Office of the City Auditor

1200, Scotia Place, Tower 1
10060 Jasper Avenue
Edmonton, Alberta T5J 3R8

edmonton.ca/auditor

City Pesticide Use Audit

November 14, 2017

The Office of the City Auditor conducted this project in accordance with the *International Standards for the Professional Practice of Internal Auditing*

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Executive Summary

The City of Edmonton is committed to providing safe and healthy urban environments. Controlling weeds and other pests is important for the enjoyment and sustainability of these environments. We had three objectives for this audit including:

- An assessment of the City's *Integrated Pest Management* Policy for clarity;
- Determining whether the City is following federal and provincial regulations; and
- Assessing whether the City is effectively managing pests and appropriately disclosing information to the public.

We observed some clarity issues with regards to the current Policy as it has not been updated since 2004. We also found some deviations in practice from the federal regulations as well as documentation issues that deviated from provincial regulations. These will need to be addressed in order to ensure the City is following all regulations. Based on our analysis of 311 calls, the City is effective in managing pests but can improve on public information relating to the pest management programs.

Based on our audit observations, we have made three recommendations:

1. Review and update the Policy to ensure staff have clear directions for the use of pesticides.
2. Update procedures to ensure pesticide usage and recordkeeping comply with federal and provincial regulations.
3. Ensure that public information relating to pesticide use is accurate and updated.

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City Pesticide Use Audit

1 Introduction

The City of Edmonton is committed to providing safe and healthy urban environments. Controlling weeds and other pests is important for the enjoyment and sustainability of these environments. The Office of the City Auditor included an audit of the City of Edmonton's pesticide use in its approved *2017 Annual Work Plan*.

2 Background

2.1 Pesticide Usage

The City of Edmonton has various programs to control pests in the city. The two main categories of pest in the city are weeds (dandelions, thistles, etc.) and other pests (mosquitoes, rodents, insects, etc.). The *Integrated Pest Management Policy – C501* (the Policy) states that the City is committed to providing a safe and healthy urban environment. The Policy indicates that a variety of preventive and non-chemical pest management strategies must be used or considered and that the City will use the least toxic approved pesticide.

Pesticides are defined by the City as substances that prevent, repel, alter or kill unwanted pests. These include:

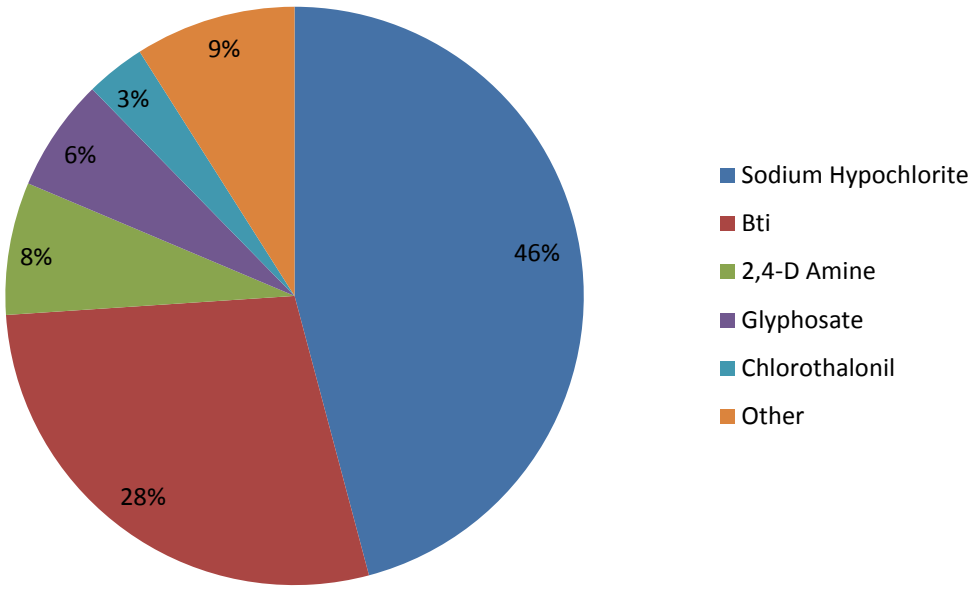
- Insecticide – used to control insects.
- Herbicide – used to control weeds.
- Rodenticide – used to control rodents.
- Fungicide – used to control fungi.

2016 Pesticide Usage

In 2016, the City used a total of 48 different active ingredients equivalent to 4,000 kilograms contained in a variety of pesticide products. Figure 1 on the following page

shows the breakdown of the amount of active ingredient used. The top 5 active ingredients used by the City in 2016 accounted for 91% of the pesticide usage. The remaining 43 active ingredients accounted for 9% of the pesticide usage.

Figure 1 – 2016 Total Active Ingredients Used (4,000 kilograms)



2.2 Federal and Provincial Regulations

Health Canada's Pest Management Regulatory Agency (PMRA) is the legal authority in defining the availability and use of pesticides in Canada. Pesticides are regulated by the PMRA to ensure they pose minimal risk to human health and the environment. Through the *Pest Control Products Act*, the PMRA's role includes:

- Registering pesticides after a stringent, science-based evaluation that ensures risks are acceptable;
- Re-evaluating the pesticides currently on the market on a 15-year cycle to ensure the products meet current scientific standards; and
- Promoting sustainable pest management.

There are over 350 scientists working at the PMRA including biologists, chemists, toxicologists, epidemiologists, plant pathologists, weed scientists and entomologists. All products that are approved will be registered and will have a Pest Control Product number on the label. The label contains specific information on using the pesticide safely.

Provincially, the *Environmental Protection and Enhancement Act* controls the sale, use, application, handling, storage, transport, and disposal of pesticides in Alberta. There are three specific regulations relating to pesticides, they are:

- *The Pesticide (Ministerial) Regulation*;
- *The Pesticide Sales, Handling, Use and Application Regulation*; and
- *The Environmental Code of Practice for Pesticides*.

The City is currently registered with Alberta Environment and Parks to use and apply pesticides in accordance with the above regulations. The current pesticide service registration is valid for 10 years and expires on March 31, 2026. Failure to comply with provincial regulations could result in the loss of the pesticide service registration.

3 Audit Objective

The objectives of this audit were to:

1) Determine whether the City's *Integrated Pest Management* Policy is clear and understandable.
2) Determine whether the City has processes in place to follow federal and provincial regulations, as well as the City's *Integrated Pest Management* Policy.
3) Assess whether the use of pesticides by the City is effective in managing pests in the City and also appropriately disclosed to the public.

4 Scope and Methodology

The scope of this review included the documentation, controls, processes and procedures related to the City's current *Integrated Pest Management* Policy. Our detailed testing included an analysis of pesticide spray summary sheets from 2016.

We also tested a pesticide spray summary sheet for the *Dursban 2.5 Insecticide (Dursban),* which was last used by the City in 2015. We selected Dursban for our sample testing as this product has received public and media attention for its use. This attention is due to the fact Dursban contains the active ingredient chlorpyrifos. However, the PMRA has reviewed the product and currently has the product registered with a September 30, 2021 expiry date.

The City has stopped using Dursban since February 2016. The city is using a lesser toxicity pesticide of Bti.[1] Bti is currently the product of choice by the City for its mosquito program. However, in certain cases the City has used an alternative product, *Pyrate 480* to combat mosquito larvae.

We did not review the efficiency of the pest management program as the City is currently conducting its own review of this. We also did not review the health risk of pesticides as this is the role of the Pest Management Regulatory Agency.

We used the following methods to gather evidence to conclude on the above objectives:

- Reviewing related policies and procedures;
- Discussions with management and supervisory employees;
- Analysis of data; and
- Testing samples for compliance with federal and provincial regulations, as well as the City's Policy.

[1] Bti is short for *bacillus thuringiensis israelensis*. Bti is used to kill mosquito larvae and applied to standing water where the mosquito larvae are found.

5 Observations and Recommendations

5.1 Integrated Pest Management Policy – C501

We reviewed the City's *Integrated Pest Management* policy and discussed with city employees who apply pesticides to determine whether the policy is clear, and contains consistent messaging. We found that the policy should improve on clarity and consistency. Specifically, this includes:

- Defining what "least toxic approved pesticide" means.
- Defining documentation required for preventative and non-chemical strategies.
- Determining the applicability of the policy for non-city property.

Least Toxic Approved Pesticide

A principle of the City's policy is to use or consider a variety of preventative and non-chemical pest management strategies before using the least toxic approved pesticide.

We found that the policy does not provide a definition or a methodology on what the least toxic approved pesticide means or how it is to be determined. The City currently uses only pesticides registered with the PMRA. Since there can be options in choosing a pesticide for certain types of pests, there is a possibility that the pesticide chosen may not be the least toxic approved pesticide.

Documentation Requirements

Another principle of the policy is to consider a variety of preventative and non-chemical strategies before using pesticides. We reviewed current documentation for evidence that preventative and non-chemical strategies were considered prior to the application of pesticides.

Current documentation consists of summary sheets which record the detailed information (mixture amount, name of the applicator, pesticide name, etc.) for the application of the pesticide. These summary sheets use a template and are completed by the pesticide

applicators after the pesticide is applied. The decision to use pesticide is based on directions from leadership staff or historical usage. In our discussion with leadership staff, best practices and alternatives are part of their day-to-day ongoing integrated pest management operations and may not be documented. Therefore, the policy should provide clearer direction on the type of documentation required to show consideration of preventative and non-chemical strategies prior to the application of pesticide products.

Policy on Non-City Property

The current policy addresses pesticide use on city property only. The City applies pesticides on both city property as well as non-city property. For non-city property, consent is obtained from private landowners to apply pesticide on their property. Although the consent form does not make reference to the policy, management operates under the assumption that non-city property also follows the principles of integrated pest management.

The policy states that only pesticide amounts used on city property will be reported annually. However, the City currently reports on total annual usage and does not differentiate between pesticide amounts used on city property vs non-city property.

In conclusion, the policy needs to be reviewed to ensure clarity issues are addressed in order for city staff to have clear directions. Consistent information should also be in place in order for the policy to be applied consistently in all areas where pesticides are being applied.

Recommendation 1 – Integrated Pest Management Policy Update
The OCA recommends that the Manager of the Parks and Roads Services Branch update the *Integrated Pest Management* policy to improve clarity on pesticide use, justification, and address the use of pesticides on non-city property.

Management Response
Accepted **Action Plan:** The City of Edmonton's Integrated Pest Management Policy will be updated to provide clarity on both the use and justification of pesticides. It will also include a process for documenting the Pest Management decision making rationale, and clear guidelines on its applicability to non-city property. **Planned Implementation Date:** June 30, 2019 **Responsible Party:** Branch Manager, Parks and Roads Services

5.2 Compliance with Federal and Provincial Regulations

The federal and provincial governments both regulate the use of pesticides. The federal government determines which pesticides are safe to use and how they should be used. The province regulates the sale, use, application, handling, storage, transport, and disposal of pesticides in Alberta.

5.2.1 Federal – PMRA product label and registration expiry date

Pesticide Product Label

Each registered pesticide has a label which defines the quantity and how the product is to be used. Therefore, following the instructions on the label ensures that the pesticide product is being used in accordance to PMRA standards. Additionally, the City must only use pesticides that have a current registration expiry date.

We tested 10 individual pesticide applications and the associated summary sheet to determine if the City complied with the PMRA label for the registered pesticide. We found three samples where the spray mixture was not in accordance to the label. For one sample we tested, the City sprayed more than the label due to a miscalculation. Furthermore, the label restricted applications during periods of dead calm, yet the

summary sheet indicated that wind speed was 0 km/hour. In two other samples, the City purposely sprayed less than the label based on their professional judgement.

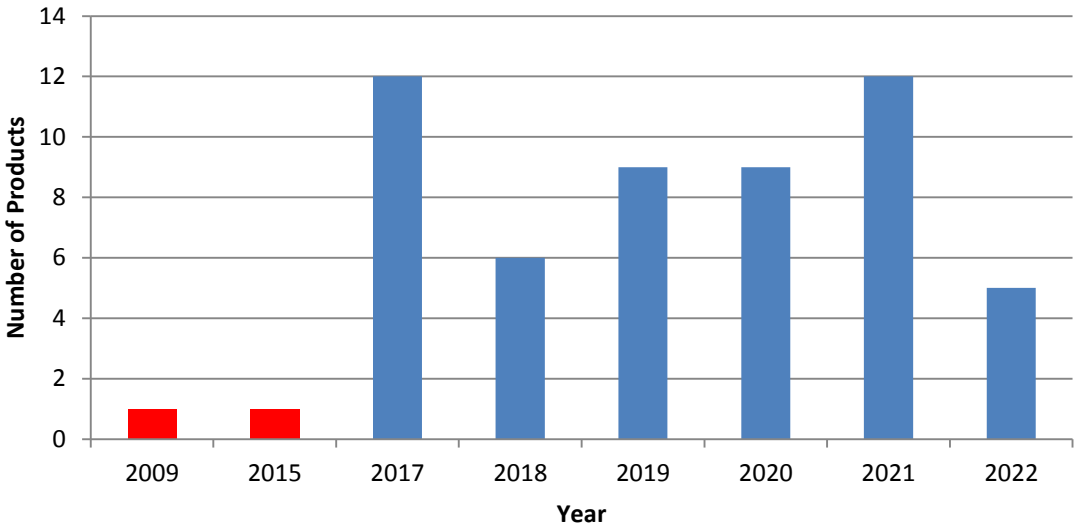
Pesticide Registration Expiry Date

Every pesticide product has a registration expiry date. The PMRA maintains a registry of all the pesticide products that are currently approved for use. This information is disclosed in a public registry and updated continuously on their website. Information includes the last sale date by registrant of the product, last sale date by retailer, and the registration expiry date.

Staff document the registration expiry dates for pesticide products on a summary sheet and discuss the use of pesticide products in team meetings. On an annual basis, a summary sheet is sent to the province to report pesticide usage.

We reviewed the 2016 summary sheet and compared the expiry dates to the federal registry. We found that 53 of 55 products had a valid registration expiry date; however, 2 products had expired registration dates. Figure 2 below summarizes the 55 pesticides used by the City and registration expiry date by year.

Figure 2 – Pesticide Product Registration – Expiry by Year



As shown in Figure 2, there were two products with an expired product registration date. One product was used. The other product was not used as the wrong product number was written. Based on these instances, the City should improve their processes to ensure that all pesticide products used have a valid product registration date and the report submitted to Alberta Environment and Parks is accurate.

5.2.2 Provincial – licensed applicators, storage sites, and documentation

The province regulates the sale, use, application, handling, storage, transport, and disposal of pesticides in Alberta.

City Storage Sites

We reviewed provincial regulations relating to storage sites and found that the City complies with these regulations. We conducted site visits to the storage sites which contain the pesticides to determine if the sites conform to the requirements of the regulation.[2] We observed compliance with this section as the storage facility met the requirements which included ensuring the site was secure from public access, warning signs were present, and containment was adequate.

Licensed Applicators

We tested ten daily summary sheets to determine if documentation was completed properly and contained all information that was required as per the Regulation. For the summary sheets sampled, we found that all the summary sheets contained either a signature of a licensed applicator or a trained assistant applicator (See Table 1 – Licensed Applicator). We also positively observed that in situations where a trained assistant applicator was applying the product, the summary sheet was reviewed by a licensed applicator. This ensured that all pesticide applications were applied by qualified staff.

[2] *Pesticide Sales, Handling, Use and Application Regulation* – Section 23(1)

Documentation

To determine if the City is properly documenting and complying with the regulations, we reviewed the documentation relating to the use of ten registered products in 2016. For each registered product, we reviewed a daily summary sheet which is completed by the crew applying pesticides. We observed deficiencies relating to the documentation on the summary sheets.

Table 1 below summarizes the results of our testing of the 10 daily summary sheets. As shown, five out of ten daily summary sheets contained documentation deficiencies. Deficiencies included not identifying the location of pesticide application, specific pest and purpose for application, and wind direction. These deficiencies should be addressed in order to ensure documentation is complete in order to satisfy the section[3] of the regulation.

Table 1 – Compliance Testing to Provincial Regulation

Product Name	Purpose of Spray	Licensed Applicator	Documentation Deficiencies
Hypochlor-12	Bacteria Control	**Comply**	**None**
Vectobac 200G	Mosquito Larvae	**Comply**	**None**
2, 4-D Amine	Thistle, Cockleburr, Sow	**Comply**	**No wind direction**
Par III Turf	Weeds in turf	**Comply**	**Name of pest not specified**
Hyvar X-L	Weeds and brush	**Comply**	**Name of pest not specified & location not specified & no wind direction**
Nufarm Trillion	Broadleaf Weeds	**Comply**	**None**
Milestone	Thistle, Cockle,	**Comply**	**No wind direction**
Pyrate 480 EC	Mosquito Larvae	**Comply**	**None**
Cycocel	Plant Growth	**Comply**	**Location not specified**
Dursban 2.5	Mosquito Larvae	**Comply**	**None**

[3] *Pesticide (Ministerial) Regulation* – Section 11(1) – Creating Records

In summary, we observed instances where the City is not fully complying with federal and provincial regulations. These included instances of not following pesticide labels, using a pesticide with expired product registration, and documentation deficiencies for the pesticide applications. We recommend the following to address these issues.

Recommendation 2 – Compliance with Regulations
The OCA recommends that the City update procedures to ensure pesticide use follows all federal and provincial regulations. Staff training should also be provided to ensure consistency in all applicable aspects of pesticide application.
Management Response
Accepted **Action Plan:** Procedures concerning pesticide use will be reviewed to ensure compliance with all federal and provincial regulations. An assessment will be conducted to determine where gaps exist, and once identified, develop and implement new documentation requirements, procedures, and training plans with an emphasis on quality control measures and consistent standards across the COE. A regulatory review schedule will also be established. **Planned Implementation Date:** September 30, 2018 **Responsible Party:** Branch Managers (Parks and Roads Services, Community Standards)

5.3 Program Effectiveness and Public Disclosure

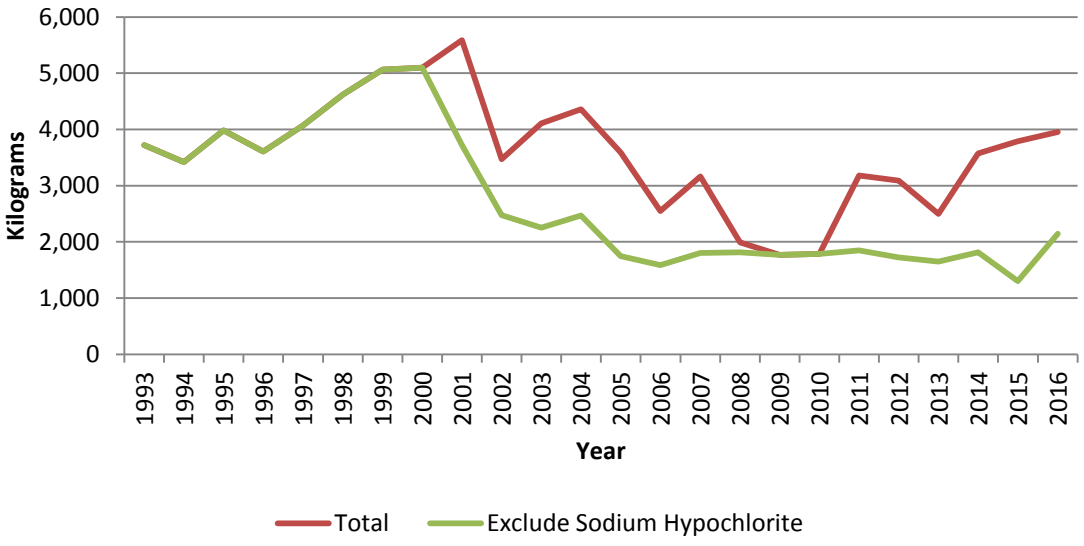
We observed that the City has overall been effective in the use of pesticides; however we have identified opportunities to improve the City's communications to the public on pesticide use.

5.3.1 Pesticide usage

The City has been tracking pesticide products and active ingredients since 1993. Active ingredients are defined as the chemicals in the pesticide products that are used to kill, control, or repel pests.

Between 1993 and 2016, the City's pesticide usage reached its highest point in 2001 at approximately 5,600 kilograms and its lowest point in 2009 at approximately 1,800 kilograms. Starting in 2001, the largest source of pesticide usage was the use of sodium hypochlorite which is used to treat harmful bacteria at the lake in Hawrelak Park for the triathlon event each summer. In the past 16 years,[4] an average of approximately 1,300 kilograms was used to treat the lake. Figure 3 below illustrates the total amount of active ingredients used from 1993 to 2016, as well as the amount of active ingredients used excluding sodium hypochlorite.

Figure 3 – Total Active Ingredients Used (1993-2016)



As shown in Figure 3, there has been a downward trend in the amount of pesticides used by the City over the past 15 years. This has resulted from various initiatives the City has implemented to reduce the use of pesticides, including:

[4] No triathlon events in Hawrelak Park Lake in 2009-2010.

- Hawrelak Lake Chlorine Reduction – The City has implemented various techniques for managing swimmer safety for international water sports events in Hawrelak Lake. These include using curtains to create enclosed playing areas and barriers to separate the treated area from the untreated area. Untreated areas create a refuge for waterfowl and other animals in the park.
- Turf Herbicide Reduction – In 2000, the City began moving away from broadcast spraying of 50% of its mowed turf grass inventory with turf herbicides to spot spraying. Spot spraying of less than 10% of inventory by 2003 and less than 5% in more recent years have been achieved.
- Insecticide Reduction – The introduction of biological controls against certain insects in the early to mid 1990's eliminated widespread pest problems on certain trees. These natural enemies quickly eliminated the need for long standing treatment programs with insecticides.
- Pesticide Programs – The City has various programs to reduce pesticide exposure to sensitive residents through restrictions of adjacent public property spray activities; the ability of residents living around a neighbourhood park to petition the park to be herbicide free; and 45 City Council directed herbicide free parks.

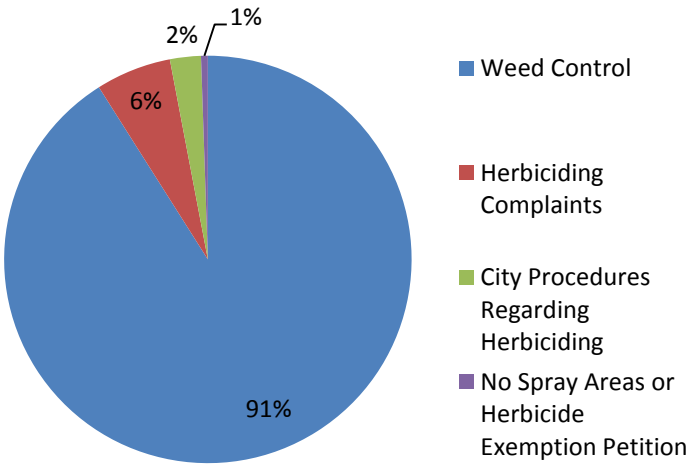
5.3.2 Program effectiveness – 311 calls

To review the effectiveness of the City's pest management program we reviewed the quantity and type of calls received by the City's 311 call centre relating to two branches in the City. The Parks and Roads Services branch is responsible for the weed program and Community Standards branch is responsible for the mosquito program.

From January 1, 2014 to July 31, 2017 the City received approximately 8,600 calls relating to pest management issues that were coded to the two branches. This is a small portion of all calls to 311, which received more than 1.8 million calls in 2016 alone. Of the 8,600 calls, approximately 1,300 related to weed concerns and approximately 400 related to mosquito concerns. The remainder were related to grass and other concerns.

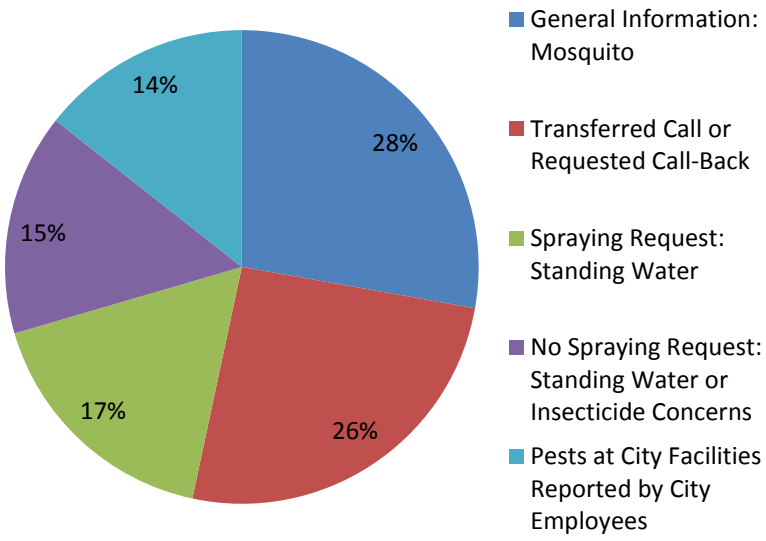
For the approximately 1,300 calls relating to weed concerns, the majority (91%) were requests for the City to address weeds at various locations. Figure 4 below shows a breakdown of the calls.

Figure 4 – Breakdown of Weed Related Calls (1,300)



Of the approximately 400 calls related to mosquito control, the majority of callers wanted information (54%), either from the 311 agent or pest management staff. Figure 5 below shows a breakdown of the calls.

Figure 5 – Breakdown of Mosquito Related Calls (400)



The relatively few spray concerns for weeds (6%) and mosquitoes (15%) suggest that the pest management program is effective in managing pests in the City.

5.3.3 Public disclosure

The City uses a variety of media to provide information for the City's pest management programs. This includes the City of Edmonton webpage which provides information such as a general timeline of the programs, advice on pest identification/management, and various guides. A telephone line is also used to inform citizens of the daily spray locations.

With the extensive amount of information provided, we reviewed selected forms of communications and noted some opportunities for improvements, including:

- On the City's webpage *Facts about Chlorpyrifos*, we noted that the methodology for comparative information was confusing, there were clarity issues, and information was not being updated.
- The City states that the pesticide spray line is updated on a daily basis. We called the spray line to determine if this was occurring. For each of the 4 quadrants that we called, three of the quadrants had updated their information to the day the call was made. For one quadrant, the spray line had not been updated for more than three months.
- The City's *Integrated Pest Management* policy includes attachments that include graphs for the Park Petition Program. The graphs use information from 1998 to 2003, yet there have been parks that have successfully petitioned in 2007 and 2010, that are not reflected.

The City needs to ensure that information released to the public is accurate, updated, and comparable. When information on City websites, newspapers and/or phone lines is not accurate or updated, this can lead to a loss of credibility and citizen confidence when information they are seeking is incorrect or not updated.

Recommendation 3 – Public Communications
The OCA recommends that the Manager of the Community Standards Branch should have a process in place to ensure information posted publically is accurate, updated, and comparable.
Management Response
Accepted **Action Plan:** A complete review of all COE public information concerning pesticides will be conducted and a process implemented to ensure accurate, consistent and timely information is available to the public using effective communication channels. **Planned Implementation Date:** March 31, 2019 **Responsible Party:** Branch Manager – Community Standards

6 Conclusion

The purpose of this audit was to assess if the City's *Integrated Pest Management* Policy was clear and understandable for the application of pesticides by city staff. Additionally, we assessed if the City was following regulations both on a federal and provincial level when applying pesticides. Finally, we assessed if the City was managing pests effectively and disclosing appropriate information to the public.

Overall, we found that the City is substantially following the principles of the *Integrated Pest Management* Policy as well as the regulations that are applicable for the application of pesticides.

In our review, we did find some clarity issues with the policy such as the definition of using the least toxic approved pesticide and recommend that the policy be updated to provide better clarity. We noted some deviations and documentation weaknesses that are applicable to following all federal and provincial regulations and recommended the city review their processes and procedures as well as provide training to ensure compliance.

We found the City to be effective in managing weeds and pests based on the number of 311 calls received by the city branches responsible for the pest management program. Finally, after our review of city information on the use of pesticides, we found some unclear and outdated information. Therefore, we recommended that this be reviewed and updated.

We thank the staff in the Parks and Roads Services Branch, Community Standards Branch, and the Community and Recreation Facilities Branch for their cooperation and openness during this audit.