



National Chemical Profile for Chemicals Management



**Trinidad and Tobago
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An Activity under the Programme “Sound Management of Industrial Chemicals under the Rotterdam Convention” to be executed in the Caribbean region.

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Executive Summary

A National Chemical Profile provides a recognized country information reference base that can be utilized to assess the country's current situation in terms of effectively managing chemicals. This document represents an update of the National Chemical Profile for Trinidad and Tobago with a focus on industrial chemicals, and identifies gaps in terms of the capacity to manage chemicals and assesses the mechanisms available to address the problems. The updated chemical profile was prepared in response to a pilot project funded by the UNEP/Secretariat of the Rotterdam Convention as part of an overarching goal to facilitate the strengthening of the capacities of developing countries to assess and manage risks, prepare and communicate important responses and take decisions on final regulatory actions for hazardous industrial chemicals that are listed under the Rotterdam Convention in accordance with the prior informed consent procedure.

The existing chemical profile for Trinidad and Tobago conducted in 2001, was analyzed, and the information gaps were identified. Formal letters of request were sent to a variety of stakeholders from the public and private sectors to collect the information needed. This data was then used to build on the previous work that had been done and included vetting of a substantial amount of the information contained. The results of the initial introductory workshop on industrial chemicals under the Rotterdam Convention were used to compile the list of stakeholders and harness the input of the major stakeholders for the development of the report. This study was compiled based on the data available in country and the willingness of Government as well as private companies to commit to submit the data as requested.

Chapter 1 of the report provides general information on Trinidad and Tobago with special emphasis on its major economic sectors, to provide the backdrop for better understanding of the issues related to the integrated management of chemicals discussed in the following sections of the report. The economy of Trinidad and Tobago expanded by almost 2% for 2014 due to accelerated growth within the non-petroleum sector by 2.5% and 1% expansion in the petroleum sector.

Chapter 2 provides a summary of the legal and institutional capacity for chemicals management in Trinidad and Tobago, focusing on: the legal instruments and non-regulatory mechanisms for managing chemicals; information on the Ministries, Agencies and other Institutions managing chemicals; describing and reviewing the various organizations and non-governmental bodies and entities which support national efforts to manage chemicals; and reviewing the inter-ministerial commissions and coordinating mechanisms for chemicals management.

This chapter of the report indicates that the legislation related to the integrated management of chemicals is fragmented among various institutions and oftentimes with very little coordination occurring among them. There is no specific piece of legislation that governs the management of chemicals in Trinidad and Tobago. The main pieces of legislation having direct influence on the importation, production, transportation, use and distribution of chemicals include the Pesticides and Toxic Chemicals Act No. 42/1979 (amended - Act No. 11 of 1986 and No. 2 of 2004) and subsidiary legislation made in 2007, the Occupational Safety and Health Act 2004 and subsidiary legislation, the

Environmental Management Act No. 3/2000 and subsidiary legislation, Customs Act No. 22/1938 and subsidiary legislation, and the Petroleum Act Ch. 61:02 and subsidiary legislation made in 1970. Among the various existing pieces of legislation, the Environmental Management Act No. 3/2000 and the Pesticides and Toxic Chemicals Act No. 42/1979 are the two single most important statutes related to the importation, production, use and disposal of chemicals. Both pieces of legislation have promulgated several important regulations to facilitate their implementation. The chapter also points out that aside from these, there are several pieces of legislation that have requirements that are incidental and have important bearing on the integrated management of chemicals which requires that their responsible institutions also be actively involved in any coordinated national effort. Of all the various institutions involved, including the principal institutions whose mandates deal directly with various aspects of the control and management of other chemicals, only the Pesticide Control Board deals exclusively with chemicals management.

The report points out that there is no single institution that fully addresses the management of chemicals throughout their entire life cycle. Chemicals are regulated at different points within their life cycle but there is no holistic approach to regulating all chemicals. The Ministry of Health (Pesticide and Toxic Chemicals Control Board), the Ministry of Trade, Industry and Investment, the Environmental Management Authority and the Ministry of Energy and Energy Affairs through their legislations are mandated to address various aspects of chemical management. However, none of their enabling Acts completely addresses the issues related to the total management of chemicals. As noted, pieces of other legislation exist but with focus on specific areas of concern.

The inter-ministerial commissions and coordinating mechanisms for chemicals management shows that there is no overarching chemicals' management coordinating mechanism although there exist a couple interagency/inter-sectoral institutions with very specialized focus pertaining to either a specific group of chemical or a specific issue associated with management of chemicals. Coordination in chemicals management occurs through the existence of the Pesticide and Toxic Chemicals Control Board, the Environmental Management Authority (EMA), the OSH Agency, as well as the Department of Natural Resources and the Environment (DNRE) of the Tobago House of Assembly which have memberships drawn from various government and private sector agencies/entities. The effectiveness of these institutions in coordinating chemicals management is limited to their area of responsibilities, often with limited focus and other priorities. Of all the various institutions involved, including the principal institutions whose mandates deal directly with various aspects of the control and management of and other chemicals, only the Pesticide and Toxic Chemicals Control Board (PTCCB) deals exclusively with chemicals management.

Trinidad and Tobago has a variety of industrial organizations and labour unions directly involved in chemicals management but focus has been mainly on the health and safety of workers. There are sufficient educational programmes at the tertiary levels which accommodates for chemicals management under the broader heading on environmental management. Research institutes (quasi-government), private laboratories as well as private environmental consultants have the capabilities to assess, monitor and manage chemicals. This chapter indicates that there exists in Trinidad and Tobago a general consensus that the private sector possesses much useful expertise as it relates to the sound

management of chemicals. However, the knowledge and skills of these stakeholders are not being fully and efficiently utilized, and the development and implementation of a comprehensive national chemicals management programme would greatly benefit from the integration of this expertise.

Information on chemical production, import, export, storage, transport and use in Trinidad and Tobago, is provided in Chapter 3 of the report and establishes the linkages with the general information provided in Chapter 1, showing that the production and export of chemicals are primarily linked to the petroleum and petrochemical sectors. The chapter also provides a summary of the chemical waste disposal, explaining disposal options by private companies. Government has no system in place to manage this waste type and the landfills do not have the infrastructure and capacity to accommodate chemical waste. Some hazardous wastes are exported to be recovered and recycled.

Chapter 4 deals with data access and use and provides an overview of the availability of data for chemicals management and the related infrastructure in Trinidad and Tobago. It also provides a brief analysis of how information is used for national and local chemical risk reduction. It appears information is available for industrial and agricultural chemicals but there is a definite lack of data on consumer chemicals and chemical waste. However, data access based on the available data is extremely difficult. The data is scattered and not kept in a central location with ease of accessibility. Data is being received and collected but it is not being compiled and analyzed and in some instances there are gaps in the data collection process. There is a need to coordinate and catalogue this available information and data in such a way that it is user friendly, accessible and compatible with all or most systems available with the government public service.

Chapter 5 deals with the technical infrastructure and provides an overview of the facilities available in the country to support programmes and policies for the integrated management of chemicals. This study provides a rapid assessment of existing laboratory capabilities in country including some of the major ones that are present in the private sector. This chapter indicates that in Trinidad and Tobago the majority of analytical equipment required to carry out the most sophisticated laboratory analysis such as atomic absorption spectrophotometers and gas chromatographs are available in the country. The Information and Communication Technology (ICT) within Trinidad and Tobago provides the basis for the development of every modern and progressive society. Government ministries within Trinidad and Tobago are consumers of ICTs and electronic services, relying more on ICTs in the areas of management, communication, education, commerce, procurement and service provision. Therefore, all technical infrastructures are in place to support an integrated management system when developed.

Chapter 6 addresses the situation of chemical emergency preparedness, response and follow up. Trinidad and Tobago has a draft chemical spill and gaseous release plan, a national response framework prepared by the Office of Disaster Preparedness and Management (ODPM) as well as a National Oil Spill Contingency Plan. All these plans contain a thorough system of reporting and documentation for the emergency response procedures to be carried out in the event of a spill. However there are still some issues that must be assessed in order to ensure that the chemical spill emergency response plan is effective and efficient. For example, service departments need to have access to specific equipment and trained staff to deal with chemical incidents or accidents and there is need for a poison control centre.

In addition, the Trinidad and Tobago Mutual Aid Scheme (TTEMAS) serves as a management organization designed to assist the operations of first responders in emergency responses. These include the Fire Service, Police Service, regional corporations and TTEMAS member organizations.

Chapter 7 deals with the awareness/understanding of workers and the public to the safe use of chemicals and attempts to give an overview of the mechanisms available to provide information to workers and to the public concerning the potential risks associated with chemical production, import, export, handling, use and disposal. This chapter also summarizes programmes and related activities designed to sensitize the population as it relates to chemical management. The awareness and understanding of chemical safety issues in the work place has been consistent within Trinidad and Tobago. The implementation of the OSHA policy as well as internal and global trading pressures with regards to occupational health and safety and the dissemination of information to their workers have been instrumental for raising awareness among workers.

Chapter 8 provides information on co-operation and involvement with international organizations, bodies and agreements, and identifies those stakeholders in Trinidad and Tobago, both within and outside of Government, having linkages with international organizations or participating in international agreements concerned with the management of chemicals. The information provided in this chapter also identifies opportunities for greater collaboration and coordination at the national level. Such linkages would offer possibilities for stakeholders to access technical assistance, information and potentially funding that would be of benefit to Trinidad and Tobago's chemicals management plans and activities. This chapter indicates that a number of organizations and agencies in Trinidad and Tobago have established working relations and linkages to regional and international bodies which are concerned with various aspects of the sound management of chemicals. There has been varied level of participation in these international organizations, bodies and agreements with certain focal points being more active than others.

Chapter 9 provides information on the resources available and needed for chemicals management and provides an overview of the human resources available within government Ministries and related agencies to various aspects of chemicals management, and highlight resources needed to strengthen the management of chemicals in Trinidad and Tobago. The section states the difficulty to precisely identify human resources that are available to the government of Trinidad and Tobago that is directed towards chemical management. The difficulty lies in that often times chemicals management related issues may be dealt as one of the many responsibilities assigned to an individual or a set of individuals within an institution beside many other responsibilities. Chemicals management related responsibilities are dispersed among several ministries and their corresponding institutions. Staff from the MEEA and PTCCB deal specifically with chemicals management related issues in the public service, whilst chemicals waste is dealt with by the Ministry of Environment and Water Resources (MEWR). However, a rapid assessment of existing resources indicates that there is a variety of expertise present within governmental and related institutions in Trinidad and Tobago.

Chapter 10 gives a summary of the current situation of chemicals management within the country as well as summarizes the properties, and recommendations for action, considered most important. The entire report demonstrates that although Trinidad and Tobago has a foundation for chemicals management, the sound management of chemicals still presents a challenge, especially in terms of managing the entire life cycles of chemicals. The assessment shows that there are five primary areas that need to be highlighted to build on the existing foundation for the sound management of chemicals within Trinidad and Tobago. These include legislative reform, setting up of a National Committee for chemicals management, chemical inventory and database development, increased infrastructural capacity and increased public awareness, training, and research and development.

The success of managing chemicals in Trinidad and Tobago requires cooperation at many different levels ranging from the communities to the decision makers to the politicians. The issue of inadequate financial, technical and political support creates a barrier for progress. However, with the assistance of international support, Trinidad and Tobago has been progressing in a positive direction towards the sound management of chemicals.

GLOSSARY OF TERMS

Pesticides	Any substance which by itself, or in combination with other substances, is proposed, represented, or used for destroying or controlling pests but does not include any antiseptic, disinfectant, drug or preservative.
Fertilizers	Any product containing three basic plant nutrients (nitrogen, phosphorus, and potassium) and micronutrients, is proposed or used for making soil more fertile
Production chemicals	Chemicals used in the petroleum industry to enhance oil recovery, maximize production, processing and transporting of petroleum and petroleum products. These include corrosion inhibitors, scale inhibitors, asphaltene inhibitors, biocides, demulsifiers, scavengers, surfactants, and others.
Hazard	Any source of potential damage, harm or adverse health effects on something or someone under certain conditions at work.
Hazardous materials	Waste that is dangerous or potentially harmful to our health or the environment. Hazardous wastes can be liquids, solids, gases, or sludges. They can be discarded commercial products, like cleaning fluids or pesticides, or the by-products of manufacturing processes.
Party	A State or regional economic integration organization that has consented to be bound by a Convention and for which the Convention is in force
General waste	Commercial, domestic or yard waste generated from normal, day-to-day operations. It poses little or no threat to its handlers or the environment.
Liquid waste	Any waste in the liquid state of matter. It includes industrial waste such as by-products from food-processing and production plants, municipal waste, chemical by-products, agricultural waste and wastewater.
Special waste	Termed due to the handling and disposal processes that it requires. This waste type may be injurious to the population and environment, and can range from tyres and condemned

foods, to asbestos and industrial waste from processing plants. Special Waste is generated mainly by industries.

Chemicals

used in a broad sense to include pesticides, fertilizers and other agricultural chemicals, chemicals used in industrial processes, petroleum products, chemicals marketed for consumer usage, pharmaceuticals, cosmetics, food additives, chemicals of natural organic and biological origin as well as unintended chemicals such as produced in combustion processes, appearing in food residue, biota and consumer goods

Industrial chemicals

Chemicals that are used by industry to produce a broad range of articles, products and formulations, that are used by industry or the public.

LIST OF ACRONYMS

AMCHAM	American Chamber of Commerce of Trinidad and Tobago
ATL	Analytical Technologies Limited
BCRC-Caribbean	Basel Convention Regional Centre for Training and Technology transfer for the Caribbean Region
CARDI	Caribbean Agricultural Research and Development Institute
CARIRI	Caribbean Industrial Research Institute
CARPHA	Caribbean Public Health Agency
CBOs	Community Based Organizations
CDA	Chaguaramas Development Authority
CEC	Certificate of Environmental Clearance
CFDD	Chemistry Food and Drug Division
CGCL	Caribbean Gas Chemical Limited
CSD	Commission on Sustainable Development
COSTATT	College of Science, Technology and Applied Arts of Trinidad and Tobago
CSO	Central Statistical Office
DDT	Dichlorodiphenyltrichloroethane
DNRE	Department of Natural Resources and the Environment
ECA	Employers' Consultative Association
ECLAC	Economic Commissions for Latin America and the Caribbean
ECOSOC	Economic and Social Council
EMA	Environmental Management Authority
FAO	Food and Agricultural Organisation of the United Nations

GDP	Gross Domestic Product
GHR	Government Human Resource Services Company Limited
GHS	Globally Harmonized System of Classification and Labeling of Chemicals
GLP	Good Laboratory Practice
HAZMAT	Hazardous Materials
IAG	International Analytical Group
INTERDEP/ENV	Interdepartmental Project on Environment and the World of Work
IFCS	International Forum on Chemical Safety
ILO	International Labour Organisation
IMA	Institute of Marine affairs
JHSC	Joint Health and Safety Committees
LMD	Land Management Division
MARPOL	International Convention for the Prevention of Pollution from Ships
MDGS	Millennium Development Goals
MEEA	Ministry of Energy and Energy Affairs
MEWR	Ministry of Environment and Water Resources
MoFE	Ministry of Finance and the Economy
MoH	Ministry of Health
MEAs	Multilateral Environmental Agreements
MEAU	Multilateral Environmental Agreement Unit
MSDS	Material Safety Data Sheets
NCC	National Chemical Committee
NCSCP	National Chemical Spill and Gaseous Releases Contingency Plan

NHCSCP	National Hydrocarbon and Chemical Spills Contingency Plan
NGC	The National Gas Company of Trinidad and Tobago
NGOs	Non-Governmental Organizations
NIHERST	National Institute of Higher Education, Research, Science and Technology
NIP	National Implementation Plan
ICCM	International Conference on Chemicals Management
ICTs	Information and Communication Technologies
OSHA	Occupational Safety and Health Act
PCBs	Polychlorinated biphenyls
PCDD	Polychlorinated dibenzodioxin
PCDF	Polychlorinated dibenzofuran
PLEA	Point Lisas Energy Association of CEO's
PRTRs	Pollutant Release and Transfer Registers
PTCCB	Pesticides and Toxic Chemicals Control Board
PTCI	Pesticide and Toxic Chemicals Inspectorate
POPs	Persistent Organic Pollutants
PIC	Prior Informed Consent
QSP	Quick Start Programme
REACH	Registration, Evaluation, Authorization and Restriction of chemicals
SAICM	Strategic Approach to International Chemical Management
SWMCOL	Trinidad and Tobago Solid Waste Management Company Limited

TEQ	Toxic Equivalency
THA	Tobago House of Assembly
TTBS	Trinidad & Tobago Bureau of Standards
TTEMAS	Trinidad and Tobago Mutual Aid Scheme
TTLABS	Trinidad and Tobago Laboratory Accreditation Service
ULABs	Used Lead Acid Batteries
UNCED	United Nations Conference on Environment and Development
UNEP	United Nations Environmental Programme
UNITAR	United Nations Institute for Training and Research
WASA	Water and Sewerage Authority
WSSD	World Summit on Sustainable Development

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Introduction

1. Context and General Vision

The chemical industry is one of the largest and most important industries worldwide as chemicals are required for use in all aspects of life. Chemicals include both artificial and natural substances and used in a broad sense to include pesticides, fertilizers and other agricultural chemicals, chemicals used in industrial processes, petroleum products, chemicals marketed for consumer usage, pharmaceuticals, cosmetics, food additives, chemicals of natural organic and biological origin as well as unintended chemicals such as produced in combustion processes, appearing in food residue, biota and consumer goods (United Nations Institute for Training and Research (UNITAR), 2012). For the purpose of this study, and in line with the Rotterdam Convention, the focus will be on industrial chemicals inclusive of some pesticides and fertilizers. Although these chemicals are used in the agricultural industry they can be regarded as industrial chemicals due to their variety of uses and the scale of manufacture/production in Trinidad and Tobago.

Chemicals are a significant contributor to our economies. Sound chemicals management across the lifecycle of a chemical, from extraction or production to disposal is therefore essential to avoid risks to human health and the environment. An important phase in strengthening national systems for handling chemicals is the preparation of a national chemical profile. The national chemical profile involves an assessment of the national infrastructure and capacity related to the legal, institutional, administrative and technical aspects of chemical management, the nature and extent of chemicals availability and use in the country, analysis of the country's gaps and needs for chemical management, and prioritizing and outlining associated proposals for action.

Trinidad and Tobago is the largest oil and natural gas producer in the Caribbean and the industry includes exploration and refining of crude oil and natural gas, both offshore and onshore. Trinidad and Tobago is also the largest exporter of ammonia and the second largest exporter of methanol worldwide, hence a major player in the global chemicals market.

The National Chemical Profile update provides a nationally recognized information base for chemicals that can be used to measure progress made in the fulfillment of meeting specific national as well as international targets. The International Policy Framework for the sound management of chemicals is administered via Agenda 21, International Forum on Chemical Safety (IFCS), the Strategic Approach to International Chemical Management (SAICM, Dubai 2006), as well as the World Summit on Sustainable Development (WSSD, Johannesburg 2002) goal of sound management of chemicals by 2020 and United Nations 2015 Millennium Development Goals (MDGs) as they relate to achieving environmental sustainability (UNITAR, 2012).

2. Background on the Framework for International Policy

Agenda 21 and Chemical Safety

International initiatives addressing chemicals came to the forefront as a result of the "Rio Conference", formally known as the United Nations Conference on Environment and Development (UNCED) 1992. The Agenda 21, a product from the Conference is a non-binding, voluntarily implemented action plan of the United Nations with regard to sustainable development. Chapter 19 of Agenda 21 entitled "Environmentally Sound Management of Toxic Chemicals" provides an international strategy for

achieving the sound management of chemicals through their life cycle, a goal to which all countries present at the UNCED agreed.

Intergovernmental Forum on Chemicals Safety (IFCS)

The IFCS was established in 1994 as a means for countries to regularly discuss their activities and priorities for the sound management of chemicals, including progress made in implementing Chapter 19 of Agenda 21. IFCS is a flexible, open and transparent brainstorming and bridge-building forum comprising of governments, international, regional and national organizations, industry groups, public interest associations, labour organizations, scientific associations and representatives of civil society. Meetings are held approximately every three years to build partnerships, provide advice and guidance, make recommendations and monitor progress on the safe use of chemicals.

World Summit on Sustainable Development (WSSD)

The 2002 WSSD held in Johannesburg, South Africa reaffirmed sustainable development as a central component of the international agenda. A wide range of targets and concrete commitments for action to implement sustainable development objectives were agreed upon by governments. A Plan of Implementation was adopted to embrace a number of new commitments related to chemicals and waste management. These included:

- to renew commitment (as stated in Agenda 21) to the sound management of chemicals throughout their life cycle and to protect human health and the environment from significant adverse effects;
- to promote the ratification and implementation of relevant international instruments on chemicals and hazardous waste;
- to further develop a strategic approach to international chemicals management based on the Bahia Declaration and Priorities for Action beyond 2000 of the IFCS;
- to encourage partnerships to promote activities aimed at enhancing environmentally sound management of chemicals and hazardous wastes;
- to achieve sound management of chemicals, with particular focus on hazardous chemicals and wastes.

Strategic Approach to International Chemicals Management (SAICM)

The SAICM is a policy framework adapted by the International Conference on Chemicals Management (ICCM) in 2006 to promote chemical safety around the world. It comprises the Dubai Declaration – expressing high-level political commitment to SAICM and an Overarching Policy Strategy which sets out its scope, needs, objectives, financial considerations, underlying principles and approaches, and implementation and review arrangements. SAICM was developed by a multi-stakeholder and multi-sectoral Preparatory Committee and supports the achievement of the goal agreed at the WSSD in Johannesburg 2002, ensuring that by the year 2020 chemicals are produced and used in ways that minimize significant adverse impacts on the environment and human health.

United Nations Millennium Development Goals (MDGs)

The United Nations MDGs relates to achieving environmental sustainability. This would involve a reduction in exposure to toxic chemicals and the improvement in frameworks for chemicals management. The preparation of a National Profile could serve as a useful tool in this context by providing a comprehensive picture of the national infrastructure and capacity in which chemicals-related international agreements would be implemented.

Policy Instruments

Additionally, several international policy instruments have been adopted to address specific areas of chemical management. These include:

- UNEP London Guidelines for the Exchange of Information on Chemicals in International Trade (as amended in 1989);
- FAO International Code of Conduct on the Distribution and Use of Pesticides (as revised in 2002);
- ILO Convention (No. 170) Concerning Safety in the Use of Chemicals at Work (1990);
- ILO Convention (No. 174) Concerning the Prevention of Major Industrial Accidents (1993);
- Vienna Convention and the Montreal Protocol on Substances that Deplete the Ozone Layer. (signed 1985 and entered into force on 22 September 1988);
- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (signed 1989 and entered into force on 5 May 1992);
- Paris Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and Their Destruction – Chemical Weapons Convention (signed 1993 and entered into force on 29 April 1997);
- Rotterdam Convention on the Prior Informed Consent (PIC) Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (signed 1998 and entered into force on 24 February 2004);
- Stockholm Convention on Persistent Organic Pollutants (POPs) (signed 2001 and entered into force on 17 May 2004);
- Globally Harmonized System of Classification and Labeling of Chemicals (GHS) (adopted in December 2002 and endorsed by ECOSOC in July 2003), which is a voluntary agreement rather than a multilateral convention.

3. Background on National Policy Framework

Agenda 21, formulated under the 1992 Rio Earth Summit sponsored by the United Nations Conference on Environment and Development (UNCED) requested inter alia that the International Labour Organisation (ILO) and a number of its members' countries make a direct contribution in its implementation of the Interdepartmental Project on Environment and the World of Work (INTERDEP/ENV). In pursuance of this project, a National Tripartite Workshop was held in Trinidad and Tobago, July 25-27, 1995, for the purpose of charting a course and setting priorities in respect of ratification and implementation of the relevant ILO Conventions and Observance of Recommendations. These include the Chemical Convention, 1990 (No. 170), Chemicals Recommendation, 1990 (No. 177) and the Prevention of Major Industrial Accidents Convention, 1993 (No. 174).

At the workshop, the outline of a national profile on chemical safety management was presented by the then Ministry of Labour and Co-operatives. The legislative infrastructure was given in respect of pesticides, toxic chemicals and environmental protection against contamination. Components of the institutional existing framework were discussed; they included both state bodies and Non-Governmental Organizations (NGOs). The types of inspection and monitoring services available were made known and the range of risk factors at high density industrial centres formed a basis for discussion. Another aspect considered was the proper disposal of hazardous materials as an important facet of chemical safety management. The outcome of the workshop was a Country Policy Framework Paper on 'Chemical Safety and the Prevention of Major Industrial Accidents in Trinidad and Tobago'. The paper formed the basis of a national profile of chemical safety management in Trinidad and Tobago. All the stakeholders in chemical safety management in Trinidad and Tobago participated and were consulted in the formulation of the original Country Paper published in 1995.

A decision to update this document was then taken on the basis of recommendations emanating from "FORUM III" meeting held in Bahia, Brazil, October 15-20, 2000. Forum III Final Report – Programme Area E: Strengthening of national capabilities and capacities for management of chemicals states that countries should inter alia regularly update national profiles. It is against this background that the profile for Trinidad and Tobago was reviewed in 2001. The exercise was conducted under the auspices of the local office of PAHO/WHO.

This document entitled "National Chemical Profile for Chemicals Management 2015" represents a further update to the 2001 National Chemical Profile for Trinidad and Tobago. This was triggered by the updated guidance document issued by UNITAR for preparing a National Chemical Profile to assess infrastructure and capacity needs for chemical management.

4. Aim, Objectives and Benefits of the National Chemical Profile

The National Chemical Profile for Trinidad and Tobago aims to strengthen the national chemicals management system whilst facilitating important national economic and trade intentions. The aim can be achieved by focusing on the following objectives:

- to encourage collaboration between government and stakeholders towards understanding and identifying priority needs for SAICM implementation to set the stage for preparation of a SAICM Implementation Plan;
- to provide practical information on ongoing programmes and activities in the country which are concerned with the management of chemicals throughout their life cycle;
- to establish a system to facilitate the exchange of information and dialogue among government ministries and authorities at national, regional, and local levels, concerned with the sound management of chemicals.

The benefits created by the National Chemical Profile are as follows:

- a greater understanding of the potential risks associated with the production, use and disposal of chemicals at a national level and improved knowledge of reducing these risks to promote improved human health and environmental protection;
- increased awareness of chemical risks as well as an understanding of the potential benefits of chemicals management via the introduction of safe systems of work to ensure safe industrialization and sustainable development and growth;
- establishment of a national dialogue on chemicals safety/management involving all concerned parties and sectors of society to encourage and facilitate trade in chemicals, and agricultural, domestic, and industrial products which rely on chemicals;
- ensure that chemicals produced, imported, and exported are supporting economic goals and are not creating economic burdens through health, environmental, and safety problems.

5. Preparation of National Chemical Profile Update

The National Chemical Profile for Trinidad and Tobago was updated in a collaborative and comprehensive manner, ensuring data accuracy where data were readily available, and transparency. The existing National Chemical Profile 2001 version was reviewed and the document was updated based on the guidance document entitled *“Preparing a National Profile to Assess Infrastructure and Capacity Needs for Chemical Management”* (UNITAR, 2012). Information gaps and obsolete data were identified.

An introductory sub-Regional stakeholder workshop on Industrial Chemicals under the Rotterdam Convention was organized during 8th-10th October 2014 in Trinidad, coordinated by the Basel Convention Regional Centre for Training and Technology transfer for the Caribbean Region (BCRC-Caribbean). This workshop raised awareness among decision makers in the relevant Ministries and Agencies and encouraged the collection of new data required for the update of the National Chemical Profile. Response sheets (see Annex I) mainly in the form of tables were given to the stakeholders to fill in and the information collected, was used to compile a report outlining the current status on chemicals management for Trinidad and Tobago. This information was used to update the National Chemical Profile for Trinidad and Tobago entitled *“National Chemical Profile for Chemicals Management, Trinidad and Tobago 2015.”* An overview of the participation and contribution from Ministries, private sector organisations and other stakeholders for the completion of this project can be viewed in Annex II.

Upon completion of the National Chemical Profile update, a national follow up seminar will be conducted to organize a National Committee that will address the Rotterdam Convention obligations on industrial chemicals and refine the national framework for the management of industrial chemicals developed at the introductory sub-regional workshop.

The preparation of the National Chemical Profile update was limited in terms of data accessibility. Although the data of chemicals exist in some capacities within both the public and private sector, timely access proved difficult. As such, and as recommended in the UNITAR guidelines, the report was compiled based on existing, attainable data.

Chapter 1: National Information Overview

This chapter provides general background information on the Republic of Trinidad and Tobago highlighting the main economic sectors of the country, in particular the industrial and agricultural industries.

1.1 Geographic Context

1.1.1 Location

Trinidad and Tobago are the southernmost islands of the Caribbean archipelago between the Caribbean Sea and the North Atlantic Ocean, northeast of Venezuela (Figure 1-1). Trinidad is separated from Venezuela by an 11km strait of the Gulf of Paria. Trinidad was once part of the South American mainland and is situated on its continental shelf whilst Tobago is part of a sunken island arc chain related to the Pacific-derived Caribbean Plate. Trinidad is located at latitude $10\ 1/2^{\circ}\text{N}$, longitude $61\ 1/2^{\circ}\text{W}$ with a total area of 4828km^2 and Tobago is at latitude 11°N , longitude 60°W covering an area of 300km^2 .



Source: www.globalcitymap.com

Figure 1-1: Location of the Republic of Trinidad and Tobago

1.1.2 Climate

Trinidad and Tobago is located within the tropics and experiences a tropical climate influenced by the northeast trade winds. The country experiences two seasons per year: a dry season roughly between January and May and a wet (rainy) season from June to December. The annual mean temperature is 26 °C (78.8 °F), and the average maximum temperature is 34 °C (93.2 °F). Humidity is high, particularly during the rainy season averaging between 85% and 87%. The islands receive an average rainfall of approximately 2,110mm (83.1 in) per year (Trinidad and Tobago Government online 2015).

1.1.3 Terrain and Elevation Extremes

The terrain of Trinidad comprises mostly of plains with some hills and low mountains. Trinidad possesses vast tracts of rich rain forests in the Northern Range, with the highest peak, El Cerro del Aripo, ascending to a height of 940m above sea level. In contrast, central plains mostly for agriculture are found in the middle of the island, whilst southern Trinidad has gently undulating hillsides.

Tobago is primarily hilly, with the highest point, Pigeon Peak reaching 550m above sea level. The southwest of the island is flat and consists largely of coralline limestone (Trinidad and Tobago Government online 2015).

1.1.4 Natural Hazards

The islands lie outside the hurricane belt. However, Hurricane Flora damaged Tobago in 1963, and Tropical Storm Alma hit Trinidad in 1974, causing damage before obtaining full strength.

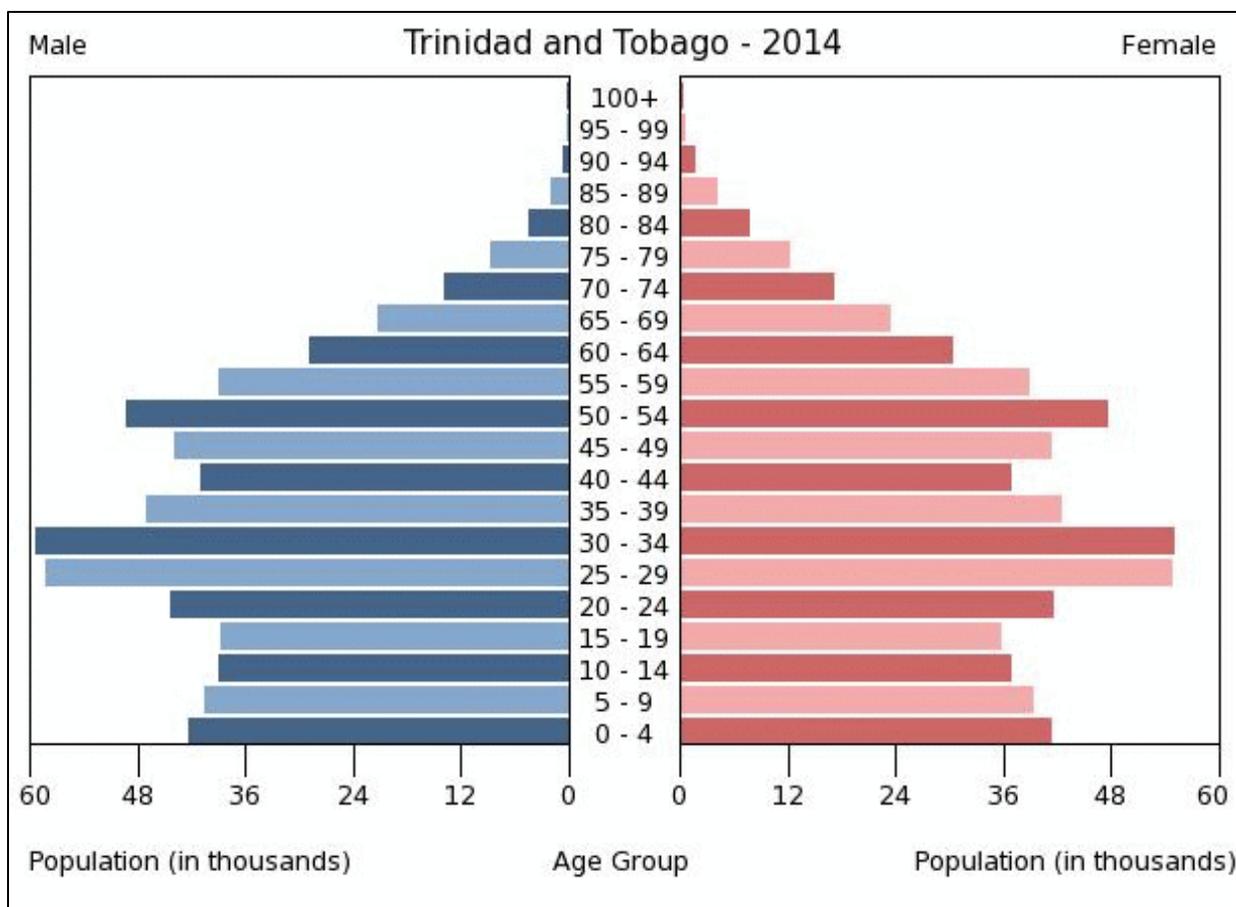
1.2 Demographic Context

1.2.1 Total Population

Trinidad and Tobago has a total population of approximately 1,341,151 (year ended 2013) growing at an average rate of 5.2% over the past decade. The majority of this population resides in Trinidad (1,267,145 persons) and the minority in Tobago (60,874 persons). The working class population within Trinidad and Tobago is 935,575 persons (Trinidad and Tobago Government online 2015).

1.2.2 Age Structure and Median Age

The population pyramid for Trinidad and Tobago (Figure 1-2) illustrates a slow growth rate, representing a relatively stable population. The gender distribution is equitable (660,055 males / 657,357 females) (Ministry of Planning and Sustainable Development 2012) and the age dependency ratio (children up to 14 years old and adults older than 65 years) is 42, a reduction by 12.5% over the past decade. This illustrates a reduced dependency on the working class population due to further growth in the working class population and a decline in the dependent population within Trinidad and Tobago. The median age of the population of Trinidad and Tobago is 33 years, meaning half of the population is younger than 33 years whilst the other half is older.



Source: Central Intelligence Agency 2014

Figure 1-2: Population pyramid for Trinidad and Tobago

1.2.3 Life Expectancy and Birth Rate

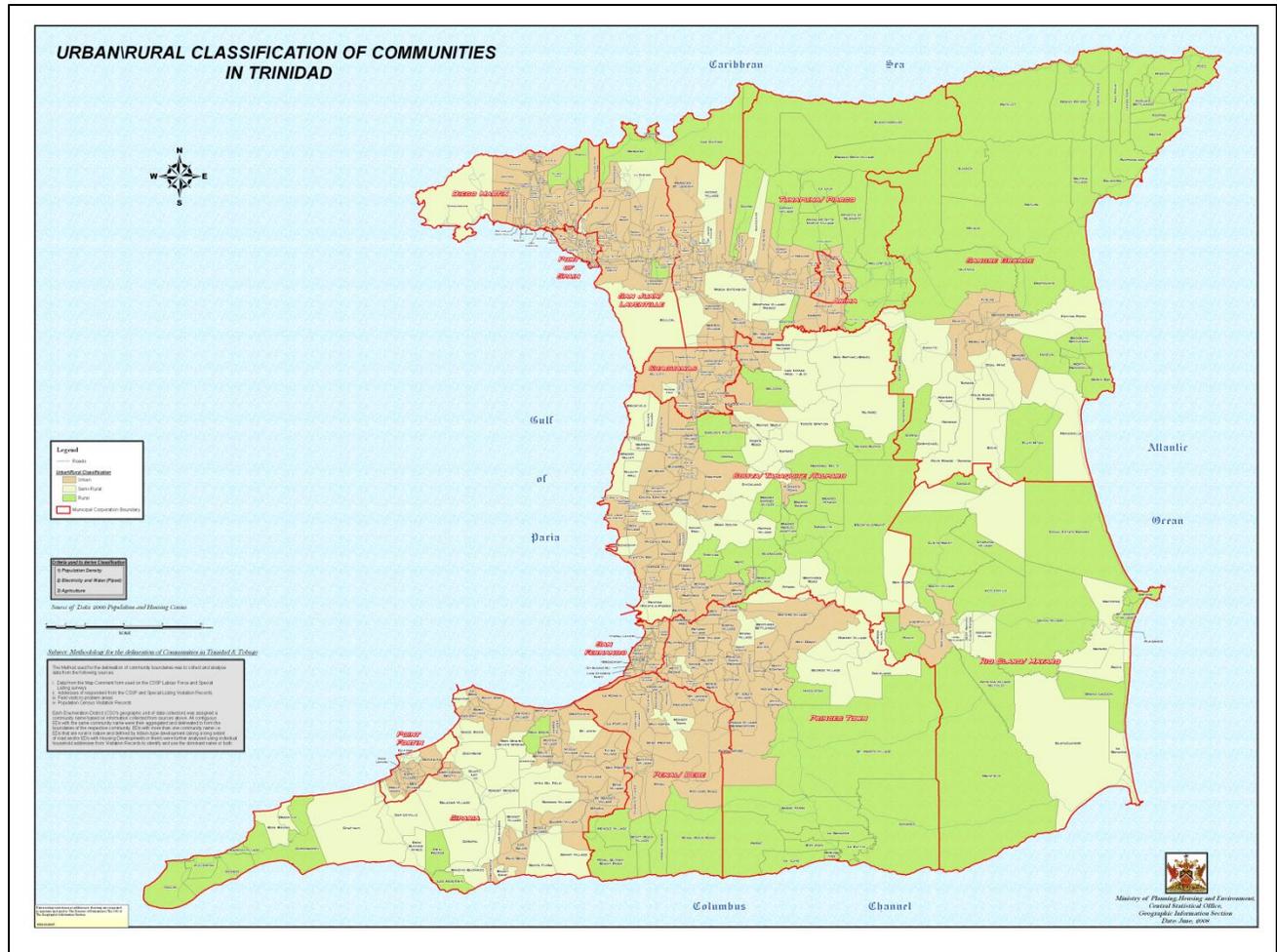
The average life expectancy at birth of Trinidad and Tobago is 73 years (Central Statistical Office 2012). Trinidad and Tobago has a low crude birth rate of approximately 15 births per 1000 people in 2012, accounting for the slow population growth of the islands (Ministry of Planning and Sustainable Development 2012).

1.2.4 Population Migration

The net migration rate for Trinidad and Tobago is approximately -6.42 migrants/1,000 population. This rate is based on the difference between the number of persons entering and leaving a country during the year per 1,000 persons (based on midyear population) and does not distinguish between economic migrants, refugees, and other types of migrants nor does it distinguish between lawful migrants and undocumented migrants.

The rural population of Trinidad and Tobago (percentage of the total population living in rural areas) is 86%, whilst the urban population (percentage of the total population living in urban areas) makes up 14%. The urban/rural classification of Trinidad can be seen in Figure 1-3. The brown areas represent the

urban areas, whilst the light green represents the semi-rural areas and the green characterizes the rural areas. The rate of urbanization (projected average rate of change of the size of the urban population over the given period of time) is predicted at 2.21% per annum (Central Statistical Office 2014).



Source: Central Statistical Office 2014

Figure 1-3: Urban/Rural Classification of Trinidad

1.2.5 Language (s)

English is the official language spoken in Trinidad and Tobago. However, a local variety of Standard English is spoken throughout the countries. Spanish is considered the first foreign language and is promoted by the Government given the proximity of the islands to the South American mainland to enhance trade. To a lesser extent, French, Hindi and Chinese are spoken by some segments of the population through culture and heritage.

1.2.6 School Life Expectancy and Literacy Rate

The school life expectancy (primary to tertiary education) in Trinidad is 12 years for boys and 13 years for girls (Central Intelligence Agency 2014). School life expectancy is the total number of years of schooling (primary to tertiary) that a child can expect to receive, assuming that the probability of his or her being enrolled in school at any particular future age is equal to the current enrollment ratio at that age. The youth literacy rate (percentage of people ages 15-24 who can, with understanding, read and write a short, simple statement on their everyday life) in Trinidad and Tobago is 99.6%, whilst the adult literacy rate (percentage of people ages 15 and above who can, with understanding, read and write a short, simple statement on their everyday life) is 98.79% (UNESCO Institute for Statistic 2014).

1.2.7 Employment/Unemployment Rate

The rate of unemployment for the non-institutional population of Trinidad and Tobago over the age of 15 is approximately 3.5% as of mid-year 2014 (Central Statistical Office 2014). From a gender perspective, the unemployment rate among males increased from 2.8% to 3.0%, while females increased from 3.5% to 4.1% during the same period (Central Statistical Office 2014).

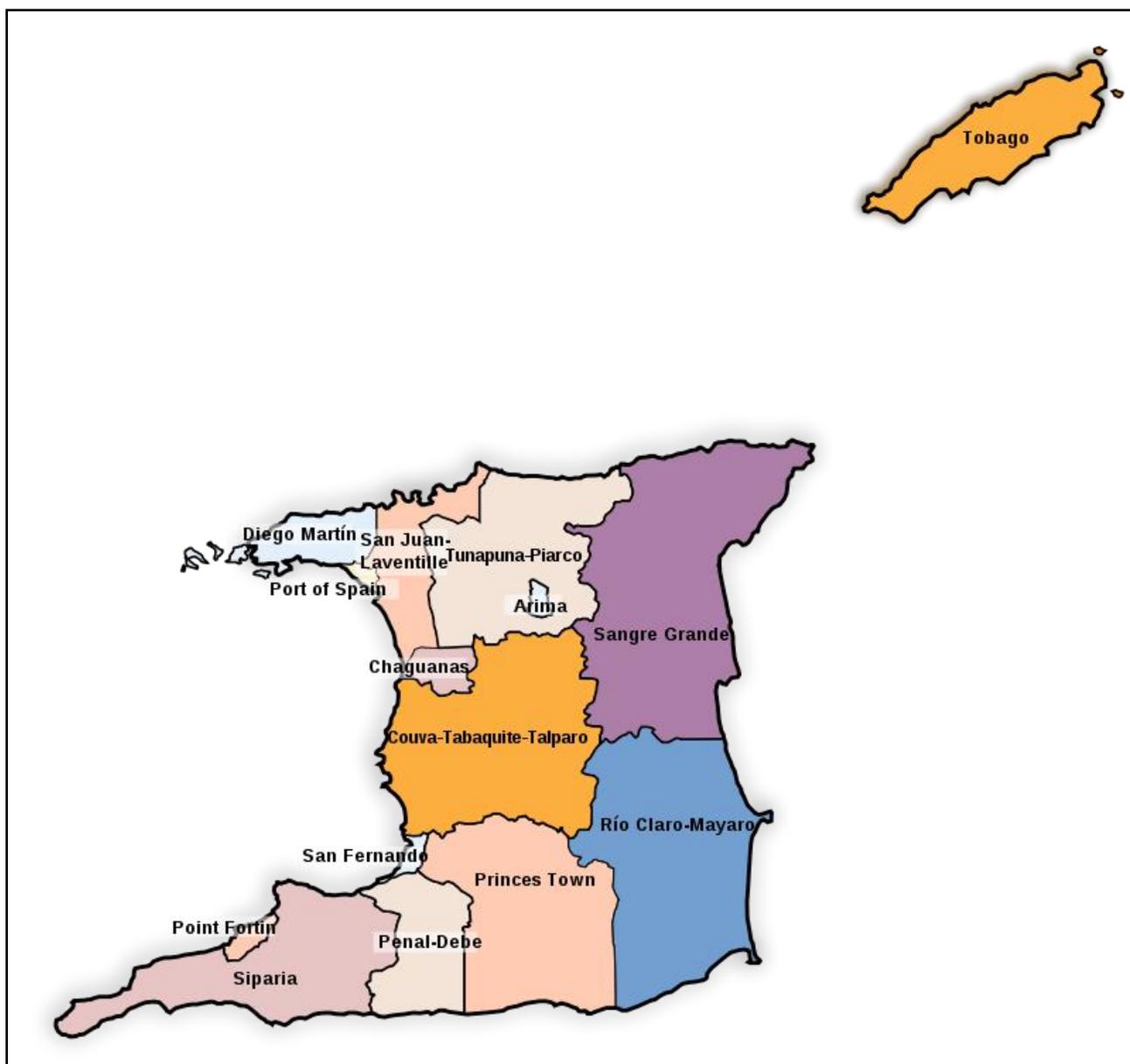
1.3 Political Structure of Trinidad & Tobago

1.3.1 Form and Description of Government

Trinidad and Tobago follows the Westminster model of government and upholds the traditions of parliamentary democracy inherited from Britain. The country gained independence in 1962 and became a republic in 1976. It is a member of the British Commonwealth. General elections are held at least every 5 years and the democratic transfer of power is peaceful and routine. Legislative power lies with the House of Representatives, which consists of elected representatives from forty-one (41) constituencies (39 from Trinidad and 2 from Tobago) and the Speaker of the House of Representatives, as well as the Senate with 31 members appointed by the President on the advice of the Prime Minister and Leader of the Opposition; nine of these members are independents. Executive power lies with the Prime Minister and the Cabinet which is appointed from Members of Parliament. Tobago has its own elected House of Assembly responsible for the administration of the island, and for the implementation of policies that are referred by Parliament (Trinidad and Tobago Government online 2015).

1.3.2 Administrative Divisions

The country's administrative divisions comprise nine regions, three boroughs and two cities (Figure 1-4). The regions include Diego Martin, Couva/Tabaquite/Talparo, Mayaro/Rio Claro, Penal/Debe, Princes Town, Sangre Grande, San Juan/Laventille, Siparia and Tunapuna/Piarco. The boroughs are Arima, Chaguanas and Point Fortin. The cities are located in Port-of-Spain (capital) and San Fernando. Tobago is a ward with the largest town and capital being Scarborough.



Source: Central Statistical Office 2010

Figure 1-4: Administrative Regions of Trinidad and Tobago

1.3.3 Division of Responsibilities among National, Regional and Local Government for Health and Environmental Control and Land Use for Economic Development

Health Sector

The Ministry of Health is the national authority charged with oversight of the entire health system in Trinidad and Tobago. The Ministry plays a central role in the protection of the population's health and in ensuring that all organisations and institutions that produce health goods and services conform to standards of safety. The responsibility for the provision of health care services in Trinidad and Tobago was devolved from the Ministry of Health to Regional Health Authorities (RHAs) with the passing of the

Regional Health Authorities Act No. 5 in 1994. RHAs are autonomous bodies and they are responsible for hospitals continuing care facilities, community health services and public health programmes. They deliver services in the region and work with local communities to provide health care to residents of the catchment area. Table 1-1 shows the administrative divisions for the delivery of health services. Each RHA is required to:

- Promote and protect the health of the population within the region and work to prevent disease and injury;
- Assess continually the health needs of the region;
- Determine priorities in providing health services in the region and allocate resources accordingly;
- Ensure that reasonable access to quality health services is provided in and throughout the region;
- Promote health services in a way that responds to the needs of individuals and the requirements of services and facilities.

Table 1-1: Administrative divisions for the delivery of health services

Administrative Division	Service Area
North-West Regional Health Authority	Diego Martin; San Juan/Laventille; Port of Spain
North-Central Regional Health Authority	Tunapuna/Piarco; Couva/Tabaquite/Talparo; Arima; Chaguana
South-West Regional Health Authority	Princess Town; Penal/Debe; Siparia; San Fernando; Point Fortin
Eastern Regional Health Authority	Sangre Grande; Mayaro/Rio Claro
Tobago Regional Health Authority	Island of Tobago

Environmental Sector

The Ministry of Environment and Water Resources is responsible for the environmental protection of Trinidad and Tobago. The primary mission of the Environmental Policy and Planning Division (EPPD) within the Ministry is to ensure that there is a balance between Government's efforts to increase the pace of socio-economic development and the need to ensure conservation of Trinidad and Tobago's natural resources. This is the heart of sustainable development and is the foundation of the mission, programmes and projects undertaken by the Policy and Planning Division. The core activities of the Environmental Policy and Planning Division are:

- Assistance in the formulation of environmental policy, through relevant research and preparation of papers;
- Provision of technical support to the Permanent Secretary through the preparation of briefs, Notes for Cabinet, etc.;

- Monitoring and evaluation of the implementation and effectiveness of environmental policy;
- Promotion and facilitation of the harmonisation of social and economic policies with national environmental policy objectives;
- Design and implementation of programmes and projects pursuant to national environmental policy objectives;
- Conduct of research to inform the formulation of environmental policy;
- Promotion and facilitation of Government's efforts to promote sustainable development;
- Coordinating and monitoring the implementation of the Multilateral Environmental Agreements (MEAs) to which the Ministry of the Environment and Water Resources has been designated as National Focal Point;
- Working in close collaboration with the Environmental Management Authority, and other environmental agencies in policy implementation;
- Assisting in the identification and mobilization of financial and technical assistance to support Government's efforts to promote sustainable development;
- Representing the Ministry on technical committees;
- Representing the Ministry/Government of the Republic of Trinidad and Tobago at regional and international meetings/conferences.

The Department of Natural Resources and the Environment (DNRE), a unit under the Tobago House of Assembly (THA) serves to protect, preserve and enhance Tobago's environment and promote the sustainable use and management of air, land and water for the benefit of current and future generations. The Department is also the arm of the Environmental Management Authority (EMA) in Tobago monitoring and enforcing the environmental regulations.

Land Use for Economic Development

The Commissioner of State Lands has the authority to manage state lands in Trinidad and Tobago on behalf of the President. The office is supported by the Land Management Division (LMD), a division of the Ministry of Food Production. The LMD is an amalgamation of Departments / Divisions within the Ministry via:

- The Lands Unit, originally part of the Director of Surveys which dealt with the management of State Lands, Land Acquisition Unit (responsible for the acquisition of property for various public purposes) and revenue (responsible for collection of rents and related fees); and
- The Land Administration Division which dealt with the administration of State Agricultural Land.

The main responsibilities and functions of the Office of the Commissioner of State Lands are as follows:

- Processing new leases and agreements, renewal of leases and tenancy agreements;
- Management of tenancies and serving of advisory notices to tenants in breach;
- Preparation, witnessing and registration of State Grants;
- Consents for transfer and mortgage of leases;
- Approval to construct buildings on State Lands
- Acquisition of private land for public purposes

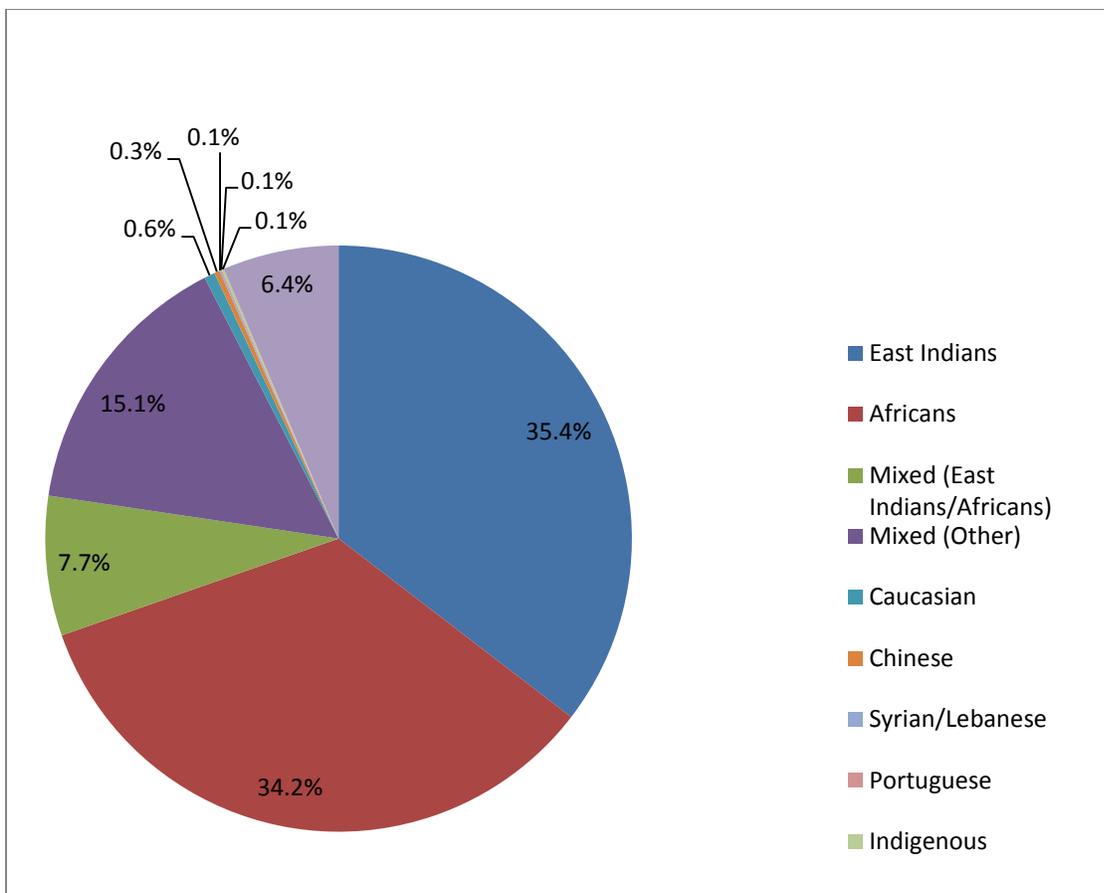
- Matters pertaining to mines and quarries (Head Leases under the purview of the CoSL);
- Prevention of squatting on and removal of squatters from State Lands;
- Management of coastal areas, including land reclamation;
- Assisting the Courts in State Land related matters;
- Management of the sea bed.

Decisions for economic development of these lands must follow all statutory requirements namely permissions from the Town and Country Planning Division (Ministry of Planning and Sustainable Development), EMA, WASA, Drainage Division of Ministry of Works and Infrastructure and the relevant Regional Corporation. Some state lands are sub-let to state enterprises to agencies such as E-Teck, Udecott. These agencies are responsible for further development of state lands for economic activities for industrial estates etc. Water and Sewerage Authority (WASA) and Chaguaramas Development Authority (CDA) are examples of statutory bodies who own land. The CDA has actively been pursuing developmental activities in the Chaguaramas Peninsula for recreational purposes.

The THA has a Division of Planning and Development comprised of three departments: the Land Management Department, the Planning Department and the Department of Advanced Training and Advisory Services. The Land Management Department is responsible for survey of lands, monitoring for the prevention of illegal activities and, administration and distribution of State lands.

1.3.4 Ethnicities of Trinidad and Tobago

Trinidad and Tobago is a multicultural society comprising of a variety of ethnicities. Figure 1-5 shows the diversity of ethnic groups within Trinidad and Tobago and illustrates that East Indians and Africans were the two largest ethnic groups in Trinidad and Tobago. East Indians accounted for 35.4% of the total population while Africans accounted for 34.2%.



Source: Central Statistical Office 2012

Figure 1-5: Percentage Distribution of ethnicity in Trinidad and Tobago (2011)

1.4 Industrial, Agricultural and other key Economic Sectors

The Review of the Economy 2014 conducted by the Government of the Republic of Trinidad and Tobago states *“the economy of Trinidad and Tobago is expected to expand in real terms by 1.9 percent in 2014, following expansions of 1.4 percent, and 1.7 percent in 2012 and 2013 respectively. Driving the accelerated growth in 2014 is a 2.5 percent increase in real economic activity in the non-petroleum sector, along with a 1.0 percent expansion in the petroleum sector”*.

Trinidad and Tobago attracts considerable foreign direct investment from international businesses, particularly in energy, and has one of the highest per capita incomes in Latin America. Economic growth between 2000 and 2007 averaged slightly over 8% per year, significantly above the regional average of about 3.7% for that same period. Growth had been fueled by investments in liquefied natural gas, petrochemicals, asphalt and steel. Trinidad and Tobago is the leading Caribbean producer of oil and gas, and its economy is heavily dependent upon these resources. It also supplies manufactured goods, notably food products and beverages as well as cement to the Caribbean region (Central Intelligence Agency 2014).

Other sectors that the Government of Trinidad and Tobago targeted for increased investment and projected growth include tourism, agriculture, information and communications technology, and shipping. Crime and bureaucratic hurdles continue to be the biggest deterrents for attracting more foreign direct investment and business (Central Intelligence Agency 2014).

Tables 1-2 and 1-3 provide a summary of the relative importance of the main economic sectors in Trinidad and Tobago. Some divisions of the service sector (non-manufacturing) which are not directly related to industrial chemicals are omitted from the study. These include finance, insurance, real estate, business services, Government, educational and cultural community services and personal services.

Table 1-2: Overview of National Economic Sectors

National Economic Sectors	Economic sub-sectors	Major products	Number of Employees ('00) 2013	Number of Facilities	Contribution to GDP* (%) 2014	Output Value (US\$ millions)	Growth Rate (%) 2014
Petroleum Industry					42.1	11842.84	(0.6)
	Oil and Gas Exploration and Production	Crude oil and condensate;	246	572	23	6453.77	3.5
	Refining	Natural gas and liquefied natural gas.			7.4	2078.11	3.5
	Petrochemicals	methanol, ammonia, urea, urea-ammonium nitrate (UAN) and melamine			6.3	1756.83	(12.6)
	Service contractors	Industrial chemicals and intermediates			2.2	622.22	(5.0)
	Distribution	n/a			3.3	919.95	(7.1)
	Asphalt Production	Underbody coating, bituminous black paint, sealant and pipe guard			0.04	11.98	(27.0)

National Economic Sectors	Economic sub-sectors	Major products	Number of Employees ('00) 2013	Number of Facilities	Contribution to GDP* (%) 2014	Output Value (US\$ millions)	Growth Rate (%) 2014
Non-Petroleum Industry					57.1	16,037.14	4.8
Agriculture and Fisheries	Export Agriculture	Cocoa, coffee	224		0.01	1.52	6.6
	Domestic Agriculture	Root crops, vegetables, paddy, livestock, sugar, small ruminants, honey, fish and shrimp			0.4	149.84	4.5
	Distilleries	Alcoholic beverages			0.1	37.52	4.0
Manufacture	Food, Beverages and Tobacco		497	317	3.3	938.70	8.6
	Textiles, Garments and Footwear			119	0.0	14.02	(9.0)
	Printing, publishing, paper products, ink and toners			274	0.5	134.72	3.7
	Wood and Related Products			218	0.1	21.52	(13.7)
	Chemicals and Non-Metallic Minerals: industrial chemicals, industrial gases, pharmaceuticals, cosmetics, adhesives and paints			175	0.7	201.77	(1.5)
	Assembly Type and Related Industries			302	0.6	175.52	5.6

National Economic Sectors	Economic sub-sectors	Major products	Number of Employees ('00) 2013	Number of Facilities	Contribution to GDP* (%) 2014	Output Value (US\$ millions)	Growth Rate (%) 2014
	Miscellaneous Manufacturing			136	0.3	84.13	(4.1)
Services	Electricity and Water		5460		1.2	340.52	3.9
	Construction (iron and steel) and quarrying (aggregates)			3009	5.8	1,620.16	10.9
	Distribution and restaurants			15038	15.7	4,408.41	7.0
	Hotels and guest houses			297	0.3	92.66	4.1
	Transport, Storage and Communication			1117	4.5	1,273.23	(3.1)
	Finance, Insurance and Real Estate			3599	11.2	3,137.77	3.3
	Government			ND	8.2	2,294.45	4.9
	Education and Cultural Services			494	2.6	723.25	(2.3)
	Personal Services			3912	1.5	424.86	14.3

Source: Central Statistical Office 2010; Ministry of Finance and the Economy 2014; ND-no data * Gross Domestic Product (GDP)

Table 1-3: Structure of the Major Economic Sectors by size (according to number of employees)

Economic Sectors	Micro Facilities¹	Small Facilities²	Medium Facilities³	Large Facilities⁴	No information provided on facility size (%)
Petroleum Industries	244	155	23	32	21
Agriculture and Fisheries	ND	ND	ND	ND	ND
Food processors and Drink	101	88	12	29	27
Textiles, Garment and Footwear	42	45	2	0	25
Printing, publishing and paper	129	63	6	9	24
Wood and related products	134	54	11	7	10
Chemicals and non-metallic minerals	50	98	13	10	31
Assembly type and related industry	149	71	11	9	21
Miscellaneous Manufacturing	52	51	6	3	18
Construction	749	489	42	35	57
Distribution	9077	1077	57	481	29
Transport, Storage and Communication	456	205	14	59	34
Hotels and Guest Houses	132	63	8	4	32
Finance, Insurance, Real Estate and	1,586	523	42	35	31

Economic Sectors	Micro Facilities ¹	Small Facilities ²	Medium Facilities ³	Large Facilities ⁴	No information provided on facility size (%)
Business Services					
Educational and Cultural Community Services	245	88	7	2	28
Personal Services	2,640	300	27	10	23

1 – 1-9 employees; 2- 10-99 employees; 3- 100-249 employees; 4- >249 employees. ND-No data

Source: Central Statistical Office 2010

1.5 Releases of Concern by Economic Sectors

Table 1-4 below gives an overview of the releases of concern within Trinidad and Tobago related to specific economic sectors.

Table 1-4: Releases by Type and Media for Major Economic sectors

ISIC	Economic sectors and related activities	Major Pollution Emissions by Chemical type	Media to which emissions are released (air, water, soil)	Waste emitted (solids, liquids, gases)
A. Sector of Agriculture, Forestry and Fishing				
A 01	Crop and animal production	Pesticides and fertilizers	Air, soil, water	Solids, liquids and gases
B. Mining and quarrying				
B 06-09	Crude oil, natural gas, metals, minerals	Volatile organic compounds (VOCs), greenhouse gases, nitrogen oxides, sulphur oxides, particulates, lead and hydrocarbons	Air, soil, water	Solids, liquids and gases
C. Manufacturing				
C 20	Chemical, agrochemical, nitrogen compounds, plastics, paints and detergents	Organic solvents, heavy metals,	Air, soil, water	Solids, liquids and gases

ISIC	Economic sectors and related activities	Major Pollution Emissions by Chemical type	Media to which emissions are released (air, water, soil)	Waste emitted (solids, liquids, gases)
C23	Cement	Dioxins and furans	Air	Gases
C24	Iron and steel	Metal oxides and salts	Air, water	Solids, liquids and gases
D. Electricity, Gas, Steam and Air Conditioning Supply				
D 35	Electric power generation	sulfur dioxide, nitrous oxides, methane, carbon dioxide	Air	Solids, liquids and gases
E. Water Supply, Sewerage, Waste Treatment and Remediation Activities				
E 36-39	Water collection, treatment, sewerage, waste collection, treatment and disposal, treatment and disposal of hazardous waste, remediation	Organic materials, heavy metals,	Soil, water	Solids, liquids and gases

1.6 Assessment

The chemicals industries located within Trinidad are nestled along the coastal areas predominantly on the western side of the island, whilst Tobago is considered a tourism based industry. The western side of the island of Trinidad is flat and sheltered and has good transport links as well as accessibility to international markets (close proximity to ports).

The economy of Trinidad and Tobago has expanded in real terms by 1.95 in 2014, following expansions of 1.4%, and 1.7% in 2012 and 2013 respectively. Driving the accelerated growth in 2014 is a 2.5% increase in economic activity in the non-petroleum sector, along with a 1.0% expansion in the petroleum sector (Ministry of Finance and the Economy 2014). The petroleum sector recorded its second consecutive year of positive economic growth due to expansions in the exploration and production, petrochemicals, service contractors and distribution sub-industries. Figure 1-6 illustrates the GDP distribution among the different economic sectors within Trinidad and Tobago. The service industries generate the highest GDP for Trinidad and Tobago (51.3%) with the majority GDP contribution from the construction, quarrying and finance, insurance and real estate sectors. Economic activity in the construction and quarrying sub-sector continues to be driven by ongoing work on several major public and private sector construction projects throughout the country (Ministry of Finance and the Economy 2014).

However, in terms of the chemical sectors, Trinidad and Tobago rely heavily on exploration and production as well as refining of oil and gas (30.4%). Petrochemical and industrial chemicals account for 6.3% and 5.5% respectively. Agriculture makes up less than 1% of the GDP for Trinidad and Tobago.

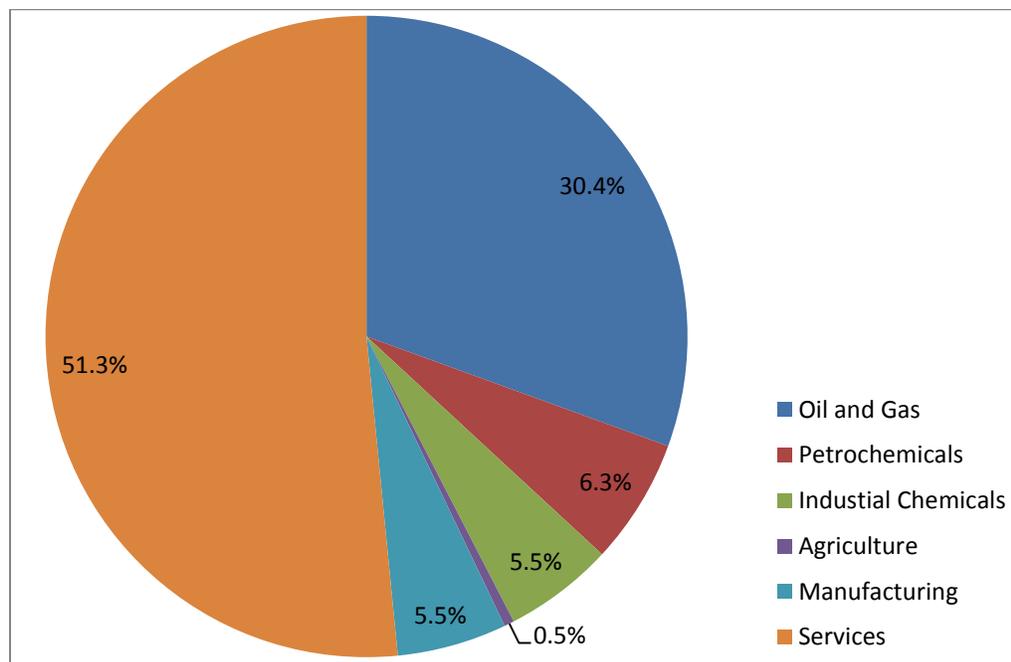


Figure 1-6: GDP Distribution for the Economic Sectors in Trinidad and Tobago 2014

Increased industrialization over the past decade has resulted in increased pollution to the environment and has become a major issue as it is an undesirable side effect of development. The Gulf of Paria has suffered impairment and loss of inland and coastal resources and ecosystems (wildlife, fisheries, mangroves and other wetlands and beaches) as a result of a number of developmental and economic activity related stresses (Environmental Management Authority 2009). These include:

- intensive onshore and offshore oil and gas exploitation;
- petrochemical operations on the west coast of Trinidad
- contaminated water courses by pesticides and herbicides;
- malfunctioning sewage treatment plants discharge; and
- untreated sewage into inland and coastal ecosystems

Growth in the national population is also generating a corresponding growing demand for goods and services. This demand has led to negative impacts on the physical characteristics and natural resource base of the country. The production, use, storage and disposal of chemicals used within these sectors as well as the lack of appropriate legislation to regulate the life cycle of these chemicals are contributing to negative impacts to the environment and human health. Trinidad and Tobago is now faced with the challenge of finding lasting and sustainable solutions to the complex problems surrounding the efficient and responsible use, storage and disposal or re-conversion of chemicals and their waste products.

Deep concern over global traffic in DDT, PCBs, mercury compounds and other hazardous chemicals has spurred international acceptance of the Rotterdam Convention as it provides an early warning on dangerous chemicals and addresses the export and import of hazardous chemicals and, by implication their use and regulation. The Convention deals with chemicals that are banned and severely restricted in some countries (particularly in industrialized regions) but that are still exported to other countries (particularly in developing regions). Trinidad and Tobago ratified the Rotterdam Convention and an update to the country's national chemical profile creates an authoritative document which serves as a basis to strengthen the national system for the management of chemicals throughout their life cycle, meeting the necessary obligations under the Convention.

Chapter 2: Legal and Institutional Capacity for Chemicals Management

This chapter provides a comprehensive overview of existing legal instruments and non-regulatory mechanisms and defines the roles and responsibilities of Ministries, Agencies and other Government Institutions involved in sound management of chemicals throughout their life cycle. Mechanisms which facilitate coordination and cooperation among ministries, agencies, and other relevant governmental and nongovernmental bodies are discussed and activities of industries, public interest groups, professional bodies and the research sector in support of national efforts to manage chemicals are described.

2.1 Overview of Legal Instruments which addresses the Management of Chemicals

2.1.1 Existing National Legislation

No specific piece of legislation governs the management of chemicals in Trinidad and Tobago. Chemicals are managed by a variety of different legal instruments based on their cross sectoral uses. The main pieces of legislation include:

- Pesticides and Toxic Chemicals Act No. 42/1979 (amended - Act No. 11 of 1986 and No. 2 of 2004) and subsidiary legislation 2007;
- Occupational Safety and Health Act, 2004 and subsidiary legislation;
- Food and Drug Act;
- Environmental Management Act No. 3/2000 and subsidiary legislation such as:
 - Water Pollution Rules 2001;
 - Noise Pollution Rules 2001;
 - Certificate of Environmental Clearance Rules 2001; and
 - Air Pollution Rules 2014;
- Petroleum Act Ch. 61:02 and subsidiary legislation 1970;
- Quarry Regulations of the Mines, Borings and Quarry Act Ch. 61:01;
- Minerals Act
- Trade Ordinance Act No. 19/1958
- Standard Act No. 18/1997
- Explosive Act Ch. 16:02;
- Shipping Act No. 24/1987;
- Archipelagic Waters and Exclusive Economic Zone Act (No. 24/1986)
- Fire Service Act 1965 (Ch 35:50)
- Customs Act No. 22/1938 (Ch78:01)

The Table below gives an overview of the existing legislation used to manage chemicals in Trinidad and Tobago. Details on each piece of legislation can be found in Annex III.

Table 2-1: Overview of all existing Legislation addressing the Management of Chemicals

Legal Instrument	Responsible Ministries or Bodies	Category of Chemical	Chemical life cycle stage covered	Objective of Legal Instrument	Relevant Articles/ Provisions
Pesticides and Toxic Chemicals Act No. 42/1979 (amended - Act No. 11 of 1986 and No. 2 of 2004)	Pesticide and Toxic Chemicals Inspectorate (PTCI), Ministry of Health	Agricultural chemicals, industrial chemicals	All	To regulate the life cycle of pesticides and toxic chemicals to safeguard human health and environment	http://rgd.legalaffairs.gov.tt/Laws2/Alphabetical_List/lawspdfs/30.03.pdf
Occupational Safety And Health Act Ch 88:08 Act 1/2004	Ministry of labour and Small and Micro Enterprise Development OSH Agency	Industrial chemicals, Consumer product chemicals,	All	To respect the safety, health and welfare of persons at work	http://www.energy.gov.tt/wp-content/uploads/2013/11/Occupational_Safety_&_Health_Act.pdf
Environmental Management Act No. 3/2000	Ministry of Environment and Water Resources Environmental Management Authority	All chemicals including waste	All	To provide protection and awareness of the environment	http://rgd.legalaffairs.gov.tt/Laws2/Alphabetical_List/lawspdfs/35.05.pdf
Petroleum Act Ch. 61:02 Act no. 46/1969	Ministry of Energy and Energy Affairs	Hydrocarbons	All	Exploration, development and production of crude oil and natural gas	http://rgd.legalaffairs.gov.tt/Laws2/Alphabetical_List/lawspdfs/62.01.pdf
Mineral Act no. 61/2000	Ministry of Energy and Energy Affairs	Ores and minerals	Import, export	To regulate mining activities whilst protecting the human health and the environment	http://rgd.legalaffairs.gov.tt/laws2/alphabetical_list/lawspdfs/61.03.pdf

Legal Instrument	Responsible Ministries or Bodies	Category of Chemical	Chemical life cycle stage covered	Objective of Legal Instrument	Relevant Articles/ Provisions
Trade Ordinance no.19/1958	Ministry of Trade, Industry, Investment and Communication	Agrichemicals, industrial chemicals, ozone depleting substances	Import and export	To regulate the importation and exportation of goods	https://www.ttbizlink.gov.tt/trade/tnt/cmn/pdf/Trade%20Ordinance-T&T%20Gazette%20No.%2019%20of%201958.pdf
Standards Act Ch. 82:03 Act no. 18/1997	Ministry of Trade, Industry, Investment and Communication Bureau of Standards	Agrochemicals and Industrial chemicals	Use and disposal	To promulgate standards that improves environmental performance.	http://rgd.legalaffairs.gov.tt/Laws2/Alphabetical_List/lawspdfs/82.03.pdf
Explosive Act Ch. 16:02 Act no.15/1907	Ministry of National Security	Inorganic chemicals	Import, storage, use	To ensure the safe use of gun powder and explosive substances	http://rgd.legalaffairs.gov.tt/Laws2/Alphabetical_List/lawspdfs/16.02.pdf
Shipping Act No. 24/1987	Ministry of Transport	Dangerous goods such as hazardous chemicals and drugs	Import, export and transport	To ensure safety of life at sea and registration of ships	http://rgd.legalaffairs.gov.tt/Laws2/Alphabetical_List/lawspdfs/50.10.pdf
Archipelagic Waters and Exclusive Economic Zone Act (No. 24/1986)	Ministry of Food Production	All chemicals	Use and disposal	To ensure protection and preservation of the marine environment, and the prevention, reduction and control of pollution to that environment arising from land-based sources including rivers, estuaries and pipelines, sea-bed activities	http://rgd.legalaffairs.gov.tt/Laws2/Alphabetical_List/lawspdfs/51.06.pdf

Legal Instrument	Responsible Ministries or Bodies	Category of Chemical	Chemical life cycle stage covered	Objective of Legal Instrument	Relevant Articles/ Provisions
Fire Service Act 1965 (Ch 35:50)	Ministry of National Security	All chemicals	Use	To save and protect life or property from damage or destruction by fire or other hazards	http://rgd.legalaffairs.gov.tt/Laws2/Alphabetical_List/lawspdfs/35.50.pdf
Customs Act No. 22/1938 (Ch78:01)	Ministry of Finance and the Economy (MoFE)	All chemicals	Import and export	To regulate and manage the import and export of goods (inclusive of chemicals)	http://rgd.legalaffairs.gov.tt/Laws2/Alphabetical_List/lawspdfs/78.01.pdf

2.1.2 National Policies and Action Plan

As part of the existing Legislation, various policies have been created by different Ministries in an attempt to manage chemicals in Trinidad and Tobago. These are briefly discussed below.

National Environmental Policy (NEP) 2006

The NEP sets out to ensure environmentally sustainable development, meaning the balance of economic growth with environmentally sound practices in order to enhance the quality of life and meet the needs of present and future generations. The specific objectives of the Policy are to:

- Prevent, reduce or where possible recycle all forms of pollution to ensure adequate protection of the environment and consequently the health and well-being of humans;
- Conserve the vitality and diversity of the natural environment through the conservation of ecological systems and the biodiversity within;
- Develop within the carrying capacity (the assimilative capacity of the environment) of the country through national physical development and planning; and the sustainable use of renewable resources and the conservation of non-renewable resources;
- Change attitudes and practices of citizens with a view to reducing the polluting practices of the public;
- Ensure that all industries install a certified Environmental Management System;
- Empower stakeholders, including communities, to care for their own environments by providing opportunities to share in managing their local resources and the right to participate in decision-making;
- Promote the integration of the principles of environmental sustainable development into all national policies and programmes.

The policy is guided by the following principles:

- Polluter Pays Principle - A key principle of pollution control policy is that the cost of preventing pollution or of minimising environmental damage due to pollution will be borne by those responsible for pollution. The principle seeks to accomplish the optimal allocation of limited resources. Important elements of the principle are:
 - a) Charges are levied as an application or processing fee, purchase price of a licence or permit, which entitle the holder to generate specific quantities of pollutants;
 - b) Money collected will be used to correct environmental damage.
- Precautionary Principle - Government policy will adhere to the principle, that if there are threats of serious irreversible environmental damage, lack of full scientific certainty will not be used as a reason for postponing measures to prevent environmental degradation.

Occupational Safety and Health Management Policy 2012

This policy states that the Ministry of Health is committed to the protection of persons from occupational or work related hazards and exposures inclusive of chemical exposure. This policy seeks to provide the framework for the implementation of a robust OSH Management System to ensure a safe working environment for all employees as well as to inculcate a culture of safety within the Ministry of Health and Regional Health Authorities.

Integrated Solid Waste/ Resource Management Policy 2013

The National Solid Waste/Resource Management Policy sets a clear direction for Trinidad and Tobago for the next 10 years. The policy encompasses solid wastes, including hazardous chemical wastes and substances, in the municipal, commercial and industrial waste streams. It sets directions in a number of key areas adopting strategies that are designed to:

- provide a coherent, comprehensive national framework for solid waste management, to include waste diversion, reduction, resource recovery and recycling over the next decade;
- enable Trinidad and Tobago to meet its international obligations regarding the management of hazardous wastes and substances and persistent organic pollutants with reduced risk for future generations;
- structure and encourage recycling initiatives;
- address transportation, shipping and market impediments and streamline the regulatory frameworks so that national companies and small and medium businesses can operate effectively and efficiently by managing products and materials responsibly throughout its life cycle;
- provide national leadership on waste and resource recovery where it is needed and facilitate collaboration with other regional states on pertinent issues;
- contribute to climate change, sustainability, innovation and employment opportunities, and
- be high impact and cost effective by setting clear national directions informed by a consultative process and carefully targeted actions that incrementally builds on the previous and existing efforts of governments.

National Chemical Spill and Gaseous Releases Contingency Plan (draft) 2015

The MEEA has prepared a draft National Chemical Spill and Gaseous Releases Contingency Plan (NCSCP) also referred to as the 'Chemical Plan' with focus on the Energy Sector. The NCSCP was developed to provide a level of preparedness to mitigate the threat posed by a chemical spill or gaseous release. The plan outlines how the combined efforts of the Government of the Republic of Trinidad and Tobago (GORTT), chemical manufacturers, shipping industries, associated users and handlers (including transportation and storage) and the Response Agencies will be activated to respond to the threat posed to the Environment and the people of Trinidad and Tobago, by a chemical or gaseous release.

The Chemical plan ensures a timely and effective response to the threat of a chemical spill or gaseous releases by establishing a reporting, alerting and assessment systems, identifying the chain of command and related responsibilities, including the competent national authorities and the national chemical spill incident command system and identifying equipment, logistic support facilities and communication capabilities available within Trinidad and Tobago. The Chemical Plan also establishes and maintains a listing of experts in the field of chemical management, planning and spill response for information and advice, identifies Trinidad and Tobago's power of intervention with cross boundary spills and releases, explains the problems to be faced with a chemical spill and gas release and appropriate response techniques and monitors and regulates storage facilities for recovered chemical as well as disposal methods.

National Oil Spill Contingency Plan, 2013

The National Oil Spill Contingency Plan (NOSCP) approved on January 31, 2013, is designed to mitigate the impact of all oil spills on the environment by setting specific standards for oil spill equipment stockpiles, establishing time frames for oil spill response and increasing collaboration among partner agencies. The NOSCP takes a tiered approach as follows:

- Tier One Spills- oil spills where in-house response capability is adequate. Impacts are low and in-house clean-up response is mandated. Tier 1 is site-specific and includes most shore-side industry with oil transfer sites, offshore installations, pipelines and all vessels from which a spill of oil is possible.
- Tier Two Spills - small or medium-sized spills where significant impacts are possible and area or national support for adequate spill response is required. Inter alia oil and gas operators, oil and condensate-handling and transport facilities and vessels owners operating in Trinidad and Tobago's EEZ must maintain in addition to a Tier 1 clean-up response capacity, a Tier 2 response capability by subscription to a dedicated Tier 2 Oil Spill Response Organization resident in Trinidad and Tobago to handle spills that cannot be handled by in-house Tier 1 capabilities. The Tier 2 response organization must be able to respond to a spill 24-hours a day, 7 days a week and must immediately mobilize upon notification of an oil spill.
- Tier Three Spills - large spills requiring substantial resources and support from regional or international oil spill co-operatives to mitigate effects perceived to be wide-reaching, i.e., of national or international significance. Oil and Gas operators that are in the business of oil and gas production and shipping of crude oil shall be required to obtain membership with a suitable Tier 3 oil spill equipment cooperative that can mobilize equipment into the country within at least 24 - 48 hours.

National Hazardous Materials Spill Response Plan 2014

The National Hazardous Materials Spill Response Plan aims to establish the organizational and operational concepts and procedures designed to minimize the impacts of hazardous materials (hazmat) spills. The plan applies to all national and regional government agencies responding to hazardous materials spills and it is designed to address each type of threat/hazard, as it pertains to hazardous materials.. The Plan sets up procedures to report hazmat spills to the necessary Authorities through established channels of communications as well as establish comprehensive training programmes to educate emergency responders in understanding the types and characteristics of hazards. The Plan also identifies the appropriate resources to promptly and effectively respond to incidents and provide a framework to coordinate volunteer resources in support of natural disaster response and recovery operations.

National Hazard Mitigation plan 2014

The National Hazard Mitigation Plan applies to all national, regional and local efforts to mitigate natural and anthropogenic hazards and serves as a guide to all the stakeholders who play a critical role in the mitigation of hazards. The Plan assesses the current environment in Trinidad and Tobago (hazard situation and vulnerability, capacity to address hazards, existing strategies), review the existing mitigation strategies and provide potential new strategies. The Plan also defines the roles, responsibilities and authorities of all key agencies to mitigate hazards and to determine how these agencies interface with each other to achieve efficiency. Hazard, vulnerability and risk assessments will be executed and the plan incorporates the following:

- National Spatial Development Strategy;
- National Oil Spill Contingency Plan (NOSCP);
- National Earthquake Plan (Draft); and
- Any other relevant plans.

2.1.3 International Conventions and Obligations

Trinidad and Tobago is signatory and party to the Rotterdam, Basel and Stockholm Conventions as well as the International Convention for the Prevention of Pollution from Ships (MARPOL). These international conventions play an important role in assisting developing countries and countries in transition with technical and financial resources to meet their obligations and to achieve the Conventions' long-term success geared towards the sound management of chemicals. Table 2-2 summarizes the international conventions related to chemicals management and the status of accession/ratification for Trinidad and Tobago. Although the Vienna Convention for the protection of the ozone layer and the Montreal Protocol on substances that deplete the ozone layer are not directly related to the management of chemicals, it is worthy to note that Trinidad and Tobago is a signatory to these conventions.

Table 2-2: International Conventions and Accession/Ratification Status for Trinidad and Tobago

Convention	Chemical(s) of concern	Objectives	Obligations under the Convention	Date acceded/ ratified
Rotterdam	Industrial chemicals, pesticides and severely hazardous pesticide formulations	To promote shared responsibility and cooperative efforts among Parties in the international trade of certain hazardous chemicals in order to protect human health and the environment from potential harm; To contribute to the environmentally sound use of those hazardous chemicals by facilitating information exchange about their characteristics, by providing for a national decision-making process on their import and export and by disseminating these decisions to Parties.	To facilitate information exchange as a first line of defence against hazardous chemicals; To enable countries to monitor and control the trade in the chemicals mentioned in the Convention via PIC; To give importing countries the power to make informed decisions as to which of these chemicals they want to receive and those they wish to exclude due to limitations in domestic capacity to safely manage them; To ensure proper labelling and provision of information on potential health and environmental effects related to the specific chemicals being traded.	16/12/2009
Basel	Hazardous waste (chemical waste)	To protect human health and the environment from the harmful effects of hazardous waste.	To develop a National Policy to address the issues of hazardous waste and other wastes and their disposal, including national objectives to minimize the generation of hazardous waste; To formulate legislation to address the formal definition of relevant terms including “hazardous waste”, “transboundary movement”, and “proper disposal”;	18/02/1994

			To formulate guidelines to deal with the storage, transportation and disposal of hazardous and other wastes;	
Stockholm	Persistent Organic Pollutants (POPs)	To protect human health and the environment from persistent organic pollutants	To prohibit and/or eliminate the production and use, as well as the import and export, of the intentionally produced POPs that are listed in Annex A to the Convention; To restrict the production and use, as well as the import and export, of the intentionally produced POPs that are listed in Annex B to the Convention ; To reduce or eliminate releases from unintentionally produced POPs that are listed in Annex C to the Convention; To ensure that stockpiles and wastes consisting of, containing or contaminated with POPs are managed safely and in an environmentally sound manner; To develop implementation plans, information exchange, public information, awareness and education , research and as well as technical assistance and financial resources and mechanisms.	13/12/2002
MARPOL	All chemicals transported by sea	To prevention of pollution of the marine environment by ships from operational or accidental causes.	To addresses pollution from ships by oil, noxious liquid substances carried in bulk, harmful substances carried by	06/06/2000

			sea in packaged form, sewage, garbage and the prevention of air pollution from ships.	
Minamata	Mercury	To protect the human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds.	To place a ban on new mercury mines, phase-out of existing mines, control measures on air emissions, and the international regulation of the informal sector for artisanal and small-scale gold mining.	Not to date

Trinidad and Tobago serves as the host country for the Basel Convention Regional Centre for Training and Technology Transfer for the Caribbean Region (BCRC-Caribbean). This Centre, an independent organisation since 2004, was established under a framework agreement signed between the Government of the Republic of Trinidad and Tobago and the Secretariat of the Basel Convention (Act Number 2 of the Laws of the Republic of Trinidad and Tobago).

The BCRC-Caribbean currently serves fourteen (14) Parties to the Convention throughout the Caribbean region and has been active in providing training, information and technical support in aspects related to the implementation of the Basel Convention as well as the Rotterdam, Stockholm and Minamata Conventions. The creation of this synergies between the conventions aim to strengthen the implementation of the conventions at the national, regional and global levels by providing coherent policy guidance, enhancing efficiency in the provision of support to Parties to the conventions, reducing their administrative burden and maximizing the effective and efficient use of resources at all levels, while maintaining the legal autonomy of these three multilateral environmental agreements. This unique approach is a successful example to other parts of the global environmental agenda and demonstrates how to enhance international environmental governance through coordination and cooperation.

2.2 Non-regulatory Mechanisms for Managing Chemicals

Green Fund

The Green Fund is the National Environmental Fund of the Republic of Trinidad and Tobago established under the Finance Act 2000, amended in 2004 and 2010. This grant facility is available to Community Groups and Organizations, and serves to enhance the quality of the natural environment of Trinidad and Tobago and achieve the goal of the National Environmental Policy of environmentally sustainable development by the provision of financial assistance to organisations and community groups engaged in remediation, reforestation and conservation activities.

The Green fund has a Green Fund Advisory Committee (GFAC) appointed by the Minister with the responsibility for the Environment. The members represent a variety of expertise relevant to the Green Fund including law, finance, environmental management and forestry sectors with the main responsibility of advising on the certification of activities for funding from the Green Fund.

Responsible Care Programmes

Some companies within the private sector, in particular the oil and gas and petrochemical industries in Trinidad, has in place responsible care programmes to ensure protection to human health and the environment through educational awareness and advertisements. At the Point Lisas Industrial Estate, the Responsible Care Mechanism has been introduced. It is a modified version of that created by the Canadian Chemical Producers' Association. It is aimed at addressing public concerns about the manufacture, use and disposal of chemicals. It represents a commitment by the chemical industry to improve continually aspects of health, safety and environmental performance and to communicate

openly about its activities and achievements. These voluntary and rigorous programmes of collective action by member companies include the following:

- Adherence to the principles and objectives of Responsible Care;
- Safety, health and environmental performance, measured by a consistent set of indicators;
- Systems for mutual aid and sharing best practice throughout;
- Channels of communication to the public;
- Responsible Care Management System Guidance and a mandatory self-assessment process.

Recycling Initiative

Trinidad and Tobago Solid Waste Management Company Limited has recently launched a recycling depot in Trinidad as part of a 'get into green' campaign. The recycling depot affords the opportunity to drop off recyclables at no charge. Currently, only beverage containers are accepted but the initiative is expected to extend the range of recyclable items by early 2015.

2.3 Ministries, Agencies and other Governmental Institutions

The following ministries, agencies and governmental institutions are involved with chemicals and waste management in Trinidad and Tobago:

- The MEAU of the Ministry of the Environment and Water Resources;
- The Ministry of Energy and Energy Affairs;
- The Ministry of Health - Pesticides and Toxic Chemicals Board;
- The Ministry of Food Production;
- Ministry of Trade, Industry, Investment and Communication;
- Customs and Excise;
- Tobago House of Assembly - Department of Natural Resources and the Environment (DNRE);
- The Environmental Management Authority; and
- The Ministry of Local Government.

Multilateral Environmental Agreement Unit (MEAU) of the Ministry of the Environment and Water Resources

In Trinidad and Tobago, multilateral environmental agreements (MEAs) are coordinated by the MEAU which falls within the Ministry of the Environment and Water Resources. There are three general categories of MEAs: climate change and ozone, biodiversity and waste, representing the mechanisms through which global environmental issues are addressed. The MEAU has been appointed as the national focal point and the official contact point under the Stockholm Convention, the focal point under the Basel Convention and the designated National Authority under the Rotterdam Convention for chemicals and chemical waste.

In 2012, the MEAU sought to establish MEA focal points, nominated from relevant stakeholders in the public sector, NGOs and Community Based Organizations (CBOs) in order to promote participatory management and decision making on national environmental issues. In particular, the role of the MEA focal point is envisioned as:

- liaising with the Ministry as the National Focal Point in respect of the role and functions of their respective institutions in the context of the national obligations under the various MEA
- providing advice and inputs into strategies and actions to be taken at the national level in the implementation of obligations under the MEA and climate change
- providing inputs, data and information to facilitate reporting requirements of Trinidad and Tobago under the MEA
- providing advice and inputs into work programmes of their respective Ministries/agencies in the context of national obligations under the MEA and climate change
- interfacing with other relevant stakeholders through relevant networking media to enhance co-operation at various levels

The MEAU undertakes the dissemination of information concerning the Conventions, including seminars and workshops.

The Ministry of Energy and Energy Affairs

The Ministry of Energy and Energy Affairs (MEEA) regulates the use of industrial chemicals in the petroleum and petrochemical sectors through its health, safety and environmental department. The MEEA is responsible for the NOSCP and is currently in the process of implementing the NCSCP for Trinidad and Tobago. The sub-committee preparing the NCSCP includes major industries such as Atlantic, PETROTRIN, National Gas Company, Trinidad and Tobago Nation Petroleum Marketing Company Limited and TTEMAS. The MEEA is also responsible for the approved list of chemicals used within the energy sector in Trinidad and Tobago. The list is updated on a monthly basis and includes the chemical intended for use, use category, the company registering the chemical, date of approval, approval period as well as date of expiration for use.

The Ministry of Health - PTCI

The Pesticide and Toxic Chemicals Inspectorate (PTCI), a unit operating under the Chemistry, Food and Drugs Division of the Ministry of Health has the responsibility to ensure that all pesticides used within Trinidad and Tobago meet international standards and the premises where these items are used and stored meet the established regulations. The PTCI is responsible for registering pesticides as well as granting import and premise licenses for the importation and storage of pesticides and toxic chemicals. Registration of a particular chemical is not permanent. Registrations can be reviewed and based on local experience or international information chemicals previously registered can be de-registered. The PTCI is also responsible for pesticide formulation and residue analysis as well as training in handling and harvesting of pesticides and pest control operators certification. The legal framework for the operations of the Inspectorate is the "Pesticides and Toxic Chemicals Act, No. 42 of 1979" (Amended - Act No. 11 of

1986 and No. 2 of 2004) and its Regulations, known as the "Pesticides (Registration and Import Licensing) Regulation of 1987".

In order to have adequate control on the use of pesticides, the Pesticides and Toxic Chemicals Control Board (PTCCB) was established in 1979 under the Pesticides and Toxic Chemicals Act, 1979. The main function of the PTCCB is to advise the Minister on matters relevant to the making of Regulations under the Act and to advise on and monitor the implementation and enforcement of those Regulations

The Ministry of Food Production

The Ministry of Food Production is involved in the control of the importation of pesticides through the PTCCB. The Chief Technical Officer of the Ministry is ex officio, the Deputy Chairman of the PTCCB. In addition, the Ministry has one other member on the PTCCB. The representatives on the PTCCB play an active role on the Screening Committee on the importation of new chemicals.

The Chief Technical Officer of the MFP is also delegated to grant duty-free concessions for agricultural chemicals (pesticides and fertilizers). Such concessions for pesticides would be granted based on recommendations from the Crop Protection sub-Division of the Research Division, on whether the pesticides are registered by the PTCCB, and the proposed use. Fertilizers are also recommended by the Research Division for duty free concessions based on use of the product in agriculture. In addition, the Ministry offers incentives of up to 50% (up to a maximum of \$TT 3,000.00) of cost for the use of environmentally friendly chemicals. A list of such chemicals has been issued by the Ministry.

Ministry of Trade, Industry, Investment and Communications

The Ministry regulates the import and export of chemicals via the negative list and a regime of import/export licenses. The Negative list contains a list of products/goods that can only be imported and exported under a specific license granted by the Ministry of Trade and Industry.

The import negative list includes the following chemicals:

- Trichlorophenyl (2, 4, 5_T);
- Dichlorodiphenyl Trichloroethane (DDT);
- Chlordimeform;
- Dibromochloropropane (DBCP);
- Ethylene Dibromide (EDB);
- Pentachlorophenol (PCP);
- Lead Arsenate;
- Thallium and its salts; and
- Aldrin, Dieldrin and Endrin.

The list includes both the regulated substance as well as any equipment containing the substance. Import licenses issued by the Ministry are used by the Customs Department for clearing cargoes, and are

also examined by the Trinidad and Tobago Bureau of Standards, the Food and Drug Division, and the Pesticides and Toxic Chemicals Inspectorate.

The export of certain chemicals is regulated via the export negative list. The list does not regulate the export of chemicals directly but regulate products containing hazardous chemicals. For example, used lead acid batteries are on the export negative list and certain conditions must be adhered to before shipping. Certain subsidised petroleum products such as gasoline, kerosene, liquid petroleum gas (non-commercial) are also on the negative lists.

Customs and Exercise Division

The work of the Customs and Excise Division is guided by legislation. Imported chemicals are held either at the port of entry or in a bonded warehouse on the importers premises, until cleared for release. When released, the chemicals would go to into warehouse storage for eventual distribution to retail sales. The Customs Division co-ordinates with other governmental agencies concerning the importation of specific substances. For example, the Ministry of Trade, Industry, Investment and Communications would issue import licenses, the Pesticides and Toxic Chemicals Inspectorate would inspect certain items, and the Trinidad and Tobago Bureau of Standards and the Food and Drug Division would inspect others and grant the relevant license.

Tobago House of Assembly – DNRE

The DNRE serves to protect, preserve and enhance Tobago's environment and promote the sustainable use and management of our air, land, and water for the benefit of current and future generations. This Department is committed to protecting and preserving Tobago's natural resources and the environment as well as its biodiversity. This Department is also the arm of the EMA in Tobago monitoring and enforcing the laws pertaining to water pollution, noise pollution, Certificate of Environmental Clearance among others. Matters pertaining to chemicals, both industrial and agricultural are normally handled by the Director of the Department of Natural Resources and the Environment. There are no plans to develop procedures for the management of chemicals specifically for Tobago. Instead, guidelines and procedures developed nationally would be used in Tobago. The DNRE is represented on the MEA Committee of the Ministry of Environment and Water Resources.

The Environmental Management Authority

The Environmental Management Authority (EMA) is an independent administrative body tasked with coordinating, facilitating and overseeing execution of the national environmental strategy and programmes, promoting public awareness of environmental concerns, and establishing an effective regulatory regime to protect, enhance and conserve the environment. The Environmental Management Authority was created under the Environmental Management Act 2000. The EMA presently regulates chemicals and waste via the following mechanisms:

- Their role as Competent Authority under the Basel Convention;
- The Certificate of Environmental Clearance Rules;

- The Water Pollution Rules; and
Air Pollution Rules

The EMA will have a further role in the regulation of waste when the draft Waste Management Rules is enacted.

Ministry of Local Government

The Regional Corporations under the Ministry of Local Government are involved in the collection of municipal solid waste in Trinidad and the THA manages this in Tobago. However, in many instances, this waste contains hazardous materials inclusive of hazardous chemicals and chemical waste. Due to lack of waste separation systems, hazardous waste containing chemicals are collected with general waste and goes directly to the landfill sites. The Solid Waste Management Company of Trinidad and Tobago (SWMCOL) manages the waste generated in Trinidad at their three Landfill sites – Beetham, Forres Park and Guanapo. In the case of liquid waste which includes industrial waste such as by-products from food-processing and production plants, municipal waste, chemical by-products, agricultural waste and wastewater, the waste is transported to the Beetham Landfill for disposal or in the case of oil waste it may be taken for recycling.

2.4 Interministerial Commissions and Coordinating Mechanisms

There are two main commissions/agencies regulating the management of chemicals in Trinidad and Tobago. These are the inter-agency body in the form of PTCCB and the occupational safety and health agency. Table 2-3 provides an overview of the mechanisms for coordinating activities by the Interministerial Commissions.

Table 2-3: Overview of Interministerial Commissions and Coordinating Mechanisms

Name of mechanism	Responsibilities	Secretariat	Members	Legislative Mandate	Effectiveness
PTCCB	Implement the provisions of the Pesticides Control Act	Yes	10	Pesticides and Toxic Chemicals Act 1979	Yes
Occupational Health and Safety Agency	Implementation of the policies formulated by the Occupational Health and Safety Authority	Yes		Occupational Health and Safety Act 2004	Yes

Pesticides and Toxic Chemicals Control Board (PTCCB)

The PTCCB is a statutory body under the Ministry of Agriculture mandated to implement the provisions of the Pesticides and Toxic Chemicals Control Act which controls the importation, sale, storage, and use of pesticides and toxic chemicals in Trinidad and Tobago. Since there are no local manufacturers of pesticides in Trinidad, the Board has registered over 700 pesticide formulations for importation and sale in the country. However, only a little more than 20 of these products are sold in the country, most of which contain the same chemicals, namely paraquat.

In order to have adequate control on the use of Pesticides, the PTCCB was established in 1979 under the Pesticides and Toxic Chemicals Act, 1979. This Act was enacted to regulate the importation, storage, manufacture, packaging, sale, use, transportation and disposal of Pesticides and Toxic Chemicals. The main functions of the Board are to advise the Minister on matters relevant to the making of Regulations under the Act, to advise on and monitor the implementation and enforcement of those Regulations and to furnish such returns as the Minister may from time to time require.

The composition of the Board provides for coordination between various ministries and their agencies, which impinge on the safety and use of pesticides. The Board is comprised of ten members. The members include the Chief Medical Officer, Ministry of Health (Chairman); Chief Technical Officer, Ministry of Food Production (Deputy Chairman); Chief Chemist and Director of Food and Drugs; Executive Director, Trinidad and Tobago Bureau of Standards; Industrial Inspections Supervisor, Occupational and Health Division; representatives from an organization of Workers and an organization of Employers; Specialists in Occupational Medicine or Industrial Hygiene, Wildlife Management and in the Use or Effects of Pesticides.

The Registrar of Pesticides and Toxic Chemicals at the Chemistry, Food and Drugs Division serves as Secretary to the Board and co-ordinates all the Board's activities. In addition, the Registrar is responsible for the Administration of this Act and Regulations. The day-to-day monitoring and enforcement is done by the PTCI and includes the following:

- Registration of Pesticides. All pesticides used in Trinidad and Tobago, whether imported or locally manufactured, must be registered by the Board and assigned a registration number. Certificates of Registration are issued for pesticides that have been approved for registration. The Register of Pesticides is maintained by the Registrar, Pesticides and Toxic Chemicals;
- Inspection and licensing of premises for the sale, storage, packaging and manufacture of pesticides. Establishments dealing in pesticides must be licensed annually. An inspection by the Pesticides and Toxic Chemicals Inspector is performed to ensure compliance with the regulations. Premises include Agricultural Shops, Hardware Stores, Pet Stores, Pest Control Operators, Supermarkets, Pharmacies, Importers, Packagers and Manufacturers of pesticides. The Register of Licenses is maintained by the Registrar, Pesticides and Toxic Chemicals;
- Routine inspection of pesticide products in the market place for compliance with Registration, Labelling and Packaging requirements;

- Monitoring and control of imports of pesticides in order to allow only the importation of registered pesticides;
- Inspection and sampling of shipments as well as sampling of locally manufactured pesticides for analysis;
- Acquisition and dissemination of information related to pesticides and toxic chemicals;
- Receiving and acting on complaints;
- Participating with local, regional and international organizations in programmes related to pesticides and toxic chemicals.

The Pesticides and Toxic Chemicals Control Board is cognizant of its role in the control of pesticides and toxic chemicals. Its policies composed of pesticide legislation and consequent regulations seek to ascertain pesticide quality, minimize exposure, and determine a proper balance between risks and benefits from the use of pesticides in Trinidad and Tobago.

Occupational Safety and Health Agency

The OSH Agency was preceded by the Factories Inspectorate which was governed by the Factories Ordinance Chapter 30 No.2, 1950. This was Trinidad and Tobago's first safety and health legislation, which provided for the making of regulations, thereby laying down safety, health and welfare standards in respect of machinery, plant and hazardous processes. The main objective of the Agency is compliance with the Act and related regulations. As such, public awareness, the sensitization of industrial partners and stakeholders and close co-operation with other Ministries and institutions, the conduct of training are critical to the promotion of a preventative safety and health culture in Trinidad and Tobago.

The Occupational Safety and Health Agency is an enforcing body with legal powers of access to every industrial establishment, to undertake investigations and to use their legal intervention powers i.e. the issuing of Improvement Notices, Prohibition Notices and starting prosecution procedures in the Industrial Court, or in specific cases, the Criminal Court. As of August 2007 the Occupational Safety and Health Agency commenced its general operations placing emphasis in the areas of Oil and Gas, Ports, Chemical and Petrochemical Industry, General Manufacturing Construction and Quarries, Agriculture and Public Services, and Occupational Health.

The Agency is responsible for the implementation of the policies formulated by the Authority, for initiating consultation with government entities performing various inspection functions, with the objective of formulating memoranda of understanding, establishing mechanisms for co-ordination across jurisdictional lines and the provision for the implementation of integrated occupational safety and health programs. One of the targets for the OSH Agency is to continuously work towards the building and sustaining of a modern, efficient, effective and highly professional Safety and Health Inspection Service that meets international standards. This implies an organisation that will be considered reliable, communicative and accountable, with a high impact and a good image.

2.5 Description of Nongovernmental Organisations/Programmes

2.5.1 Industrial Organization and Entities

The Energy Chamber of Trinidad and Tobago, ECTT (formerly The South Trinidad Chamber of Industry and Commerce, STCIC) is the representative organization for the Trinidad & Tobago energy and related sectors. The Chamber is based in the Point Lisas Industrial Estate - a world class hub of dynamic energy and heavy industrial sectors in Trinidad and Tobago. The Energy Chamber is an independent non-political organization governed by a Board elected annually by the membership. The Energy Chamber has a strong tradition of vigorously and effectively representing their members' interests and for significantly contributing to national development.

The Chamber conducts training on Hazard Communication (Hazcom) designed to provide workers with the information needed to understand the hazards and identities of the chemicals they are exposed to when working. In addition, the Energy Chamber of Trinidad and Tobago promotes the practice of corporate social responsibility by being involved in social and environmental issues such as beach clean ups.

Joint Health and Safety Committees (JHSC) exist at some of the better organized industrial establishments in Trinidad and Tobago. They consist of representatives of management and workers and are chaired by a person with authority to take important decisions.

An important attention area of any JHSC is the matter of sound management of chemicals and the prevention of industrial disasters. JHSCs consider the systems of work generally, and that relating to the handling, use, transport and disposal of chemicals with special reference to proper personal protective clothing and equipment.

A non-governmental organisation involved in chemical safety management is the Trinidad and Tobago Emergency Mutual Aid Scheme (TTEMAS). The organisation's vision is to provide regional leadership in industrial preparedness and emergency response. Its mission is to provide an effective mutual aid system in the event of critical incidents and to influence the national community to adopt policies, practices and procedures for the elimination, containment and mitigation of technological disasters.

The Responsible Care Approach has been adopted in which there is commitment to safety and environmental sustainability, where environmental and safety management has been merged into all business processes. Emergency simulations conducted by TTEMAS include a release of ammonia, an aircraft crash at a chemical plant, offshore earthquake with natural gas line rupture, a chlorine release, a methanol release with fire and explosion and a release of butane from a tank.

Point Lisas Industrial Port Development Corporation Limited (PLIPDECO) has an important role in chemical safety management. It manages an industrial estate where there are 11 ammonia plants, 2 urea plants, 7 methanol plants, and 1 urea formaldehyde plant. PLIPDECO and the major petrochemical tenants of the Point Lisas Industrial Estate, under the auspices of the Point Lisas Energy Association of CEO's (PLEA) embarked upon a project to ensure that all stakeholders are made aware of the operations

on the industrial estate and are adequately prepared for emergencies that may arise through industrial mishaps due to chemical releases, explosions, fires or natural disasters (earthquakes, hurricanes and floods). PLEA therefore took a decision to develop and implement an Estate-wide Community Awareness and Emergency Response programme to improve on its community interaction and relations on emergency preparedness and response. They also work closely with the neighbouring communities and schools to ensure that they are aware of the emergency plans and contingency measures.

2.5.2 Labour Unions and Workers' Association

In respect of occupational safety and health, the Employers' Consultative Association (ECA) is a major stakeholder. It is the umbrella organisation for the Chamber of Commerce, the Trinidad and Tobago Manufacturers Association (TTMA) and others. The activities of the ECA relative to the occupational safety and health include:

- Creation of awareness of OSH among its 86 members.
- Management training: an average of four programmes annually and
- Representation on committees on OSH, on the National Emergency Management Agency (NEMA) and on the Pesticides and Toxic Chemicals Control Board.

The ECA, the labour movement and the government discuss matters of occupational safety and health and seek to promote awareness generally. At the enterprise level, small and medium-sized enterprises (SMEs) establish OSH committees having employer and worker representation on a voluntary basis.

The National Safety Council of Trinidad and Tobago attempts to educate and influence workers and employers to adopt safety, health and environmental policies, practices and procedures that prevent and mitigate human suffering and economic losses arising from preventable causes. The Council, a non-government organisation cannot regulate but influences public opinion, attitudes and behaviour in matters of safety and the working environment.

2.5.3 Universities, Research institutes, Private laboratories, Libraries and Governmental Organisations, Agencies and Statutory Authorities

Universities

The Department of Life Sciences at the University of the West Indies offers a Bachelor of Science (B.Sc.) Degree in Natural Resource Management and the Department of Chemistry offers a Master of Science (M.Sc.) Degree in Occupational and Environmental Safety and Health. The University of Trinidad and Tobago also offers an M.Sc. in Environmental Science and Management programme which is designed to prepare professionals to become technical managers and leaders in the areas of Environmental Science and Management.

The Department of Environmental Sciences at the College of Science, Technology and Applied Arts of Trinidad and Tobago (COSTAATT) offers a wide range of degrees to ensure the sound management of chemicals. These include degrees in environmental management, water and wastewater management, water resources management and technology, occupational safety and environmental health.

Research institutes

The Department of Science and Technology at the University of the West Indies is also a research based institute. Research has been done to identify hazardous chemicals such as heavy metals and hydrocarbons in inland water ways as well as environmental monitoring and hazardous waste management and disposal.

The Caribbean Agricultural Research and Development Institute (CARDI) have been steadfast in providing contributions to the growth and development of the agricultural sector of Member Countries of the Caribbean Community. CARDI serves as the agricultural research and development unit and it is the only regional agricultural institution. CARDI has a critical role to play in the implementation and co-ordination of key technology and Information Systems.

Global Management, Environment, Safety and Health Limited is a private multi-disciplinary company based in Trinidad. They have the capacity to undertake risk assessments for industrial chemicals as well as pesticides. Other private environmental consulting firms on the island do not currently have the in-house capacity to undertake risk assessment on chemicals but can partner with international companies with the required expertise on short notice.

Private laboratories

Trinidad and Tobago has a variety of private laboratories conducting the following tests:

- a wide range of water quality tests (heavy metals, dissolved oxygen and oxygen demand, suspended solids, nutrients, bacteriological tests and inorganics as well as petrochemical process and product testing).
- pesticides, industrial chemicals, petroleum organic and inorganic chemicals testing and analysis

The private laboratories have various degrees of accreditation and standards, inclusive of the following:

- accreditation with the TT Labs System of the TTBS which is audited by the EMA (for general environmentally safe practices) and the MEEA
- testing in accordance to the American Water and Wastewater Association, United States Environmental Protection Agency, American Society for Testing and Materials and International Standards Organisation.

Libraries

The EMA has an Information Centre which houses a reference collection. The collection consists of books, reports, periodicals, law, audio visual materials, environmental posters, newspaper clippings, pamphlets, brochures and ephemera on the environment. It is open to the public. The National Registers are housed in the Information Centre. They are the Certificates of Environmental Clearance Register, the Noise Variation Register, the Source Registration Register and the Water Polluters' Permit Register. Members of the public can access the files and request photocopies.

The Alma Jordan library at the UWI contains a wide collection of information on chemicals and chemical management. The library also houses all theses completed at the Universities (B.Sc., M.Sc. and doctorate) on research carried out on both industrial chemicals and agrichemicals. These documents can contain chemical data and mechanism for sound management but are of limited use due to very restricted circulation.

Governmental Organisations, Agencies and Statutory Authorities

The Institute of Marine affairs (IMA) is a state-owned research unit with the focus on stimulating and advancing marine scientific research in Trinidad and Tobago. IMA aims to develop and implement programmes and projects that translate the marine and related policies of the Government into activities that contribute to national development as well as develop and execute programmes and projects that foster and encourage regional and international collaboration in the exploitation of the marine and other related areas of the environment.

The Environmental Laboratory at the Chemistry Food and Drugs Division (CFDD) of the Ministry of Health undertakes testing with regards to pesticide formulations, water quality (including pesticides and heavy metals) and pesticide residues on agricultural produce. CFDD's laboratory is not accredited but the testing is monitored by the Ministry of Health. Testing is conducted according to the American Water and Wastewater Association and United States Environmental Protection Agency. The laboratory presently has the capacity to test pesticides and toxic chemicals.

The National Institute of Higher Education, Research, Science and Technology (NIHERST) was established as a statutory body by the Republic of Trinidad and Tobago and has resourcefully pursued its mandate to promote the development of science, technology and higher education in Trinidad and Tobago, and enhance the innovative, creative and entrepreneurial capabilities of the general population. The fulfilment of this mandate has been guided both by changes in national development priorities and government's policy imperatives.

The Caribbean Industrial Research Institute (CARIRI) is a state owned research institution doing testing according to the American Water and Wastewater Association and United States Environmental Protection Agency. CARIRI has the capability to test for pesticides and industrial chemicals.

The Caribbean Public Health Agency (CARPHA) is the new single regional public health agency for the Caribbean. It was legally established in July 2011 by an Inter-Governmental Agreement signed by Caribbean Community Member States and began operation in January 2013. The Agency rationalized public health arrangements in the Region.

CARPHA monitors environmental health through laboratory services providing water quality testing – potable, recreational, wastewater, bottled water, coastal water and heavy metal and pesticide residue testing – soil, water, raw materials and processed food products.

2.5.4 Public Interest Groups and other Nongovernmental Organisations

Greenlight Network, a community based organisation, was founded 2006, Trinidad & Tobago to act on behalf of the Environment to identify problems, develop creative solutions and initiate action to ensure that the responsibility towards nature is fulfilled, stimulate positive transformation and, educate and raise awareness through creative projects and activism. Greenlight Network launched the Plastikeep Recovery Programme was created to address Trinidad’s problem of plastic waste as well as the lack of knowledge and consciousness by the general population regarding responsible disposal of post-consumer plastics.

The Green TNT (www.greentnt.org) website and blog discusses issues on chemicals and the potential environmental impacts. Environment Tobago is a national, environmental, non-governmental, volunteer and membership organization established in 1996 that rallies against negative environmental activities. Education ranks highly on the Environment Tobago agenda. Outreach programs include a traveling eco-classroom (exhibitions, audio-visual presentations and activities), public exhibitions. Secondary school presentations for Business and Chemistry (covering topics such as Environmental Economics, solid waste and water pollution, climate change, ethics and valuation), primary schools biodiversity modules and teacher training environmental education.

2.6 Summary of the Key Administrative Procedures for Control of Chemicals

EMA (Certificate of Environmental Clearance (CEC) Rules, 2001)

The CEC Rules is a piece of legislation generated from the Environmental Management Act Chapter 35:05. The Rules guides the assessment of small and large-scale developmental projects which may have both positive and negative environmental effects.

The Certificate of Environmental Clearance (Designated Activities) Order 2001 defines the forty-four (44) activities which require a CEC. During the assessment of applications, the EMA takes into consideration foreseeable impacts which may arise out of any new or significantly modified construction, process, works or other activity as outlined by the Order. At the preliminary phase of the assessment of the proposed project, if potential significant environmental and human health impacts have been identified, the applicant may be asked to conduct an environmental impact assessment which identifies the likely effects the project as whole may have on the environment and society. In terms of chemicals

management, the environmental impact assessment is used to demonstrate the potential risks associated with hazardous chemicals reaching the environment, possible mitigation measures as well as the use of alternatives.

Pesticide and Toxic Chemicals Inspectorate (PTCI)

The PTCI operating under the Chemistry, Food and Drug Division of the Ministry of Health is responsible for the registration of pesticides as well as ensuring that the premises where these items are used and stored meet the established regulations. This is done through a registration and licensing system.

The pesticide registration involves the submission of a completed application form, publication in the daily paper, public consultation, product review by a screening committee, product approval by the PTCCB and generation of a registration certificate. This process takes approximately 120 days from receipt of completed application form and has a fee attached.

The importation of pesticides or toxic chemicals involves the submission of a completed application form to the PTCI together with proof of product registration and/or authorization from the manufacturer of the product. This process has a timeframe of three days before an import license is prepared and granted. A premises license is granted upon submission of a completed application form and inspection of the premises. This can take up to one month before a premises license is prepared.

Central Statistical Office (CSO)

The Central Statistical Office is a Division of the Ministry of Planning and Sustainable Development charged with the responsibility of taking censuses in the Republic of Trinidad and Tobago and collecting, compiling, analyzing and publishing statistical information relating to all social and economic activities of the people of the Republic of Trinidad and Tobago. The CSO collects data on all chemicals produced, imported and exported from Trinidad and Tobago.

Trinidad and Tobago Bureau of Standards (TTBS)

The Trinidad and Tobago Bureau of Standards (TTBS) is a corporate body governed by the authority of the Standards Act No. 18 of 1997. The TTBS operates under the aegis of the Ministry of Trade, Industry, Investment and Communications. It has a statutory responsibility for the quality of goods and services, which are subject to trade in the Republic of Trinidad & Tobago, except food, drugs and cosmetics, medical devices, pesticides and agricultural produce. All other chemicals fall under the jurisdiction of the TTBS.

The primary role of TTBS is to develop, promote and enforce standards in order to improve the quality and performance of goods produced or used in the country, to ensure industrial efficiency and development, to promote public and industrial welfare, health and safety and protect the environment.

Ministry of Trade, Industry, Investment and Communications

The Negative List controls in import and export of certain hazardous chemicals. All applications for related to the import of chemicals on the negative import list must be made online via the government website and the must clearly state the chemical being imported and the supplier information.

The export negative list provides provisions for the movement of used lead acid batteries (ULABs) from Trinidad and Tobago. The following must apply:

- ULABs must not be shipped in any container containing other goods, materials or scrap metal;
- containers containing ULABs for export may be subject to inspection by the relevant authorities;
- containers containing ULABs for export purposes must clearly bear the name of the exporter and must be airtight;
- the minimum capacity requirement for the shipment of ULABs is one (1) twenty-tonne container per month;
- containers used for the shipment/export of ULABs must carry International Maritime Dangerous Goods (IMDG) sticker labels class 6, 8 and 9 on the exterior of the container to clearly distinguish containers that hold hazardous materials; and
- shipping documents are to be authorized by the Customs and Excise Division and submitted to the Port Authority of Trinidad and Tobago prior to the arrival of the container at the Port. Persons whose documents are found not to be in order will not be allowed entry of the container on the Port.

Customs and Excise, MoFE

Customs and Excise Department uses Asycuda, a computerized customs management system which uses the Harmonised System (HS) code developed by the World Customs Organization to classify all traded products. The importance of this system is that it is used by customs organizations worldwide to control which products enter and exit a country. The system has the ability to generate trade data that can be used for statistical economic analysis. All chemicals imported are given specific HS code and are the quantity imported/exported and the associated monetary value is recorded. Trinidad and Tobago has adopted the Asycuda since 2009, which replaces the manual system of recording imports and exports of products.

Ministry of Energy and Energy Affairs

The MEEA keeps an updated list of all approved chemicals used within the energy sector of Trinidad and Tobago. Any requests for approval of chemicals to be used in the energy sector are forwarded to the Downstream and Retail Marketing Division, MEEA. Companies requesting approvals are required to abide by the MEEA Guidelines found in the “Procedure for the Approval of Oilfield and Industrial Chemicals” before consideration is given for the chemical to be used within the energy sector. These guidelines stipulate that information must be provided to the MEEA on the use of the chemical, the

concentration to be used, the frequency of use, treatment/storage/disposal after use as well as verified laboratory reports on the chemical's toxicity and biodegradability properties.

2.7 Assessment

There is existing legislation for the sound management of chemicals in Trinidad and Tobago. However, the current legislation does not coherently regulate the entire life cycles of chemicals (Table 2-4) and the legislation is segregated according to different Ministries. Table 2-5 provides a legal overview of the responsibilities and activities of ministries, agencies and other governmental institutions related to chemical management for each stage of the chemical life cycle from production/import through disposal and recycling.

Table 2-4: Overview of Legal Instruments to Manage Chemicals

Category of Chemical	Importation	Production	Storage	Transport	Distribution	Use/Handling	Disposal/Recycle
Pesticides	X	X	X	X	X	X	X
Fertilizers	X	X	X	X	X	X	X
Industrial Chemicals	X	X	X	X		X	X
Petroleum Products		X	X	X		X	X
Consumer Chemicals	X						
Explosives	X	X	X	X		X	
Chemical Waste				X		X	X

Table 2-5: Responsibilities of Ministries, Agencies and other Governmental Institutions¹

Stages of Life Cycle Concerned Ministries, Agencies and Governmental Institutions	Importation	Production	Storage	Transport	Distribution	Use/Handling	Disposal/Recycle
Environment			X				X
Health	X		X	X	X	X	X
Energy		X	X	X	X	X	
Food Production	X				X	X	
Labour & Small & Micro Enterprise Development			X			X	X
Trade, Industry, Investment and	X	X			X		

Communication							
Finance	x	X					
National Security	x			x	x	x	x
Customs & Excise	x	X					
Foreign Affairs	x						
Local Government				x		x	x
DNRE, Tobago House of Assembly						x	
EMA			x			x	x
SWMCOL				x		x	x

1 represents a check in the appropriate box with an 'x' to demonstrate where ministries, agencies and other governmental institutions have responsibilities

The PTCI Acts and Regulations for the management of agrichemicals and toxic chemicals have been proven to be an effective piece of legislation in Trinidad and Tobago as it allows for a “cradle to grave” approach to the management of chemicals. The only reported drawback was a lack of regulations to manage operators and importers of pesticides. However, there appears to be a greater focus on the regulation of pesticides than industrial chemicals. In comparison, legislation is severely lacking in terms of consumer products such as household detergents, cosmetics and toiletries. Regulating the use and disposal of these products is of primary importance as they are continually used on a daily basis. The Occupational Safety and Health Division under the Ministry of Labour and Small and Micro Enterprises Development have the responsibility for promoting and monitoring chemical safety of persons employed in the workplace.

The Government of Trinidad and Tobago, in particular the Ministry of Environment and Water Resources (MEWR) is working on existing gaps within legislation affecting the sound management of chemicals. The MEWR are currently in the process of enacting a Waste Recycling Bill to encourage the reuse and recycling of metals and plastics and other recyclable items, hence reducing the quantities reaching the environment. The Waste Management (Hazardous Waste) Rules 2014 (draft) is currently out for public consultation and an integrated solid waste management action plan is currently being developed to ensure the protection of people and the environment. The draft regulations for the disposal of hazardous wastes incorporate tenets enshrined in the Basel Convention (1989), hence this is a step in the right direction to meeting international obligations.

Synergies between the different Convention (Basel, Rotterdam and Stockholm) have also strengthened the implementation of the three conventions at the national, regional and global levels by providing coherent policy guidance, enhancing efficiency in the provision of support to Parties to the conventions, reducing their administrative burden and maximizing the effective and efficient use of resources at all levels, while maintaining the legal autonomy of these three multilateral environmental agreements. The role and functions of the BCRC-Caribbean therefore continues to expand given the lack of a regional centre for the Stockholm and Rotterdam Convention in the Caribbean. The BCRC-Caribbean has successfully managed workshops and projects related to e-waste and used tyres, industrial chemicals, and POPs.

The different Ministries and Agencies have different responsibilities in terms of chemicals management due to the different stages in the life cycle and different uses of chemicals. The MEEA manages to a limited extent, the use of industrial chemicals whilst the PTCCB is responsible for registering toxic chemicals and pesticides imported into Trinidad and Tobago. There is the potential for overlap as some of these chemicals have multiple uses. The transportation and distribution of chemicals are poorly managed. The disposal of waste inclusive of any hazardous chemicals from companies is managed independently by private companies. Hazardous chemicals are collected from these companies and treated at different facilities. However, there is no system in place to mandate this presently. Also household hazardous wastes are disposed of in the municipal waste stream and end up at the various landfill sites. These landfill sites were not designed for hazardous wastes though. A proper waste management system is needed for managing disposal where the amount of hazardous chemicals reaching landfills can be reduced.

Although there is currently no overarching chemicals' management coordinating mechanism, several important interagency/inter-sectoral institutions exist, which have very specialized focus pertaining to either a specific group of chemical or a specific issue associated with management of chemicals. The mechanisms for obtaining input and for co-ordination have been working satisfactorily. They have achieved their objectives regarding the management of chemicals and the preservation of the environment. All the agencies have been very cooperative in providing information and in sending representatives when required for discussions. The following feedback was received concerning coordinating mechanisms (Sammy 2013):

- The administration of import controls via the Negative List involves a number of agencies, and the Ministry of Trade, Industry, Investment and Communication and the Comptroller of Customs consider this to be an efficient and successful collaborative effort.
- The Chief Technical Officer of the Ministry of Food Production is, ex officio, the Deputy Chairman of the PTCCB. In addition, the MFP has one other member on the PTCCB. There is a representative of the EMA on the PTCCB. The MFP reported that its representative plays an important role on the Screening Committee on the importation of new chemicals.
- The MEEA noted that the Subcommittee preparing the Chemical Management Plan includes major industries and TTEMAS, hence there is information flow to the industrial sector via these organisations. Generally, the information flow is very good with the larger industries as compared to medium and small scale industries.
- The EMA has assigned Memorandums of Understanding with a number of government agencies. One manifestation of coordination is the multi-agency review of environmental impact assessments. The EMA agrees that this system is functional but acknowledges that some agencies were less available than others possibly due to resource limitation.

- The DNRE of the THA indicated that under their Memorandum of Understanding with the EMA, the roles and functions of the EMA are delegated to the DNRE. There are regular meeting between the director of the DNRE and the CEO of the EMA, and the DNRE considers that the system of delegation works well. The DNRE also involves a large number of Agencies of the THA and other stakeholders in the CEC/EIA process.
- The DNRE is also represented on the Multilateral Environmental Agreements Committee of the Ministry of Environment and Water Resources and the Wildlife Committee of the Forestry Division. The system is reported to work satisfactorily, except for occasional challenges in getting DNRE staff to meetings in Trinidad.

Trinidad and Tobago has an array of activities of industries, public interest groups, professional bodies and the research sectors with the capacities and capabilities to support national efforts to manage chemicals. For example, a non-government organization such as TTEMAS has played an important role in heightening awareness and sensitivity of the corporate community in a number of areas including preparedness for chemical fires. The emergency simulations are vital aspects of preparedness. The operations of the National Safety Council of Trinidad and Tobago have also been enhanced over the past years. They have been actively involved in offering workshops and seminars on different aspects of health and safety in the workplace. More recently the Council has been promoting an outreach compliance program on the Occupational Safety and Health Act No. 1, 2004 (as amended) aimed at assisting both member and non-member establishments to meet or exceed the requirements of the Act.

The universities, research institutes, Governmental Organisations, Agencies and Statutory Authorities, and the private laboratories also contribute to accumulating data on chemicals in the environment. Although there are information, studies and research conducted by these non-governmental organisation relevant for strengthening the government's capacity for chemicals management, this information is not easily available. There is no communication system in place to allow ease of use of data as data are kept independently within each organisation.

The different ministries/agencies within the Government of Trinidad and Tobago have systems in place to allow for public consultation for any national policy and legislation being enacted. Copies of draft regulation/policies are distributed to the Regional Corporations and the public (inclusive of NGOs) is given the opportunity to submit comments and concerns. Further relationships need to be built to ensure that non-governmental organizations can work together with government to strengthen the management of chemicals in Trinidad and Tobago, focusing on creating opportunities for information exchange. There is currently a need for more involvement from NGOs to support national efforts to manage chemicals. Although Greenlight Network has started a recycling initiative and awareness programmes, emphasis still needs to be placed on education and mindfulness of the safe use of chemicals especially at homes. Funding availability creates a hurdle for involvement for NGOs, however the Green Fund under the Ministry of Environment and Water Resources as well as other international funding agencies can be approached to attain funds. Table 2-6 provides a summary of the

nongovernmental organizations which might be available to support national programmes and policies related to chemicals management.

Table 2-6: Summary of Expertise available outside of Government

Field of Expertise	Industrial organisation	Labour Unions and Workers' Association	Universities	Research Institutes	Private laboratories	Libraries	Organisations, Agencies and Statutory Authorities	Public Interest Groups and NGOs
Data collection	X		X	X	X	X	X	
Testing of chemicals	X		X	X	X		X	
Risk assessment			X	X	X		X	
Risk communication	X	X		X			X	
Risk reduction			X	X			X	
Policy analysis			X	X			X	
Classification and labelling				X			X	
Training and education	X	X	X	X	X	X	X	X
Accreditation				X	X		X	
Research of Alternatives				X	X		X	X
Monitoring	X		X	X	X		X	
Health surveillance	X	X	X	X	X		X	
Environmental surveillance	X		X	X	X		X	X
Enforcement								
Information to Workers	X	X	X	X		X	X	X
Information to specific professional groups	X	X	X	X		X	X	X
Information to public	X		X	X		X	X	X
Diagnoses and treatment of poisoning								

'x' represents availability of expertise outside the Government

An ideal approach for the sound management of chemicals would involve a holistic approach to have a single piece of legislation governing all chemicals including all stages of their entire life cycles. This will not only addresses the risks to man and the environment resulting from the production of individual substances, but also the risks posed by products made from these substances and by the use of natural resources and energy to create these substances and products. A collective approach to legislation would also enable the examining and responding to the possible negative impacts on chemical safety as well as facilitating and promoting environmental democracy in relation to chemical safety, so that all stakeholders will be better informed and on an equal footing when discussing relevant environmental

issues. There is also the need for a functional coordinating mechanism with clear legislated mandates and broad membership under the MEWR and MEEA completely devoted to the integrated management of chemicals. In light of diverse ministerial responsibility, for the sound management of chemicals it is critical that everyone be actively involved in the organization of Trinidad and Tobago's chemicals management sector by creating a comprehensive and well-coordinated, functional inter-ministerial/inter-sectoral mechanism.

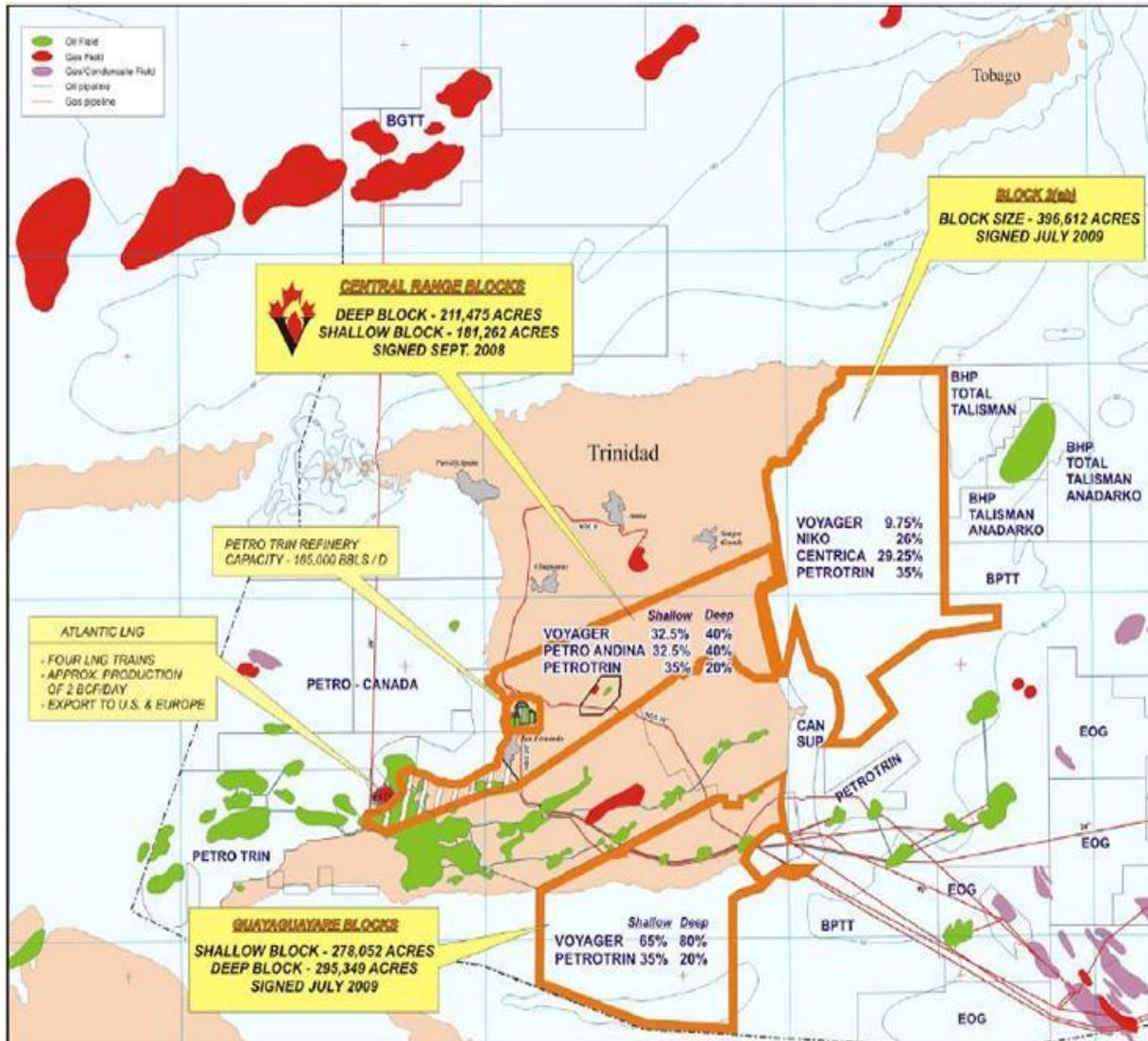
Chapter 3: Chemical Production, Import, Export, Storage, Transport, Use and Disposal

This chapter provides an overview of the life cycle of chemicals in Trinidad and Tobago from production and/or import to disposal and handling of chemical waste.

3.1 Background

Trinidad and Tobago is the largest oil and natural gas producer in the Caribbean and a major player in the global chemicals market. The hydrocarbon industry in Trinidad and Tobago includes exploration and refining of crude oil and natural gas, both offshore and onshore. The industry shifted from an oil dominant one to a mostly natural gas based sector in the early 1990s. Proven crude oil reserves in 2013 were estimated at 728 million barrels whilst natural gas reserves were 25.24 trillion cubic feet. The offshore and onshore oil and gas fields as well as the refinery at Pointe-a-Pierre are shown in Figure 3-1.

Additionally, over 20 service companies import production chemicals for use within the oil and gas sector (Ministry of Energy and Energy Affairs 2015).



Source: Ministry of Energy and Energy Affairs 2015

Figure 3-1: Oil and Gas Industry of Trinidad and Tobago

Trinidad and Tobago is the world’s largest exporter of ammonia and the second largest exporter of methanol. The industrial sites include 11 ammonia plants ranging in annual capacity from 285,000 tonnes to 650,000 tonnes; for a total annual capacity of 5.7 million tonnes, seven (7) methanol plants ranging in annual capacity from 480,000 tonnes to 1.89 million tonnes; for a total annual capacity of 6.6 million tonnes and 2 urea plants with a daily capacity of 4123MT (Trinidad and Tobago Extractive Industries Transparency Initiative 2014). The major industrial sites in Trinidad and Tobago are shown in Figure 3-2.



Source: Central Statistical Office 2010

Figure 3-2: Major Industrial sites in Trinidad and Tobago

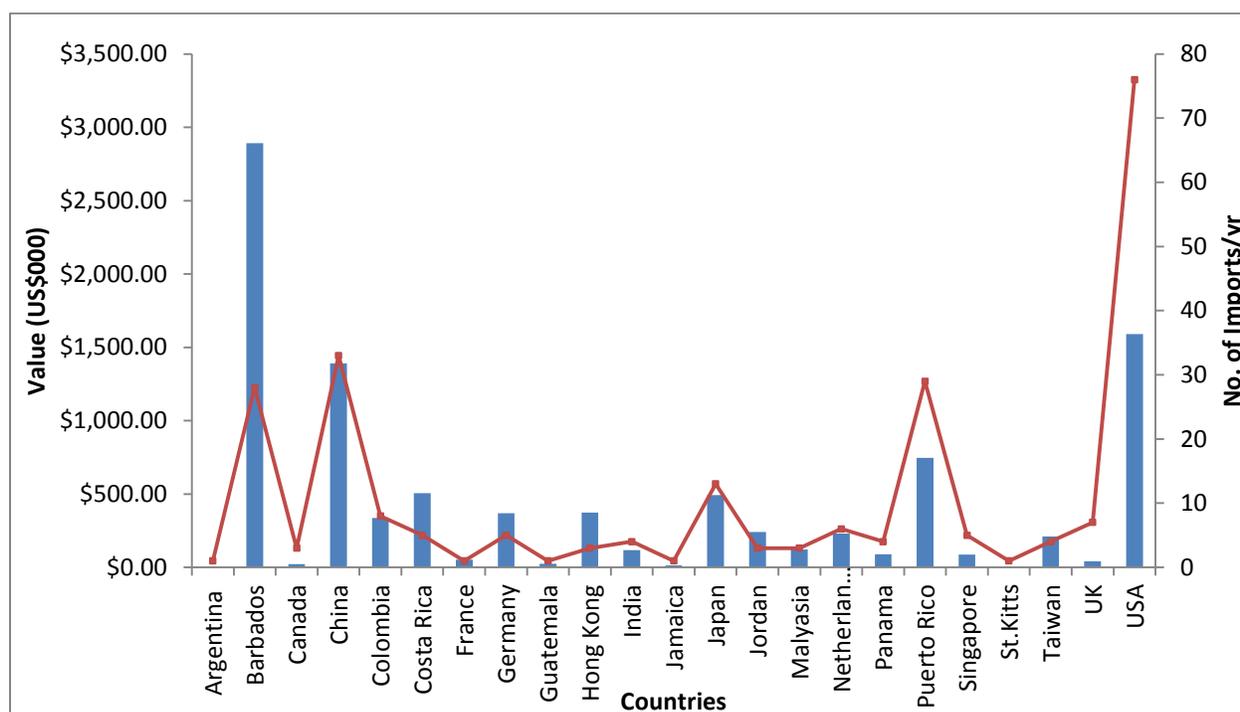
Power generation in Trinidad and Tobago is largely from natural gas. There are five power plants in Trinidad ranging in size from 225 MW to 838 MW, with a total capacity of 2,289 MW. The single power plant in Tobago, located at the Cove Eco-Industrial Estate, has a capacity of 76.6 MW, and can run on diesel as well as natural gas.

3.2 Chemical Production, Import and Export

The extensive chemical industry in Trinidad and Tobago includes all stages of chemical production from crude oil and natural gas extraction and refining, to the production of major feedstock chemicals such as methanol and ammonia to end-user chemicals such as bleaches and detergents. The MoFE reported that the country's energy sector contributed to 43.7% of the country's GDP, 84% of the country's exports and 54.3% of total revenues in 2012 (TTEITI 2013). Approximately 75% of methanol produced is exported to the North American market, 24% to the European market and the remaining 1% is sold locally. Some intermediate chemicals include urea production in Point Lisas with an annual output of 550,000 tonnes and a downstream Ammonia-Urea Ammonium Nitrate-Melamine (AUM) Complex also located in Point Lisas, which commenced commercial operations in 2010 with product sales to both North America and Europe. The AUM Complex produces 1.5 million metric tonnes of urea ammonium nitrate and 60,000 metric tonnes of melamine. There are also plans underway for a new methanol and di-methyl-ether (DME) plant in Union Estate, La Brea. This plant will be operated by Caribbean Gas Chemical Limited (CGCL). A new liquefied natural gas plant is also planned for La Brea and will be operated by Caribbean LNG Limited (CLNG).

In addition to the major players in the chemicals sector, there are numerous medium to small scale manufacturing industries, and service companies specific to the oil and gas sector in Trinidad and Tobago. Chemicals produced include maleic anhydride and its derivatives, sodium hypochlorite, chlorine gas, sodium hydroxide and calcium chloride. The service companies are privatized and import chemicals to be reformulated, repackaged and distributed as production chemicals as well as for cleaning, degreasing, anti-corrosion and water treatment for the oil and gas sector.

Chemicals used in the agricultural sector as fertilizers and pesticides are also used in the industrial sector as intermediate chemicals, hence the need for consideration pesticides and fertilizers in this report. Figure 3-3 gives an overview of the imports of pesticides for Trinidad and Tobago for 2014. The graph illustrates that whilst the highest number of imports comes from the United States, the largest quantity of pesticides imported (based on monetary value) comes from Barbados. Other high import countries include China, United States and Puerto Rico. Consumer chemicals are included as some industrial chemicals are used within the household as cleaning agents. Table 3-1 summarizes the major industrial chemicals produced, imported and exported for Trinidad and Tobago. Annex IV give details on all imports and exports from Trinidad and Tobago.



Source: Data from PTCI 2014

Figure 3-3: Pesticide Import to Trinidad and Tobago 2014

Table 3-1: Chemical Production, Import and Export for Trinidad and Tobago 2013

Chemical Type	Production/ Manufacturing		Imports		Exports	
	Quantity	US\$000	Quantity	US\$000	Quantity	US\$000
Pesticides (Tons/yr)	ND	ND	3241	14,001	786	3,173
Fertilizers (Tons/yr)	ND	ND	131	5,173	7449	511,261
Petroleum products (crude oil and condensate) (BBLs/yr)	29,606,610	3,132,083	20,694,352	1,270,268	11,899,935	4,613,282
Natural Gas (MMSCF/yr)	1,485,185	18,676,710	38	7,050	102,930	7,814,124
Petrochemicals (MT/yr)	10,762,330	ND	3	19	10,421,263	2,342,601
Industrial chemicals	ND	ND	76,485	54,197	4,523,022	1,986,744

Chemical Type	Production/ Manufacturing		Imports		Exports	
	Quantity	US\$000	Quantity	US\$000	Quantity	US\$000
(used in manufacturing /processing facilities) (Tons/yr)						
Consumer chemicals (Tons/yr)	ND	ND	29,088	106,507	13,807	26,511

Sources: Market Analysis and Research 2015; Ministry of Energy and Energy Affairs 2014; Ministry of Finance and the Economy 2014;

ND - No data

3.3 Chemical Use by Categories

Tables 3-2 and 3-3 give a breakdown of the natural gas and crude oil utilization within Trinidad and Tobago respectively. The major use of natural gas is for conversion to liquefied natural gas (LNG) which provides consumers with access to vast natural gas resources worldwide to be used as fuel. Crude is mainly utilized for conversion to fuel for the transport sector (gasoline and diesel).

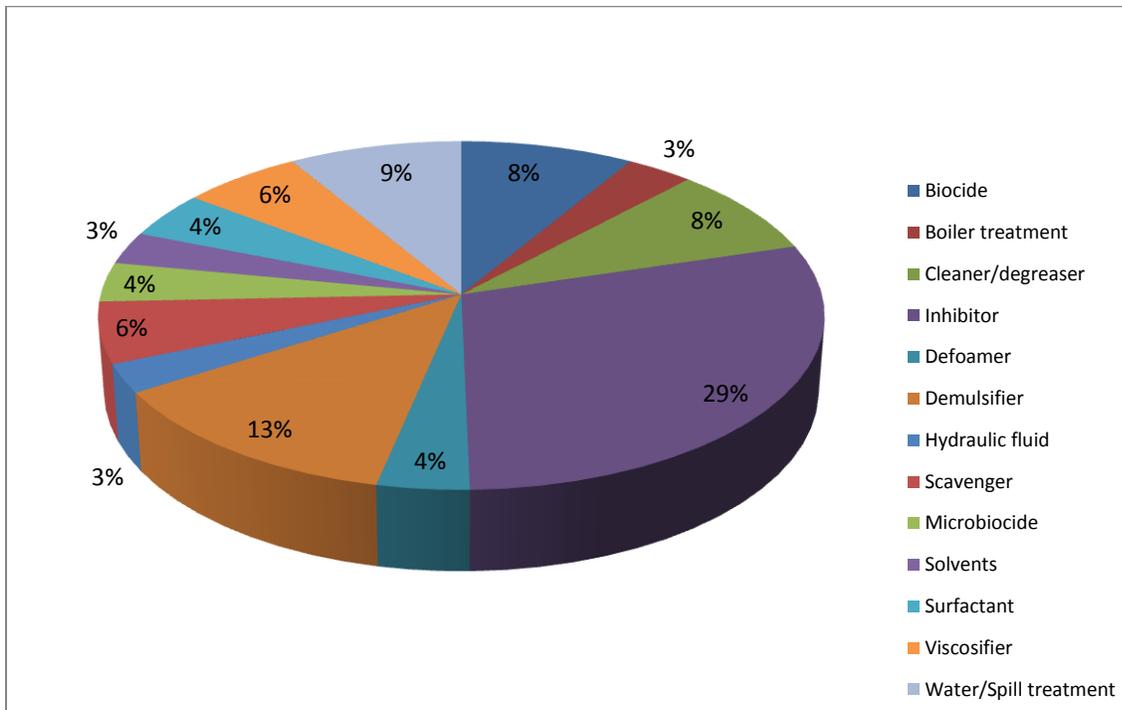
Table 3-2: Natural Gas utilization in Trinidad and Tobago 2013

Chemical Type	Sector use	Usage (MMSCF/D)
Natural Gas	Power generation	304
	Ammonia manufacture	546
	Methanol manufacture	543
	Refinery	69
	Iron and steel manufacture	106
	Cement manufacture	12
	Ammonia derivatives	21
	Gas processing	28
	Small consumers	11
	LNG	2,214
TOTAL		3,854

Table 3-3: Crude Oil utilization in Trinidad and Tobago 2013

Product	Usage (BBLs)
Liquefied Petroleum Gas	469,894
Motor gasoline	4,351,326
Aviation gasoline	1,431
Kerosene/Jet	1,104,439
Gas oils/diesel	4,068,907
Bitumen	236,252
TOTAL	10,232,229

In addition to natural gas and crude oil utilization in Trinidad and Tobago, the energy sector also utilizes a variety of chemicals (mainly production chemicals) used in the recovery, production and transportation of oil and gas, that are approved by the MEEA. Figure 3-4 illustrates the major chemical uses by the energy sector in Trinidad and Tobago.



Source: MEEA Approved list of chemicals 2014

Figure 3-4: Major Chemical use by the Energy Sector 2014

3.4 Storage of Chemicals and Related Issues

Chemicals imported to Trinidad and Tobago are stored in Government controlled bonded warehouses until the chemicals are cleared by Customs. According to the OSH Act 2004, all chemicals must be accompanied by a chemical safety data sheet written in English.

Chemicals manufactured in Trinidad and Tobago, in particular in the oil and gas sector all have onsite storage facilities. The Petrotrin refinery (the only refinery in the country) sits on an expanse of 2000 acres of land and is located in Pointe-a-Pierre on the west coast of Trinidad along the Gulf of Paria. The facility includes over 140 storage tanks for aviation jet fuel (13,800 bbls capacity), fuel tanks (super unleaded gasoline, premium unleaded gasoline and diesel) with a maximum capacity of 58,000 bbls and ethanol tanks with a storage capacity of 16,000 bbls.

Atlantic's Point Fortin facility has four (4) tanks, each about 45 metres tall, and which are designed to withstand earth movements and high winds. Each tank has two walls: an outer wall of reinforced concrete lined with carbon steel and an inner wall of nickel steel. Between both walls is a layer of insulation. From these tanks, LNG is loaded onto tankers.

Liquid chemicals such as methanol are stored in above-ground tanks at the Point Lisas Industrial Estate. These tanks are usually built with steel (mild, stainless or carbon-steel). Some of the tanks would have internal or external floating roofs can be used to control vapour emissions from storage tanks. Many of these tanks are blanketed with nitrogen. The tanks are situated in a bunded area with spill containment of at least 110% of the maximum volume of the tanks. Fire suppression systems are located close to the tanks so that fires can be extinguished readily. Either water or foam is used as the media.

In addition, many of the petrochemical plants would have on-site storage tanks for diesel, caustic soda and sulfuric acid. Many of the caustic soda and sulfuric acid tanks are located in buildings that are bunded for spill containment. Other chemicals in these plants are stored in semi-bulk containers or drums and stored in warehouses. These warehouses are usually located in a restricted area and bunded for spill containment. Incompatible chemicals are not stored together and there are usually provisions for fire through fire suppression systems.

Smaller service companies within the oil and gas sector also have warehousing facilities for solvents and production chemicals. These warehouse facilities average a maximum capacity of 2700 drums (50,000m³) and are covered and completely enclosed.

3.5 Transport of Chemicals and Related Issues

Trinidad and Tobago has an extensive network of approximately 8,320 km of paved roads that traverses both islands; with main roads and highways constituting approximately 800 km hence, the ease of efficiency for the transportation of chemicals throughout the country. Trinidad possesses over 1,000km of pipeline for crude oil and 19km of pipeline for refined petroleum products. There are also more than 900km of gas pipelines, construction of which occurred in conjunction with the development of gas-based petrochemicals at the Point Lisas estate. Crude oil and LNG are also transported via trucks and tankers.

The National Gas Company of Trinidad and Tobago (NGC) owns and operates a transmission and distribution pipeline network of approximately 1,000km of onshore and offshore pipelines that has a capacity of 4.4 billion cubic feet per day (Bcf/d). This network transports gas from the producing fields offshore to final consumers on the industrial estates and elsewhere in Trinidad. NGC has embarked upon the construction of the following new pipeline infrastructure to upgrade its capacity and bolster the reliability and integrity of the network:

- a 24-inch diameter spur line to transport gas to the Trinidad Generation Unlimited power plant in the Union Industrial Estate;
- a 36-inch diameter offshore line to transport gas from BHP Billiton's Gas Export Platform off Trinidad's north-east coast to interconnect with the existing network at Beachfield; and
- a 12-inch diameter line to transport gas from BHP Billiton's Gas Export Platform to Tobago and to the Cove Eco-Industrial Estate in particular. This pipeline project will also provide the staging point for the proposed eastern Caribbean Pipeline Project allowing Trinidad and Tobago to facilitate investment opportunities in gas-based industries in the neighbouring Caribbean countries.

Ammonia is transported by vessel and tank-wagons. Urea is transported by vessel and containerized bag. The plants are located near the Savonetta Pier, which can accommodate vessels with a maximum LOA (length overall) of 604 feet (184 meters) with a maximum loaded draft of 39 feet (11.8 meters). Other industrial chemicals inclusive of production chemicals are transported via trucks in totes and barrels to various locations within the countries as required.

Draft guidelines, 2002, are set out by the MEEA for the safe road transport of petroleum and petroleum products. Trucks/Road tank wagons used for the transport of any flammable or combustible chemicals, regardless of quantity, or whether loaded or empty, must be conspicuously and legibly marked in accordance with the following, unless the TTBS and/ or other authorities having jurisdiction take precedence:

- vehicle manufacturer;
- manufacturer's serial no.;
- date of manufacture;

- original test date;
- certificate date;
- design pressure;
- test pressure;
- head material;
- shell material;
- weld material;
- Lining material;
- nominal tank capacity;
- maximum product load;
- loading limits; and
- unloading limits.

The markings cannot be modified, obstructed, made inaccessible or unreadable by paints or any fixtures. Placards/ warning signs/ internationally accepted signage (at least 273mm (10.8 inches) on both sides and have a 12.7mm (0.5 inches) solid line inner border) must be conspicuously sited. The text indicating the hazard and the hazard class should be at least 41mm (1.6 inches) in height for both.

3.6 Chemicals and Waste management

In 2008, Trinidad and Tobago disposed of approximately 41,889 tons of hazardous waste (inclusive of chemicals and chemical waste), an increase of 11% over the past three years (Caribbean Environmental Health Institute 2009). There are no legal provisions for the separation of wastes hence hazardous waste is also included in the waste disposed. Chemicals waste is managed by a variety of agencies in Trinidad and Tobago. These include SWMCOL, the THA, the Regional/Municipal Corporations which falls under Local Government and a variety of private contractors. The responsibility for monitoring lies with the Ministry of Health (MoH) and the Environmental Management Authority (EMA), whilst SWMCOL is responsible for the landfill sites: the Beetham, Guanapo and Forres Park landfills in Trinidad, and the THA is responsible for the Studley Park landfill in Tobago. Point Fortin Borough Corporation manages the Guapo Landfill Site.

The chemical waste generated by industry, agriculture and households in Trinidad and Tobago include waste acids/alkalis, heavy metal sludges, heavy metal slags, paint sludges, oil waters, sludges, waste lube oils, spent filter media and catalysts, waste solvents and pesticides, waste chemical/pesticide containers, asbestos, polychlorinated biphenyls (PBCs) and lead recycling wastes. Table 3-4 gives an outline of the chemical waste generated and traded in Trinidad and Tobago and Table 3-5 gives an overview of chemical waste generated by sector.

Table 3-4: Chemical Waste Generation in Trinidad and Tobago 2004-2008

Type of chemical waste	Generation (tons/yr)	Export (tons/yr)	Import (tons/yr)
Pharmaceuticals, biocides and phytopharmaceuticals	117.17	0.001	---
Wood preserving chemicals	0.32	---	---
Organic solvents	114.32	---	---
Mineral oils	71.2	---	---
Waste oils/water, hydrocarbon mixtures	38552.43	---	---
PCBs, PCT, PBB	13.28	---	---
Ink, dyes, paints, lacquer	56.5	---	---
Industrial waste disposal operations (incineration and wastewater treatment)	1.25	---	---
Heavy metals (chromium, copper, zinc, cadmium, lead, mercury, arsenic)	248.49	1817	---
Acidic solutions	139.22	---	---
Basic solutions	138.8	---	---
Organic solvents	213.94	---	---
Dioxins	0.002	---	---

(National Hazardous Waste Inventory for Trinidad and Tobago 2009)

Table 3-5: Chemical Waste Generation by sector (2004-2008)

Sector	Waste generation	
	Tons/yr.	% of Total Waste
Agriculture, hunting and related activities	345.4	0.02
Extraction of crude oil and natural gas	82,253.1	47.83
Other mining and quarrying	86.3	0.05
Manufacture of wood and wood products	245.3	0.14
Manufacture of refined petroleum products, chemicals and chemical products, rubber and plastic products	3066.5	1.78
Electricity, gas, steam and hot water supply	51,187.3	29.76
Transport (land and air)	1014.9	0.59

(National Hazardous Waste Inventory for Trinidad and Tobago 2009)

Trinidad and Tobago is Party to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, and has the responsibility to ensure that transboundary movements of hazardous and other wastes are minimized and that any such movement is conducted in a manner which will protect human health and the environment. Table 3-6 summaries the movement of hazardous chemicals and chemical wastes in Trinidad and Tobago.

Currently, there are other chemical wastes such as lead acid batteries, spent catalysts and used motor oils in the process of being exported from Trinidad and Tobago to South Korea. However, proper documentation is being gathered before the movement of chemical wastes can occur.

Table 3-6: Movement of Hazardous Chemicals and Chemical Wastes – Trinidad and Tobago 2012-2014

	Type of chemical waste	Quantity	Destination/Country of export
EXPORT	Organic solvents	1500 tons	Netherlands
	E-waste	500MT	Singapore
IMPORT	Organic solvents (obsolete chemicals)	ND	Dominica (Importation of waste for treatment and disposal rejected by the EMA – April 2015)
	Chemical waste (acids, bases, phenols, hydrocarbons)	256 BBLs	Suriname (Importation to Trinidad rejected by the EMA due to lack of additional information requested by the EMA – April 2015)
IN TRANSIT	Hydrocarbon contaminated waste	1784tons	French Guyana to France
	Industrial waste	620 tons	French Guyana to France
	Heavy metals (chromium, copper, zinc, cadmium, lead, mercury, arsenic)	2400 tons	French Guyana to Belgium
		2300MT	Guyana to India
		500 tons	Suriname to Belgium

(EMA Notification list 2015) ND- No Data

3.6.1 Obsolete Chemical Stockpiles, Chemical Waste Sites and Contaminated Sites

There is approximately 5,926.3 tonnes of obsolete pesticides materials within Trinidad and Tobago (Food and Agriculture Organisation of the United Nations, 2012) and there are currently no standardized or approved methods for the disposal of obsolete chemicals. Table 3-7 gives an overview of the obsolete pesticide stockpiles in Trinidad and Tobago until 2012. Obsolete pesticides average 60 tonnes whilst contaminated soils and other materials were estimated at 2600 and 3200 tonnes respectively. Almost all of the obsolete pesticides are stored at the Camden Base site, Couva. Table 3-8 identifies the nature and conditions of the obsolete pesticides containers and stocks for Trinidad and Tobago. According to the report by the Food and Agriculture Organisation of the United Nations 2012, approximately 45% of the obsolete pesticide containers are leaking whilst only 0.7% remains intact.

In the early nineties, Demerara Road, east Trinidad was contaminated by lead due to the illicit dumping of lead wastes. A report on the investigation of lead pollution at Demerara Road done by Dr Ivan Chang-Yen, Senior Lecturer at the University of the West Indies, confirmed that high concentrations of lead were found in the soil and water, affecting over 400 residents which included 180 children. In 1998, one child died from lead poisoning. Of the 101 children tested in that area by the EMA and the Ministry of Health, 12 tested positively for high blood lead levels. These children were immediately sent to the Eric Williams Medical Sciences Complex for medical attention. Lead remediation works were completed in early June. All of the contaminated soil was removed from the site and restored with clean soil.

Table 3-7: Obsolete Pesticide Stockpiles in Trinidad and Tobago

Site / Store	Pesticide (Tonnes)	Soil (Tonnes)	Other Material (Tonnes)
Camden Base, Main Store	53.37	2640.00	3200.00
Industrial Sawmilling Limited, Store 1	0.50	18.00	0.00
Penal Demonstration Station, Store 1	0.10	9.00	0.00
Austin Chang & Co. Ltd, Warehouse	4.02	0.00	0.00
Oscar Francois Limited, Store 1	1.03	0.00	0.00
Marketing and Distribution Ltd., Warehouse	0.25	0.00	0.00
Total	59.26	2667.00	3200.00

Source: Mission Report, FAO 2012

Table 3-8: Nature and Condition of Obsolete Pesticides Containers and Stocks

Nature and Condition of Containers and Stocks	Quantity (Tonnes)
Leakage	2,659.42
Surface damage, no leakage	0.46
Undamaged	39.39
Other*	3,227.00
Total	5,926.27

Source: Mission Report, FAO 2012; *Other – empty containers, contaminated soil, buildings and equipment.

3.6.2 Technical Facilities for Recovery and Recycling of Chemicals

Private contractors carry out recovery and recycling. Few companies exist that have the capacity to recycle chemical waste. Most companies collect the chemical waste and it is shipped abroad to be recycled. Table 3-9 gives an overview of the capacity to treat chemical waste within Trinidad and Tobago.

Table 3-9: Facilities for Recovery and Recycling of Chemicals and related waste

Location of Facility	Description of Facility/ Operation or Process	Recovery Operation	Capacity of the Facility	Does the facility treat imported wastes?
Kaizen-TT Labidco Estate, La Brea	Waste oil recovery	Used oil and waste oil is processed and reused as a fuel source	300m ³ processing capacity	No
	Solvent recovery	Solvent recovery system to recover solvents and hydrocarbons. Recovered material reused as a fuel source	0.2m ³ /day (Unit capable of 40L/hr)	No
	Metal recycling (inclusive of aluminum cans)	Metal containers and scraps are decontaminated and crushed before sending to metal recycler	100BBLs/day	No
	Plastic recycling	Plastic containers are decontaminated and shredded before sending to plastic recycler	80BBLs/day	No
	Glass recycling	Glass containers are decontaminated before sending to glass recycler	2m ³ /day	No
Oil Mop Labidco Estate, La Brea	Oil processing	Oil processing and recycling	200 barrels per day / 31.8 m ³	No
Tiger Tanks Labidco Estate, La Brea	Soil remediation and possible oil recovery	Infrared heating	70/tons per day – DTDU*; VIR 25m ³ per week	Yes

**The DTDU can be retrofitted to destroy liquid chemicals such as amines in the oxidizer; it is also capable of treating pesticides. We were also able to destroy mercaptans stored in pressurized cylinders in this unit.*

Source: Kaizen Environmental Services 2015; Oil Mop 2015; Tiger Tanks 2015;

3.6.3 Capacity for Disposal of Chemicals

Private contractors carry out the disposal of industrial chemicals in Trinidad and Tobago. These contractors provide a certificate of destruction to companies to ensure that chemical wastes are properly disposed of in an environmentally friendly manner. The Trinidad and Tobago Solid Waste Management Company (SWMCOL) manages the three (3) operational landfill sites in Trinidad, Point Fortin Borough Corporation manages a site in south-west Trinidad and the THA manages the Studley Park Landfill in Tobago, but they do not have the capacity to accept chemicals and hazardous waste. Table 3-10 gives an outline of the facilities available for the disposal of chemicals and chemical waste in Trinidad and Tobago.

Table 3-10: Facilities for disposal of Chemicals and Chemical Waste

Location	Description of Facility, operation or process	Disposal Operation	Capacity of the Facility	Does the Facility treat wastes imported? (yes/no)
Kaizen-tt Labidco Estate, La Brea	Bioremediation	Microbial, aerobic decomposition in bio-cell plots	20,000m ² remediation surface	No
	Liquid incineration	Thermal decomposition	55 BBLs/day	No
	Solid incineration (cardboard, paper, contaminated rags, solid chemicals, medical waste)	Thermal decomposition	90kg/hr	No
	Neutralizations (acids and bases)	Low or high pH materials are neutralized	75BBLs/day	No
	Stabilization	Materials with the tendency to leach are stabilized using cement	50BBLs/day	No
Oil Mop Labidco Estate, La Brea	Incineration	Incineration	Approx. 220 lbs/hr	No
Tiger Tanks Labidco Estate, La Brea	Bioremediation	Thermal decomposition	ND	Yes

Source: Kaizen Environmental Services 2015; Oil Mop 2015; Tiger Tanks2015; ND-No Data

3.7 Unintentionally Generated Chemicals

The main types of combustion byproducts released into the atmosphere include PAHs, PCBs, PBDE, organo-lead compounds, polychlorinated dibenzodioxins (PCDD) and polychlorinated dibenzofurans (PCDF). The main source categories are summarized in Table 3-11. Data on the levels of unintentionally generated chemicals within Trinidad and Tobago are very scarce as these contaminants are not monitored on a regular basis. However, the National Implementation Plan (NIP) for Trinidad and Tobago under the Stockholm estimated a total production of 67,168.8 g TEQ of unintentionally produced PCDD/PCDF to air for 2011, largely from the production of chemicals and consumer goods and open burning processes (Table 3-12). However, the inventory notes significant information gaps due to lack of existing data.

Table 3-11: Sources of unintentional emissions in Trinidad and Tobago

Chemical Type	Source
PAHs	Exhaust emissions from motor vehicles, forest and bush fires
PCBs, PBDE, dioxins and furans	Burning and incineration of medical, municipal and some industrial wastes
Organo-lead compounds	Exhaust emissions from motor vehicles using leaded fuel

Source: Environmental Management Authority 2003

Table 3-12: Annual releases of PCDD/PCDF by Main Source Categories for Trinidad and Tobago (2011)

UPOPs Category	Annual release (g TEQ/a)					
	Air	Water	Land	Product	Residue	TOTAL
Waste Incineration	1.1	0.0	0.0	0.0	0.0	1.1
Ferrous & non-ferrous metal production	0.0	0.0	0.0	0.0	0.0	0.0
Heat and power generation	0.0	0.0	0.0	0.0	0.0	0.0
Production of mineral products	0.4	0.0	0.0	0.0	0.0	0.4
Transportation	0.1	0.0	0.0	0.0	0.0	0.1
Open burning processes	73.9	0.0	45.1	0.0	0.0	119.1
Chemical production and consumer goods	67,048.0	0.0	0.0	0.0	0.0	67,048.0
Miscellaneous	0.1	0.0	0.0	0.0	0.0	0.1
Disposal	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL						67,168.8

An independent study done by Mohammed, A. et. al, 2009 (Life Sciences Department, University of the West Indies) indicated the presence of PCDDs and PCDFs in sediments in Sea Lots, Port-of-Spain. Added to this, open burning remains a major issue in Trinidad and Tobago contributing to the already existing levels of dioxins and furans. Trinidad and Tobago Air Pollution Rules 2014 have included total dioxins and furans limits for maximum permissible levels in ambient air of 0.5 pg TEQ/m³ for 24hrs and stack release limits of 0.2ng TEQ/Nm³.

3.8 Assessment

Trinidad and Tobago is the most industrialized country within the Caribbean region. This is demonstrated by the high rates/volumes of manufacturing/production and export for Trinidad and Tobago, in particular petroleum products, liquefied natural gas and petrochemicals. Trinidad and Tobago uses a large quantity of industrial chemicals mainly natural gas for power generation, ammonia and methanol production, and crude oil for gasoline, liquefied petroleum gas and diesel. Chemicals used on a smaller scale include inhibitors, demulsifiers and wastewater/spill treatment chemicals.

Most companies within the energy sector especially manufacturing/production have onsite storage tank facilities whilst the smaller service companies for the energy sector has covered, bonded warehousing facilities. Chemicals imported are stored in warehouses at the ports of entry but there are no specific areas for the storage of chemicals only. These chemicals, mainly industrial and agrochemicals are stored together with other goods hence the increased potential for spills and contamination of the storage areas. Chemicals are transported by an extensive network of onshore and off shore pipelines and tank-wagons. Sea vessels are used for the export of chemicals from Trinidad and Tobago.

Chemicals and waste management is an area that needs to be strengthened in terms of infrastructural capacity as well as data availability. The oil and gas sector is responsible for the majority of chemical waste generated. Few facilities exist that can accommodate the chemical waste generated by the industrial sector. The implementation of the Waste Management Rules 2014 has the potential to regulate these issues as it allows registration of waste generators, the generators' storage capacity and the establishment of a waste management register. Additionally, there is concern for the obsolete pesticides situation in Trinidad and Tobago. The majority of obsolete chemicals (over 99%) are currently stored at Camden Base. Table 3-8 indicates high levels of leakage hence the increased possibility for a site contamination.

There are no government owned technical facilities for recycling, recovery and disposal of chemical waste. This is done primarily by private contractors. Although, there are three operational landfill sites in Trinidad and one in Tobago, these facilities do not have the capacity to treat chemicals and chemical waste. There is need for the development of fully engineered landfill facilities within Trinidad which will include hazardous waste cells to address the issue of chemicals and chemical waste disposal. Environmentally sound disposal mechanisms for chemicals and chemical waste also need to be implemented.

Chapter 4: Data Viability for Chemicals Management

This chapter provides an overview of the information management capacity of Trinidad and Tobago related to the sound management of chemicals, particularly the availability of data and its use for chemical risk reduction.

4.1 Overall availability of data for National Chemicals Management

As demonstrated by this study, the availability and access of chemical data is very limited and restricted in Trinidad and Tobago. Access to information such as production, import or export statistics, hazardous waste data, inventory of chemical records, location of records, are vital to policy formulation and decision-making for chemicals. Table 4-1 provides an overview of the availability of data for decision making and other activities that may be required as part of chemicals management programme.

Table 4-1: Sufficiency in Quality and Quantity of Available Information

Data needed for/to:	Pesticides/ Fertilizers	Industrial Chemicals	Consumer chemicals	Chemical wastes
Chemical Inventory	x	x		x
Assess chemicals impact under local setting	x	x		
Risk assessment	x ¹	X ¹		x ¹
Classification and labelling	x ¹	X ¹		
Registration	x	x		
Licensing (use)	x	x		
Permitting (importing)	x	x		
Risk reduction decisions		x		
Accident preparedness/response		x		
Poisoning control				
Emissions inventory	x	x		x
Inspection and audits				
Information to workers	x	x		x
Information to public	x	x		x ¹
Other				

'x' represents sufficient data available for the tasks listed in the first column of the table.

'x¹' represents limited data available for the tasks listed in the first column of the table.

Where an *'x'* is **NOT** present it implies no data availability.

4.2 Sources of National Data, Access and Format

Table 4-2 indicates the nature of national data related to chemicals management which is available and provides practical information on how to gain access to the data.

Table 4-2: Sources of National Data and their Access and Format

Type of data	Location (s)	Data source	Who has access	How to gain access	Format
Production statistics	Central Statistical Office (CSO)/ Trade map	Various	Public	Internet /formal request	Digital copy
Import statistics	Trade map/ CSO Customs/MEEA/ PTCI	Customs entry/ Chemical importers (private sector)	Restricted	Formal request	Digital copy
Export statistics	Trade map/ CSO/ Customs	Customs entry	Restricted	Formal request	Digital copy
Chemical use statistics	PTCI/ Industry	Various	Restricted	Formal request	Digital copy
Industrial accident reports	Occupational health, MoH	Industry/ medical records	Restricted	Formal request	Digital/ hard copy
Transport accident reports	MEEA/ Office of Disaster Preparedness and Management (ODPM)	Industry/ medical records	Restricted	Formal request	Digital/ hard copy
Occupational health data	Occupational health, MoH	Industry/ medical records	Restricted	Formal request	Digital/ hard copy
Poisoning statistics	N/A	N/A	N/A	N/A	N/A
Pollutant release and transfer register	EMA	EMA	Public with the exception of trade secrets and confidentiality	Formal request	Digital/ hard copy
Hazardous waste data	SWMCOL/EMA/Basel Convention Regional centre	EMA	Restricted	Formal request	Digital/ hard copy
Register of pesticides	PTCI	PTCI	Restricted	Formal request	Digital/ hard copy
Register of	PTCI	PTCI	Restricted	Formal	Digital/ hard

Type of data	Location (s)	Data source	Who has access	How to gain access	Format
toxic chemicals				request	copy
Inventory of existing chemicals	MEEA	MEEA	Restricted	Formal request	Digital copy
Register of imports	Customs and Excise	Customs entry	Restricted	Formal request	Digital/ hard copy
Register of producers	MEEA	Various	Public	Internet	Digital copy
Prior informed consent decision	N/A	N/A	N/A	N/A	N/A

4.3 Procedures for Collecting and Disseminating National/Local Data

The Registrar of Pesticides and Toxic Chemicals is required to keep and maintain the appropriate Registers for licences, for pesticides and for toxic chemicals. He enters in these registers such information as prescribed by regulations. Inspectors receive from the Registrar, the type of information that is necessary for carrying out their duties which include examinations, inspections, investigations and inquiries pertinent to the Pesticides and Toxic Chemicals Act.

In the application of registration of a pesticide the following information has to be furnished:

- (1) Identity of the substance, including common name of the active ingredient, its chemical name, IUPAC nomenclature, ISO nomenclature, empirical formula and structural formula.
- (2) Patents covering the active ingredient or the production process thereof, name and address of country of origin of the active ingredient, chemical composition and quantitative composition of each active ingredient, nature of solvents, dispensing agents, emulsified, additives et al, registration in any other country.
- (3) Application method in the field, dosage recommended for each application method, miscibility of the product with other pesticides, compatibility with other pesticides, efficacy of the product, laboratory and field tests conducted and results, the phytotoxicity of the product.
- (4) Proposal for labelling and directions for use, proposal for packaging including net contents and overall capacity of the package.
- (5) Method of destruction and neutralisation, recommended procedure for dealing with spillages on land or in water, decontamination and dispersal, disposal of waste and of excess prepared for use.

(6) Safety advice in respect of handling, storage and transportation, any disaster or emergency preparedness plan for chemical accidents.

(7) Physical, chemical and technical properties of the product e.g. flammability, explosivity, oxidising nature, CFC content, acidity/ alkalinity, density, suspension or emulsification properties, corrosive properties, fat solubility, surface tension melting point, boiling point, vapour pressure, hydrolysis stability.

(8) The method used to detect and determine the active ingredients in the product e.g. CIPAC, AOAC, ISO or others, the spectra data and chromatograms provided such as UV, FTIR, NMR, Mass Spectroscopy and Chromatography.

(9) Acute and toxicity, acute dermal toxicity, acute inhalation toxicity, chronic toxicity, carcinogenic effect, mutagenic effect, teratogenic effect, neurotoxicity, toxicity of metabolites, sensitisation, ecotoxicological data, accumulation in soil adsorption to soil particles, toxicity to soil organisms, leaching, biotic degradation, toxicity to wild fauna, birds/honey, beneficial insects, human toxicity and antidotes/first-aid phytotoxicity.

(10) Residue data such as maximum residue limits, metabolism in plants, methods of detecting residues in food, water, soil, air, wildlife, wood, textiles or treated materials.

Data on industrial chemicals by the MEEA are collected on a systematic basis and the digital database is updated every three (3) weeks. However, the scope of the data is limited to a listing of chemicals approved for use and no data is collected on quantities used. Requests for approval of chemicals to be used in the energy sector are forwarded to the Downstream and Retail Marketing Division. Companies requesting approvals are required to abide by the Ministry of Energy and Energy Affairs Guidelines found in the "Procedure for the Approval of Oilfield and Industrial Chemicals" before Consideration is given for the chemical to be used within the energy sector in Trinidad and Tobago. These guidelines stipulate mainly that information must be provided to the MEEA on the use of the chemical, the concentration to be used, the frequency of use, treatment/storage/disposal after use as well as verified laboratory reports on the chemical's toxicity and biodegradability properties.

The source registration of water pollutants by the EMA provides an inventory of all water pollutants in the country, some of which include chemical waste. An application must be made if there is a discharge of wastewater containing water pollutants from a discrete opening (pipe, ditch, canal, etc.) during the normal operation of the facility. This information is kept in a Water Polluters Register (public record containing particulars of or relating to source registration) and can be accessed by the general public.

4.4 Availability of International Literature and Database

There is limited data derived from research being conducted in Trinidad and Tobago. As such, like most of the other countries in the Caribbean sub-region, Trinidad and Tobago relies on international literature and guidance for its source of authoritative information for the sound management of chemicals. Table 4-3 and 4-4 provides a detail list on international literature and databases accessible within Trinidad and Tobago, including location, in order to facilitate access to them.

Table 4-3: Availability of International Literature

Literature	Location (s)	Who has access	How to gain access
SAICM Information Clearinghouse	http://www.saicm.org/index.php?menuid=36&pageid=251	Public	Free access via the internet
Environmental Health Criteria Documents (WHO/IPCS)	http://www.who.int/ipcs/publications/ehc/en/index.html	Public	Free access via the internet
Concise International Chemical Assessment (WHO/IPCS)	http://www.who.int/ipcs/publications/cicad/en/index.html	Public	Free access via the internet
International Chemical Safety Cards (WHO/ILO)	http://www.inchem.org/pages/icsc.html	Public	Free access via the internet
Decision Guidance Documents for Prior Informed Consent Chemicals (FAO/UNEP)	http://www.pic.int/TheConvention/Chemicals/AnnexIIIChemicals/tabid/1132/language/en-US/Default.aspx	Public	Free access via the internet
FAO/WHO Pesticides Safety Data Sheets	http://www.who.int/ipcs/publications/pds/en/index.html	Public	Free access via the internet
Documents from the FAO/WHO Joint Meeting on Pesticide Residues	http://www.who.int/ipcs/publications/impr/en/	Public	Free access via the internet
Documents from the FAO/WHO Joint Expert Committee on Food Additives	http://www.who.int/ipcs/publications/jecfa/en/index.html	Public	Free access via the internet
GHS	http://www.unece.org/trans/danger/publi/ghs/ghs_welcome_e.html	Public	Free access via the internet
Material Safety Data Sheets (MSDS)	http://www.msds.com	Public	Free access via the internet
OECD Guidelines for the Testing of Chemicals	http://www.oecd.org/document/40/0,3343,en_2649_34377_37051368_1_1_1,00.html	Public	Free access via the internet

Literature	Location (s)	Who has access	How to gain access
Good Laboratory Practice (GLP) Principles (OECD)	http://www.oecd.org/document/63/0,3343,en_2649_34381_2346175_1_1_1_1,00.html	Public	Free access via the internet
Good Manufacturing Practice Principles (WHO)	http://www.who.int/medicines/areas/quality_safety/quality_assurance/production/en/index.html	Public	Free access via the internet

Table4-4: Availability of International Databases

Literature	Location (s)	Who has access	How to gain access
ILO CIS	http://www.ilocis.org/	Public	Access via internet
WHO/IPCS INCHEM	http://www.inchem.org/	Public	Access via internet
WHO/IPCS INTOX	http://www.intox.org/	Public (subscription)	Access via internet
WHO/IPCS Human Health Risk Assessment Toolkit: Chemical Hazards	http://www.who.int/ipcs/methods/harmonization/areas/ra_toolkit/en/index.html	Public	Access via internet
IRPTC	http://www.chem.unep.ch/irptc/irptc/databank.html	Public	Access via internet
Chemicals Abstract Services Database	http://www.cas.org/	Public (subscription)	Access via internet
Global Information Network on Chemicals (GINC)	http://www.oshweb.com/owd/owd01.nsf/s/181-01	Public	Access via internet
STN Database	http://www.cas.org/products/stnfamily/index.html	Public	Access via internet
Trade map - Trade statistics for international business development (chemical import/export data)	http://www.trademap.org/	Public (subscription)	Access via internet

4.5 National Information Exchange Systems and IT Capacity

The Freedom of Information Act No. 26 of 1999 is a legal instrument aimed at giving members of the public, a general right of access to official documents of public authorities. It seeks to make available to the public information about the operations of public authorities and to create a general right of access to information in documentary form that is in the possession of public authority. There are exceptions such as information deemed to be confidential business information which the authority possesses.

Statements of possession of certain documents are to be published by a public authority. Included in this category of documents is an environmental impact statement prepared within the public authority. By extension, if a pesticide impact assessment was done, the possession of such a document may have to be publicly stated. There are voids in the information base for national chemicals management. In the area of chemical wastes produced, the quantities of solid, liquid or gaseous wastes are not required to be provided by law. As a result, the records of these are very often not available, even if inputs and output are known in a transformation process, the waste components are not carefully monitored.

These are over 240 online databases to which The University of the West Indies, St Augustine Campus Libraries, currently subscribes as well as free databases. Due to terms and conditions in licensing agreements, access to certain databases, are restricted to registered students, current faculty and staff of the University of the West Indies.

4.6 Assessment

Data exists for the industrial chemicals and pesticides due to long standing legislative commitments in Trinidad and Tobago. The MEEA is responsible for collecting and housing data on industrial chemical. Consolidated monthly bulletins are prepared which comprise of data on crude oil, natural gas and petrochemicals production, import and export. All industrial chemicals approved for use in the energy sectors is also tracked in terms of use and the time frame for use. However, the quantities utilized are not recorded. Data are also available for storage, transport and disposal of chemicals within the energy sector. However, this information is not centrally housed and had to be collected manually for each of the upstream and mid streams operators. For this national chemical profile update, the major players in the energy sector were contacted and the data collected gives a good estimate but do not represent exact values.

The PTCCB houses data on pesticides and keeps a record of individuals or companies who import, sell, store, package or manufacture a pesticide within Trinidad and Tobago. They are also responsible for keeping track of the quantities of obsolete chemicals and their proper disposal. Information on consumer chemicals is very limited. Data on chemical waste was also difficult to acquire due to lack of a proper waste management system for Trinidad and Tobago.

Although data exists for industrial and agro-chemicals, weaknesses in the information systems persists on records, surveillance and vital statistics and continue to be a problem in Trinidad and Tobago. Data availability for chemicals in consumer goods as well as chemicals waste is extremely limited. The

distribution of the existing data locally is a difficult process and the capacity of the country to access and collect this data is very limited. In many cases the quality of the data is questionable due to variations in methodologies for collection. Data are also held independently by different ministries, agencies and the private sector and the majority of information is only shared upon a formal request. The MEEA has made progress in terms of publishing data on their website on chemicals approved for use by the petroleum and petrochemical sector as well as data on oil and gas production and export. There is a need to formalize the sharing of information among the various ministries and agencies and other institutions in order to compliment the national information and data, thus permitting interested parties to make better decisions as well as to increase the awareness among the population on proper chemical management.

A proper chemical inventory and database of existing chemicals is needed for Trinidad and Tobago. This should encompass all sectors of the economy involved with the production, import, export, storage, transport, use and disposal of chemicals. Pollutant Release and Transfer Registers (PRTRs) are recognized in Chapter 19 of Agenda 21 as an important tool to raise public awareness about potential chemical risks and as an effective environmental management tool to stimulate chemical risk reduction. Common characteristics of many PRTR programmes include a listing of pollutants, reporting of releases and transfers i.e. to air, water or land, reporting by source and reporting annually. The PRTRs can be used as a starting point for data gathering in Trinidad and Tobago, with the long term goal of a proper inventory system for chemicals.

The accessibility to international data is readily available via the internet, and ministries/agencies as well as companies within the private sector have the required expertise in house to interpret and apply the information. However, limited resources in terms of staffing may be a constraint. Currently there are no databases on chemicals in Trinidad and Tobago. Access to international databases such TOXNET and the eChemPortal established under the European Chemicals Agency give information on chemical properties, toxicity and access to safety data sheets. Some institutions at tertiary level have paid subscriptions to chemical databases which also provide a source of information. Strengthening mechanisms to gather information needs to be enforced but require a lot of ground work in gathering the necessary information. It may be of greater benefit to create a data pool for chemicals at a regional level to alleviate repetition and conserve the limited resource base in the region. This will involve the implementation of regional policies to accommodate this system. Emphasis should also be made to include the formal education system as means to disseminate chemical management information as there is a notable lack of knowledge as to the risks involved in the daily use of chemicals products.

Chapter 5: Infrastructural Capability for Managing Chemicals

This Chapter provides an overview of the technical infrastructure including analytical capacity related to the sound management of chemicals.

5.1 Overview of Laboratory Capacity

There are over 80 laboratories throughout Trinidad and Tobago. However, most of these facilities are privately owned medical laboratories and do not conduct chemical analysis. Table 5-1 deals with the laboratory capacity related to regulatory chemical analysis and Table 5-2 focuses on the monitoring capability and ability to support health and environmental surveillance.

Table 5-1: Overview of the Laboratory Infrastructure for Regulatory Chemical Analysis

Name	Location	Equipment/Analytical Capabilities	Accreditation	Certified GLP	Purpose
TTBS	Industrial Estate, Macoya	Range from analyses to calibrations/verifications of equipment and purity of materials; Consultancy services for the research and compilation of internationally accepted analytical test methods; Testing Services: Water, Conductivity, Degrees of hardness, pH, Refractive index, Trace metals, heavy metals, Total, dissolved & suspended solids, Bleach, Chlorine content, sodium hydroxide, Determination of active ingredient, Volatile matter content and moisture content, Preparation and standardization of solutions, Flash point of paints and organic solvents Sampling Viscosity measurements of paints & oils.	ISO/IEC 17025: 1999 – General Requirements for the Competence of Testing and Calibration Laboratories. By United Kingdom Accreditation Service (UKAS)	No	Developing standards; Water and soil quality analysis; oil and grease analysis; Consumer product testing;
CFDD	Port-of-Spain	Analysis of food, drugs, cosmetics, (medical) devices; Analysis of pesticides and toxic chemicals; Analytical and advisory support to the Customs and Excise Division; Alcohol content of alcoholic beverages ;	Not accredited but testing is monitored by MoH	No	Compliance with the Food and Drugs Act and Regulations to ensure safety, efficacy and fitness for use; Compliance with the Pesticides and Toxic Chemicals Act and

Name	Location	Equipment/Analytical Capabilities	Accreditation	Certified GLP	Purpose
		Analysis of other imported products ; Analytical and advisory support to the Director of Contracts to determine composition and efficacy to enable objective comparison of products during the tendering process.			Regulations; Excise, Duty and customs tariff classification;

Table 5-2: Overview of the Laboratory Infrastructure for Monitoring and Analysis

Name	Location	Equipment/Analytical Capabilities	Accreditation	Certified GLP	Purpose
CARIRI	St. Augustine	Cement analysis, aggregate analysis, chemical analysis; Testing for effluents and toxic chemicals in water and soil; Food analyses, nutritional analyses, tests for contaminants and harmful levels of any ingredient; Compositional analysis, fuel quality, MSDS Verification, toxicity and biodegradability testing, Royalty Lease Evaluation 1; Active ingredient analysis, purity assay of raw materials. Equipment: Atomic Absorption Spectrometry, UV-VIS Spectrometry, Gas Chromatography, High Performance Liquid Chromatography, Ion Chromatography, Microtox, Gas Chromatography-Mass Spectrometry, Microwave digestion.	ISO/IEC 17025: 2005 international standard for Laboratory Competence and meet the principles of ISO 9001:2008	No	Analyze product composition; Test for required parameters – EMA Water Pollution Rules; Ensure products meet regulatory/market requirements; Conduct an array of environmental tests for both business and regulators to provide customized training programmes specific to individual Client needs
Institute of	Chagaramas	Gas Chromatograph-Mass	No	No	Primary purpose for

Name	Location	Equipment/Analytical Capabilities	Accreditation	Certified GLP	Purpose
Marine Affairs (IMA)		Spectrometer (GC-MS) for hydrocarbon analysis; Hydrocarbon, heavy metals, microbiology, organochlorine and organophosphorus pesticides;			research. The laboratories routinely analyze samples of seawater, freshwater, effluent, sediment and biota for various physical, chemical and microbiological parameters
Analytical Technologies Limited	Industrial Estate, Couva	Environmental Testing – includes effluent/waste water analysis; Microbiological Testing; Petrochemical – Process and Product testing, Iron and Steel testing; Trace Metal Analysis; Analyses of Caustic and Polyols; Petroleum Products testing; Sampling Equipment: Gas Chromatograph Atomic Absorption Spectrophotometer, Vapour Generation Assembly (Heavy Metal Analysis), Ultra Violet / Visible Spectrometer, Fourier Transform Infra-Red Spectrophotometer, Karl Fischer Titrator (capable of analyzing routine samples and sludges, crude oil and gases), Phase Contrast Microscope ‘Leyland	ISO 9001:2000 Certification applies to Analytical Testing Services (inclusive of sampling and onsite testing) Audited by the EMA for general environmentally safe practices; Toxicity laboratory audited by MEEA;	No	Testing of industrial wastewater for industry; Consultancy services;

Name	Location	Equipment/Analytical Capabilities	Accreditation	Certified GLP	Purpose
		Boxer Oil Waste Disposal Truck.			
ECOTOX Environmental Services Ltd	Chaguanas	Fully equipped to conduct testing in all areas of environmental testing, occupational air and noise, geotechnical and microbial testing.	MEEA certified and in the process of ISO/IEC 17025: 2005 international standard for Laboratory Competence		Testing for the noise, water and air pollution rules, MEEA approval of chemicals, industrial wastewater, inorganics, toxicity testing and microbial and food analysis services.
Mitco Water Laboratory Services	San Juan	Analysing and water treatment products for boiler water systems, cooling water and chilled water treatment systems , Equipment: Automatic pH & Conductivity Controllers, Chemical Injection Pumps and Feed Systems, Pot Feeders, Timers, Filters & Media, Softeners & Resin, RO Systems, UV Systems, Disinfection Equipment.	No	No	To control scale, corrosion or biological growth in industrial equipment.
International Analytical Group (IAG)*	Florida, USA	Handles all aspects of environmental samples such as analysis on water, soil and sediment including metals, petroleum organics, other organics, inorganics compounds etc.	Test America Pensacola Laboratory is accredited ISO/IEC 17025: 2005 international standard for Laboratory Competence and	Test America Pensacola Laboratory gas adopted GLP	All environmental testing and analysis.

Name	Location	Equipment/Analytical Capabilities	Accreditation	Certified GLP	Purpose
			meet the principles of ISO 9001:2008		
Analytical Services Unit, Department of Chemistry, UWI	St. Augustine	Chemical analysis such as structure elucidation and chemical identification, determination of impurities and contaminants, extractables and leachables studies, trace analysis on environmental samples, food, drug, industrial and commercial products, gas samples and petroleum products; Equipment: Gas liquid and droplet countercurrent chromatographs, spectrometers, calorimeters, microscopes,	No	No	Analytical and consultancy services.
Kaizen Environmental Services	La Brea	Testing of Trace Organics, Pesticide/ Herbicide, Trace Metals; Microbial Analysis, Water Quality and Waste Characterization; Soil Analysis; Effluent Monitoring Program Sampling Services: Water / wastewater, Soil / solid waste, Air; Oil Testing.	ISO/IEC 17025: 2005 international standard for Laboratory Competence	No	Specializes in analytical techniques applied to environmental chemistry for Water and Wastewater analysis, Soil and Solid Waste Characterization and enhanced data interpretation.

*IAG is an international organisation based in Florida, USA, but has a local representative in Trinidad and Tobago. All samples are air-freighted to Florida for testing at Test America Pensacola Laboratory.

5.2 Ports and Industrial Estates

Ports and industrial estates are integral for the expansion and deepening of the oil and gas based and petrochemical industries in Trinidad and Tobago. There are two fully developed industrial ports at Port of Spain in the north of Trinidad and at Point Lisas in the south. There are also seven sector-specific ports that serve marine traffic. These are located at Pointe-a-Pierre, Chaguaramas, Point Fortin, Brighton, Galeota, Tembladora and Scarborough in Tobago. All the ports provide support for the industrial estates. For example, the Galeota port is used for the export of crude oil from the east coast and serves as an industrial estate facility with a support and logistics centre for the exploration and production companies in Trinidad & Tobago.

There are four major industrial estates which are tailored specifically to facilitate activities of the petroleum and petrochemical industries. Currently, Trinidad has three major energy-based industrial sites located at Point Lisas, a site for petrochemical and metals processing, Point Fortin, a site for LNG and Pointe-a-Pierre, a site for petroleum refining. Tobago has one industrial estate, the Cove Eco-Industrial Estate, the first gas-based industrial estate in Tobago. The estates' infrastructure include petrochemical plants, access to port facilities, facilities for the transportation, distribution and processing of oil and natural gas, and related service industries for the energy sector.

The following include recently completed and planned expansions for the ports and industrial estates in Trinidad and Tobago:

- Point Lisas south and east industrial estate expansion to house new tenants manufacturing chemicals
- Point Lisas south and east expansion port/multi-user pier facilities—This project comprises three berths in the first phase, expandable to nine berths with associated reclamation and corridor development.
- Alutrint dock and storage yard—This project comprises a 307 metre quay wall with a total of 9 hectares of backland which will include accommodation for raw material storage.
- Oropouche bank reclamation—This site will allow for the large scale cluster of gas-based industries and is located approximately 3.5km from the existing coastline 5km south of San Fernando. The seaward side is adjacent to natural deep water for development of a post Panamax harbour.

5.3 Information Systems and Computer Capabilities

The Information and Communication Technology (ICT) within Trinidad and Tobago provides the basis for the development of every modern and progressive society and allows for incorporation into the global information economy. Government ministries within Trinidad and Tobago are consumers of ICTs and electronic services, relying more on ICTs in the areas of management, communication, education, commerce, procurement and service provision. The World Economic Forum, Global Information Technology Report shows that Trinidad and Tobago's readiness to leverage ICT for increasing competitiveness and development jumped upwards from 79 out of 133 countries in 2010 to 60 out of 142 countries in 2012 (Inter-Ministerial Committee for Cyber Security 2012).

The government ministries in Trinidad and Tobago have transitioned to the use and reliance of computers and have their own web-sites. However some governmental web-sites remain unpopulated and with outdated information due to poor maintenance often associated with the absence of a dedicated person responsible for data and information management. Most Ministries have more powerful servers as part of their data and information management programme.

5.4 Assessment

Developments in world trade, particularly trade liberalization and the emphasis on Mutual Recognition Agreements plays a major role in justifying the need for a national laboratory accreditation service. It became evident that TTBS needed to expand its activities related to conformity assessment and offer the service of accreditation to local and regional laboratories. As such, the revision of the Standards Act in 1997 (Act No. 18 of 1997) provided the legal framework for operation of the Trinidad and Tobago Laboratory Accreditation Service (TTLABS) as the national laboratory accrediting body. The TTLABS Secretariat has continuously improved all aspects of its implementation of ISO/IEC 17011 and related international standards and guides. TTLABS are internationally recognized through existing multi-lateral recognition arrangements.

Laboratories involved in the management of chemicals are reasonably well equipped to conduct analytical work. They are headed by persons trained in the fields of chemistry, toxicology, chemical metrology, agronomy and environmental sciences. In cases where very specific analysis needs to be conducted, the local laboratories have partnerships and affiliations with international laboratories that can offer assistance. They may be more cost effective particularly in cases where this analysis may be one off. Companies within the oil and gas sector, in particular the service companies have in house laboratories. These are used mainly for the blending of chemicals and quality assurance of finished products. Large companies within the manufacturing sector also have research and development laboratories.

However, a study carried out by the Caribbean Environmental Health Institute to assess laboratories in Trinidad and Tobago indicated that training is required with respect to quality management systems and there is need for the strengthening of the accreditation system used by laboratories in Trinidad and

Tobago. It should be noted that this study only assessed three laboratories in Trinidad and Tobago and can only be used as a guide and not a true representation of all laboratories in country.

The ports and industrial estates in Trinidad and Tobago are well situated for their roles and functions within the petroleum and petrochemical sectors. The industrial estates are built on the sheltered coastlines of Trinidad and Tobago and the main ports have deep water harbours, with the Labidco Port at La Brea having a natural deep water harbor. The ports all have fully covered warehouse with capacities reaching up to 50,000ft².

The ICT system in place is also efficient. Trinidad and Tobago has four major service providers of broadband internet. All of the public and private sectors have access to the internet hence increased convenience to access international literature and databases. Trinidad and Tobago therefore, has sufficient technical infrastructure in place to actively manage chemicals.

Chapter 6: Emergency Preparedness, Response and Follow-up

This chapter provides an overview of the capacity for preparedness, response to and follow-up of, emergencies involving chemicals.

6.1 Chemical Emergency Planning

At the national level, Trinidad and Tobago has the Trinidad and Tobago Emergency Mutual Aid Scheme (TTEMAS) set up as an Association by the Government of Trinidad and Tobago. TTEMAS aims to:

- to establish and develop mutual aid assistance in case of industrial or community emergency situations, natural or man-made;
- to provide timely and organized assistance to cope with an emergency which is beyond the ability of the affected member to handle;
- to sensitize and educate its members as well as the general public to disaster threats and the benefits of pre-incident planning;
- to provide more efficient emergency response services for all members of TTEMAS;
- to establish uniform operations and practices for use by members of TTEMAS; and
- to encourage and promote Loss Control Procedures as they relate to hazards associated with industry

Additionally, a National Response Framework prepared by the Office of Disaster Preparedness and Management, a division of the Ministry of National Security, as well as a National Oil Spill Contingency Plan exists.. A draft National Chemical Spill and Gaseous Releases Contingency Plan and a draft National Hazard Mitigation Plan also currently exist in Trinidad and Tobago.

According to the draft NCSCP, the MEEA will be the body responsible for the coordination of the national approach to the preparedness and response to a potential chemical or gas release in either the marine or onshore environment. A National Hydrocarbon and Chemical Spills Contingency Plan (NHCSPP) Committee is envisioned to be charged with the responsibility for updating the plan, providing advice to the Government of Trinidad and Tobago on strategic policymaking, funding direction and coordinating drills. This Committee will be a Standing Committee chaired by the MEEA and will include a cross section of the public sector (different Ministries and Agencies) and private organizations such as industrial organisations and entities and private companies. Sub-committees may be formed as necessary upon sanction by the chairman of the Committee.

The NHCSPP Committee will also be primarily responsible for ensuring that contingency plans are updated and tested. Chemical Manufacturers, users and handlers (including storage and transportation) shall have emergency response procedures for dealing with chemicals and/or gaseous releases. The NHCSPP Committee will also have the responsibility of ensuring these plans are in compliance with the NCSCP, and guide the development of those which do not exist.

The responsibility and responding agencies for combating chemical spills is dependent on whether the spill occurs onshore or the marine (shallow and deep water) environment. At land-based facilities (chemical manufacture, storage and use) the relevant chemical company or their relevant designated response company is responsible. If the response is beyond the chemical company or their relevant designated response company, the National Responding Agency (Trinidad and Tobago Fire Service) will respond with the assistance of other National Plan stakeholders as required. Within jurisdictional waters, the National Responding Agency will be the Trinidad and Tobago Coast Guard. The draft NCSCP proposes three levels of response as summarized in Table 6-1 below.

Table 6-1: Summary of Responses based on graduated Chemical Spills Scenarios

	LEVEL 1 (Potential Emergency Condition)	LEVEL 2 (Limited Emergency Condition)	LEVEL 3 (Full Emergency Condition)
Size of release/incident	Small	Medium or Significant	Major
Boundaries	Within the berth, vessel, facility or small geographical area	Within the berth, vessel, facility or geographical area	Beyond the immediate area of spill
Potential impact	None anticipated outside of operations area	serious impact on human life and/or the environment	very serious impact on human life and/or the environment
Response	Responsible Party able to respond to contain and clean up a spill with its own resources. Report incident to MEEA	Responsible party will initiate a response and simultaneously notify ODPM and relevant Regional Corporations	Responsible party will initiate a response MEEA Incident Command System (ICS) will be activated along with other government emergency operations centres
Resources	In-house resources sufficient	Local resources to be coordinated via a mutual aid scheme	Local, national and international resources required

The draft NCSCP also ensures that all companies have emergency response plans and procedures for all potential chemical spills and gaseous releases as a result of their operations. These plans and procedures and any subsequent revisions must be submitted to the MEEA. Companies that transport chemicals whether it is by land or sea must have a detailed Journey Management Plan. This plan must be made available to the relevant Regional Corporations and the PTCCB prior to the start of any journey involving the transport of chemicals or gases and should include the response procedures in case of a chemical spill during transportation.

The National Coordinating Committee, along with the ODPM and industry, will conduct regular training programs and exercises for personnel likely to be involved in a response to a spill or release. These training programs and exercises are designed to enable Trinidad and Tobago to have sufficient numbers of trained personnel to mount a credible and effective response to a chemical or hydrocarbon release incident.

6.2 Chemical Incident Response

Trinidad has a significant amount of industrial development, hence an increased risk of possible industrial hazards. In 1979, the collision of two ships, the Atlantic Empress and the Aegean Captain which collided off Little Tobago resulted in an estimated 90 million gallons of crude being spilled. During December 2013 a total of eleven (11) oil spills occurred due to a ruptured pipeline in the Gulf of Paria, Trinidad. Data on the quantities of crude spilled and the financial losses are currently being consolidated.

In the event of an oil spill, the NOSCP states that the first imperative of an oil spill response must be spill prevention, and measures must be instituted to mitigate the potential for a spill. If a spill incident occurs, safety of life is the highest priority and should never be compromised regardless of the environmental imperative. Following notification (verbal and/or initial reporting), the Incident Commander from the MEEA will activate the Emergency Operations Centre and spill assessment surveillance of the oil slick would be conducted. Sampling of oil for fingerprinting analysis (to determine the source of the oil spill) will be done by trained personnel and the contaminated area will be determined. Clean up response decisions and operations as well as the proper disposal of recovered oil will be initiated. If a chemical spill and/or gaseous release in the onshore and/or marine environment should occur, the draft NCSCP outlines a similar response as the NOSCP.

6.3 Chemical Incident Follow-up and Evaluation

Both the NOSCP and the draft NCSCP include a thorough system of reporting and documentation for the emergency responses procedures to be carried out for chemical spills. However, there is a lack of information on the description of procedures to be taken in order to follow-up of a chemical incident. No information gathering, reporting, follow-up and evaluation is carried out in terms of exposed persons and the environment (inclusive of rehabilitation measures) so as to improve preparedness and response in the future. Additionally, no registry of chemical incidents is kept.

6.4 Assessment

It is of importance that Trinidad and Tobago has a chemical emergency preparedness, response and follow-up procedures in place to ensure human health and environmental safety in the event of a chemical spill. Trinidad and Tobago is making progress in terms of planning for chemical emergencies. The adaptation of the NOSCP serves as the first step in a positive direction. The draft NCSCP is also expected to be completed and published within the upcoming months. ODPM is also currently working on the National Hazard Mitigation plan. The ODPM's website also contains information on planning,

preparedness and response to hazards of which chemicals spills are listed, information which is tailored to the general public.

However there are still some issues that must be assessed in order to ensure that the chemical spill emergency response plan is all embracing, effective and efficient. For example, not all departments of the fire, police, coast guard and other emergency services have access to specific equipment and trained staff to deal with chemical incidents or accidents. There is no toxicological information services/poison centres to provide front line support in case of an accident and to provide guidelines to local health centres, hospitals and emergency services in relation to services of decontamination for patients and reserves of antidotes and medications for persons exposed to chemicals.

Follow-up and evaluation of chemical incidents is another area which requires strengthening through the creation of a formal mechanism for investigating the consequences of chemical incidents. The follow-up phase should include a retrospective assessment of initial exposure and an assessment of continuing exposure risks. Epidemiology can be used as a tool for evaluating the health consequences for populations exposed to chemicals as a result of chemical incidents or environmental contamination. It will measure effects and supply information on which to base action to deal with the current event and to help manage future ones.

Chapter 7: Chemical Awareness and Understanding

This chapter gives an overview of the mechanisms available to provide information to workers and the general public concerning the potential risks associated with chemicals and the capacity for training and education of target groups affected by chemicals.

7.1 Awareness and Understanding of Chemical Safety Issues

A general duty of employers under the occupational safety and health act pertains to hazard communication. The employer has to ensure that all employees who work with or in proximity to a dangerous or toxic substance received from a supplier is informed about all hazard information which the employer received from the supplier, concerning that substance and all further hazard information of which the employer is or ought to be aware, concerning its use, handling and storage. Further, an employer who produces a dangerous or toxic substance must ensure that every employee who works with or who is in proximity to that substance is informed about all hazard information available in respect of storage, use and handling.

The public is to be informed as well. The occupier of every industrial establishment is required to take steps to protect the safety and health of the public in the vicinity of his industrial establishment from dangers created by the operation or processes carried on. He is to take special care to ensure that plant and equipment used are of such integrity and that adequate safety systems are in place as to prevent the occurrence of fugitive emissions, such as chemical gaseous releases.

Importers are supplied with MSDSs which indicate physical and chemical properties of the chemical, the hazards associated with the handling, use, transportation and storage. Workers and their representatives have access to this information and to the precautions to be taken to ensure their protection against risks involved. An important precaution is the use of suitable personal protective clothing and equipment. Included in the emergency preparedness of PLIPDECO is the CAER programme Community Awareness and Emergency Response. It aims at preventing loss of life or injury to health, damage to property in the event of an emergency; it indicates the steps to be taken by members of the neighbouring community when faced with an emergency including one in which there are hazardous chemicals.

7.2 Education and Training for Sound Management of Chemicals and Waste

Educational institutions currently provide instruction in environmental science and occupational safety to various levels of proficiency. These include the UWI, University of Trinidad and Tobago, COSTATT, NIHERST as well as private institutions. However, not much emphasis is placed on the topics of chemical waste disposal and hazardous waste. Although the EMA and the NGOs often have educational and awareness programmes at school, youth programmes and community outreach on environmental issues, the focus tends to gravitate towards general environmental issues and very little has been done to date which specifically discusses chemicals and issues related to the use and disposal of chemicals.

The BCRC-Caribbean, since 2011, has been the dominant institution within the Caribbean region focusing on the sound management of chemicals and waste. The BCRC-Caribbean is constituted to serve the varied needs of the Caribbean Sub-region as they relate to the understanding and implementation of the Basel Convention by providing appropriate training, identifying and assessing environmentally sound mechanisms for waste management and then ensuring the transfer of this technology to member countries as required, providing technical support to member countries in the form of consultancy services and ensuring that pertinent information and awareness on the issues related to current trends in waste management are disseminated to member countries.

However, in light of decisions of the Basel, Stockholm and Rotterdam Conventions to enhance cooperation and coordination of the regional centres of the three conventions, the role and functions of the BCRC-Caribbean has now expanded for the Stockholm and Rotterdam as well as Minamata Conventions serving the needs of small island states with regards to training and technology transfer of chemicals and waste. The primary activities of the Centre include the participation in regional workshops coordinated by other conventions and the organization of international and regional workshops in cooperation with other Secretariats.

It is expected that the Centre would also be required to facilitate training courses on complying with the requirements of all of the conventions that deal with waste materials and chemicals in some form or fashion for its member countries, including assisting with conducting national annual inventories, reporting and the development of strategies for management of Basel defined wastes, mercury, persistent organic pollutants, obsolete chemicals, etc.

With regard to the role of the Centre on the implementation of international chemical conventions, the Centre currently has limited capacity to facilitate the implementation of other conventions in areas such as project implementation, communications, information sharing and activities. This deficiency can be easily addressed by expanding the scope and function of the BCRC-Caribbean with additional appropriate professional staff retained on an as needed basis.

There are no specific education and training programmes for the sound management of chemicals and waste in Trinidad and Tobago. The topic of chemicals and waste are covered under the general heading of the environmental sciences at the primary, secondary and tertiary level education system.

7.3 Assessment

The awareness and understanding of chemical safety issues in the work place has been consistent within Trinidad. Most companies carry out job safety analysis and conduct toolbox meeting prior to work that may involve the use of chemicals. However, it is essential to have common knowledge among workers on the dangers of chemicals used and a common means of identification of hazards to ensure that proper mitigation. The use of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) is an internationally agreed-upon system, created by the United Nations. It is designed to replace the various classification and labelling standards used in different countries by using consistent criteria for classification and labeling on a global level. Trinidad and Tobago has not yet

adapted this system. Attempts were made by some Ministries but due to lack of proper legislation the GHS is still voluntary and not mandatory. Some companies within the private sector, in particular the internationally based companies have adapted the GHS system.

More emphasis needs to be placed on education and awareness of the proper use of chemicals and disposal of chemical waste in Trinidad and Tobago. Programmes tailored to chemicals management should be implemented at a tertiary levels and basic education drive can be done at a primary and secondary level to ensure an understanding of the importance of managing chemicals. Bespoke training can also be carried out at industries to communicate the workers an understanding or refresher courses on the safe use and proper disposal of chemicals.

Chapter 8: International Linkages

This chapter describes national participation and involvement in international organisations and agreements concerned with the management of chemicals and to identify opportunities for an integrated approach at a national level.

8.1 Cooperation and Involvement with International Organisations, Bodies, and Agreements

A number of organizations and agencies in Trinidad and Tobago have established working relations and linkages to regional and international bodies which are concerned with various aspects of the sound management of chemicals. Table 8-1 lists the international organizations involved with chemicals management along with the local counterparts (focal point, lead and supporting government agencies) and local activities.

Participation in these international organizations, bodies and agreements has been limited with certain focal points being more active than others. Two major challenges encountered are that often times a single individual may be the focal point for several international and regional organizations and there is a very small pool of resource personnel that would allow the desired and required level of attention and follow up. There are also several activities that, while they do not have a direct focus on chemical management, can provide indirect support in certain areas of integrated chemicals management. Several of these activities are in the form of specific projects with specific time frames. Table 8-2 shows the type of associated activities linked to the international organization.

Table 8-1: Membership in International Organisations, Programmes, and Bodies

International Organisation/ Programme/ Body	National Focal Point (ministry/Agency and Primary Contact Point)	Other Ministries/Agencies involved	Related National Activities
UNEP	Ministry of Environment and Water Resources	EMA, BCRC-Caribbean	Global partnership on waste management
WHO/PAHO	Ministry of Health	Ministry of Food Production	Human and environmental health issues, DDT regional project such as Chemical Safety Management in Trinidad and Tobago 2001
GEF	Ministry of Environment and Water Resources	Ministry of Health, EMA, BCRC-Caribbean	National Biodiversity Strategy, Action Plan and First Report to the CBD; Enabling Trinidad and Tobago to Prepare its First National Communication in Response to its Commitments to UNFCCC; Preparation of Trinidad and Tobago's Third National Communication and First Biennial

International Organisation/ Programme/ Body	National Focal Point (ministry/Agency and Primary Contact Point)	Other Ministries/Agencies involved	Related National Activities
			Update Report to the UNFCCC; National Capacity Self Assessment (NCSA) for Global Environmental Management; Climate Change Enabling Activity (Additional Financing for Capacity Building in Priority Areas); Improving Forest and Protected Area Management; Technical and financial assistance for NIPs and NIPs update under Stockholm Convention Capacity Development for Improved Management of Multilateral Environmental Agreements for Global Environmental Benefits;
FAO	Ministry of Health	Ministry of Food Production	Obsolete pesticides programme
UNIDO	None	None	Resource-efficient and low-carbon industrial production; Clean energy access for productive use; and Capacity building for the implementation of multilateral environmental agreements
ILO	Ministry of Labour and Small and Micro Enterprise Development	Ministry of Environment and Water Resources, Ministry of Labour and Small and Micro Enterprise Development	Occupational health and safety issues, Labour and workplace related issues.
UNDP	Ministry of Planning and Sustainable Development	Ministry of Trade and Industry Parliament of Trinidad and Tobago Ministry of National Security, ODPM Ministry of Local	Technical support for strategic development projects and capacity building to eradicate pockets of extreme poverty, facilitate citizen security, enable youth development, promote democratic governance, promote and protect human rights and

International Organisation/ Programme/ Body	National Focal Point (ministry/Agency and Primary Contact Point)	Other Ministries/Agencies involved	Related National Activities
		Government Ministry of Community Development	improve energy and environmental management, and disaster risk reduction
World Bank	Ministry of Planning and Sustainable Development	Ministry of Trade and Industry Ministry of Finance and the Economy	Project implementation for implementing sustainable land management Extractive Industries Transparency Initiative Implementation
Regional Development Bank (Inter-American Development Bank)	17 Alexandra Street, St. Clair, Port of Spain, (T) (1-868) 822-6400 (F) (868) 622-6047 Email: IDBTrinidad@iadb.org	Ministry of Health, Environmental Management Authority, Ministry of Environment and Water Resources, Ministry of Energy and Energy Affairs	Upgrades to public healthcare infrastructure, feasibility study for coastal zone management, institutional strengthening of the EMA to improve its coordinating role in mainstreaming environmental management and climate change related priorities. To develop and promote the widespread use of internationally acceptable industry-wide health, safety and environmental standards. sustainable energy program that will focus primarily on renewable energy, energy efficiency and conservation and optimization of fossil fuel based production and use
Economic Commissions for Latin America and the Caribbean (ECLAC)	Ms. Diane Quarless, Director 1 Chancery Lane, Port of Spain, Te: (868)224-8000 Email: registry@eclacpos.org		Training Workshop on the ECLAC Methodology for Assessing the Macroeconomic, Social and Environmental Impacts of Natural Disasters An assessment of the economic impact of climate change on the agriculture, energy and health sectors

Table 8-2: Participation in International Agreements/Procedures Related to Chemicals Management

International Agreements	Primary Responsible Agency (designation of focal point)	Relevant National Implementation Activities
SAICM	Ministry of the Environment & Water Resources Permanent Secretary	Funding for project implementation to meet the initiatives under the different agreements and conventions
Stockholm Convention¹	Ministry of the Environment & Water Resources Permanent Secretary	Implementation of the activities under Trinidad and Tobago's NIP; e.g. public awareness to industries, schools etc. Participation in the GEF-UNIDO project "Development and Implementation of a Sustainable Management Mechanism for POPs in the Caribbean". Participation in the FAO project "Disposal of Obsolete Pesticides, including POPs, Promotion of Alternatives and Strengthening Pesticides Management in the Caribbean".
Rotterdam Convention¹	Ministry of the Environment & Water Resources (DNA) Permanent Secretary Ministry of Health-PTCCB (DNA)	Implementation of projects related to the safe management of the chemicals subject to the Pic procedure via projects listed under the Stockholm Convention above, as relevant. Transmission of local chemical usage to the Secretariat for further use by the CRC, as required.
Basel Convention¹	Ministry of the Environment & Water Resources Permanent Secretary	Development of the Draft Waste Management (Hazardous Waste) Rules 2014 Proposal to amend the Import and Export Negative Lists to include hazardous wastes.
Montreal Protocol¹	Ministry of the Environment & Water Resources National Ozone Officer	Implementation of a national phase out plan for hydrochlorofluorocarbons (HCFCs); e.g. training of technicians, custom brokers etc. Retrofitting of foam companies currently using HCFCs as an agent in production; Phase out of methyl bromide as a fumigant; Public awareness; schools, mall displays etc. Purchase of ozone friendly equipment; e.g. hydrocarbon leak detectors.
International Health	Ministry of Health	

Regulations 9IHR 2005		
ILO Convention 170	Trinidad and Tobago has not ratified to these conventions	
ILO Convention 174		
Chemical Weapons Convention	Ministry of Foreign Affairs, Customs and Exercise	Preventing the diversion of precursor chemicals. This objective focuses on monitoring certain chemicals' import, export and domestic use to ensure that it does not contribute to the domestic or global production of illicit narcotic drugs.
FAO Code of Conduct	Ministry of Food Production	
GHS	N/A	N/A
UN Recommendations for the Transport of Dangerous Goods	Ministry of Transport, Maritime Services Division	Ballast water waste management Upgrade national legislation
Agenda 21 – Commission for Sustainable Development	Ministry of Planning and Development	

1 - Designated National Authority (DNA) or Focal Point of the Convention should be identified

8.2 Participation in Relevant Development and Technical Assistance Projects

Trinidad and Tobago is involved in two major on-going and planned bilateral regional assistance activities related to the management of chemicals. The projects are summarized in Table 8-3 below. The FAO project started in 2009 and is expected to be completed by 2017. To date, with the FAO support, Caribbean countries have collectively located nearly 300 tons of obsolete pesticides that include some of the most dangerous chemicals that have been banned internationally such as dieldrin and heptachlor. This information is being used to plan a clean sweep of the region in order to safely dispose of all existing obsolete pesticides at an estimated cost of US\$ 2 million.

The GEF/UNIDO project was approved by the GEF Council in 2013 and seeks to enable the region to reduce and/ or eliminate the threat of POPs as part of the obligations under the Stockholm convention, within the context and realities of eight (8) Caribbean countries, inclusive of Trinidad and Tobago. This project is expected to be completed by 2018.

Table 8-3: Participation as Recipient in Relevant Technical Assistance Projects

Name of Project	International/ Bilateral Donor Agency involved	National Contact Point	Relevant Activities
Prevention and Disposal of Obsolete Pesticide Programme	FAO, European Union	Ag. Registrar, Pesticides and Toxic Chemicals, Chemistry Food and Drugs Division, 92 Frederick Street, Port-of Spain.	address priorities in pest and pesticide management such as the safe disposal of obsolete pesticide stocks Finding the safest methods for controlling pests in agriculture and homes Reducing risks from pesticides to the environment and the health of both local populations and tourists Communicating with farmers, politicians and the general public about pesticide dangers and the positive actions that can be taken
Development and Implementation of a Sustainable Management Mechanism for Persistent Organic Pollutants in the Caribbean	GEF, UNIDO	BCRC-Caribbean, #8 Alexandra Street, St. Clair, Port of Spain.	Strengthened institutional framework to improve capacity and coordination in decision-making within and across ministries Improved capacity for risk evaluation and chemicals management Enhanced information sharing and public awareness Reduction of UPOPs by improved landfill practices Identification and mapping of contaminated sites for remediation

Name of Project	International/ Bilateral Donor Agency involved	National Contact Point	Relevant Activities
			Removal and disposal of obsolete stocks of POPs and PCBs Improved biomedical waste management

8.3 Assessment

The government of Trinidad and Tobago is involved in a series of agreements and international activities linked to the management of chemicals. Trinidad and Tobago is a member of the United Nations and of several of its specialized agencies such as the ILO, UNEP, UNIDO, FAO and UNDP and has ratified the following Conventions:

- Vienna Convention (1985) on substances that deplete the ozone layer;
- Basel Convention (1989) on the Transboundary Movement of Hazardous Waste;
- Stockholm Convention (2002) on Persistent Organic Pollutants (POPs);
- Rotterdam Convention (2009) on Industrial Chemicals and Pesticides.

These international agencies assist developing countries and countries in transition with technical and financial resources to meet the requirements of the different conventions. The international programs work with specific national counterparts or focal points appointed by the competent Secretariat and are responsible for aligning proposed activities with institutional planning. As such, the degree of development of national implementation activities of international agreements varies between organisations in terms of priorities and resources.

The development of synergies between the different conventions is important as it improves the use of available resources through more coordinated national frameworks, institutional mechanisms and enforcement capacity dealing with chemicals and wastes, reduces cost of implementing the conventions through synergistic efforts and leads to raised profile of the issue at the national, regional and international levels which can result in increased resources to support chemicals and waste management programmes. Better coordinated technical assistance activities, better use of resources to support developing countries and countries with economies in transition to implement the conventions, the development of an integrated approach towards sound chemicals and waste management and the opportunity to mainstream those issues into national development plans are further benefits to the development of synergies.

Chapter 9: Availability of Resources for Chemical Management

This chapter provides an overview of the human resources available within government Ministries and related agencies as well as non-governmental organisations to various aspects of chemicals management and highlight resources needed to strengthen the management of chemicals.

9.1 Resources available in Government Ministries/Institutions for Chemical Management

There is no single department/division/unit for the sound management of chemicals within Trinidad and Tobago. The persons working with chemicals in terms of manufacture/production, use, disposal, research, management and safety are located within the different Ministries, working on different projects concerning chemicals. The Table below gives a summary of the resources available within the government Ministries and Institutions for chemical management.

Table 9-1: Resources Available in Government Ministries/Institutions

Ministry/Agency concerned	Number of Professional Staff involved*	Type of Expertise Available	Financial resources Available
Environment	8	Waste specialist, Environmental policy and management persons, environmental engineers, climate change specialist	Government appropriation
Health	6	Physicians, Occupational Hygienist, Chemist	Government appropriation
Agriculture	10	Graduates in Agricultural Science, Chemist, Entomologist	Government appropriation
Labour	6	Chemists, Engineers, Physicist	Government appropriation
Trade/Commerce	4	Economists	Government appropriation
Finance	6	Economists, Accountants	Government appropriation
Works and Transport	4	Environmental engineers, specialists and manager	Government appropriation
Energy	10	Chemical and industrial Engineers, Petroleum Engineers, Environmental and risk assessment specialists	Government appropriation and private sector
Customs	ND	Customs officers and chief custom officers	Government appropriation
EMA	20	EIA, chemicals and waste specialists, environmental technicians, compliance officers and manager, environmental lawyers, librarian	Government appropriation (Part Government)

Ministry/Agency concerned	Number of Professional Staff involved*	Type of Expertise Available	Financial resources Available
IMA	8	Research analysts, chemists, biologists, environmental specialists, geochemists	Government appropriation (Part Government)

*Figures are estimated based on personal communication with each Ministry/Institution

ND –No data

9.2 Resources needed by Government Institutions to fulfil responsibilities related to Chemicals Management

The Ministries in Trinidad and Tobago are sufficiently staffed with professionals for the sound management of chemicals. However, there needs to be more integration between Ministries or Government needs to focus of an integrated system for the sound management of chemicals. This system will however require the institutionalizing of a division or unit dealing solely with chemicals throughout its entire life cycle, inclusive of recycling and reusing and will require additional expertise. This would have to consist of an entire suite of staff from administrative personnel, IT persons as well as professional staff. Experts will be needed in the field of project management, chemistry, biology, physics, toxicology, environmental policy and compliance.

9.3 Resources available in Nongovernment Institutions for Chemicals Management

Trinidad and Tobago Emergency Mutual Aid Scheme (TTEMAS) is an NGO that focuses on industrial mutual aid and emergency preparedness services. Its vision is to provide regional leadership in industrial preparedness and emergency response. Its mission is to provide an effective mutual aid system in the event of critical incidents and to influence the national communities to adopt policies, practices and procedures for the elimination, containment and mitigation of technological disasters. The membership of TTEMAS is over 40 and the industries include oil and gas, petroleum refining, petrochemicals (ammonia, urea and methanol) and the cement industry. The NGO conducts emergency exercises and simulations, hosts workshops and seminars and shares experience in the management of chemicals.

The National Safety Council of Trinidad and Tobago is an NGO formed to educate and influence society to adopt safety, health and environmental policies, practices and procedures that prevent and mitigate human suffering and economic losses arising from preventable causes. The NGO serves as an impartial intermediary in bringing together safety and health professionals representing industry and labour and enthusiasts in the field. They are able to form national coalitions on key safety, health and environmental issues.

The Oilfield Workers Trade Union (OWTU) is one of the most powerful unions in Trinidad and Tobago. It represents workers on the production, refining and marketing sectors of the oil industry; other members come from the petrochemical industry e.g. methanol, ammonia and urea. The Union has a well-established information centre with resources relating to safety, health and environmental matters. It organizes training sessions for its membership and takes an active part in accident investigations where members are involved.

The Trinidad and Tobago Manufacturers Association (TTMA) is another NGO fully representative of manufacturing and allied services industries. It provides support to its members to achieve and sustain their full potential in the areas of investment, job creation, market development and national wealth creation. They have an Environmental, Health and Safety Committee which focuses on the role of education, both for its members and for the public.

American Chamber of Commerce of Trinidad and Tobago (AMCHAM), is an organization that seeks to facilitate trade and investment opportunities between Trinidad and Tobago and the United States of America, by providing a forum for the exchange of opinions and for influencing policies designed to enhance the investment climate. In this context, AMCHAM T&T serves the needs and represents the interests of the private sector of Trinidad and Tobago. The organization offers assistance to foreign investors as well as local entrepreneurs at the initial stages of their business ventures. It provides valuable information to persons wishing to import or export in terms of prospective buyers, distributors, suppliers and agents. AMCHAM has a Safety, Health and Environment Committee of forty members.

The Committee promotes awareness and engenders interest in matters affecting the environment and impacting on workers' health. AMCHAM T&T hosts an annual Health, Safety, Security & Environment (HSSE) Conference & Exhibition and continuously demonstrates themselves to be a strong advocate of the promotion of HSSE best practice and has played a critical role in the development of both the environmental and occupational safety and health movements in Trinidad & Tobago. One example of this is the AMCHAM T&T HSSE Committees which seek to foster consciousness and awareness in the areas of Occupational Health & Safety, Security, the Environment and related subject areas throughout the private sector, our membership and the national community. We firmly believe that HSSE best practice makes good business sense and that organizations should be encouraged to implement same; as the benefits accrue not only to the organization but to the wider society.

9.4 Resources from Development Assistance Activities

Many developing countries and those in economic transition, like Trinidad and Tobago, benefit from multilateral and bilateral assistance activities related to the management of chemicals. The Table below gives a summary of funding institutions and support given to Trinidad and Tobago to better manage chemicals. The BCRC-Caribbean has been very instrumental in acquiring numerous funded projects on chemicals management, all of which have been successfully completed.

Table 9-2: Resources Available through Development Assistance and Technical Cooperation Activities

Funding Institution and International Supporting Institutions	Title of Project and duration dates	Number of Professional Staff involved	Type of Expertise provided	Financial resources of project (budget in US\$)
UNIDO	Enabling Activities Of facilitate Early Action On the Implementation of the Stockholm Convention on Persistent Organic Pollutants (POPs) in the Caribbean Region (PPG Phase)	3	Technical expertise based on project	149,850
The United Nations Environmental Programme (UNEP)	Waste Tyre Management Systems for the Caribbean Region	2	Technical and administrative expertise based on project	48,650
The Secretariat of the Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal	Assessment of Waste Electrical and Electronic Equipment Management and Data for the Republic of Suriname	2	Technical and administrative expertise based on project	23,990
UNEP	Sound Management of Industrial Chemicals ;under the Rotterdam Convention to be executed in the Caribbean Region	2	Technical and administrative expertise based on project	

9.5 Assessment

The different government ministries and agencies have environmental professionals with varied backgrounds working with chemicals management. For example, the EMA has members drawn from the following disciplines or groups, namely environmental management, ecology, environmental health, and environmental engineering, whilst the Chemistry, Food and Drug Division of the MoH has chemists, toxicologists and inspectors involved in the area of chemicals management. The Occupational Safety and Health Authority and Agency consist of safety and health inspectors and the MEEA has chemical and industrial engineers on staff. This demonstrates the diversity of expertise available in terms of human resources that can be utilized for chemical management and emphasizes the importance of collective opinions from different research areas when making decisions for managing chemical.

However, in order to strengthen the development of capacities and the formation of human resources the following specific areas of chemical management need to be staffed:

- Regulation and policy development
- Coordination/project management
- Management of information on chemicals and chemical waste
- Designing and implementing procedures and tools for managing chemicals
- Chemical waste, in particular, storage, transportation and disposal of hazardous chemicals

The Government of Trinidad and Tobago has a Government Human Resource Services Company Limited (GHRM) which began in 2006 with the overarching mandate to enhance the Human Resource capacity in the Public Service of Trinidad and Tobago. The operationalization of this addresses both the current and future skills gaps of the Republic of Trinidad and Tobago, by taking a proactive perspective which focuses on securing the best talent, both locally and internationally, supporting Public Sector initiatives to enhance human resource capacity, skills forecasting and applying technology to human resource processes to create efficiencies. However, the recruitment process is lengthy and tedious, and in most cases dependent of the specific Ministry. An efficient system is thus required.

Chapter 10: Conclusions and Recommendations

This chapter concludes the National Chemical Profile for Trinidad and Tobago and discusses the current situation of chemicals management within the country. Its intent is to summarize the properties and recommendations for action considered most important.

10.1 Chemicals Management situations in Trinidad and Tobago

Trinidad and Tobago is the most industrialized country within the Caribbean region, with the petroleum and petrochemical sector contributing approximately 38.5% to the GDP for 2014 (Ministry of Finance and the Economy 2014). The diversity and potential consequences of such industrialization, combined with limited capacity in developing countries and economies in transition to manage potential risks, make the sound management of chemicals and waste a key cross-cutting issue in the country. The Government of Trinidad and Tobago has responded with various tools such as laws, policies and practices at all levels, from national to regional and international. Tools have been designed to reflect the inherent hazards and risks of chemicals attempting to limit the exposure of humans and the environment at or below levels that do not cause harm.

However, the sound management of chemicals still presents a challenge as the management of chemicals in Trinidad and Tobago is spread over several Ministries such as agriculture, environment, health, trade and planning, and between several agencies within each Ministry based on their respective legislations. The concept of life cycle thinking is overlooked, placing little emphasis on the issue that the release of substance not only occur during chemical production but also during the use of products containing chemicals and finally at their disposal. As such, disposal facilities for both used and expired chemicals are not available. The difficulty in accessing data on industrial chemicals and chemical waste also creates a major problem in Trinidad and Tobago. Data is available within both the government and private sector, but lack of data management and personal commitment creates a problem to retrieve this data.

10.2 Recommendations

The National Chemical Profile update for Trinidad and Tobago functions as a working document to evaluate the management of chemicals at a national level. The management of chemicals and associated wastes involves the process of directing, coordinating and controlling the life cycle of chemicals in order to promote an integrated approach to the sustainable production and consumption whilst minimizing the negative effects at a local, national and regional level.

The effective management of chemicals therefore requires better information gathering and integrated approaches to chemicals, and waste management, supported where appropriate by improved environmental governance. The management approach should focus on sustainable development, with emphasis placed on preventative rather than curative actions. The complete life cycle of chemicals must be assessed with the ultimate result conforming to a 'cradle to cradle' approach to chemicals management. This will encourage the recovery and recycling of chemicals to reduce the quantity of

chemical waste generated. Appropriate information systems, human and financial resources are required.

Five key issues are of primary importance to achieve the sound management of chemicals in Trinidad and Tobago:

- Legislative reform
- Set up a National Committee for chemicals management
- Chemical inventory and development of database
- Increased infrastructural capacity
- Public awareness, training, and research and development

Legislative reform

Chemicals are mandated through various pieces of legislation in Trinidad and Tobago. In many cases, legislation are inadequate or do not exist to control the manufacture, registration, application, labelling, packaging, marketing, transportation, storage, use and disposal of chemicals. An overarching piece of legislation is required to govern and manage the life cycle of chemicals to ensure the protection of human health and the environment from the potential risks, while enhancing the competitiveness of the chemicals industry. This can be adopted from the European Union's on the Registration, Evaluation, Authorization and Restriction of chemicals (REACH) legislation and drafted under the Environmental Management Act 2000. REACH legislation streamlines and improves the former legislative framework on chemicals of the European Union and makes industry responsible for assessing and managing the risks posed by chemicals and providing appropriate safety information to their users. Additionally, national definitions of 'industrial chemicals' and 'chemical waste' need to be identified and included in the legislation.

Trinidad and Tobago like many of the small island developing states is Party to many international agreements, protocol, treaties and conventions on chemicals which are essential to facilitate international acceptance and trade. However, a major issue is lack of proper understanding of the implications of these agreements. Governments therefore need be aware and educated on the full implications of these commitments before signing. The BCRC-Caribbean has been assisting with training and technology transfer of information for a better understanding on the required commitments and responsibilities under the different agreements and conventions. However, it is recommended that additional funding be granted to such organizations to increase resources necessary to carry out such work.

Set up a National Committee for Chemicals Management

The development of a well-coordinated, multi-sectoral committee is needed as part of the national framework for the sound management of chemicals in Trinidad and Tobago. The committee needs to be established with stakeholders from the Government, private sectors as well as NGOs. The committee will serve as the national steering committee for the environmentally sound management of chemicals, similar to what already exists in other Caribbean countries. The Committee will be responsible for making decisions on the import and use of restricted chemicals under the different Conventions. In particular, the National Committee can address the Rotterdam Convention obligations on industrial chemicals developed at the introductory sub-regional workshop during the initial phase of this project.

The proposed NCC for Trinidad and Tobago is shown in Figure 10-1 below. The committee can comprise of a core committee and member representatives from the different ministries, statutory bodies, associations, energy companies and other organisations. The core committee should comprise of the key players (decision makers) involved with the management of chemicals within Trinidad and Tobago, specifically the Ministries directly involved with production, import, export, use, storage, transport and disposal of the chemicals and chemical waste. The core NCC should meet on a quarterly basis and serve as the national steering committee for the environmentally sound management of chemicals.

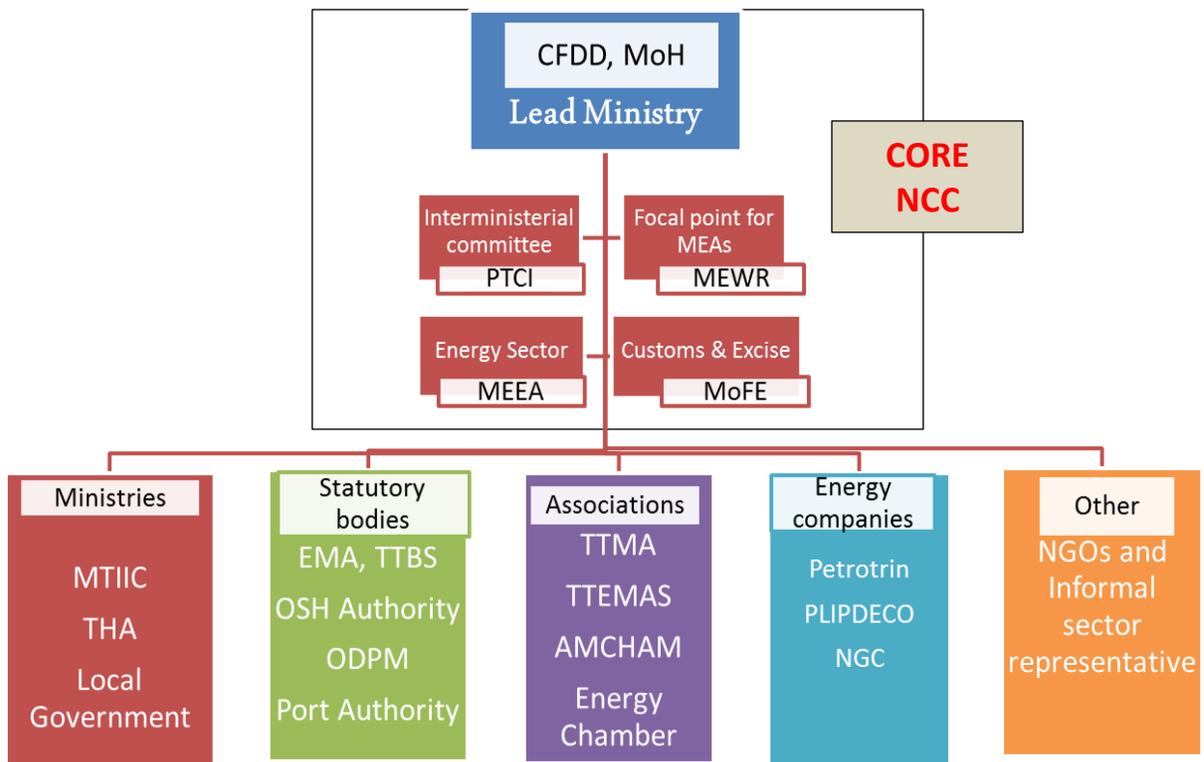


Figure 10-1: Proposed National Chemical Committee for Trinidad and Tobago

Chemical inventory and development of database

The success of chemicals management is closely linked to accessible and timely information. A chemicals database needs to be established to house information on all chemicals used in Trinidad and Tobago. This would include a chemical inventory in terms of properties, use and use categories, manufacturers, importers, distributors, storage facilities, transportation, exposure pathways, risks, and potential and actual health effects and environmental impacts. The inventory should also include the necessary treatments to chemical exposure and the use of alternative chemicals to be used for decision making regarding risk mitigation and the identification of chemicals that are banned or severely restricted for use. Chemical waste production, industrial effluents and monitoring data should also be collected and recorded. A separate inventory should be done for new chemicals being introduced into the market, taking into consideration the same criteria. This database should be housed at the EMA or MoH, being readily available and free of charge to the public.

Increased infrastructural capacity

A centralized facility for the storage of expired and unused industrial chemicals should be established with standard operating procedures. A disposal facility for industrial chemicals and chemical waste is also recommended to ensure the safe disposal/destruction of industrial chemicals in an environmentally sound manner.

There is also need for the establishment of a Poison Control Centre within Trinidad and Tobago. The University of the West Indies' Faculty of Medical Sciences at the Eric Williams Medical Sciences Complex can host the poison centre. This facility will serve as direct-service providers offering poison treatment advice on a 24hours basis. This facility is beneficial as it ensures toxico and public health surveillance, public and professional education, and research data on product safety and toxicity.

Public awareness, training, and research and development

Proper technical expertise and appropriate infrastructure is a priority to adequately manage chemicals. The National Chemical Profile update serves as a reference document to evaluate what is currently available in terms of chemicals management, the gaps that exists and what is needed to bridge the gaps. However, expert training as well as supporting personnel will be needed to implement the recommendations, including involvement of all stakeholders involved with chemicals. There will be a need for a sustained public awareness programme which targets politicians, decision-makers, workers, schools and communities at large. Empowering communities inclusive of NGOs and CBOs and making them involved in the management process can result in a better decision making process by the politicians to ensure the safe and effective use and disposal of chemicals.

Research by universities and industries to re-engineer the manufacturing processes used in the chemical industry should be subsidized by government. This will allow for minimization of waste and for the use of safer chemical alternatives, reducing the quantities of potential hazardous chemicals reaching the market.

The success of managing chemicals in Trinidad and Tobago requires cooperation at many different levels ranging from the communities to the decision makers to the politicians. The issue of inadequate financial, technical and political support creates a barrier for progress. However, with access to international support, Trinidad and Tobago has been progressing in a positive direction towards the sound management of chemicals.

References

Caribbean Environmental Health Institute 2009, *Laboratory Assessment Report for Trinidad and Tobago in support of the GEF-IWCAM Project*. The Environmental Management Authority on behalf of the Government of the Republic of Trinidad and Tobago. The Integrating Watershed and Coastal Areas Management (IWCAM) Project P.O. Box 1111, The Morne, Castries, St. Lucia.

Caribbean Environmental Health Institute 2009, *National Hazardous Waste Inventory for Trinidad and Tobago*. The Environmental Management Authority on behalf of the Government of the Republic of Trinidad and Tobago.

Central Intelligence Agency 2014, *The World Factbook 2013-2014*, Office of Public Affairs Washington, DC 20505. Available from: <https://www.cia.gov/library/publications/the-world-factbook/index.html> [15 October 2015].

Central Statistical Office 2010, *Pocket Digest 2010*, Central Statistical Office Printing Unit. Available from: <http://www.planning.gov.tt/sites/default/files/content/mediacentre/documents/Pocket%20Digest.pdf> [19 November 2014].

Central Statistical Office 2010, *Maps*, Ministry of Planning and Sustainable Development. Available from: <http://cso.planning.gov.tt/tt-today/Maps.html> [24 March 2015].

Central Statistical Office 2012, *Trinidad and Tobago Human Development Atlas*, Ministry of Planning and Sustainable Development. Available from: http://www.planning.gov.tt/sites/default/files/content/mediacentre/documents/Human_Development_Atlas.pdf. [15 October 2015].

Central Statistical Office 2014, *Labour Force Bulletin-2nd Quarter Profile 2014*, Ministry of Planning and Sustainable Development. Available from: <http://cso.planning.gov.tt/content/labour-force-bulletin-2nd-quarter-profile-2014> [11 June 2015].

Environmental Management Authority 2003, *Trinidad and Tobago Report on Sources and Environmental Levels of PTSS*. Regionally based assessment of persistent, toxic chemicals. Accessed from EMA Library on 17 December 2014.

Environmental Management Authority 2009, *National Environmental Policy 2006*. Government of the Republic of Trinidad and Tobago. Available from: <http://www.ema.co.tt/new/images/policies/national-environmental-policy2006.pdf> [13 November 2014].

Food and Agriculture Organisation of the United Nations 2012, *Capacity Building related to Multilateral Environmental Agreements in African, Caribbean and Pacific (ACP) countries – Clean-up of Obsolete Pesticides, Pest Management and Sustainable Pest Management*. Mission Report - Caribbean Obsolete Pesticides Inventory.

Government of Trinidad and Tobago 2013, *National Implementation Plan (NIP) for Trinidad and Tobago*. Prepared within the framework of the project “Initial Assistance to Enable Trinidad and Tobago to Fulfil its Obligations under the Stockholm Convention on Persistent Organic Pollutants”.

Inter-Ministerial Committee for Cyber Security 2012, *National Cyber Security Strategy*. Government of the Republic of Trinidad and Tobago. Available from: http://www.nationalsecurity.gov.tt/Portals/0/Pdf%20Files/National_Cyber_Security%20Strategy_Final.pdf [24/02/2015]

International Trade Centre 2015, *Market Analysis and Research – Trinidad and Tobago Imports and Export*. Palais des Nations; CH-1211 Geneva 10; Switzerland. Available from: http://www.trademap.org/Bilateral_TS.aspx?nvpm=1|780||780||TOTAL||2|1|1|1|2|1|1|1|1

Market Analysis and Research 2015, *Trade statistics for international business development monthly, quarterly and yearly trade data. Import & export values, volumes, growth rates, market shares, etc.* International Trade Centre (ITC); Palais des Nations; CH-1211 Geneva 10; Switzerland. Available from: <http://www.trademap.org/Index.aspx> [12 November 2014]

Ministry of Energy and Energy Affairs 2014, *Consolidated Monthly Bulletins: MEEA Bulletins Vol. 51 No. 12*. Government of Trinidad and Tobago. Available from: <http://www.energy.gov.tt/wp-content/uploads/2015/01/December-2014-MEEA-Consolidated-Bulletins.pdf> [15 January 2015]

Ministry of Energy and Energy Affairs 2015, *Trinidad and Tobago Energy Guide: A directory for the Oilfield and Energy Sector*. Government of the Republic of Trinidad and Tobago. Available from: http://www.energyguidett.com/O-P_oilfieldServ.html [23 February 2015].

Ministry of Finance and the Economy 2014, *Review of the Economy 2014*, Government of the Republic of Trinidad and Tobago. Available from: <http://finance.gov.tt/wp-content/uploads/2014/09/ROTE-2014.pdf> [19 November 2014].

Ministry of Planning and Sustainable Development 2012, *Trinidad and Tobago 2011 Population and Housing Census Demographic Report*, Central Statistical Office. Available from: https://guardian.co.tt/sites/default/files/story/2011_DemographicReport.pdf. [07 October 2014].

Mohammed, A., Peterman, P., Echols, K., Manoo, A., Maraj, D. and Agard, A. 2009, *Polychlorinated dibenzo-p-dioxin (PCDDs) and polychlorinated dibenzofurans (PCDFs) in harbor sediments from Sea Lots, Port-of-Spain, Trinidad and Tobago*, Marine Pollution Bulletin. Volume 58(6). P. 928-34.

Sammy, George 2013, *Development of a National Profile on Chemical and Waste Management of Trinidad and Tobago to support the implementation of the Stockholm Convention*. Final Report.

Sammy, G and Mc Calla, W 2011, *Strengthening the Legal, Regulatory and Enforcement Capacity of Small Island Developing States (SIDS) in the Caribbean with regard to the Basel, Stockholm and Rotterdam Conventions*.

The Stockholm Convention on Persistent Organic Pollutants (POPs) National Implementation Plan (NIP) for Trinidad and Tobago. September 2013

Trinidad and Tobago Extractive Industries Transparency Initiative 2014, *Trinidad & Tobago EITI Report 2012 - Making Sense Of T&T's Energy Dollars*, Available from: <http://www.tteiti.org.tt/eiti-reports/tteiti-report-summary-making-sense-of-energy-dollars-2012/> [24 February 2015].

Trinidad and Tobago Government online 2015, *Geographic Information*. Available from: https://www.ttconnect.gov.tt/gortt/portal/ttconnect/SharedDetail?WCM_GLOBAL_CONTEXT=/gortt/wcm/connect/GorTT%20Web%20Content/ttconnect/home/about+t+and+t/general+information/climate. [10 February 2015]

Trinidad and Tobago's annual Extractive Industries Transparency Initiative (TTEITI) 2013, Trinidad and Tobago EITI Report 2012 - Making Sense of T&T's Energy Dollars. Available from www.tteiti.org.tt/category/eiti-reports/ [24/02/2015]

Trinidad and Tobago Government online 2015, *Political Structure*. Available from: https://www.ttconnect.gov.tt/gortt/portal/ttconnect/CitizenDetail?WCM_GLOBAL_CONTEXT=/gortt/wcm/connect/GorTT%20Web%20Content/ttconnect/Citizen/role/astudent/informationandstatistics/government [30 October 2014].

UNESCO Institute for Statistics 2010, *Demographic information*. Available from: <http://www.unesco.org/new/en/natural-sciences/science-technology/overview-of-unescos-work/unesco-institute-for-statistics/> [17 November 2014].

ANNEX I

Data required to update the National Chemical Profile for Trinidad and Tobago

Introduction

The National Chemical Profile for Trinidad and Tobago will be updated in a collaborative and comprehensive manner ensuring data accuracy, where data are readily available, and transparency. The existing National Chemical Profile (2001) for Trinidad and Tobago was reviewed and the document will be updated based on the guidance document entitled *“Preparing a National Profile to Assess Infrastructure and Capacity Needs for Chemical Management”* (UNITAR, 2012).

The National Chemical Profile update will contain, in addition to an introductory section, an executive summary and a reference list, 10 distinct chapters and a series of annexes, as appropriate. Table 1 outlines the structure for the updated National Chemical Profile.

Outline of National Chemical Profile document

Executive Summary
Introduction to the National Profile
Chapter 1: National Background Information
Chapter 2: Legal and Institutional Capacity for Chemicals Management
Chapter 3: Chemical Production, Import, Export, Storage, Transport, Use, and Disposal
Chapter 4: Data Viability for Chemicals Management
Chapter 5: Infrastructural Capability for Managing Chemicals
Chapter 6: Chemical Emergency Preparedness, Response, and Follow-up
Chapter 7: Chemical Awareness and Understanding
Chapter 8: International Linkages
Chapter 9: Availability of Resources for Chemicals Management
Chapter 10: Conclusions and Recommendations
References
Annex I: Data required to update the National Chemical Profile for Trinidad and Tobago
Annex II: Participation of Ministries, Organisations and other Stakeholders
Annex III: Overview of Legislation governing Chemicals Management in Trinidad and Tobago
Annex IV: Trinidad and Tobago’s Import and Export for 2012-2013

In an attempt to meet the requirements to update the National Chemical Profile, the following information is required:

Chapter 1: National Background Information

Overview of National Economic Sectors

National Economic Sectors	Economic sub-sectors	Major products	Number of Employees ('00)	Number of Facilities	Contribution to GDP (%)	Output Value (US\$ millions)	Growth Rate (%)
Agriculture and Forestry							
Fishing							
Mining and quarrying							
Manufacturing							
Electricity and water							
Construction							
Secondary Industries							
Tertiary Industries							

Structure of the Major Economic Sectors by size (according to number of employees)

Economic Sectors	Micro Facilities ¹	Small Facilities ²	Medium Facilities ³	Large Facilities ⁴	No information provided on farm/facility size (%)
Petroleum Industries					
Agriculture and Fisheries					
Food processors and Drink					
Textiles, Garment and Footwear					
Printing, publishing and paper					
Wood and related products					
Chemicals and non-metallic minerals					
Assembly type and					

related industry					
Miscellaneous Manufacturing					
Construction					
Distribution					
Transport, Storage and Communication					

1 – 1-9 employees; 2- 10-99 employees; 3- 100-249 employees; 4- >249 employees.

Chapter 3: Chemical Production, Import, Export, Storage, Transport, Use, and Disposal

Chemical Production, Import and Export

Chemical Type	Production/ Manufacturing (tons/yr & US\$)	Imports (tons/yr & US\$)	Formulation/ Packaging (tons/yr & US\$)	Exports (tons/yr & US\$)
Pesticides				
Fertilizers				
Petroleum Products				
Industrial (used in manufacturing processing facilities)				
Consumer chemicals				
Other chemicals (unknown/mixed use)				

Chemical Use in Trinidad and Tobago

Chemical Type	Usage (tons/yr)
Pesticides- Agricultural	
Pesticides- Public health	
Pesticides- Consumer use	
Fertilizers	
Petroleum Products	
Industrial (used in manufacturing /processing facilities)	
Consumer chemicals	
Other chemicals (unknown/mixed use)	

Bulk Chemical Storage and Warehousing Facilities

Chemical Type	Size/Capacity (m ³ /tons)	Type of Facility ¹	Location (port, industrial complex, urban, rural)	Labelling, Health & Environment Protection Measures ²

- 1- Is the storage facility open, partly opened, completely enclosed, bounded monitored for air and water emissions
- 2- Indicate whether the GHS or other system is used for labelling the storage facility and, as may be appropriate, whether there are special precautions to protect flammables from ignition; to minimise the potential of exposure to poisons; and to segregate incompatible compounds to prevent their accidental mixing (via spills, residues left in storage containers, earthquakes, fires, or human error).

Bulk Chemical Distribution and Transportation

Chemical Type	Type of Transportation facility (maritime, inland waterway, rail, road, air)	Appropriate Capacity transported (m ³ or tons/yr)	Labelling, Health & Environment Protection Measures ¹

- 1- Indicate whether the GHS or other system is used for labelling the storage facility and, as may be appropriate, whether there are special precautions to protect flammables from ignition; to minimise the potential of exposure to poisons; and to segregate incompatible compounds to prevent their accidental mixing (via spills, residues left in storage containers, earthquakes, fires, or human error).

Chemical Waste Generation

Type of waste chemical	Generation (tons/yr)	Export (tons/yr)	Import (tons/yr)

Obsolete Chemicals Stockpiles, Chemical Waste Sites and Contaminated Sites

	Geographical Location (GPS coordinates)	Main content by chemical or groups of chemicals/waste	Magnitude of the site or stock (small, medium, large)
Obsolete Chemicals Stockpile			
Chemical Waste Sites			
Contaminated Sites			

Technical Facilities for Recovery and Recycling of Chemicals

Location of Facility/Operation or Process	Description of Facility/Operation or Process	Recovery Operation	Capacity of the Facility (m ³)	Does the facility treat wastes imported? (yes/no)

Capacity for Disposal of Chemicals

Location	Description of Facility, operation or process	Disposal Operation	Capacity of the Facility	Does the Facility treat wastes imported? (yes/no)

Chapter 6: Chemical Emergency Preparedness, Response, and Follow-up

Chemical Emergency Planning

Describe briefly the existing emergency arrangements in the event of a chemical incident:

- Does the country have a chemicals emergency plan and is it part of an overall national disaster management plan?
- Which authorities have various responsibilities and how does the plan operate at regional and local levels?
- Which stakeholders are involved in the development of the plan and its implementation? For example, besides the emergency services themselves, are the following stakeholders involved: health, environment, and local authorities; industry and the transport sector; and meteorological services? Responsibilities may vary depending on whether the chemical incident is in the industrial, transport, domestic, or public health fields.
- Does the plan include regular testing under simulated conditions and are there provisions for modification of the plan based on experience of specific emergencies?
- How are the media involved and what mechanisms exist to inform the public in an emergency?

Are inventories made of installations and transport routes at risk of chemical incidents? Do the fire, police, and other emergency services have specific equipment, including protective clothing, to deal with chemical incidents and are staff specifically trained for such incidents?

Is the GHS being applied in the country? What are the chemical hazard identification systems already in place and enforced in the country, both in the transport and industrial/ commercial sectors? Do they apply to small and medium size enterprises (SMEs)?

Is there a poisons information or other chemicals information service which is available around the clock to provide advice in a chemical emergency and are there dedicated emergency communication systems?

Do local hospitals have patient decontamination facilities and stocks of antidotes, medicines, and appropriate equipment for chemical emergencies?

Are the health or emergency services equipped for transportation of chemically exposed persons?

What facilities are available for incident clean-up and for long term follow-up of exposed persons?

What training is available to prepare the emergency services (e.g. fire, police, civil defence) personnel in dealing with a chemical incident, as well as medical and paramedical staff in handling and treating chemically exposed persons?

Is there any training for veterinarians concerning treatment of exposed animals to toxic substances?

Chemical Incident Response

Describe some of the more significant chemical incidents that have occurred recently in the country:

Date of Incident	Location ¹	Type of Incident ²	Chemical (s) involved ³	No. of deaths/injured /evacuated	Environmental Contamination or Damage ⁴

1 —Location, give the name of the place, e.g. town and the region/province.

2 —Type of Incident could be: industrial accident/fire; transport (road, rail, waterways, air) accident, fire, spill; warehouse/storage site fire; contamination of drinking water, food, medicines, or other consumer goods; chemical misuse; natural disaster involving chemicals; terrorist attack; etc.

3 Chemicals involved could be one individual chemical (e.g. chlorine) or a group of chemicals (e.g. pesticides, PCBs); a natural occurring chemical or toxin (e.g. arsenic in drinking water, aflatoxins, toxic algae in red tide incidents), or a large mixture (e.g. in a fire, when material being burned should be given).

4 Environmental contamination or damage should be described briefly, e.g. air pollution; drinking/ground water, river, lake, sea pollution; soil contamination; destruction of plants, woodlands, commercial crops; loss of wildlife or commercial animals (cattle, sheep, goats, horses, camels, etc.).

Chemical Incident Follow up and Evaluation

Is there a formal or informal mechanism in place to investigate a chemical incident and its outcome? Is there a standardised format for collecting the information about the incident? Give a brief description.

Can the investigation lead to a formal enquiry about the causes and responsibilities of various parties involved? Can the investigation lead to a follow-up activity, e.g. an epidemiological study, a study of improved fire prevention in warehouses? Give a brief description where this has been done in the past.

Is there a register of chemical (and other) incidents? Who has the responsibility for it? Is it kept systematically? How is an incident defined to be entered in the registry?

Is there a follow-up surveillance and rehabilitation mechanism in the health service for exposed persons who may suffer long-term disabilities and sequelae? How is this achieved?

Do the environmental and local authorities (or others) have the responsibility for clean-up after an incident? Is there a follow-up of any damage to the natural or physical environment? Give a brief description.

ANNEX II

Participation of Ministries, Organisations and other Stakeholders for the National Chemical Profile Update

Participation of Ministries, Organisations and Stakeholders for National Chemical Profile update

Organisation	Name	Position	Contact information	Contribution
BCRC-Caribbean	Dr. Ahmad Khan	Director	#8 Alexandra Street, St, Clair, Port-of-Spain. Tel: 628-8369	Review of National Chemical Profile
BCRC-Caribbean	Dr. Danelle Dhaniram	Research Analyst	#8 Alexandra Street, St, Clair, Port-of-Spain. Tel: 628-8369	Preparation and compiling National Chemical Profile
BCRC-Caribbean	Ms. Camille Roopnarine	Consultant	#8 Alexandra Street, St, Clair, Port-of-Spain. Tel: 628-8369	Review of the National Chemical Profile update for Trinidad and Tobago
Central Statistical Office	Ms. Natasha Thompson	Temporary Statistical Assistant	Scott Building 30 Park Street, Port of Spain Tel: 624-7001 ext 306 Tel: 326-5966	Data on chemicals imported and exported
Ministry of Energy and Energy Affairs	Mrs. Gail Kowlessar-George	Senior Environmental Officer	Maska Compound, South Trunk Road La Romaine, San Fernando Tel : 697-7864/697-1484	Data on industrial chemicals
Ministry of Energy and Energy Affairs	Ms. Shenil Granger	Chemical Engineer Service Provider	Level 23, Tower C International Waterfront Center #1 Wrightson Road Port of Spain Tel : 623 6708 ext 2325 sgranger@energy.gov.tt	Draft Chemical Spill and Gaseous Release Contingency Plan
Ministry of Environment and Water Resources	Ms. Keima Gardiner	Environmental Engineering Specialist	Level 26, Tower D International Waterfront Complex 1A Wrightson Road, Port-of-Spain. Republic of Trinidad & Tobago. Tel: 225-3394	Information of international linkages
Environmental Management Authority	Tricia Beejai	Technical Officer-waste	8 Elizabeth Street, St. Clair, Port of Spain Tel: 628-8042 Ext: 2243	Information on hazardous waste
Ministry of Health	Mr. Hasmath Ali	Ag. Registrar, Pesticides and	92 Frederick Street, Port-of Spain.	Information on pesticides import and

Organisation	Name	Position	Contact information	Contribution
(Chemistry Food and Drugs Division)		Toxic Chemicals		obsolete pesticides
Customs and Excise	Mr. Ammar Samaroo,	Comptroller of Customs and Excise	Custom House, Abercrombry Street, Port-of-Spain. Tel:625-3311	No response
Tucker Energy Services Ltd	Ms. Kavelle Mohammed	Senior Chemist	Chaguaramas Office, Treating Chemicals Division, 1st Avenue South, Chaguaramas. Tel: 634-2832 Fax: 634-2830	Information on chemical storage and transport for production chemicals
Kaizen TT	Mr. Aamar Roopchan	Technical Manager	Waste Services Division Phone: 299-0009 Ext 243 Cell: 299-8833	Data on chemical waste, recycling facilities
Oil Mop	Ms. Jenna Ross	Marketing Manager	Oil Mop Environmental Services, #13 La Brea Industrial Estate (Labidco), La Brea. Tel: 651-1306/1361 Fax: 651-1237	Data on chemical waste, recycling facilities
Tiger Tanks	Mr. Ronnie Superville	Director	Mr. Ronnie Superville, Tiger Tanks Limited, Lot # 22B, La Brea Industrial Development Company (LABIDCO) La Brea. Tel: 651-1544, Fax: 648-9763	Data on chemical waste, recycling facilities
PLIPDECO	Ms. Melinda Jagessar	Senior HSE Officer	Point Lisas Industrial Port Development Corporation Limited, PLIPDECO House, Orinoco Drive, Point Lisas Industrial Estate, Couva. Tel: 636-2201	Commitment made for data provision - No data received (see letter below)

Organisation	Name	Position	Contact information	Contribution
			Fax: (868) 636-4008	
BP TT	Mrs. Karen Ragoonanan-Jalim	Regulatory, Compliance and Environment Manager	BP TT, Queens Park West Plaza, Port-of-Spain. Tel: 623 2862	No response
Atlantic	Mrs. N. Elias-Samlalsingh	HSE Manager	HSE Department, Princes Court, 5th Floor, Corner Keate and Pembroke Streets, Port-of-Spain. Tel: 624-2916	No response
Petrotrin	Mr. Shyam Dyal	Manager – Health, Safety & Environment	Southern Main Road, Pointe-a-Pierre. Tel: 658-4200	No response
BHP Billiton	Mr Prem Dukharan	HSE Manager	BHP Billiton, Invader's Bay, Port-of-Spain. Tel: 821-5100	No response
University of the West Indies	Dr. Azad Mohammed	Lecturer	St. Augustine Campus, Trinidad. Tel:662-2002	No response
Ansa Mcal Chemicals	Mr. Robert Mohammed	Marketing Manager	North Sea Drive, Trinidad. Tel: 636-9918	No data due to company confidentiality
Caribbean Chemicals Limited	Ms. Marina		Cor. Churchill Roosevelt H'way and Cyrus Road, El Socorro. Tel: 638-4769	Telephone conservation on products, imports and warehousing facilities
Inter Chem	Ms. Mungroo		9th Avenue South , Barataria, Trinidad Tel: 638-3800	No Response
SCL (Trinidad) Limited	Mr. Brian Cabrel	Marketing Manager	Tel: 675-5555	No Response

2015-08-11

Mr. Ernest Ashley Taylor,
President,
Point Lisas Industrial Port Development Corporation Limited
PLIPDECO House,
Orinoco Drive, Point Lisas Industrial Estate,
Couva.

Dear Mr. Taylor,

***Re: Preparation of a National Chemical Profile update for Trinidad and Tobago –
Request for Data and Information from PLIPDECO.***

The Basel Convention Regional Centre for Training and Technology Transfer for the Caribbean (BCRC-Caribbean) in collaboration with the Secretariat of the Rotterdam Convention (SRC) is currently executing a regional programme to address the sound management of industrial chemicals under the Rotterdam Convention. The Programme consists of an Introductory Workshop on Industrial Chemicals (completed October 2014), updates of the National Chemicals Profiles in three (3) pilot countries (Trinidad and Tobago, Belize and St. Vincent and the Grenadines) and National Follow-Up seminars in the three (3) pilot countries. To date the BCRC-Caribbean has held National Follow-up seminars in Trinidad and Tobago (July 22nd, 2015) and in Belize (July 30th, 2015).

The Point Lisas Industrial Port Development Company Limited (PLIPDECO) has been participating in this programme as a key stakeholder since October 2014 and was represented at the National Follow-up seminar for Trinidad and Tobago by Ms. Malinda Jagessar (Senior HSE Officer) and Ms. Keisha Barcellos (HSE Officer). It was noted by PLIPDECO's representatives that the information gathered by the BCRC-Caribbean can be further strengthened by data and information held by the tenants of the Industrial Estate as well as PLIPDECO. This will allow the Industrial Chemicals Profile report prepared for the country to be much more comprehensive. In this regard therefore, we now write to formally request any data and information on industrial chemicals used by the tenants of the Point Lisas Industrial Estate and which PLIPDECO may have compiled over the past ten years as a matter of course in your capacity as landlords of the Point Lisas Industrial Estate.

Please note that any data and information which you may provide will be incorporated into the National Industrial Chemical Profile report for Trinidad and Tobago which will be an unrestricted and widely circulated document through the Secretariat of the Rotterdam Convention. Data and information of a sensitive and confidential nature to either PLIPECO and/or its tenants must by nature be excluded unless it is agreed by all stakeholders concerned that data and information so provided is available for unrestricted access.

The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade is a multilateral environment agreement which entered into force on the 24th February 2004 and provides obligations on the import and export of certain hazardous chemicals. The convention's objective is to promote shared responsibility and cooperative efforts among countries in the international trade of these chemicals so as to protect human health and the environment and contribute to the environmentally sound use of chemicals.

Countries who are parties to the convention, including Trinidad and Tobago which became a Party to the Convention on 16th December 2009, are empowered through virtue of membership, to make informed decisions about the chemicals to be received and those to be excluded that cannot be safely managed in country. In this regard, it is necessary that countries have in place a National Industrial Chemical Profile and this profile be updated on a regular basis.

The National Industrial Chemical Profile report serves as a reference document which involves a comprehensive assessment of the national infrastructure and capacity related to the legal, institutional, administrative, and technical aspects of chemicals management, along with the nature and extent of chemicals availability and use throughout their life cycle in the country. The National Industrial Chemical Profile report will provide core information and an evidence base for the development of a situation analysis and priority setting for actions required to implement the Rotterdam Convention by Trinidad and Tobago in the future.

You may wish to note that the BCRC-Caribbean is an autonomous regional institution which is hosted by the Government of the Republic of Trinidad and Tobago on behalf of the United Nations Environment Programme and the Secretariat of the Basel Convention. The role of the BCRC-Caribbean is to assist parties to the various multilateral environmental agreements on wastes and chemicals (Basel, Rotterdam, Stockholm and Minamata) to comply with and implement the provisions of these conventions. The BCRC-Caribbean achieves this objective by working closely with and through the many focal points for these conventions in each Country.

The focal point of the Rotterdam Convention in Trinidad and Tobago is the Permanent Secretary of the Ministry of the Environment and Water Resources and we are pleased to advise that the BCRC-Caribbean has received the full endorsement of the national focal point to compile the first national inventory of industrial chemicals and to prepare the national industrial chemicals profile for Trinidad and Tobago.

We look forward to PLIPDECO's assistance in strengthening the draft National Industrial Chemical Profile report for Trinidad and Tobago and will be grateful for receipt of the data and information compiled by PLIPDECO over the past ten years at your earliest convenience.

Yours sincerely,

Ahmad A Khan Ph.D.
Director

Vidiah Ramkhelawan
Permanent Secretary
Ministry of the Environment and Water Resources

ANNEX III

Overview of Legislation governing Chemicals Management in Trinidad and Tobago

This annex provides a summarized description of the legal instruments outlined in Table 2.A.

Pesticides and Toxic Chemicals Act No. 42/1979 (amended - Act No. 11 of 1986 and No. 2 of 2004) and its subsidiary legislation;

The Pesticides and Toxic Chemicals Act, 1979 seeks to regulate the importation, storage, manufacture, sale, use and transportation of pesticides and toxic chemicals and to provide for the establishment of the Pesticides and Toxic Chemicals Control Board (PTCCB) and for matters incidental thereto. The functions of the Board are to:

- (1) Advise the Minister on matters relevant to the making of regulations under the Act.
- (2) Advise on and monitor the implementation of the regulations and
- (3) Furnish returns as the Minister may require from time to time.

Regulations can be made in respect of the following matters inter alia:

1. Prohibiting the manufacture, importation, sale, advertisement and use of any class of pesticide or toxic chemical;
2. Controlling the use of pesticides in agriculture generally or in particular crops or pests, for toxic chemicals in agriculture, the arts, commerce, industry, for domestic or other purposes;
3. Prescribing the procedure for granting licenses to function pest control operators;
4. Controlling the use of pesticides on produce during storage or transportation;
5. Protecting workers against risk of poisoning by pesticides or toxic chemicals during usage, storage or manufacture of these substances;
6. Disposing of packaging material and unwanted stocks of these hazardous substances.

Occupational Safety and Health Act, 2004;

The Occupational Safety and Health Act (OSHA) applies to all industrial establishments such as factories, shop, office place of work or other premises except for premises occupied for residential use, owned or occupied by the State. OSHA revised and extended the law regarding the safety, health and welfare of persons at work and in so doing it imposes duties and obligations on certain persons in a wide variety of workplaces.

OSHA addresses a variety of work place issues including workplace health, safety, welfare, occupational diseases and employment of young persons. To this end OSHA imposes responsibilities on employers, occupiers, employees and manufacturers and suppliers of goods. Some of these duties are not only owed to persons working at the industrial establishment but also to visitors and persons in the environs who might be affected by the activities carried out at the industrial establishment. Employees are also subject to certain duties under OSHA. The Act specifically provides that a person who works in an industrial establishment of any kind whatsoever, incidental to or connected with the process or article made, is deemed to be employed therein. The duties owed by an employee include the duty to: take reasonable care for the safety of himself and others; to report contraventions of OSHA to his employer; to use personal protection and clothing devices correctly; to ensure that he is not intoxicated at work so

as to be a danger to himself and others and to act reasonably in exercising his discretion (where applicable) to refuse to work. There are also duties on designers, manufacturers, importers and suppliers of any technology, machinery, plant, equipment or material for use in any industrial establishment to ensure that these items are safe and without risks to health when properly used.

OSHA provides for a variety of penalties in the event of a person being convicted of a statutory offence. Directors and/or officers of companies who can be shown to have consented, acquiesced or connived in such offences can be held personally liable.

Environmental Management Act No. 3/2000

This piece of legislation acts as an umbrella piece of legislation incorporating important environmental policy statements of the Government of Trinidad and Tobago; a blueprint for the further development of environmental policy and legislation; and a monitoring and enforcement mechanism.

The Environmental Management Act pertains to the directing and administering of matters affecting the quality of all land, area beneath the land surface, atmosphere, climate, surface water, groundwater, sea, marine and coastal areas, seabed, wetlands and natural resources within the jurisdiction of Trinidad and Tobago. The Act also establishes requirements for the handling and disposal of wastes and to establish standards and design criteria for handling and disposal facilities and to establish licensing requirements in respect of hazardous wastes.

The following subsidiary legislation dealing with the sound management of chemicals falls under the Environmental Management Act No. 3/2000:

Certificate of Environmental Clearance Rules

The Certificate of Environmental Clearance (CEC) is an environmental permit which sets forth conditions for the construction and operation of certain types of development. Under the CEC Rules, no developer can proceed with a development that includes one or several Designated Activities. A total of 44 Designated Activities are listed in the Certificate of Environmental Clearance (Designated Activities) Order, 2001; including the establishment, expansion of a wide range of industries and the manufacture of petrochemicals as well as industrial chemicals. It also includes waste disposal facilities. The CEC Process only applies to facilities established or expanded after 2001. For facilities not covered by the CEC Rules, the EMA can exercise control on liquid discharges via the Water Pollution Rules, Air Pollution Rules and the Waste Management Rules (draft).

Water Pollution Rules

The EMA's Water Pollution Rules (2001, as amended) regulate wastewater discharges from industrial facilities, commercial facilities, agricultural facilities, institutions and sewerage facilities. The First Schedule of the Rules lists a number of parameters or substances, and the concentrations at which they would be considered to be "pollutants". All facilities which discharge any "pollutant" must apply for Source Registration under the Rules. The Second Schedule of the Rules lists the permissible

concentration of the same parameters or substances. Where any facility releases a water pollutant into a receiving environment outside the permissible level, that is likely to cause harm to human health or to the environment, the EMA may at any time notify that person to apply for a permit. The Water Pollution Rules regulates petrochemical and other industrial chemical release to the environment.

National water quality objectives (effluent pollutant loadings) for general industrial operations have been established for Trinidad & Tobago by the Trinidad and Tobago Bureau of Standards (TTBS). The major guiding principle in the development of these effluent specifications was to assist in mitigating or eliminating problems known to have significant adverse effects on human health or on the environment, and to be practical, enforceable and feasible. The requirements of this standard will be enforced by the EMA in the context of the Water Pollution Rules 2001 (which have legal precedence over TTS 547:1998).

Air Pollution Rules 2014

Various industrial, agricultural, commercial and institutional operations will come under the ambit of these rules. The First Schedule of the draft Rules sets limits for 28 parameters in ambient air, of which there are eight inorganic chemicals, five metallic substances and 12 non-metallic inorganic substances. The Second Schedule sets limits for 19 parameters in stack emissions, three inorganic chemicals, six metallic substances and nine non-metallic inorganic substances.

Waste Management (Hazardous waste) Rules 2014 (draft)

The draft Waste Management Rules (2014) seek to impose a duty on persons or organizations that generate, handle or dispose of any hazardous or other waste:

- To prevent the escape of any hazardous waste;
- To transfer any hazardous waste only to a person or organization who is the holder of a waste handling permit or a waste facility license;
- Categories of hazardous waste are listed in the First Schedule to the draft Rules, and several categories would cover POPs.

Under the draft Rules:

- Persons or organizations who generate hazardous waste must apply for Registration as a Generator;
- Any person or organization (including a Local Authority) who proposes to carry out any activities for the storage, treatment or disposal of hazardous waste must apply for a Waste Handling Permit;
- Any person or organization (including a Local Authority) who proposes to carry out any activities for the storage, treatment or disposal of hazardous waste must apply for a Waste Facility License;
- The EMA has confirmed that these Rules will focus on hazardous waste, and a separate Rule will be enacted for non-hazardous solid waste. The Waste Management Rules may have to be re-issued for public comment, and then must be vetted by the Chief Parliamentary Council and

finally tabled in Parliament. This could be done by 2015, provided it was given priority on the Legislative Agenda.

Petroleum Act Ch. 61:02;

The petroleum industry, which is Trinidad and Tobago's largest and most important industry is governed principally by the Petroleum Act, Chap. 62:01 ("the Act") and the Petroleum Regulations, Chap. 62:01 ("the Regulations"). The focus of the Petroleum Act is to regulate the main elements of petroleum operations in land and marine environments. Section 29 of this Act makes provision for the drafting of regulations for the prevention of oil pollution of land, water or air, and for compensation for damage caused by any such pollution. The MEEA is authorized to regulate and manage spills caused by the petroleum and petrochemical licenses

The Act together with its subsidiary regulations establish a regulatory framework for granting exploration and production licences and production sharing contracts for the conduct of upstream exploration and production operations, including activity on land and in the submarine areas beneath the territorial waters and the continental shelf of Trinidad and Tobago. The Act and Regulations also regulate several other types of petroleum operations apart from upstream exploration and production. The term "petroleum operation" is very widely defined by the Act and no petroleum operations may be carried on without the appropriate regulatory approval.

Pipeline Code of Practice, 1997

The "Code of Practice for the Operation and Maintenance of Pipelines in the Petroleum Industry of Trinidad & Tobago" was drafted in accordance with the Petroleum Act (Ch. 62:01). This Code sets out the minimum requirements and standards for the design, installation, operation and maintenance of pipelines for transporting petroleum (both oil and gas). The guidelines apply to pipelines performing three basic functions in the petroleum industry – gathering systems, trunk line systems, and distributing systems. The purpose of the Code is to ensure that, with compliance, the release of hydrocarbons from pipelines is prevented, thereby avoiding losses of product, losses in production time, costs of repair and compensation, and to minimize the risk to personnel, property and the environment.

Pipeline Licence 2001 prepared by the MEEA in accordance with the Petroleum Act, Chapter 62:01, require that specified safety, pollution control and environmental protection measures be undertaken by any Licensee (pipeline owner, operator, agent's representatives and assignees), including strict adherence to the terms and conditions of the approved EIA for the pipeline. Furthermore, Section 11 requires the license must be submitted to the MEEA by January 31st of each year (as part of an Annual Report) "A safety and environmental review".

Code of Practice for Drilling and Production Rigs, 1990

The MEEA developed the “Code of Practice for Drilling and Production Rigs Operating in Trinidad & Tobago” in accordance with the Petroleum Act (Chapter 62:01). The objectives of the Code are to secure the health, safety, and welfare of persons employed in the petroleum industry, and it includes a number of provisions in that regard. Section 19 of the Code lists the “Pollution Prevention” guidelines for drilling and production rig operations, and these include:

- No oil, oily products, drilling fluids, or other harmful substances shall be allowed to escape from a land well location over adjacent lands, to enter streams, or seep into shallow freshwater bearing sands;
- Rig waste, such as engine oil, waste oil, grease, etc., shall be accumulated in suitable containers, drip trays, sump tanks or collected by some other suitable means;
- Wastewater used in cleaning rig tools, and equipment shall be collected with the aid of an effective drainage system in a storage pit or sump;
- Drilling/well servicing fluids containing harmful substances in toxic concentrations shall be safely treated and/or disposed of on location, or transported to an approved disposal site;
- Where oil-based fluids are in use, the cuttings shall be effectively cleaned and washed prior to transfer to mud disposal pits;
- The rig crew must ensure that proper housekeeping is maintained on the location at all times.

Mineral Act no. 61/2000

The Minerals Act, Chap. 61:03, currently prevails as the key piece of legislation regulating the operations of the sector. This Act, which took effect on November 6, 2000, intended to regulate mining and mining associated matters; however, no Regulations made under the Minerals Act, to give effect to the provisions of the Act, were ever laid in Parliament for approval. The Minerals Act repealed the Mines, Borings and Quarries (MBO) Act of 1907, but saved and retained the Regulations made under that said MBQ Act, which remains in effect today. However, it is widely recognized that there are several gaps which must be addressed to ensure that the MEEA is able to effectively regulate the sector operations to prevent adverse impacts upon the environment and the citizens of Trinidad and Tobago.

The lack of modern and effective Regulations, to give effect to the provisions in the Minerals Act, over the last decade resulted in ineffective management and poor regulation of mining and mining related activities, and the Minerals Sector in general; with the resultant deleterious effects on the environment and on host communities, as well as the poor collection of revenue due to the State. The MEEA drafted Regulations which went to Cabinet in October 2012, and which were then forwarded to the Finance and General Purposes Committee for consideration. Proposed recommendations for further amendment of these Regulations are currently being finalized for returning to Cabinet.

Trade Ordinance no.19/1958

The Trade Ordinance creates the concept of “negative list” which works to prohibit or regulate the importation into Trinidad and Tobago. The Minister does this by granting an Open General Licence to import or export all goods except those listed in a Notice issued by Parliament called a “Negative List”. All items appearing on this list may only be imported or exported under a specific Licence granted by the Ministry of Trade, Industry, Investment and Communication.

The Import Negative List (Legal Notice No 151 / Notice to Importers, 2013) already contains a number of chemicals mainly pesticides such as dichlorodiphenyltrichloroethane (DDT), aldrin, dieldrin, chlordimeform, parathion and pentachlorophenol. The Ministry has indicated that, in general, import licenses would not be issued for items on the Negative List. This includes both the regulated substance as well as any equipment containing that substance. The Negative List system has been generally acknowledged as an excellent example of effective co-ordination between Government Agencies.

Standards Act Ch. 82:03 Act no. 18/1997

The Act makes provision that TTBS will promote and encourage the development and maintenance of standards for the protection of the environment, where a standard which is intended primarily to protect the environment may be deemed a compulsory standard. If there is reason to believe that goods imported or about to be imported are likely to threaten the environment, whether a standard exists for such goods or not, the Bureau may require the importer or vendor to submit such goods for testing.

Explosive Act Ch. 16:02;

The Explosives Act Ch. 16:02 relates to gunpowder and other explosive substances. The Minister may by order, prohibit absolutely, or subject to conditions or restrictions, the manufacture, keeping, importation, conveyance and sale or any of them of any explosive which is of so dangerous a character that it is expedient for the public safety to make an order. Regulations may be made in respect of conditions under which explosives are stored and the disposal of deteriorated explosives.

Under the Quarry Regulations of the Mines, Borings and Quarry Act Ch. 61:01, no explosive and no fuse or detonator is to be stored otherwise than in a magazine constructed and situated in accordance with the requirements and subject to the approval of the Senior Inspector of Factories. Explosives, fuses and detonators required for blasting must be conveyed from the magazine to the quarry at the time required and must be kept until used in secure cases or canisters so made and closed as to prevent any escape of the explosives and any danger from sparks. Detonators are to be kept in separate and secure boxes.

Shipping Act No. 24/1987;

Dangerous Goods are considered at part XIV of the Shipping Act No. 24 of 1987. Section 309 states: “The Minister may by regulations establish which goods, articles or materials to be carried in a ship are dangerous goods in accordance with the International Convention for the Safety of Life at Sea, 1974

relating to the carriage of dangerous goods and to amendments thereto or replacements thereof or with any other Convention which may be accepted by Trinidad and Tobago, and such regulations shall have regard to the International Maritime Dangerous Goods (IMDG) Code of the International Maritime Organization.

Archipelagic Waters and Exclusive Economic Zone Act (No. 24/1986)

This Act declared Trinidad & Tobago an “Archipelagic State” and established an Exclusive Economic Zone (EEZ) of 75000 km² of marine environment. Section 1 of this Act provided inter alia that Trinidad & Tobago has sovereign rights over the exploration, exploitation, conservation and management of the living and non-living natural resources contained within the defined EEZ. This Act also declared the willful and serious pollution of the EEZ waters by a foreign ship to be an offense, considered as “prejudicial to the peace, good order or security of Trinidad & Tobago”. Section 32 provided for the drafting of regulations for implementing the provisions of the Archipelagic Waters and EEZ Act, with regard to the protection and preservation of the marine environment, and the prevention, reduction and control of pollution to that environment arising from land-based sources including rivers, estuaries and pipelines, sea-bed activities under the jurisdiction of Trinidad & Tobago, artificial islands and structures under its jurisdiction, dumping, vessels and the atmosphere.

Fire Service Act 1965 (Ch 35:50)

The Trinidad and Tobago Fire Service is authorized under the Fire Service Act 1965 (Chapter 35:50) Section 3A to save and protect life or property from damage or destruction by fire or other hazards, whether fire related or not, to provide and advise upon, preventative measures against the occurrence of such damage or destruction, to render related humanitarian services where required and to conduct investigations in order to ascertain the cause or origins of a fire or other hazards.

ANNEX IV

Trinidad and Tobago's Import and Export

2012-2013

Bilateral trade between Trinidad and Tobago and Trinidad and Tobago

Product: TOTAL All products

Sources: ITC calculations based on UN COMTRADE statistics.

Data based on the partner reported data (Mirror data)

Unit : US Dollar thousand

Product code	Product label	Trinidad and Tobago's exports to world		Trinidad and Tobago's imports from world	
		Value in 2012	Value in 2013	Value in 2012	Value in 2013
TOTAL	All products	19,834,176	19,161,326	6,535,174	6,960,357
'01	Live animals	68	37	1,887	2,899
'02	Meat and edible meat offal	51	0	83,132	92,627
'03	Fish, crustaceans, molluscs, aquatic invertebrates nes	41,160	41,534	35,167	49,168
'04	Dairy products, eggs, honey, edible animal product nes	3,326	2,664	102,263	108,311
'05	Products of animal origin, nes	30	30	787	979
'06	Live trees, plants, bulbs, roots, cut flowers etc	6	1	1,153	1,766
'07	Edible vegetables and certain roots and tubers	1,456	1,288	37,281	38,754
'08	Edible fruit, nuts, peel of citrus fruit, melons	496	318	22,590	26,190
'09	Coffee, tea, mate and spices	1,376	1,291	9,658	10,769
'10	Cereals	197	281	92,657	96,310
'11	Milling products, malt, starches, inulin, wheat gluten	3,223	4,623	22,790	24,415
'12	Oil seed, oleagic fruits, grain, seed, fruit, etc, nes	144	130	10,622	10,247
'13	Lac, gums, resins, vegetable saps and extracts nes	880	1,380	1,579	1,655
'14	Vegetable plaiting materials, vegetable products nes	0	0	356	159
'15	Animal,vegetable fats and oils,	5,619	4,941	56,746	51,028

Product code	Product label	Trinidad and Tobago's exports to world		Trinidad and Tobago's imports from world	
		Value in 2012	Value in 2013	Value in 2012	Value in 2013
	cleavage products, etc				
'16	Meat, fish and seafood food preparations nes	3,118	2,873	19,266	23,675
'17	Sugars and sugar confectionery	5,261	5,266	74,350	54,158
'18	Cocoa and cocoa preparations	9,897	10,228	14,354	13,508
'19	Cereal, flour, starch, milk preparations and products	57,860	57,242	62,731	66,538
'20	Vegetable, fruit, nut, etc food preparations	17,490	17,091	59,969	59,747
'21	Miscellaneous edible preparations	25,291	27,740	54,087	61,661
'22	Beverages, spirits and vinegar	113,356	110,067	70,961	65,877
'23	Residues, wastes of food industry, animal fodder	613	702	60,970	66,728
'24	Tobacco and manufactured tobacco substitutes	27,794	25,956	11,401	11,132
'25	Salt, sulphur, earth, stone, plaster, lime and cement	16,774	19,191	30,297	33,769
'26	Ores, slag and ash	17,199	5,379	628,242	576,978
'27	Mineral fuels, oils, distillation products, etc	12,162,567	12,437,195	1,231,226	1,284,318
'28	Inorganic chemicals, precious metal compound, isotopes	2,672,327	2,348,579	33,564	25,953
'29	Organic chemicals	1,844,739	1,980,766	34,897	28,263
'30	Pharmaceutical products	963	1,395	68,981	75,136
'31	Fertilizers	964,337	511,261	4,892	5,173
'32	Tanning, dyeing extracts, tannins, derivs,pigments etc	5,885	4,598	39,903	39,100
'33	Essential oils, perfumes, cosmetics, toileteries	7,296	8,525	62,905	61,433
'34	Soaps, lubricants, waxes, candles, modelling pastes	20,214	17,986	42,327	45,074

Product code	Product label	Trinidad and Tobago's exports to world		Trinidad and Tobago's imports from world	
		Value in 2012	Value in 2013	Value in 2012	Value in 2013
'35	Albuminoids, modified starches, glues, enzymes	648	409	5,742	5,775
'36	Explosives, pyrotechnics, matches, pyrophorics, etc	795	874	1,671	2,413
'37	Photographic or cinematographic goods	133	157	3,876	4,304
'38	Miscellaneous chemical products	36,128	11,947	142,310	108,550
'39	Plastics and articles thereof	26,574	26,016	199,142	206,911
'40	Rubber and articles thereof	501	609	56,653	62,440
'41	Raw hides and skins (other than furskins) and leather	6	6	281	96
'42	Articles of leather, animal gut, harness, travel goods	148	139	4,453	5,072
'43	Furskins and artificial fur, manufactures thereof	0	0	5	190
'44	Wood and articles of wood, wood charcoal	6,098	3,554	52,391	55,832
'45	Cork and articles of cork	0	0	372	372
'46	Manufactures of plaiting material, basketwork, etc.	2	2	166	512
'47	Pulp of wood, fibrous cellulosic material, waste etc	1,494	1,673	14,769	11,465
'48	Paper and paperboard, articles of pulp, paper and board	60,301	70,319	99,402	102,484
'49	Printed books, newspapers, pictures etc	8,683	6,644	28,945	24,947
'50	Silk	7	7	315	60
'51	Wool, animal hair, horsehair yarn and fabric thereof	0	0	72	62
'52	Cotton	143	264	1,809	1,934
'53	Vegetable textile fibres nes, paper yarn, woven fabric	0	0	72	60

Product code	Product label	Trinidad and Tobago's exports to world		Trinidad and Tobago's imports from world	
		Value in 2012	Value in 2013	Value in 2012	Value in 2013
'54	Manmade filaments	237	254	10,785	11,313
'55	Manmade staple fibres	475	450	8,741	8,360
'56	Wadding, felt, nonwovens, yarns, twine, cordage, etc	214	452	8,015	6,349
'57	Carpets and other textile floor coverings	4	17	4,775	4,555
'58	Special woven or tufted fabric, lace, tapestry etc	70	51	2,165	2,033
'59	Impregnated, coated or laminated textile fabric	35	47	2,996	3,851
'60	Knitted or crocheted fabric	8	8	2,378	2,659
'61	Articles of apparel, accessories, knit or crochet	850	772	14,549	12,523
'62	Articles of apparel, accessories, not knit or crochet	3,032	2,153	16,942	21,532
'63	Other made textile articles, sets, worn clothing etc	726	641	17,286	17,262
'64	Footwear, gaiters and the like, parts thereof	192	16	15,319	14,530
'65	Headgear and parts thereof	36	25	1,006	1,054
'66	Umbrellas, walking-sticks, seat-sticks, whips, etc	25	25	895	988
'67	Bird skin, feathers, artificial flowers, human hair	5	2	2,296	3,305
'68	Stone, plaster, cement, asbestos, mica, etc articles	603	215	15,421	18,628
'69	Ceramic products	993	1,308	29,505	32,283
'70	Glass and glassware	12,175	9,882	12,992	15,915
'71	Pearls, precious stones, metals, coins, etc	7,999	13,340	13,673	14,657
'72	Iron and steel	1,419,108	1,147,017	115,527	122,788
'73	Articles of iron or steel	15,167	16,361	185,953	233,368

Product code	Product label	Trinidad and Tobago's exports to world		Trinidad and Tobago's imports from world	
		Value in 2012	Value in 2013	Value in 2012	Value in 2013
'74	Copper and articles thereof	10,466	8,346	37,523	28,961
'75	Nickel and articles thereof	249	49	1,071	878
'76	Aluminium and articles thereof	6,961	7,644	35,839	32,750
'78	Lead and articles thereof	697	24	4,061	4,453
'79	Zinc and articles thereof	35	64	562	653
'80	Tin and articles thereof	2,090	154	298	275
'81	Other base metals, cermets, articles thereof	45	103	438	186
'82	Tools, implements, cutlery, etc of base metal	769	663	20,841	22,461
'83	Miscellaneous articles of base metal	248	590	17,364	20,125
'84	Machinery, nuclear reactors, boilers, etc	45,715	50,390	798,775	1,023,061
'85	Electrical, electronic equipment	30,631	26,441	314,367	333,050
'86	Railway, tramway locomotives, rolling stock, equipment	3,065	1,921	22,450	34,619
'87	Vehicles other than railway, tramway	1,642	1,176	427,821	538,455
'88	Aircraft, spacecraft, and parts thereof	1,267	143	132,050	66,244
'89	Ships, boats and other floating structures	3,976	719	62,173	76,032
'90	Optical, photo, technical, medical, etc apparatus	4,891	5,952	149,526	158,618
'91	Clocks and watches and parts thereof	10	0	1,505	1,319
'92	Musical instruments, parts and accessories	264	281	1,748	876
'93	Arms and ammunition, parts and accessories thereof	0	2	1,957	2,762
'94	Furniture, lighting, signs,	12,895	11,931	63,793	117,643

Product code	Product label	Trinidad and Tobago's exports to world		Trinidad and Tobago's imports from world	
		Value in 2012	Value in 2013	Value in 2012	Value in 2013
	prefabricated buildings				
'95	Toys, games, sports requisites	172	132	18,419	22,158
'96	Miscellaneous manufactured articles	1,151	565	24,074	28,520
'97	Works of art, collectors pieces and antiques	1,237	1,049	1,040	336
'99	Commodities not elsewhere specified	62,315	76,748	216,253	190,958

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