



REPUBLIC OF MAURITIUS

NATIONAL AUDIT OFFICE

PERFORMANCE AUDIT REPORT

ENVIRONMENT PROTECTION - ENSURING PROPER DISPOSAL OF HAZARDOUS WASTES

**Ministry of Environment,
Solid Waste Management
and Climate Change**

JUNE 2020

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PREFACE

Section 16(1A) of the Finance and Audit Act requires the Director of Audit to carry out performance audit and report on the extent to which a Ministry, Department or Division is applying its resources and carrying out its operations economically, efficiently and effectively.

I am pleased to submit to the Minister of Finance, Economic Planning and Development, and through him to the National Assembly this Performance Audit Report entitled "Environment Protection - Ensuring Proper disposal of Hazardous Wastes. The subject matter was selected for the audit in view of its significance and the difference it can make to the lives of citizens through the enhancement of the operational efficiency and effectiveness in its management.

The objective of audit was to assess whether the measures taken by Ministry of Environment, Solid Waste Management and Climate Change to ensure proper disposal of the three waste streams, namely e-wastes, Hazardous Chemical Wastes and Medical Wastes, to protect the environment were efficient and effective. The Report contains audit findings, conclusion, recommendations and emphasises on areas of improvements in the management of the three waste streams from generation to disposal. The Ministry was given the opportunity to comment on the content of the Report.

My Office intends to carry out a follow-up audit at an appropriate time regarding actions taken by the audited entity in relation to the implementation of the recommendations.

I would like to take this opportunity to thank the Permanent Secretary and staff of the Ministry of Environment, Solid Waste Management and Climate Change particularly the staff of the Solid Waste Management Division for their cooperation and collaboration. I also wish to express my sincere thanks to the staff of the Performance Audit Unit of the National Audit Office for their commitment.



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30 June 2020

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ABBREVIATIONS AND ACRONYMS

AGO	Attorney-General's Office
EEE	Electrical and Electronic Equipment
EPA	Environment Protection Act
EWMS	E-Waste Management System
FSU	Field Services Unit
HCW	Hazardous Chemical Wastes
HW	Hazardous Wastes
ISF	Interim Storage Facility
LGA	Local Government Act
MID	Maurice Ile Durable
MoE	Ministry of Environment, Solid Waste Management and Climate Change
MoHQL	Ministry of Health and Quality of Life
MoHW	Ministry of Health and Wellness
MoLG	Ministry of Local Government and Outer Islands
MW	Medical Wastes
NAO	National Audit Office
SDG	Sustainable Development Goal
SWMD	Solid Waste Management Division
SWMS	Solid Waste Management Strategy
TEU	Technical Enforcement Unit
WHO	World Health Organisation
WMF	Waste Management Facilities

EXECUTIVE SUMMARY

Over the years, there has been a continuous increase in the volume of Hazardous Wastes (HW) generation in Mauritius. HW pose immediate and long term risks to human beings, plants and the environment at large. Unsound management of HW may lead to the contamination of soil and freshwater, as well as air emissions and marine pollution.

HW are defined under the Environment Protection Act (EPA), and listed under the Environment Protection (Standards for Hazardous Wastes) Regulations 2001. The First and Second Schedules of the Regulations provide descriptions of the different HW streams.

The Solid Waste Management Division (SWMD) was operating under the then Ministry of Local Government and Outer Islands, and in January 2015, came under the aegis of the then Ministry of Social Security, National Solidarity and Environment and Sustainable Development. As from December 2019, it is operating under the aegis of the Ministry of Environment, Solid Waste Management and Climate Change (MoE). The Division is the enforcing agency for HW, including Hazardous Chemical Wastes (HCW), e-wastes and Medical Wastes (MW), and as such, it is responsible to ensure that HW are managed and disposed of in accordance with existing regulations.

Government has commissioned the construction, operation, management and maintenance of an Interim Storage Facility (ISF) at La Chaumière for the disposal of HCW for a sum exceeding Rs 500 million. For e-wastes, two collection campaigns in 2015 and 2019 respectively have been carried out, followed by the award of two contracts for their disposal. For MW, SWMD provided assistance for the preparation of a feasibility study for the setting up of a Centralised Disposal Facility.

The National Audit Office (NAO) carried out this Performance Audit entitled 'Environment Protection – Ensuring Proper Disposal of Hazardous Wastes' to assess whether the measures taken to ensure proper disposal of e-wastes, HCW and MW to protect the environment were efficient and effective. The key findings, conclusion and the key recommendations are as hereunder.

Key Findings

Policy, Strategy and Action Plan for the Proper Disposal of Hazardous Wastes

For e-wastes, the E-Waste Management System (EWMS), through which the Policy, Strategy and Action Plan devised by EU Consultants since October 2014 were to be implemented, has not been set up. According to the Attorney-General's Office (AGO), the approach adopted to finalise the Partnership Agreement between the Ministry and the association regrouping importers was not in line with legislations in force. The delay for the setting up of an EWMS acted as a deterrent in managing e-wastes in a holistic manner.

The Ministry informed NAO that according to AGO, its portfolio did not include management of HW. It would have been an illegal action had it signed the agreement.

- As of December 2019, there was no policy for the management of MW. Moreover, since 2009, all the initiatives taken by the then Ministry of Health and Quality of Life

for developing a MW Management Plan were unsuccessful. SWMD stated that it was not solicited by the Ministry of Health and Wellness (MoHW) for the drafting of a National Policy and a Management Plan for MW. SWMD, though being the enforcing agency of HW, did not deem it necessary to ensure that the Policy and Plan for MW is developed.

Legal Framework

There are no specific Regulations for e-wastes, HCW and MW. Draft Regulations for e-wastes as recommended by the EU Consultants in 2014, as well as those for HCW containing additional provisions not addressed in the current regulations were prepared by SWMD in 2017 and 2018 respectively, but as of 31 December 2019, they were not finalised. For MW, SWMD has not evaluated the need to come up with specific Regulations.

The Ministry explained that vetting of the draft e-waste regulations was put on hold due to the legal issue faced on the project for the setting up and operation of the EWMS. As for MW, according to SWMD, it has not received any request from MoHW for the drafting of Regulations. It is also of opinion that while specific regulations for the management of MW may not be warranted, there is a need to have appropriate guidelines for their management and disposal.

Inventory and Database on Hazardous Wastes

- For e-wastes, as of 31 December 2019, there was neither a record on Electrical and Electronic Equipment (EEE) imported, nor a database on the volume generated and recycled.

The Ministry explained that the amount of e-wastes generated is proportional to the amount of electronic/electric goods imported, and data is available from the Customs Department.

- Since 2012, no other inventory on HW has been carried. SWMD took the initiative to develop a comprehensive database on potential generators of HCW. As of October 2019, a list of some 1,410 generators was established. However, the list did not include the types and quantities of HCW generated.

The Ministry informed NAO that despite the setting up and operation of the ISF, it is acknowledged that much remain to be done.

- Under the current Regulations, a waste generator has an obligation to draw up an inventory of the quantity of HW generated, stored and disposed of, and to forward quarterly a copy to SWMD. MW generators did not comply with the requirements, and no actions were taken against them for non-compliance.

The Ministry explained that the World Health Organisation assumes 0.2 kg to 0.5 kg of MW are generated per bed per day, so there is no need to duplicate, and there are reports available at MoHW.

Issues on e-Wastes Collection Campaign 2015

- Following the interruption of the services of the Field Services Unit, SWMD disbursed some Rs 800,000 for the carting away of some 10,500 units of e-wastes from the Waste Management Facilities, which have remained there for more than one year. SWMD did not assess the extent to which the environmental medium had been affected by the possible leaching out of contaminants/ hazardous substances in the soil and the surrounding area.

The Ministry informed NAO that the e-wastes were placed in plastic sheets and stored in containers to prevent any leaching of hazardous components. As the e-wastes are stored temporarily in containers, the risk of air and soil pollution does not arise.

- Following site visits by the Technical Enforcement Unit (TEU) at the Mare Chicose Landfill on 22 and 29 May 2017, it was reported that piles of e-wastes were stacked on the ground and in open space. They were exposed to dust, and most of them were damaged and valuable parts were missing. In August 2017, the Ministry had to disburse some Rs 300,000 for sorting and cleaning of the e-wastes before they could be carted away.
- As of 31 December 2019, e-waste fractions extracted, including 65,600 kg of Cathode Ray Tube Glass, 35 kg of Printed Circuit Boards and 3 kg of Toner, were not yet exported to licensed facilities.

The Ministry explained that it took more than nine months for the contractor to receive the consent of the importing and transit countries for exportation, and that this is beyond the control of the contractor and SWMD.

Issues on E-Wastes Collection Campaign 2019

- Of the 44,000 units collected from the 2019 Collection Campaign, 11,000 units were burnt in August 2019. From March to December 2019, the contractor for recycling of e-wastes managed to export 7,800 units, while the remaining 25,200 units were still lying at his premises as of 31 December 2019.

The Ministry informed NAO that the contractor has submitted its programme of exportation, and the necessary clearances are being awaited from the relevant foreign authorities.

- On 25 November 2019, SWMD sought confirmation from the contractor, as to whether the storage areas had valid Fire Certificates as required by the Mauritius Fire Rescue Service (Fire Safety Plan and Fire Certificate) Regulations. On 27 December 2019, the contractor informed SWMD that the applications were still in process. Thus, the storage areas were not operating under required conditions.
- Following a fire outbreak in one of the storage area on 31 August 2019, some 10,900 units of e-wastes were completely burnt down. On 2 September 2019, the contractor was instructed to make necessary arrangements for their disposal. However, TEU repeatedly reported that the burnt e-wastes were uncovered, stacked in a disorganised

manner on the ground. No adequate action was taken by SWMD to remedy the situation, and to avoid risk of leachate in the soil.

In its reply, the Ministry stated that the carting away works are still ongoing, and soil samples may be tested to assess whether there has been any leaching. Remedial measures will accordingly be taken.

Storage of Hazardous Chemical Wastes

From April 2017 to November 2019, some 230 tonnes of HCW were carted away to the ISF. They included collections for the period April 2017 to November 2018 weighing some 170 tonnes. However, only some 20 of the 170 tonnes have been exported. As at December 2019, some 150 tonnes relating to collections during that period have remained at the Facility for more than one year.

The Ministry informed NAO that the contractor is expected to export the HW by June 2020.

Medical Wastes Management at Health Institutions

Due to unavailability and frequent breakdown of incinerators at the Health Institutions, over the period July 2016 to June 2019, some 2,000 tonnes of MW from Health Institutions were sent to the Landfill, without being disinfected and shredded off.

The Ministry informed NAO that the recommendations for disinfecting, shredding off before disposal at the Mare Chicose Landfill were made in the feasibility study dated November 2015 and are not prescribed in the 2001 Regulations. MoHW has been requested to take necessary actions with regard to the construction of appropriate disposal facilities.

Mitigating Environmental Risks

The Ministry and the other enforcing agencies did not carry out any monitoring exercises to determine the extent to which the environment and/or human health have been affected by the improper disposal of e-wastes. Likewise, for MW, despite several complaints about the emission of black smokes from the incinerators, it did not carry out any tests of the air quality in the vicinity. As regards HCW, the risk of damage to the environment due to inappropriate storage conditions and improper handling practices was also not assessed.

Conclusion

Improper disposal of HW has the highest potential to cause harm to the environment and public health. Government has taken various initiatives aimed at their disposal in an efficient and effective manner. However, various shortcomings noted in their implementation indicate that HW has not been disposed of efficiently and effectively. The extent to which the environment, as well as public health is affected is not known.

Key Recommendations

Policy, Strategy and Action Plan for the Proper Disposal of Hazardous Wastes

- SWMD should take appropriate actions, and within the legal parameters, activate the establishment of a regulated EWMS that would ensure the proper collection, handling, as well as disposal of e-wastes.
- A National Policy and a Management Plan on MW that incorporate all the international principles that are required to protect human health and the environment should be formulated. The skills and expertise of the personnel of SWMD can be used for assisting MoHW in drafting the Policy and Plan.

Finalising the Regulations for E-Wastes and Hazardous Chemical Wastes

SWMD should identify and address the causes of delay for finalisation of the Regulations. It should also consider amending the draft Regulations with respect to changes if any, as well as upcoming developments following the way forward to be pursued before finalising them.

Establishing Legal Framework for Medical Wastes

SWMD should consider providing assistance to MoHW in drafting specific Regulations for MW. The Regulations should include specific provisions on treatment for different MW categories, segregation, collection, storage, handling, disposal, and transport of wastes, responsibilities, and training requirements.

Accurate and Updated Inventory of Hazardous Wastes

SWMD should

- explore every avenue for assistance from local or international experts to carry out an inventory of e-wastes generated. This information would assist SWMD to develop strategies towards e-waste minimisation; better treatment of e-wastes; raising awareness to prevent illegal dumping; and determining the frequency of collection campaigns.
- ensure that a complete database of HCW generators is established and regularly updated.
- ascertain that quarterly inventory of the quantity of MW generated, stored and disposed of, is submitted to the Division.

Lessons Learned from E-Wastes Collection Campaigns and Contract Management

Before embarking on new collection campaigns, SWMD should ensure that the ongoing contracts for recycling of e-wastes have been completed successfully. It should ascertain that all problems encountered during the carrying out of the two previous campaigns do not recur in future collection campaigns.

Storage of Hazardous Chemical Wastes at the Interim Storage Facility

SWMD should ensure that, as far as possible, HCW are not stored in the ISF for a period exceeding one year. Appropriate actions have to be taken against the contractor, wherever necessary, to discourage such practice.

Disposal of Medical Wastes at Landfill

SWMD should ensure that MWs are pre-treated by Health Institutions before they are dumped at the Landfill. Enforcement activities should be designed to ensure compliance with the existing Regulations at Health Institutions.

Mitigating Environmental Risk

In the light of the shortcomings elaborated regarding the disposal of e-wastes, HW and MW in Mauritius, Government should assess the extent of harm caused to the environment. The skills and expertise of SWMD can be solicited for that purpose.

Ministry's Reply

SWMD is in general agreeable with the recommendations.

CHAPTER ONE

INTRODUCTION

This Chapter provides the background of the subject matter and describes the approach used to carry out this Performance Audit.

1.1 Background

According to Consultants, with industrialisation and increasing economic development of Mauritius, problems connected with Hazardous Wastes (HW) have cropped up. There is now an urgent need to manage and control them as they pose immediate and/or long term risks to human beings, plants, animals and the environment at large. Unsound management of HW may lead to the contamination of soil and freshwater, as well as air emissions and marine pollution. In 1992, Mauritius ratified the Basel Convention on the Control of Transboundary Movement of Hazardous Wastes.

The Solid Waste Management Division (SWMD), now operating under the aegis of the Ministry of Environment, Solid Waste Management and Climate Change (MoE) is the enforcing agency for HW, including HCW, e-wastes and Medical Wastes (MW), and as such, it is responsible to ensure that HW are managed and disposed of in accordance with existing regulations.

1.2 Motivation

It was estimated that in 2016, the volume of HW generated on the island was around 20,400 tonnes, and included some 9,300 tonnes of e-wastes, 1,725 tonnes of Medical Wastes (MW), and 400 tonnes of Hazardous Chemical Wastes (HCW).

For e-wastes, only two to five per cent of the 9,300 tonnes were reported to be dismantled and exported. The remainder was suspected to be stored on the premises of their generators or to find their way into the environment. Regarding MW, the media has on several occasions reported emissions of heavy black smoke, noise and bad smell arising from their incineration. As enforcing agency, SWMD also has to ensure that MW generated at the Health Institutions are disposed of according to the provisions of the existing Regulations.

Conscious of the importance to protect the environment and public health, Government has commissioned the construction, operation, management and maintenance of an Interim Storage Facility for the disposal of HCW at La Chaumière costing more than Rs 500 million. For e-wastes, two collection campaigns have been carried out, followed by the award of two contracts for their disposal, and for MW, SWMD provided assistance for the preparation of a feasibility study for the setting up of a Centralised Disposal Facility.

It is against this background that the National Audit Office (NAO) has carried out this Performance Audit entitled ‘Environment Protection – Ensuring Proper Disposal of Hazardous Wastes’.

1.3 Audit Objective

The audit assessed whether the measures taken to ensure proper disposal of the three waste streams, namely e-wastes, HCW and MW to protect the environment were efficient and effective.

1.4 Audit Design

The audit objective is further detailed by the audit questions and the audit scope as described below:

Policy, Strategy and Action Plan for Hazardous Waste Management

Were there a policy, a strategy and an action plan for the proper disposal of e-wastes, HCW and MW?

Identification, Segregation, Collection, Storage and Disposal of Hazardous Wastes

- Were these activities carried out in compliance with the provisions of relevant laws, regulations and procedures?
- Was the volume of the three waste streams generated recorded and reported?
- Were education and awareness programmes for the proper handling of the three waste streams sufficient?
- Did SWMD have the necessary monitoring tools to ensure that none of the three waste streams were left unattended?
- Did HW generators and the contractors for disposal of e-wastes and HCW comply with their legal and contractual obligations?

1.5 Audit Scope

The audit focused on the management of household e-wastes, HCW and MW in Mauritius from their generation to disposal. The efficiency and effectiveness of the procedures, processes and activities and the measures taken were examined. The audit was carried out at SWMD, and it covered the period 2016-17 to 2018-19, but was supplemented with information for period prior to June 2016. The Report includes status of the measures for the proper disposal of HW up to December 2019.

1.6 Audit Methodology

The audit was conducted in accordance with the requirements of the NAO Performance Audit Manual, which is based on International Standards of Supreme Audit Institutions. Different methodologies were used to understand the audit area, along with obtaining sufficient, relevant and reliable audit evidence that support the conclusions and recommendations.

1.7 Methods of Data Collection

Data was collected from files, documents reviews and interviews.

1.7.1 Documents Reviewed

Relevant Acts, Conventions and Regulations, as well as Procedural Documents were consulted. Further, information on policies, structures, processes, systems, procedures and practices were obtained from MoE, SWMD and Ministry of Health and Wellness (MoHW). Financial information was extracted from the Treasury Accounting System.

1.7.2 Interviews

Interviews were conducted to confirm the information collected from files and documents reviewed, and for obtaining more explanations where information was not available therein. Interviews were carried out with key personnel at operational, middle and senior management level of the MoE, SWMD and MoHW.

1.8 Assessment Criteria

Assessment Criteria are the standards that were used as a basis for evaluating the evidence collected, developing audit findings and reaching conclusions on the audit objective. The criteria were extracted from various sources as follows.

- **Law and Regulations:** Environment Protection Act (EPA), Local Government Act (LGA) 2011, Environment Protection (Standards for Hazardous Wastes) Regulations 2001 and Local Government (Registration of Recycler and Exporter) Regulations 2013
- **Policy, Strategy and Action Plans:** Maurice Ile Durable (MID) Policy, Strategy and Action Plan 2013, Solid Waste Management Strategy (SWMS) 2011-15, Hazardous Waste Inventory Report for Mauritius 2012, and Report on e-Waste Management in Mauritius 2014
- **Contract Documents:** Contract for Recycling of e-Wastes Generated by Households 2015, Contract for Operation, Management and Maintenance of Interim Storage Facility for Hazardous Wastes at La Chaumiere 2017 and Contract for Recycling of e-Wastes 2019

Details on the other assessment criteria used are in the relevant Sections in this Report.

1.9 Data Validation

SWMD was provided with the audit criteria, findings, conclusion and practicable recommendations to confirm their relevance, accuracy and suitability.

1.10 Structure of the Audit Report

The remaining part of the Report covers the following:

- Chapter Two describes the audit area, and the roles and responsibilities of the key stakeholders involved in the management of e-wastes, HCW and MW;
- Chapter Three presents the audit findings based on the audit questions;
- Chapter Four provides the audit conclusion; and
- Chapter Five outlines the practicable recommendations based on the audit findings and conclusion.

CHAPTER TWO

DESCRIPTION OF THE AUDIT AREA

This Chapter describes the audit area and the roles and responsibilities of the key stakeholders involved in the management of e-wastes, HCW and MW.

2.1 Introduction

Several aspects of the audited area have been elaborated. They include definitions of HW, HW Management Hierarchy, HW selected for examination, the current practices for the disposal, the organisational arrangement for HW management, the existing legal framework, and the initiatives for HW management taken by Government.

2.2 Hazardous Wastes

HW are defined under the Environment Protection Act (EPA), and listed under the Environment Protection (Standards for Hazardous Wastes) Regulations 2001. The First and Second Schedules of the Regulations provide the descriptions of the different HW streams.

2.2.1 Hazardous Waste Management Hierarchy

Good practices require a hierarchy approach for sound management of HW as follows:

➤ *Preventing*

Prevention is deemed to be the most efficient solution, and is placed at the top of the waste hierarchy. Prevention may involve reducing the quantity and limiting the adverse effects of wastes, and reducing the content of harmful substances in materials. Policies aimed at reducing the amount of wastes may involve changing consumer patterns or strategies in the manufacturing industry. There are several Authorities, namely the Dangerous Chemical Control Board, MoHW and MoE, which take necessary action to ban the import of certain chemicals.

➤ *Recovery*

Recovery of wastes may be carried out by the generator of the wastes, or organised externally after the collection and transport stages.

➤ *Disposal*

Disposal in Landfills is the most common solution for handling wastes that cannot be treated by recycling, composting or incineration.

2.2.2 Hazardous Wastes Selected for Examination

HW selected for examination in this Report include e-wastes, HCW and MW. They are defined and their disposal processes briefly described in the paragraphs below.

2.3 E-Wastes

Waste Electrical and Electronic Equipment or e-wastes are the most commonly used terms for electrical and electronic wastes, and include all components, sub-assemblies and consumables, which are part of the equipment at the time of discarding. E-wastes include computers, laptops, printers, fax machines and household appliances, such as refrigerators, washing machines, televisions and radios which are intended to be discarded.

E-wastes broadly consist of ferrous and non-ferrous metals, plastics, glass, printed circuit boards and other items. They contain valuable materials that can be recovered and recycled. The presence of elements therein, like lead, mercury, arsenic, cadmium, selenium, and hexavalent chromium in e-wastes makes them particularly hazardous, and hence are classified as HW.

The management of e-wastes comprises identification, segregation, collection, and transportation, transit at Contractors' warehouses and recycling and/or exportation for recycling.

2.3.1 E-Wastes and Sustainable Development

The increasing level of e-wastes and their improper management pose significant risks to the environment. They also present several challenges to sustainable development and to the achievement of Sustainable Development Goal (SDG). Management of e-wastes is closely linked to SDG 12 (Responsible Consumption and Production), and Target 12.5 which aims to substantially reduce waste generation through prevention, reduction, repair, recycle and reuse.

2.3.2 Maurice Ile Durable Policy, Strategy and Action Plan 2013 for E-Wastes

The MID was a societal project report defining policies, strategies and action plans for a sustainable development for the country. Unlike the SWMS 2011-2015, MID Policy, Strategy and Action Plan 2013 laid more emphasis on the management of e-wastes. During the consultative process with the MID Commission, the then Ministry of Local Government and Outer Islands (MoLG), now referred to as the Ministry of Local Government, Disaster and Risk Management acknowledged the development of an e-Waste Sustainable Management System (EWMS) as one of the areas that required immediate action in view of the growing amount of e-wastes generated in Mauritius, and their potential negative environmental and health risks associated therewith.

In that respect, there was a need to have appropriate National Policies, Strategies, Legal and Institutional Frameworks, as well as Economic and Policy Instruments geared towards e-wastes reduction, their re-use, recovery and safe disposal. Accordingly, a project write-up, as well as the Terms of Reference for Consultancy Services for the project, was included in the MID Policy, Strategy and Action Plan 2013.

2.4 Hazardous Chemical Wastes

HCW require careful management as they exhibit any of the characteristics, such as ignitable, corrosive, toxic and reactive, or are specifically listed in the Regulations.

Mauritius, being a party to the Basel and Bamako Conventions¹, has an obligation to comply with their provisions. In this respect, the SWMD commissioned the construction of an Interim Storage Facility for HCW for Rs 217 million. Since December 2016, a five-year contract has been awarded to a foreign Company (contractor) for the sum of Rs 230 million and € 1.4 million to operate the Facility. HCW that cannot be treated and disposed of on the island are tested, collected, sorted, pre-treated (if possible), regrouped, re-packaged, labelled, stored and exported to licensed recovery/ treatment/ disposal facilities.

2.4.1 Collection of Hazardous Chemical Wastes

The contractor is responsible for the safe collection and transportation of HCW to the Interim Storage Facility in accordance with the terms and conditions of the contract. According to the procedures in place, requests can be made in writing and then transmitted to the contractor for consideration. The latter carries assessment visits at the generators' premises to inspect and take representative samples of the HCW for analysis at the Facility's onsite laboratory.

As from July 2018, requests can also be made through the online web application. They are handled and processed by the SWMD and the contractor on a computerised HW Management System, developed by the contractor as part of its obligations. The System enables the tracking of the requests as and when required, and fixing the scheduled dates of inspection and collection and completion of the final recovery and disposal operations.

In line with the Polluter Pays and User Pays Principles, generators have to pay a fee of Rs 100 per kg of HCW, and an additional fee of Rs 2,500 for quantities of HCW exceeding one tonne for their disposal. Following payment of the fees, generators are informed of the date of collection. Officers of the Enforcement Unit of SWMD supervise the removal and carting away of the HCW. The exact weight is known after collection and weighing at the Interim Storage Facility. Prohibited wastes found in the consignment of wastes collected are returned back, and a fee of Rs 2,500 is charged accordingly.

2.5 Medical Wastes

Healthcare Institutions are responsible for the delivery of patient care services. During this process, MWs are generated. MW include all wastes generated by medical activities. They embrace activities of diagnosis, as well as preventive, curative and palliative treatments in the field of human and veterinary medicine. According to the World Health Organisation (WHO), 15 to 20 per cent of MWs are hazardous. If not properly managed, they may pose environmental and health risks.

¹ Under both Conventions, Mauritius has to take all practicable steps so that HW generated are managed in a manner which will protect human health and the environment.

2.5.1 Guiding Principles on Medical Waste Management as per World Health Organisation

The Guiding Principles are to prevent health risks, support efforts to reduce disease from noxious emissions and promote practices to reduce exposures to toxic pollutants from incineration.

The WHO's strategies in the short term are to develop recycling options where possible, use PVC-free materials, and promote small-scale non-incineration alternatives, while the medium term strategies are to reduce the number of unnecessary injections to reduce sharps wastes and to assess the health risks associated with incineration and exposure to MW.

The long term strategies include the promotion of non-incineration technologies, the development of national guidance manuals for sound management of MW, the development and implementation of national plans, policies and legislations on MW, and to promote the principles of environmentally sound management of MW.

2.5.2 Management of Medical Wastes in Health Institutions

The management of MW from their point of generation to their final disposal includes segregation, collection, on-site transportation, on-site storage, off-site transportation when required, incineration and disposal of ashes. Specific procedures on segregation, packaging and labelling have been explained to the Medical Staff and Ancillary Staff and displayed in each Department of the public Health Institutions. MW are collected at both public and private Health Institutions in yellow-coded bags, stacked in sheds and are earmarked for disposal through incineration or are landfilled.

2.5.3 Incineration of Medical Wastes

As of December 2019, there were seven incinerators at the public Health Institutions. Two of them were commissioned in 2001, three in 2003, and the remaining two in 2007 and 2013. The capacity of the incinerators ranged from 28 kg/hour to 180 kg/hour. The ashes generated from the incineration process are disposed of at the Landfill. As regards private Health Institutions, some of them were equipped with incinerators, while others had to make their own arrangements for incineration of MW.

2.5.4 Initiatives for a Centralised Disposal Facility

On 21 July 2015, a Technical Sub-Committee was set up under the Chairmanship of the Director of SWMD to conduct a feasibility study on the most appropriate Centralised Disposal Facility for MW. One of its terms of reference was to provide an evaluation of the disposal system and to quantify MW generated at both public and private Health Institutions and their projections. The report was submitted in November 2015.

2.6 Organisational Arrangement for Hazardous Waste Management

The objectives, functions, roles and responsibilities of the MoE and other stakeholders, as well as the Regulatory Framework governing HW Management and Disposal are described in this section.

2.6.1 Ministry of Environment, Solid Waste Management and Climate Change

The vision of the Ministry is to achieve a cleaner, greener and safer Mauritius in a sustainable manner through protection and management of our environmental assets, mainstreaming sustainable development principles in different sectors of the economy, and solid and hazardous waste management. Its mission in relation to solid and hazardous waste management is to devise appropriate legal and policy framework to minimise the negative impact.

2.6.2 Solid Waste Management Division

The Division was operating under the MoLG, and in January 2015, came under the aegis of the Ministry of Social Security, National Solidarity and Environment and Sustainable Development. As from December 2019, it is operating under the aegis of the MoE.

The major functions of SWMD include devising policies and strategies and developing programmes for the environmentally sound management of waste streams (including HW), management, control and supervision of waste disposal sites, enforcement of legislations with regard to solid and HW management, including the Environment Protection (Standards for Hazardous Wastes) Regulations 2001, and register recyclers and exporters under the Local Government (Registration of Recycler and Exporter) Regulations 2013.

2.7 Other Stakeholders in Hazardous Waste Management

They include Local Authorities and MoHW. Their roles and responsibilities are described.

2.7.1 Local Authorities

For e-wastes, Local Authorities have in place mechanisms for their collection, conveyance to waste disposal sites or Waste Management Facilities (WMF), including transfer stations and Landfill, to ensure that they are put in appropriate storage receptacles for carting away.

2.7.2 Ministry of Health and Wellness

This Ministry is responsible for controlling health-related aspects of wastes. It has to ensure that MW are segregated, collected, transported, stored and disposed of effectively. It operates seven incinerators for the disposal of MW.

2.8 Legal Framework

The main legal Acts defining the framework for HW management and their disposal are the EPA, the LGA 2011 and specific Regulations made under these Acts.

2.8.1 Environment Protection Act

The overall goal of the EPA is to provide for the protection and management of the environmental assets of Mauritius, and more specifically, to provide for the legal framework and the mechanism to protect the natural environment, to plan for

environmental management and to coordinate the inter-relations of environmental issues, and to ensure the proper implementation of governmental policies and enforcement provisions necessary for the protection of human health and the environment.

2.8.2 Environment Protection (Standards for Hazardous Wastes) Regulations 2001

The Regulations require generators of HW to ensure that wastes are properly stored, treated on site or disposed of as approved by the appropriate enforcing agency. Generators also have to draw up an inventory of the quantity of HW generated, stored and disposed of every three months, and forward a copy of such inventory to the enforcing agency, seek approval for the use of any store, warehouse or other premises for the storage of a container or package containing HW, classify, pack and label HW as prescribed in the Regulations, and fill in consignment notes, whenever the HW generated leave their premises.

2.8.3 Local Government Act 2011

This Act defines the functions and services of the Local Authorities on waste management and disposal. Section 4 of the Local Government (Registration of Recycler and Exporter) Regulations 2013 provides that no person shall dismantle wastes, recycle wastes and export wastes unless he is registered under these Regulations.

2.9 Initiatives taken by the Solid Waste Management Division for Hazardous Waste Management

Several initiatives for the management of wastes have been taken by SWMD. The salient features of the main initiatives are described below.

2.9.1 Strategic Plan 2011-15

The SWMS 2011-15, which was published by the then MoLG in September 2011, addressed the problem of both hazardous and non-hazardous wastes in Mauritius, and established five key strategies in the waste sector with precise objectives and tasks, including one on HW. Accordingly, the four components that should be provided for a national system for HW management to be successful were Legal Framework, Proper Infrastructure, Resources for Enforcement and Control and Support Services.

2.9.2 Elaboration of a National e-Waste Policy, Strategy and an Action Plan

In 2013, Government benefited from the technical assistance of EU Consultants for the development of the National e-Waste Policy, Strategy and an Action Plan. In October 2014, they submitted their report and recommended two options for the National e-Waste Policy Framework. The first option was a private-led EWMS, based on the principle of the widely accepted Extended Producer Responsibility, while the second option was to adopt a Government-led approach.

2.9.3 Construction of a Dedicated Facility for Hazardous Chemical Wastes

The construction works of an Interim Storage Facility started in April 2015, and were substantially completed in June 2016. The Facility has been designed to receive 400 tons

of HCW annually which cannot be disposed of locally. These include inorganic solid and liquid waste, flammable and non-flammable organic waste, pharmaceutical wastes and compressed gases. These wastes are regrouped, repackaged, labelled, stored and exported to international licensed facilities for final disposal. However, radioactive wastes, explosives wastes, infectious MW and e-wastes are prohibited at the Facility.

2.9.4 Hazardous Waste Inventory

A Hazardous Waste Inventory Report for Mauritius was prepared by MoLG and the Africa Institute for the Environmentally Sound Management of Hazardous and Other Wastes in 2012. According to the Report, the potential e-wastes generated annually were 7,600 tonnes. MWs generated at private Health Institutions were estimated at 200 tonnes.

2.9.5 E-Wastes Collection Campaigns

Pending the setting up of a EWMS, the SWMD, in collaboration with the then MoLG organised two e-wastes collection campaigns at household level in 2015 and 2019. Two contracts were awarded to private contractors for the recycling of the e-wastes collected. The campaigns included collection by Local Authorities, the storage at WMF and the recycling of e-wastes.

CHAPTER THREE

FINDINGS

This Chapter presents the audit findings on whether the measures taken for the proper disposal of e-wastes, HCW and MW to protect the environment were effective and efficient.

3.1 Policy, Strategy and Action Plan for the Disposal of Hazardous Wastes

One of the major functions of SWMD is to devise policies and strategies, and to develop programmes for the environmentally sound management of waste streams, including HW. The SWMS 2011-15 addressed the management of wastes in Mauritius, and established five key strategic areas, including one on HW, followed by objectives and tasks. As these waste streams have different characteristics, they require specific, but different management measures to be taken from generation to disposal to ensure maximum environment protection. However, the objectives and tasks mentioned in SWMS 2011-15 relate to management of HW in general and did not specifically address management of e-wastes, HCW and MW in a holistic manner from generation to disposal.

3.1.1 E-Wastes

For e-wastes, the Policy, Strategy and Action Plan devised by the EU Consultants since October 2014 were to be implemented through the setting up of the EWMS. A Memorandum of Understanding (MoU) between MoE and an association regrouping importers and commercial dealers in Electrical and Electronic Equipment (EEE) was signed in February 2016, wherein both parties agreed to pursue discussions for the signing of a Partnership Agreement for an efficient and cost effective EWMS.

However, as at December 2019, the EWMS had not been set up as the Ministry did not proceed with the signature of the Partnership Agreement. According to the Procurement Policy Office and the Attorney-General Office (AGO), the approach adopted to finalise the Agreement with the association regrouping importers was not in line with legislations in force. The delay for the setting up of an EWMS acted as a deterrent in managing e-wastes in a holistic manner and achieving Target 12.5 of SDG 12 which relates to substantially reduce waste generation through prevention, reduction, repair, recycling, and reuse.

The Ministry explained that consultations were held with the Procurement Policy Office during the preparations of the MoU. Several meetings were held with the association regrouping importers to work on a fair and reasonable draft agreement. Also, this agreement would bind both parties for a period of about five to 10 years, and there was no point on starting the venture on a wrong footing. Furthermore, in 2019, AGO advised that the portfolio of the MoE does not include management of HW. It would have been an illegal action had SWMD signed the agreement.

3.1.2 Medical Wastes

According to research studies, a National Policy is the first and key step to create a sustainable MW Management System. Further, WHO recommends that the hazardous and harmful nature of MW requires that the different activities in the management thereof be carefully organised from generation to disposal. However, as of December 2019, there was no policy for the management of MW. Moreover, all the initiatives taken by the then Ministry of Health and Quality of Life (MoHQL) since 2009 for developing a MW Management Plan were unsuccessful.

SWMD stated that it was not solicited by the Ministry of Health and Wellness (MoHW) for the drafting of a National Policy and a Management Plan for MW. SWMD, though being the enforcing agency of HW, did not deem it necessary to ensure that a policy and a plan for MW is developed.

3.2 Legal Framework

One of the four components for a successful HW Management System identified in the SWMS 2011-15 is the establishment of an appropriate legal framework. Currently, the activities for HW disposal are regulated by the Environment Protection (Standards for Hazardous Wastes) Regulations 2001. However, the Regulations do not cover specific and detailed aspects relating to the management of e-wastes, HCW and MW. The status of the initiatives taken to have specific Regulations for e-wastes, HCW and MW is as follows.

3.2.1 Regulations for E-Wastes

In 2014, the EU Consultants initially drafted the Environment Protection (Environmentally Sound Management of e-Wastes) Regulations which were revised by the e-Wastes Technical Working Group to address emerging issues. The draft Regulations which covered, among others, the definition of EEE and e-wastes, roles of the e-Waste Steering Committee in ensuring the implementation of the Partnership Agreement, mandate of the Importers Responsibility Organisation with respect to the operation and management of the EWMS, the obligations of importers, local manufacturers and assemblers of EEE, consumers and bulk consumers of EEE were submitted to the AGO for vetting since May 2017. However, as of 31 December 2019 they were not yet vetted and finalised.

The Ministry explained that vetting of the draft Regulations for e-wastes was put on hold due to the legal issue faced on the project for the setting up and operation of the EWMS. Based on the advice received from the Procurement Policy Office and AGO, the Regulations cannot be vetted as such, and would need to be reviewed. This is still awaited and is being taken up at the level of the Ministry of Finance, Economic Planning and Development as well.

3.2.2 Regulations for Hazardous Chemical Wastes

For HCW, following the operationalisation of the Interim Storage Facility in April 2017, the SWMD decided to come up with Environment Protection (Environmentally Sound Management of Hazardous Wastes) Regulations. Some of the additional provisions proposed in the new Regulations were that a waste generator shall bear the cost of managing

and disposing of his HW, he shall ensure that datasheet of chemicals used at his premises is at all times available for consultation by the enforcing agency, and to prepare a contingency plan. It is also prescribed that if a person fails to comply with or acts in contravention of any provisions of the Regulations, he shall commit an offence and shall on conviction, be liable to specified penalties.

The revised draft Regulations were submitted to the AGO for vetting on 26 July 2018. However, as of December 2019, that is, after more than one year, they have not yet been vetted and finalised.

3.2.3 Regulations for Medical Wastes

The WHO advocates that for implementing an effective MW Management System, it is important that the basic requirements are regulated. Under the Environment Protection (Standards for Hazardous Wastes) Regulations 2001, human and animal MW are classified as hazardous. However, the Regulations make provisions for HW in general, and do not make specific and detailed provisions for a clear and properly categorised definition of MW, standards for segregation, labelling, transportation, storage, treatment and disposal of MW, methodology for record keeping and reporting, monitoring and enforcement mechanism, as well as penalties to be imposed for mismanagement. In the absence thereof, the existing Regulations were deemed prevailing.

In its reply, the Ministry stated that SWMD has not been solicited by MoHW for the drafting of Regulations for MW. It is also of opinion that while specific regulations for the management of MW may not be warranted, there is a need to have appropriate guidelines for their management and disposal.

3.3 Inventory and Database on Hazardous Wastes

Adequate record keeping and realistic databases are important to effectively manage HW. The availability of accurate and updated information can be used as the basis for developing and reviewing policies and strategic actions.

The carrying out of an inventory of HW generated by the industrial and non-industrial sector, and the development of a database formed part of the objectives and tasks of SWMS 2011-15. A Hazardous Waste Inventory for Mauritius was prepared by the then MoLG and the Africa Institute for the Environmentally Sound Management of Hazardous and Other Wastes in 2012. Since then and up to December 2019, no other inventory was carried out on the three waste streams. This did not allow the SWMD to take cognizance of the complexities of the problems, and consequently, address the challenges in the right manner.

The Ministry explained that conducting an accurate national inventory of HW is a resource intensive exercise and cannot be conducted every year. Once an inventory is carried out, it should be updated from the reporting, and an enforcement mechanism provided for under the Regulations. The Ministry is working with the Department of Environment on the funding of the inventory amongst others under the Global Environment Facility funding.

3.3.1 E-Wastes

As of 31 December 2019, there was neither a record on EEE imported nor a database on the volume of e-wastes generated and recycled.

The Ministry informed NAO that letters were issued on 26 October 2018 to all recyclers/exporters to submit their annual returns. Some of them responded positively. The amount of e-wastes generated is proportional to the amount of electronic/electric goods imported, and data is available from the Customs Department.

3.3.2 Hazardous Chemical Wastes

SWMD took the initiative to develop a comprehensive database on potential HCW generators. As of October 2019, various associations regrouping manufacturers have contributed to establish a list of some 1,410 generators. However, the list did not include the types and quantities of HCW generated.

The Ministry informed NAO despite the setting up and operation of the Interim Storage Facility, it is acknowledged that much remains to be done with the limited resources available at SWMD in terms of human capacity, and technical expertise.

3.3.3 Medical Wastes

Under the current Regulations, a waste generator has an obligation to draw up an inventory of the quantity of HW generated, stored and disposed of and forward quarterly a copy of such inventory to the enforcing agency. Waste generators did not comply with the provisions of the Regulations. For example, records at MoHW showed that in 2019, some 690 tonnes of MW were generated in the public Health Institutions. However, this information was not submitted to the enforcing agency as required by the Regulations. SWMD also did not receive this information. No actions were taken against the waste generators. The non-compliance of the provisions of the Regulations by waste generators did not help the SWMD to compile statistics on HW generated.

The Ministry informed that the WHO assumes that 0.2 kg to 0.5 kg of MW are generated per bed per day, so there is no need to duplicate, and there are reports available at MoHW.

3.4 Sensitisation/Awareness Programmes and Segregation

In the SWMS 2011-15, it was pointed out that waste separation is a key activity in any successful resource recovery initiative. One of the objectives of segregating HW from other waste streams is to avoid cross-contamination of potentially recyclable materials, and to reduce the health and safety risk to people and the environment. It was further mentioned that wastes can be separated at the household, commercial and industrial level and at the waste disposal site.

3.4.1 E-Wastes

Segregation was not carried out at household level. To some extent, this can be due to inadequate sensitisation and awareness programmes by SWMD. Over the past four years, from 2016 to 2019, no such programme was carried out to inform the public about the importance of segregating e-wastes from other municipal wastes, their hazardousness, and/or the handling at their ends.

The Ministry informed NAO that during e-waste collection campaigns, Local Authorities distributed pamphlets to inform the public on the types of e-wastes and the dates of collection. Several meetings were held with Local Authorities to discuss on the ‘modus operandi’ and awareness campaigns.

3.4.2 Hazardous Chemical Wastes

For HCW, during inspections, the enforcement team of SWMD and the appointed contractor reported several unsatisfactory storage and handling practices thereof which directly pose serious threats to public health and environment.

These shortcomings were attributed to inadequate awareness campaigns and education given to waste generators and other stakeholders on the different types and characteristics of waste streams, as well as the effects of improper wastes disposal in the environment.

After the setting up of the Interim Storage Facility, SWMD carried out various meetings with the HCW generators in collaboration with the contractor to sensitise them on the management of HCW. However, SWMD did not set any target regarding the frequency of such meetings to be carried out. Moreover, sensitisation and education programmes on the handling and disposal of HCW for the community at large were not carried out.

The Ministry informed NAO that SWMD with its limited staff carried out ‘in-situ’ training of the personnel in 240 organisations since the operation of the Interim Storage Facility. Sensitisation campaigns have been effected through meetings with the relevant association informing its members on the operation of the Facility.

3.5 Short-Term Measures to Manage E-Wastes

Pending the setting up of the EWMS, SWMD took some short term measures to manage e-wastes. These measures, though commendable, had shortcomings in their implementation. They are described in paragraphs 3.5.1 to 3.6.9 below:

3.5.1 E-Wastes Collection Campaigns 2015

SWMD, in collaboration with the then MoLG, organised the first e-Wastes Collection Campaign at household level during the first week of October 2015. The Campaign which included the collection of e-wastes by Local Authorities, and their storage at WMF, was followed by the recycling of e-wastes. On 15 October 2015, MoE awarded the contract for ‘Recycling of e-Wastes’ generated at household level to a contractor for some Rs 7.3 million. The duration of the contract was nine months, and it catered for the dismantling and recycling of 46,800 units of e-wastes.

3.5.2 Collection of E-Waste Units

According to the contract for 'Recycling of e-Wastes', 46,800 units of e-wastes were estimated to be recycled. However, by the end of the Collection Campaign, some 24,500 units were collected by Local Authorities and transported to the WMF. Of the 24,500 units, 71 per cent, that is 17,500 units met the eligibility criteria for recycling. The remaining 29 per cent or 7,000 units were reported by the SWMD to be damaged and were landfilled.

The Ministry informed NAO that the remaining 29 per cent also comprised non e-waste items collected by Local Authorities during the Collection Campaign 2015.

3.5.3 Interruption of the Services of Field Services Unit

The responsibility for carting away the e-wastes collected during the Campaign from the WMF to the contractor's premises for recycling was conferred to the Field Services Unit (FSU) of MoLG. Over the period 23 October 2015 and 18 March 2016, some 7,000 of the 17,500 units (40 per cent) were carted away, as FSU stopped providing its services to SWMD in March 2016. Following the interruption of the services provided by FSU, SWMD, on 16 May 2017, awarded the contract to another contractor for carting away of e-wastes from the Landfill at Poudre d'Or and La Laura Transfer Stations to the premises of the contractor for recycling for the sum of some Rs 800,000. The contract was for a period of four months. Hence, the remaining 10,500 units of e-wastes (60 per cent) had remained at the WMF for more than one year.

The delay in carting away the remaining e-waste units increased the potential risk of harm to the environmental medium². However, SWMD did not conduct any monitoring³ exercises to determine the extent to which the environmental medium had been affected by pollutants⁴. Also, no exercise was carried out to assess the environmental impact from the possible leaching out of contaminants/ hazardous substances in the soil and the surrounding area. The delay in carting away also exposed the e-wastes to environmental hazards, such as fire. On 30 April and 29 May 2017, the e-wastes at La Chaumiere Transfer Station were destroyed by a fire outbreak. The effect of the harmful smoke from the burned e-wastes to the environment and human life was also not assessed.

The Ministry informed NAO that the e-wastes were placed in plastic sheets and stored in containers to prevent any leaching of hazardous components. As the e-wastes are stored temporarily in containers, the risk of air and soil pollution does not arise.

3.5.4 Storage Conditions of E-Wastes at the Landfills

All e-wastes collected must be stored in conditions which protect the environment from being affected by the hazardous materials. Key requirements for an appropriate storing condition include avoiding breakage, protection from weather and storing on an impermeable and bonded surface. Following site visits at the Mare Chicose Landfill by the Technical Enforcement Unit (TEU) on 22 and 29 May 2017, it was reported that piles of

² According to EPA, 'environmental medium' includes air, land and water.

³ 'Monitoring' includes the inspection, measurement, sampling or analysis of any discharge of a pollutant, or of any environmental medium in any locality, whether periodically or continuously.

⁴ 'Pollutant' means a substance which may cause harm, damage or injury to the environment, to plant or animal life, or to human health, and includes any substance from which a pollutant is derived.

e-wastes from the 2015 Collection Campaign were stacked on the ground and in open space. They were exposed to dust, and most of them were damaged and valuable parts were missing. In August 2017, the Ministry had to disburse an additional amount of some Rs 300,000 for sorting and cleaning of the e-wastes from the piles before they could be carted away.

3.5.5 Units Delivered for Recycling

Following the interruption of services by FSU, the delay in awarding the Contract for carting away of e-wastes and poor storage conditions, some 14,600 units of e-wastes were delivered to the contractor's premises for recycling from 23 October 2015 to 4 December 2017 as compared to some 17,500 of e-waste units which were initially expected to be delivered. The remaining ones were not delivered to the contractor's premises and were eventually landfilled.

The Ministry informed NAO that the remaining units were not delivered to the contractor's premises as they were not acceptable for recycling.

According to SWMD, the estimated quantity of e-wastes fractions arising from the dismantling operation of some 7,000 units carted away to contractor's premises from 23 October 2015 to 18 March 2016 were around 139 tonnes. However, the quantity of e-wastes fractions recovered was only around 77 tonnes, and this was significantly lower, as it represented some 44 per cent of the estimate. Likewise, the quantity recovered from the 7,600 units carted away from 29 May 2017 to 6 February 2018 was around 47 tonnes as compared to the estimated quantity of 65 tonnes worked out by SWMD, representing a shortfall of 27 per cent. The Ministry acknowledged that most of the e-wastes collected by Local Authorities and delivered to the Contractor's premises were damaged and stripped of their valuable components. SWMD had not taken adequate actions to prevent occurrence of such incidents.

The Ministry explained that it is practically impossible to prevent such occurrences.

3.5.6 Transit at Contractor's Warehouses

According to conditions of the contract, the contractor had to make available, at least one warehouse or storage facility having impermeable surfaces with sealed drainage system, weatherproof covering, appropriate containers, and proper ventilation. However, the Contractor did not comply fully with the contractual obligations. Following an inspection visit on 8 December 2015, TEU reported that the plot of land leased by the contractor at La Chaumière was not fenced, and significant amount of construction wastes was dumped in the open air, along with loads of dismantled e-wastes plastic covers. During follow-up visits in January, March, April and May 2016, TEU observed that the quantity of dismantled e-wastes plastic covers was continuously increasing. The contractor was instructed to proceed with the disposal of the plastic covers as they were considered as environmental nuisances, and there was a risk of fire outbreak associated with the stacking of plastic covers in the open space. However, the latter did not comply with the instructions. In September 2016, a fire broke out in the bare land, and all the plastic covers which were stacked to be processed were burnt completely. No action was taken against the contractor.

The Ministry informed NAO that regular meetings were held with the contractor and instructions were given to take necessary precautions for proper storage and to install fire-fighting equipment. Unfortunately, there was a fire outbreak from outside the site storage area which propagated beyond the control of the contractor.

3.5.7 Disposal of E-Wastes

In February and March 2018, SWMD requested the contractor was requested to dismantle e-wastes delivered to its warehouse and ensure locally recyclable fractions are recycled, with the exception of Cathode Ray Tube Glass which would have to be dismantled for export by end of April 2018. However, as of April 2018, TEU reported that some e-wastes were still not dismantled.

Following an extension of time, the contractor was requested to complete the dismantling and recycling of e-wastes by end of June 2018. However, by that time, only some 3,000 of the 8,000 units were dismantled. The dismantling of the remaining 5,000 units was completed by 30 June 2019.

SWMD and the contractor agreed that all the extracted fractions should be disposed of without further delay. However, as of 31 December 2019, 65,600 kg of Cathode Ray Tube Glass, 35 kg of Printed Circuit Boards and 3 kg of Toner from the 2015 Collection Campaign were not yet exported to licensed facilities for recycling/ disposal purposes. The contract was expected to be completed within nine months (July 2016), and yet as at 31 December 2019, the Contractor had not completed its services.

The Ministry informed NAO that it took more than nine months for the contractor to receive the consent of the importing and transit countries for exportation, and that this is beyond the control of the contractor and SWMD.

3.6 E-Wastes Collection Campaign 2019

Another e-Wastes Collection Campaign was launched in March 2019, and ran over six consecutive months. On 12 February 2019, another contractor was awarded the contract for 'Recycling of e-Wastes' for the sum of Rs 13.4 million. The contract period was 18 months starting on 1 March 2019. It catered for the carting away and export of some 47,000 units of e-wastes generated at household level. The contractor also had to cater for receipt and export of e-wastes from Government Bodies.

Lessons learned from the 2015 Collection Campaign were not considered to improve the management of e-wastes by the key stakeholders. Shortcomings identified at each stage of the process, that is, collection, transportation, unloading and storage in the 2019 Collection Campaign are elaborated.

3.6.1 Collection, Transportation and Unloading of E-Wastes by Local Authorities

Local Authorities were instructed by SWMD on the proper handling of e-wastes starting from their collection, transportation to unloading at the WMF. However, some Local Authorities did not comply with instructions. A few examples of non-compliance are:

- Transporting e-wastes in a different mode of transportation, which ultimately damaged the e-wastes;
- Mishandling of e-wastes at the Landfill during the unloading process;
- Bringing damaged, pilfered and/ or tampered e-wastes to the WMF; and
- Not segregating e-wastes from other types of wastes.

The Ministry informed NAO that the e-wastes were already damaged. The public removed all wastes that they deemed necessary, and this was remedied through additional enforcement by SWMD, and letters were issued to the Local Authorities concerned.

3.6.2 Storage of E-Wastes at the Waste Management Facilities

E-wastes were temporarily stored in areas earmarked at the WMF by SWMD. However, during the Campaign, TEU repeatedly highlighted some problems regarding the storage of e-wastes as described hereunder:

- The area earmarked for storage of e-wastes at the Landfill was full due to the accumulation of debris, which comprised metal and plastic remains with no electronic elements. In July/August 2019, there was no place to accommodate e-wastes collected.
- E-wastes were stored in the open space at the WMF at different point in time due to the delay in carting away by the contractor.
- The e-wastes collected by Local Authorities, which were temporarily stored at the WMF, were tampered with at the Facilities, and the valuable parts were removed therefrom.

3.6.3 Collection and Transportation of E-Wastes by Contractor for Recycling

The contractor is required to cart away the e-wastes from the WMF within a week. However, TEU repeatedly reported that the contractor was not deploying additional resources to cart away the e-wastes to its warehouses within a week leading to their accumulation in all the WMF. Due to limited space at the Facilities, e-wastes were stacked in the open space or at other places at the WMF not earmarked for storing e-wastes. SWMD pointed out that this could have serious consequences, such as the risk of fire outbreaks in the Facilities and/or further damages to the e-wastes. There was no significant improvement, and delay to remove the e-wastes from the WMF was recurrent feature. Though the delay was regarded as a serious deviation from its contractual obligations, no action was taken against the contractor by SWMD.

3.6.4 Unloading of E-Wastes at Contractor's Warehouses

The contract⁵ stipulates that care should be taken by the contractor when loading and unloading the e-wastes into and from the vehicle. Also, the contractor should ensure that e-wastes are being handled properly, and are not damaged during handling, loading, transportation and unloading. However, TEU reported that some e-wastes which were

⁵ Section V of Scope of Service and Performance Specifications, Paragraph 2.1 Collection and Transportation of e-Wastes

collected and stored at the WMF in good conditions were damaged at contractor's premises during the unloading exercise. For instance, on 23 July 2019 when a survey was carried out by TEU, the latter observed that e-wastes collected in good conditions from the WMF were unloaded from a truck trailer by means of its ejecting device, and were damaged at the contractor's premises.

3.6.5 Storage of E-Wastes at Contractor's Premises (Warehouses and Open Spaces)

For the purpose of the contract, the Contractor shall make available, at least one warehouse which can accommodate all the e-wastes that will be handed over to it. Initially, the contractor had two warehouses located at Le Hochet and Terre Rouge. With the increasing volume of e-waste units collected during the Campaign, the contractor used two additional plots of land of one arpent each at Khoyratty for storage purposes. However, the contractor failed to comply with its contractual obligations, as almost all the e-wastes at the two additional plots were kept in an open space, and not in a warehouse having impermeable surfaces with sealed drainage system, weatherproof covering, appropriate containers for the storage of hazardous wastes and proper ventilation as stipulated in the contract. Also, both storage areas were not fenced, and as from May 2019, TEU reported that no watchman or security officer was seen thereat. The SWMD neither took appropriate action to inform the contractor that it had deviated from the contractual obligations nor requested it to look for another alternative suitable warehouse to accommodate those e-waste items.

3.6.6 Fire Safety Requirements at Contractor's Premises (Warehouses and Open Spaces)

On 25 November 2019, SWMD sought confirmation with the contractor, as to whether both storage areas at Le Hochet and Terre Rouge had valid Fire Certificates as from mid-October 2019 as required by the Regulations. On 27 December 2019, the contractor informed SWMD that application for Fire Certificates was made for both storage areas. However, they were still in process at the level of Mauritius Fire Rescue Service. This implied that the storage areas were not operating under required conditions.

The open storage areas at Khoyratty also did not have all necessary firefighting equipment and clearances from the Mauritius Fire and Rescue Service as required in the contract. As mentioned above, both storage areas did not have Fire Certificates as required by the Mauritius Fire and Rescue Service Act, which stipulates that owner of premises⁶ shall apply to the Chief Fire Officer for a Fire Certificate in relation to the premises, which certifies that all safety requirements have been met thereto.

3.6.7 Fire Outbreak at the Contractor's Storage Area

On 31 August 2019, a fire outbreak propagated into one of the contractor's open storage area at Khoyratty, and some 10,900 units of e-wastes were completely burnt down. On 2 September 2019, the contractor was instructed to make necessary arrangements for their disposal. However, after subsequent inspection visits, TEU repeatedly reported that the burnt e-wastes were uncovered, stacked in a disorganised manner on the ground. No adequate action was taken by SWMD to remedy the situation, and to avoid risk of leachate in the soil. As at 31 December 2019, the carting away exercise of the burnt e-wastes was still ongoing.

⁶ According to Mauritius Fire and Rescue Service Act, premises include land whether built on or not.

Following the fire outbreak in August 2019, the SWMD required the contractor to take some immediate actions with regard to the storage conditions at the other non-compliant storage area at Khoyratty. However, as at 31 December 2019, most of them were not implemented within the allocated time, while others were inadequate.

In its reply, the Ministry stated that the carting away works are still ongoing, and soil samples may be tested to assess whether there has been any leaching. Remedial measures will accordingly be taken.

3.6.8 Dismantling of E-Wastes

According to the Local Government (Registration of Recycler and Exporter) Regulations 2013, a registered exporter is a person who is registered to offer his services for the export of wastes, while a registered recycler is a person who is registered to offer his services for the dismantling, recycling of wastes, or both.

When the agreement was signed, the contractor was registered as exporter of e-wastes, and not as a registered recycler. However, during site visits held on 31 May and 10 June 2019, TEU drew attention that various items were dismantled at the contractor's premises. This major deviation was not followed by appropriate sanctions against the contractor.

The Ministry informed NAO that the e-wastes were dismantled so as to fill void spaces in refrigerators for optimising storage capacity. In the last meeting held with the contractor, the guarantee was given that all the e-wastes collected would be exported to additional recyclers in South Africa.

3.6.9 Disposal of E-Wastes

The Ministry sought and received the consent of the Department of Environmental Affairs in South Africa for the exportation of 1,500 tonnes of e-wastes for recovery in South Africa, and it was valid up to 31 December 2019. Of the 44,000 units collected during the Campaign, 11,000 units were burnt in August 2019. From March to December 2019, the contractor managed to export 7,800 units, while the remaining 25,200 units were still lying at the premises of contractor. Since 22 November 2019, SWMD requested the latter to submit a programme for exportation for the remaining stored e-wastes. As of 31 December 2019, the programme was still awaited.

The Ministry informed NAO that the contractor has submitted its programme of exportation, and the necessary clearances are being awaited from the relevant foreign authorities.

3.7 Issues in Management of Hazardous Chemical Wastes

The issues in the management of HCW are described in paragraphs 3.7.1 to 3.7.5

3.7.1 Prevention of Hazardous Chemical Wastes Generation

Prevention is deemed to be the most efficient solution to the problems caused by wastes, and is thereby placed at the top of the waste hierarchy. It may involve reducing the quantity

of wastes, limiting the adverse impacts generated by wastes, and reducing the content of harmful substances in materials. Policies aimed at reducing the amount of wastes may involve changing consumer patterns or strategies in the manufacturing industry.

One of the responsibilities of the HW generator, as defined in the Environment Protection (Standards for Hazardous Wastes) Regulations 2001, is to minimise generation of HCW by using best practicable means. SWMD did not assess whether HCW generators were complying with this requirement of the Regulations.

The Ministry informed NAO that in practice, it is difficult to assess compliance of generators to the requirements.

3.7.2 Classification of Hazardous Chemical Wastes

According to the provisions of the Environment Protection (Standards for Hazardous Wastes) Regulations 2001, a waste generator has to ensure that HW are properly stored, treated on site or disposed of as approved by the appropriate enforcing agency.

However, this activity requires the waste generator to have knowledge to identify the HCW in view of enhancing segregation, and it avoids the risks that HCW are collected in combination with non-hazardous wastes. Although details of HCW that are accepted by the contractor of the storage facility along with those listed in the First, Second and Third Schedules of the Environment Protection (Standards for Hazardous Wastes) Regulations 2001 were regularly communicated, the HCW generators were still facing difficulties in identifying them.

During inspections, the contractor for the operation, management and maintenance of the Facility had on several occasions reported that HW were not properly identified and segregated at the HCW generators' premises. For example, in January 2018, during inspection in an educational institution, the contractor reported that acids, alkalis, flammable solvents and other chemicals had not been segregated from non-hazardous wastes.

The Ministry stated that informing generators of HW of their obligations under the Environment Protection (Standards for Hazardous Wastes) Regulations 2001 is a continuous process and meetings are conducted with generators to apprise them of their responsibilities.

3.7.3 Hazardous Chemical Wastes at Household Level

In the SWMS 2011-15, it was reported that HCW, like expired drugs, paints and gas cylinders were all suspected to be dumped haphazardly in the environment. One of the tasks identified in the Strategy is to segregate household HW, including HCW with the aim to avoid cross-contamination of potentially recyclable materials, and to reduce the health and safety risk to people and the environment. As at December 2019, this task was not implemented. Moreover, the quantity of HCW generated at household level had never been assessed.

The Ministry informed NAO that funds have been earmarked in the 2019-20 budgets for the collection, management and disposal of household HW. SWMD is currently working

on the implementation of a system for the collection and management of small mixed waste batteries and compact fluorescent lamps from households, which might be extended to other household HW streams.

3.7.4 Disposal of Hazardous Chemical Wastes

As per the contract for the Operation, Management and Maintenance of the Interim Storage Facility, HCW should not be stored in the Facility for a period exceeding one year as from the date of receipt.

From April 2017 to November 2019, some 230 tonnes of HCW were carted away to the Facility. They included collections for the period April 2017 to November 2018 weighing some 170 tonnes. However, only some 20 tonnes of the 170 tonnes have been exported (10 tonnes in July 2018 and 10 tonnes in July 2019). As at December 2019, some 150 tonnes relating to collections during that period have remained at the Facility for more than one year.

On 3 October 2019, during a meeting with the National Disaster Risk Reduction and Management Centre, with the forthcoming cyclonic season, the Ministry was requested to make arrangement with the contractor to ensure that HCW stored at the Facility are exported as frequently as possible. As at December 2019, no further HCW were exported, and no action was taken against the contractor.

The Ministry informed NAO that two shipping containers of 20 feet and two containers of 40 feet have been shipped by the contractor during the period January to February 2020. The contractor has been instructed to export all the HW that have been stored. It is expected to export these HW by June 2020.

3.7.5 Storage of Hazardous Wastes

The Environment Protection (Standards for Hazardous Wastes) Regulations 2001 provide that no waste generator shall use any store, warehouse or other premises for the storage of a container or package containing a hazardous waste unless he has obtained an approval from the relevant enforcing agency. He should also ensure that HW is kept in a container or package designed and constructed so as to preclude their spillage or leakage to the environment.

During inspections in 2018, TEU reported unsatisfactory storage and handling practices of suspected HCW on the premises of a private company and two Educational Institutions, among others.

The Ministry informed NAO that letters have been issued to secondary schools with copy to the Ministry of Education, Tertiary Education, Science and Technology to remind them of their obligations under the current Regulations.

3.8 Issues in Management of Medical Wastes at Health Institutions

The following Sections of the Environment Protection (Standards for Hazardous Wastes) Regulations of 2001 are important and relevant for the proper disposal of MW.

- Section 4 provides that a waste generator shall minimise the generation of HW by using the best practical means, and it shall ensure that they are properly stored, treated on site or disposed of as approved by the appropriate enforcing agency.
- Section 5 makes provisions for HW to be stored in container or package designed and constructed as to preclude spillage or leakage to the environment, and that incompatible HW must be stored in separate containers.
- Section 6 requires the Waste Generator to ensure that any container in which HW are stored or carried is labelled in accordance with the Fifth Schedule.

The Health Institutions in Mauritius are required to comply with the different provisions of the Regulations. SWMD, as enforcing agency, did not ascertain whether they were complying with the different provisions of the existing Regulations. It also did not even assess the effectiveness of some of their current practices. Cases of non-compliance with the above-mentioned provisions are described below.

3.8.1 Medical Waste Minimisation and Segregation

Waste segregation is one of the most important steps to successfully manage MW, as treatment and disposal costs are greatly reduced. Specific procedures on MW segregation, packaging and labelling have been explained to the Medical and Ancillary Staff and displayed in each Department of the public Health Institutions. Ward Managers and the Charge Nurses have to ascertain that segregation is carried out accordingly. These procedures have been based on WHO Guidelines on safe management practices.

SWMD did not ascertain whether both public and private Health Institutions were complying with Section 4 of the Regulations, and whether procedures established have been extended to private Health Institutions.

The Ministry informed NAO that there is an acute lack of human resources at SWMD for monitoring the management and disposal of MW in Health Institutions.

3.8.2 Medical Waste Storage

The WHO recommends that space for storing wastes should be incorporated into a building design when new construction of public Health Institution is undertaken. The facility should be easy to clean, have good lighting and ventilation, be equipped with a freezer and designed to prevent rodents, insects or birds from entering. The Health Institutions must provide an enclosed structure, marked with a biohazard symbol. SWMD did not confirm whether the health institutions had complied with the recommendations of the WHO.

The Ministry is of opinion that the recommendations of WHO are not legally enforceable.

3.8.3 Medical Wastes Disposal

According to the Feasibility Study prepared by SWMD, the small-scale incinerators in the public Health Institutions are designed to meet an immediate need for public health protection. It was reported that as of December 2019, most of the incinerators were over 10 years old. The current practice of disposal of MW by land filling is considered as inappropriate, and the WHO, as part of its long term strategies, recommends the promotion of non-incineration technologies for the disposal of MW.

As per Section 3 of the Regulations, no person shall dispose of a HW at any place, except at a disposal site, and after such pre-treatment as may be imposed by the enforcing agency prior to disposal. Over the past years, several requests for the disposal of MW from both public and private Health Institutions at the Landfill, due to unavailability and frequent breakdown of incinerators, were addressed to SWMD. About 2,000 tonnes of MW from public Health Institutions and 50 tonnes from private Health Institutions were sent to the Landfill, without pre-treatment over the period 1 July 2016 to 30 June 2019. These were recommended to be disinfected, shredded off before they were disposed of at the Landfill.

However, SWMD, as enforcing agency, did not ensure that MoHW has taken appropriate actions to address the issue regarding MW not pre-treated before disposing at Landfill.

The Ministry informed NAO that the recommendations for disinfecting, shredding off before disposal at the Mare Chicose Landfill were made in the feasibility study dated November 2015 and are not prescribed in the 2001 Regulations. MoHW has been requested to take necessary actions with regard to the construction of appropriate disposal facilities.

3.8.4 Standards for Stack Emissions

Since April 2014, the MoE has proposed to come up with the Environment Protection (National Standards for Ambient Air Quality and Stack Emission) Regulations 2014 in replacement of the Environment Protection (Standards for Air) Regulations 1998.

According to the MoE, the Air Quality Standards were approved by the AGO in 2015. However, during a meeting of the Environment Coordination Committee held on 27 February 2017, the Chairperson informed that MoHW has requested for a moratorium period of three years for the promulgation of the Standards for incinerator stack emissions until the National Health Care Waste Management Centre becomes operational.

In a subsequent meeting of the Environment Coordination Committee on 31 May 2017, the Chairperson reported that complaints were still being received against smoke caused by incinerators in hospitals. He requested the then MoHQL to start carrying an air quality monitoring exercise regarding dioxins and furans emission, together with a health screening exercise of the operators of incinerators and the inhabitants living in the vicinity of the hospitals where incinerators were operational. Following promulgation of the new Standards, the MoHW will have to comply with them, and undertake air sampling requirements, including those for dioxins and furans.

On 27 June 2018, MoHQL was given a moratorium of three years in order to comply with the air emission standards until the setting up of the Centralised Disposal Facility for MW. However, as of 31 December 2019, the implementation of the project had not started, and the air emission standards had not yet been proclaimed though they were approved by the AGO in 2015.

3.8.5 Enforcement

As enforcing Agency, SWMD is required to carry out monitoring visits to Health Institutions to ensure that HW generated are managed in an environmentally sound manner. However, over the period July 2016 to June 2019, there was no evidence of visits carried out at the public and Private Health Institutions by SWMD to ensure compliance with Regulations.

The Ministry informed NAO that the Enforcement Unit of SWMD has carried out around 25 visits at hospitals and private clinics with a view to sensitising on segregation and/or disposal of the different types of MW during the period 2011-17.

3.9 Mitigating Environment and Health Risks

The processes for e-wastes management include the temporary storage of the collected items at the WMF and at the contractors' premises pending their exportation. Where the collected items are left exposed on the ground and in open spaces, they can potentially affect both the environment and public health. Moreover, the occurrence of fire outbreaks posed additional and increased the risks to the environmental medium.

However, MoE and the other enforcing agencies did not carry out any monitoring exercises to determine the extent to which the environment and/or human health have been affected by the improper disposal of e-wastes. For example, the risks of possible leaching out of contaminants hazardous substances in the soil and the surrounding area and/or the release of harmful substances into the atmosphere have not been assessed. Despite MoE is the enforcing agency for air quality, it did not carry out any exercises after the fire outbreaks at the WMF and the contractors' premises to confirm whether the air quality was not affected.

The Ministry informed NAO that environmental monitoring, including air quality is effected at the Landfill and the parameters are within the prescribed standards.

For MW, despite several complaints about the emission of black smokes from the incinerators that contained dioxins and furans, MoE did not carry out any tests at the Landfill and on air quality to assess the extent of harm to the environment. As regards HCW, the risks of damage to the environment due to inappropriate storage conditions and improper handling practices was not assessed by MoE.

CHAPTER FOUR

CONCLUSION

This Chapter concludes against the audit objective based upon analysis and findings supported by audit evidence.

With industrialisation and increasing economic development, Mauritius has experienced an increasing trend in the generation of HW. Improper disposal of HW has the highest potential to cause harm to the environment and public health. Government has taken several initiatives aimed at their disposal. However, various shortcomings noted in their implementation indicate that HW have not been disposed of efficiently and effectively. The extent to which the environment, as well as public health is affected is not known.

The EWMS as agreed by Government in 2016 has not yet been set up as the proper approach has not been adopted. Unlike HCW, there is no policy and a management plan for the proper disposal of MW.

The existing Regulations of 2001 are limited in as much as they do not cover all aspects of e-wastes, HCW and MW management. Separate draft Regulations for e-wastes and HCW containing additional provisions have been prepared by SWMD in 2017 and 2018 respectively, but have not yet been finalised.

At SWMD, there is no updated information on the quantity of HCW, e-wastes and MW generated. This does not help SWMD for setting and monitoring targets and in decision making.

Several shortcomings from generation to disposal/export in both Collection Campaigns in 2015 and 2019, along with improper handling and cases of non-compliance to contractual obligations impacted on the management of e-wastes.

Monitoring activities for the disposal of MW are inadequate. For HCW and e-wastes, the monitoring activities have not improved the processes for their proper disposal. Insufficient sensitisation and awareness programmes have not allowed the safe handling of HW.

CHAPTER FIVE

RECOMMENDATIONS

This Chapter presents the recommendations based on the findings and conclusions. They are presented under each of the hazardous waste streams examined.

5.1 Disposal of E-Wastes

5.1.1 Reactivating the E-Waste Management System

The SWMD should take appropriate actions, and within the legal parameters, activate the establishment of a regulated EWMS that would ensure the proper collection, handling, as well as disposal and export of e-wastes. In doing so, the SWMD should, amongst others, ensure that the subject matter relating to HW falls within the purview of the MoE and those procedures are strictly adhered to.

5.1.2 Finalising E-Waste Management Regulations

The SWMD should identify and address the causes of delay for the finalisation of the Regulations, namely, the Environment Protection (Environmentally Sound Management of e-Wastes) Regulations submitted to the AGO since May 2017. It should also consider amending the draft Regulations with respect to changes, if any, during the past two and a half years, as well as upcoming developments following the way forward to be pursued before finalising them.

5.1.3 Introduction of the Restriction of Hazardous Substances Standards/Guidelines

The SWMD should consider the gradual introduction of the Restriction of Hazardous Substances Standards/Guidelines whose primary purpose is to make electronics manufacturing safer at every stage of an electronic device's life cycle. This concept which has already been adopted by several countries, such as China, Singapore, Turkey and India compels importers to put only Restriction of Hazardous Substances Standards - compliant EEE in the market.

5.1.4 Accurate and Updated E-Waste Inventory

The SWMD should explore every avenue for assistance from local or international experts to carry out a study or survey in which an assessment of the quantities of EEE imported, e-wastes generated, disposed of and recycled over the past years, as well as projections regarding e-wastes for the upcoming years is made. The accurate and updated information on e-wastes would enable SWMD to evaluate e-waste development over the recent and forthcoming years, and ultimately this would assist the Division in taking appropriate decisions, such as setting targets to minimise e-waste generation, better treatment of e-wastes, raising awareness among the population to prevent illegal dumping, improper handling of e-wastes and determining the frequency of e-Waste Collection Campaign.

5.1.5 Sensitisation and Awareness Campaign on E-Wastes

The SWMD should consider conducting a mass sensitisation campaign aiming at creating an awareness, as well as educating the population that e-waste is one of the fastest growing solid wastes, and it has a damaging effect on the environment and to their health, if not handled properly. The Division should also measure the effectiveness of the sensitisation campaign.

Much emphasis should be laid on the importance of the three 'R' Principles, namely reduce, re-use, and recycle, the segregation of e-wastes from the solid wastes and the health hazards caused by the improper way of handling and disposing of e-wastes. More importantly, the campaign should foster a sense of responsibility and commitment of the citizens. The SWMD should also consider preparing and publicising a guideline on the procedures for the handling and disposal of e-wastes by consumers of EEE.

5.1.6 Conducting More E-Waste Collection Campaigns

Following Government decision to increase the frequency of the e-Waste Collection Campaign, along with proper monitoring and enforcement activities in January 2018, the SWMD, in collaboration with MoLG, should carry out more campaigns.

5.1.7 Lessons Learned from Campaigns and Contract Management

Before embarking on new Collection Campaigns, the SWMD should ensure that the ongoing 'Recycling of e-Wastes' Contracts pertaining to both campaigns awarded in 2015 and 2019 respectively have been completed successfully. Besides, the Division should ascertain that all problems encountered during the carrying out of the two previous campaigns, whether it be with Local Authorities or WMF contractors or contractors for recycling do not recur in the future e-Waste Collection Campaigns.

5.1.8 Alternative Ways of E-Waste Collections

The SWMD should also consider alternative ways of collecting e-wastes, for instance, through the setting up of collection points/drop off points in different regions of the country. This alternative way of getting e-wastes to be collected and recycled is being practiced in developed countries, like Switzerland, Germany or Australia, and it enables the population, including those residing in remote areas to dispose of their e-wastes for free. To some extent, this alternative way will address the problem of hoarding and/or dumping of e-wastes by the population.

5.2 Disposal of Hazardous Chemical Wastes

5.2.1 Finalisation of Draft Regulations

SWMD must ensure that the vetting exercise of the Draft Environment Protection (Environmentally Sound Management of Hazardous Wastes) Regulations 2018 at the AGO is completed without further delay so that they can be finalised and put into practice at the earliest. This will provide an appropriate legal framework for the proper disposal of HCW.

5.2.2 Inventory of Hazardous Chemical Wastes

SWMD must ensure that a complete database of HCW generators is established and regularly updated, and that quarterly inventory of the quantity of HCW generated, stored and disposed of, is submitted to the Division. Appropriate actions should be taken against the defaulters for non-compliance.

5.2.3 Sensitisation and Awareness

Potential HCW generators should be sensitised on the identification and classification of HCW, as well as on the existence and the categories of HCW accepted at the Interim Storage Facility. This will contribute in mitigating health and safety risks. Awareness campaign followed by appropriate guidance for community at large to handle HCW properly should be carried out to protect the environment.

5.2.4 Storage of Hazardous Chemical Wastes at the Interim Storage Facility

SWMD should ensure that, as far as possible, HCW are not stored in the Interim Storage Facility for a period exceeding one year. Appropriate actions have to be taken against the contractor, wherever necessary, to discourage such practice.

5.3 Disposal of Medical Wastes

5.3.1 Formulation of a National Policy on Medical Wastes

A National Policy on MW that incorporates all the international principles that are required to protect human health and the environment should be formulated. In addition, the initiatives to meet appropriate targets of SDG 12 have also to be taken into account when formulating the Policy, which will provide a framework for developing the legal statutes and regulations. The skills and expertise of the personnel of SWMD can be used for assisting MoHW in drafting a Policy for MW.

5.3.2 Developing Medical Waste Management Plan

The skills and expertise of the personnel of SWMD can also be used for assisting MoHW in developing a MW Management Plan. Its aim will be to protect public health and safety in providing a safe work environment, minimising the environmental impact of waste generation treatment and disposal, and reducing waste handling, disposal volumes and costs without compromising health care.

5.3.3 Establishing Legal Framework for Medical Wastes

SWMD should consider providing assistance to MoHW in drafting specific Regulations for MW. This will help in improving MW practices as it will regulate some of them, and provide a basis for monitoring activities. The law should be complemented by a policy document and by technical guidelines developed for its implementation. The Regulations should include specific provisions on treatment for different MW categories, segregation, collection, storage, handling, disposal, and transport of wastes, responsibilities, and training requirements.

5.3.4 Disposal of Medical Wastes at Landfill

SWMD should ensure that MWs are pre-treated by Health Institutions before they are dumped at the Landfill. Enforcement activities should be designed to ensure compliance with the existing Regulations at Health Institutions.

5.4 Evaluating the Impact on Environment

Research studies have shown that unsound management of HW may lead to the contamination of soil and fresh water, and air emissions and marine pollution. This may in turn entail serious risk to the environment. In the light of the shortcomings elaborated regarding the disposal of e-wastes, HW and MW in Mauritius, Government should assess the extent of harm caused to the environment. The skills and expertise of SWMD can be solicited for that purpose. The proclamation of Standards for Stack Emissions should be accelerated so that legal actions could be taken against defaulters and non-compliant medical units.

Ministry's Reply

SWMD is in general agreeable with the recommendations.

National Audit Office

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