National

ACTION PLAN

On

Asbestos

Ministry of Health & Quality of Life

October, 2002

NATIONAL ACTION PLAN ON ASBESTOS

1. Background

Following concern raised in different quarters over the possible health risks associated with the use of asbestos and the presence of asbestos- containing materials in buildings, EDC houses and factories, an Interministerial Committee chaired by the Deputy Prime Minister and Minister of Finance was set up in June 2001 to look into the health dimension of asbestos in Mauritius.

2. Interministerial Committee

The Interministerial Committee met all the stakeholders including members of the "Committee for the Ban of Asbestos". It was agreed that due to the complexity of the problem and the absence of local expertise, the services of a consultant from the Commonwealth Fund for Technical Co-operation, Commonwealth Secretariat, be sought.

3. Consultancy Services

In this connection, the Commonwealth Fund for Technical Co-operation was approached for the services of an expert in asbestos. The services of **Mr John Addison**, Consultant, were retained to carry out a study to assess the health dimension of asbestos in Mauritius. ***Terms of reference of the Consultant are at Appendix 1.***

4.Visit of Mr. John Addison

Mr John Addison was in Mauritius from 21 October to 22 December 2001. He visited some 30 companies using asbestos containing materials, EDC houses and Government buildings and had discussions with officers of different ministries, departments and other stakeholders.

5. Recommendations of Addison report

In January 2002, Mr. Addison submitted his final report in which he made a number of recommendations to address the issue of Asbestos in Mauritius. These are:

(i) To develop a plan for the sound management of asbestos in Government and other public buildings, EDC houses, industries and in public utilities

(ii) To prohibit the import and use of raw asbestos materials and of materials containing amphibole types of asbestos

(iii) To set up laboratory facilities for bulk sampling of asbestos materials, sampling and analysis of asbestos fibers at the workplace and in the environment.

(iv) To prepare regulations on " Work with Asbestos" and to prepare a 'Protocol on Precautions and Measures to protect workers at work with asbestos'.

(v) To train personnel to identify asbestos fibers, to monitor workplaces and to ensure compliance with regulations on asbestos.

(vi) To regulate transportation and disposal of asbestos wastes in Mauritius

(vii) To carry out remedial actions for asbestos containing materials in Government buildings, EDC houses and in industries, under supervision and using safe working methods.

6. Technical Committee

Following the submission of the Addison report, Government decided to set up a Technical Committee under the chairmanship of the Ministry of Health and Quality of Life, comprising ministries, departments and other stakeholders to review the Report and to come up with an Action Plan for the implementation of the recommendations of Mr Addison.

The List of Technical Committee members is at appendix II.

The Technical Committee met on seven occasions and invited each member to come up with an action plan for immediate, short term and long term implementation.

7. Action Plan

An action plan has been submitted to the committee by each stakeholder with a time frame for immediate, short term and long term implementation.

It contains action already taken and measures proposed by members in their respective areas of responsibility and expertise which are as follows:

7.1 Ministry of Health & Quality of Life

7.1.1 Immediate/Short Term Action

(i) **Secretariat for Asbestos**

The Ministry of Health & Quality of Life has set up a Secretariat at the Occupational Health Unit to coordinate all activities concerning asbestos and to collect, prepare and disseminate information on Asbestos. It also provides advice and guidance on matters relating to asbestos.

(ii) **Health Screening of EDC Inhabitants**

The Occupational Health Unit screened a first group of 52 inhabitants of EDC houses in June 2002. No health effects related to asbestos were detected in this small sample.

A sensitisation campaign was launched among the EDC residents by health care workers prior to the screening exercise to encourage residents to come forward in view of the poor response.

Following the sensitisation campaign, the health screening of a second group of about 350 inhabitants started on 14 October and will be completed by 15 November. A report on the health status of the EDC residents will be submitted in December 2002.

(iii) **Medical Surveillance and Health Education**

Occupational Health Physicians are carrying out medical examinations of workers exposed to asbestos specially from Central Water Authority, National Transport Corporation, Sugar Planters' Mechanical Pool Corporation, Development Works Corporation and other sectors at risks.

Health education programmes for those concerned with asbestos are being delivered in collaboration with the Ministry of Labour, Mauritius Employers Federation and the Sugar Industry.

(iv) **Protocol on Precautions and Measures to protect Workers at work with Asbestos**

The Occupational Health Unit has prepared a ' Protocol on precautions and measures to protect workers at work with asbestos. This guidance document gives a list of measures to protect the health of workers and the public and also to protect the environment. ***A copy of the protocol is at Appendix III.***

7.1.2 Long Term Action

(i) The Occupational Health Unit will carry out medical screening of all EDC residents following the sample survey.

(ii) A periodic medical examination for all workers exposed to asbestos will be carried out as a follow - up programme.

(iii) The Ministry of Health & Quality of Life will take necessary steps to ban future imports of all types of asbestos in Mauritius with certain derogation for products where substitutes are not available.

(iv) The Occupational Health Unit in collaboration with other Ministries will carry out health risk assessments of buildings and workplaces where asbestos is present and prepare a plan for the phased removal and replacement of all asbestos materials.

7.2 Ministry of Housing and Lands

7.2.1 Immediate/Short Term Action

(i) The Ministry of Housing and Lands has prepared a sample list of 150 households where changes were made to the houses. This list was submitted to the Ministry of Health & Quality of Life for the sensitisation programme followed by medical examinations of the residents of EDC houses.

(ii) The Ministry of Housing and Lands is carrying out a survey of all EDC Housing Estates to identify asbestos wastes present on the housing estates and to arrange for their safe disposal.

7.2.2 Long Term Action

The Ministry of Housing and Lands will continue with the sensitisation programme for residents of the EDC housing estates in view of proper maintenance of the houses so as to reduce the risk of exposure to asbestos fibers.

7.3 Ministry of Agriculture, Food Technology and Natural Resources

7.3.1 Immediate/Short Term Action

(i) In view of the concern raised by the Consultant concerning the presence of asbestos in the sugar industry and the way some sugar factories were being dismantled and asbestos waste disposed of, the Ministry of Agriculture, Food Technology and Natural Resources set up a committee to carry out a survey on the existence of asbestos in the Sugar Industry.

The committee visited all the sugar factories and also the housing estates and the irrigation networks on the sugar estates. ***A copy of the committee's report is at Appendix IV***.

The main findings of the report are:

- Asbestos is present in all the sugar factories varying from 30 kgs to 5000 kgs, mostly used as lagging of steam pipes and also present in boilers
- Only a few houses with asbestos containing materials exist on sugar estates

- Asbestos cement pipes have been used for irrigation. A site plan has been included where available.

- A total of about 92 workers involved with work with asbestos during maintenance, replacement and dismantling have been identified. Many of them have been seen by the company doctors.

- Certain sugar estates have their own disposal sites for asbestos.

(ii) It was agreed that any work with asbestos would be carried out by licensed contractors and according to guidelines. All workers will be given proper protective equipment and will undergo regular medical examinations.

(iii) Information would be given to employees of sugar estates regarding high risk areas where asbestos is to be found.

(iv) In closed factories, further demolition would be stopped where asbestos-containing material is found, and action is being taken to carry out any further work under the required conditions.

(v) Arrangements are being made to remove and dispose of all asbestos debris from houses which have been demolished.

7.3.2 <u>Long Term Action</u>

(i) A work plan will be prepared outlining how asbestos related issues will be addressed in the case of factories undergoing major repairs or where dismantling work is being undertaken.

(ii) Asbestos containing material will be replaced by non asbestos-containing material in the sugar factories

(iii) A health education programme for workers handling asbestos will be

implemented and medical follow-up of employees exposed to asbestos fibers will continue.

(iv) Companies undertaking work with asbestos will have to be licensed by the Ministry of Labour & Industrial Relations.

(v) Asbestos disposal sites on the sugar estates will be identified, marked and fenced under guidance from the Ministry of Local Government.

(vi) Detailed maps of the asbestos piping used in sugar estates will be completed.

(vii) As soon as is practically possible, the occupants of those few houses containing asbestos will be moved to houses known to be asbestos free.

7.4 Ministry of Environment

7.4.1 Immediate Action

(i) The Ministry of Environment has prepared a policy paper on "The Environmentally Sound Management of Asbestos Waste in Mauritius" ***A copy of the policy paper is at Appendix V.***

(ii) The Ministry of Environment is co-ordinating with the Ministry of Local Government so that the collection, storage and transport of asbestos wastes will be carried out in accordance with the provisions of the Environment Protection Regulations of 2001 (Standards for Hazardous Wastes)

7.4.2 Short Term/Long Term Action

Various options have been formulated in the policy paper for the disposal of asbestos wastes:

Option 1: Disposal at Mare Chicose

This will continue for small amount of asbestos in a staggered manner and in accordance with existing regulations.

Option 2 Sugar Estate disposal sites for asbestos wastes.

The possibility of allowing sugar estates to operate waste disposal sites on their property will have to be considered by The Ministry of Environment, taking into consideration future health and environment risks.

Option 3 Disposal of asbestos at high seas.

The disposal of asbestos at high seas is viewed as a viable option, because in the wet state asbestos wastes do not present a danger to human health and the environment. The Ministry of Environment will give due consideration to such an option.

Dumping at sea of bulk asbestos containing materials e.g. asbestos cement pipes is recommended and would be carried out in accordance with the global rules and standards established under the London Convention 1972.

The Ministry of Environment will set out procedures for the bulk disposal of asbestos from CWA and other institutions at sea.

7.5 Ministry of Education and Scientific Research

7.5.1 Immediate/Short Term Action

(i) A survey of government primary and secondary schools has been carried out, and 12 schools have been identified where asbestos is present and needs removal. Arrangement is being made for its removal and replacement

(ii) The occupants of buildings, where asbestos materials are present but do not constitute health risks, will be sensitised on the precautions to be taken.

7.5.2 Long Term Action

The Ministry of Public Infrastructure, Land Transport and Shipping will

inspect all the schools and administrative buildings for the presence of asbestos. Removal of all asbestos - containing materials will be completed by the end of 2003.

7.6 Central Water Authority

7.6.1 Immediate Action

(i) Though studies have not shown that asbestos water pipes present risk to human health, as a matter of policy, CWA has stopped using asbestos pipes for potable water supply.

(ii) All asbestos pipes at Cite la Cure have been stacked together awaiting disposal. All asbestos debris have been collected and placed in polyethylene bags ready for disposal.

(iii) Regular awareness campaigns are being carried out for workers. Those workers dealing with asbestos are being medically examined by the Occupational Health Unit of the Ministry of Health & Quality of Life. This unit has also started an educational programme for Central Water Authority workers exposed to asbestos.

7.6.2 Short Term/Long Term Action

(i) All asbestos cement pipes lying at Cité la Cure and at other sites will be disposed of as per recommendations of Ministry of Environment and with all necessary precautions to avoid workers and the public being exposed to any danger.

(ii) Disposal at sea of all asbestos cement pipes has been recommended by the Ministry of Environment.

(iii) The sites at Cite la Cure will be decontaminated under guidance of the Ministry of Health & Quality of Life, Ministry of Labour & Industrial Relations and Ministry of Environment.

7.7 Ministry of Industry and International Trade

7.7.1 Short Term Action

(i) The Ministry will prepare an inventory of all existing manufacturing enterprises using asbestos/asbestos based materials as raw materials, including details on production processes and will request the Ministry of Health & Quality of Life to carry out health risk assessments.

(ii) An inventory of closed manufacturing enterprises which were using asbestos/asbestos based materials in the past will be carried out and then referred to Ministry of Labour and Industrial Relations so that the former employees can be medically followed up.

7.7.2 Long Term Action

The Ministry will assist the Customs Department, Ministry of Commerce & Cooperatives and other concerned Authorities in keeping an updated database on the nature, source, category, quantity imported and used by the manufacturing sector of products/materials containing asbestos.

7.8 Ministry of Labour & Industrial Relations

7.8.1 Immediate/Short Term Action

(i) The Ministry is carrying out sensitisation programmes for employers and employees in contact with asbestos.

(ii) There is a lack of expertise in Mauritius to deal with problems of asbestos. It is proposed to send some officers overseas for training with attachments to some overseas organisations/agencies specialised in work with asbestos. In addition, the services of an overseas Consultant will be considered for the local training of staff.

(iii) Blue asbestos has been banned in Mauritius and in many countries. The trend worldwide is to ban all types of asbestos. Action will be initiated in collaboration with the Ministry of Health & Quality of Life to prohibit amphibole-containing materials in the first instance.

(iv) The Ministry is drafting regulations on 'Work with A sbestos' to protect workers from exposure to asbestos. New codes of practice and standards for exposure limits will be set.

7.8.2 Long Term Action

(i) The Ministry proposes to have a licensing system for all construction companies and contractors involved in work with asbestos and its removal.

(ii) Managers and employers will be trained in safe working methods.

(iii) There are presently no facilities for sampling of asbestos fibres in Mauritius. In the past, samples have been sent overseas for analysis. The Ministry is proposing to set up facilities with proper equipment and trained personnel for the sampling, analysis and counting of asbestos fibers.

7.9 Ministry of Local Government and Rodrigues

7.9.1 Short Term/Long Term Action

(i) The Ministry of Local Government and Rodrigues is the enforcing agency under the hazardous wastes regulations for the disposal of hazardous wastes in Mauritius. It is responsible for the Mare Chicose landfill where asbestos waste is presently being disposed of. It will ensure that disposal of all asbestos wastes is carried out in accordance with the above mentioned regulations .

(ii) The Ministry of Local Government and Rodrigues will set procedures for the disposal of bulk asbestos cement pipes from the CWA

(iii) The Ministry will assist the Authorities to carry out a survey on the presence of asbestos in Rodrigues and to propose a plan for replacement and disposal, as required.

7.10 Mauritius Employers Federation

7.10.1 Immediate/Short Term

(i) A workshop was organised for health and safety officers on asbestos with the collaboration of the Ministry of Health and Quality of Life and Ministry of Labour & Industrial Relations.

(ii) A training programme for the supervisors, managers and human resource personnel will start next year.

APPENDIX I

Terms and Conditions

The Expert will be required to work in close consultation with the Safety and Health Inspectorate of The Ministry of Labour and Industrial Relations, the Ministry of Housing and Land and the Ministry of Environment in order to:

- Undertake a sample survey of the houses built in early 1960s with materials containing asbestos as well as of Government buildings and offices and assess the risk they pose to residents and employees.

- advise, based on recent survey of workplaces where asbestos is used, on measures to protect workers from asbestos exposure;

- advise on legislation to regulate the use of asbestos;

- recommend equipment for sampling, identification and country of asbestos fibres as well as for monitoring exposure of workers to asbestos at place of work and for efficient enforcement of legislation, regulating use of asbestos and disposal of asbestos waste;

- advise on appropriate techniques and equipment for safe removal of asbestos containing materials and products at places of work, houses, etc.

- examine the desirability or otherwise of banning asbestos, admixtures of asbestos and materials containing asbestos at places of work, in industry and the country at large;

- carry out training of staff involved in monitoring and regulation of asbestos in place; and

- submit a report summarising his/her findings and recommendations.

Verified by Mrs S. Joomun- Sairally
Assistant Secretary

Appendix II

Members of the Technical Committee on Asbestos

Representatives of:

1. Ministry of Health and Quality of Life
2. Ministry of Finance
3. Ministry of Industry and International Trade
4. Ministry of Agriculture, Food Technology and Natural Resources
5. Ministry of Local Government and Rodrigues
6. Ministry of Public Utilities
7. Ministry of Environment
8. Ministry of Public Infrastructure, Land Transport and Shipping
9. Ministry of Labour & Industrial Relations
10. Ministry of Education and Scientific Research
11. Ministry of Commerce and Cooperatives

12. Ministry of Housing and Lands
13. Central Electricity Board
14. Central Water Authority
15. Waste Water Management Authority
16. Mauritius Employer's Federation

PROTOCOL ON PRECAUTIONS AND MEASURES TO PROTECT WORKERS AT WORK WITH ASBESTOS

1. Identification of asbestos

- Employers must avoid the use of asbestos as far as practicable and use substitute instead.

- The presence and type of asbestos should be confirmed as far as possible before the job starts.

2. The assessment and plan of work

If asbestos is present and work which is liable for exposure is unavoidable, employers must carry out an adequate assessment of the likely exposure of employees and others that may be affected by the work.

- Employers must carry out a risk assessment

- Employers should make sure that a competent person carries out the assessments.

- **The assessment should cover**:

➢ Description of the work and expected duration

➢ Type of asbestos used/ present

➢ Methods to be applied to prevent or control exposure

- The number of people likely to be affected
- Provision of protective equipment
- Whether air monitoring is envisaged
- Steps to be taken to reduce exposure to the lowest level reasonably practicable
- Steps to be taken to reduce release of asbestos to the environment
- Procedures for the removal of waste from the workplace

3. Action Levels and Exposure Control Limits.

The action levels are exposures to asbestos accumulated over a period of time and expressed as fibres - hours /ml

If, from the assessment of the work, it is likely that the exposure of any employee will exceed exposure limits then the action level will be exceeded

When the action level is exceeded then regulations on notification of the work, designation areas and medical surveillance will apply.

4. Preventing and controlling exposure

- Prevention of exposure must be the employer's first objective
- Employers must take steps to reduce to a minimum the exposure of workers and others by the work as practicably reasonable
- Limit the number of employees exposed to asbestos to a minimum
- Remove materials containing asbestos before carrying any other work.
- Work practices to reduce emission of dusts as far as practicable
- Use a wrap and cut method

- Avoid using power tools
- Keep materials thoroughly wet
- Using local exhaust ventilation
- Avoid dry working methods such as cutting, sanding, abraising, etc

5. Maintaining Cleanliness of Premises

- Employees should ensure that the working area is kept clean by removing dusts and debris as they work.
- Use of vacuum cleaner or damp cloth for small amount of Asbestos dust.
- Dry manual brushing or sweeping must not be allowed.
- After work with Asbestos has been completed, the area should be thoroughly clean before allowing people entering the place.

6. General duties of employees

- Employees should in particular:
- Use any control measures, including respiratory protective equipment and protective clothing and keep them in the places provided
- Follow carefully all the procedures set out in the employer's assessment and plan of work, including those for changing and decontamination.
- Keep the workplace clean
- Do not eat, drink and smoke in the workplace except in the places provided

7. Respiratory protective equipment (RPE)

- Employers must provide suitable respiratory protective equipment and make sure that it is used correctly by those carrying the work with asbestos.

- Respirators should never be hung around the neck in contact with contaminated clothing, or put down or stored in a contaminated area.

- RPE and protective clothing should be removed at the end of working period, cleaned and kept in the storage place specifically provided.

- Disposable RPE and protective clothing should be treated as asbestos waste

- The RPE should be routinely checked before reuse

8. Protective clothing

- The employer should provide protective clothing for work with asbestos

- It must protect the parts of the body likely to be affected

- Disposable overalls should be used if possible and should be discarded as asbestos waste at the end of the shift

- If not possible, contaminated clothings should be vacuum cleaned and removed on leaving workarea for breaks and at the end of work period

- Contaminated clothings should be stored separately from clean clothes and should not be taken home for cleaning

- Arrangements should be made to have contaminated clothings washed separately

9. Preventing the spread of asbestos

- Any plant or equipment, which has been contaminated with asbestos, should be thoroughly decontaminated before it is moved for use in other premises or for disposal

- Asbestos materials should never be left loose or in a state where they can be trampled or otherwise spread

10. Marking of Asbestos areas and respirator zones

- The purpose of marking asbestos areas is to make sure that workers and other people do not enter areas where they may be exposed to asbestos unknowingly.

- The purpose of marking areas as respirator zones is to ensure that RPE is worn when entering the respirator zones.

11. Monitoring

Monitoring of employee exposure consists of personal sampling followed by analysis. The main purpose is to determine the concentration of airborne asbestos to which they are exposed.

12. Washing facilities

Washing facilities should be provided at the place of work

13. Medical Surveillance

- Medical surveillance should be carried out by a Medical Practitioner preferably specialized in Occupational Medicine.

- A Health Record should be kept in a safe place and should contain the following information:

- Name, Age, Sex, Date of Birth, Permanent Address, Tel No. ID No.

- A record of types of work carried out with asbestos, dates and duration of work

- A record of any work with asbestos prior to this employment.

- A record of the medical examinations with dates and including the following

- A Clinical Medical Examination
- A spirometric test every year
- A Chest X-Ray every 2 years

14. Storage and Disposal

- Asbestos debris and dusts should be stored in double lined plastic sacks
- The sack should be securely tied or sealed and labeled
- Stronger sacks should be used for wastes containing sharp objects to prevent puncturing of the plastic sack
- Large pieces should not be broken but should be double wrapped and covered with tarpaulin awaiting disposal
- Disposal methods should be according to Environment Protection (Standards for Hazardous Wastes) Regulations 2001.
- Asbestos wastes should be disposed of in designated areas for hazardous wastes or on sites identified and approved by the Ministry of Local Government.

Report on the Existence

of Asbestos

in the Sugar Industry

Mauritius Sugar Authority
October 2002

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Chapter 1

Nature and Scope of Survey

The Ministerial Committee set up by Government to monitor the implementation of the "Expert Report on Assessment of the Health Dimension of Asbestos in Mauritius" appointed a sub-committee and assigned to it the responsibility of making an assessment of the amount and types of asbestos present in sugar factories, in housing estates of the sugar industry and in sugar cane fields. The Sub-Committee was composed as follows:

Mr J. Ramjada	Mauritius Sugar Authority	**Chairman**
Dr K. Deepchand	Mauritius Sugar Authority	Member
Mr A.Auladin	Ministry of Health	Member
Mr V. Parmanum	Ministry of Public Infrastructure	Member
Mr R. Seenauth	Ministry of Environment	Member
Mr Y. Cheddy	Ministry of Labour and Industrial Relations	Member
Mr P.P. Mohabeer	Irrigation Authority	Member
Mr P. Legris	Mauritus Sugar Producers Association	Member
Mr A. Jugmohun	Mauritius Sugar Authority	**Secretary**

1.2 The Sub-Committee decided that the best approach to carry out the exercise was to conduct a survey by actually visiting all sugar estates and gather data through physical inspection. A questionnaire was designed and sent to all sugar estates prior to visits by the team. The questionnaire itself aimed essentially at obtaining information to enable the team to establish mainly the following:

(i) the locations within the factory where there is asbestos;

(ii) the housing estates where asbestos is seen to be present;

(iii) the types of asbestos present;

(iv) the extent of asbestos-containing pipes present in irrigation networks;

(v) how and where asbestos was disposed of;

(vi) the total weight of asbestos present in kgs; and

(vii) precautionary measures taken to protect workers involved in the handling of asbestos.

The team has visited all sugar factories including those that have already closed down using St Antoine as the earliest case. The reason for going as far back in the past is simply that it was considered quite likely that traces of asbestos could exist within the premises of a closed factory even after all equipment were removed away.

1.3 Regarding irrigation networks, the team found out that most of the asbestos containing pipes were essentially feeder pipes installed as far back as half a century ago. These feeder pipes, located both underground and at surface level, are known to contain around 14% of asbestos by weight. To the extent that information was available, stocks of asbestos pipes were included in our information base.

1.4 The team also visited all housing estates which are presently still under the ownership of sugar estates although almost all are actually in the process of being phased out.

1.5 Although the assignment was essentially to take stock of all asbestos and asbestos containing material, the team has ventured to make certain recommendations on possible actions that need to be taken by the authorities as well as the sugar estates.

Chapter 2

Approach and Methodology

The use of a questionnaire, supported by actual visits to sugar estates, was considered to be the most reliable means to collect data on the existence of asbestos. The survey was conducted in two phases. During the first phase preliminary data was collected on the existence of asbestos inside sugar factories and in irrigation networks. The second phase was devoted to the collection of more precise information on the extent and layout of irrigation networks, the location of asbestos disposal sites and the possible existence of asbestos in housing estates. The returns containing all the primary data gathered are at Appendices I and II.

Visits to sugar estates were carried out during both phases of the survey and these were held on the following dates:

Visits during First Phase

Name of Sugar Estates	***Date of Visit***
Rose Belle Bel Ombre Britannia	17 May 2002
Highlands Constance	21 May 2002
Mount Beau Plan St Antoine	23 May 2002
St Félix St Aubin Savannah Mon Trésor Riche en Eau	27 May 2002
Mon Désert Alma FUEL Beau Champ	29 May 2002
Belle Vue	31 May 2002

Mon Loisir Médine	

Visits during Second Phase

Name of Sugar Estates	***Date of Visit***
Bel Ombre Union St Aubin Britannia Mon Trésor Riche en Eau	20 September 2002
Highlands Mon Désert Alma FUEL Constance Beau Champ	24 September 2002
Beau Plan Belle Vue Mount Mon Loisir	26 September 2002

2.2 With regard to the survey conducted inside factories, it was considered important to make a clear distinction between factories actually in operation and those that have already closed down. The reasons are two-fold: firstly with regard to factories which are now closed, the interest of the team was focussed on precautionary measures being taken during the dismantling phase. Certain factories such as that of Constance which have sold their equipment to foreign buyers have left it to the buyers themselves to organise the dismantling and shipment of the equipment. Others which have sold their equipment to local buyers used their own employees to carry out dismantling work. The second reason is that, as opposed to factories still running, those that have closed down are more concerned about how to get rid of the remnants of asbestos still present within the factory premises. On the other hand, factories which are still operating have since the mid-nineties, been implementing plans for the gradual replacement of asbestos by other asbestos free substitutes.

2.3 The visits to the sugar factories usually started with a brief working session between the team members and the management of the estate. These working sessions proved to be invaluable to the extent that the team was able to explain clearly the nature of the data to be collected. Thus in some cases it found that because of the age of the buildings and installation, management made it clear that they were not in possession of relevant record regarding amounts of asbestos purchased, the names of the suppliers, and the places where asbestos were utilised especially where these involved built-in structures. Regarding long-standing structures the team noted that the present management have not been involved in the construction of especially those components such as boilers, which may have interior asbestos linings not visible from outside. The team members while appreciating the difficulties of obtaining absolutely reliable data, settled for accepting information that, at least, revealed orders of magnitude. In most cases, where pipe lagging containing asbestos could be seen, the team accepted that management could work out estimates of the weight of asbestos present on the basis the length and diameter of the pipes and the density of asbestos. The team was thus aware that the survey would, at most, reveal rough estimates of the effective weight of asbestos.

2.4 The working session, which was usually very brief, was followed by inspection of locations within the factory where asbestos was known to exist. During inspections team members were free to move anywhere within the factory and ask management any question which they considered relevant. The team was satisfied that in the context of this survey, which was of limited scope, they were able to obtain all information to the extent that these were available to management.

2.5 With regard to the housing estates, the approach was similar. However the inspection of houses proceeded more speedily as almost all the housing estates visited contained houses which were made either entirely of concrete or a combination of concrete and iron sheets. In the absence of rigorous tests conducted in laboratories the team concluded it was not possible to make any statement on whether or not the concrete structures of these houses, like those of factories, do contain traces of asbestos. However as revealed later in the report, a few housing units were seen where asbestos containing corrugated sheets were used as roofing and panels for partitioning.

Chapter 3

Survey Reports

This chapter essentially contains a brief description of the utilisation of asbestos at factory and field levels as well as in housing estates and the presentation is on an estate-to-estate basis. Most of the information presented have been drawn from the questionnaires which have been filled by the representatives of the estates concerned. However, to some extent, the team has relied on personal notes taken in course of working sessions or observations made during inspections.

3.2 Factories Having Closed Down

3.2.1 *Bel Ombre*

The management of Bel Ombre factory, which closed down in 1999, has dismantled most of its machinery which have been sold mainly to local buyers. Asbestos still exists within the factory building mainly in the form of steam pipe lagging and the amount is estimated to be around 20 kgs. The remaining asbestos is of the white type. Management had employed a specialised team with dedicated equipment to handle all asbestos containing machinery and all asbestos removed has been dumped in a pit. The site of the pit is known.

3.2.2 *Rose Belle*

Rose Belle factory was closed down this year and all equipment containing asbestos are still lying within its premises. These equipment include boilers, steam pipe, turbines and joints. The asbestos present is essentially of the white type and is estimated to weight around 50 kgs. This figure does not seem to include asbestos which is likely to exist inside the factory boilers. The management has provided specialised equipment to employees handling asbestos and medical check ups have also been arranged.

3.2.3 *Constance*

Constance factory was closed down in 1996 and almost all its machinery and equipment have been sold to an Indian company. Given that

foreign labour was used to dismantle and transport all equipment, it was left solely to the buyer to organise safety measures. Some asbestos which was left, was filled in bags and disposed of at Mare Chicose with the consent of the Ministry of Environment. The company also manages an extensive irrigation network extending over 20 kms. The pipes used contain around 14% asbestos and 82% of the network is underground. Handling asbestos were usually provided with protective equipment.

3.2.4 *Highlands*

Around 650 kgs of asbestos (white type) is known to exist within the factory, mainly inside boilers, in steam pipe lagging and joints. Employees handling asbestos are provided with protective equipment. Since the closure of the factory, a substantial amount of asbestos has been disposed of, through burying in a pit and covered with concrete slab. The disposal site is at Bagatelle. The employees handling asbestos are subjected to regular medical check up. There also exist irrigation pipes containing asbestos in the Ebène area and these are around 6.59 km long.

3.2.5 *Beau Plan and Mount*

The premises of ex-Beau Plan factory are being converted into a museum which is virtually asbestos free. Traces of asbestos were however found in one particular location in the yard where all the dismantled equipment have been heaped. Mount factory has been completely dismantled but the yard of the factory still contain traces of asbestos. Certain pieces of equipment have still not been removed but the management of the ex-factory was not in a position to put a figure on the amount of asbestos which could still be found. However asbestos was found to be still existing.

3.2.6 *St Antoine*

Having closed down in 1994, the factory buildings are still standing and are asbestos free. Hence with regard to the factory a nil weight has been reported. At field level however, the company has an extensive irrigation system equipped with asbestos containing pipes which lie mostly underground. At the time of dismantling of the factory in 1995, mostly contractual labour was utilised.

3.3 Factories in Operation

3.3.1 *Mon Désert Alma*

Asbestos, in white form, is mainly contained in cement pipe. The amount is estimated to be around 50 kgs. The risk of exposure of employees to asbestos is negligible. The company also has an irrigation network using mainly asbestos containing pipes of around 8.7 kms length.

3.3.2 *Deep River Beau Champ*

The company has set up a new milling plant when Constance factory closed down. The new factory is virtually asbestos free but the old mill, which is adjacent to the new one and totally fenced, contains a substantial amount of asbestos. Access to the old mill is prohibited. Just at the level of the old mill the amount of asbestos (white type) is estimated to be around 5,000 kg contained mainly in the two boilers. The company also runs an irrigation network extending over 11 kms utilising asbestos containing pipes. During handling the company usually provides dedicaded equipment to employees exposed to asbestos and medical check-ups are organised twice yearly.

3.3.3 *Britannia*

Asbestos exists as steam pipe lagging and is of the white type. Within the factory there is an estimated amount of 900 kgs of asbestos. Much of the asbestos surface is covered with plastic. Employees handling asbestos are supplied with protective equipment. At field level, there exists an irrigation network of around 2.2 km of asbestos containing pipe which is buried underground.

3.3.4 *Mon Loisir*

Within the factory an estimated amount of 1,000 kg of mainly white asbestos is known to exist. Asbestos is found in boilers, steam pipe lagging, turbines, cement pipe and joints. The company also has a substantial irrigation network extending over 5 kms. Protective equipment are usually provided to workers handling asbestos containing materials.

3.3.5 *Belle Vue Mauricia*

Around 3,000 kgs of white asbestos exist within the factory mainly in joints and asbestos cement pipes. The company has been gradually replacing asbestos by other substitutes. The unused asbestos have been dumped in sites which are known. Part of the asbestos have also been disposed of at the landfill at Mare Chicose. The company also manages four subsidiary growing companies each having its own irrigation network with a total asbestos pipe network extending over 32.6 kms. Workers handling asbestos have usually been supplied with protective equipment.

3.3.6 *St Félix*

The factory of St Félix has asbestos mainly in its steam chests and steam pipe lagging. Around 2,000 kg of mainly white asbestos is reported to exist. Like other factories, St Félix has followed a policy of gradually replacing asbestos by other substitutes. Basic precautionary measures are adopted during handling with dedicated teams using specialised equipment. Irrigation systems containing asbestos, do not exist.

3.3.7 *Riche en Eau*

The factory has roughly about 100 kgs of mainly white asbestos, contained mainly in boiler linings, steam pipe lagging and joints. The gradual replacement of asbestos by mainly ceramic fibres is being pursued. Protective equipment have been provided to workers handling asbestos containing materials and medical follow-up have been regularly organised.

3.3.8 *Union St Aubin*

Only a limited amount (about 50 kgs) of white and blue asbestos is found inside the factory, located mainly around steam pipes and in cement pipes, and to some extent inside boilers. No asbestos-based irrigation system exists. Protective equipment is provided to employees exposed to asbestos and special precautions are taken during manipulation. To have reduced its utilisation of asbestos to such a low level, the company has, over the years, systematically replaced asbestos by mainly fibre glass wool.

3.3.9 *Mon Trésor*

Asbestos is present mainly in joints, pipe lagging and cement pipes. Around 250 kgs of mainly white asbestos is reported to still exist. A dedicated team of about eight workers, equipped with specialised equipment, has usually done all manipulation of asbestos containing material. Medical check-ups have regularly been organised. The substitution of asbestos by fibre glass and ceramic have been pursued over the years. The company has an irrigation system using asbestos containing pipes, which are buried underground. This is located at Sauveterre and the length is not specified.

3.3.10 *Savannah*

There exists around 2,800 kgs of asbestos inside the factory located mainly in boilers around steam pipes and in cement pipes. The type of asbestos is not known. Specially trained teams wearing protective equipment are used in handling asbestos containing material. Regular check-ups by the estate doctor is regularly organised. The use of substitute is being pursued as part of company policy. Irrigation systems using asbestos pipe are located at various sites within the factory area and the total length of the network is around 42.9 kms.

3.3.11 *Médine*

Within the factory asbestos (white type) exist mainly in cement pipe and to some extent in installations beneath the floor. The amount of asbestos reported to exist is estimated to be around 100 kgs. Use is usually made of protective equipment provided to workers handling asbestos. The estate has also an extensive irrigation system. The company has over the years replaced asbestos by substitute products, mainly fibre glass and ceramic rope.

3.3.12 *FUEL*

There exists asbestos mainly around steam pipes and in cement pipes. Around 125 kgs of asbestos is reported to exist. The company has plans to eventually replace the existing asbestos by substitutes. The company has a specialised team of four employees to manipulate all asbestos containing material. They are provided with protective equipment and are subjected to regular medical checks.

3.4 Housing Estates

All housing estates were visited and were found to be predominately made of concrete. In quite a number of housing estates, iron sheets have been used as a complement to the concrete structures. While in most cases, the iron sheets form part of the standard structure, a number of housing units were seen where extensions, using iron sheets, were undertaken by the occupants themselves.

Asbestos containing corrugated sheets were found to exist in a number of houses at Labourdonnais SE. Many of these houses, now unoccupied, have been demolished. On the sites of these demolished houses broken pieces of asbestos sheets were found to be haphazardly scattered in the yard. However, those houses which were still occupied, had asbestos sheets on the roof, and pieces of asbestos sheets were found in the yards of these houses.

At Cité des Artisans, at Beau Plan SE which consists of 8 separate houses, there is one individual house which has its roof made of asbestos containing sheets. This unit is presently rented out to a private lessee. However there exists a ceiling inside the house which insulates the living space from the asbestos sheets.

Chapter 4

Findings and Recommendations

The survey has produced a wide range of information on the existence of asbestos in the sugar industry. While much of the information is of a qualitative nature and may be verified through inspections, much of what was seen have been expressed in quantitative terms. As said earlier, the questionnaire was the main medium used for obtaining information from the sugar estates. Much of what is contained in the returns, is reproduced in a table annexed to this report, and a glance at this table gives an overall picture of asbestos related issues on an estate-to-estate basis. Although not strictly in conformity with its attributions, the team has taken the liberty to make a few recommendations in the light of what was revealed as a result of the survey.

4.2 The team was conscious of the fact that asbestos is a danger to health in very specific circumstances. In the context of a sugar factory in operation where most of the existing asbestos may be permanently outside the reach of workers (e.g. inside boilers) or exist as fittings around pipes and joints, the risk of inhaling asbestos fibre almost does not exist. The danger to health may become real when basic precautionary measures are not taken when asbestos is handled during the dismantling of equipment and structures. For instance, failure to add water to asbestos containing material, particularly asbestos ropes during handling increases the risk of small asbestos fibres becoming airborne, and being inhaled.

4.3 The survey revealed that asbestos mainly of the white type (chrysotile) is found in almost all sugar factories in varying amounts ranging from negligible quantities to as much as 5,000 kgs. While irrigation systems may contain huge amount of asbestos present in feeder pipes, most of these pipes are buried underground and do not represent a direct threat to human health.

4.4 The team noted that most of the existing companies have been pursuing a policy of gradually replacing all asbestos containing materials by other substitutes which are not harmful to human health. To the extent that such substitution is technically feasible, this practice should be continued. However the current methods used for the disposal of unusable asbestos should be regulated as the present means of disposal seems to be determined by the companies themselves. In certain cases, the Ministry of Environment

seems to have been consulted. It is known however that the Ministry of Environment is devising a strategy for the disposal of asbestos and one of the method might be the introduction of a system of licensing sugar estates to operate asbestos waste disposal sites.

4.5 The authorities concerned should establish closer working links with sugar estates with regard to the implementation of new legal provisions for the control of factory environment with special focus on the means to safeguard workers against asbestos fibres.

4.6 The team observed that in many factories there exists no sign to indicate to employees which are those areas within the factory, where the risks of exposure to asbestos are high. In a few factories such signs do exist. Even asbestos free areas could be appropriately marked.

4.7 With regard to irrigation networks, there is a need for the management of sugar estates to have plans of pipe layouts especially when these pipes are beneath the ground. To the extent that such plans do exist, they should be made available to the authorities concerned should the need arise. By all means plans of irrigation systems would serve as a useful tool to the management of the estates in the event that repair works or the replacement of pipes are being undertaken.

4.8 The team observed that sugar estates have, on their own, taken the initiative to provide whatever equipment or material they consider necessary for the protection of the employees who are involved in handling asbestos containing materials. In certain cases dismantling work was done by private contractors who may be less amenable to control by the public authorities. The team considers that, to render more effective the safeguard of employees handling asbestos, a protocol should be established by the relevant authorities which spells out clearly the type of protective equipment needed, the precautions and measures to be adopted by the employees and the employers as well as the medical treatment and follow-up the employees would require. This should apply also to employees responsible for handling asbestos containing pipes used for irrigation purposes.

4.9 In the event of any factory closing down or undertaking major repairs, it is essential for the company responsible for dismantling to prepare a written work plan outlining how asbestos related issues will be addressed. This plan should exist before the start of all dismantling work.

4.10 Whenever dismantling work is undertaken, the company responsible for dismantling should ensure that all works are carried out under the supervision of a qualified person with a sound technical knowledge of asbestos-related issues.

4.11 Sites of factories having closed down should be rendered asbestos free as soon as it is practically feasible. Otherwise these sites should be sealed off and made completely inaccessible to unauthorised persons.

4.12 As is the current practice in certain sugar estates, it should be made a matter of general policy for all companies in the sugar industry to clearly identify employees who are called upon to handle asbestos. These employees should be offered specialised training, and equipped with protective equipment, which must always remain in serviceable conditions. In addition to replacing any equipment when it becomes unserviceable, the employer must ensure that this special category of employees are subject to regular medical check-ups.

4.13 In the whole sugar industry, only a few houses still exist where part of the building materials have been seen to contain asbestos. Of the few houses a number has been demolished while the others are still occupied. The team considers that, for those units which have been demolished, the sugar estates should immediately take necessary steps to remove all traces of asbestos containing materials from the sites concerned by complying to conditions established by relevant authorities. The few houses which are still being occupied must be kept under close scrutiny by the estate and as soon as is practically possible, the occupants must be moved to houses which are known to be asbestos free.

Mauritius Sugar Authority
23rd October 2002

DEPARTMENT OF ENVIRONMENT

POLICY PAPER

ON THE

ENVIRONMENTALLY SOUND

MANAGEMENT OF

ASBESTOS WASTE IN MAURITIUS

SEPTEMBER 2002

1.0 INTRODUCTION

Following concern raised by different stakeholders, the Ministry of Health & Quality of life commissioned a study to assess the impacts of the presence of asbestos in Mauritius and to make recommendations thereon. The study was carried out by Mr. John Addison from the United Kingdom. He made a series of recommendations regarding handling and disposal among others.

Consequently, a Technical Committee, comprising of various authorities, including Ministry of Environment was set up at Ministry of Health and Quality of Life to discuss on the contents of Addison's report so as to devise an action plan for the implementation of the recommendations of the expert report for the short, medium and long terms period. The Ministry of Agriculture & Natural Resources has also set up a sub-committee to look into the problem of asbestos in the sugar sector.

As asbestos is widely applied in the local context, it has been found imperative to develop a policy on the issue. In light of the recommendations of the Addison's report, Ministry of Environment was entrusted the task of preparing a policy regarding the management of asbestos and asbestos-containing wastes in a manner, which will safeguard human health and the environment. The draft of this policy paper was circulated to Ministry of Local Government & Rodrigues, Ministry of Health & Quality of life and Ministry of Labour & Industrial Relations for comments. Relevant comments have been incorporated in this Final Policy Paper.

2.0 GENERAL BACKGROUND

Asbestos is not harmful to the environment per se, but nonetheless represents a major threat. Asbestos is listed in the hazardous waste regulations 2001, in force since April 2002,and is consequently a hazardous waste. As per the Environment Protection Act 2002, the Ministry of Local Government & Rodrigues has the responsibility of Enforcing Agency for all types of wastes, including hazardous wastes.

Being a health hazard, asbestos-containing materials and asbestos have to be disposed of with care after its removal so as to avoid exposure to it. It is to be noted that it is the handling of asbestos, which represents the most risks, not so much its disposal.

There is a risk hazard only if asbestos is inhaled/breathed by a person. Exposure to asbestos dust may lead to health consequences such as asbestosis, lung cancer and mesothelioma. Hence, in the wet form, asbestos does not constitute a hazard. Asbestos fibers do not evaporate into air or dissolve in water. Asbestos fibers are generally not broken down to other compounds and will remain virtually unchanged over long periods. Asbestos fibers are not able to move through soil.

Asbestos is known to be resistant to heat and chemicals and provides excellent insulation properties. Because of the above–mentioned characteristics, asbestos has been used for a wide range of manufactured goods, mostly in building materials (roofing shingles, ceiling and floor tiles, paper products, and asbestos cement products), friction products (automobile clutch, brake, and transmission parts), heat-resistant fabrics, water pipes, gaskets, and coatings. It has extensively been used as insulation material in the sugar industry and is also present in EDC houses, built in the 1960's. Many houses, schools and other buildings containing asbestos are presently undergoing renovation works throughout the island. Several sugar factories have been demolished and other are on the way of being dismantled as a result of centralization.

The import of asbestos as a dangerous chemical is controlled under the Consumers Protection (control of imports) Regulations, 1999 by the Ministry responsible for the subject of Commerce and the Ministry of Health & QL**.** The importation of crocidolite (Blue Asbestos) and its products is prohibited under the same regulations. However, no regulation has so far been made to provide for products containing asbestos to bear a label accordingly.

3.0 PRESENT SITUATION

3.1 Sugar Industry

According to a survey carried out in June 2002 by the Mauritius Sugar Authority, it was revealed that almost all sugar factories contain asbestos in varying amounts ranging from negligible to as much as 5 000 kg per factory. According to Mr. Addison, asbestos used in the sugar factories as insulation materials gives the greatest concern. The irrigation networks of

the sugar estates also contain asbestos-cement pipes, buried underground. Sugar factories have traditionally been disposing of their asbestos waste by burial within their estate boundaries, but since recently, a few have, in consultation with Ministry of Environment and Ministry of Local Government , been disposing of asbestos at Mare Chicose landfill. Several sugar factories have already been demolished and other are expected in the future.

3.2 EDC Housing Estates

According to a list submitted by the Ministry of Housing & Lands, out of the 3113 houses built in the EDC housing estates over 69 sites in the 1960's, 263 have been pulled down and new houses rebuilt on the sites. Therefore, it is estimated that 2850 houses are still in place, whether in the original state or extended, each containing about one tonnes of asbestos. It is assumed that about 275 tons demolition debris is presently lying in the premises of the residents in those housing estates.

3.3 Central Water Authority

The Central Water Authority (CWA) has several kilometres of asbestos-cement (AC) pipes stacked at La Cure storage facilty. The CWA has announced that the use of AC pipes has been discontinued following a policy adopted by the authority. Many of the pipes have been stored for periods excess of 25 years, pending a suitable mode of disposal is identified. Given the bulky nature of these pipes, they are not accepted for disposal at Mare Chicose landfill.

4.0 Management of asbestos waste

4.1 Waste minimisation

Government policy is to promote waste reduction and minimize its generation, and wherever possible promote the adoption of environmenttally sound methods of resource recovery by direct use, alternative use, reclamation or recycling, reuse and recycling of wastes. However, reuse and recycling of asbestos of waste is not recommended due to the inherent problems linked to the handling of asbestos and asbestos – containing

materials. Nevertheless, where practicable, economically feasible and environmentally sounded, every effort should be done to avoid or minimize the generation of such wastes. It is recognized that removal of asbestos is one of the operations posing the greatest risk to workers and people around, and also release of asbestos fibres in the environment Therefore, undamaged asbestos should not be removed as the operation may be more hazardous than leaving the asbestos in place. As recommended by Mr. Addison, maintaining asbestos-containing structures would contribute significantly to reduce exposure of people to asbestos, towards waste minimisation and problems with disposal**.**

4.2 The Precautionary Principle

If there is a doubt about the presence of asbestos in a waste, the procedure for management of asbestos should be followed.

4.3 Duty Of Care

The concept of duty of care request all parties involved in the asbestos waste management chain to have regard for the proper observance of good waste management practice throughout the chain.

4.4 Collection, storage and transport

Collection, storage and transport of asbestos wastes shall be in accordance with the provisions of the Environment Protection (Standards for Hazardous Wastes) Regulations 2001. Workers who are exposed to asbestos should be provided with training and informed about handling asbestos as well as its disposal. Asbestos waste must be collected in suitable sealed packaging (e.g. heavy-duty plastic bags) with labels indicating that it contains asbestos, and removed from the place of generation as soon as possible, and stored safely. For large items, e.g asbestos sheets and boards, these should be wrapped and sealed in polypropylene, if necessary, with precautions to prevent any damage by sharp edges of the contents. Transport of asbestos waste should be done in a secure manner and in compliance with provisions concerning the transport of dangerous goods and hazardous wastes. Necessary measures should be taken in the course of transport so as no asbestos fibres or dust are released into the air and no liquids which may contain asbestos are spilled.

4.5 Disposal of asbestos waste

4.5.1 Present Status

(a) Small generators

Asbestos waste is presently generated in small quantities and generators are advised to contain the asbestos waste securely in either doubled lined high density polyethylene bags or polypropylene bags lined with low density polyethylene bags of thickness not less than 70 microns. These bagged wastes are presently being accepted at Mare Chicose Landfill where they are disposed of in specially identified cells alongside municipal solid waste. Large items, e.g. asbestos sheets and boards, should be wrapped and sealed in polyethene with precautions to prevent any damage by sharp edges of the contents. A protocol for disposal of asbestos waste at Mare Chicose landfill has already been established and is being followed. Provisions laid down in the hazardous waste regulations, including transport, waste manifest system and record keeping should strictly be adhered to.

Mr. J. Addison views that the mode of disposal currently practiced meets most of the requirements for the safe disposal of asbestos. He further indicated that asbestos is not mobile in ground water, the asbestos materials leach chemicals only very slowly from their structure, and they are not reactive with normal domestic waste or indeed with any normal chemicals.

(b) Big generators

For big stocks of asbestos wastes, for instance, Asbestos Cement pipes from the Central Water Authority, these should be safely stored until a sustainable mode of disposal is identified and put in place. The Consultant, Mr. J.Addison has recommended that Asbestos Containing Materials in storage be appropriately sprayed with Poly Vinyl Acetate (PVA) /water solution to mitigate the release of asbestos dust to the ambient air.

4.5.2 Immediate/Short Term Measures (disposal and storage)

Being the only landfill in Mauritius, Mare Chicose will continue to accept asbestos only in discrete quantities. With the present quantity of solid waste

being disposed of at Mare Chicose, the landfill is expected to reach saturation by the end of 2005.

5.0 Future options for asbestos disposal

5.1 OPTION I : Disposal at sanitary landfill

Landfilling asbestos and asbestos containing waste, being an acceptable mode of disposal can be pursued, depending on the capacity of the receiving landfill. It is understood the provisions of the hazardous waste regulations have to be followed.

5.2 Option II : A Central Disposal Site for Asbestos Waste

In view of the possible generation of large quantities of asbestos requiring disposal in the future, the possibility of looking into a central asbestos disposal site has been considered. This site could receive asbestos waste from all sectors, including sugar factories, CWA, EDC houses, etc. for disposal. Once the site is identified, a feasibility study for its suitability followed by an Environmental Impact Assessment should have to be carried out. The modality of operation of the site needs to be worked out by Ministry responsible for the subject of Local Government.

5.3 Option III : Sugar Estates disposal site for asbestos waste

A high percentage of asbestos and asbestos-containing materials are located in the sugar estates (factories and irrigation pipes), for which there is a need for safe disposal in case of their removal. Asbestos in the sugar factories is used mainly in side boilers and for insulation purposes. These sugar factories have generated substantial amount of asbestos wastes, for which there is a need for safe disposal. In the context of the sugar sector reform, a number of sugar factories have closed down and been dismantled, and in many cases asbestos waste has been disposed of by burial in the estate land. Several other sugar factories are on the way of being dismantled /demolished.

The asbestos expert has advised that consideration should be given to the possibility of allowing Sugar Estates to operate asbestos waste disposal sites on their property. Therefore, this Ministry suggests that this option needs

consideration. However, the possibility of disposal of Asbestos cement irrigation pipes in the high seas could be considered.

The sites would be limited to asbestos waste and it is understood that after their lifetime, these sites would become contaminated land with no after use. Such a policy would relieve the Mare Chicose Landfill and future landfill sites from accommodating bulky asbestos wastes and thus increase their operation life time. Sugar factories may be requested to cater for the disposal of asbestos waste from other sources apart from the factory itself. It is to be noted that some sugar factories have private dumps on their property which are used for asbestos waste disposal, among others.

5.4 Option IV : Disposal of asbestos waste at High Seas

Being inert, insoluble in water and harmless when wet, the disposal of asbestos in the high sea is viewed as a viable option. In the wet state, asbestos waste does not present any danger to human health and the environment.

The ocean surrounding Mauritius and the outer islands is very deep. The possibility of disposing of asbestos in the high sea looks very appealing and warrants serious consideration. Moreover, this practice could also provide another way of creating artificial reefs. This Ministry views that the possibility of dumping asbestos waste in the sea as an alternative to land disposal should also be given due consideration. This may relieve from the necessity and constraints in looking for land as disposal sites, which would become permanently contaminated sites and also the pressure on Mare Chicose landfill and future landfill sites would be significantly relieved.

However, dumping at sea must be in accordance with the requirements of the London Convention (Convention on the prevention of marine pollution by dumping of wastes and other matter). Although, Mauritius has signed various ocean-related conventions, we are still not a party to the London Convention. However, to preserve our image on the international arena, provisions of the London Convention should, as far as practicable, be adhered to. The views of the International Maritime Organization (IMO) have been sought on the matter and it was given to be understand that although Mauritius is not a Contracting Party to the London Convention 1972, we are Party to the UN Convention on the Law of the Sea since

November 1994, and Article 210(6) of that Convention concerning "Pollution by Dumping" provides that: "National Laws, regulations and measures shall be no less effective in preventing, reducing and controlling such pollution than the global rules and standards." These global rules and standards are those established under the London Convention 1972 and, when it enters into force, those of the 1996 Protocol thereto. In other words, Mauritius is indirectly bound by the London Convention 1972. As per the provisions of the London Convention, the dumping of asbestos in the sea, under certain conditions, could be considered. This Ministry views that, the Asbestos Cement pipes, e.g. those of the CWA could be disposed of at high seas.