

National Profile

of Chemicals Management in Barbados



GOVERNMENT OF BARBADOS

APRIL 2009

Introduction

The Strategic Approach to International Chemical Management (SAICM) is a policy framework for international action on chemical hazards, which was adopted in February 2006 during the first session of the International Conference on Chemicals Management. The overall objective of SAICM is to support the achievement of the goal agreed at the Johannesburg World Summit on Sustainable Development in 2002. That goal was to ensure the sound management of chemicals by 2020.

The Overarching Policy Strategy (OPS) of SAICM indicates that implementation of SAICM could begin with an enabling phase to build the necessary capacity to develop, with stakeholder participation, a national SAICM implementation plan. This National Profile of Chemicals Management has been prepared as a key component of the enabling phase that Barbados will take towards implementation of the Strategic Approach. Additionally, it is envisioned that this Profile will facilitate greater understanding of the functioning, strengths and weaknesses of the Barbadian chemicals management framework.

This National Profile is an update of a profile that was prepared in 2004 and is meant contribute to a better understanding of the problems or potential problems related to chemicals that exist in Barbados and identify the mechanisms that are available to address these problems. It is hoped that this Profile will facilitate greater understanding of the functioning, strengths and weaknesses of the Barbadian chemicals management framework. Preparation of the National Profile is also intended to complement other national activities aimed at the achievement of the principles outlined in Chapter 19 of the Agenda 21 programme of action, which was passed by more than 170 countries at the 1992 United Nations Conference on Environment and Development. Chapter 19 established the international goal of environmentally sound management of toxic chemicals.

The guidance document, “Preparing a National Profile to Assess the National Infrastructure for Management of Chemicals” and its accompanying supplementary guidance note, both prepared by the United Nations Institute for Training and Research (UNITAR), were invaluable aids in the completion of the Profile. Under the aegis of the National Coordinating Team, the preparation process was at every stage informed by the recommendations and principles outlined in the UNITAR guidance documents.

The National Coordinating Team reviewed the data collected and compiled to ensure that

the National Profile was prepared through a process which involves all concerned ministries and other government institutions, as well as other interested national parties. Additionally, the Team ensured that the information contained in the Profile complied with UNITAR guidance and that no major omissions were made.

The Team comprised the following agencies and persons:

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Barbados Fire Service	Mr. Ricardo Gittens	Acting Divisional Officer
Barbados Workers' Union	Mr. Orlando Scott	Senior Assistant General Secretary
Labour Department	Mr. Errol Goodridge	Safety and Health Officer
University of the West Indies	Dr. Jeanese Badenock	Lecturer
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It is the hope of the National Coordinating Team that this document will not be seen as a conclusive assessment of the Barbadian chemicals management framework, but that it will be continually revisited and revised, so that it may remain a relevant, useful, and authoritative source of information. With this in mind, corrections and additions to the Profile will be appreciatively received.

Sincere thanks are extended to all who supported and participated in the production of this document.

Executive Summary

This National Profile on Chemicals Management provides an assessment of the framework for chemicals management in Barbados, and includes information about the legal, institutional, administrative and technical aspects of chemicals management.

Chapter 1: National Background Information

Chapter 1 provides a brief summary of the physical, demographic and political conditions of Barbados. It also contains information about the contribution of key sectors of the Barbadian economy to the Gross Domestic Product (GDP).

Barbados, the most easterly island in the Caribbean, has a land area of approximately 431 km² and a population of approximately 275,000 persons. The country is an independent sovereign state within the Commonwealth and has a parliamentary democracy.

Based on the contributions to the Gross Domestic Product in 2007, Finance, Insurance and Business sector (19.3%); Government (17.3%); and Wholesale and Retail sector (17.0%) were the largest sectors of the Barbadian economy. However, over the period 2005-2007, the construction sector showed the greatest increase in average growth. It is purported that the major pollutant emissions from the various sectors of the economy are agricultural chemicals, particulates and used oils.

The limited land space and the high population density of the island restrict the options available to address the challenges of chemical disposal. Consequently, one of the options typically employed for the disposal of chemicals is to transport chemicals and related waste to recycling or disposal facilities abroad in accordance with the Basel Convention. However, emphasis needs to be placed on improving the controls over importation and public education.

Chapter 2: Chemical Import, Production, Export, Storage, Use and Disposal

Chapter 2 contains information on the import and export of chemicals to and from Barbados. Information about chemical production and reformulation is not included, as the privacy requirements of the Statistics Act Cap. 192 of Barbados law prevent this data from being published. No quantitative data on national chemical use was readily available.

Data for the period 2004-2007 revealed that, on average, 431,138 kg of pesticides were imported into Barbados. Average total exports of pesticides for 2004-2007 amounted to

2,313,282 kg. The United States of America and Trinidad and Tobago were the main source of pesticide imports. The five leading recipients of exports were Trinidad and Tobago, Jamaica, Antigua, St. Lucia and Haiti.

On average, 5,777,609 kg of fertilizers were imported into Barbados between 2004 and 2007. The main sources of imports were the United States of America, Trinidad and Tobago, the Dominican Republic, and Canada. An average of 457,492 kg of fertilizers was exported primarily to Suriname, St. Vincent, St. Lucia, and Guyana in this period.

With respect to petroleum products, an average of 614,091,102 kg of petroleum products were imported into Barbados; the main sources of imports being Trinidad and Tobago, Suriname, the United States of America, Venezuela and Curacao. An average of 16,009 kg of petroleum products were exported from the island, primarily to Trinidad and Tobago, Canada, the United Kingdom, Grenada and St. Vincent.

The ability to collect data relating to the import, export and use of chemicals is adequate even though it is not effectively utilised. However, there is a marked inability to collect data pertaining to the disposal of chemical waste. Additionally, existing mechanisms for exporting hazardous waste need to be publicised so that stakeholders are made aware of their existence and their requirements. There must also be greater enforcement of these mechanisms. Furthermore, the actions outlined in the National Implementation Plan for the Management of Persistent Organic Pollutants need to be implemented to reduce the threat posed by POPs.

Chapter 3: Priority Concerns Related to Chemical Production, Import, Export and Use

Chapter 3 presents an overview of the nature and priority of environmental and health concerns associated with chemicals production, trade, use and disposal in Barbados. The problem areas and concerns highlighted in this chapter were identified using existing reports and data, as well as the input of stakeholders who participated in a national consultation on chemicals management.

The environmental and health concerns identified relate to groundwater contamination; coastal and marine pollution; impacts on biodiversity; air contamination; hazardous waste management; management of obsolete chemicals; soil contamination; occupational health; and chemical residues in food. Of these, groundwater contamination, coastal and marine pollution, biodiversity reduction, management of hazardous wastes and obsolete chemicals, and occupational health have been ranked as high priority issues.

In several cases there is a lack of data about the magnitude and severity of the problems identified; this data deficiency and the absence of coordinated programmes to gather the necessary information are themselves causes for concern.

Chapter 4: Legal Instruments and Non-Regulatory Mechanisms for Life-Cycle Management of Chemicals

Chapter 4 provides an overview of the existing legal and non-regulatory mechanisms governing chemicals management in Barbados.

The key pieces of legislation in this regard are the Pesticides Control Act, 1974, the Health

Services (Control of Drugs) Regulations, 1970 and the Marine Pollution Control Act, 1998. A number of other laws and regulations with bearing on chemicals management exist, although the enforcement status of these instruments varies widely.

The Pesticides Control Act provides for “the control of the importation, sale, storage, and use of pesticides” and empowers the Minister to make regulations in all areas of pesticides management. Regulations developed under the Act are the Pesticides Control Regulations, which regulate the manufacture, import, storage, use, distribution, and sale of approved pesticides, and the Labelling of Pesticides Regulations, which regulate the labelling of pesticides that are distributed, exposed or offered for sale.

The Health Services (Control of Drugs) Regulations define the mechanism by which drugs used in the health services may be imported into, manufactured, and distributed in Barbados. However, a notable deficiency is the disposal of obsolete pharmaceuticals.

The Marine Pollution Control Act (MPCA) is “an Act to prevent, reduce and control pollution of the marine environment of Barbados from whatever source.” It aims to protect the sea around Barbados from any source of pollution that might impact negatively on the environment or human health.

There is little regulation of industrial chemicals, consumer chemicals and chemicals wastes, and there are a limited number of formal non-regulatory processes for the control of chemicals management in Barbados.

Chapter 5: Ministries and Government Agencies Managing Chemicals

Chapter 5 lists those governmental ministries, and their subsidiary agencies, that play a role in the management of chemicals in Barbados.

Ministries that exercise functions related to chemicals management are the Ministry of Environment, Water Resources and Drainage (through the Environmental Protection Department); the Ministry of Health; the Ministry of Agriculture; the Ministry of Finance, Investment, Telecommunication and Energy; the Ministry of Economic Affairs and Empowerment, Innovation, Trade, Industry and Commerce (through the Barbados National Standards Institute and the Customs and Excise Department); the Ministry of Home Affairs (through the Department of Emergency Management, the Barbados Fire Service, and the National Council on Substance Abuse); the Ministry of International Business and International Transport (through the Barbados Port Authority); and the Ministry of Transport and Works.

Collectively, the various ministries involved, either directly or indirectly, with chemicals management ensure that all aspects of the life cycle management of chemicals are addressed. Each ministry has clearly defined mandates; however there are a few instances of overlapping mandates among some of the departments within ministries.

Chapter 6: Relevant Activities of Industry, Public Industry Groups and the Research Sector

Chapter 6 identifies non-governmental stakeholders in chemicals management, outlines the roles these stakeholders play in the chemicals management process, and summarizes the experience and expertise housed within each organization.

Stakeholder organizations listed in Chapter 6 come from a variety of sectors, including industry, manufacturing and distributing, non-governmental organizations, regional and international organizations, the research sector and labour unions. Areas of expertise include data collection, training and education, monitoring, and provision of information to workers. Areas where there appear to be a deficit of expertise and experience include enforcement and chemical testing.

Chapter 7: Inter-Ministerial Commissions and Coordinating Mechanisms

This chapter describes existing collaborative mechanisms for national chemicals management. Chief among these are multi-stakeholder authorities and committees, such as the Pesticides Control Board, the Risk Analysis Monitoring Committee on Industrial Development, the National Chemicals Convention Committee, Barbados National Response Team and the National Advisory Committee on Occupational Safety and Health, which involve participants from both the public and private sectors. Chapter 7 provides an overview of the mandate and functioning of these committees.

Generally, the existing inter-ministerial commissions and co-ordinating mechanisms function effectively relative to their roles in chemicals management and appear to address the most pertinent aspects. However, there are some challenges that confront the operations of these inter-ministerial commissions and co-ordinating mechanisms. The challenges include administrative issues and the lack of information sharing between mechanisms.

Chapter 8: Data Access and Use

Chapter 8 provides an overview of the availability of data to inform and facilitate effective chemicals management in Barbados.

Key agencies housing such data include the Ministry of the Environment, the Pesticides Control Board, the Labour Department, the Governmental Statistical Department and the Customs and Excise Department. The lack of coordinated and centralised data collection hampers ready access to and use of this data, as does the absence of standardised formats for its collection, compilation and storage.

The Pan American Health Organisation and the Food and Agriculture Organisation are two of the leading sources of international chemicals management related literature. However, there appears to be no designated agencies where literature on chemicals management can be accessed from international databases. Consequently, individuals or entities have to source such information on their own and bear the associated costs.

There is a pressing need for the national information exchange system to be strengthened to facilitate the flow of information between local agencies, and from international organisations to local government departments and other stakeholder groups.

Chapter 9: Technical Infrastructure

Chapter 9 provides an overview of the technical infrastructure in Barbados that could be made available to support a comprehensive chemicals management programme.

There are three laboratories capable of providing the chemical analyses required to support

effective chemicals management. These are the laboratories of the Government Analytical Services, the Forensic Sciences Centre, and the Department of Biological and Chemical Science of the University of the West Indies. These labs possess a wide range of equipment that could be utilised in national chemicals management. This equipment includes both specialised equipment for data analysis and general hardware for the storage, analysis, retrieval and sharing of data.

There are a number of offices that house computerised information systems that could be used in the development and implementation of a national chemicals management programme. However there is currently no programme in place for harmonisation or connectivity between these offices, and the compatibility of these various systems is unknown.

The development of a coordinated and effective approach to chemicals management in Barbados will require significant strengthening of the existing technical infrastructure, particularly as it relates to equipment, staffing, and technical training and education.

Chapter 10: Chemical Emergency Preparedness, Response, and Follow-up

Chapter 10 is intended to provide a synopsis of the facilities in Barbados related to preparedness for, response to, and follow-up of emergencies involving chemicals.

The capacity in Barbados to respond to chemical emergencies can be described as sufficient but there is significant room for improvement. There are pressing needs for: a programme for conducting frequent simulation exercises; a dedicated communication system for use by all emergency personnel during emergencies; updating of the existing medical facilities so that they can care for persons exposed to chemicals; and harmonisation of the various coordinating mechanisms in an effort to improve the holistic approach to national chemical emergency response and preparedness.

Chapter 11: Awareness/Understanding of Workers and the Public; and Training and Education of Target Groups and Professionals

Chapter 11 reviews worker and public awareness of and sensitivity to chemicals management issues.

Generally, there is a dearth of specific policy initiatives to address the need for public awareness and understanding. Although individual organisations may have internal policies with regards to occupational health and safety and the dissemination of information to their workers, this does not diminish the need for a national policy to promote and encourage greater awareness of the need for sound chemicals management.

Nonetheless, there are a number of activities being undertaken to raise public awareness to chemical management issues. Agencies that are currently involved in such activities include: Counterpart Caribbean; the Environmental Education Committee; the Ministry of Environment, Water Resources and Drainage; and the Solid Waste Project Unit.

The main legal instruments specifically requiring the dissemination of information regarding chemicals management to the public are the Pesticides Control Act and its accompanying regulations, which govern the labelling of pesticides and the provision of

safety information to persons working with pesticides. The Act also imposes a duty of care on employers, workers and others involved in the management of pesticides.

Both tertiary institutions, the University of the West Indies, Cave Hill Campus, and the Barbados Community College provide educational programmes in the areas of chemistry and environmental studies, which could aid in furthering capacity building related to chemicals management. Additionally, the Solid Waste Project Unit has implemented an initiative that is geared towards increasing solid waste management issues including hazardous waste management in primary and secondary schools.

Chapter 12: International Linkages

Chapter 12 identifies linkages between Barbados and international organisations with some interest in sound chemicals management. These organisations include the United Nations Environment Programme, the World Health Organisation, the Food and Agriculture Organisation of the United Nations, the International Labour Organisation, the International Programme on Chemical Safety and the International Organisation for Standardisation, among others. There are regional offices of the World Health Organisation and The Food and Agriculture Organisation in Barbados; connections with other international organisations have been formed via the relevant Government ministries and other local institutions.

Barbados is a participant in a number of international agreements related to chemicals management. These include the Basel, Rotterdam and Stockholm Conventions. The national focal points for the various international organisations and agreements are scattered over a wide range of departments and ministries, and there are few inter-departmental/inter-ministerial mechanisms to co-ordinate activities initiated by these international bodies or agreements. As a result, although a number of related projects may be on-going within the island; these projects may not be effectively integrated into a comprehensive national programme for chemicals management.

Chapter 13: Resources Available and Needed for Chemicals Management

Chapter 13 provides an overview of the human resources existing within governmental institutions involved in chemicals management, and highlights the need for capacity building within these institutions.

While there is a range of expertise within the public sector in the area of chemicals management, it is rare that a ministry or department will have professional staff working exclusively in areas related to chemicals management or that budgetary provision will be made specifically for chemicals management activities. Most agencies have indicated that there is a need for additional staff to enable their chemical management mandates to be effectively carried out. There is also a need for chemicals management training for existing staff, particularly in the areas of safe handling and use, monitoring, analysis, risk identification, emergency response, risk management and enforcement.

Chapter 14: Conclusion and Recommendations

There are six principal issues that could hinder the development of an effective chemical management programme in Barbados. These issues are lack of harmonization; lack of relevant legislation and enforcement; an absence of disposal facilities; lack of data on the

use and disposal of chemicals; limited involvement of non-governmental stakeholders; and an absence of local scientific research.

To overcome these obstacles relevant legislation would need to be developed, implemented and enforced; the responsibility for chemicals management would have to be consolidated; guidelines for the disposal of chemical waste would need to be developed and publicised; greater involvement of the civil society should be encouraged; a detailed skill assessment should be conducted; and the public would need to be further educated on the impacts that chemicals can have on human and environmental health.

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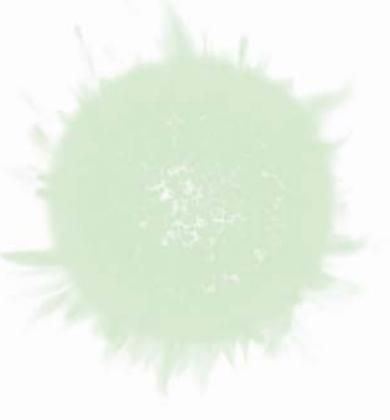
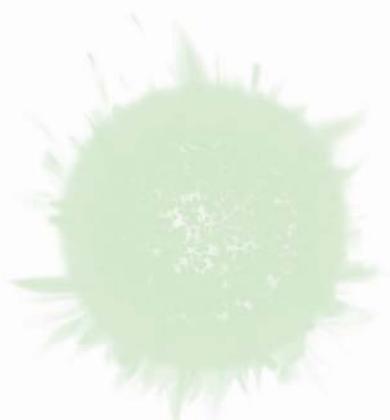
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Chapter 1

National Background Information



This chapter provides general background information on Barbados, its physical and demographic attributes, political structure and the size and nature of its primary economic sectors

1.1 PHYSICAL AND DEMOGRAPHIC CONTEXT

Barbados is the most easterly island in the Caribbean, with a land area of approximately 166 square miles (431 square kilometres). English is the official language. However, a local English dialect exists.

By the end 2007, the island's population was estimated at 274 700 persons; of which 132 700 were men and 142 000 were women. Women had a life expectancy of 77 years whereas the life expectancy for men was approximately 73 years. The birth rate was 12.9 births per 1000 persons and approximately 77% of the total population were of working age. The provisional unemployment rate was 7.4%.

Education is free and available to all up to the tertiary level; and is mandatory for children at the primary and secondary level. Hence, the average level of education of the population is secondary, as not all children undertake tertiary education.

1.2 POLITICAL/GEOGRAPHIC STRUCTURE OF THE COUNTRY

Barbados is divided into eleven (11) parishes. There are no divisions into regions or states.

The country is an independent sovereign state within the Commonwealth and adopts a parliamentary democracy, with the Head of State being Queen Elizabeth II, represented by a Governor General. The country has as its Head of Government a Prime Minister.

A bicameral system of Parliament exists in the country, consisting of the Senate and the House of Assembly. Members of the Senate are appointed by the Governor General, while members of the House of Assembly are elected by direct popular vote to serve five-year terms. Nationals are eligible to vote from eighteen (18) years of age. There is no system of local government.

1.3 INDUSTRIAL, AGRICULTURAL, AND OTHER KEY ECONOMICS SECTORS

Table 1.A below summarizes of the relative importance of various sectors of the Barbadian economy. The table highlights the output value and contribution to the gross domestic product of sectors of the Barbadian economy for 2007, along with the average growth rate in each sector over the period 2005 -2007.

Information on structure of the industrial and agricultural sectors in terms of the number of facilities and persons employed was not available.

Table 1.A: Overview of Some National Economic Sectors

Economic Sectors and Related Activities	Contribution to Gross Domestic Product (%)	Output Value (USD)	Average Growth Rate Over Period 2005-2007 (%)
Sugar (manufacture of)	0.5	15,403,954	0.0
Non-Sugar Agriculture ¹	2.0	54,836,001	2.7
Mining & Quarrying	0.8	22,584,597	-0.8
Manufacturing	6.2	172,672,314	1.1
Electricity, Gas & Water ²	3.6	101,222,057	5.6
Construction	6.3	176,197,951	8.5
Wholesale & Retail ³	17.0	476,537,798	5.5
Tourism	13.6	381,824,088	0.9
Transport, Storage & Communication ⁴	6.1	171,571,292	5.5
Finance, Insurance & Business	19.3	539,706,736	5.0
General Services	7.3	205,617,163	5.0
Government	17.3	483,513,432	3.2

¹Excludes all activities related to forestry (i.e. 02), the growing of sugar cane (i.e. 0114) and aquaculture (i.e. 032)

²Includes Electric power generation, transmission and distribution and the Manufacture of gas; distribution of gaseous fuels through mains only whereas E includes Water collection, treatment and supply only

³Excludes the repair and maintenance of vehicles and motorcycles

⁴Excludes all activities related to information. Include telecommunications only (i.e ISIC code 61)

1.4 RELEASES OF CONCERN BY MAJOR ECONOMIC SECTORS

Table 1.B provides an overview of the releases of concern related to specific economic sectors of the Barbadian economy. It should be noted that the releases outlined in Table 1.B below are only meant to be indicative of possible emissions from each sector based on expert opinion. A dearth of available research prevents the quantification, either by weight or volume, of wastes emitted.

Table 1.B: Releases by Type and Media for Major Economic Sectors

Economic Sectors and Related Activities	Major Pollution Emissions by Chemical Types	Media to which Emissions are Released: Air, Water, Soil	Wastes Emitted as: Solids, Liquids or Gas
Sugar (manufacture of)	Pesticides/Fertilizers/Particulates	Soil/Water/Air	Solid/Liquid/Gases
Non-Sugar Agriculture ⁵	Pesticides/Fertilizers	Soil/Water/Air	Solid/Liquid
Mining & Quarrying	Used oil/Particulates	Soil/Water/Air	Liquid/Solid
Manufacturing	Used oil/VOCs/Particulates	Soil/Water/Air	Liquid/Gas
Electricity, Gas & Water ⁶	Used oil/Carbon Dioxide/Particulates	Soil/Water/Air	Liquid/Gas
Construction	Used oil/Particulates	Soil/Air	
Wholesale & Retail ⁷	Solid Waste	Soil	Solid
Tourism	Detergents/Pesticides	Soil/Water	Liquid
Transport, Storage & Communication ⁸	Used oil/VOCs/Particulates	Soil/Water/Air	Solid/Liquid/Gases
Finance, Insurance & Business	Solid Waste	Soil	Solid
General Services	N/A	N/A	N/A
Government	Pesticides/Fertilizers/Particulates/Used oil	Soil/Water/Air	Solid/Liquid/Gas

⁵ Excludes all activities related to forestry (i.e. 02), the growing of sugar cane (i.e. 0114) and aquaculture (i.e. 032)

⁶ Includes Electric power generation, transmission and distribution and the Manufacture of gas; distribution of gaseous fuels through mains only whereas E includes Water collection, treatment and supply only

⁷ Excludes the repair and maintenance of vehicles and motorcycles

⁸ J excludes all activities related to information. Include telecommunications only (i.e ISIC code 61)

1.5 COMMENTS/ANALYSIS

Due to the predominantly limestone structure of the island, inappropriate disposal of chemicals and related wastes, and/or excessive use of chemicals such as agricultural pesticides, can lead to increased concentrations of these substances in the groundwater and in the marine environment. Increased concentrations of chemicals in groundwater and the marine environment can have adverse social impacts ranging from:

- contamination of potable water sources;
- reduction in the contribution to the Gross Domestic Product of major economic sectors such as tourism; and
- inaccessibility to marine recreational bathing water.

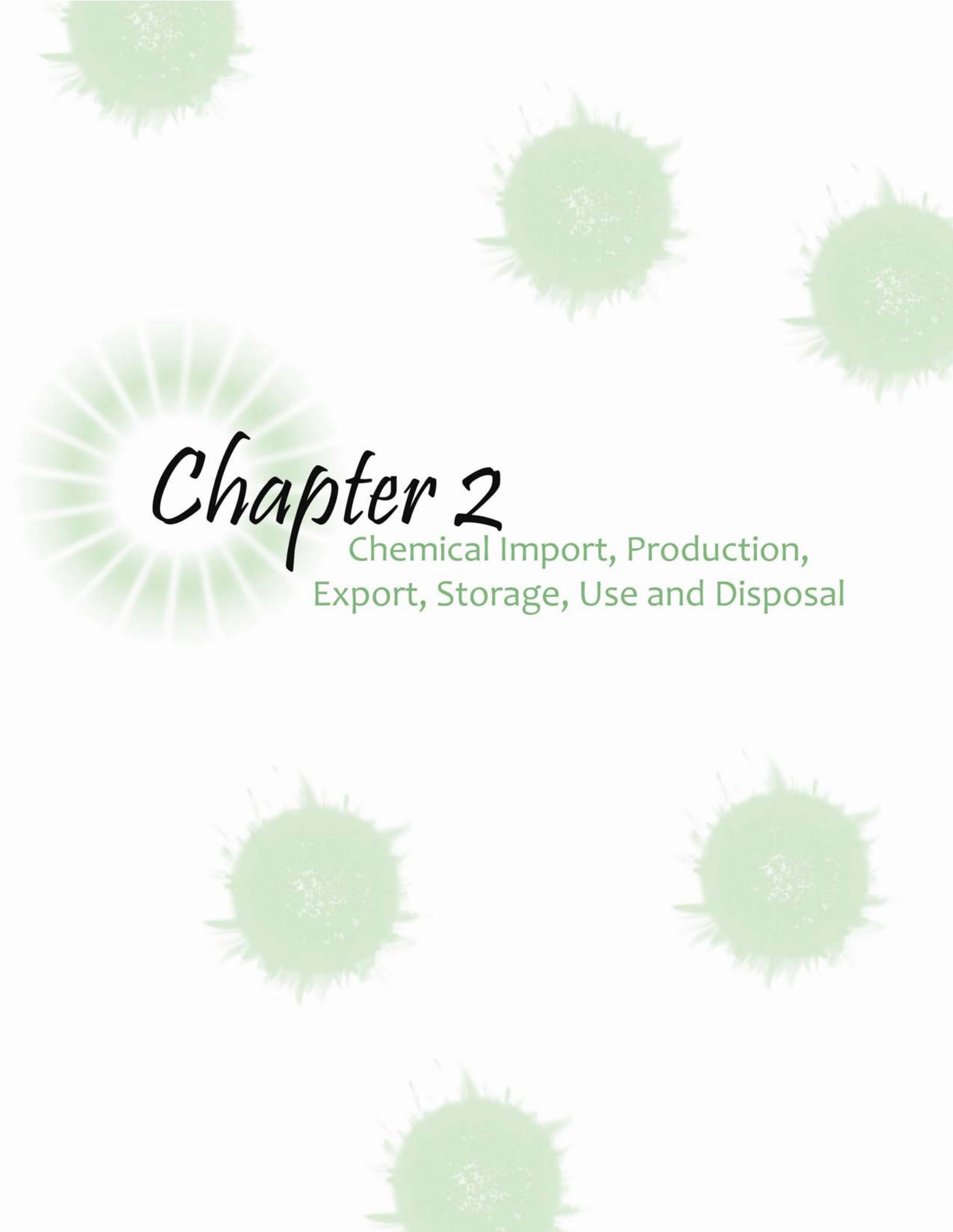
The primary challenges to the management of chemicals and related waste posed by the physical and demographic aspects of Barbados stem from the limited land space and the high population density of the island. These two factors limit the number, size and location of disposal facilities for chemicals and related wastes. Consequently, the main options available to manage chemicals and related wastes include:

- transporting chemicals and related waste to recycling or disposal facilities abroad in accordance with the Basel Convention;
- developing and implementing policies to control the importation, handling, use and disposal practices related to chemicals and related wastes; and
- educating the public about the impacts of indiscriminate disposal of chemicals to the environment and how to mitigate the various adverse impacts.

The development and implementation of policies to control the importation, handling, use, storage and disposal practices related to chemicals and related wastes and continued public education need to be integral components if an effective chemical management programme is to be achieved.

Political stability within the country and the existence the Cabinet, our central national decision making body, can facilitate the development of overarching policies to manage the importation, handling, use and disposal of chemicals. However, there may be some implementation challenges as responsibility for various aspects of chemicals management is fragmented amongst a number of agencies.

Additionally, all communication, utilities and information services are available throughout the island, which can facilitate effective communication of chemical risks to all sectors of society; thereby augmenting chemicals management.



Chapter 2

Chemical Import, Production,
Export, Storage, Use and Disposal

The aim of this chapter is to provide basic information on the import, production, and export of chemicals in Barbados.

2.1 CHEMICAL IMPORT, PRODUCTION, AND EXPORT

Table 2.A summarizes the average quantity and monetary value of the three major categories of chemicals imported to, and exported from, Barbados over the period 2003 – 2007. Due to the privacy clauses by which the Government Statistical Department is governed, which state that under the Statistics Act Cap 192 of Barbados Law no information may be released in a form that allows for the identification of any individual or business, the statistics for production and formulation cannot be shown.

When reviewing Table 2.A it should be noted that Barbados values its imports on a cost, insurance and freight (cif) basis whereas exports are valued on a free on board (fob) valuation. The cif value is made up of the cost of the goods at the port in the country of origin along with the value of insurance and shipping charges incurred in the transport of these goods to the country of the importer. The fob-value only takes into account the cost of the goods at the port in the country of the exporter. Valuation is consistent with World Trade Organisation (WTO) agreement on valuation, and weights are determined on a net weight basis.

Table 2.A: Chemical Production and Trade

Description	Imports (cif)		Exports (fob)	
	Net Mass (kg)	Value (BDS \$)	Net Mass (kg)	Value (BDS \$)
Fertilizers	5,777,069	5,299,385	457,492	216,154
Pesticides	431,138	5,102,212	2,313,382	20,676,832
Petroleum Products	614,091,102	499,850,726	16,009	35,766
Consumer & Industrial Chemicals	N/A	N/A	N/A	N/A

The following should also be noted:

- With respect to petroleum products, Trinidad and Tobago, Canada, the United Kingdom, Grenada and St. Vincent were five leading recipients of petroleum products exports from Barbados; whereas Trinidad and Tobago, Suriname, the United States of America, Venezuela and Curacao were the leading sources of petroleum imports.
- The five leading recipients of exports of fertilisers from Barbados (in order of decreasing net mass) were Suriname, Dominica, St. Vincent, St. Lucia and Guyana; while the United States, Trinidad and Tobago, the Dominican Republic, Canada and Ireland were the leading sources of fertiliser imports.

- Trinidad and Tobago, Jamaica, Antigua, St. Lucia and Haiti were leading recipients of pesticides. On the other hand, the United States of America and Trinidad and Tobago were the main sources of pesticide imports.

2.2 CHEMICAL USE BY CATEGORIES

No quantitative data on national chemical use was found. It was therefore not possible to present information on the types and quantities of chemicals used in Barbados or the sectors in which they are used. However, data on the importation of chemicals is available, which can be used to give an indication of the types and quantities of chemicals used.

2.3 STORAGE OF CHEMICALS AND RELATED ISSUES

There are no bulk chemical storage facilities currently in existence in Barbados, neither is there any significant warehousing of chemicals while in transit to another country.

2.4 TRANSPORT OF CHEMICALS AND RELATED ISSUES

There are no transportation facilities that are specifically for transit of chemicals to other countries. Transport of chemicals to or from the island occurs through two of three ports of entry namely, the Bridgetown Port with its regular shipping facilities and Grantley Adams International Airport.

2.5 CHEMICALS WASTE

There are no existing inventories of chemical waste generation in Barbados; therefore it is not possible, based on existing data, to present an estimate of the quantities and types of chemical waste generated annually.

Under the Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal, Barbados occasionally ships hazardous wastes overseas for environmentally sound disposal. However, no shipments have been made since 2003. Table 2.B below shows the amounts and types of wastes exported in 2003. It should be noted that these quantities were voluntarily reported by two companies wishing to have their waste exported, and therefore should not be taken as representative of overall hazardous waste generation rates in Barbados.

The categories used to classify the waste are those designated by the shipping company that undertook its transportation. Solid waste was quantified in kilograms, and quantities of liquid waste are expressed in litres.

Table 2.B: Chemical Waste Generation and Trade in 2003

Type Of Chemical Waste	Quantity
Flammable liquids (petroleum distillate)	480L
Environmentally hazardous substances, liquid (polyglycol ester, ethylene glycol)	10,720L
Environmentally hazardous substances, solid (polymers, stearates)	12,000kg
Corrosive solids (zirconyl chloride)	420kg
Corrosive liquids (sodium silicate solution)	20L
TOTAL	11,220L, 12,420kg

It has been reported that companies have exported shipments of chemical waste since 2003 but this information was not reported to the relevant authority. As a result, the existing mechanisms for exporting chemical waste need to be publicised so that stakeholders are made aware of their existence and their requirements. Moreover, there must be greater enforcement of these mechanisms.

There are no known imports of chemical waste into Barbados.

2.6 OVERVIEW OF TECHNICAL FACILITIES FOR RECYCLING OF CHEMICALS

A number of privately owned recovery facilities exist in Barbados, which collect and transport solid inert recyclable products such as plastic, glass, metal and paper and some chemical waste to be recycled or disposed in an environmentally friendly manner. The categories of chemical wastes recovered include lead acid batteries, used oil, metals and plastics. Table 2.C summarizes the facilities for the recovery of chemicals. The recovery codes are taken from Annex IVB of the Basel Convention:

- R1 – denotes the use of recovered material as a fuel (other than in direct incineration) or other means to generate energy
- R3 – denotes an operation for the recycling/reclamation of organic substances which are not used as solvents;
- R4 – denotes an operation for the recycling/reclamation of metals and metal compounds; and
- R5 – denotes an operation for the recycling/reclamation of other inorganic materials.

Presently, there are no recycling facilities on the island for chemicals and related wastes.

Table 2.C: Facilities for Recovery and Recycling of Chemicals and Related Waste

Name & Location of Operation	Description	Recovery Operation R Code	Capacity of Facility	Does the Facility Treat Wastes Imported? Yes/No
Ace Recycling Barbados Limited Massiah Street St. Joseph	Recover paper and lead-acid batteries to transport abroad for disposal or to be recycled.	R3, R5	N/A	No
Arawak Cement Company Limited Checker Hall St. Lucy	Cement Manufacturing.	R1	N/A	No
B's Bottle Depot ⁹ Cane Garden St. Michael	Recover plastics, metals, and lead-acid batteries to transport overseas for disposal or to be recycled.	R4, R5	N/A	No
ClayTone Products Incorporated Greenland St. Andrew	Manufacturer of silica-based roofing materials.	R1	N/A	No
Dice-A-Bed #8 Gibbons Christ Church	Shreds, dices and compacts newspaper for bedding by the local and regional horse and poultry industries.	R3	N/A	No
Groorganic Soil Conditioner #8 Gibbons Christ Church	Recovers used shredded newsprint from the horse and poultry industries to make organic fertilizer.	R3	N/A	No
Recycling Preparation Inc Warrens Industrial Estate St. Michael	Receives and exports non-ferrous metals except lead.	R4	N/A	No
Rum Distillery of Mount Gay Limited Mount Gay St. Lucy	Rum Distillery	R1	N/A	No
Tropical Batteries P.O. Box 602C Fontabelle St. Michael	Exports spent lead acid batteries for recycling. They also reuse 2-litre PET bottles in which they supply deionised water to their clients.	R5	N/A	No

⁹It should be noted that discussions are ongoing between B's Bottle Depot and government regarding its operation.

2.7 OVERVIEW OF CAPACITY FOR DISPOSAL OF CHEMICALS

Table 2.D provides an overview of the facilities and processes for disposal of chemicals in Barbados. The disposal operation D code is taken from Annex IV A of the Basel Convention:

- D1 – signifies deposit into or onto land, (e.g., landfill, etc.);
- D4 – signifies surface impoundment, (e.g., placement of liquid or sludge discards into pits, ponds or lagoons, etc.); and
- D10 – signifies incineration on land.

Table 2.D: Facilities for Disposal of Chemicals and Related Waste

Name & Location of Operation	Description	Disposal Operation D Code	Capacity of Facility	Does the Facility Treat Wastes Imported? Yes/No
Mangrove Pond Landfill Mangrove Pond St. Thomas	Site for the disposal of municipal wastes by land filling	D1	N/A	No
Blood and Grease Disposal Site Lonesome Hill St. Peter	Site for the disposal of liquid, organic, biodegradable wastes	D4	N/A	No
Queen Elizabeth Hospital St. Michael	Incineration of medical waste	D10	N/A	No
Barbados Port Inc University Row St. Michael	Incineration of wastes from ships	D10	N/A	No
Grantley Adams International Airport Christ Church	Incineration of bio-hazardous, narcotics and some municipal wastes	D10	N/A	No
Asbestos Disposal Site Rock Hall St. Philip	Site for the disposal of asbestos and fibreglass	D1	N/A	No

2.8 STOCKPILES, WASTE DEPOSITS AND CONTAMINATED SITES

A limited number of chemical stockpiles and contaminated sites exist across the island. Where stockpiles of chemicals exist, this is usually a temporary situation until suitable disposal can be arranged. Some known stock piles of chemicals and contaminated sites are summarized in Table 2.H below. Note that the magnitudes of the obsolete stocks were assessed as follows:

Small	less than 200 kg solid chemicals and less than 150 litres of liquid chemicals
Medium	200 – 500 kg solids chemicals and 150 – 350 litres liquid chemicals
Large	greater than 500 kg of solid chemicals and greater than 350 litres of liquid chemicals

On the contrary, the assessment of the magnitude of contaminated sites is subjective as no criteria could be identified to objectively assess the magnitudes of the sites.

In addition to the obsolete chemical stocks tabulated below, it should be noted that some of the secondary schools and other tertiary institutions may also have stocks of obsolete chemicals from their science laboratories.

Table 2.H: Obsolete Chemical Stocks, Chemical Waste Sites, and Contaminated Sites

	Geographical Location (GPS Coordinates or Lat. Long)	Main Content by Chemical or Group of Chemicals/ Waste	Magnitude of the Site or Stocks Small/ Medium/Large
Obsolete Chemical Stocks			
Site 1: University of the West Indies Cave Hill St. Michael	N/A	Laboratory chemicals	Large
		PCB containing equipment	Small
Site 2: Veterinary Laboratory, Ministry of Agriculture Pine East-west St. Michael	N/A	Laboratory Chemicals	Medium
Site 3: Soil Conservation Unit, Ministry of Agriculture Haggatts St. Andrew	N/A	Pesticides	Small
Site 4: Government Analytical Services Laboratory, Ministry of Agriculture Culloden Road St. Michael	N/A	Laboratory Chemicals	Large
Site 5: Ministry of Agriculture Graeme Hall Christ Church	N/A	Pesticides	Small
Site 6: Barbados National Standards Institution Culloden Road St. Michael	N/A	Laboratory Chemicals	Medium
Site 7: Forensic Sciences Centre Culloden Road St. Michael	N/A	Laboratory Chemical	Small
Site 8: Barbados Light and Power Company Limited Spring Garden St. Michael	N/A	PCB containing equipment	Small
Contaminated Waste Sites			
Site 1: Barbados Transport Board Weymouth St. Michael	N/A	Petroleum Products	Small
Site 2: Gibbons Boggs Gibbons Christ Church	N/A	Petroleum Products	Medium

Efforts are currently underway to ship the stocks of potentially PCB containing equipment owned by the Barbados Light and Power Company Limited and the University of the West Indies Cave Hill Campus overseas for appropriate disposal. However, an inventory of polychlorinated biphenyls (PCBs), which was completed in 2004, identified 16 facilities including the Barbados Light and Power Company Limited and the University of the West Indies Cave Hill Campus where equipment likely to contain PCBs was held. Overall, 56 transformers and 90 capacitors were identified as potentially PCB-containing. Also identified were 12 pieces of hydraulic equipment, four transformer welders, eleven motor starters and one switch. The status of the potentially PCB containing equipment at the other facilities identified in the 2004 study is currently unclear and Environmental Protection Department and other relevant regulatory agencies should investigate the matter to ensure that the equipment is being stored adequately or has been disposed in an appropriate manner.

In addition to exploring options for the management of the potentially PCB containing equipment, the 2004 PCB inventory report provided a number of recommendations. These included the development of a public awareness programme to encourage voluntary reporting of potentially PCB containing equipment; identification of potentially PCB containing hotspots, such as disposal sites, and determination of the level of contamination existing at these locations.

2.9 UNINTENTIONALLY GENERATED CHEMICALS

According to an inventory of dioxins and furans that was conducted in 2004 using the UNEP document "Standardized Toolkit for Identification and Quantification of Dioxins and Furans Releases" as a guide, the overall releases of dioxins and furans in Barbados were estimated at 49.0 g TEQ per annum, with 44.6 g TEQ per annum being released to the air. The majority (87 % of the national total) of these emissions were determined to originate from the incineration of waste. The emissions derived from waste incineration were generated largely from the combustion of medical waste. Other sources of dioxins and furans identified in the study included: uncontrolled combustion, power generation and heating, transportation, production of mineral products, metal production and disposal and land filling.

The study suggested that reductions in releases of dioxins and furans in Barbados could be effected by improved process control at relevant facilities, improvement of air pollution control systems at industrial facilities, and public education programmes to help reduce the open burning of domestic waste.

It was also noted that there was a paucity of data about the processes in Barbados likely to result in the release of dioxins and furans and better record-keeping would facilitate more improved characterization of the relevant processes and increase the accuracy of future inventories.

2.10 COMMENTS/ANALYSIS

The ability to collect data relating to the import and export of chemicals is adequate. Information pertaining to the import and export of chemicals is normally captured at the various ports of entry across the island by the Customs Department. With respect to chemical use, this information can typically be collected at the various points of sale across the island or is captured at the port of entry to the island but is not readily available to the public. Nonetheless, it should be noted that, except for pesticides, there are no formal mechanisms for licensing or monitoring end users. Therefore, it has to be assumed that any chemicals purchased are used for its intended purpose.

Information on the use of radioactive materials is collected by the Environmental Protection Department since permission is required from this Department to import radioactive materials.

However, the capacity for data collection on the disposal of waste chemicals is inadequate. Currently it is possible, although not encouraged, to dispose of chemical wastes in the sanitary landfill. Since the chemicals wastes are intermingled with municipal waste, it is not possible to collect data on the quantities or types of waste disposed. Consequently, only data generated from Basel Convention forms and shipping documents are captured.

Under the Integrated Solid Waste Management Programme, it is proposed to erect a chemical storage facility by 2009. Disposers of chemical wastes would be allowed to store their wastes at the facility until it can be shipped overseas and appropriately disposed. Such a facility should greatly improve the ability to collect data on the disposal of chemicals wastes and obsolete chemicals.

There is the need for increased control over the importation of chemicals into the island. Improving the ability to control the types and quantities of chemicals imported would facilitate better management of prevent toxic, hazardous or ozone depleting substances entering the island. Additionally, the importation of substances that might be difficult to dispose of after their usefulness or act as precursors for hazardous substances could also be controlled. Similarly, there needs to be greater control over the exportation of chemicals to ensure that the island fulfils its commitments under various international agreements. Improved control over chemical imports and export would also prevent illegal trafficking of banned or restricted substances.

It should be noted that Barbados has a National Implementation Plan for the management of persistent organic pollutants (POPs), which outlines actions to eliminate or reduce the use or release of POPs. This plan should be reviewed to ensure that it is being followed and assessed to verify that it is effective.

With respect to the technical infrastructure for recovery of chemicals, reporting procedures have been established with the various recovery operations to:

- ensure that in cases where the recovered waste is shipped overseas, this is done in keeping with the provisions under the Basel Convention to which Barbados is a

signatory; and

- increase the awareness of the environmental agencies to the quantities of wastes, namely used oil and lead-acid batteries, that are recovered; thereby informing the decision making process.

Waste handlers should be examined periodically by the Labour Department to identify, and where necessary, address occupational health and safety issues pertaining to, among other things, the use and handling of chemicals. At present these agencies are only inspected by the environmental agencies in response to complaints of breaches of prevailing environmental legislation, policies and practices. It would be prudent therefore for the environmental agencies to conduct more frequent inspections to ensure compliance with prevailing environmental legislation and policies. To achieve compliance, however, additional legislation and human resource will be needed.



Chapter 3

Priority Concerns Related to Chemicals
at all Stages of their Lifecycle

This chapter provides an overview of the nature of environmental and health problems associated with chemicals production, trade, use and disposal in Barbados. Moreover, to the extent known, the chemicals or the categories of chemicals which are causing the concerns are highlighted.

3.1 PRIORITY CONCERNS RELATED TO CHEMICALS IMPORTS, PRODUCTION AND USE

The following tables (3.A and 3.B) are intended to assist in diagnosing and prioritizing potential problems related to chemicals import, production, and use. Table 3.A provides a quick overview of existing and potential areas of concern relating to the management of chemicals in Barbados. Chemicals listed in the table are those that are generally associated with the areas of concern outlined; in many cases data is not available to indicate the extent to which a concern may be exhibited in Barbados or which specific chemicals are associated with the nationally identified priority areas.

Table 3.A: Description of Priority Areas

Nature of the Problem	Area	Brief Description of the Concern	Chemicals/Pollutants
Contamination of Groundwater	Island wide	<p>Groundwater quality may be at risk of increased contamination from agricultural activity, the petrochemical industry, industrial facilities, hazardous wastes, urban development and domestic waste disposal.</p> <p>There is concern that any significant increase in chemicals use, particularly in abstraction and protection zones, may severely compromise the safety and quality of the water supply.</p>	<p>Chemicals known to be groundwater contaminants: atrazine and metabolites (trade name: Aatrex), nitrates</p> <p>Chemicals posing the potential for ground water contamination: ametryne, sulfates, phosphates, Polycyclic Aromatic Hydrocarbons, Phthalates (Bi-(2-ethylhexyl)-phthalate and di-N-butyl-phthalate), lead oxide, nickel sulphonate, perchloroethene, malathion, diazinon, dursban 4E and commodore W/P, D/P, Methyltetraabutylethyl-ene (MTBE)</p>
Coastal and Marine Pollution	West and south coasts	There is the potential for degradation of sensitive coastal ecosystems and associated species and coastal water quality (coral reefs, mangroves, seagrass beds etc.) if agrochemicals are mis- or over-used.	Polycyclic aromatic hydrocarbons, organotin compounds (tributyl tin), nitrates, phosphates, agrochemicals
Chemical Residues in Food	Unknown	There is the potential for food to be contaminated by agro-chemicals. Chemicals may also bio-accumulate in fish due to contamination of marine waters.	agro-chemicals.
Impacts on Biodiversity	Island wide (Particularly the Scotland District and coastal and marine areas)	Contamination by agro-chemicals of underground water supplies, near shore waters and biota is not well documented for Barbados, but it is generally recognised as a threat to biodiversity.	Chlorinated hydrocarbons, organo-phosphates, pyrethroids, triazines, amides, dinitroanilines, sulphonyl urea, uracil, triazole, diazole, diazine, morpholines, cyanide generators, hypercalcaemics, bipiridils, benzimidazole, dithiocarbamates, heavy metals.
Air Contamination	Island wide	Air pollutants are produced by all combustion processes including burning and incineration of solid waste. Indoor air quality is an increasingly serious concern. Poor air quality is sometimes found to result from the inappropriate use of pest control; industrial cleaning chemicals in or near office environments; and emissions from vehicular maintenance facilities.	Dioxins and furans, pest control chemicals, industrial cleaning chemicals, volatile organic compounds and particulates.

Table 3.A: Description of Priority Areas

Nature of the Problem	Area	Brief Description of the Concern	Chemicals/Pollutants
Hazardous Waste Treatment/ Disposal	Island wide	The inappropriate disposal of chemicals into gullies and drains poses a threat to human and environmental health. The lack of a designated hazardous waste management/disposal facility hinders safe disposal of hazardous waste.	Zinc phosphates, nitrates, cadmium, ethylene diamine, sulphuric acid, mercury, chloroform, propylene glycol, chromic acid, nitric acid, manganous nitrate solution, toluene, isopropyl alcohol, cadmium, phosphoric acid, chromic acid, methylene chloride, amines, diethyl ether.
Storage/ Disposal of Obsolete Chemicals	Island wide	<p>The safe disposal of stockpiles of obsolete chemicals is a major concern. There is a lack of information on the presence, type, size and location of such stockpiles.</p> <p>Long-term storage of chemicals can result in containers being damaged and degraded, with the potential for leakage.</p>	Endosulphan, alkylated naphthalene sulphonate, tetra potassium pyrophosphate, benzene, benzaldehyde, ethylene glycol, triethylene glycol, xylene, perchloroethylene, polycyclic aromatic hydrocarbons, carbon tetrachloride, sodium metabisulfite, ethoxylated methyl glucoside dioleate, and tetrapotassium pyrophosphate, polychlorinated biphenyls and others.
Soil Contamination	Localised unknown areas	<p>Improperly maintained, aged, and leaking petroleum storage tanks can result in contamination of soils.</p> <p>Improper disposal of waste oils, particularly from vehicle maintenance facilities and service stations, is also a cause for concern.</p>	Polycyclic aromatic hydrocarbons, waste oils
Occupational Health	National	<p>There is a general lack of sensitivity to the need to use of protective equipment in the agricultural and industrial sectors. Training, education and greater public awareness are required at all levels.</p> <p>There are concerns about the use of pesticides indoors affecting air quality at the workplace. Concerns also exist about risks posed by failures to follow packaging and MSDS instructions at all levels, including in domestic usage.</p>	Pesticides.

Table 3.B (Priority Concerns Related to Chemicals) provides additional information and a general analysis with respect to identified problem areas while also ranking the identified concerns.

The levels of concern and priority rankings were determined using the input of stakeholders participating in the National Consultation on Chemicals Management held in June 2003. A preliminary list of potential problems was presented to the participants, who were invited to propose additions and amendments to this list. Participants then evaluated, as a group, and using a scale of medium, high, and low, the level of concern that they would attribute to each identified problem area, based upon the potential for negative environmental and human health impacts. Stakeholders also assigned each area of concern with a priority ranking. Concerns deemed to have the most pressing need for attention were ranked as 1, or high priority, while less immediate concerns were assigned lower rankings of 2 or 3. Several issues for which data is unavailable have been assigned a high priority ranking; this is representative of the urgent need for data to allow evaluation of the scope of the problems identified.

Table 3.B: Priority Concerns Related to Chemicals

Nature of Problem	Scale of Problem	Level of Concern	Ability to Control Problem	Availability of Statistical Data	Priority Ranking	Source
Contamination of groundwater	National	High	Low	Sufficient	1	Enviromental Protection Department's Groundwater Quality Monitoring Programme
Coastal and marine pollution	National	High	Low	No data	1	
Impacts on biodiversity	National	High	Low	No data	1	
Air contamination	National	Medium	High	No Data	2	
Hazardous waste treatment/ Disposal	National	High	Medium	Insufficient	1	Hazardous Chemicals/ Substances Survey and Inventory 1995-1998
Storage/ Disposal of obsolete chemicals	National	High	Low	Insufficient	1	Hazardous Chemicals/ Substances Survey and Inventory 1995-1998
Soil Contamination	Localized	Low	No data	No data	3	
Occupational Health	National	High	High	No data	1	
Chemical residues in food	National	High	Medium	No data	2	

3.2 COMMENTS/ANALYSIS

Generally, there is not sufficient data available to form clear conclusions and inform decision making regarding the priority concerns for Barbados in relation to chemical production, trade, use, storage and disposal. Singh (2002) identified the following missing data gaps:

- Comprehensive inventories focusing on persistent toxic substances and other chemicals have not yet been compiled in Barbados. Hence, a complete understanding of the prevalence of these substances and their effects is lacking.
- There are many substances stockpiled, the nature of which may be unknown due to improper labelling or because the chemical composition of the substance is regarded as a trade secret.
- Data has yet to be collated to determine the relationship between national levels of environmental contamination and human health.

Since Singh's 2002 report inventories of pesticides, dioxins and furans, and polychlorinated biphenyls have been compiled. However, there is still a dearth of information on chemicals such as mercury and mercury related compounds, cadmium and lead. Furthermore, the Hazardous Chemicals/Substances Survey and Inventory 1995-1998 is over ten years old and needs to be updated in order to obtain a clear picture of the situation in Barbados.

Information on the extent to which persistent organic pollutants and other chemicals have impacted or are impacting on human and environmental health is needed in Barbados. There is also a need for a systematic approach to identifying the types and quantities of chemicals in use or stockpiled in Barbados. A national monitoring and inventory programme would help to provide information to determine what kinds of strategies should be implemented to address the identified concerns. However, such a programme would be challenged by the fact that the identification of some substances being stockpiled is difficult as these substances may be unknown due to missing or illegible labels and costly analysis would be required. There is also a need for information on the storage practices for chemicals since adequate storage can prevent the release of chemicals into the environment.

In recognition of the proximity of the Caribbean islands and the common problems faced in terms of impacts on economy and environment, consideration should be given to regional co-operation and the development of common, regional policies and approaches to chemicals management.



Chapter 4

Legal Instruments and
Non-Regulatory
Mechanisms for the Lifecycle
Management
of Chemicals



This chapter seeks to provide an overview of the existing legal instruments and non-regulatory mechanisms which make either specific or general reference to the management of chemicals, including their implementation and enforcement, and identify relevant strengths, weakness and gaps.

It is to be noted that the term 'chemical' has been used here in its broadest sense to include both raw chemicals, and products that might include potentially hazardous chemicals as constituents.

4.1 OVERVIEW OF NATIONAL LEGAL INSTRUMENTS WHICH ADDRESS THE MANAGEMENT OF CHEMICALS

Table 4.A lists existing laws and regulations that are relevant to the management of chemicals in Barbados. For each legal instrument listed the Ministry responsible for its implementation is identified, as are the classes of chemicals it covers. A summary of the scope of each instrument, as indicated by its short title, is provided, and the sections, articles and provisions that address issues of chemicals management are identified and/or summarised.

Table 4.A.1: References to Existing Legal Instruments Which Address the Management of Petroleum Products

Legal Instrument	Responsible Ministries or Bodies	Chemical Use Categories	Objective of Legislation	Relevant Articles/ Provisions	Enforcement Rankings
Fuel Oil Act (Cap. 164A) – 1917	Ministry of Finance, Labour, Civil Service and Energy	Fuel Oil	Short Title: “an Act relating to the importation and storage of fuel oil.”	Empowers the Minister to regulate the landing, storage, and keeping of fuel oil.	N/A
Shipping (Oil Pollution) Act (Cap. 296A) – 1994	Ministry of International Business and International Transport	Crude Oil, Fuel Oil, Lubricating Oil	Short Title: “An Act to make provision concerning oil pollution of navigable waters by ships, to provide for civil liability for oil pollution by ships and to give effect to certain international conventions relating to pollution of the sea.”	The Act covers: the discharge of oils and mixtures from Barbadian ships (section 4); the discharge of oil into the territorial waters of Barbados (section 5); the discharge of certain oils from pipelines and exploration areas (section 6); the discharge of ballast water into ports, and the provision of port facilities for the disposal of oil residues (sections 11 and 12).	N/A
Storage of Petroleum Act (Cap. 172) – 1882	Ministry of Finance, Labour, Civil Service and Energy	Volatile Petroleum	Short Title: “An Act to consolidate and amend the law relating to the storage and importation of petroleum”	Governs importation and warehousing of volatile petroleum and other inflammable liquid. Empowers the Minister to make and amend related rules and regulations. Licensing Regulations - 1929: Regulations govern the licensing of volatile petroleum importation, sale and storage. Offers design guidance on the distances between storage tanks.	N/A

Table 4.A.2: References to Existing Legal Instruments Which Address the Management of Agricultural Chemicals

Legal Instrument	Responsible Ministries or Bodies	Chemical Use Categories	Objective of Legislation	Relevant Articles / Provisions	Enforcement Rankings
Sale of Poisons Act (Cap. 151) – 1885	Ministry of Health	Various	Short Title: “An Act to regulate the sale of poisons”	Requires that no poison be sold by any person, either wholesale or retail, unless the container is distinctly labelled with the name of the article and the word ‘poison’, and with the name and address of the seller.	N/A
Fertilisers and Feedings Stuffs (Cap. 261) – 1961	Ministry of Agriculture	Fertilisers	Short Title: “an Act to amend the law with respect to the sale of fertilisers and feeding stuffs.”	Provides for the registration of fertilisers and feedstuffs by the Chief Agricultural Officer, and for the regulation of imports, manufacturing, labelling and sale.	Effective
Pesticides Control Act (Cap. 395) – 1974	Ministry of Agriculture	Pesticides	Short Title: “An Act to provide for the control of the importation, sale, storage and use of pesticides”	The Act <ul style="list-style-type: none"> • defines functions of the Pesticides Control Board, exercisable powers of Inspectors, and • Empowers the Minister to make regulations in all areas of Pesticide Management (import, manufacture, transportation, use, disposal, etc.) Pesticides Control Regulations (1974) Regulate the manufacture, import, storage, use, distribution and sale of approved pesticides. Labelling of Pesticides Regulations (1976) Regulate the labelling of pesticides which are distributed, exposed or offered for sale.	Effective

Table 4.A.3: References to Existing Legal Instruments Which Address the Management of Industrial Chemicals

Legal Instrument	Responsible Ministries or Bodies	Chemical Use Categories	Objective of Legislation	Relevant Articles/ Provisions	Enforcement Rankings
Health Services Act (Cap. 44) – 1969	Ministry of Health	Various	Short Title: “an Act relating to the promotion and preservation of the health of the inhabitants of Barbados”	Offensive Trades Regulations - 1969 Chemical or acid making, soap boiling and several other industrial processes are included in a schedule of offensive trades which may only be executed under licence by the Medical Officer of Health.	N/A

Table 4.A.4: References to Existing Legal Instruments Which Address the Management of Consumer Chemicals

Legal Instrument	Responsible Ministries or Bodies	Chemical Use Categories	Objective of Legislation	Relevant Articles/ Provisions	Enforcement Rankings
Health Services Act (Cap. 44) – 1969	Ministry of Health	Pharmaceuticals	Short Title: “an Act relating to the promotion and preservation of the health of the inhabitants of Barbados”	Control of Drugs Regulations - 1970 Defines the mechanisms by which drugs engaged in the health services may be imported into, manufactured and distributed in Barbados.	N/A
		Artificial Sweeteners		Control of the use of Artificial Sweeteners in Food Regulations – 1970 Regulates the sale and use of calcium cyclamate, magnesium cyclamate, potassium cyclamate and sodium cyclamate as artificial sweeteners used in food, and of any other substance derived from cyclamic acid.	N/A
Barbados Port Inc. (Transfer of Management and Vesting of Assets) Act 2003-13 and Harbours Regulations 1961	Ministry of International Business and International Transport	All	Long Title: “an Act to provide for the Port of Bridgetown to be managed by Barbados Port Inc., a company incorporated under the Companies Act, for the purpose of enabling the port to operate as a commercial entity to transfer the assets and liabilities of the Government of Barbados in relation to the operation of the Port of Bridgetown to the Barbados Port Inc.; to repeal the Barbados Port Authority Act; and to provide for related matters.	Part VIII of the Regulations, “Dangerous, Hazardous and Poisonous Goods”, provides inter alia for prior notification of intention to land such goods, and procedures to be followed by ships while in Port.	N/A

Table 4.A.4: References to Existing Legal Instruments Which Address the Management of Consumer Chemicals

Legal Instrument	Responsible Ministries or Bodies	Chemical Use Categories	Objective of Legislation	Relevant Articles/ Provisions	Enforcement Rankings
Control of Standards Act (Cap. 326A) – 1981	Ministry of Economic Affairs and Empowerment, Innovation, Trade, Industry and Commerce	All	Short Title: “An Act to provide for the control of standards and the labelling of commodities”	<ul style="list-style-type: none"> Defines standard specification to be obligatory if it is intended primarily to protect the consumer against danger to health or safety. No person shall label commodities contrary to the Barbados National Standard. Where Imports do not comply with the relevant obligatory standard specification, the import shall not be admitted for distribution in Barbados. Relevant Standards already available include: <ul style="list-style-type: none"> BNS 8: 1987 - Specification for Pictorial Marking for Handling of Goods (General Symbols) BNS 44: 1978 - Specification for Pictorial Marking for Handling and Labelling of Dangerous Goods. BNS 45: 1980 - Specification for Classification of Hazardous Chemicals and Chemical Products BNS 46: 1982 - Specification for Classification of Dangerous Goods. 	N/A
Highways Act (Cap. 289) – 1900	Ministry of International Business and International Transport	Fireworks	Short Title: “an Act to make provisions in relation to highways in the island”	Section 43 Prohibition against the discharge of fireworks on highways.	N/A
Explosive Act (Cap. 162) October 11, 1890 – Part 1 February 14, 1918 – Part 2	Ministry of Home Affairs	Explosives	Short Title: “An Act to consolidate and amend the Acts relating to Merchants gunpowder and to regulate the importation and sale of certain explosives”	Provides coverage for import, transportation and storage of blasting powder, gun-cotton, dynamite, nitroglycerine and all other explosive matter whatsoever.	N/A

Table 4.A.5: References to Existing Legal Instruments Which Address the Management of Storage/Handling/Transport/Disposal of Chemicals

Legal Instrument	Responsible Ministries or Bodies	Chemical Use Categories	Objective of Legislation	Relevant Articles/ Provisions	Enforcement Rankings
Carriage of Goods by Sea (Cap. 301) –1981	Ministry of International Transport	All	Short Title: “An Act to provide for the implementation in Barbados of the United Nations Convention on the Carriage of Goods by Sea, 1978”	Section 13, Special rules on dangerous goods. Requires the shipper to label in a suitable manner dangerous goods as dangerous, and to provide information, if necessary, of the precautions to be taken.	N/A
Factories Act (Cap. 347) – 1984	Ministry of Labour	All	Short Title: “an Act to revise and consolidate the law relating to factories and the safety, health and welfare of persons employed therein”	General provision for Occupational Health and Safety issues and for factory inspections. Section 11: Fencing of places containing dangerous substances. Section 26: Storage of gas or dangerous liquid. Section 27: Precautions with respect to explosive or inflammable dust, gas, vapour or substance. Section 45: Disposal of wastes and effluents. Section 60: Protection of workers against gases, dusts and fumes. Section 61: Meals in dangerous trades. Section 67: Provisions as to employment of person in processes involving lead compounds. Section 68: Importation and sale of materials and articles made with prohibited materials. Section 104(f): Maximum allowable concentrations of dusts, fumes and other hazardous substances in the working environment.	Fair

Table 4.A.5: References to Existing Legal Instruments Which Address the Management of Storage/Handling/Transport/Disposal of Chemicals

Legal Instrument	Responsible Ministries or Bodies	Chemical Use Categories	Objective of Legislation	Relevant Articles/ Provisions	Enforcement Rankings
Marine Pollution Control Act – 1998	Environmental Protection Department	All	Short Title: “An Act to prevent, reduce and control pollution of the marine environment of Barbados from whatever source.”	Section 3 states that “no person shall release or cause to be released any pollutant into the environment which is in violation of any applicable standards, conditions or requirements specified under this Act or regulations.” The Act charges the Head of the Environmental Engineering Division to investigate, characterise and define the extent of pollution and significant sources of pollution from land-based sources, sea-bed activities, dumping activities and airborne sources.	Weak
Coastal Zone Management Act – 1998	Coastal Zone Management Unit	Explosives, poisons, or other noxious substances	Short Title: “An Act to provide for the more effective management of the coastal resources of Barbados, for the conservation and enhancement of these resources and for matters related thereto.”	Section 27 makes it an offence to use or permit to be used “any explosive, poison or other noxious substance” for the purpose of harvesting coral or catching, taking or harvesting fish. Section 29 prohibits the fouling of the foreshore with offal or garbage.	Weak

Table 4.A.5: References to Existing Legal Instruments Which Address the Management of Storage/Handling/Transport/Disposal of Chemicals

Legal Instrument	Responsible Ministries or Bodies	Chemical Use Categories	Objective of Legislation	Relevant Articles/ Provisions	Enforcement Rankings
Health Services Act (Cap. 44) – 1969	Ministry of Health	Various	Short Title: “an Act relating to the promotion and preservation of the health of the inhabitants of Barbados”	Building Regulations - 1969 Section 12: A person shall not discharge any sullage or any waste matter into any street or into any public place except as approved by the Medical Officer of Health	N/A
				Nuisances Regulations - 1969 The regulations define nuisances to be <ul style="list-style-type: none"> • ‘any place, matter, thing deposit or accumulation of liquid or solid matter that is full, in such a state, or so placed, made or left, as to be unsanitary, injurious or dangerous to health or likely to become so’ (section 3/1); and • ‘any discharge, except in accordance with a permit granted by the Minister or Medical Officer of Health, of any industrial waste or other noxious matter on or to any course, pond, ditch, drain or other place’ (section 3/15). 	N/A

Table 4.A.6: References to Proposed Legislation Addressing the Management of Chemicals

Legal Instrument	Responsible Ministries or Bodies	Chemical Use Categories	Objective of Legislation	Relevant Articles/ Provisions
Safety and Health at Work Act	Labour Department	All	An Act to make provision: for securing the health, safety and welfare of persons at work; for protecting other persons against risks to health and safety in connection with the activities of persons at work; for controlling certain emissions into the environment; to consolidate the law relating to health, safety and welfare in the workplace; and for related matters	<p>Section 5 states that “It shall be the duty of every occupier [the person who has control over a workplace and the work that is done there] to ensure, so far as is reasonably practicable, the health, safety and welfare of all his employees”</p> <p>Section 88(1): Where by the regulations, the use of any material or process is prohibited, the Minister responsible for Trade may, on the advice of the Minister Responsible for Labour absolutely or subject to exception, prohibit the importation into Barbados of the material or any article used in the manufacture of which such material or process is employed.</p> <p>Section 106 (1)(d) The Minister, may, in respect of any class or description of a workplace, make Regulations prescribing the maximum allowable concentrations of specific dusts, fumes and other hazardous substances within the factory or working environment.</p>
Environmental Management Act	Ministry of the Environment	All	An Act to provide for the wise management and sustainable use of the natural environment and resources of Barbados by making provision for the management of the natural heritage of Barbados, the Barbados National Park and the coastal zone of Barbados and for controlling pollution of the environment of Barbados	<p>Specific articles or provision are not available as the document is being revised.</p>
Customs (Restricted and Prohibited Imports and Exports) Order 2009	Ministry of Finance, Labour, Civil Service and Energy	Ozone Depleting Substances	To restrict the imports and exports of CFC	N/A

4.2 SUMMARY DESCRIPTION OF KEY INSTRUMENTS RELATING TO CHEMICALS

The following is a detailed summary of the three legal instruments namely the Health Services (Control of Drugs) Regulations, 1970, the Pesticides Control Act, with its accompanying regulations, and the Marine Pollution Control Act, 1998. These three pieces of legislation are considered of particular importance for the effective control and management of chemicals.

If members of the public wish to increase their awareness of the provisions under the Acts or regulations, copies of these and other articles of legislation are available for purchase from the Government Printery for a nominal fee.

4.2.1 *Health Services (Control of Drugs) Regulations, 1970*

The Health Services (Control of Drugs) Regulations, 1970, regulate the importation, manufacture, production and distribution of all drugs in Barbados. Under the Regulations drugs are defined as:

Any substance or mixture of substances manufactured, sold or represented for use in –

- a. the diagnosis, treatment, mitigation or prevention of a disease, disorder, abnormal physical state, or the symptoms thereof in man or animal;*
- b. restoring, correcting or modifying organic functions in man or animal, and includes –*
- c. any substance or mixture of substances in common use when intended to be used as a drug;*
- d. any substance or mixture of substances manufactured, sold or represented for use in –*
 - i. cleansing, improving or altering the complexion, skin, hair, or teeth, or*
 - ii. disinfection in premises in which food is manufactured, prepared or kept, for the control of vermin in those premises.*

Section 8 of the Regulations controls the manufacture and production, for sale, of drugs in Barbados and requires:

- That persons engaged in the business of manufacturing or producing drugs for sale should be licensed and the Chief Medical Officer of Health is required to keep a register of such licensed persons;
- That the process of manufacturing or producing drugs should be directed and supervised by a druggist;
- That each batch of every drug manufactured or produced should be numbered and a sample of each batch submitted to an analyst for analysis and assay as approved by

the Chief Medical Officer; and

- That every container in which a drug is sold should carry a label stating the ingredients, their quantities per unit dose, the batch number, and, where appropriate, the expiration date.

Under Section 9 of the Regulations, the import and distribution of drugs listed in the Third Schedule by persons other than:

- A medical practitioner;
- A dentist;
- A veterinary surgeon;
- A wholesale dealer;
- A druggist carrying on a retail business;
- A government hospital;
- A licensed private hospital;
- A licensed nursing home;
- A licensed maternity home; or
- The Barbados Family Planning Association in relation to an oral contraceptive;

requires issuance of a licence by the Minister or person authorised by the Minister.

Section 10 of the Regulations prohibits the importation, manufacture, sale, distribution or use of thalidomide, L.S.D., mescaline and all other hallucinogenic substances, except under licence issued by the Minister or person authorised by the Minister.

The Regulations allow for the appointment of drug inspectors to investigate compliance with the Regulations. Additionally, Section 8 of the Health Control Act allows for the Minister to appoint a Drug Control Advisory Committee to advise on matters relating to the control of drugs, and the amendment of any Schedules within the Regulations.

Any person who contravenes these regulations is guilty of an offence and is liable on summary conviction to a fine not exceeding \$5,000 BDS, imprisonment of up to one year or both. In the case of a continuing offence, the further fine not exceeding \$200 BDS may be imposed for each day or part thereof during which the offence continues after a conviction is first obtained.

4.2.2 *Pesticides Control Act*

The Pesticides Control Act (1974) is “an Act to provide for the control of the importation, sale, storage and use of pesticides”. Accompanying regulations include:

- Pesticides Control (Approval of Pesticides) Regulation, 1974; and
- Pesticides Control (Labelling of Pesticides) Regulation, 1976.

The Act and its attendant regulations make provision for:

- Prohibiting the manufacture, packaging, importation, advertisement, sale and use of particular pesticides or classes of pesticides;
- Controlling the manufacture, packaging, importation, transportation, advertisement and sale or other distribution of particular pesticides or classes of pesticides;
- Controlling the use of pesticides in agriculture generally or on particular crops or pests;
- Controlling the use of pesticides on produce during its storage and transportation;
- Setting out the conditions under which pesticides are to be stored;
- Protecting workers against the risk of poisoning or other injury by pesticides;
- Prescribing the permissible level of any pesticide in any particular kind of produce at the time of marketing;
- Controlling 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;
- Controlling the labelling of containers, their subsequent disposal and the disposal of unwanted stocks of pesticides;
- Recording keeping and inspection and the furnishing of returns and other information with respect to pesticides;
- Restricting and prohibiting the use of particular pesticides or classes of pesticides;
- Imposing restrictions and obligations on pest control operators;
- Imposing duties on employers, workers and others in respect of the occupational safety and health of persons working with pesticides;
- Prescribing standards for the composition of pesticides; and
- Requiring licences to manufacture, import, package, sell or otherwise distribute or use

any pesticide.

The Act establishes a Pesticides Control Board to carry out the provisions of the Act and Regulations, and allows for the designation of inspectors to investigate compliance with the Act and Regulations.

A person found guilty of an offence under this Act is liable on summary conviction, to a fine not exceeding \$250 BDS and in the case of a continuing offence, to a fine not exceeding \$50 for each day or part thereof, during which the offence continues.

4.2.3 The Marine Pollution Control Act

The Marine Pollution Control Act (MPCA) is “an Act to prevent, reduce and control pollution of the marine environment of Barbados from whatever source.” It aims to protect the sea around Barbados from any source of pollution that might impact negatively on the environment or human health. The MPCA covers all waste disposal and discharges across Barbados that could have an impact on marine water quality. It applies to both inland disposal that pollutes the groundwater and piped discharges on the coast.

Under the MPCA a register of pollutants is to be established that details the dischargers and the type of waste they are discharging. Additionally, the Act establishes a List of Prohibited Concentration for which environmental standards can confidently be applied. It is these standards that discharges must meet before disposing their waste.

Discharging at higher concentrations than the standards is an offence. The maximum penalties written into the MPCA are \$200, 000 or imprisonment for 5 years or both on indictment for the first offence.

4.3 EXISTING LEGISLATION BY USE CATEGORY ADDRESSING VARIOUS STAGES OF CHEMICALS FROM PRODUCTION/IMPORT THROUGH DISPOSAL

Table 4.B provides an overview of the legal instruments that apply to the regulation of various categories of chemicals at each stage of the chemical lifecycle, from production/import through disposal. The purpose of the overview is to highlight areas where the legislation is deficient as well as opportunities for strengthening the existing system.

It should be noted an “✖” in Table 4.B indicates that the legislation exists to adequately address that particular stage in the chemical lifecycle.

Table 4.B: Overview of Categories of Chemicals for which Legal Instruments of Control Exist

Category of Chemical	Import	Production	Storage	Transport	Distribution/Marketing	Use/Handling	Disposal
Pesticides (agricultural, public health and consumer use)	*	*	*	*	*	*	*
Fertilisers	*	*			*	*	*
Industrial chemicals (used in manufacturing/processing facilities)		*				*	*
Petroleum Products			*				*
Consumer Chemicals		*					*
Chemical Wastes							*

4.4 DESCRIPTION OF KEY APPROACHES AND PROCEDURES FOR CONTROL OF CHEMICALS

The key policy approach used to control various classes of chemicals in Barbados is to ban or restrict the importation or manufacture of the chemical or class of chemical in question. Presently, the two classes of chemicals that are directly controlled by legal instruments are pharmaceuticals and pesticides. These classes of chemicals are controlled by two legal instruments namely the Health Services (Control of Drugs) Regulations, 1970, and the Pesticides Control Act (described in Section 4.2.).

4.4.1 Health Services (Control of Drugs) Regulations, 1970

The Third Schedule of the Health Services (Control of Drugs) Regulations lists chemicals for which importation and distribution are controlled. These drugs are listed in Table 4.C.1 and should not be imported except under a license.

Table 4.C.1: Drugs Listed in the Third Schedule of the Health Services (Control of Drugs) Regulations, 1970

Amidopyrine	Aminopterin
Amitriptyline, Protriptyline, Imipramin, and all other anti-depressant substances	Amphetamine, Methyl Phenidate Hydrochloride, Pipradol Hydrochloride, and all other stimulants of the Central Nervous System, except caffeine and ephedrine
Apiol	Barbituric Acid
Bromoform	Calcium Carbimide and all other drugs used in the treatment of alcoholism
Carbromal, Paraldehyde, Sulphonal and all other hypnotic substances	Carbutamide, Tolbutamide, Phenformin and all other anti-diabetic substances for oral use
Chloral hydrate (except in preparations for external use containing not more than 1% W/V of Chloral hydrate)	Chlorcyclizine (except in preparations for external use only)
Chloroquine, Hydrochloroquine	Chlorpromazine, Promazine, Diazepam, and all other tranquilising substances
Corticotrophin, Cortisone, Prednisone and all other organic or synthetic adrenocortical substances	Cyclizine
Dithiazanine Iodide	Ectylurea
Ergot	Heparin, dicoumarol, phenindione, Warfarin and all other anti-coagulants except when used as rodenticides
Hexachlorophene except in preparations containing 0.1% or less of hexachlorophene	Hexamethonium, Pentamethonium, Rauwolfia, Veratrum and all other hypotensive substances
Indomethacin	Isoniazid, Para-aminosalicylic acid, Ethionamide, Pyrazinamide and all other anti-tuberculosis substances for oral use
Meclizine	Mefenamic Acid, Flufenamic Acid
Mustine, Busulphan, melphalan and all other neoplastic substances	Nitrofurazone, Furazolidone, Nitrofurantoin, and all other furan derivatives
Para-aminobenzene sulphonamide	Penicillin, Chloramphenicol, Streptomycin, Tetracycline, and all other antibiotics whether produced synthetically or by living micro-organisms
Phenylbutazone	Phenylcinchoninic Acid, Salicylcinchoninic Acid
Phenelzine, Pheniprazine, and all other monoamine oxidase inhibitors	Phenytoin, Paramethadione, Primidone, and all other anti-convulsant substances
Procaine, Lignocaine, Benzocaine, and all other local anaesthetic substances (except when included in preparations used exclusively for external application)	Sex Hormones, except in cosmetic preparations which are demonstrated to be without systemic effects
Thiabendazole	Thiouracil and all other anti-thyroid substances
Thyroid and all other organic or synthetic Thyroid-like substances	

4.4.2 Pesticides Control Act

The Pesticides Control Board has banned or severely restricted the use of thirty-three (33) pesticides. These are listed in Table 4.C.2. Among these 33 banned or severely restricted substances are six of the nine pesticides specified as persistent organic pollutants under the Stockholm Convention. These six are aldrin, chlordane, DDT, dieldrin, endrin and heptachlor. The other three POPs pesticides – hexachlorobenzene, mirex and toxaphene – have not been designated as either banned or severely restricted by the Pesticides Control Board.

Table 4.C.2: Banned and Severely Restricted Pesticides

Trade Name	Common Name	Level of Restriction [ban (B) or severe restriction (R)]	Date of Action	Details of restriction (e.g. reasons for control action, remaining allowed uses, etc.)
ALDRIN	Aldrin	B	1987-09-24	
ARKOTINE D18	DDT	B	1967-06-11	
AZODRIN	Monocrotophos	B		
BIDRIN	Dicrotophos	B		
BHC DUST		B		
BROMADIOLONE	Bromadiolone	B	1979-01-25	High toxicity.
CHLORDANE	Chlordane	B	1986-12-31	EPA guidance on oncogenicity, and General misuse by the public.
DIELDRIIN	Dieldrin	B		
DYNAP	Dinoseb	B	Aug. 1989	Based on EPA "Emergency Suspension Order" (1986-10-07) on all uses of herbicides containing dinoseb.
ENDOSULPHIAN	Endosulphan	B		
ENDRIN	Endrin	B		
E.P.N.	Dichlorofenthion	B	1987-10-27	Toxicity.
FOLIDOL M	Parathionmethyl	B		
FURADAN 4F	Furadan 4F	B		
FURADAN 10G	Furadan 10G	SR		
GALECRON	Chlordimeform	B		
HEPTACHLOR	Heptachlor	B		
MARSHALL 25EC	Carbosulfan	B	1991-02-14	Failure by farmers to comply with harvest limit.
NEMAGON	DBCP (dibromochloropropane)	B	1980-01-16	Suspended under the recommendation of the USEPA. Only for use with pineapples.
PHOSVEL	Leptophos	B		
POLYOXIN A1	Polyoxin B	B		Public health risk.

Table 4.C.2: Banned and Severely Restricted Pesticides

Trade Name	Common Name	Level of Restriction [ban (B) or severe restriction (R)]	Date of Action	Details of restriction (e.g. reasons for control action, remaining allowed uses, etc.)
RAMROD		B	1979-07-04	
RENTOKIL LIN-DANE GEL	Lindane	B	1989-04-25	
STREPTOMYCIN 20WP	Streptomycin sulphate	B	1979-01-25	Risk to health of human beings. Fears that if used on crops, resistant strains may result, which may cause medical and public health problems.
TAMARON	Methamidophos	B		
TERRACUR	Fensulfothion	B		
VEGATROL A-4AT	2,2,5-T	B	1980-03-27	EPA suspension of pesticides containing 2,4,5,T due to their carcinogenicity.
VYDATE L	Oxamyl	B	1968-05-17	
WEEDAR 2,4,5-T		B	1980-01-16	EPA suspension of pesticides containing 2,4,5,T due to their carcinogenicity.
WEEDONE BRUSH KILLER 64		B	1975-05-07	EPA suspension of pesticides containing 2,4,5,T due to their carcinogenicity.
WEEDONE LV6		B	1975-05-07	EPA suspension of pesticides containing 2,4,5,T due to their carcinogenicity.
WEEDONE 2,4,5-TP		B	1975-05-17	EPA suspension of pesticides containing 2,4,5,T due to their carcinogenicity.
METHYL BROMIDE		R		

4.5 NON-REGULATORY MECHANISMS FOR MANAGING CHEMICALS

Due diligence such as the training of staff and participation in conferences and workshops on the part of stakeholders employed in the manufacture and trade in chemicals is the primary non-regulatory mechanism for managing chemicals in Barbados. However, mechanisms do exist, though not specifically directed towards chemicals management, which serve indirectly to promote the sound management of chemicals.

The Minister of Environment Award acts as an incentive for individuals and organizations to exhibit environmental stewardship including the area of chemicals management. Through this award the Minister with responsibility for environmental matters seeks to recognise and reward the excellent achievements that organisations and individuals have made in the facilitation of environmental works, innovation and enterprise that have helped protect and sustain the environment and the natural resources of Barbados. It is hoped that the awards will inspire Barbadians by showcasing those individuals and organisations that have contributed to the enhancement, preservation, and protection of the environment. It is also anticipated that the awards will raise the profile of those who strive for environmental excellence in Barbados.

4.6 REGULATORY INSTRUMENTS FOR RELATED ACTIVITIES WHICH IMPACT ON CHEMICALS MANAGEMENT

Many broader areas of legislation exist in Barbados that, though not specifically concerned with chemicals, may have an important impact on the life cycle management of chemicals. Such pieces of legislation include the Barbados Water Authority Act, 1980, the Fiscal Incentive Act, 1974, the Returnable Containers Act, 1986 and the Environmental Levy Act, 1996.

The Barbados Water Act, 1980, is an Act to provide for the establishment of the Barbados Water Authority (BWA), which serves to, among other things, control and regulate the production, treatment, storage, transmission, distribution and use of water for public purposes; and to manage, allocate and monitor the water resources of Barbados with a view to ensuring their best development, utilization, conservation and protection in the public's interest. A Statutory Board comprising 7-11 members is responsible for the policy and general administration of the Authority.

Under the Barbados Water Authority Act, 1980, (Part VII 27(2) (b)) it is an offence to place, deposit, discharge or allow to remain material of any kind that is likely to impair the quality of water in an area that has been defined as an area for public water supply. Anyone found guilty of an offense is subject, on summary conviction, to a fine of \$1,000 or imprisonment for 12 months or both and to a further fine of \$100 for each day or part thereof during which the offence continues after a conviction.

Currently, non-governmental organizations have no role in enforcement, education or public awareness activities of the BWA. However, they may have some input into its

monitoring activities by reporting water quality issues to the BWA through its dedicated customer service department. It should be noted that although the input of non-governmental organization into the processes of the BWA seems limited, input from the BWA is often requested by non-governmental and governmental entities when considering developmental initiatives; thereby ensuring that any impacts to the water quality are considered.

The Fiscal Incentive Act, 1974 is an Act to implement the Agreement, to which Barbados is a party, between certain countries in the Caribbean region for the harmonisation of fiscal incentives to industry. The Act makes provisions for manufacturing entities that produce product(s), which have both economic and non-economic benefits to Barbados, to be eligible for a number of incentives. Incentives available under this Act include time-limited tax holidays and exemption from tax duties on the import of plant and equipment from outside of the region. Applications to receive the incentives stipulated under the Act are examined by the Risk Assessment and Monitoring of Industrial Development Committee (RAMCID). RAMCID ensures that, among other things, any chemicals used in the manufacturing processes are stored, used and disposed in an environmental sound manner (See Chapter 7 for more on RAMCID).

The Returnable Containers Act, 1985, encourages dealers of beverages in Barbados to use returnable containers. The Act provides for the control of the sale of beverages in beverage containers, the payment of a deposit on beverage containers, a refund for the return of those containers and the final disposal of unused or usable containers. It is suggested that the reduction of widespread littering on the island with plastic and glass bottles have been a direct result of this Act and the bottle refund programme initiated by several supermarkets and recyclers.

The Environmental Levy Act, 1996, establishes the collection of a levy on goods imported into Barbados. The monies collected are used to, among other things, defray the cost of operating and maintaining refuse disposal sites and for the preservation and enhancement of the environment.

4.7 COMMENTS/ANALYSIS

Legislation exists to address each of the national priorities indicated in Table 3.B in Chapter 3 with the exception of the national priorities of hazardous waste treatment/disposal, storage/disposal of obsolete chemicals, impacts on biodiversity, soil contamination and chemical residues in food.

Nevertheless, there are several gaps in the established formal mechanisms for chemicals management in Barbados, particularly pertaining to disposal of various chemical use categories. Only the disposal of pesticides is explicitly legislated. Furthermore, there is an absence of legislation to govern aspects of the life-cycle management of chemicals relative to chemical wastes.

Enforcement of the existing legislation is difficult due to limited human resources and

administrative challenges in some cases, and the outdated nature and vagueness of some of the pieces of legislation. For example, to ensure that only licensed chemicals are sold and that they conform to the Pesticide Control (Labelling of Pesticides) Regulations, 1976, Pesticide Inspectors audit retail outlets and importers' storage facilities. However, a number of factors severely hinder the effective enforcement of the regulations. These include an inadequate number of appropriately trained inspectors; an absence of an immediate supervisor for the management of the functions of the inspectorate; and lack of provisions for continuous training and updating with respect to new developments in the pesticide market and international regulations.

The existing legislation for the control of chemicals lists classes of chemicals or individual chemicals whose importation or manufacture is banned or restricted. However, in order to be truly effective, ongoing research to assess the risks posed by substances needs to be conducted and used as a basis for periodically updating the lists of prohibited substances. Currently, it does not appear as though this practice is employed.

In light of the deficiencies in the existing legislative instruments and to ensure compliance with selected international treaties and obligations new legislation, namely the Environmental Management Act, is being developed. The Environmental Management Act proposes to, among other things, make provisions for the regulatory control over all aspects of the life cycle of hazardous substances; from importation/production through disposal.

The Safety and Health at Work Act, which is expected to offer comprehensive coverage of workplace occupational health and safety issues has been passed in both the houses of parliament and the senate and is now awaiting proclamation.

With respect to the existing non-regulatory mechanisms, it is not possible to assess the effectiveness of such instruments in reducing chemicals risks in Barbados. No assessments have been conducted to assess the usefulness of such instruments.



Chapter 5

Ministries, Agencies and Other
Institutions Managing
Chemicals and Waste



The aim of this chapter is to describe and analyze the directives and programmes of different ministries, agencies and other governmental institutions responsible for, and concerned with, various aspects of chemicals management.

5.1 RESPONSIBILITIES OF DIFFERENT GOVERNMENT MINISTRIES, AGENCIES AND OTHER INSTITUTIONS

Table 5.A provides a general overview of ministerial responsibilities and activities related to chemicals management for each stage of the chemical life-cycle from production/import through disposal. Each cell of the table provides an indication of which government ministry has responsibility for control of various stages of the chemical life-cycle.

Table 5.A: Responsibilities of Government Ministries, Agencies and Other Institutions

Stages of Life Cycle Ministry Concerned	Importation	Production	Storage	Transport	Distribution/ Marketing	Use/ Handling	Disposal
Environment			x			x	x
Health	x	x	x		x	x	x
Agriculture	x	x	x		x	x	
Labour		x	x	x		x	x
Commerce					x		
Home Affairs	x		x	x			
International Transport			x	x			
Energy and Public Utilities	x		x		x	x	
Finance	x						

5.2 DESCRIPTION OF MINISTERIAL AUTHORITIES

Brief descriptions of the responsibilities and activities of each ministry/agency mentioned in Table 5.A are presented below. Where applicable, reference is made to the relevant subsidiary agencies with specific responsibility for or involvement in national chemicals management.

5.2.1 *Ministry of Environment, Water Resource and Drainage*

Through the Environmental Protection Department (EPD), formerly the Environmental Engineering Division, the Ministry of Environment, Water Resources and Drainage performs the regulatory functions legislated in the Marine Pollution Control Act, 1998-40. The Act empowers the Head of the EPD to investigate, characterise and define the extent of pollution and significant sources of pollution from land-based sources, sea-bed activities, dumping activities and airborne sources.

The EPD is also responsible for the implementation of the Basel and Stockholm Conventions in Barbados, and is one of two designated National Authorities (the other is the Ministry of Agriculture) for the implementation of the Rotterdam Convention. Under the Basel Convention, the Department oversees the exportation of hazardous waste for environmentally sound disposal overseas. Under the Stockholm Convention, the Department is responsible for the development of a National Implementation Plan for the management of Persistent Organic Pollutants. Additionally, the EPD is involved in environmental monitoring and emergency response.

The Environmental Unit, which is also under the Ministry of Environment, Water Resources and Drainage, has responsibility for the Montreal Protocol. The Montreal Protocol on Substances That Deplete the Ozone Layer is an international treaty designed to protect the ozone layer by phasing out the production of a number of substances believed to be responsible for ozone depletion.

Through the Solid Waste Project Unit, the Ministry of Environment, Water Resources and Drainage is also responsible for the development of an integrating solid waste management programme, which seeks to manage the solid waste of Barbados in the most efficient and effective way.

5.2.2 *Ministry of Health*

The Ministry of Health has responsibility for enforcing the regulatory function of the Health Services Act. The Act includes two regulations relevant to chemicals management. These are the Control of Drugs Regulations and the Use of Artificial Sweeteners in Food Regulations. The importation, manufacture and distribution of drugs, and the sale and use of artificial sweeteners in food, are controlled by these regulations.

The Ministry of Health is also responsible for administration of the Sale of Poisons Act,

which governs the sale and distribution of poisonous substances to householders.

5.2.3 Ministry of Agriculture

The Ministry of Agriculture is the lead agency for the Pesticides Control Act and accompanying regulations, which govern the licensing, importation, manufacture, storage, labelling, distribution, sale, use, handling and disposal of pesticides.

The Ministry of Agriculture is also responsible for the Fertilisers and Feeding Stuffs Act, which provides for the registration and control of the importation, manufacture, labelling and sale of fertilisers and feedstuffs.

5.2.4 Ministry of Finance, Labour, Civil Service and Energy

Under the Factories Act, the Occupational Health and Safety Section of the Labour Department, Ministry of Finance, Labour, Civil Service and Energy, regulates matters concerning Occupational Health and Safety in the workplace. The Labour Department will have responsibility for enforcing the Health and Safety at Work Act once it comes into force.

Under the Fuel Oil Act and the Storage of Petroleum Act, the Ministry of Finance, Labour, Civil Service and Energy regulates the importation, landing, storage and care of fuel oil, volatile petroleum and flammable liquids.

The Customs and Excise Department, which falls under the umbrella of the Ministry of Finance, monitors and regulates the import and export of all chemicals and hazardous substances to and from Barbados. It is through the Customs Department that import, export, and trade restrictions imposed by other regulatory agencies are enforced.

5.2.5 Ministry of Economic Affairs and Empowerment, Innovation, Trade, Industry and Commerce

The Barbados National Standards Institution (BNSI), in the Ministry of Trade, Industry and Commerce, is the authority responsible for the execution of the Control of Standards Act. In this regard the BNSI specifies standards for graphic marking for handling of goods, handling and labelling of dangerous goods, and classification of hazardous chemicals, chemical products and dangerous goods.

5.2.6 Ministry of Home Affairs

The Department of Emergency Management (DEM), formerly the Central Emergency Relief Organisation (CERO), and the Barbados Fire Service, both agencies in the Ministry of Home Affairs, play crucial roles in emergency response. The Fire Service is a key response agency in events of chemicals spills or fires. The Service also educates the public about risk

management and hazard reduction. DEM is involved in the coordination of response to emergency incidents, as well as education and raising awareness about emergency preparedness and response.

The National Council on Substance Abuse also plays a role in chemicals management, through efforts to control the import, production and export of chemical precursors to illegal narcotics.

5.2.7 Ministry of International Business and International Transport

The Barbados Port Authority is responsible for the implementation of the Barbados Port Authority (Transfer of Management and Vesting of Assets) Act, the Carriage of Goods by Sea Act, and the International Maritime Dangerous Goods Code. These instruments mandate that the Authority ensure the safe transportation, carriage, storage and handling of dangerous and offensive goods that are imported or exported via the island's ports of entry.

5.3 COMMENTS/ANALYSIS

Collectively, the various ministries involved, either directly or indirectly, with chemicals management ensure that all aspects of the life cycle management of chemicals are addressed. Each ministry has clearly defined mandates and where legislation exists the responsibility of the ministries are stipulated within the legislation. Nonetheless, there are a few instances of overlapping mandates among some of the departments within ministries. The most notable example of overlapping mandates is that of Environmental Protection Department, Ministry of Environment Water Resources and Drainage, and the Occupational Safety and Health Section, Ministry of Labour and Civil Service.

Both the Environmental Protection Department and Occupational Safety and Health Section address chemical management from the perspective of occupational health and safety. Historically, the Environmental Protection Department has addressed indoor air quality in office buildings which included occupational health and safety, but the Labour Department's occupational health and safety mandate also speaks to health and safety in workplaces. Generally, this overlapped is circumvented through cooperation on investigations pertaining to occupational health and safety. However, a policy paper on indoor air quality that was prepared in 2007 recommends that the occupational health and safety function of the Environmental Protection Department are transferred to the Ministry Labour, which will have the new Occupational Safety and Health at Work Act. Consequently, the responsibilities with respect to occupational health and safety would no longer be fragmented.



Chapter 6

Relevant Activities of Industry,
Public Interest Groups and
the Research Sector



There are a variety of chemicals management stakeholders in Barbados in addition to Government Ministries, Departments and Statutory Boards. This chapter identifies a number of these non-governmental stakeholders, briefly describes their involvement in the chemicals management framework and outlines the types of expertise and experience associated with each organisation. It should be noted that this chapter is not intended to constitute an exhaustive list of all non-governmental chemicals management stakeholders.

6.1 DESCRIPTION OF ORGANISATIONS

6.1.1 *Regional and International Organisations*

Barbados is home to the offices of a number of regional and international organisations with some degree of involvement in chemicals management.

6.1.1.1 Food and Agriculture Organisation of the United Nations

The Food and Agriculture Organisation of the United Nations (FAO) is interested in the broad area of pesticides management and chemicals safety as it relates to agriculture and food production. Activities include chemicals inventories, policy analysis and development of legislation, administration of international Conventions, and training and education.

Contact Information: Food and Agriculture Organization of the United Nations

2nd Floor United Nations House

Marine Gardens

Hastings

Christ Church, Barbados

Telephone: (246) 426-7110/429-2002

Fax: (246) 427-6075

6.1.1.2 Inter-American Institute for Cooperation on Agriculture

The Inter-American Institute for Cooperation on Agriculture (IICA) is the specialised agency for agriculture in the Inter-American system. It is an agency that promotes the sustainable development of agriculture, food security and the prosperity of rural communities in the Americas (www.iica.int, 2008).

The Institute collaborates with the FAO and the Pan American Health Organisation (PAHO) in areas covering agricultural health and safety, including the safe handling and use of chemicals and toxic materials. Collaborations also exist at the national and regional levels with Ministries of Agriculture, Rural Development and Environment. Additionally, IICA conducts distance education courses in Occupational Health and Safety and Organic

Farming as part of their objective to promote safe and sustainable agricultural practices.

Contact Information: Inter-American Institute for Cooperation on Agriculture

P. O. Box 705

Bridgetown, Barbados

Telephone: (246) 427-4740/427-4741

Fax: (246) 429-3509

6.1.1.3 Pan American Health Organisation

The Pan American Health Organisation (PAHO) is a regional office of the World Health Organisation. Their involvement in national and regional efforts to manage chemicals relates primarily to the mitigation and reduction of human and environmental health impacts resulting from chemical production, use and disposal. PAHO provides technical assistance and advice on matters relating to environmental quality and environmental health, as well as developing and implementing training and capacity-building programmes in the region. PAHO is also a repository of useful information and guidance on issues related to sound chemicals management, and seeks to facilitate the dissemination of this information to other stakeholders.

Contact Information: Pan American Health Organisation

P. O. Box 508

Bridgetown, Barbados

Telephone: (246) 426-3860

Fax: (246) 436-9779

6.1.2 *Universities and Research Institutes*

6.1.2.1 University of the West Indies

The Department of Biological and Chemical Sciences and the Centre for Resource Management and Environmental Studies (CERMES) are key departments at the Cave Hill Campus of the University of the West Indies with an interest in chemicals management.

The Department of Biological and Chemical Sciences possesses expertise in the areas of pesticide data collection, analytical techniques such as gas chromatography and mass spectrometry, analysis of chemical levels in environmental media, and health effects research, particularly in the area of air pollution. The Department also uses chemicals, both organic and inorganic, in their teaching and research laboratories.

CERMES provides training at the post-graduate level for students of Natural Resources Management. Although the Centre is not currently involved in hazardous/toxic chemicals

management, staff possess expertise in risk assessment, environmental monitoring (particularly the monitoring of marine water quality), and data collection.

Contact Information: Department of Biological and Chemical Sciences

Faculty of Pure and Applied Sciences

University of the West Indies

Cave Hill

St. Michael, Barbados

Telephone: (246) 417-4324

(246) 417-4325/4597

Centre for Resource Management and Environmental Studies

University of the West Indies

Cave Hill

St. Michael, Barbados

Telephone: (246) 417-4316

Fax: (246) 417-4204

6.1.3 Commerce, Trade and Industry

Chemicals management stakeholders in the fields of commerce, trade and industry include importers, distributors, manufacturers and users of chemicals.

6.1.3.1 Barbados Light and Power Company Limited

Barbados Light and Power Co. Ltd. (BL&P) is the national electricity generation and distribution company. They currently have in storage a quantity of used PCB oils and PCB-containing equipment, and are in the process of developing a plan for the environmentally sound disposal of these materials.

Contact Information: Barbados Light and Power Company Ltd.

The Garrison

St. Michael, Barbados

Telephone: (246) 436-1800

Fax: (246) 429-6000

6.1.3.2 Barbados National Oil Company Limited

The Barbados National Oil Company Ltd. (BNOC) carries out the extraction, importation and exportation of petroleum products. They are responsible for the management of the chemicals associated with these exercises. They also perform some monitoring of environmental media (primarily groundwater) likely to be affected by their activities.

Contact Information: Barbados National Oil Company Ltd.

Woodbourne
St. Philip, Barbados
Telephone: (246) 420-1800
Fax: (246) 420-1818

6.1.3.3 Importers of Pesticides and Agricultural Chemicals

Agro Chemicals Inc. and Carter's General Stores are the major importers and distributors of agricultural chemicals in Barbados.

Contact Information: Agro Chemicals Inc.

Warrens Industrial Park
St. Michael, Barbados
Telephone: (246) 425-3939/425-3941
Fax: (246) 425-3943

Carter's General Stores
Barbarees Hill
St. Michael, Barbados
Telephone: (246) 431-1538
Fax: (246) 431-1539

6.1.3.4 McBride Caribbean Limited

McBride is a manufacturer/reformulator of household chemicals and personal use products, including detergents and insect sprays. McBride carries out regular environmental and occupational health and safety audits of their facilities, in accordance with the policy of their parent company in the United Kingdom.

Contact Information: McBride Caribbean Ltd.

Lowlands

Christ Church, Barbados

Telephone: (246) 428-7766

Fax: (246) 428-3414

6.1.3.5 Golf Course Operators

There are a number of golf courses operating in Barbados. Operators at such facilities are involved in the application of chemicals for the maintenance of the turf on the courses. Golf courses are typically required to carry out some degree of environmental monitoring as required by the national regulatory agencies. Among the leading golf course operators in the island are the Royal Westmoreland Resort and the Sandy Lane Hotel.

Contact Information: Royal Westmoreland Resort

Westmoreland

St. James, Barbados

Telephone: (246) 422-4653

Fax: (246) 422-3021

Sandy Lane Hotel

Sandy Lane

St. James, Barbados

Telephone: (246) 444-2000

Fax: (246) 444-2222

6.1.4 *Environmental/Consumer Groups*

6.1.4.1 Counterpart Caribbean

Counterpart Caribbean is an environmental non-governmental organisation with a focus on the promotion of sustainable development in Barbados. The organization is a volunteer-run organisation, which is actively involved in raising public awareness of sustainable development practices.

Contact Information: Counterpart Caribbean
Edgehill
St. Thomas, Barbados
Telephone: (246) 425-2020
Fax: (246) 425-0088

6.1.4.2 Caribbean Conservation Association

The Caribbean Conservation Association (CCA) is a regional organisation, with its Secretariat in Barbados. The CCA has a membership that covers the wider Caribbean and includes participation by non-governmental organisations, governmental agencies, and individuals. The mission of the CCA is “to enhance the quality of life for present and future generations of the Caribbean by facilitating the development and implementation of policies, programmes and practices, which contribute to the sustainable management of the region’s natural and cultural resources” (www.ccanet.net, 2008). Specific initiatives related to chemicals management include information management, environmental assessment and monitoring, environmental awareness raising and assisting with compliance with international Conventions.

Contact Information: Caribbean Conservation Association

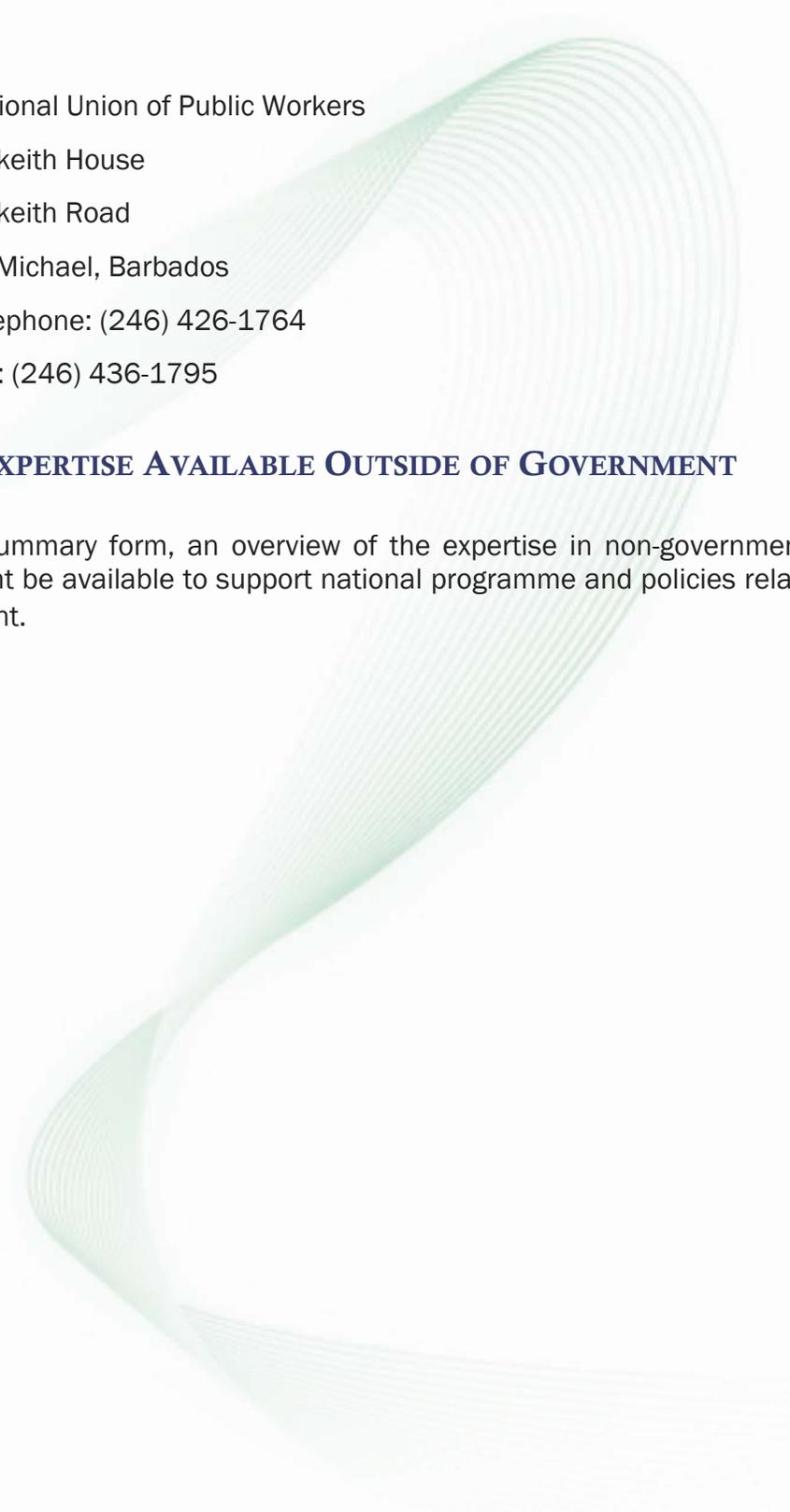
Bush Hill
The Garrison
St. Michael, Barbados
Telephone: (246) 426-5373
Fax: (246) 429-8483

6.1.5 *Labour Unions*

The Barbados Workers’ Union (BWU) and the National Union of Public Workers (NUPW) are both concerned with ensuring the occupational safety and health (OSH) of workers in Barbados. In this regard, the unions arrange training sessions for workers and negotiate with management for the implementation of OSH provisions in the workplace.

Contact Information: Barbados Workers’ Union

Harmony Hall
St. Michael, Barbados
Telephone: (246) 4126-3492/426-3495
Fax: (246) 436-6496



National Union of Public Workers
Dalkeith House
Dalkeith Road
St. Michael, Barbados
Telephone: (246) 426-1764
Fax: (246) 436-1795

6.2 SUMMARY OF EXPERTISE AVAILABLE OUTSIDE OF GOVERNMENT

Table 6.A provides, in summary form, an overview of the expertise in non-governmental organizations which might be available to support national programme and policies related to chemicals management.

Table 6.A: Summary of Expertise Outside of Government

Field of Expertise	Research Institutes and Universities	Trade/Industry	Environmental/Consumer Groups	Labour Unions	Regional/International Organizations
Field of Expertise	Department of Biological and Chemical Sciences (UWI)	Barbados Light and Power Company Limited	Counterpart Caribbean	Barbados Workers' Union (BWU)	Pan American Health Organization
	Centre of Resource Management and Environmental Studies (UWI)	Barbados National Oil Company Limited		National Union of Public Workers (NUPW)	Inter-American Institute for Cooperation on Agriculture
		Pesticide Importers/Distributors			
		McBride Caribbean Limited			
		Golf Course Operators			
Data Collection	x	x	x	x	x
Testing of Chemicals	x				
Risk Assessment	x		x		
Risk Reduction	x	x			
Policy Analysis	x		x		x
Training and Education			x	x	x
Research on Alternatives	x		x	x	
Monitoring	x	x	x		
Enforcement					
Information to Workers	x	x		x	x
Information to Public		x	x	x	x

6.3 COMMENTS/ANALYSIS

There is present in Barbados a variety of non-governmental stakeholders and interest groups encompassing a range of sectoral interests in chemicals management issues. With reference to Table 6.A, it is evident that the key non-governmental stakeholders house much useful expertise that is brought to bear on the execution of their particular individual mandates as they relate to the sound management of chemicals. However, to some extent the knowledge and skills present in these organisations are not being fully and efficiently utilised in regards of national chemicals management. The expertise held in non-governmental organisations could be of great benefit if adequately integrated into the development and implementation of a comprehensive national chemicals management programme. Further to this, several of the agencies included in this chapter have linkages with regional and international organisations, and these linkages offer opportunities to access and take advantage of wider pools of resources and information.

Any national plan or programme to strengthen the chemicals management framework in Barbados would be enhanced by provisions for the establishment of formal linkages and cooperation between governmental agencies and mechanisms and non-governmental chemicals management stakeholders. Particular benefits could be reaped in the areas where non-governmental agencies have a wealth of expertise, such as monitoring and data collection, training and education, and awareness raising.

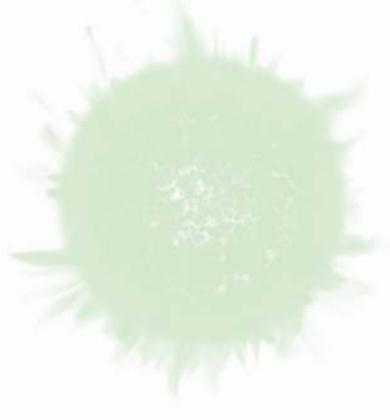
Government's policy regarding the involvement of non-governmental organizations in issues related to sustainable development including chemicals management is outlined in the National Sustainable Development Policy, 2004. The National Sustainable Development Policy outlines government's commitment to, among other things, strengthen participation of all major stakeholders in the decision making process at all levels from national and international policy development to project development and implementation for every sector and/or issue. Under the policy public participation refers to the interaction between the civil society and government and includes the process by which government and the civil society open dialogue, establish partnerships, share information, and otherwise interact to design, implement and evaluate development policies, projects and programmes.

As part of the process of strengthening the national chemicals management infrastructure, attention must also be given to the development and improvement of capacity within non-governmental agencies. Enforcement is an area where expertise is lacking. At present, non-governmental organizations have no rights to seek enforcement of laws or regulations related to the control of chemicals. However, entities such as the labour unions do have the ability to lobby for and advocate the development of regulatory and non-regulatory instruments for the management of chemicals particularly the use and handling of chemicals.



Chapter 7

Inter-Ministerial Commissions and Coordinating Mechanisms



The intent of this chapter is to describe and analyze mechanisms which facilitate coordination and cooperation among ministries, agencies and other relevant governmental bodies in particular areas of chemicals management.

7.1 INTER-MINISTERIAL COMMISSIONS AND COORDINATING MECHANISMS

Several public sector authorities exist that seek to address national development considerations and sustainability in a manner that draws upon the necessary input of key stakeholders. Those that have some bearing on chemicals management in Barbados include:

- the Pesticide Control Board (PCB);
- the National Ozone Committee;
- Risk Analysis Committee on Industrial Development (RAMCID);
- the National Advisory Committee on Occupational Safety and Health (NACOSH);
- the National Chemical Convention Committee; and
- the Barbados National Response Team.

Table 7.A provides an overview of the existing mechanisms for co-ordinating chemicals management activities among relevant institutions. The effectiveness of the existing mechanisms was assessed as follows:

- Excellent – attaining in excess of 90% of its objectives or the obligations under its mandate;
- Adequate – attaining between 50% - 90% of its objectives or the obligations under its mandate; and
- Poor – attaining less than 50% of the its objectives or the obligations under its mandate

More detailed summary descriptions of the key mechanisms are provided in Section 7.2.

Table 7.A: Overview of Inter-ministerial Commissions and Co-ordinating Mechanisms

Name of Mechanism	Responsibilities	Secretariat	Members	Legislative Mandate/ Objective	Effectiveness
Pesticides Control Board	To advise the Minister on matters relevant to the making of regulations under the Pesticides Control Act; and To carry out the provisions under the Act.	Ministry of Agriculture	<ul style="list-style-type: none"> • a Deputy Chief Agricultural Officer assigned by the Minister, to be the Chairman; • the Chief Medical Officer or his nominee; • the Government Analyst; and • two (2) other persons, one of whom may be a public officer. 	Pesticides Control Act	Adequate

Table 7.A: Overview of Inter-ministerial Commissions and Co-ordinating Mechanisms

Name of Mechanism	Responsibilities	Secretariat	Members	Legislative Mandate/ Objective	Effectiveness
National Ozone Committee	To assist the Ministry of Environment with the execution of the Barbados Country Programme for the phasing out of ozone-depleting substances.	Environmental Unit, Ministry of Environment, Water Resources and Drainage	<ul style="list-style-type: none"> • Environmental Unit (Chair and Convener) • National Council for Science and Technology • Environmental Protection Department • Customs and Excise Department • Statistical Services Department • Barbados National Standards Institution • Ministry of Labour • Ministry of Finance, Economic Affairs and Development and Energy • University of The West Indies • Barbados Industrial Development Corporation • Ministry of Trade, Industry and Commerce • Barbados Manufacturers' Association • Bridgetown Fisheries Complex • Governmental Analytical Services Laboratory 	Cabinet Authorisation (October 1994)	Adequate

Table 7.A: Overview of Inter-ministerial Commissions and Co-ordinating Mechanisms

Name of Mechanism	Responsibilities	Secretariat	Members	Legislative Mandate/ Objective	Effectiveness
National Advisory Committee on Occupational Safety and Health (NACOSH)	To advise the Minister on issues of safety and health as they affected the workplace	Labour Department, Ministry of Finance, Labour and Civil Service and Energy	<ul style="list-style-type: none"> • Ministry of Health • Ministry of Agriculture and Rural Development • Barbados National Standards Institution • Barbados Association of Medical Practitioners • Barbados Association of Professional Engineers • Barbados Workers' Union • Barbados Employers' Confederation • Barbados Manufacturers' Association • Labour Department • Environmental Protection Department 	Cabinet Authorisation (1983)	Adequate

Table 7.A: Overview of Inter-ministerial Commissions and Co-ordinating Mechanisms

Name of Mechanism	Responsibilities	Secretariat	Members	Legislative Mandate/ Objective	Effectiveness
Risk Analysis and Monitoring Committee for Industrial Development (RAMCID)	To advise on and make recommendations concerning risks to environment and workers associated with the use and manufacture of hazardous materials at industrial facilities in Barbados	Barbados Investment and Development Corporation (BIDC)	<ul style="list-style-type: none"> • Director, Barbados National Standards Institution (Chair) • Chief Executive Officer, BIDC • Chief Town Planner • Permanent Secretary, Ministry of Housing and Lands • University of the West Indies • Director, Environmental Protection Department • Chief Labour Officer • Director, National Council for Science and Technology • Barbados Association of Professional Engineers • Senior Medical Officer of Health • Permanent Secretary, Ministry of Economic Affairs and Empowerment, Innovation, Trade, Industry and Commerce • General Secretary, Barbados Workers' Un- 	Cabinet Authorisation (1982)	Excellent

Table 7.A: Overview of Inter-ministerial Commissions and Co-ordinating Mechanisms

Name of Mechanism	Responsibilities	Secretariat	Members	Legislative Mandate/ Objective	Effectiveness
National Chemicals Convention Committee	The National Implementation Plan outlines strategies and action plans suitable for Barbados to meet the obligations of the Stockholm Convention, as well as to meet its country-specific objectives and priorities for POPs management.	Environmental Protection Department	<ul style="list-style-type: none"> • Environmental Protection Department • Environment Unit, Ministry of Family, Youth, Sports and Environment; • Ministry of Agriculture and Rural Development • Ministry of Health • Labour Department, Ministry of Labour and Civil Service • Government Analytical Services • Barbados Water Authority • University of the West Indies • Barbados Agricultural Society • Barbados Workers' Union • Caribbean Conservation Association • Counterpart Caribbean 	Cabinet Authorisation (2007)	Adequate

Table 7.A: Overview of Inter-ministerial Commissions and Co-ordinating Mechanisms

Name of Mechanism	Responsibilities	Secretariat	Members	Legislative Mandate/ Objective	Effectiveness
The Barbados National Response Team	Provides for coordinated response actions by agencies of the Government of Barbados and the local petroleum industry to protect the terrestrial and marine environment from the damaging and polluting effects of oil discharges.	Environmental Protection Department	<ul style="list-style-type: none"> • Barbados Defence Force • Department of Emergency Management • National Conservation Commission • Barbados Port Authority • Coastal Zone Management Unit • Barbados Fire Service • Royal Barbados Police Force • Environmental Protection Department • Local Petroleum Industry • Energy Division 	Oil Spill Contingency Plan (2002)	Adequate

7.2 DESCRIPTION OF INTER-MINISTERIAL COMMISSIONS AND COORDINATING MECHANISMS

7.2.1 *Pesticides Control Board*

The Pesticide Control Board (PCB) is an inter-ministerial entity, which exists to service the mandate accorded to the Ministry of Agriculture through the Pesticides Control Act. It represents the supporting mechanism for the Minister in making regulations under the Act for various aspects of pesticides management. The regulatory tools recommended by the PCB may cover the issues of importation, manufacture, labelling, use restrictions and occupational risk, among others.

There are a few issues that influence the functioning of the PCB. These issues include the diversity of professional skills; and research capabilities. Firstly, the constituted board generally reflects medical, agricultural and analytical expertise. However, the expertise represented on the Board should be expanded to include those that are vital to the agriculture sector; workers' health and environmental protection. Finally, there is a need for continuous research by the PCB regarding the health and environmental impacts of pesticides to ensure that pesticides are used effectively and safely.

7.2.2 *National Ozone Committee*

Barbados signed the Vienna Convention and its associated Montreal Protocol on Substances that deplete the Ozone Layer in 1987. The subsequent development of the Barbados Country Programme and the formation of the National Ozone Committee were primarily to effect compliance with the requirements of the protocol. Barbados imports all of its Ozone-Depleting Substances (ODS). The use of these substances in the refrigeration and air-conditioning sectors is the primary area of national concern. The functions of the Committee is largely related to the formulation of strategic policies to give effect to realising the phase-out targets defined in the Country Programme. Strategies offered to date include:

- a licensing and certification programme for persons in the refrigeration industry, inclusive of training in chlorofluorocarbon (CFC) recovery and recycling;
- fiscal incentives to promote the transition towards the employ of ozone friendly refrigerants;
- supporting mechanisms to facilitate the reclamation and recycling of CFC's as a means of reducing annual ODS imports;
- the promotion of greater collaborative efforts with the various sectors involved in the use of ODS; and

- developing legislation to govern the import and export of restricted or prohibited goods that are ozone depleting.

Legislation is being developed which would further support the activities by this committee.

7.2.3 National Advisory Committee on Occupational Safety and Health

The Terms of Reference for the National Advisory Committee on Occupation Safety and Health (NACOSH) are as follows -:

- to make recommendations on matters referred to it by the Minister, submitted to it by interested parties, or pursued by the Committee on its own initiative;
- to advise the Minister on programmes in the field of occupational safety, health and hygiene;
- to advise the Minister on policies, and procedures in standard setting and in the development and review of regulations and guidelines to be used by the Government;
- to review and make recommendations to the Minister on the introduction of new processes or substances in the workplace;
- to review and make recommendations regarding the safety, health and welfare arrangements for specific occupational groups and in areas where there are no formal health and safety programmes, or where such programmes are judged to be inadequate;
- to assist with educating the public on matters pertaining to health and safety and minimise accidents on the job and to a lesser extent, the financial cost to the State; and
- to liaise with other relevant agencies and coordinate all activities pertaining to occupational health and safety.

Since its establishment in 1983, NACOSH has been affected by several periods of inactivity. At present, however, meetings of the committee are convened on a monthly basis.

The committee has played a pivotal role in the development of the Safety and Health at Work Act. Unfortunately, this Act has yet to be proclaimed. Once proclaimed, it is intended to serve as a replacement for the Factories Act (Cap. 347), 1984.

7.2.4 Risk Analysis and Monitoring Committee for Industrial Development

The Risk Analysis and Monitoring Committee for Industrial Development (RAMCID) is a 13-member Committee, the formation of which was approved by Cabinet in 1982. The

Committee is chaired by the Director of the Barbados National Standards Institution, and its membership comprises representatives from Governmental offices, academia and the private sector.

The functions of the Committee are:

- to advise on the particular risk to the environment and workers of setting up industries that use or manufacture hazardous materials and or industries where Quality Control is of the utmost importance;
- to advise on the possible location of such plants with consideration given to their compatibility with existing industries and the general environment;
- to recommend monitoring of the use and disposal of hazardous materials of such industries, and the risks involved in the industries;
- to assist the Barbados Investment and Development Corporation in developing a national policy for development of industries which produce and use hazardous products in Barbados;
- to co-ordinate the functions of organisations already involved in the approval of new industries in Barbados.

After an extended period of inactivity RAMCID currently meets as and when necessary to review applications for industrial processes.

7.2.5 National Chemical Convention Committee

The national Chemicals Convention Committee bears responsibility for providing policy input and overall oversight of the implementation of the three multilateral environmental agreements namely the Stockholm, Basel and Rotterdam Conventions. The duties of the Committee would include:

- overseeing the national implementation of the Basel, Rotterdam and Stockholm Conventions;
- reviewing, commenting on, and approving plans for action and activities to implement the Basel, Rotterdam and Stockholm Conventions;
- reviewing, commenting on, and approving documents and reports required under the Conventions, including strategy documents and action plans;
- recommending general and specific tasks for the implementation of the Conventions;
- reviewing and commenting on the execution of activities and actions for the implementation of the Conventions;

- Ensuring that the national implementation of the Convention adequately addresses a range of relevant cross-sectoral issues; and
- Reviewing and commenting on the state of Barbados' compliance with the Basel, Rotterdam and Stockholm Conventions.

The committee meets as and when necessary.

7.2.6 Barbados National Response Team

The Barbados National Response Team (BNRT) is an inter-agency group established under the National Oil Spill Contingency Plan, which was approved by Cabinet in 2002, to address policy matters and technical issues pertaining to oil spill response. The functions of the BNRT are to, among other things, develop response plans prior to a spill and coordinate activities during an oil spill response action.

The Barbados National Response Team is required in the Oil Spill Contingency Plan to meet at least quarterly to review pollution emergency response action. Based on the continual evaluation of the response action, the BNRT makes recommendations relating to training and equipping the response team; research and evaluation of activities to improve response capabilities; stockpiling equipment/material; and other operational matters.

The primary challenge faced by the BNRT is that there is no dedicated budget for oil spill response. Consequently, training and equipping of the response team and stockpiling of equipment/materials is achieved on a piecemeal basis.

7.3 DESCRIPTION OF MECHANISMS FOR OBTAINING INPUT FROM NON-GOVERNMENTAL BODIES

Increasingly, Government has sought to secure a wider range of input into its decision making processes. Such input is generally solicited in one of two ways; either in an ad-hoc manner or via structured mechanisms.

Input from non-governmental agencies is generally sought in an ad-hoc manner when reports are received by parent Ministries relating to specific situations of concern either at the individual or community level.

On the other hand, input can be sought from non-governmental bodies in a structured manner by inviting individuals to be co-opted members of various standing committees.

7.4 COMMENTS/ANALYSIS

Generally, the existing inter-ministerial commissions and co-ordinating mechanisms function effectively relative to their roles in chemicals management and appear to address the most pertinent aspects of chemicals management. Stakeholders from all relevant ministries are normally represented on the various committees and boards and where additional input from other governmental and non-governmental agencies is needed all efforts are made to do so.

There are, however, some challenges that confront the operations of these inter-ministerial commissions and co-ordinating mechanisms. The most prominent issues are outlined as follows:

- in some cases, administrative issues have negatively impacted the operation of some the mechanisms resulting in prolonged periods of inactivity.
- each mechanism acts independently and do not always benefit from each others information due to limited sharing of information.

Procedures need to be put in place by the various inter-ministerial commissions and coordinating mechanisms to ensure that they meeting regularly and keeping abreast of chemical management situation in Barbados. Furthermore, there needs to be greater information exchange. Currently, information is exchanged on request but a more formal procedure would ensure that all commissions and mechanisms are aware of what the other is doing.



Chapter 8

Data Access and Use

This chapter is intended to provide an overview of the availability of data for chemicals management and the related infrastructure. It is also intended to analyse how information is used for national and local chemical risk reduction.

8.1 AVAILABILITY OF DATA FOR NATIONAL CHEMICALS MANAGEMENT

Data access and use are important in many ways, particularly in policy formulation and decision-making as they relate to national and local chemical risk reduction. Table 8.A provides an overview of the availability of data for decision-making and other activities that may be required as part of a chemicals management programme, and identifies the agencies responsible for gathering the types of data listed. An “x” indicates that sufficient data is available.

Table 8.A: Quality and Quantity of Available Information

Data Needed For	Pesticides (agricultural, public health and consumer use)	Industrial Chemicals	Consumer Chemicals	Chemical Wastes
Priority Setting	x			
Assessing Chemicals Impact under Local Conditions	x			
Risk Assessment (environment/ health)	x			
Classification/Labelling	x			
Registration	x			
Licensing	x			
Permitting	x			
Risk Reduction Decisions	x			
Accident Preparedness and Response	x	x	x	x
Poisoning Control				
Emissions Inventories				
Inspections & Audits (Environmental and/or Occupational Health and Safety)	x	x	x	x
Information to workers	x	x	x	x
Information to the Public	x			

8.2 LOCATION OF NATIONAL DATA

Table 8.B indicates the location and accessibility of national data related to chemicals and chemicals management. It should be noted that it is not certain how often the data at these locations are updated and consequently it is not certain how current the data are.

Table 8.B: Location of National Data

Type of Data	Location(s)	Data Source	Who has Access?	How to gain access?	Format
Production Statistics	Manufacturers/Producers	Company Records	Government	Write	Paper
Import Statistics	Statistical Department	Customs Department	Members of the Public	Request & Visit	Electronic Database
	Importers	Company Records	N/A	N/A	N/A
Export Statistics	Statistical Department	Customs Department	Members of the Public	Request & Visit	Electronic Database
Chemical Distribution and Use Statistics	Distributors & Retail Outlets	Company Records	N/A	N/A	N/A
Industrial Accident Reports	Workers Union	Employers	Unions, Inspectors & Members of the Public	Request & Visit	Paper Files & Reports
	Labour Department		Restricted ¹⁰	Request to the Chief Labour Officer	
Occupational Health Data (agricultural)	Workers Union & Labour Department	Employers	Restricted	Request to the Chief Labour Officer	Paper Files & Reports
Occupational Health Data (industrial)	Labour Department	Employers	Restricted	Request to the Chief Labour officer	Paper Files & Reports
Poisoning Statistics	Queen Elizabeth Hospital, Ministry of Health	Public	Members of public	Request to the Director of the Hospital	Database at Emergency Room
Pollutant Release and Transfer Register	N/A	N/A	N/A	N/A	N/A
Hazardous Waste Data	Environmental Protection Department	Company	Members of public	Request to Director	Paper Files

¹⁰Data can be accessed only by authorised personnel of the Labour Department, and in the case of an occupational incident, by the affected employee and his/her designated representatives

Table 8.B: Location of National Data

Type of Data	Location(s)	Data Source	Who has Access?	How to gain access?	Format
Register of Pesticides	Ministry of Agriculture (PCB)	Manufacturers and/or Distributors	Members of the public	Request and visit	Database
Register of Toxic Chemicals	N/A	N/A	N/A	N/A	N/A
Inventory of Existing Chemicals	N/A	N/A	N/A	N/A	N/A
Register of Imports	Statistical Department and Customs Department	Customs Department	Members of the public	Request & Visit	Electronic Database
Register of Producers	N/A	N/A	N/A	N/A	N/A
PIC Decisions	PCB EPD	Rotterdam Secretariat	Members of the public	Request to the Chair of the PCB or the EPD	Hard Copy Digital format

8.3 PROCEDURES FOR COLLECTING AND DISSEMINATING NATIONAL/ LOCAL DATA

Under the Pesticides Control Act, persons wishing to import pesticides into Barbados are required to provide core data to the Pesticides Control Board; this data relates to toxicity, environmental data, target organisms, efficacy etc. The Board may also require any further information that they deem necessary to make a decision on the registration of a chemical.

For chemicals other than those agro-chemicals regulated by the Pesticides Control Board, there is an absence of coordinated national programmes and procedures for data collection.

Although there are few programmes explicitly geared towards disseminating information to the public, by and large the Barbadian public has unhampered access to data. However, there are some exceptions, for example, under legislation governing the operations of the Statistical Department access to certain data are prohibited.

8.4 AVAILABILITY OF INTERNATIONAL LITERATURE

Barbados is fortunate in that a number of regional and international institutions are located in the country (refer to Chapter 6 for further information), which allow access to international

literature and other informational resources that they hold. Table 8.C outlines the nature of the international literature on chemicals management available, identifies their locations and means of gaining access.

Table 8.C: Availability of International Literature

Literature	Location(s)	Who has access?	How to gain access
Environmental Health Criteria Documents (WHO)	PAHO Library	Public	By appointment
Health and Safety Guides (WHO)	PAHO Library	Public	By appointment
International Chemical Safety Data Cards (IPCS/EC)	Labour Department	Public	By appointment
Decision Guidance Documents for PIC Chemicals (FAO/UNEP)	PAHO Library FAO Library	Public	By appointment
FAO/WHO Pesticides Safety Data Sheets	PAHO Library FAO Library	Public	By appointment
Documents from the FAO/WHO Joint Meeting on Pesticide Residues	PAHO Library FAO Library	Public	By appointment
Materials Safety Data Sheets (industry)	Labour Department Individual Industrial Companies Suppliers (Local & International)	Public	By appointment
OECD Guidelines for the Testing of Chemicals	PAHO Library	Public	By appointment
Good Laboratory Practice Principles	Government Analytical Services BNSI	Government Departments	By appointment
International Organisation for Standardisation (ISO)	BNSI	Public	Visit

8.5 AVAILABILITY OF INTERNATIONAL DATABASES

There appear to be no designated location(s) where literature on chemicals management can be accessed from international databases such as IRPTC; ILO CIS; IPCS INTOX; Chemical Abstract Services Database; Global Information Network on Chemicals; STN Database or relevant databases for other countries. Consequently, individual persons or entities would have to source such information on their own and also bear any associated costs.

8.6 NATIONAL INFORMATION EXCHANGE SYSTEMS

There is scope for improvements to the current arrangements for managing information exchange and flow from international agencies to concerned parties, ministries,

departments, agencies and stakeholder groups within the country.

A lack of clarity about which local agency has specific responsibility, or is the focal point, for particular areas of chemicals management can result in information being misdirected to the incorrect agency or focal point which can impede the flow of information from international organisations to national agencies. Significant delays can be experienced before the information is received by the agency best able to make use of it.

Situations such as these would benefit greatly from the establishment of a formal structure for the delivery and exchange of information to and between national institutions.

8.7 COMMENTS/ANALYSIS

There are acute difficulties to be faced in attempting to obtain data on chemicals management in Barbados. This should not be interpreted to mean that there is no data; there is data, but a number of factors contribute to prohibiting access to and effective use of this data. One such factor is the format in which the data is stored. Data is typically collected in a form which meets the specific requirements of the collection agency; this form may not be convenient for use for other purposes or by persons external to the organisation. Since there are a variety of agencies collecting such data for their own mandated purposes, it can be difficult to piece information together to get a holistic picture of the chemicals management situation in Barbados.

The Barbados Statistical Department remains the primary repository of data on chemicals import/production, export and trade. Outside of this department, there only are smatterings of data to be found elsewhere, as indicated in Table 8.B. The Pesticides Control Board (PCB), chaired by the Ministry of Agriculture and Rural Development, holds a wealth of information on agricultural chemicals. This is a result of the existence of a clear legislative framework governing the operation of the Board.

With respect to other groups of chemicals, which do not fall under the ambit of responsibility of these two agencies, difficulty may be encountered in determining which agency has responsibility for gathering and collating specific types of data. Oftentimes there is no clear indicator as to which agency holds the data required. Also, as previously mentioned, data may be stored in a manner that makes retrieval cumbersome and time-consuming.

A formal structure to oversee and co-ordinate the collection, storage and publication of chemical management data needs to be established. Gaps and deficiencies in existing databases could then be identified and programmes devised to collect or generate the deficient information.

With reference to Table 8.B, it can be noted that some information from governmental agencies is restricted, particularly information related to chemicals management. Such restriction is due in part to the fact that under the conditions of service of public officers and employees outlined in section 3.13 of the General Orders for the Public Service of

Barbados (revised edition 1997):

“An officer or employee shall not, without the approval of the Minister concerned, make public or communicate to the Press or cause to be made public or so communicated to the Press or to unauthorized individuals, any documents, papers or information which may come into his possession in his official capacity, or make private copies of any such documents”.

The Freedom of Information Bill proposes to remove the barrier to information by establishing a legal process by which government information is required to be available to the public. The Bill proposes to, among other things:

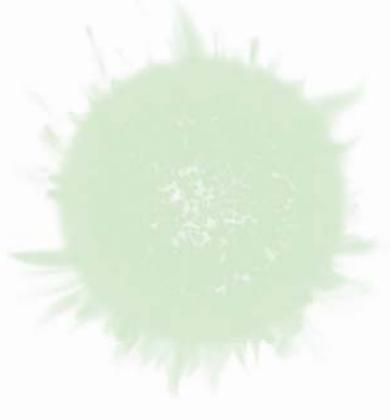
- make provisions for public access to public information about the operations of public authorities and, in particular, ensure that the authorizations, policies, rules and practices affecting members of the public are readily available to persons affected by those authorizations, policies, rules and practices; and
- create a general right of access to information in documentary form in the possession of public authorities limited only by exceptions and exemptions necessary for the protection of essential public interest in democratic society and the private or business affairs of persons in respect of whom information is held by public authorities.

If enacted, the Freedom of Information Act would increase the ability of the public to access information relating to chemicals management possessed by government agencies.



Chapter 9

Technical Infrastructure



The purpose of this chapter is to provide an overview of the technical infrastructure in Barbados pertaining to the management of chemicals.

9.1 OVERVIEW OF LABORATORY INFRASTRUCTURE

Barbados has three facilities that are capable of providing the chemical analyses required to support the implementation of a chemicals management programme for the island. These laboratories are:

- the Government Analytical Services (GAS), of the Ministry of Agriculture;
- the Forensic Sciences Centre (FSC), of the Office of the Attorney-General (AGO); and
- the Department of Biological and Chemical Sciences, University of the West Indies (UWI), Cave Hill Campus.

Collectively, these facilities possess a wide range of skill-sets with respect to chemical analyses. These skills include:

- Assessing the quality of chemicals;
- Residue analysis; and
- Identification of unknown samples.

Table 9.A is intended to provide an overview of the laboratory facilities available in the country to support programmes and policies for the management of chemicals.

Table 9.A: Overview of Laboratory Infrastructure for Regulatory Chemical Analysis

Name, Address & Description of Laboratory	Equipment/ Analytical capabilities available	Accredited (if yes by whom)	Certified GLP (yes/no)	Purpose/Activities
<p>Government Analytical Services Culloden Road St. Michael Barbados</p> <p>Description An analytical laboratory specialising in both chemical and microbiological analysis of food, water, soil and plant tissue.</p>	<ul style="list-style-type: none"> • Gas Chromatograph with Mass Selective Detector (GC-MS) • Gas Chromatograph with Flame Ionisation Detector and Flame Photometric Detector (GC-FID/ FPD) • Gas Chromatograph with Nitrogen Phosphorus Detector and Electron Capture Detector (GC-NPD/ECD) • High Pressure Liquid Chromatograph with Multi Wavelength Detection, Fluorescence and Refractive index (HPLC-MWD) • Dionex (Ion Chromatograph) • Pulse Auto analyzer • UV-Visible spectrometer • Atomic absorption spectroscopy – Flame and Graphite Furnace • Fourier Transform Infrared Spectrometer (FT-IR) 	NO	NO	<ul style="list-style-type: none"> • Conducts several monitoring programme of environmental significance for agencies such as the Environmental Protection Department, the Barbados Water Authority, the Coastal Zone Management Unit and the Ministry of Agriculture. • Monitors imports for the Customs Department. • Determines constituent levels for exporting manufacturing companies. • Analyses samples for the general public. • Utilises United States Environmental Protection Agency, Environment Canada, and United States Food and Drug Administration analytical methods.

Table 9.A: Overview of Laboratory Infrastructure for Regulatory Chemical Analysis

Name, Address & Description of Laboratory	Equipment/ Analytical capabilities available	Accredited (if yes by whom)	Certified GLP (yes/no)	Purpose/Activities
<p>Forensic Science Centre Culloden Road St. Michael Barbados</p> <p>Description An analytical laboratory specialising in the chemical, microbiological, toxicological analysis of samples submitted by the Royal Barbados Police Force and other police forces across the Caribbean region.</p>	<ul style="list-style-type: none"> • Comparison Microscope • GC-MS • GC-MS-MS • GC-FID/FPD • Gas chromatogram with head space (GC-HSP) • Glass Refractive Index Microscope (GRIM) • High Pressure Liquid Chromatograph – Diode Array Detector (HPLC-DAD) • HPLC-MS • HPLC-MS-MS (Q-Trap) • FT-IR • Scanning UV-Visible spectrometer • Scanning Electron Microscope (SEM) • Inductively Coupled Plasma Spectrometer with mass spectrometer (ICP-MS) • Polymerase Chain Reaction (PCR) machine • Realtime PCR • Janus-automated extraction • Ultra-centrifuge • FMBIO DNA Gel Scanning Instrument • ABI prism Electrophoresis 	NO	NO	<ul style="list-style-type: none"> • The Forensic Science Centre is a fully equipped laboratory; their focus is on crime-related matters in Barbados and the Caribbean region.

Table 9.A: Overview of Laboratory Infrastructure for Regulatory Chemical Analysis

Name, Address & Description of Laboratory	Equipment/Analytical capabilities available	Accredited (if yes by whom)	Certified GLP (yes/no)	Purpose/Activities
University of the West Indies Department of Biological and Chemical Sciences Cave Hill St. Michael Barbados	<ul style="list-style-type: none"> • Nuclear Magnetic Resonance (NMR) • GC-MS • Gas Chromatograph • HPLC • UV-Visible spectrometer • Atomic absorption spectrophotometer • Fourier Transform Infrared Spectrometer • Infra-red gas analyzer • Ethylene gas analyzer • PCR machine • Polarimeter • Magnetobalances • Ultra-centrifuge 	NO	NO	<ul style="list-style-type: none"> • The University of the West Indies is a teaching and research institution.
The university is planning to upgrade its equipment and acquire two new NMRs, LCMS and GCMS				

9.2 OVERVIEW OF GOVERNMENT INFORMATION SYSTEMS/COMPUTER CAPABILITIES

Table 9.B outlines the major computer capabilities that could potentially be used in activities related to chemicals management. Such activities may include the development of chemicals information systems, databases and inventories, accessing international information databases, and otherwise lending support to Government's policies and programmes related to the sound management of chemicals.

Table 9.B: Computer Capabilities

Computer system/ Database	Location	Equipment available	Current uses
Server	Government Analytical Service Culoden Road St. Michael	<ul style="list-style-type: none"> • Servers: 3 SQL • Exchange • File & print services • Intranet • Internet access • Personal Computers: 23 systems networked 	<ul style="list-style-type: none"> • Data processing, storage, and reporting • Information gathering • At least one system in a section is internet capable • Instrument interface
Server	Forensic Science Center Culoden Road St. Michael	<ul style="list-style-type: none"> • Servers: 2 SQL • Exchange • File & print services • LIMS • Intranet • Internet access • Personal Computers: 43 systems networked 	<ul style="list-style-type: none"> • Data processing, storage, and reporting • Information gathering • At least one system in a section is internet capable • Instrument interface
Server	University of the West Indies Department of Biological and Chemical Sciences Cave Hill St. Michael	<ul style="list-style-type: none"> • Campus wide network • File and print services • Internet • Website 	<ul style="list-style-type: none"> • Research • E-mail • Sourcing of spare parts and equipment
Databases	Coastal Zone Management Unit Bay Street St. Michael	<ul style="list-style-type: none"> • Server: 1 SQL • Geographic Information System • Global Positioning System • Relational database of planning applications 	<ul style="list-style-type: none"> • Georeferencing • Maps & planning • Spatial querying • Reef data • Water quality data • Beach profile data • Bathymetry data • Coastal aerial photos

Table 9.B: Computer Capabilities

Computer system/ Database	Location	Equipment available	Current uses
Databases	Statistical Department Fairchild Street Bridgetown St. Michael	<ul style="list-style-type: none"> • Server: 1 SQL • File and print services • Internet access (1 system) • PCs: 44 systems networked 	<ul style="list-style-type: none"> • Gathering and collation of data on imports and exports
Databases	Customs Department Port Authority Building University Row Bridgetown St. Michael	<ul style="list-style-type: none"> • Servers: 10 • Wide area network using fixed-frame related connections: 150 PC • Corporate vibrational scanners • Internet access 	<ul style="list-style-type: none"> • Information gathering on imports and exports
Databases	Environmental Protection Department	<ul style="list-style-type: none"> • Server: 1 SQL • Internet access • Personal computers: 25 systems networked 	<ul style="list-style-type: none"> • Groundwater quality data • Marine water quality data

All of the computer systems listed above have the ability to access email and the internet, in order to communicate with computer systems in other countries. The systems are also compatible with those in other government institutions.

9.3 OVERVIEW OF TECHNICAL TRAINING AND EDUCATION PROGRAMMES

Technical training in Government-operated analytical facilities has consisted primarily of in-house training and training from suppliers of new instruments and equipment. In addition, Government departments have formulated and implemented their own internal skills development programmes. Opportunities for professional development may also become available through the capacity building components of regional and international technical assistance and co-operation initiatives. For example, an 18-month project was approved by the United Nations Environment Programme (UNEP) that will focus on capacity building for laboratory analysis of Persistent Organic Pollutants (POPs) to support the Global Monitoring Plan of POPs for effectiveness evaluation of the Stockholm Convention. One of the activities under this project is to train the developing country laboratories in POPs

analysis according to international standards. The laboratory strengthening component of the project, “Integrating Watershed and Coastal Areas Management (IWCAM) in Caribbean Small Island Developing States” is another example of a regional and international initiative. The overall objective of the IWCAM project is to strengthen the commitment and capacity of the participating countries to implement an integrated approach to the management of watersheds and coastal areas. The long-term goal is to enhance the capacity of the countries to plan and manage their aquatic resources and ecosystems on a sustainable basis (www.iwcam.org, 2009). Laboratory strengthening in participating countries has been identified by key stakeholders as necessary to support and promote IWCAM practices activities. Some of the activities under the laboratory strengthening component of the project include (Caribbean Waterways, 2008):

- a. the preparation of an implementation plan for addressing any identified weaknesses, including recommendations for strengthening the capacity of national laboratories to support the monitoring needs of countries; in terms of equipment and materials, training in their use, repair and servicing of existing equipment, and where necessary, improvements to laboratory infrastructure; and
- b. the design and delivery of a regional training of trainers course in designing simple environmental monitoring systems, sample collection, laboratory testing, interpretation and presentation of results.

There are two tertiary institutions in Barbados, the Barbados Community College (BCC) and the University of the West Indies (UWI) that offer courses in subjects relevant to chemicals management.

9.4 COMMENTS/ANALYSIS

The current technical infrastructure is inadequate to fully support an effective chemicals management programme. The main weaknesses in the existing infrastructure can be categorised as lack of accreditation; availability of equipment ; staffing; and training.

The absence of accreditation can significantly impede the enforcement component that is necessary for any chemicals management initiatives. The Forensic Science Centre is currently working towards securing accreditation to ISO 17025 standards, which is the international standard for testing laboratories. Additionally, a seminar that was co-hosted by the Barbados Community College and the CARICOM Regional Organization of Standards and Quality (CROSQ), outlined goals of strengthening regional accreditation mechanisms and providing assistance to laboratories to help them to secure accreditation to international standards. CROSQ is the regional body for the development and implementation of quality standards.

The unavailability of necessary equipment is still one of the greatest limitations constraining analytical facilities in Barbados. Although most of the equipment that is required is available, there are a number of instruments still required to perform, for

instance, analysis of volatile organics, temperature-sensitive compounds and persistent organic pollutants. The costs of both equipment and the strict maintenance schedules necessary for accreditation can be prohibitively high for individual institutions. Serious consideration should be given to greater collaboration with respect to the purchase of equipment and sharing of equipment as a means of reducing overall operating expenses.

Adequate staffing is another requirement for a proper chemicals management programme. The current complement of personnel with the required knowledge and expertise is small. Consequently, undertaking routine analysis of the sort likely to be associated with a chemicals management programme would increase the workload on the already limited manpower. Hence there is a need for capacity building within the technical infrastructure.

An increase in staff would also allow for specialisation to take place, which is likely to result in improvement in the timeliness and quality of data produced. This, however, is difficult to achieve if a technician or scientist's attention is divided over several areas.

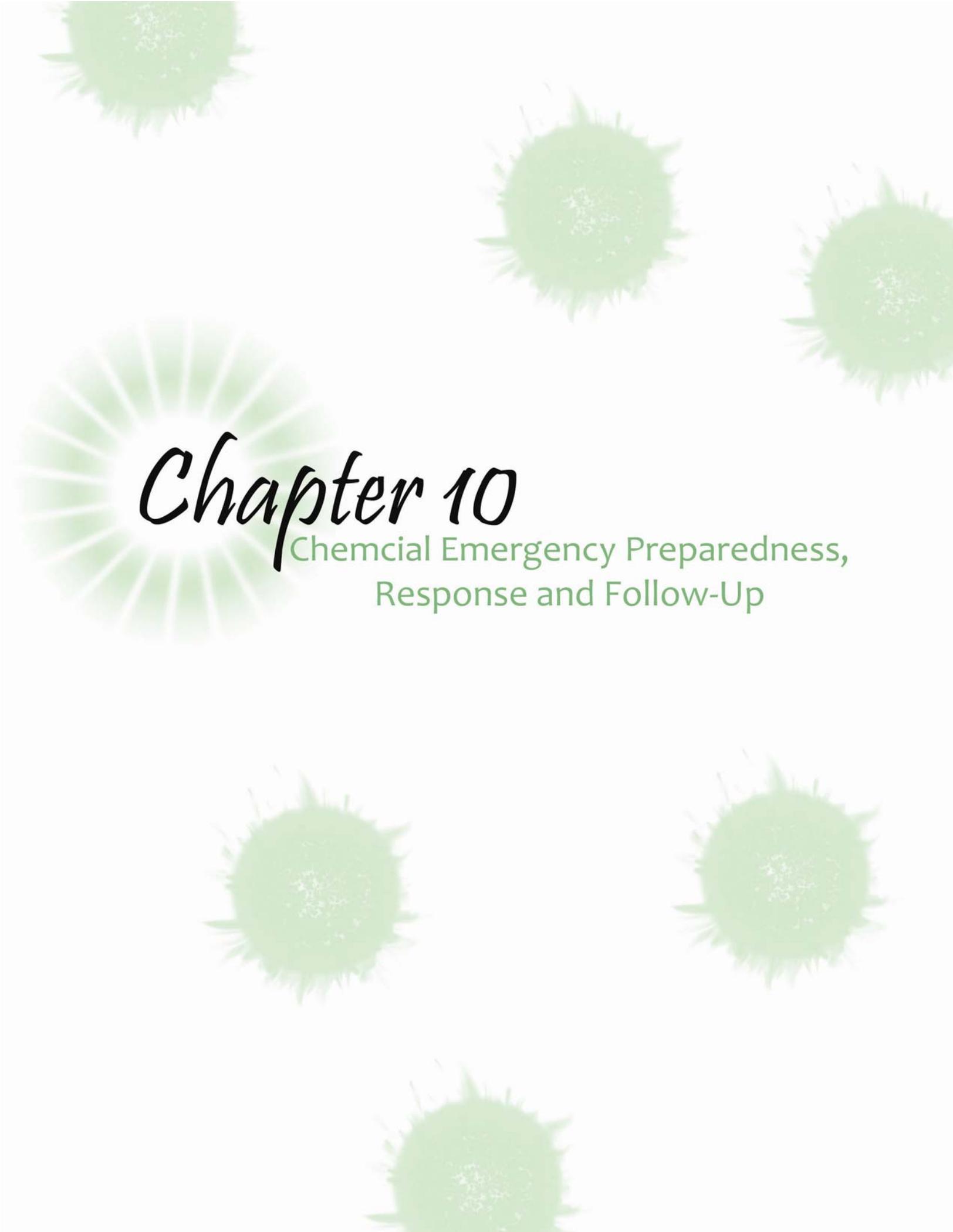
Training and ongoing professional development are of paramount importance. Training attachments at laboratories that routinely monitor for certain compounds and that are accredited for the associated analyses will assist in skills development and capacity building.

Additional benefits of such attachments include:

- The establishment of relationships with laboratories that can assist with method development (especially for methods for which accreditation is being sought)
- Development of quality control procedures applicable to the methods
- The opportunity to benefit from the years of experience in problem-solving that these laboratories have acquired.

It will not always be necessary to have technicians travel overseas, as in some cases it may be more beneficial to have experienced people come in and provide training for more than one person with the equipment currently available at the local facilities.

In addition to the development of equipment, staffing and technical expertise, the technical infrastructure in Barbados would also benefit greatly from the harmonisation of laboratory facilities, their functions and capabilities. For a number of years there has been a working group examining the issue of rationalisation of laboratory facilities, but no final proposals have arisen from the working group's discussions. Great benefits could be obtained from the development of a national policy to improve the quality and quantity of laboratories and technical facilities in general.



Chapter 10

Chemical Emergency Preparedness,
Response and Follow-Up

The following is intended to provide an overview of the facilities in Barbados related to preparedness for, response to, and follow-up of, emergencies involving chemicals.

10.1 CHEMICAL EMERGENCY PLANNING

Appropriate contingency planning by the primary national response agencies is a crucial component to initiating an effective response in any emergency. The island's emergency arrangements in the event of a chemical incident are outlined in two response plans: the Hazardous Materials Emergency Response Plan and the Oil Spill Contingency Plan.

The Hazardous Materials Emergency Response Plan is a local plan with the overall objective of setting forth a course of action targeted at minimizing public and environmental harm in the event of hazardous material emergency incident. Under the plan a hazardous material is defined as any solid, liquid, gaseous or radioactive substance or waste, which is flammable, explosive, and/or toxic to humans and animals, or otherwise poses a threat to health and/or the environmental resources. The plan was developed by a committee with representation from the Royal Barbados Police Force (RBPF), Barbados Fire Service (BFS), Ministry of Environment, Ministry of Health and the Department of Emergency Management. It outlines the roles and responsibilities of the RBPF, BFS, Environmental Protection Department, Chief Medical Officer of Health, Department of Emergency Management, Government Information Service and the Ministry of Transport and Works during an incident. A senior police officer will serve as the Incident Commander for the duration of the incident, and work with an officer from the Government Information Service to coordinate all press releases to inform the public of the situation.

The primary thrust of the National Oil Spill Contingency Plan is to provide a coordinated response at the scene of an unplanned or accidental discharge of oil. The response action involves organizing the activities of the various agencies of the Government of Barbados and the local petroleum industry to protect the terrestrial and marine environment from the damaging and polluting effects of oil discharges. Development of the Plan occurred under the guidance of a multi-sectoral group consisting of representatives from the Barbados Defence Force; Department of Emergency Management; National Conservation Commission; Barbados Port Authority; Coastal Zone Management Unit; Barbados Fire Service; Royal Barbados Police Force; Environmental Protection Department; Local Petroleum Industry; and the Energy Division, Ministry of Finance, Economic Affairs and Development and Energy. Each of these entities plays a role in the response during an emergency and their roles are outlined in the Plan. The Plan mandates that the National Coordinator, in conjunction with the Government Information Service, act as the focal point for public information releases so as to minimize or prevent dissemination of inaccurate information to the public.

Presently, only some aspects of the the Hazardous Materials Emergency Response Plan and the Oil Spill Contingency Plan have been tested. This is inadequate; greater emphasis needs to be placed on conducting simulation exercises to ensure the response plans are effective and ably executed in the event of an emergency.

There is a cadre of trained personnel to deal with chemical emergencies. This cadre is expanded in a piecemeal fashion either by sending persons overseas to participate in relevant training courses or by inviting qualified persons to the island to provide training. The inventories of equipment to deal with chemical incidents are increased in a similar fashion.

No poisons information or other chemical information services currently exist. However, such inquiries are dealt with by the ambulance or other medical services.

10.2 CHEMICAL INCIDENT RESPONSE

Over the past four years (2005 – 2008) there have only been a few incidents involving chemicals in Barbados. Table 10.A outlines some of the most significant chemical incidents that have occurred during this period.

A brief review of the incidents summarized in Table 10.A highlighted some of the weakness pertaining to chemicals management in Barbados. The fire at McBride Caribbean limited drew attention to the need for improved storage of chemicals and for such consideration to be incorporated into the design and layout of industrial operations, so that any fire is localized and unable to spread.

The fire at the Mangrove Pond Landfill underscored the need to develop a comprehensive safety and response plan for landfills, and also the need to upgrade the local emergency response authorities to address such threats.

Table 10.A: Examples of Chemical Incidents in Barbados

Date/Period of Incident	Location	Type of Incident	Chemical(s) Involved	Casualties	Environmental Contamination or Damage
10 th February, 2005	Harris Paints	Fire	Paints and resins	None	Air Pollution
11 th -13 th May, 2006	Mangrove Pond Landfill	Fire	Plastics	None	Air Pollution
3 rd Sept. 2007	McBride Caribbean Limited Lowlands Christ Church	Fire	Insecticides PVC Plastics Resins	None	Air Pollution
30 th April, 2008	Graeme Hall Christ Church	Fire	PVC pipes	None	Air Pollution
28 th June, 2008	Tropical Laundries	Fire	Linens and cleaning chemicals	None	Air Pollution
19 th August, 2008	Oistins Christ Church	Spill	Aviation Fuel	None	Sea Pollution Soil Contamination

10.3 CHEMICAL INCIDENT FOLLOW-UP AND EVALUATION

There is no national mechanism in place to investigate chemical incidents and their outcomes. Procedures for investigating chemical incidents vary depending of the agency that is investigating the incident. Consequently, there is no standardized format for collecting information about an incident. It follows therefore that there is also no national register of chemical incidents. However, each agency keeps records of the incidents that it investigates and is responsible for updating its records.

Despite there not being a standardized format for collecting information about an incident, investigations can lead to a formal enquiry into the causes and responsibilities of the parties involved, and prompt follow-up activities. For example, the fire at McBride Caribbean Limited, which razed the entire operations, led to a police investigation into the cause of the fire. Additionally, a requirement to perform an environmental scoping study was imposed to ensure that there is hazard identification. An environmental scoping study may be thought of as a simplified environmental impact assessment, and consists of a preliminary identification and assessment of the impacts associated with a proposed development.

It should be noted that the cost for clean-up after an incident generally lies with the party or parties responsible for the incident with any necessary technical assistance from the local emergency and environmental authorities. On the other hand, the costs and responsibility for rehabilitation of person exposed to chemicals who may suffer long term disabilities lies with that person unless some recourse can be found through the courts or a company health insurance scheme.

10.4 COMMENTS/ANALYSIS

The capacity in Barbados to respond to chemical emergencies can be described as sufficient but there is significant room for improvement. First of all, there needs to be a programme for conducting frequent simulation exercises. This would greatly increase the ability of agencies to respond to emergencies and to be aware of their role(s) during such emergencies.

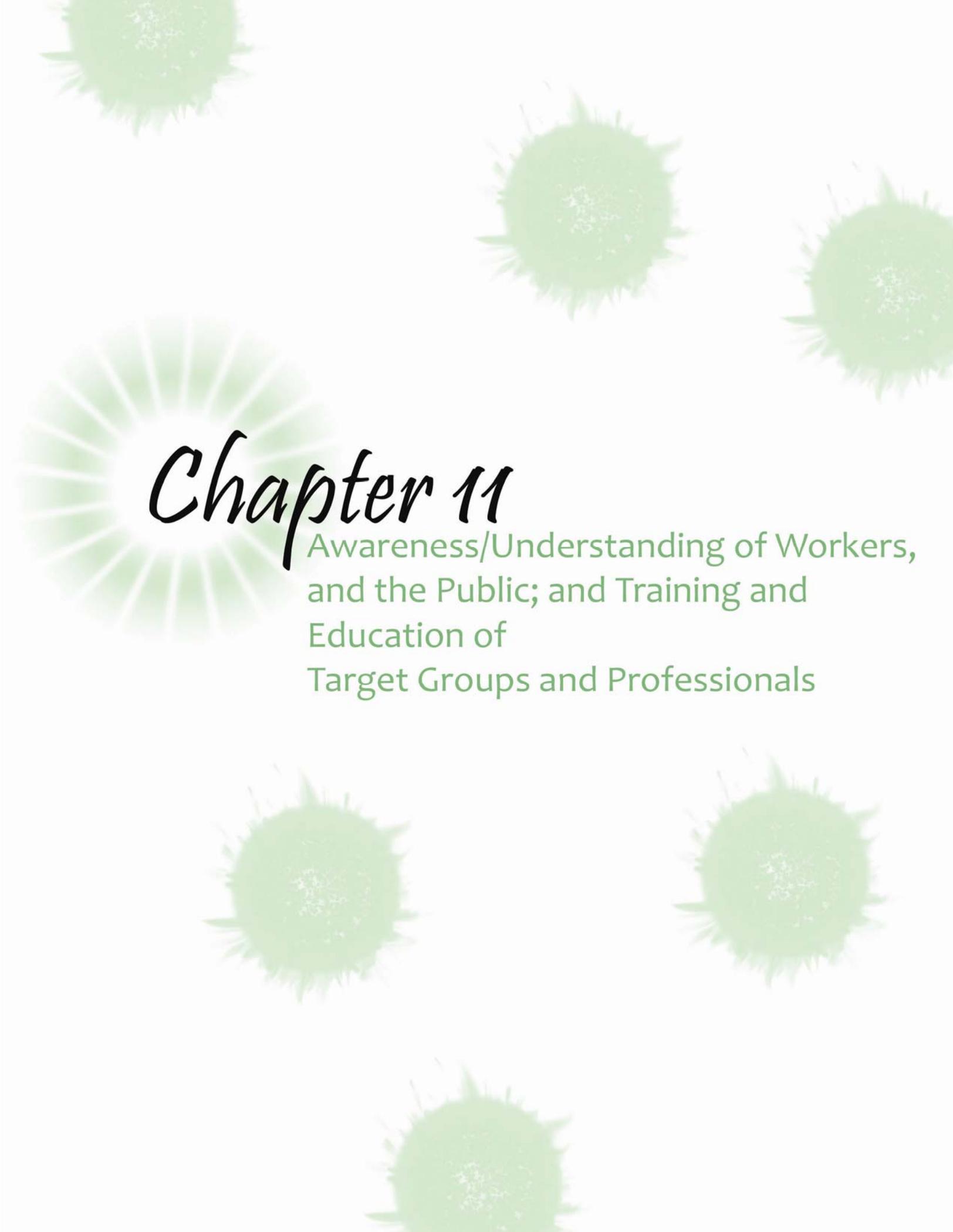
Secondly, there is an urgent need for a dedicated communication system so that status updates of an incident can be exchanged between all of the emergency responders. Currently, only the Royal Barbados Police Force, Barbados Fire Service and the Department of Emergency Management have access to a dedicated communication system.

Thirdly, the harmonisation of the various coordinating mechanisms would improve the holistic approach to national chemical emergency response and preparedness. At present, coordination of chemical emergency response and preparedness is split over a number of agencies and committees.

Finally, specific medical facilities should be established to care for persons who are

exposed to chemicals.





Chapter 11

Awareness/Understanding of Workers,
and the Public; and Training and
Education of
Target Groups and Professionals

The purpose of the chapter is to provide an overview of:

- a. the mechanisms available to provide information to workers and to the public concerning the potential risks associated with chemicals;
- b. the capacity for training and education of target groups affected by chemicals and related waste; and
- c. the professionals/agencies involved in sound life-cycle management of chemicals.

11.1 AWARENESS AND UNDERSTANDING OF CHEMICAL SAFETY ISSUES

A number of activities are being undertaken by governmental and non-governmental agencies to provide information to workers and to the public concerning the potential risks associated with chemicals. Some of these activities are outlined below:

- Counterpart Caribbean is actively involved in raising public awareness of sustainable development practices through presentations to community and school groups. Additionally, it distributes information on sustainable development through its email list.
- The Environmental Education Committee (EEC), Ministry of Environment, Water Resources and Drainage, provides information to the public through various public fora concerning, among other things, risks to the environment, health, and safety from chemicals. Through the Minister of Environment Awards the public is made awareness of organizations that are exhibiting environmental stewardship.
- Under the Integrated Solid Waste Management Programme, the Solid Waste Project Unit of the Ministry of Environment, Water Resources and Drainage is carrying out an initiative, which seeks to inform the public about hazardous waste management through the use of educational materials such as brochures and pamphlets.
- The Barbados Workers' Union educates its membership and the general public to chemical management issues, particularly occupational health and safety issues, through the publishing and distribution of a newsletter, radio broadcasts and coordinated training courses in occupational health and safety.

With respect to legal instruments, the main legal instrument pertaining to the monitoring and regulation of chemicals in Barbados is the Pesticides Control Act. The main provisions for information to be provided to workers and the public under this Act are made through requirements for labelling of pesticides.

Under the Labelling of Pesticides Regulations, 1976, every container in which a pesticide is

distributed or exposed or offered for sale should have affixed to it a label, approved by the Pesticides Control Board, clearly setting forth, in the English language:

- the trade and proprietary name of the pesticide;
- the name and address of the distributor or manufacturer;
- the common name of the active ingredient and its percentage content; and
- the net contents by weight or volume of the container.

Additionally, under the Pesticides Control Regulations, 1974, each package of a pesticide sold or distributed shall be accompanied by a copy of the conditions regarding its use, as laid down by the Pesticides Control Board.

The Pesticides Control Act also includes provisions imposing a duty of care on employers, workers and others to reduce the risk of harm to workers as a result of working with pesticides. Safety measures outlined in the Pesticides Control Act include:

- the provision and maintenance in good order of protective clothing and equipment;
- the use of devices by employers to warn against poisoning by pesticides, to ensure proper use of protective equipment and facilities, and to warn against eating, drinking or smoking where there may be a risk of pesticides poisoning or explosion;
- prescribing for workers limits to periods of exposure and the length of the intervals between periods of exposure to risks related to pesticide poisoning
- provision of instruction and training in the use of equipment, apparatus and facilities; and
- prescribing measures for investigation and detecting cases in which workers may have been victims of pesticide poisoning.

When the Safety and Health at Work Act is proclaimed, organizations will be required to establish Health and Safety Committees or safety delegates whose responsibility, among other things, will be to inform employees of workplace hazards and other matters relating to the work environment.

11.2 EDUCATION AND TRAINING FOR SOUND MANAGEMENT OF CHEMICALS AND WASTE

Both tertiary institutions, the University of the West Indies, Cave Hill Campus, and the Barbados Community College provide educational programmes in chemistry and environmental studies. The Barbados Community College offers an educational programme in environmental science, which is intended to provide students with up to date knowledge of environmental issues and the basic skills needed to address them. The

University of the West Indies offers a degree programme in chemistry, a course in environmental chemistry, and postgraduate degree in Natural Resource and Environmental Management through its Centre for Resource Management and Environmental Studies (CERMES). The postgraduate degree in Natural Resource and Environmental Management is offered in five specialization including climate change and Solid Waste Management.

An initiative by the Solid Waste Project Unit, Ministry of Environment, Water Resources and Drainage, is also worth noting. The Solid Waste Project Unit has prepared a guide to assist teachers at the primary and secondary school level to integrate solid waste management including hazardous materials into the curriculum. The guide can be used as part of a larger curriculum, as stand-alone activities, or on an occasional basis to teach students about solid waste issues. It includes ready-to-use lesson plans, supplemental handouts and hands-on materials that teachers can use to engage their students in Solid Waste Management Education. Lessons can also be adapted to individual teacher needs.

11.3 COMMENTS/ANALYSIS

Currently, there is a dearth of specific policy initiatives to address the need for public awareness and understanding. Although individual organisations may have internal policies with regards to occupational health and safety and the dissemination of information to their workers, this does not diminish the need for a national policy to promote and encourage greater awareness of the need for sound chemicals management. Employers should be made aware of the need to inform emergency response organisations, such as the fire service, of the presence of chemicals and dangerous goods. Further to this, requirements to provide workers with ongoing training in safe chemicals use, handling and management, and to put in place effective occupational health and safety provisions, would be a welcomed initiative.



Chapter 12

International Linkages

This chapter identifies those chemicals management stakeholders in Barbados, both within and outside of Government, that have linkages with international organisations or that participate in international agreements concerned with the management of chemicals. Such linkages would offer possibilities for stakeholders to access technical assistance, information and potentially funding that would be of benefit to the Barbadian chemicals management infrastructure.

12.1 CO-OPERATION AND INVOLVEMENT WITH INTERNATIONAL ORGANISATIONS, BODIES AND AGREEMENTS

A number of organisations and agencies in Barbados have connections to regional and international bodies which are concerned with various aspects of the sound management of chemicals. Table 12.A outlines these connections, and describes the local activities that are facilitated by involvement with these external agencies. Although not all of the agencies listed have chemicals management initiatives currently ongoing, they may still be able to provide resources that would facilitate and inform the establishment of a national chemicals management programme.

Table 12.A: Cooperation/Affiliation with International Organizations, Programmes and Bodies

International Organisation/ Body/Activity	National Focal Point (Ministry/ Agency and Primary Contact Point)	Other Ministries and/or Agencies Involved	Related National Activities
United Nations Environment Programme	Permanent Secretary Ministry of Environment, Water Resources and Drainage	<ul style="list-style-type: none"> Ministry of Foreign Affairs and Foreign Trade 	Implementation of the Decisions of the UNEP Governing Council
World Health Organisation	PAHO/WHO Representative for the Eastern Caribbean Pan American Health Organisation	<ul style="list-style-type: none"> Ministry of Environment, Water Resources and Drainage Ministry of Health 	
International Programme on Chemical Safety	PAHO/WHO Representative for the Eastern Caribbean Pan American Health Organisation		
Food and Agriculture Organisation of the United Nations	The Sub-Regional Coordinator Food and Agriculture Organisation of the United Nations	<ul style="list-style-type: none"> Inter-American Institute for Cooperation on Agriculture Ministry of Agriculture 	
International Labour Organisation	Chief Labour Officer Labour Department, Ministry of Finance, Labour, Civil Service and Energy	<ul style="list-style-type: none"> National Union of Public Workers Barbados Workers' Union 	
International Confederation of Free Trade Unions		<ul style="list-style-type: none"> Barbados Workers' Union National Union of Public Workers 	
Trades Union Congress (UK)		<ul style="list-style-type: none"> National Union of Public Workers 	
Economic Commission for Latin America and the Caribbean	Permanent Secretary Ministry of Foreign Affairs and Foreign Trade		

Table 12.A: Cooperation/Affiliation with International Organizations, Programmes and Bodies

International Organisation/ Body/Activity	National Focal Point (Ministry/ Agency and Primary Contact Point)	Other Ministries and/or Agencies Involved	Related National Activities
International Organisation for Standardisation	Director Barbados National Standards Institution, Ministry of Economic Affairs and Em- powerment, Innovation, Trade, Industry and Commerce		
International Maritime Organisa- tion	Permanent Secretary International Transport Division, Ministry of International Business and Interna- tional Transport	<ul style="list-style-type: none"> • Coastal Zone Management Unit, Ministry of Environment, Water Resources and Drainage • Barbados Coast Guard • Barbados Port Inc. 	Implementation of international maritime Conventions ratified by Barbados
Inter-American Development Bank	Permanent Secretary Ministry of Finance	<ul style="list-style-type: none"> • National Union of Public Workers 	Development of an Integrated Solid Waste Management Plan, including a component for addressing hazard- ous waste.
Inter-American Drug Abuse Control Commission (CICAD)	Manager National Council for Substance Abuse, Ministry of Home Affairs		Provision of information and technical assistance on chemicals precursors and pharmaceutical products, and on the regulation of chemicals used in the illicit production of narcotic drugs and psychotropic substances.
Global Environmental Fund (GEF)	Permanent Secretary Ministry of Environment, Water Resources and Drainage		

Table 12.B outlines Barbados' involvement in international agreements and procedures related to the management of chemicals; and identifies those agencies which bear primary responsibility for the administration and implementation of these agreements and procedures.

Table 12.B: Participation in International Agreements/Procedures Related to Chemicals Management

International Agreements	Primary Responsible Agency	Relevant National Implementation Activities
Agenda 21 – Commission for Sustainable Development	Environmental Unit, Ministry of Environment, Water Resources and Drainage	Preparation of Annual Reports to the Commission for Sustainable Development
Montreal Protocol	Environmental Unit, Ministry of Environment, Water Resources and Drainage	
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal	Environmental Protection Department, Ministry of Environment, Water Resources and Drainage	Annual reporting of hazardous waste exports
London Convention	International Transport Division, Ministry of International Business and International Transport	Monitoring waste disposal, grant of licences by the Environmental Protection Department for dumping of approved wastes at sea
International Maritime Dangerous Goods (IMDG) Code	Barbados Port Inc. International Transport Division, Ministry of International Business and International Transport	Safe transport, handling, packaging, labelling, storage and segregation of dangerous goods in port areas with appropriate emergency response action plans in accordance with the IMDG Code Submission of annual reports to the IMO
Rotterdam Convention on the Prior Informed Consent (PIC) Procedure for Certain Hazardous Chemicals and Pesticides in International Trade	Ministry of Agriculture Environmental Protection Department, Ministry of Environment, Water Resources and Drainage	
Stockholm Convention on Persistent Organic Pollutants	Environmental Protection Department, Ministry of Environment, Water Resources and Drainage	Development of a National Implementation Plan for the Management of Persistent Organic Pollutants
Strategic Approach to International Chemicals Management (SAICM)	Environmental Protection Department, Ministry of Environment, Water Resources and Drainage	Performing the enabling activities outlined in the SAICM overarching Policy Strategy

12.2 PARTICIPATION IN RELEVANT TECHNICAL ASSISTANCE PROJECTS

Table 12.C provides an overview of some of the on-going and planned activities related to the management of chemicals involving assistance by regional and international organizations. The projects highlighted in Table 12.C not only address those which are specifically directed to chemicals management, but also outlines projects related to the environment, sustainable development, agricultural and industrial development, which may have some bearing on chemicals management.

Table 12.C: Participation as Recipients in Relevant Technical Assistance Projects

Name of Project/ Project Overview	International/ Bi-lateral Donor Agency Involved	National Contact Point	Project Scope and Objectives	Participating National Organizations	Relevant Experience Gained/Project Outcomes
IADB/GOB Modernization of the Statistical System	Inter-American Development Bank (IADB)	Barbados Statistical Department	<ul style="list-style-type: none"> To propose a new legal system to enable the Barbados Statistical Department (BSD) to perform its duties more effectively To establish a statistics networking including governmental agencies which produce relevant public data To enhance the technical infrastructure of the BSD and its capacity for disseminating its products and facilitating public access to statistical information To improve the managerial, statistical and administrative procedures of the BSD To improve the human capacity of the BSD 		<ul style="list-style-type: none"> The standardization of statistical methodologies, definitions, and procedures in all relevant agencies
UNDP/GEF Sustainable Land Management (SLM) Capacity Development	United Nations Development Programme (UNDP) The Global Environment Facility (GEF)	Environment Unit, Ministry of Environment, Water Resources and Drainage	<ul style="list-style-type: none"> To reverse the trend of land degradation through enhanced capacity for sustainable land management within relevant Government agencies, the private sector, non-governmental and civil society organizations, and the institutionalization of sustainable land practices with national development planning, process, programmes and strategies. 	Soil Conservation Unit, Ministry of Agriculture	<ul style="list-style-type: none"> A policy and regulatory framework for SLM Strengthening of key SLM agencies

12.3 COMMENTS/ANALYSIS

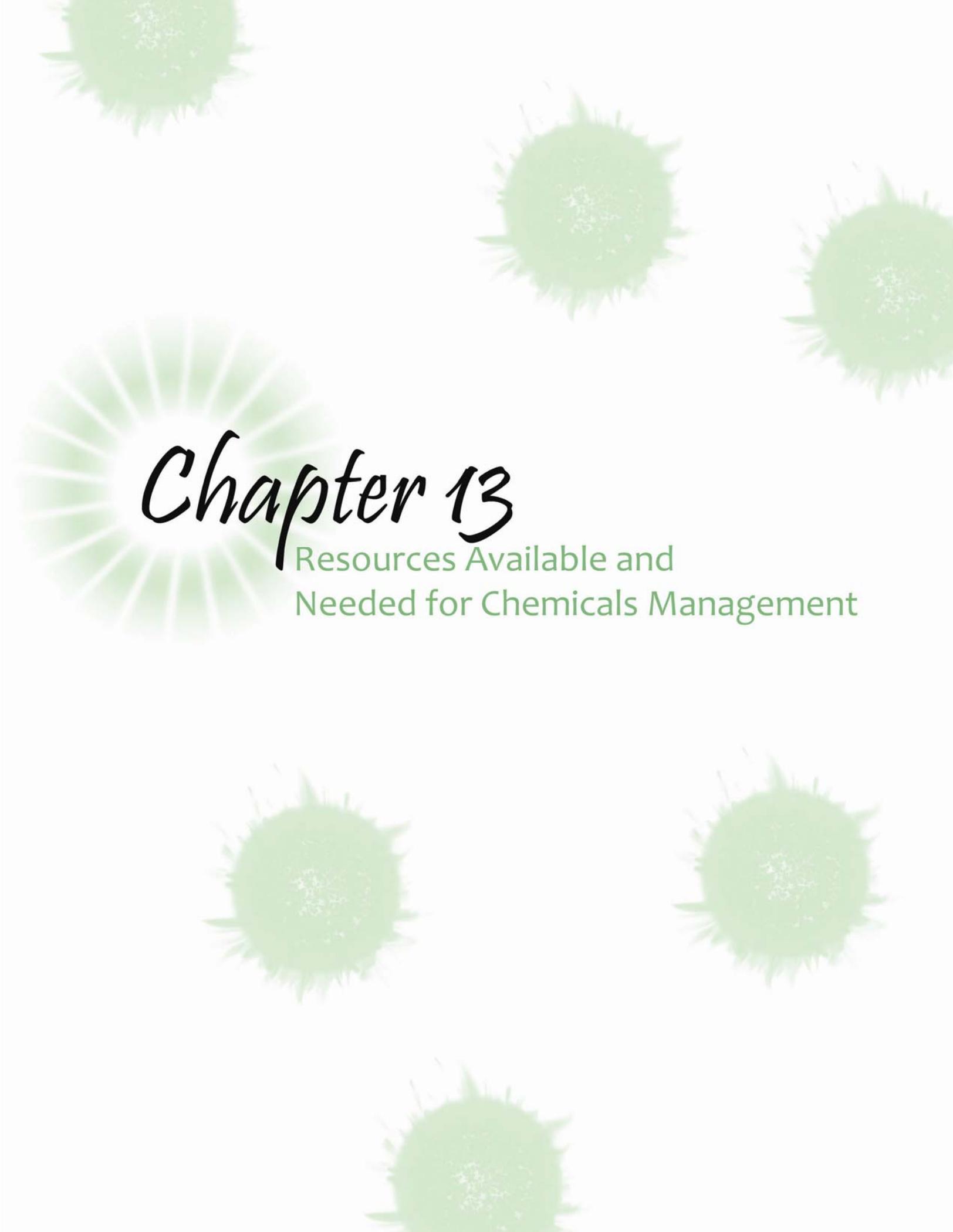
Tables 12.A and 12.B indicate that there are several relevant and potentially useful linkages between agencies in Barbados and international organisations, programmes and bodies concerned with chemicals management. Such linkages offer opportunities for Barbadian agencies to benefit from information sharing and exchange, technical advice, training and other forms of technical and financial assistance.

It must be taken into account, however, that chemicals management is not necessarily defined as a priority in the programmes of international bodies operating in conjunction with Barbadian agencies; neither is it necessarily a priority for the local agencies receiving assistance. This can mean that international affiliations are not used to their full advantage to strengthen chemicals management programmes and activities in Barbados – in some instances local agencies have failed to take advantage of the opportunities made available by international organisations.

The national focal points for the various international organisations and agreements are scattered over a wide range of departments and ministries, and there are few inter-departmental/inter-ministerial mechanisms to co-ordinate activities initiated by these international bodies or agreements. As a result, although a number of related projects may be on-going within the island; these projects may not be effectively integrated into a comprehensive national programme for chemicals management.

It is anticipated that under the proposed Environmental Management Act, the establishment of a Policy and Coordination Unit will serve to improve the level of coordination and collaboration between agencies with regards to the implementation of international activities, programmes, and agreements. The Policy and Coordination Unit would have responsibility for matters related to the development and implementation of international and national environmental management.

Barbados is in the process of attaining compliance with the various international agreements that the island is involved with. Unfortunately, although it is recognized that significant benefits can arise from involvement in these multilateral agreements, the implementation activities for such may not be in keeping with the national strategic development goals.



Chapter 13

Resources Available and
Needed for Chemicals Management

This chapter provides an overview of the human resources available within government ministries and departments related to various aspects of chemicals management and highlight resources needed to strengthen the management of chemicals in Barbados. Additionally, a summary of the expertise available in non-governmental organizations is provided.

13.1 RESOURCES AVAILABLE IN GOVERNMENT MINISTRIES/INSTITUTION

There is a variety of expertise present within governmental institutions in Barbados. Some of this expertise was acquired through formal education to the tertiary level, some through professional development activities such as workshops and conferences, and some through on-the-job training and experience. Table 13.A below summarizes the available expertise.

Table 13.A: Resources Available in Government Ministries/Institutions

Ministry/Agency Concerned	Number of Professional Staff Involved	Types of Expertise Available
Environmental Protection Department (Ministry of Environment, Water Resources and Drainage)	4	<ul style="list-style-type: none"> • Chemical Safety • HAZWOPER Training • Environmental Chemistry • Eco-toxicology (related to persistent toxic substances)
Environmental Unit (Ministry of Environment, Water Resources and Drainage)	N/A	N/A
Ministry of Agriculture	8	<ul style="list-style-type: none"> • Pathology • Entomology • Weed Science • Agronomy • Risk Analysis • Use and application of agrochemicals
Solid Waste Project Unit (Ministry of Environment, Water Resources and Drainage)	3	<ul style="list-style-type: none"> • Policy Development • Education and Awareness Raising • Hazardous and Solid Waste Management
Vector Control Unit (Ministry of Health)	3	<ul style="list-style-type: none"> • Environmental Health Management
Labour Department (Ministry of Finance, Labour, Civil Service and Energy)	10	<ul style="list-style-type: none"> • Chemicals Handling and Safety • Occupational Health and Safety
National Council for Science and Technology (Ministry of Economic Affairs and Empowerment, Innovation, Trade, Industry and Commerce)	2	<ul style="list-style-type: none"> • Handling of hazardous chemicals • Policy Development
Barbados Fire Service (Ministry of Home Affairs)	39	<ul style="list-style-type: none"> • Hazmat 1st Responders
Department of Emergency Management (Ministry of Home Affairs)	5	<ul style="list-style-type: none"> • Accident and Emergency Response and Planning
Government Analytical Services (Ministry of Agriculture)	4	<ul style="list-style-type: none"> • Chemical analysis
International Transport Division (Ministry of International Business and International Transport)	2	<ul style="list-style-type: none"> • Administration of international maritime safety Conventions
Barbados Port Inc.	3	<ul style="list-style-type: none"> • Administration of international maritime safety Conventions • Storage and handling of dangerous goods
Barbados National Standards Institution (BNSI)	N/A	<ul style="list-style-type: none"> • Setting of standards for classification, labelling and handling of chemicals and other dangerous substances
Barbados Agricultural Development and Marketing Corporation	6	<ul style="list-style-type: none"> • Agricultural extension on topics including safe use and handling of agricultural chemicals
Barbados Statistical Services	N/A	<ul style="list-style-type: none"> • Collection, analysis and interpretation of statistical data

13.2 RESOURCES NEEDED BY GOVERNMENT INSTITUTIONS TO FULFIL RESPONSIBILITIES RELATED TO CHEMICAL MANAGEMENT

Although there is some chemicals management expertise present within government institutions, there is still a need for capacity to be built and strengthened. This strengthening would include increasing overall staff complements by hiring persons with chemicals management expertise, as well as upgrading the skills of existing staff, thus enabling them to better execute tasks related to the management of chemicals and hazardous substances.

Table 13.B summarizes the resource needed, as identified by various government agencies. It should be noted that information in table 13.B does not necessarily represent new staff but the number of professionals that need to be available for the agency to effectively perform its role in chemical management.

Table 13.B Resources Needed by Government Institutions to Fulfil Their Responsibilities Related to Chemicals Management

Ministry/Agency Concerned	Type/Number of New Professional Staff Needed	Training Requirements
Environmental Protection Department (Ministry of Environment, Water Resources and Drainage)	5	<ul style="list-style-type: none"> • Handling and storage of chemicals • Emergency response procedures • Chemicals risk management • Policy formulation and development • Hazardous chemicals/waste management
Ministry of Agriculture	Head of Pesticides Unit (1) Research and Database Officer (1)	<ul style="list-style-type: none"> • Negotiating skills • Environmental Impact Assessment • Handling and storage of pesticides • Information technology and database management
Vector Control Unit (Ministry of Health)	Environmental Health Officers (6; one for each environmental health catchment)	<ul style="list-style-type: none"> • Chemicals management and environmental health to the Diploma level
Labour Department (Ministry of Finance, Labour, Civil Service and Energy)	5	<ul style="list-style-type: none"> • Refresher and introductory course in production, use and handling of chemicals
	10	<ul style="list-style-type: none"> • Advance training in all areas of chemicals management
Barbados Fire Service (Ministry of Home Affairs)	15	<ul style="list-style-type: none"> • Hazmat Technicians
	25	<ul style="list-style-type: none"> • Hazmat 1st Responders
Customs Department	None identified	<ul style="list-style-type: none"> • Implementation of trade controls related to chemicals and other dangerous goods • Profiling and identification of chemicals, including information on placarding, labelling, packaging, trade and scientific names and designations, and appearance of chemicals as they are traded • Use of applicable regional and international Customs codes

Table 13.B Resources Needed by Government Institutions to Fulfil Their Responsibilities Related to Chemicals Management

Ministry/Agency Concerned	Type/Number of New Professional Staff Needed	Training Requirements
Barbados Agricultural Development and Marketing Corporation	None Identified	<ul style="list-style-type: none"> • Safe storage and disposal of chemicals • Pesticides poisoning response procedures • Selection and use of personal protective equipment
Sanitation Services Authority	None Identified	<ul style="list-style-type: none"> • Occupational Health and Safety • Use of personal protective equipment • Safe handling and disposal of chemicals and hazardous materials • Public relations/ public awareness raising
Government Analytical Services	Trace Organics Analyst (1) Pesticide Residues Analyst (2)	<ul style="list-style-type: none"> • Analysis for pesticide residues in food crops and environmental samples • Trace Organic Analysis • Environmental Toxicology • Laboratory Quality Analysis/ Quality Control • Occupational Health and Safety

13.3 RESOURCES AVAILABLE IN NON-GOVERNMENTAL INSTITUTIONS FOR CHEMICALS AND RELATED WASTE MANAGEMENT

Table 13.C below provides an overview of the resources available within the non-governmental community.

Table 13.C: Resources Available in Non-Governmental Institutions

Concerned Institution	Specific Responsibilities for which Resources are Allocated	Number of Professional Staff Involved	Type of Expertise Available
Agrochemicals Limited	N/A	N/A	N/A
Barbados Institute of Environmental Professionals	N/A	N/A	N/A
Barbados Light and Power Company Limited	N/A	N/A	N/A
Barbados National Oil Company Limited	N/A	N/A	N/A
Caribbean Conservation Association	N/A	N/A	N/A
Carter's General Stores	N/A	N/A	N/A
Counterpart Caribbean	N/A	1	N/A
Food and Agriculture Organization of the United Nations	N/A	N/A	N/A
Inter-American Institute for Cooperation on Agriculture	N/A	N/A	N/A
Pan American Health Organization	<ul style="list-style-type: none"> • Risk Assessment • Training • Planning and policy formulation • Monitoring 	greater than 20	<ul style="list-style-type: none"> • Occupational Health and Safety • Health Care • Solid-, and Hazardous Waste and Substances Management; • epidemiology. • Pollution Control.
University of the West Indies	Education	N/A	N/A

13.4 COMMENTS/ANALYSIS

There are two primary deficiencies to be highlighted in discussing the availability of chemicals management resources in government agencies and statutory bodies.

The first of these is the limited expertise specifically focused on the sound management of chemicals. Although a number of Ministries, Departments and other bodies have professional staff with some level of qualification in the area of chemicals management, there has been a clearly expressed need for more comprehensive training to enable these existing personnel to better carry out their relevant duties, particularly in regulatory and emergency response organisations. Further to this, it is rarely the case that an organisation will have staff working exclusively in areas related to chemicals management, and few organisations have training programmes in place to develop their chemicals management capacity. It is also of note that in agencies that are involved with the operational (rather than regulatory) aspect of chemicals management, there is a clear need for workers to receive training in safe chemicals use, handling, storage and disposal, including spill/accident response procedures and the use of personal protective equipment.

The second deficiency in capacity relates to the mismatch between the staffing levels of organisations and those organisations' chemical management mandates. A prime example can be found in the Labour Department, where there are nine Safety and Health Officers responsible for regulating over 1 000 factory-defined operations island-wide. With the proclamation of the Safety and Health at Work Act the number of workplaces that safety and health officers would have responsibility for will greatly increase. The fact that individuals have several other duties in addition to their chemicals management responsibilities is a significant constraint on the effective functioning of the national chemicals management infrastructure.

It is not immediately clear what would be the best strategy to mobilize sufficient technical and human resources to ensure the sound management of chemicals in Barbados. However, regardless of which strategy is developed two things are for certain; input from all stakeholders will be needed to ensure that the strategy is sustainable and a detailed skill assessment for chemicals management will be needed to determine what skill sets are absent or deficient and to devise strategies to obtain the necessary skills.



Chapter 14

Conclusions and Recommendations

This chapter presents overall conclusions concerning the situation in the country in relation to the life cycle management of chemicals and a summary of the recommendations for action.

14.1 CONCLUSIONS

It appears that there are six major issues that need to be address if Barbados is to effectively and holistically manage chemicals from importation or manufacturing through to disposal. Those issues are the:

1. lack of harmonization of the governmental agencies responsible for various aspects of chemical management;
2. lack of legislation particularly with respect to chemical waste and the ineffective enforcement of the existing legislation;
3. absence of facilities, and lack of awareness of mechanisms, for appropriate disposal of chemicals;
4. the inability to collect, collate and communicate data relating to the import, export, use and disposal of chemicals;
5. limited involvement of the civil society; and
6. lack of research to characterize the extent to which particular chemicals exist in our environment and the extent to which these chemicals are affecting human health and the environment

Without these issues being addressed any efforts made towards strengthening chemicals management are likely to be met with obstructions, and this would prevent the successful management of chemicals on the island.

14.2 RECOMMENDATIONS

- It is clear that regulations and enforcement of said regulations is crucial. Therefore, the relevant legislation needs to be developed, implemented and enforced. With regards to enforcement, greater authority should be awarded to officers/inspectors of the various regulatory bodies.
- To streamline the chemicals management process key aspects should be allocated to one ministry or a specialized agency that will be able to manage the process more effectively and holistically.

- Any guidelines pertaining to the disposal of chemicals should be publicised and easily accessible so that companies are aware of the steps needed to safely dispose of their chemical waste.
- One of principles in the Sustainable Development Policy is to seek participation from non-governmental agencies in sustainable development initiatives; this policy needs to be enforced to ensure a multi-stakeholder/participatory approach to chemicals management
- The public needs to be further educated as to how hazardous and toxic chemicals can impact on their health and the environment in which they live.
- A detailed skills assessment should be conducted to determine what skills and expertises are needed to establish an effective chemicals management programme. The results of the skills assessment could then be used to devise strategies to obtain the necessary skills for an effective chemicals management programme.
- Additionally, encouraging right-to-know programmes, MSDS training for workers and emphasising employers responsibility to have MSDS information available should also be considered to reduce the risks posed by chemicals.

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Appendix 1

Glossary

Term/Abbreviation/Acronym	Description
Agricultural Chemical:	A substance such as fertilizers and pest control agents that are used to increase crop yield and quality.
BCC:	Barbados Community College
BFS:	Barbados Fire Service
BNRT:	Barbados National Response Team
BNSI:	Barbados National Standard Institution
BSD:	Barbados Statistical Department
CFC:	Chlorofluorocarbon
CICAD:	Inter-American Drug Abuse Control Commission
CIF:	Cost, Insurance and Freight
Consumer Chemical:	Substances typically used in or around the home
CROSQ:	CARICOM Regional Organization of Standards and Quality
EEC:	Environmental Education Committee
FAO:	Food and Agriculture Organization of the United Nations
FOB:	Free on Board
FSC:	Forensic Science Centre
GAS:	Government Analytical Services Laboratory
GEF:	Global Environmental Fund
GOB:	Government of Barbados
IADB:	Inter-American Development Bank
IMDG:	International Maritime Dangerous Goods

Term/Abbreviation/Acronym	Description
Industrial Chemical:	Substances intended for use in industrial operations or research by industry, government, or academia
ISIC:	International Standard Industrial Classification of all Economic Activities
ISO:	International Organization for Standardization
MSDS:	Material Safety and Data Sheet
N/A:	Information not available for inclusion in National Profile
NACOSH:	National Advisory Committee on Occupational Safety and Health
NMR:	Nuclear Magnetic Resonance
Obsolete Chemical:	A substance that has expired or can no longer serve its intended purpose or any useful purpose
ODS:	Ozone Depleting Substances
PAHO:	Pan-American Health Organization
PC:	Personal Computer
PCB:	Pesticide Control Board
Pesticide:	A product intended to be used for the control of pest
PIC:	Prior Informed Consent
POPs:	Persistent Organic Pollutants
RAMCID:	Risk Analysis Committee on Industrial Development
RBPF:	Royal Barbados Police Force
SQL:	Structured Query Language
TEQ:	Toxic Equivalent
UK:	United Kingdom
UNEP:	United Nations Environment Programme
UWI:	University of the West Indies
VOC	Volatile Organic Compound

