

# Survey of Pest Control Operators



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## **I INTRODUCTION**

A pesticide is defined as a chemical preparation for destroying plant, fungal, or animal pests ([www.dictionary.com](http://www.dictionary.com)). Unfortunately, pesticides, which are targeted at killing pests, have the potential to harm human beings, pets, and the environment when used indiscriminately.

The use of pesticides across Barbados is regulated by the Pesticide Control Act (1974), which governs “the control of the implementation, sale, storage and use of pesticides” in Barbados.

The Act allows for regulations to be made to:

- a. prohibit the manufacture, packaging, importation, advertisement, sale and use of particular pesticides or classes of pesticides;
- b. control the manufacture, packaging, importation, transportation, advertisement and sale or other distribution of particular pesticides or classes of pesticides;
- c. control the use of pesticides in agriculture generally or on particular crops or pests;
- d. control the use of pesticides on produce during its storage and transportation;
- e. set out the conditions under which pesticides are to be stored;
- f. protect workers against risk of poisoning or other injury by pesticides;
- g. prescribe the permissible level of any pesticide in any particular kind of produce at the time of marketing;
- h. control the quantities of pesticides which may be imported or manufactured and the types of containers in which such substances may be imported, transported, offered for sale or otherwise distributed;
- i. control the labelling of containers, their subsequent disposal and the disposal of unwanted stock of pesticides;
- j. require the keeping and inspection of records;
- k. restrict and prohibiting the use of particular pesticides or classes of pesticides;
- l. impose restrictions and obligations on pest control operators (PCOs);
- m. impose duties on employers, workers or others with regards to occupational safety and health of persons working with pesticides;
- n. prescribe standards for the composition of pesticides; and

- o. regulate licences to manufacture, import, package, sell or otherwise distribute or use any pesticide.

However, only two sets of regulations have been established. These are the Approval of Pesticide Regulation (1974) and the Labelling of Pesticides Regulation (1976).

The Act also establishes a Pesticide Control Board (PCB) to perform the provisions of the Act and Regulations, and allows for the designation of inspectors to investigate compliance with the Act and Regulations.

In spite of the prevailing legislation, a number of incidences within the past ten years that have suggested that there still areas that must be addressed. One area in particular is the operation and practices of pest control operators (PCOs). Outlined herein are the findings of audits of the PCOs in the islands and recommendations as to how the current situation can be improved.

### *1.1 BACKGROUND*

Over the past decade, the impact of indiscriminate pesticide use on indoor air quality has been highlighted by a number of incidents across the island. In 1997, the Black Rock Polyclinic was closed due to the excessive use of Demon EC. Similarly, in 1999, the staff of the Central Purchasing Department was affected by the use of malathion. More recently, in 2005, the impact of indiscriminate pesticide use was brought to the fore via an incident at the Office of the Attorney General. The health of a number of workers at the location was compromised when a pesticide, Demon EC, was used inside of the building. Several occupants of the affected areas of the building had to seek medical attention. The reported acute toxicological affects included headaches, eyes and upper respiratory tract irritation, dyspnea and gastrointestinal tract irritation were consistent with overexposure to the solvent components of the pesticide concentrate.

In light of the latest incident at the Attorney General's Office, an investigation was launched into the operations and practices of the PCOs. The investigation provided the Environmental Protection Department (EPD), as a member of the Pesticide Control Board technical subcommittee, with an opportunity to collect information regarding the storage and handling of pesticides. .

This survey is the first phase in addressing this problem area by determining the current operating practices of PCOs across the island. From the information gathered the necessary operating guidelines for this sector can be developed to safeguard the safety of the environment and inhabitants of Barbados.

### *1.2 OBJECTIVES*

The objectives of this survey were:

1. to assess the operations and practices of pest control operators; and

2. to make recommendations to inform the development of regulations, under the Pesticide Control Act (1974) for pest control operators in Barbados.

## **2 METHODOLOGY**

A questionnaire (Appendix A) was developed to capture information about the operation PCOs. The information that was collected pertained to seven categories. These categories were:

1. General Information;
2. Personnel;
3. Management of Chemicals;
4. Emergency Response;
5. Storage;
6. Waste Disposal; and
7. Application of Chemicals

A list of the known pest control operators in Barbados was compiled from the listing in the telephone directory as well as those that were known to the Department. The compiled list of PCOs is presented in Appendix B. Each PCOs on the list was sent correspondence, via post, along with a copy of the questionnaire to be completed. The correspondence, in addition to informing them of the purpose of the survey, specified a date on which officers from the EPD would perform a site visit. The site visit allowed officers to verify some of the information required on the questionnaire; for example, the receipt and validity of permits for chemicals imported.

## **3 LIMITATIONS OF METHODOLOGY**

The list of PCOs was compiled from the listing in the telephone directory as well as those that were known to the Department. As a result, PCOs not listed in the directory or not known to the Department were not included in the survey.

## 4 OBSERVATIONS

A total of 21 PCOs were to be surveyed. However, only ten of these were actually surveyed as officers were unable to reclaim questionnaires or perform site visits at the majority of establishments despite efforts to do so. Many operators could not be contacted in order to arrange a site visit or collect questionnaires, which they should have received via post. Furthermore, a small percentage of PCOs did not return the completed questionnaire. The list of PCOs that did not respond can be found in Appendix B.

The summary of responses and observations presented below are therefore based on the operations of the ten PCOs surveyed. The following were noted:

### 4.1 GENERAL INFORMATION

1. The majority of pest control operations (4) were located in the parish of St. Michael. Two were located in the parish of St. George while one operation was located in each of the parishes of Christ Church, St. Philip, St. Joseph and St. John.
2. The PCOs were asked to indicate the services that they offered given the options of fumigation, termite control, pesticide control, rodent control, vegetation control, insect control and other. The responses are tabulated in Table 1 below:

**Table 1: Frequency of Services Offered by PCOs**

Service Offered	# of PCOs
Fumigation	3
Termite Control	9
Rodent Control	8
Insect Control	8
Vegetation Control	1
Hygiene Control	1

3. Four of the ten PCOs indicated that they imported chemicals, which were subsequently retailed. These four PCOs further indicated that they possessed the necessary licences from the Pest Control Board and this was verified during the site visits. All of the PCOs purchased chemicals locally from Agro Chemicals Incorporated.

## 4.2 PERSONNEL

### 4.2.1 Health Related Issues

1. The majority of the PCOs do not have medical plans/health insurance for their employees. Only three out of the ten indicated that they had medical plans, which are extended to all employees of the business. Two PCOs did not respond as to whether or not they offered medical plans to their employees.
2. One half of the PCOs surveyed reported that health checks were mandatory. In 80% of cases the health checks were not available to all employees; the health checks were given primarily to technicians. The remaining five PCOs did not respond to the question as to whether health checks were offered.
3. Three of the five PCOs offering their employees health checks offered these checks on an annual basis, one offered biannual checks and one offered checks as necessary.
4. A general examination was the most common type of health check offered to employees, followed by blood and urine tests. One pest control operator indicated that a cholinesterase test was undertaken. One respondent reported that "other" tests were performed. However, information on the other tests requested was not provided by this respondent.

### 4.2.2 Training

5. With respect to the handling of hazardous chemicals, eight of the ten PCOs responded that their employees were trained in handling hazardous chemicals. The other two PCOs did not provide information pertaining to the training of their employees with respect to handling chemicals. In cases where PCOs reported that their employees were trained in hazardous chemicals handling, three PCOs stated that their employees received on-the-job training; two indicated that their employees received formal training and one indicated that training originated from the instructions provided by the manufacturer of the chemicals they use. The remaining two PCOs did not provide information as to the nature of the training of their employees in the handling of chemicals.
6. Half of the PCOs survey indicated that training/refresher courses were performed "As necessary". Two out of the ten PCOs indicated that training was performed yearly whereas the remainder of PCOs did not provide information as to the frequency of training and refresher courses.
7. Eight of the ten PCOs surveyed responded that their employees were aware of the risks associated with the chemicals used, whereas two of the ten PCOs did not indicate whether or not their employees were aware of the risks. Where employees were said to be aware of the risks associated with the chemicals, six PCOs stated that employees had access to

Material Safety Data Sheets (MSDS); one operator stated that employees did not have access to MSDS while the remainder did not comment as to the availability of MSDS.

- a. Fifty percent of the eight PCOs who indicated that employees were aware of risks and safety issues associated with the chemicals used stated claimed that employees were cognizant of the relevant emergency procedures. The remaining 50% did not provide information regarding the awareness of their employees to the relevant emergency procedures.

### 4.2.3 Safety Equipment

- 8. None of the PCOs indicated that safety guidelines were posted in the work area. It should be noted that only five of the ten PCOs surveyed responded to the question about whether or not safety guidelines were posted in the work area.
- 9. In nine of the ten pest control operations technicians were reported to be issued with safety equipment. One pest control operator did not indicate whether or not safety equipment was issued to its technicians.
- 10. Rubber gloves, respirators with cartridges and overalls accounted for the largest proportion of equipment issued to employees (see Figure 1). Boots and dust masks were the next most common issue. The least common pieces of equipment issued were chemical suits, face shields and respirators with adductions.

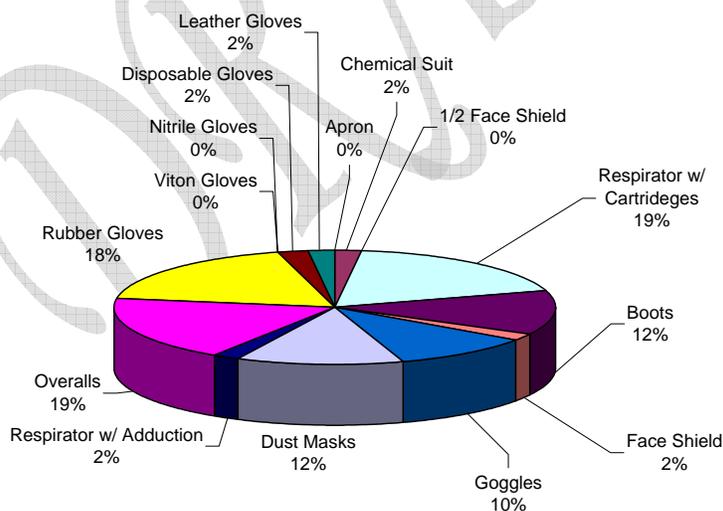


Figure 1: Equipment Usage by Pest Control Operators

#### **4.2.4 Uniforms**

11. Seven of the ten PCOs surveyed stated that their technicians wore uniforms. One pest control operator indicated that its employees were not issued with uniforms and two PCOs did not provide information regarding the issuance of uniforms to its employees. Of the seven PCOs whose employees had uniforms, three stated that the uniform had long sleeves whereas four of the PCOs noted that issued uniforms did not have long sleeves. Additionally, in the seven cases where uniforms were issued, six had short pants
12. In the majority of cases uniforms were wet washed.
13. In 70% of the pest control operations, employees were responsible for the cleaning of their uniforms. One pest control operator stated that the company was responsible for cleaning uniforms. Twenty percent of the PCOs surveyed did not provide information as to who was responsible for laundering the uniforms.

### **4.3 MANAGEMENT OF CHEMICALS**

#### **4.3.1 Keeping of Inventory**

1. Seven of the ten PCOs surveyed kept an inventory of the chemicals used in their operations. Two PCOs indicated they did not keep an inventory and one pest control operator did not provide information concerning the existence of an inventory. In cases where PCOs kept an inventory of chemicals used, five PCOs indicated that their record keeping systems were paper based; whereas one operator stated that they used a combination of paper based and electronic record keeping. The remainder stated that they visually kept track of their inventory.

#### **4.3.2 Chemicals Utilized by PCOs**

2. The chemicals used by the operation are classified in the table below based on the number of operations that use the chemical. Chemicals were categorized as “Least Used” when used in only one of the operations surveyed; Commonly Used when used in 2 – 3 operations and Most Used when used in greater than three operations. Further information on the chemical listed below is presented in Appendix C.

Exhibit 1: Chemicals Utilized by Surveyed Pest Control Operators

Most Used	Commonly Used	Least Used
<ul style="list-style-type: none"> <li>◆ Premise</li> <li>◆ Termidor</li> <li>◆ Maxforce Roach Gel</li> <li>◆ Prelude</li> </ul>	<ul style="list-style-type: none"> <li>◆ Demon WP</li> <li>◆ Pre-empt Roach Gel</li> <li>◆ Klerat Pellets</li> <li>◆ Bora Care</li> <li>◆ Demon TC</li> <li>◆ Lambda Cyhalothrin/Demand CS</li> <li>◆ Actellic 50 EC</li> <li>◆ Baygon 2%</li> <li>◆ Pest Ban</li> </ul>	<ul style="list-style-type: none"> <li>◆ Maxforce Ant Gel</li> <li>◆ Jecta Gel</li> <li>◆ Malathion</li> <li>◆ Precor</li> <li>◆ Bromodiolone Blocks</li> <li>◆ Roach Powder</li> <li>◆ PreControl Plus</li> <li>◆ Talstar One</li> <li>◆ Icon 2.5 EC</li> <li>◆ Liqua-Tox II</li> <li>◆ Diazinon</li> <li>◆ Petcor</li> <li>◆ Jaguar</li> </ul>

### 4.3.3 Operational & Emergency Procedures

3. Three of the PCOs surveyed stated that there was no written operations manual. An equal number of PCOs pointed out that they had a written operations manual. The remainder of the PCOs did not indicate whether they had a manual.
4. One half of the PCOs did not have an emergency procedure manual. One pest control operator did have an emergency procedure manual, and four PCOs did not indicate whether or not they had a manual for emergency procedures.

### 4.3.4 Fire Fighting Equipment

5. Six of the ten PCOs possessed fire fighting equipment. Information pertaining to the presence of fire fighting equipment was not obtained from the remaining four PCOs. With regard to PCOs that utilized fire fighting equipment, in the majority of cases fire extinguishers were the

most common piece of fire fighting equipment. Water hoses were the next popular and then sand. Carbon dioxide and powder fire extinguishers were the most common type of fire extinguisher used. Only one establishment stated the use of a foam extinguisher.

6. Eight of the ten PCOs stated that they did not repackage chemicals under a new name. Information for the other two PCOs was not provided.

#### *4.4 EMERGENCY RESPONSE*

1. Sixty percent of PCOs responded to the question pertaining to the existence of procedures to inform the EPD and other services as to the nature of their operation; the remainder did not respond. In the 60% of cases where the PCOs responded, half indicated that there were procedures in place to inform the emergency services. The other half said that no such procedures were in place. Where procedures were in place, these procedures were to inform the fire service and police.

#### *4.5 TRANSPORTATION OF CHEMICALS*

1. Seventy percent of the PCOs surveyed responded that their chemicals were transported by qualified persons. However, it should be noted that the survey did not define a criteria for “qualified persons”. The remaining 30% did not respond.
2. Some of the precautions taken by PCOs to ensure safe transport of chemicals include transporting chemicals in locked boxes and transporting only the necessary quantities.

#### *4.6 WASTE DISPOSAL*

1. Six PCOs stated that they rinsed chemical containers before discarding them. One operator noted that containers were not cleaned/rinsed before disposal. In instances where containers were rinsed, rinse water was used in foundation treatments or mixed into future treatments.
2. The majority of empty containers were disposed in the Mangrove Pond Landfill. One operator indicated that its containers were reused as containers for other chemicals. Three of the ten operations did not indicate how containers were disposed.
3. Most of the PCOs did not respond to the question pertaining to the disposal of expired chemicals. Two PCOs stated that they had no expired chemicals. One pest control operator indicated that expired chemicals were used in foundation treatments.

#### *4.7 OPERATIONS/APPLICATION PROCEDURE*

##### **4.7.1 Client Awareness**

1. Seven of the ten PCOs asserted that their clients were made aware of the dangers associated with the chemical concentrations used during the service operations.

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## **5 DISCUSSION**

### *5.1 PERSONNEL*

#### **5.1.1 Health Related Issues**

Half of the PCOs surveyed affirmed that health checks were mandatory. These checks were given primarily to the technicians in the organization and were typically required annually by most PCOs. It would be prudent for PCOs to require that all employees be checked at least annually, as office staff may be impacted by the chemicals when technicians enter the office area. Pesticides and other chemicals present on the technicians (e.g. on their clothes) may contaminate surfaces with which the office staff come into contact. Additionally, a number of these offices are fully enclosed; therefore chemicals entering the office are continually circulated throughout the space and can impact the health of staff in that area.

With respect to the health checks, the general examination is currently the primary form of health check. Although this is a practice that should be encouraged, the scope of the general examination should be expanded to include the test for cholinesterase.

Cholinesterase is one of many important enzymes needed for the proper functioning of the nervous systems of humans, other vertebrates, and insects. Organophosphates, carbamates, and other classes of pesticides, work against pest by inhibiting cholinesterase. While the effects of cholinesterase inhibiting products are intended for insect pests, these chemicals can also be poisonous, or toxic, to humans in some situations. Symptoms of cholinesterase inhibition from exposure varying depending on the level of exposure but typically include: tiredness; weakness; dizziness; nausea; headache, sweating, tearing, drooling, vomiting, tunnel vision, abdominal cramps; urinating; diarrhoea; muscular tremors; hypotension (abnormally low blood pressure); slow heartbeat; breathing difficulty, and possibly death, if not promptly treated by a physician.

Humans have three types of cholinesterase: red blood cell (RBC) cholinesterase, called "true cholinesterase" is found in the nervous system; plasma cholinesterase, called "pseudocholinesterase;" which is made in the liver; and brain cholinesterase. When a cholinesterase blood test is taken, two types of cholinesterase can be detected. Physicians find plasma cholinesterase readings helpful for detecting the early, acute effects of organophosphate poisoning, while red blood cell readings are useful in evaluating long-term, or chronic, exposure.

The cholinesterase test is a blood test used to measure the effect of exposure to certain or cholinesterase-affected insecticides. Both plasma and RBC cholinesterase should be tested. These two tests have different meanings and the combined report is needed by the physician for a complete understanding of the individual's particular cholinesterase situation. The approved methods for cholinesterase testing include: Michel, microMichel, pH stat, Ellman, micro-Ellman, and certain variations of these. However, laboratory methods for

cholinesterase testing differ greatly, and results obtained by one method cannot be easily compared with results obtained by another. Sometimes there is also considerable variation in test results between laboratories using the same testing method. Whenever possible, cholinesterase monitoring for an individual should be performed in the same laboratory, using a consistent testing method.

### **5.1.2 Training**

Eighty percent of the PCOs indicated that their employees were trained in handling hazardous chemicals. Furthermore, the majority of these the employees received on-the-job training. On-the-job training can be a cheap and effective method of training new staff; however there is the risk that new staff is schooled in the unsound practices of the organization. Consequently, formal training of staff should be encouraged, and this training should be conducted by an institution/entity that is satisfactory to the PCB.

### **5.1.3 Uniforms**

In the majority of cases where employees were issued uniforms these uniforms did not have long sleeves or long legs. Consequently, there is increased of exposure to chemicals. Employees should be issued with overalls so as to avert excessive contact with chemicals.

### **5.1.4 Keeping of Inventory**

Over fifty percent of the PCOs kept records of their inventory. These records were primarily kept in a paper based system. For the purpose of periodic review and assessment, electronic based inventory systems should be encouraged so that inventory summaries could be readily obtained for inspection. Moreover, all PCOs should be required to keep records of their pesticide inventory. Furthermore, these records should include a log of the location and nature of the treatment performed by the operators. Such records would provide inspectors with an indication of the quantities and classes of pesticides being utilized by PCOs as well as the suitability of the chemicals used for the treatments.

## ***5.2 MANAGEMENT OF CHEMICALS***

### **5.2.1 Chemicals Utilized by PCOs**

None of the chemicals used by the PCOs are banned chemicals, neither are they persistent organic pollutants (POPs). One chemical, Pestban, has been recorded in the Barbados National Pesticide Inventory 2003-2004 as a persistent toxic substance. Consequently, the use of this chemical should be closely monitored and regulated by the Pesticide Control Board to mitigate against possible impairment of human health and the environment.

### **5.2.2 Operational and Emergency Procedures**

Only a small percentage (30%) of the PCOs surveyed had written operation manuals. The absence of an operational manual prevents standardization of the organization's operations. It would be prudent that PCOs implement operational

procedures to ensure that all technicians perform their duties in an approved manner.

Similarly, there should be a documented emergency manual. Moreover, all employees should be aware of the manual and the procedures outlined therein, so that everyone is clear on the action to be taken during an emergency.

### **5.2.3 Client Awareness**

Currently, only 70% of the PCOs indicated that they informed clients of the danger associated with the concentration of chemicals applied during a service operation. All PCOs should be required to verbally inform clients of the associated dangers.

### **5.3 FUTURE ACTION**

Under the Pesticide Control Act (1974) there are provisions to development regulations, which could address all of the aforementioned issues. The most applicable provisions for the development of regulations or guidelines to control the activities of PCOs are:

- a. the requirement to keep and inspect records with respect to pesticide; and
- b. the imposition of restrictions and obligations on pest control operators.

These provisions should be used by the PCB to develop regulations or guidelines to govern the operations and practices of PCOs.

To further inform the development of the regulations, another survey should be conducted to collect information that was not captured by this survey. Such information would include:

- a. application rates and concentrations of chemical concoctions;
- b. the appropriateness of chemicals used for various applications;
- c. the relative sizes of the pest control operations in Barbados; and
- d. an assessment of whether the PCOs are legally/formally established.

This new survey should be conducted by inspectors designated by the Pesticide Control Board. Under the Pesticide Control Act (1974) these inspectors have the power of entry and “to make examinations and enquiries to discover whether this Act and the regulations are complied with”. Moreover, by having the survey conducted by inspectors from the Pesticides Control Board a greater response rate should be obtained since these inspectors have legal power to conduct interviews and make examination to ensure compliance to the Act, whereas the officers of the Environmental Protection Department would have to rely on goodwill on the part of the PCOs. This reliance on goodwill may have contributed in the low response rate to this survey.

## **6 CONCLUSIONS**

From the proceeding discourse it can be concluded that:

1. there is a need for guidelines/regulations to govern the operations of the pest control industry;
2. further information needs to be collected to inform the development of the regulations/guidelines;
3. persons involved in the handling or application of pesticides should be tested for cholinesterase;
4. an insufficient number of PCOs inform clients of the potential health impacts associated with the chemical used during a service.

## **7 RECOMMENDATIONS**

1. Regulations/guidelines should be developed under the Pesticide Control Act (1974) to govern the operations of PCOs. Such regulations/guidelines should dictate:
  - a. requirements for the transportation of chemicals;
  - b. the minimum safety equipment requirement of rubber gloves, overalls, goggles and a respirator;
  - c. that PCOs should undertake at least one training course that highlight best management practices for the storing and handling of chemicals;
  - d. that each pest control operator should have an inventory system and that the system should be capable of recording and tracking information pertaining to the type and quantity of chemical used during a specified period as well as any permits relating to the importation of pesticides; and
  - e. a requirement that PCOs should inform all clients of the hazards associated with chemical concentrations during an application of a pesticide.
2. Another survey should be conducted by the end of 2008 to collect information not captured by this survey. This survey should be conducted by inspectors from the PCB.
3. PCOs should be subject to a registration process under the Pest Control Act as no such process currently exists. A registration process would facilitate better regulation and monitoring of the sector.

4. A code of practice should be developed jointly between the Ministries of Agriculture, Health and the Environment.
5. BNSI standards for PCOs should be developed.

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# Appendix A

**DATA COLLECTION INSTRUMENT**

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# Survey of Pest Control Operators in Barbados

The objective of this survey is to assess the operations and practices of pest control operators

## GENERAL INFORMATION

1. Name of Establishment: \_\_\_\_\_

2. Location of Establishment: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

3. Name of Owner: \_\_\_\_\_ 4. Contact Person: \_\_\_\_\_

Address: \_\_\_\_\_

Position: \_\_\_\_\_

\_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Tel #: \_\_\_\_\_

Tel #: \_\_\_\_\_

Fax #: \_\_\_\_\_

Email: \_\_\_\_\_

5. Indicate the types of services offered by your establishment:

Fumigation

Vegetation Control

Termite Control

Insect Control

Rodent Control

Other \_\_\_\_\_

6. How are your services distributed? ( as a % of your total services)

\_\_\_\_ Residential

\_\_\_\_ Commercial

\_\_\_\_ Industrial

\_\_\_\_ Agricultural

\_\_\_\_ Other

7. Do you import chemicals?  Yes  No

If Yes,

- a. Do you have a license from the Pesticide Control Board for the chemicals imported?  Yes  No
- b. Are these chemicals imported as raw materials to mix your final product or for resale?  Raw material  Resale

If No,

- c. Do you buy your chemicals locally?  Yes  No
- d. if yes, state the company from which the chemicals are purchased

\_\_\_\_\_

\_\_\_\_\_

## PERSONNEL

1. State the total number of personnel by grade:

Senior Management \_\_\_\_\_ Office Staff \_\_\_\_\_

Technicians \_\_\_\_\_ Other \_\_\_\_\_

2. Indicate the number of employees by grade with qualifications/training in pest control or chemical management/handling:

Senior Management \_\_\_\_\_ Office Staff \_\_\_\_\_

Technicians \_\_\_\_\_ Other \_\_\_\_\_

*With reference to supplementary sheet attached please clearly provided the information requested.*

3. Does the company have a medical plan for employees?  Yes  No

a. If yes, are they given to all employees?  Yes  No

b. If no, to whom are they given?

Senior Management  Officer Staff  Technicians

Other \_\_\_\_\_

4. Are health checks mandatory?  Yes  No
- a. If yes, are they given to all employees?  Yes  No
- b. If no, to whom are they given?
- Senior Management  Office Staff  Technicians
- Other \_\_\_\_\_

5. What is the frequency of the health checks?
- Quarterly  Bi-annually  Annually  Other \_\_\_\_\_

6. What type of health checks are given to employees?
- General Exam  Blood Test  Urine Test  Chest X-rays
- Cholinesterase  Other \_\_\_\_\_

For blood and urine tests what parameters are tested for?

---

---

7. Are employees trained in emergency response procedure for handling of hazardous materials related to pest control?  Yes  No
- a. If yes, what type of training?

---

---

8. How often is this training repeated or refresher courses performed?
- Never  Bi-annually  Yearly  As necessary
- Other \_\_\_\_\_

9. Are employees aware of the health risk and safety requirements of chemicals used?  
 Yes     No

a. Do employees have access, AT ALL TIMES, to Material Safety Data Sheets?

Yes     No

b. Do you have readily available Material Safety Data Sheets, less than 3 years old, for all chemical used in operations?  Yes     No

c. Do employees know the emergency response procedures for the chemicals used?  Yes     No

10. Are safety guidelines clearly posted in the work area?  Yes     No

11. Is the company aware of the characteristics of each of the chemicals used including their hazardous characteristics and disposal methods?  Yes     No

12. Are technicians issued with safety equipment?  Yes     No

a. if yes, please indicate:

Gloves

Types of gloves:  Rubber     Viton

Nitrile     Other \_\_\_\_\_

Apron     Chemical suit     ½ face shield     Respirators with cartridges

Boots     Face shield     Goggles     Dust mask

Respirators with adduction     Overalls     Other \_\_\_\_\_

13. Do the technicians have uniforms?  Yes     No

If yes,

do the uniforms have long sleeves?  Yes     No

do the uniforms have long legs?     Yes     No

14. How are the uniforms cleaned?  Wet Wash     Dry Cleaned     Other \_\_\_\_\_

15. Who cleans the uniforms?

Laundry    Company    Employee    Other \_\_\_\_\_

### MANAGEMENT OF CHEMICALS

1. Do you have a readily available inventory of all chemicals in stock?  Yes    No

a. If yes, how is it kept?

Paper    Electronic    Other \_\_\_\_\_



3. Is there a written operations manual?  Yes  No
4. Is there a written emergency procedure manual?  Yes  No
5. If yes to either 6 or 7, are they easily accessible to employees?  Yes  No
6. Is there fire fighting equipment?  Yes  No
- a. If yes, please indicate all that apply:
- Water hoses  Sand
- Extinguishers  Other \_\_\_\_\_
- Type(s) of extinguishers  CO<sub>2</sub>  Foam
- H<sub>2</sub>O  Powder
7. When did the last industrial accident (spill, fire, on the job injury etc.) occur? (how many years ago)
- Never  < 1 year  1 – 3  4 – 6  7 – 10  > 10
- a. Was it reported?  Yes  No
- b. If yes, to who was it reported? \_\_\_\_\_
8. Are chemicals bought in bulk and repackaged under a new name?  Yes  No
- If yes, are MSDS sheets available for products under the new name?  Yes  No
9. Are chemical brought as raw materials and mixed to obtain final product?
- Yes  No
- If yes, where are these chemicals mixed?
- Customer Location  Office  Other \_\_\_\_\_

## EMERGENCY RESPONSE

1. Has CERO been notified of the chemicals stored and handled on site?  Yes  No
  
2. Has the Fire Service been notified of the chemicals stored and handled on site?  
 Yes  No
  
3. Is the nearest medical facility aware of the type of work and the chemical substances involved at the operation?  Yes  No
  
4. In the event of an accident are procedures in place to inform the EPD, Fire Service and other emergency services?  Yes  No
  - a. If yes, please indicate the agencies  
 EPD     Fire Service                       Environmental Health  
 CERO    Environmental Health    Police     Other \_\_\_\_\_

## TRANSPORTATION OF CHEMICALS

1. Are chemicals transported by personnel qualified to transport such chemicals?  
 Yes  No  Don't Know
  
2. What precautions are taken when transporting chemicals?

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## STORAGE

1. Are pesticides only “stored” on shelves of the retail outlet(s)?  Yes  No

If No, do you have a storage area for pesticides?  Yes  No

2. What is the maximum storage capacity/floor area at your facility? \_\_\_\_\_ m<sup>2</sup>

3. By what means is the chemical storage area ventilated?

Mechanical  Natural

a. If mechanical, what is the mechanical ventilation rate? \_\_\_\_\_ CFU/min

b. If natural, please provide the ratio of storage floor area to window area \_\_\_\_\_

4. Are there safety procedures for the chemical storage area?  Yes  No

If yes, briefly outline the procedure

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5. Is there a “berm” around the storage area?  Yes  No

6. Is the storage area neatly kept?  Yes  No

## WASTE DISPOSAL

1. Are empty containers cleaned before they are discarded?  Yes  No

If a container is cleaned before it is discarded, how is the rinse/waste water disposed?

- To sewer  Septic Tank  Suck Well  Stored Indefinitely  Other

If other, briefly describe

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2. If rinse water is stored, what is the procedure if it spills?

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3. How are the empty containers disposed?

- Sold  Given Away  Sent to Landfill  Recycled

c. If containers are sold, given away or recycled for what purpose are they used?

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4. What is done with expired chemicals?

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**OPERATIONS/APPLICATION PROCEDURE**

1. Are your clients made aware of the dangers associated with the concentration chemicals used during service operations?  Yes  No

**COMMENTS**

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# Appendix B

## **LIST OF PEST CONTROL OPERATORS**

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Survey of Pest Control Operators

Company Name	Address	Parish	Surveyed?
A& B Pest Control Company Limited	Lower Bank Hall	St. Michael	✓
Alition Pest Control & Fencing Limited	Gertz Plaza, Collymore Rock	St. Michael	✗
Arthur Moore Services	271 Union Hall	St. Philip	✓
Blackhawk Service	75 Sunset Crest	St. James	✗
Early Bird Exterminating Company Limited	Fantasy Retreat Terrace, Black Rock	St. Michael	✓
Flick Services Limited	Browne's Gap, Jackson	St. Michael	✓
Green's Exterminating Services & Fencing Incorporated	1 Lorde's Court 81, Roebuck Street	St. Michael	✗
J S Pest Control Service Incorporated	Suite #2 Top Floor #121, Roebuck Street	St. Michael	✓
Mac's Pest Control	Clifton Hall	St. Joseph	✓
Mr. Pest	Super's Land	St. Philip	✗
Norquest Hygiene & Pest Control	11 Pine Road, Belleville	St. Michael	✗
Omega Pest Control Limited	Pillersdorf Development' Grazettes	St. Michael	✗
Parsons Pest Control Limited	Foster Lodge	St. George	✓
Pest Buster	Inch Marlow	St. Philip	✓
Pied Pier Pest Control & Land Scaping	Stuarts Road, Bush Hall	St. Michael	✗
Ray's Pest Control	Harmony Cottage	St. George	✗
Rentokil Initial (Barbados) Limited	Rentokil House, Chelston Avenue, Culloden Road	St. Michael	✓
Rodkill Pest Control	Welches Terrace	St. Michael	✗
Rodney Pest Control Services	Prospect	St. James	✗
The House Doctor Pest Control	Guinea Land	St. John	✗

Survey of Pest Control Operators

Company Name	Address	Parish	Surveyed?
Tor-Demon's Pest Control	13 Rose Gate	St. Joseph	✓
Worrell's Pest Management Incorporated	Grazettes	St. Michael	✗

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# Appendix C

## **LIST OF PESTICIDES AND THEIR ACTIVE INGREDIENT**

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**Exhibit 2: List Pesticide and their Active Ingredients**

Commercial Name	Active Ingredient	Chemical Group	Toxicity Group
Prelude	Permethrin 25.6%	PY	II
Klerat	Brodifacoum	CO	Ia
Pest Ban	Chlorpyrifos 48%	OP	II
Diazinon	Diazinon	OP	II
Malathion	Malathion	OP	III
Baygon	Propoxur	C	II
Maxforce Roach Gel	Hydramethylon		III
Precor	(S)-Methoprene 1%	T	
Pre-empt Roach Gel	Imidacloprid 0.005%	N	II
Talstar	Bifenthrin 7.9%	CO	Ia
Roach Powder	Boric Acid 99%	Inorganic	
Jaguar	Brodifacoum 0.005%	CO	Ia
Contrac Blox/ Bromadiolone Blocks	Bromadiolone	CO	Ia
Maxforce Ant Gel	Hydramethylon 1%		III
Demon TC	Cypermethrin Technical (25.3%)		
Demon WP	Cypermethrin 40 %		
Bora-Care	Disodium Octaborate Tetrahydrate 40%		
Demand CS	Lambda-Cyhalothrin Technical (9.7%)	PY	
Liqua-tox II	Sodium Diphacinone 0.106%		
Jecta Gel	Ethylene Glycol		
Icon 2.5 EC	Lambdacyhalothrin	PY	

Commercial Name	Active Ingredient	Chemical Group	Toxicity Group
Actellic 50 EC	Pirimiphos-methyl	OP	III
Premise 75	Imidacloprid 75%	N	II
Termidor 80 WG	Fipronil 80%	PZ	II

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**Exhibit 3: Definition and Description of Pesticide Chemical Groups**

Acronym	Name
C	Carbamate
CO	Coumarin Derivative
N	Nicotinoid
OP	Organic Phosphates
PY	Pyrethroid
PZ	Pyrazole
T	Terpenoid

**Exhibit 4: The Recommended WHO classification for Pesticides by Hazard**

Acronym	Description
Ia	Extremely Hazardous
Ib	Highly Hazardous
II	Moderately Hazardous
III	Slightly Hazardous