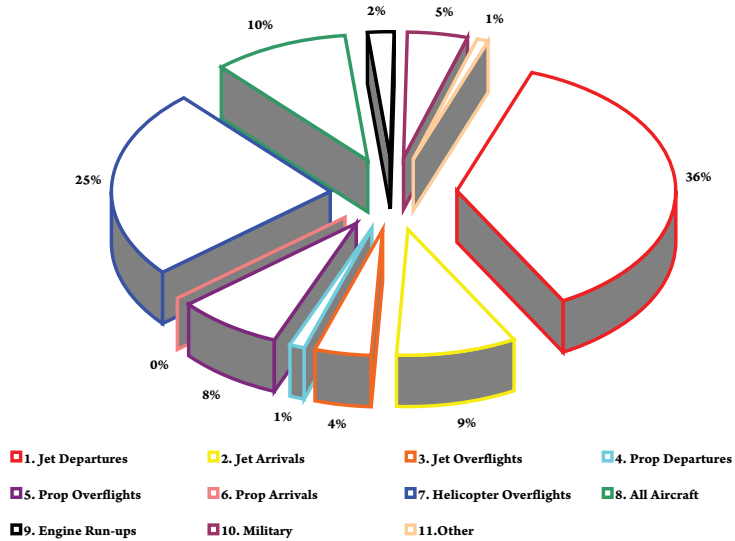


Figure 4 2008 noise concerns by activity



## WATER QUALITY MANAGEMENT

The Authority's Water Quality Program looks to prevent pollution that results from airport-related activities, with a focus on protecting surface and ground water and ensuring sensitive aquatic habitats are not compromised. This is achieved through a strict program of emergency response preparedness, spill prevention initiatives, and diligent water quality monitoring at key locations around the airfield.

Three key airport activities have the largest potential to impact stormwater runoff and local water quality: aircraft de-icing, aircraft refuelling, and construction activities.

### *Surface Water Monitoring - Aircraft De-icing*

The primary reason for surface water monitoring at YYC is to detect the presence of contaminants, in particular glycol. The Authority closely monitors and regulates de-icing activities. In 2008, 42 water samples were collected from water quality monitoring stations and analyzed for ethylene and propylene glycol - key ingredients in aircraft de-icing fluids. Of the 42 samples, three exceeded the CCME Glycol Guideline limit of 100 parts per million.

The majority of deicing (September - May) that occurs at YYC is carried out on Apron I, II and VII where all runoff is collected and diverted to the City of Calgary waste water treatment plant (WWTP). Additional storage capacity provided by the North Retention Pond (NRP) captures contaminated surface run-off from Aprons I, II and VII that does not get diverted to the WWTP. An aeration system in the NRP promotes the degradation of glycol contaminated surface run-off. In the summer months, when water quality criteria, in the North retention Pond, have been met, water is then released to Nose Creek.

The south end of the airfield is not equipped with deicing infrastructure and as a result there is an increased likelihood of glycol leaving YYC's property. The south airfield stormwater outlets release directly into the City of Calgary's infrastructure. As a result, there are a number of sampling stations located at outflows off YYC's property. Sampling station number 2A, saw three glycol exceedances which are related to one south end tenant. These incidents were reported to Environment Canada and upgrades to the Glycol Mitigation Plan were implemented to ensure no further exceedances.

All de-icing operations at the airport are managed through a Glycol Mitigation Plan which is developed through a committee consisting of the airlines and ground service providers. This Plan is then reviewed and accepted by The Authority.

### *Groundwater Monitoring*

Throughout the airfield, there are a number of groundwater wells which are sampled annually to determine contamination has occurred or whether there has been an increase in contamination through out the year. With the quantity of deicing, refuelling, firefighting and construction activities on site there is potential for groundwater contamination.

In 2008, 13 groundwater wells were sampled with no significant changes to the existing contamination levels and concentrations with the exception of well number K91-08 where levels of contaminants have decreased.

A new effluent filtration system at the fire mock-up site was commissioned in 2008. Initial water quality results of the effluent from the filtration system indicate a high level of treatment in the removal of unburned hydrocarbons and a reduction in turbidity. Further work in 2009, will be conducted to confirm the level of treatment this filter offers and to determine if the Fire Mock-up Site effluent requires further treatment.



## MATERIALS MANAGEMENT

The Authority, airlines, fuel suppliers, car rental companies, couriers, maintenance shops, construction companies and a number of other tenants located on YYC property use hazardous chemical products in their operations. Hazardous materials are also produced as waste products of some airport-related operations.

Chemical products and wastes considered hazardous materials may include the following.

- Flammable liquids (aviation fuel, jet fuel, solvent, paint)
- Compressed gases (propane, natural gas, nitrogen, oxygen)
- Corrosives (batteries, battery acid, sodium hypochlorite, ferric chloride)
- Others (PCB ballasts, waste oil, and asbestos)

The majority of hazardous wastes generated by The Authority include waste oil, rubber removal product (removes aircraft tire rubber from asphalt), waste paint, antifreeze, waste fuel, batteries and oil filters. These materials are generated during spill clean-ups, vehicle preventative maintenance and line painting. The Authority has designated areas where hazardous materials can be stored – Hazardous Material Storage Compound located at the Airfield Maintenance Centre (AMC). All wastes are inventoried and labelled for storage and prior to being shipped offsite for appropriate disposal or recycling. HazCo was the local environmental waste company contracted to remove hazardous materials from YYC lands in 2008.

Where ever possible, the Environment Department redirects any hazardous material from the waste stream that can be recycled. Table 1 below lists the materials that were diverted from the hazardous waste stream for recycling.

*Table 1 Hazardous Materials Recycled*

<b>Hazardous Material</b>	<b>Quantity</b>
Hydraulic Oil	400L
Cold Patch Pavement Repair	240L
Plastic Paint Pails & Metal	75
Line Marking Paint	160L

### *Hazardous Materials Management Program*

The Hazardous Material Management Program has two critical objectives:

1. To ensure The Authority handles hazardous materials in a safe and environmentally conscientious manner that meets or exceeds all applicable laws, regulations and incorporates best management practices; and
2. To minimize the amount and variety of hazardous materials used at YYC.

In 2006, one of the more important tasks performed under the new program included updating the inventory of all hazardous materials stored on The Authority property and creating maps showing where these materials are stored. All airport tenants were asked to participate and fill out the information on line through YYC's extranet site. Tenants were asked to fill out the hazardous materials inventory so The Authority could be due diligent and have up-to-date knowledge of materials found on site. However, this is a voluntary initiative for which tenants is not required to provide this information to Authority. At both 2008 Calgary Airport Environment Tenant Committee (CATEC) meetings, the importance of this task was conveyed again. The Authority's Environmental Services Group continues with this endeavour and aims to have all tenants that store hazardous materials at YYC complying with this voluntary measure.

### *Spills Reporting*

The Authority requires tenants to have spill response plans in place to ensure the safe handling of hazardous goods. The Authority also has an Environmental Emergency Contingency Plan (updated in 2007), and regularly audits tenants' level of preparedness and management of hazardous materials. In addition, The Authority has a spill reporting policy which all employees, tenants and contractors must abide by when on airport property.

When spills do occur on YYC property, they are reported to Airport Duty Manager (403.735.1300) to ensure immediate clean up and diminish

the opportunity for further environmental concerns. The Authority's Fire Department does respond to and will complete the immediate clean-up for most spills. Spills that enter the environment (soil, water, drain) must be reported to Alberta Environment and Environment Canada. Once the regulatory agencies have been contacted a follow-up must be conducted to ensure appropriate clean-up has been completed and mitigative measures have been established for future spills. Spill clean-up is done by the company responsible for the spill and is monitored by The Authority. All spills on YYC property, in 2008, are provided in Table 2. The largest spill recorded at YYC in 2008, was the aqueous film forming foam (AFFF) spill at WestJet.

*Table 2 Recorded spills in 2008*

Material	2006 (litres)	2007 (litres)	2008 (litres)
Jet Fuel	249	5382	151.5
Hydraulic Oil	615	440	171
Transmission Oil	1	3	0
Motor Oil	4	34	9
Glycol	-	201	400
Diesel	-	2	284
Antifreeze	1	-	-
Gasoline	6	10	-
Av Gas	519		-
Lav Fluid	-	-	50
Fish Dye	-	-	0.4 kg
AFFF	250	300	1000
Halocarbon	-	-	181 kg
Total spills reported	51	66	45
Total Qty (litres)	1645	6372	2065.5

### *National Pollutant Release Inventory*

As a federal facility, The Authority is required to report, under the *Canadian Environmental Protection Act*, to the National Pollutant Release Inventory (NPRI). NPRI is a nation-wide publicly accessible database of pollutant inventory information on annual releases to air, water, land and disposal or recycling from our stationary operations. For the Materials Management program, it includes materials such as asbestos, PCBs, lead, and mercury. Table 3 provides material amounts submitted to the NPRI for 2007\*.

*Table 3 2008 Reported materials to NPRI*

<b>Part 1A</b>					
<b>Asbestos</b>	Pipe insulation, pipe fittings,	Restoration of mechanical rooms	1.51 tonnes for 2007	NO	+145%
<b>CFC's and HCFC's</b>	Cooling equipment	Releases or spills	0	NO	N/A
<b>Ethylene glycol</b>	Heating and cooling systems	Releases or disposals	0	NO	N/A
<b>Part 1B</b>					
<b>None</b>	None Generated in 2007	N/A	0	NO	N/A
<b>Part 2</b>					
<b>None</b>	None generated in 2007	N/A	0	NO	N/A

\*NPRI is reportable for the year previous.

## WILDLIFE MANAGEMENT

The vast majority of wildlife strikes, approximately 90%, occur in the immediate vicinity of airports during takeoff or landing. Controlling and managing wildlife populations, at and around an airport, are important components of operating an airport in a safe and diligent manner.

To reduce the risks associated with birds (and mammals) at the airport, The Authority maintains a comprehensive wildlife management program. Our program has four main components: habitat management, monitoring, reactive harassment techniques and, where a safety risk is perceived, lethal control of wildlife. One wildlife staff is on property 24 hours a day, seven days a week to monitor the site for wildlife activity. In 2008, the Wildlife Management Plan was updated for YYC. This plan is in compliance to the Canadian Aviation Regulations.

### *Wildlife Struck by Aircraft*

In 2008, there were 68 wildlife strikes – 66 birds and two mammals. The mammals that were struck were coyotes. Factors that contribute to wildlife strikes include aircraft operations, environmental conditions and variability in bird populations. In 2008, unknown birds accounted for 28% of all strikes with gulls accounting for more than 26% of all wildlife killed by aircraft at YYC. It is important for The Authority to have an understanding of where strikes occur – on property or off property. In 2008, 55 strikes occurred within our fence line (on property) and 13 strikes occurred off property.

August 2008 saw the largest number of strikes ever recorded in a one month period at YYC. This significant increase in strikes was more than likely due to mowing activities concurrent with a grasshopper infestation on the airfield. Mowing the grass during this time allowed birds a greater ease of access to the grasshoppers.

Annual summary reports of The Authority's wildlife strikes are prepared and submitted to Transport Canada and Environment Canada (see Figures 5 & 6). Every strike that is filed through CADORS, is responded to by Transport Canada to establish any further information on the strike.

### *Wildlife Intervention*

While habitat management and harassment techniques are the primary tools used, lethal control occurs when the officer perceives wildlife behaviour to be a safety risk. This may consist of an immediate risk to an approaching aircraft, or a potential or chronic risk that has increased to an unacceptable level.

In May 2008, summer student staff removed a total of 33 of nests from both airside and groundside areas – a removal rate of -51% from 2007. Overall, 2008 saw a decrease in hawk nesting activities around the airfield with only five nests being found and destroyed - as opposed to 22 hawk nests in 2007. Nest removal has been used as a management technique for six years and appears to have become very successful at deterring nesting activities. The purpose of nest removal is to deter and impede all active mating pairs from having a successful nest, which ultimately decreases the number of juveniles around the airfield in late summer. All nests that are removed are only done so when no young are present. Nesting pairs will need to have their nest destroyed a number of times before they cease for the season.

The Authority also continued with the hawk trapping/relocation program in May 2008. During that month, no hawks were successfully trapped. This suggests that our hawk trapping/relocation program along with our nest control activities have alleviated the recurrence of nesting pairs here at YYC.

Annual summary reports of The Authority's wildlife control activities are prepared and submitted to Transport Canada and Environment Canada in February 2009.

### *Avian Radar - Merlin*

In 2008, The Authority continued to evaluate and adapt a technology developed for military application into a civil aviation bird detection and risk evaluation tool. Efforts now include working with the Federal Aviation Administration and a team from the University of Illinois to work towards a civil aviation application of this tool.



Figure 5 2008 monthly wildlife strikes

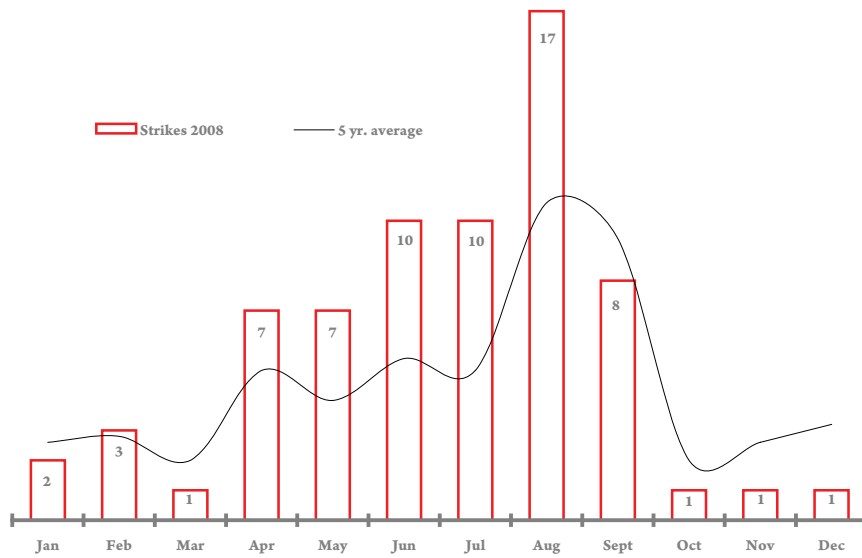
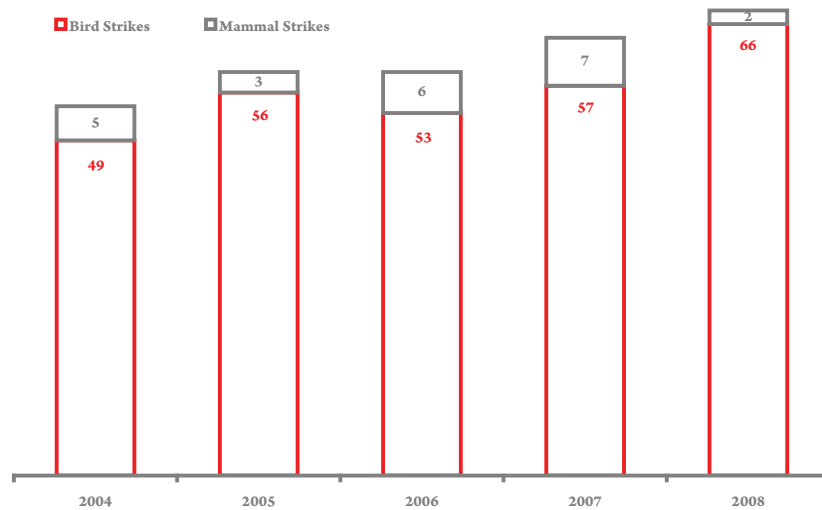


Figure 6 2004 - 2008 total wildlife strikes



## AIR QUALITY MANAGEMENT

The Authority's air quality program addresses airport and airport-related activities that could impact local, regional and global air quality through the production of pollutants, including greenhouse gases and ozone-depleting substances. The program aims to reduce emissions by raising awareness of clean air issues, promoting alternative forms of transportation and the use of alternative fuel and low-emission vehicles.

At YYC, air quality is usually reported one year previous to the reporting year. So for the purpose of this report air quality figures will be reported for 2007, where required.

### *Ambient Air Quality*

The Authority is a voluntary attendee in the Calgary Regional Airshed Zone (CRAZ) ambient air quality management monitoring program. CRAZ has three monitoring stations within the City of Calgary and each station documents concentrations of pollutants such as O<sub>3</sub> (ozone), NO<sub>x</sub> (nitrous oxides), CO (carbon monoxide), PM<sub>10</sub> and PM<sub>2.5</sub> (Particulate matter), CH<sub>4</sub> (methane), THC (total hydrocarbons), and NMHC (non-methane hydrocarbons). There are no sampling station occurs within immediate proximity to YYC. The closest station is the University of Calgary.

Data collected from each station are documented in report format and can be accessed through the CRAZ website ([www.craz.ca/documents.html](http://www.craz.ca/documents.html)).

### *YYC Emission Inventories*

#### **National Pollutant Release Inventory**

As stated previously, The Authority is required to report, under the *Canadian Environmental Protection Act*, to the NPRI. This includes emissions from generators, fire mock-up site and boilers. It does not include sources from YYC vehicles or aircraft. Reporting information is due each year in June.

In 2008, The Authority reported pollution figures for 2007. Table 4 provides pollution figures reported to Environment Canada in fulfillment of the NPRI. The Authority submitted a report to the NPRI in 2008 (for 2007), due to CO threshold exceedance as a result of fire safety training.

*Table 4 NPRI reporting for 2007*

<b>Part 4 – Criteria Air Contaminants (tonnes)</b>					
	<b>Target</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>
CO	20 t	38.21	37.27	30.53	26.2592
NOX	20 t	0.29	7.52	11.561	11.009
SO <sub>2</sub>	20 t	0.06	0.18	0.31	.2306
TPM	20 t	9.23	8.19	5.50	4.9012
PM <sub>10</sub>	0.5 t	9.23	8.19	6.20	4.9012
PM <sub>2.5</sub>	0.3 t	0.0	0.13	0.15	0.1629
VOC	10 t	1.15	1.38	1.44	1.25

To decrease our CO emissions, The Authority has set fuel burn targets and commenced the use of bio-diesel (B20) which will decrease the overall CO and PM<sub>10</sub> emissions. Because the airport has replaced jet fuel with a B20 blend, the CO and PM levels have decreased.

### *GHG Inventory*

In 2006, The Authority conducted an inventory of air emissions from mobile sources at YYC. A particularly comprehensive study, the inventory estimated emissions of greenhouse gas (GHG) CO<sub>2</sub> and N<sub>2</sub>O emissions from all mobile sources. The purpose of the study was to provide a current inventory of YYC's GHG emissions in reference to Kyoto required 1990 baseline levels. The study included the estimated emissions from ground support equipment for aircraft operations, building emissions, emissions from common aircraft and road vehicle emissions (both airport and public vehicles).

Aircraft emissions were separated into those associated with take-offs and landing cycles (TLO), and those associated with the use of aircraft auxiliary power units. This study will continue to be updated, annually, to better understand The Authority's growth in emissions and where feasible, opportunities for emission savings. Table 4 provides 2007 GHG figures for YYC's operations.

*Table 4: Estimated Annual GHG emissions in tonnes per annum for 2007 (not CO2 equivalent)*

2007		
	CO <sub>2</sub> (Tonnes CO <sub>2</sub> /annum)	NO <sub>x</sub> (Tonnes NO <sub>x</sub> /annum)
Aircraft	132,874.47	12.44
Vehicles - airside	1,259.39	0.11
Building*	22,765.66	0.40
Other sources (fire training, APU etc...)	1,448.23	0.03
2005		
	CO <sub>2</sub> (Tonnes CO <sub>2</sub> /annum)	NO <sub>x</sub> (Tonnes NO <sub>x</sub> /annum)
Aircraft	128,162.33	11.12
Vehicles - airside	1,080.12	0.11
Building	21,136.89	0.37
Other sources (fire training, APU...)	1,458.84	0.03

\* Building data is estimated as emission information relating was not complete.

### *Current Initiatives to Improve Air Quality*

Some of the strategies employed to improve local air quality include the following.

- Continued the GHG emissions inventory to identify areas for improvement
- Continued participation on the Calgary Regional Airshed Zone Committee
- Exploring green power opportunities with an alternative power provider
- Purchase of hybrid vehicles for airport use
- Continued annual participation in the Commuter Challenge and Walk with Wallace

Each year The Authority supports the Government of Canada's Commuter Challenge as part of National Environment Week. The event encourages people to use sustainable and active modes of transportation during their daily commute and to track their transportation for the duration of the challenge (one week). The Environmental Services Group tasks summer students to convey the message on the importance of emissions savings.

The 2008 commuter challenge saw 9.5% of The Authority employees participate, for a total of 3,499 kilometres saved in travel. Across Canada, only two airports competed for the coveted title of 'Greenest Airport.' YYC came in 2nd place with Winnipeg International winning 1st place. However, Winnipeg may have had more participants, but YYC saved the most mileage. When comparing YYC with other Calgary organizations of similar size, YYC came in 6th place with a total of 18 participants.

The Environmental Services Group is proud to announce that The Authority has progressively increased its reduction of emissions through the Commuter Challenge and recognizes the individual commitments necessary for its success. This year we have the honor to recognize the true power of a number of emission-saving commuters. These commuters are recognized personally due to their commitments to commuting outside the Commuter Challenge week.

In 2008 these individuals are recognized for their emission savings.

- **Bruce McFarlane – 8200 km (Smart Car)**
- **Joe Baisi – 7392 km (car pool)**
- **Chris Armstrong – 6149 km (bike)**
- **Katherine Kelly - 2688 km (bike & foot)**
- **Barry Ferguson – 2250 km (bike)**

- Dan Baziuk – 1560 km (car pool)
- Shaye Folk-Blagbrough -1540 km (bike)
- Leanna Heidebrecht – 851 km (transit)
- Lorraine Jessee – 810 km (bike)
- Peter Rudolf – 425 km (bike and car pool)
- Cathy Niegarth – 414 km (bike and car pool)
- Bryce Paton – 20 km (transit)

### *Reducing Emissions - Airport Vehicles*

In 2008, The Authority purchased two Ford Escape Hybrids. One is used by the Core of Commissionaires in the airport parkade and the second was purchased for the IFP. It is expected that emissions will be saved by the purchase of these vehicles.

## RESOURCE MANAGEMENT

The Resource Use program promotes the importance of resource-efficient operations and identifies ways to reduce consumption conserve at the airport. Measuring for environmental performance was enhanced through maintenance of our BOMA Go Green certification. Ongoing efforts with the IFP focused on sustainable development, LEED certification and looking at the use of Low Impact Development best practices for Deerfoot North.

### *Energy*

Initiatives to reduce energy consumption in 2008 included replacing the AMC parking lot lights from high pressure sodium to LED lighting. While this project was meant to reduce energy consumption it also has benefits from a hazardous materials perspective. High pressure sodium lights contain significant amounts of mercury and as such should be diverted from the landfill to a recycling facility. With the adoption of LED lighting, mercury is no longer an issue. The lighting in the AMC office building was also upgraded to a brighter more efficient fluorescent lighting fixture reducing energy consumption.

The Authority has committed to replace, where possible, existing lighting with energy efficient lighting in part of our commitment to the BOMA Go Green certification.

### *Recycling*

The Authority has produced nearly 160,000 tonnes of crushed concrete and 40,000 tonnes of recycled asphalt products. It's estimated The Authority saved over \$1 Million over the past eight years by not having to haul and dispose of the large volumes of concrete and asphalt waste. Recycled products ensure that materials are diverted from local landfills and are put back into use.

In 2008, a total of 12.18 tonnes of metal and approximately 10.89 tonnes of wooden pallets were diverted from the waste stream and recycled. These major recycling initiative aim to keep concrete debris out of landfills, reduces need for gravel mining, and reduces pollution involved in trucking materials off-site.

