CARPENTARIA
ENVIRONMENTAL SERVICES

PROPOSAL TO TRANSPORT PCBs & AGRICULTURAL CHEMICALS FOR EXPORT FROM WESTERN AUSTRALIA

PUBLIC ENVIRONMENTAL REVIEW

CARPENTARIA ENVIRONMENTAL SERVICES
&
ALAN TINGAY & ASSOCIATES

DECEMBER 1991

REPORT NO: 91/33

AN INVITATION TO COMMENT ON THIS PER

The Environmental Protection Authority invites people to make a submission on this Public Environmental Review (PER).

Carpentaria Environmental Services Pty Ltd have proposed a program for the transport of PCBs and agricultural chemicals so that they may be exported from Western Australia for destruction by high temperature incineration.

In accordance with the Environmental Protection Act 1986, a PER has been prepared which describes this proposal and its potential effects on the environment. The PER is available for a public review period for 10 weeks commencing 23 December 1991 and finishing on 28 February 1992.

Following receipt of comments from Government agencies and the public, the Environmental Protection Authority (EPA) will prepare an assessment report with recommendations to government, taking into account issues raised in public submissions.

Why write a submission?

A submission is a way to provide information, express your opinion and put forward your suggested course of action - including any alternative approach. It is useful if you indicate any suggestions you have to improve the proposal.

All submissions received by the EPA will be acknowledged. Submissions will be treated as public documents unless confidentiality is requested, and may be quoted either in full or in part in each report.

Why not join a group?

If you prefer not to write your own comments, it may be worthwhile joining with a group or other groups interested in making a submission on similar issues. Joint submissions may help to reduce the workload for an individual or group, as well as increase the pool of ideas and information. If you form a small group (up to 10 people) please indicate all the names of the participants. If your group is larger, please indicate how many people your submission represents.

Developing a submission

You may agree or disagree with, or comment on, the general issues discussed in the PER or the specific proposals. It helps if you give reasons for your conclusions, supported by relevant data. You may make an important contribution by suggesting ways to make the proposal environmentally more acceptable.

When making comments on specific proposals in the PER:

- clearly state your point of view;
- indicate the source of your information or argument if this is applicable; and
- suggest recommendations, safeguards or alternatives.

Points to keep in mind

By keeping the following points in mind, you will make it easier for your submission to be analysed:

- attempt to list points so that the issues raised are clear. A summary of your submission is helpful;
- refer each point to the appropriate section, chapter or recommendation in the PER;
- if you discuss different sections of the PER, keep them distinct and separate, so there is no confusion as to which section you are considering;
- attach any factual information you wish to provide and give details of the source. Make sure your information is accurate.

Remember to include:

- your name;
- address; and
- date.

The closing date for submissions is: 28 February 1992

Submissions should be addressed to:

The Chairman,
Environmental Protection Authority
1 Mount Street
PERTH WA 6000

Attention: Dr Victor Talbot

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SUMMARY

1. Introduction

This Public Environmental Review (PER) describes a proposal by Carpentaria Environmental Services to transport polychlorinated biphenyls (PCBs) and pesticides so that they can be exported from Western Australia for destruction by high temperature incineration in the United Kingdom.

The EPA has required the PER to be prepared in order to provide information about the project to the general public and to assist the EPA in the preparation of an Assessment Report for the Minister for the Environment.

The Western Australian Environmental Protection Act, 1986 is applicable only to the State of Western Australia including coastal waters to a distance of 3 nautical miles from the coast. Therefore, Carpentaria Environmental Services can only seek approval through the PER process for those components within Western Australia and the EPA can only make recommendations to the Minister for Environment on these particular matters.

The Proponent

Carpentaria Environmental Services, a division of Carpentaria Transport Pty Ltd, will have full responsibility for all aspects of the proposal to transport the wastes for export.

Ownership of Wastes

It is important to note that Capentaria Environmental Services will not accept title or ownership of any chemicals collected by the company and such title and ownership will remain with the current holder of the waste until destruction.

Timing

The export and destruction of the waste materials will be organised and implemented over an estimated period of up to two years from the time when all approvals are in place and contracts with the owners have been secured.

2. The Proposal

Material in Storage

This proposal involves the export of some 1000 tonnes of presently packaged waste materials owned by SECWA, the Department of Agriculture and Pilbara mining companies. These quantities are distributed as follows:

- 740 tonnes of PCBs , and
- 260 tonnes of pesticides.

Small quantities owned by other companies and Government Agencies are also stored at a number of other locations principally in the Perth Metropolitan Region.

It is important to note that the weight of current packaging is included in the above tonnage calculations. The majority of the calculated weight is comprised of solids with low levels of contamination, for example of the 405 tonnes of SECWA waste material only 63 tonnes is actually liquid waste.

Current Packaging

The vast majority of the waste materials are packaged in 205 litre drums, however many of these drums are not of an approved type for the export of the waste materials or are showing signs of deterioration and thus need to be repackaged. All are inappropriately labelled for export overseas. Other PCB contaminated materials and equipment are packaged in steel containers, some of which have deteriorated to some degree.

Repackaging and Handling

It is proposed that PCBs and pesticides will be transferred from their present containers into new heavy duty 205 litre drums, these drums will be placed in steel bins, and the bins placed into shipping containers prior to any transport. All of the packaging operations will occur at the present storage locations to provide maximum containment for all phases of the transport operation.

The only exceptions to the above procedures will be for large transformers containing PCBs. The PCBs from these transformers will be drained on-site into new, heavy duty, 205 litre drums. The transformers will be secured in specially built steel trays and placed into shipping containers for road transport.

Labelling

All drums, bins and containers containing waste chemicals will have the required labelling specified by the Dangerous Goods (Road Transport) Regulations 1983, the Australian Code for the Transport of Dangerous Good by Road and Rail and the International Maritime Dangerous Goods Regulations which encompasses the International Convention for Safety of Life at Sea.

Inspection

All bins and containers will be inspected prior to their transport to ensure that they are all free from spills or leaks and are properly marked and labelled.

Transport

Consignments of shipping containers will be transported by road to the Port of Fremantle for loading onto ships. The trucks will take the shortest route from the current storage area to the Port. The roads selected are in good condition and are suitably controlled. An estimated total of about 70 truck movements will be required to

transport all of the waste materials to the Port of Fremantle. This estimate is based on a 15 tonne load for each truck/trailer.

The trucks will be driven by drivers licensed to carry Dangerous Goods of the relevant classes. They will therefore be competent and fully trained in the operation of safety equipment and in dealing with emergency situations involving chemical leakage and fire. The trucks will be escorted by escort vehicles. All trucks will have the required safety equipment.

Prior Notification

Prior notification of the quantities of wastes being transported in each consignment will be given to the Environmental Protection Authority, the Department of Mines, Police and Fire Brigade. The notification will also include point of departure, destination, description, route to be travelled, and estimated departure and arrival times.

Audit Trail

It is normal practice for an operation such as the one proposed to fully document the whole process of repackaging of the waste materials through to ultimate destruction. Full sets of documentation will accompany the container to the port of destination. Carpentaria Environmental Services will have their own auditing system that will allow the company to keep track of all quantities of wastes and their location and ownership.

3. Potential Impacts Of A Spill And Their Management

The waste materials described in this proposal belong to a group of chemicals known as chlorinated organic compounds. Some of the high molecular weight compounds of this group, have great chemical stability, and as a result take a long time to degrade. Consequently they can be widely dispersed by physical and biological agents throughout the natural environment and still retain their chemical structure and properties.

Research has indicated that exposure to chlorinated pesticides and PCBs via bioaccumulation can result in a wide range of effects in animals including death, the inhibition of growth, reduction in the success rates of reproduction, and behavioural abnormalities. Therefore it is very important that the potential for release of the waste materials dealt with in this proposal is minimised.

Direct exposure to high concentrations of the compounds found in the waste materials can result in what are known as acute effects to human health. As a result it is important to prevent the general public and personnel who are physically involved with the project from coming into direct contact with the waste materials.

Emergency Procedures

The Western Australian Hazardous Materials Emergency Management Scheme specifies procedures for coping with hazardous materials emergencies in Western

Australia. Procedures from this scheme will be observed in the event of any emergency involving the waste materials that are to be transported for export. In the event of an emergency, priorities will be to minimise the spread of waste materials into the environment and to prevent humans coming into direct contact with the waste materials.

4. Conclusions

The Proponent has gone to great lengths to minimise the potential for accidental release of the waste materials to the environment and to prevent direct contact of those waste materials by personnel during their transport. The actions taken to minimise these potential risks are described within this PER. Any residual risk associated with the proposal and the destruction of the waste materials by high temperature incineration is considered to be small compared to the risks of continuing to store the material at numerous locations throughout the State. On this basis it is considered that the very minor risks posed to the environment by this proposal are acceptable.

5. Commitments

Commitments represent the Proponent's solutions to potential environmental problems posed by the proposal. Essentially they are promises by the Proponent regarding the way in which certain aspects of the proposal will be carried out.

Carpentaria Environmental Services commit to carrying out the following commitments:

1. The Proponent will perform the packaging, handling and transport of the waste materials in conformance to the relevant Local, State, Federal and International Regulations that pertain to the operation. This will be done to the satisfaction of the Government Authorities who are responsible for these regulations, the EPA and the owners of the waste materials.

2. The Proponent accepts responsibility for the waste materials (even though ownership of the waste materials has not changed) from when the packaging and transport of the waste materials has commenced through to the presentation of the Certificate of Destruction of the wastes to the owner. This will be done to the satisfaction of the EPA and the Federal Department of Arts, Sport, the Environment, Tourism and Territories.

3. The Proponent commits to the triple containment of the waste materials prior to transport of the material where the nature of the waste materials will allow. This will be done to the satisfaction of the owners of the waste, the EPA and all other relevant Government Authorities.

4. The Proponent commits, in the case of mishap involving the waste materials, to performing emergency procedures including the clean-up of any spill to the

satisfaction of the owners of the waste materials, the EPA and all relevant Government Authorities.

5. The Proponent commits to seeking approval for any interim storage facility that may be required for the consolidation of small holdings of waste material. This will be done to the satisfaction of the EPA.

6. The Proponent commits to establishing an audit trail for the transport operation to the satisfaction of the owners of the waste materials and the EPA.

7. The Proponent commits to reporting the progress of the waste materials transport operation to the owners of the waste materials and the relevant Government Authorities at their request. This will be done to the satisfaction of the EPA, the owners of the waste materials and other relevant Government Authorities.

8. The Proponent commits to modifying the modus operandi of the transport operation should the EPA deem that unforeseen circumstances have arisen that require such changes in operation. This will be done to the satisfaction of the EPA.

1. INTRODUCTION

1.1 Background

This Public Environmental Review (PER) describes a proposal by Carpentaria Environmental Services to transport polychlorinated biphenyls (PCBs) and pesticides so that they can be exported from Western Australia for destruction by high temperature incineration in the United Kingdom. The PER has been designed to meet the requirements of the Environmental Protection Authority (EPA) and primarily addresses the transport of the materials within Western Australia, however, the receiving port, modes of transport, and method of destruction once the materials are in the United Kingdom are also identified.

The EPA has required the PER to be prepared in order to provide information about the project to the general public and to assist the EPA in the preparation of an Assessment Report for the Minister for the Environment. The public is encouraged to provide written comment to the EPA as part of the environmental review process during the nominated public review period. The PER process is described in more detail in Section 1.8.

PCBs and a range of chemicals including organochlorine pesticides with agricultural and other applications have been withdrawn from use in Western Australia and now constitute intractable waste material. The ingredients in these waste materials are very stable and have the potential to be long term contaminants of the environment as they can be transferred through food webs, and can bioaccumulate in wildlife and humans. Specific requirements therefore apply to their packaging, handling, transport and destruction. The chemicals can be destroyed in various ways, but at present the only suitable and generally available method of destruction which is capable of handling the full range of waste and contaminated containers is by high temperature incineration. The only alternative to destruction is long term storage with its associated inherent risks of accidental spillage and fire.

Approximately 1000 tonnes of PCBs and organochlorine pesticides, including their current packaging, are stored at various locations in WA. PCBs were used mainly in relatively large electrical equipment associated with power stations, substations and transmission and distribution systems. The largest quantities of PCBs are therefore owned by the State Energy Commission of Western Australia (SECWA) and mining companies in the Pilbara which require their own power generating capacity. Small quantities owned by other companies and Government agencies are also stored at a number of other locations principally in the Perth Metropolitan Region. The pesticides are held in 3 storage facilities near agricultural centres in the southwest and are owned by the Department of Agriculture.

At present Carpentaria Environmental Services is negotiating or formulating business proposals with SECWA, the Department of Agriculture and the Pilbara mining companies to export and destroy their stockpiles of waste materials. It hopes eventually also to collect and export the remainding waste material which is currently stored in small quantities and at many locations. Small quantities are defined as amounts from 1kg packages up to 10 tonnes.

The present proposal involves the standard packaging of the waste materials and placement into shipping containers at their current storage locations, transport of the packaged materials to the Port of Fremantle, and loading and stowage onto ships for transport to the United Kingdom. These activities are described in detail in the PER together with the procedures that will be adopted to ensure public and occupational safety, and environmental protection. The PER provides, in particular:

- identification of the Proponent and the responsible authorities,
- a description of the types and volumes of waste materials,
- a description of the proposed procedures for packaging, labelling, inspection, collection and loading of waste materials for transport,
- details of transport routes and safety procedures during transport,
- background information on the potential impacts of a release of the waste materials,
- details of how the impact of any release will be minimised
- details of the controls and procedures relating to the international movement of the waste materials.

The PER has been prepared to conform with guidelines issued by the EPA. A copy of these guidelines is reproduced in Appendix 1.

Carpentaria's ability to implement the proposal will depend on the negotiation of appropriate contracts with the owners as well as the acquisition of the necessary approvals. The proposal as described in this PER will form the basis of such contracts. Other companies are also seeking approval for very similar proposals through the EPA process and also hope to acquire contracts with the owners of the waste materials. The Health Department of Western Australia has also recently received approval from the EPA for the establishment of a long term storage facility for these chemicals at a location east of Mt Walton in the Eastern Goldfields. The Health Department intends to construct this facility if export of the chemicals does not proceed.

Various earlier proposals (Maunsell & Partners, 1986, 1988, and Alan Tingay & Associates, 1991) for the handling, packaging and transport of PCBs and organochlorine pesticides have been reviewed by the EPA and have been approved by the Minister for Environment. The EPA have produced assessment reports in response to these proposals (EPA 1987, 1988 and 1991). The most recent proposal by the Health Department of Western Australia (Alan Tingay & Associates, 1991) and the related EPA assessment report and conditions of the Minister for Environment, describe the nature and location of the waste and approved procedures for handling, packaging and transport. These documents, therefore, have provided the basis for the present proposal.

1.2 The Proponent

Carpentaria Environmental Services, a division of Carpentaria Transport Pty Ltd, will have full responsibility for all aspects of the proposal to transport the wastes for export. Carpentaria Environmental Services is a company which specialises in the management and disposal of intractable wastes and has considerable Australian and overseas experience in this field. Its registered office in Western Australia is located at 73 Leach Highway, Kewdale, Western Australia, 6105. The Head Office of the company is at 9 Newstead Avenue, Newstead, Brisbane, Queensland 4006 and the Head Office of Carpentaria Transport Pty Ltd is at 839 Beaudesert Road, Coopers Plains, Queensland 4108.

Carpentaria is the Australasian agent for Rechem Environmental Services of the United Kingdom. Rechem operate high temperature incinerators at Fawley, England and Pontypool, Wales. Carpentaria has the overall contractual responsibility for the packaging, transport and destruction of the waste materials and will manage the overall transport of the waste materials to the incinerator while Rechem will be responsible for the destruction of the waste.

1.3 Overview

In the present proposal PCBs and pesticides in general will be emptied from their present containers into new heavy duty 205 litre drums, these drums will be placed in steel bins, and the bins placed into shipping containers prior to any transport. However, if the present packaging is suitable, that is, if it is of a type approved for transport of hazardous wastes and is in good condition it will be placed directly into a steel bin. All of the packaging operations will occur at the present storage locations in order to minimise handling and the risk of occupational exposure and to provide maximum containment for all phases of the transport operation.

The drums, bins and containers will be labelled in accordance with regulatory requirements. Consignments of shipping containers will then be transported by road to the Port of Fremantle for loading onto ships.

The only exceptions to the above procedures will be for large transformers containing PCBs. The PCBs from these transformers will be drained on-site into new, heavy duty, 205 litre drums. The drums then will be labelled and packaged as above while the transformers will be secured in specially built steel trays and placed into shipping containers for road transport to Fremantle for shipment. Large capacitors will be packaged into steel sealed bins.

All personnel involved in the operations will have been specifically trained and the waste materials will have been audited in all stages of transport. The operations will be subject to a number of regulations and inspections by Federal, State and local government authorities in Australia and by various agencies in the United Kingdom.

In the United Kingdom the shipping containers will be unloaded from the ships and immediately placed into a secure storage area at the receiving port, from where they

will be trucked to incineration facilities at Fawley and Pontypool. At these facilities the liquid wastes may be transferred from the heavy duty drums and other packaging to storage tanks for injection into the combustion chamber of the incinerator. Solid wastes and contaminated containers including the drained transformers will be prepared for incineration to ensure maximum flame exposure and will then be placed in the incinerator to ensure destruction of residues. The metal equipment and containers will be converted to a molten slag, tested to ensure destruction of residual wastes, and conveyed to a well managed landfill.

The incinerators operate with minimum combustion temperatures of 1200^{o}C and are required to achieve 99.9999% destruction of the chemicals. Emissions from the combustion chamber pass through a pollution control system before being discharged to atmosphere through a stack. All operations at the facilities, stack emissions and the surrounding environment are systematically monitored to ensure compliance with required procedures, performance levels, and emission and environmental quality standards.

1.4 Ownership of the Waste

It is important to note that Capentaria Environmental Services will not accept title or ownership of any chemicals collected by the company and such title and ownership will remain with the current holder of the waste until destruction. This is because in the unlikely event that the waste are not destroyed under international convention they must be returned to the state of origin. If Carpentaria were to retain ownership they would then be responsible for the wastes. This is unacceptable to Carpentaria and could be seen by others as a way of transferring ownership of the wastes for purposes other than their proper disposal.

This action of "non acceptance of ownership and title" is consequent upon the Basel Convention in the Control of Transboundary Movements of Hazardous Wastes and Their Disposal. This convention, of which Australia is a signatory, sets forth the legal obligations of countries which are signatories to the agreement, and these legal obligations provide the controls for the International Movement of Waste between Australia and the United Kingdom.

If for some unforeseen reason the waste materials landed into the U.K. cannot be destroyed, then under Article 8 of the Basel Convention the wastes must be returned viz:

> "Where transboundary movement of wastes, to which the consent of the States concerned has been given, cannot be completed in accordance with the terms of the contract, the State of export shall ensure that the wastes in question are taken back into the State of export, by the exporter, if alternative arrangements cannot be made for their disposal in an environmentally sound manner within 90 days from the time that the importing State informed the State of export or such other period of time as the States concerned agree. To this end, the State of export and any Party of transit shall not oppose, hinder or prevent the return of those wastes to the State of export."

Title for the chemicals must therefore remain with the present owners to provide for the contingency of their possible return.

1.5 Timing

The export and destruction of the waste materials will be organised and implemented in accordance with all international, Commonwealth and State requirements over an estimated period of up to two years from the time when all approvals are in place and contracts with the owners have been secured.

1.6 Statutory Requirements and Approvals

The handling, packaging and transport of PCBs and pesticides in Western Australia, as proposed in this PER, can only occur after specific approvals have been obtained and must be carried out in accordance with a number of Acts and Regulations designed to ensure high levels of safety and environmental protection. The specific Acts and Regulations are as follows:

- Environmental Protection Act, 1986.
- Explosives and Dangerous Goods Act, 1961, Dangerous Goods (Road Transport) Regulations, 1983 and Dangerous Goods (Road Transport) Amendment Regulations, 1988.
- Health Act 1911 and the associated Health (Licensing of Liquid Wastes) Regulations, 1987, Health (Pesticides) Regulations 1956 and Health (Poisons) Regulations 1965.
- Occupational Health Safety and Welfare Act,1984, and Occupational Health Safety and Welfare Regulations, 1988.

These Acts are administered by the EPA, and the Explosives and Dangerous Goods Division of the Department of Mines, Health Department, and Department of Occupational Health Safety and Welfare.

The following are the Commonwealth guidelines and codes that will be adhered to:

- Australian Code for the Transport of Dangerous Goods by Road and Rail, and
- Guidelines for the Handling, Storage and Transport of PCBs.

As no Western Australian regulations are currently available for the storage and handling of hazardous materials (with the exception of flammable materials) the Victorian Dangerous Goods (Storage and Handling) Regulations, 1989 will be adhered to for any interim storage of materials.

In order to export the chemicals a specific export permit is required in accordance with the Hazardous Wastes (Regulations of Exports and Imports) Act, 1989 which is

administered by the Commonwealth Department of Arts, Sport, The Environment, Tourism and Territories. Carpentaria International was the first company in Australia to be granted a permit under this legislation and currently maintains an export permit. The Australian Maritime Safety Authority also requires notification of the shipment of PCBs and pesticides and compliance with the International Maritime Dangerous Goods Code (IMDG).

In order for the chemicals to be imported to the United Kingdom, approval must be obtained from relevant authorities specified by the European Community Hazardous Waste Trans-Frontier Legislation. In the present case the relevant authorities are:

- The Torfaen Borough Council for the Rechem Pontypool Plant, and
- The Hampshire County Council for the Rechem Fawley Plant.

Carpentaria currently holds duly signed approvals from the relevant Federal Australian and United Kingdom authorities for the shipment of 1000 tonnes of intractable wastes from Western Australia to the United Kingdom and specifically to the Rechem incineration facilities at Fawley, Hampshire and Pontypool, Wales. The nature, tonnage and ownership of the waste materials are specifically identified in these Transfrontier documents.

The handling, packaging, transport and destruction of the waste in the United Kingdom is required to comply to a further set of Acts and Regulations including the:

- Classification, Packaging and Labelling of Dangerous Substances Regulations, 1984,
- Control of Pollution Act, 1974, and
- Road Traffic (Carriage of Dangerous Substances in Packages) Regulations, 1986.

1.7 Scope of this PER

The Western Australian Environmental Protection Act, 1986 is applicable only to the State of Western Australia including coastal waters to a distance of 3 nautical miles from the coast. Therefore, Carpentaria Environmental Services can only seek approval through the PER process for those components of the proposal within Western Australia and the EPA can only make recommendations to the Minister for the Environment on these particular matters. These include the handling, packaging, and transport of the chemicals and their loading onto ships at the Port of Fremantle. The Act does not therefore cover the export or destruction of the waste materials.

1.8 PER Process

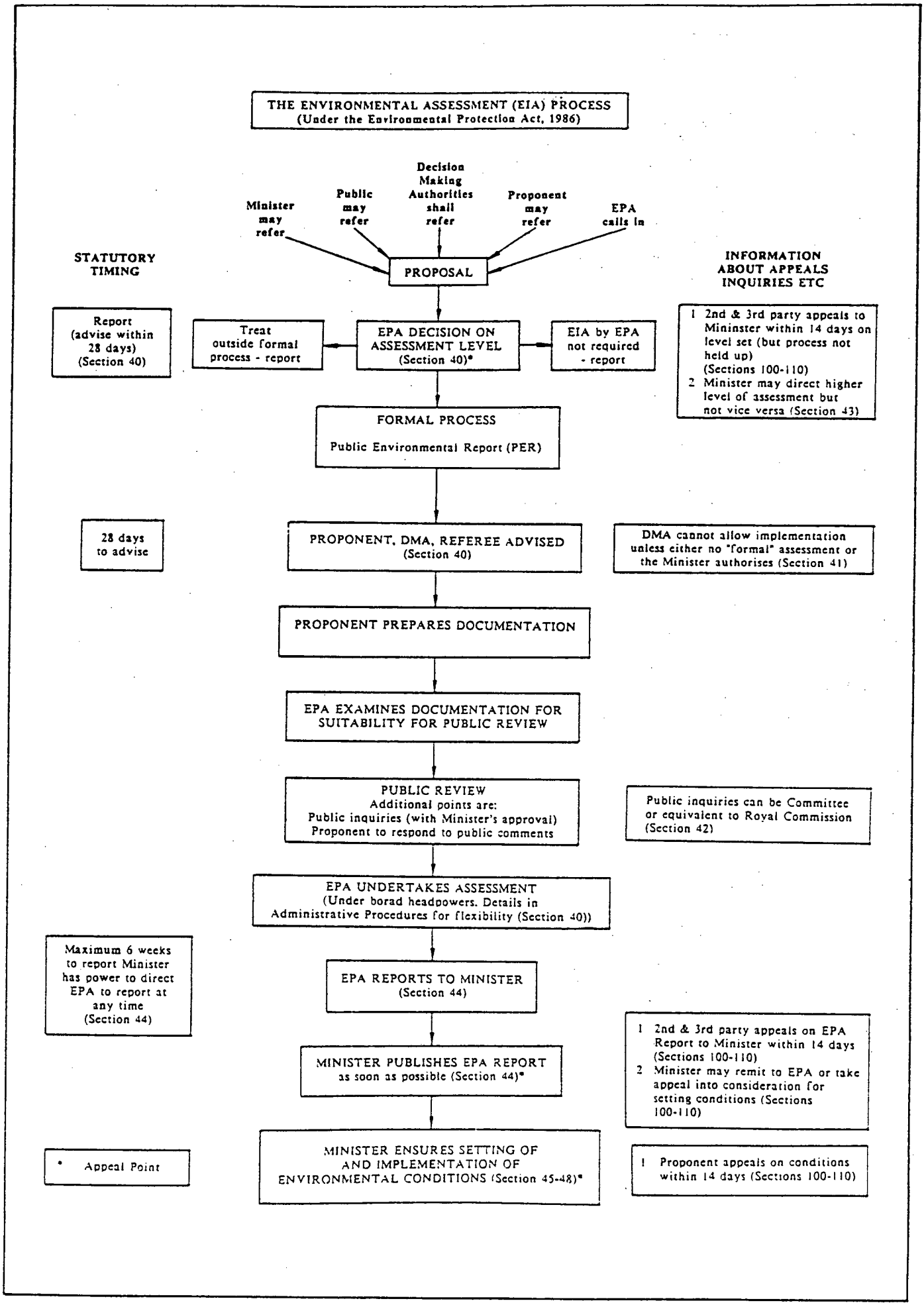
The EPA can require a report for any development proposal in Western Australia which can be in the form of a Consultative Environmental Review (CER), Public

Environmental Review (PER) or Environmental Review and Management Programme (ERMP). The CER, PER or ERMP are intended for distribution to the public for review and comment and are required to provide information on the environmental implications of the proposal and procedures for environmental management and monitoring. The process is illustrated in Figure 1.1.

Public review is an important part of the EPA assessment process and comments from interested persons in the form of written submissions are sought. A guide to the preparation of submissions is provided at the beginning of this PER.

After public review the EPA will prepare an assessment report on the PER for the Minister for the Environment. That report will take into account public submissions and the Proponent's response to the issues raised. The report will make recommendations to the Minister as to whether the proposal should be allowed to proceed, and if so, under what conditions.

The assessment report will be published and any interested party may appeal against any of its recommendations to the Minister within 14 days of its publication. A final decision on the proposal will be made by the Minister for the Environment on behalf of the Government of Western Australia after consideration of any appeals. If the proposal is allowed to proceed, the Minister will impose a set of conditions which must be complied with by the Proponent. The Proponent may appeal against any of these conditions within 14 days.



PUBLIC ENVIRONMENTAL REVIEW (PER) PROCESS
FIGURE 1.1

2. NEED FOR THE PROPOSAL

At present the waste PCBs and pesticides in Western Australia are stored in a variety of forms of packaging and at a number of locations. In many cases the packaging is deteriorating and re-packaging is required, while other packaging can be expected to deteriorate in the future because of the corrosive nature of some of the waste materials and sub-optimal storage conditions. It is also probable that transport of these waste materials will occur into the future as a result of the need for better storage facilities, and commercial changes relating to changes in contract storage agreements, and ownership of storage facilities.

All re-packaging of waste materials, and handling and transport create an ongoing possibility of exposure of personnel as a result of spillage and the clean-up requirements at the site of any spill. While this possibility is low due to the stringent procedures required for the handling and transport of the waste materials, it is nevertheless present and will continue while the wastes remain in existence.

More significantly, there is a possibility that wastes in current storages may be involved in fires and that hazardous emissions may occur as a result. As some of the waste materials are currently stored in the Perth Metropolitan Region and others are in country towns and agricultural areas, the potential consequences of a fire involving these chemicals in terms of public health, exposure of firefighters and other emergency personnel, and environmental contamination need to be recognised.

The Health Department of Western Australia has proposed the establishment of a single facility for the long term storage of waste PCBs and agricultural pesticides at a remote and unpopulated location east of Mt Walton in response to the above concerns. This would enable all of the waste to be packaged in uniform containers and stored in a specifically designed facility that would reduce the need for further handling. Certain pesticides, however, would have to be repackaged from time to time because of their corrosive nature. Storage at Mt Walton would also reduce the possibility that the waste materials would be involved in accidental fire and with accidental exposure to humans and the environment.

Long term storage, however, even in a purpose built facility, does not offer a permanent solution to the problems associated with these waste materials. Ultimately, a permanent solution can only be achieved by their destruction.

The various methods available for destruction were reviewed in Maunsell & Partners (1986) in which it was concluded that the only method suitable for the range of waste materials in Western Australia was destruction by high temperature incineration. Other methods were either only applicable to liquid chemicals or were at an early stage of development and had not been proven in full scale trials. While there have been advances in alternative technology since 1986, high temperature incineration continues to be the only applicable destruction technology.

High temperature incineration is a proven method of destruction for intractable waste materials and incinerators are routinely required to achieve 99.9999% destruction efficiency. The incineration facilities in the United Kingdom cited in this PER operate

to a guaranteed destruction efficiency factor of 99.99995%. Incineration facilities operate in most large countries of Europe as well as the United Kingdom, in the USA and in Canada. Indeed Australia is one of the few developed countries which does not have access to a domestic high temperature incineration facility. It also appears unlikely that such a facility will be built in Australia in the near future.

The present proposal therefore provides a more satisfactory alternative to the present situation of long term storage and provides the only currently available option for destruction of these waste materials. The benefits of destruction compared to long term storage include the resolution of occupational and public safety issues, and removal of the ongoing possibility of environmental contamination.

3. DESCRIPTION OF THE PROPOSAL

3.1 Materials in Storage

3.1.1 Classification of Materials

The Australian Code for the Transport of Dangerous Goods by Road and Rail classifies dangerous materials into classes based on the different types of hazard the materials pose to human health and the environment. The Code provides prescriptions for the packaging, handling, transport and storage of these materials so that the risks posed by them are limited. The materials to be exported overseas for destruction are described below along with the characteristics that cause them to be classified as Dangerous Goods. Figure 3.1 describes the proposed packaging and labelling for the waste materials.

PCB Liquids and PCB Contaminated Solids

The PCB liquids, also known as PCB oils, have mostly originated from the draining of electrical equipment. The PCB contaminated solids are mostly equipment which has contained PCBs, or clothing, soils and equipment that have been contaminated with PCBs during cleanups. PCBs are classifed as Dangerous Goods Class 6.1 "Poisons" according to the Australian Code for the Transport of Dangerous Goods by Road and Rail. All the PCB liquids are considered to be medium danger substances and are allocated to Packaging Group II.

PCB Contaminated Solvents

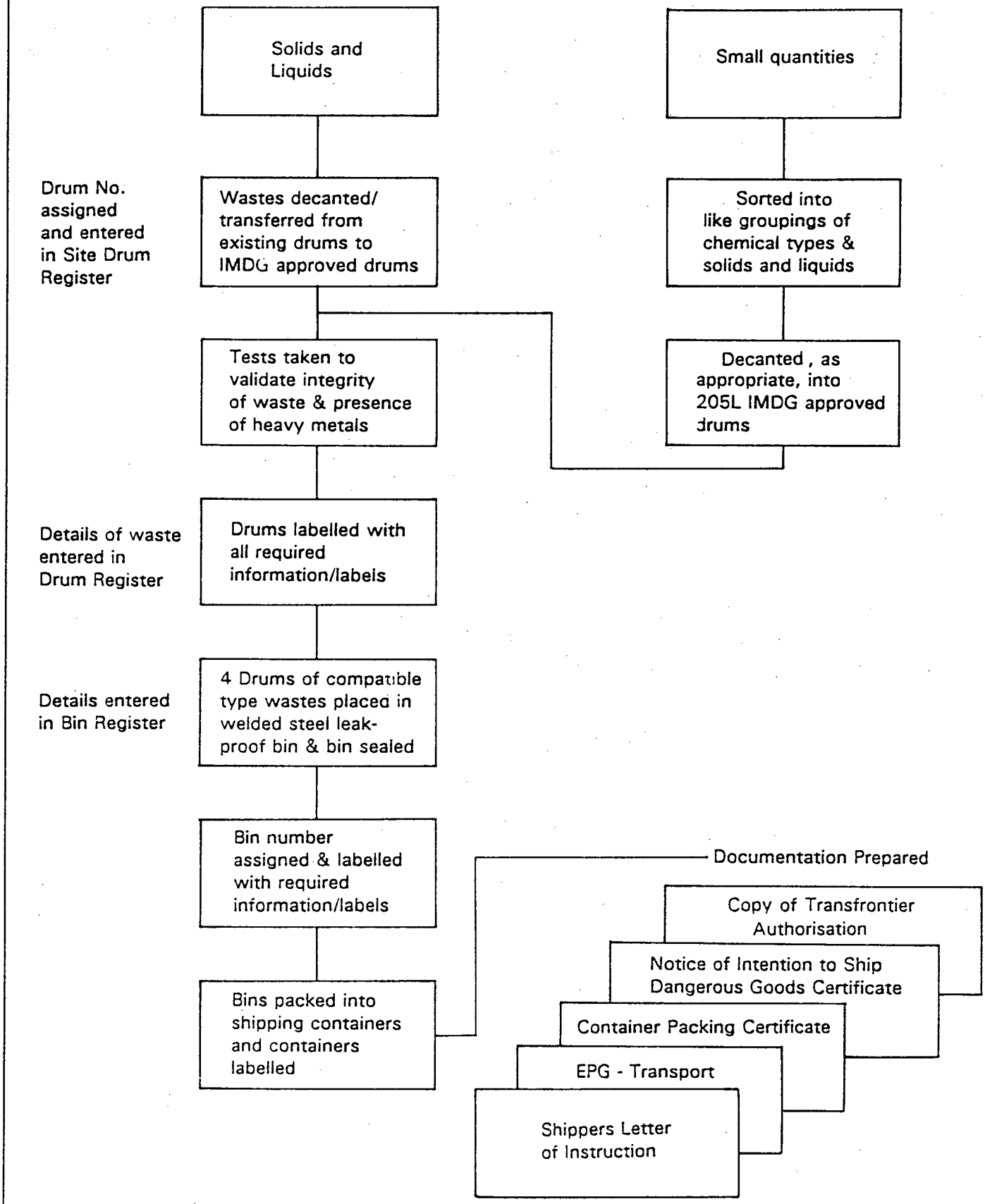
In the past, a number of transformers filled with PCBs were drained and then flushed with non-flammable solvents such as Trichlorethylene to remove residual PCBs still in the transformers. This has resulted in the collection of waste solvent contaminated with trace amounts of PCBs. The primary risk posed by these solvent wastes relates to the PCBs dissolved in them, and consequently they are classified as Dangerous Goods Class 6.1.

Pesticides

The pesticide chemicals to be exported are mainly chlorinated hydrocarbons, including organochlorines such as DDT, Chlordane, Aldrin, Dieldrin, Heptachlor and Chlorinated Phenols. All of these compounds are poisonous if ingested or inhaled in quantity. They are classified as Dangerous Goods Class 6.1 Poisons. Some of these wastes also have a subsidiary risk classification 3 due to the risk posed by their flammability.

3.1.2 Volumes in Storage

This proposal involves the export of at least 1000 tonnes of presently packaged waste materials owned by SECWA, the Department of Agriculture and the Pilbara mining companies. These quantities are distributed as follows:



EPG Emergency Procedure Guide

IMDG International Maritime Dangerous Goods Code

PACKAGING AND LABELLING SYSTEM FOR WASTES
FIGURE 3.1

- 740 tonnes of PCBs , and
- 260 tonnes of pesticides.

It is important to note that the weight of current packaging is included in the above tonnage calculations. The additional packaging detailed in this proposal is not included. The majority of the calculated weight is comprised of solids with low levels of contamination, for example of the 405 tonnes of SECWA waste material only 63 tonnes is actually liquid waste.

Previous inventories carried out in 1986 and 1990 during preparation of other proposals to dispose or store of the materials have not included packaging in their volume calculations. On the basis of these previous inventories, a total of 1722 drums of solvent and pesticide wastes, 1670 drums of liquid PCBs and PCB contaminated solid wastes, and 980 steel containers holding capacitors will be transported for export. However, additional wastes that have yet to be included in any audit may be discovered. It is expected that this proposal would include such wastes.

3.1.3 Storage Locations

PCB Liquids, Solids and Equipment

The majority of PCB solvents and wastes are currently held in stores throughout the State. However, most are in large stores close to Perth or Fremantle. Significant quantities belonging to mining companies are held in the the Pilbara. The majority of smaller holdings are held within the Metropolitan Region.

Pesticides

The organochlorine pesticide wastes are held in three major storage locations within the southwest of Western Australia. Large holdings are held by the Department of Agriculture near Katanning, Merredin and Wongan Hills all of which are within 300km of Perth.

3.1.4 Current Packaging

The vast majority of the waste materials are packaged in 205 litre drums, however many of these drums are not of an approved type for the export of the waste materials. In addition some are overfilled, leaking, or showing signs of deterioration and thus need to be repackaged. All are inappropriately labelled for export overseas. Other PCB contaminated materials and equipment are packaged in steel containers composed of thick sections of welded steel. Some of these also have deteriorated to some degree.

3.2 Preparations for Transport

3.2.1 Repackaging and Handling

Liquid Waste Materials

Liquid waste materials such as PCB liquid, and PCB contaminated solvents will be packaged at their current locations into new, clean, heavy duty 205 litre drums that have passed leak and pressure tests. The drums will be of a type that meet the requirements for approval by the Australian Code for the Transport of Dangerous Goods by Road and Rail for the transport of Packaging Group II material (medium danger) and will have the necessary markings to indicate that approval. The drums will be inspected prior to repackaging (Figure 3.2). Transfer of the wastes materials will be done by decanting liquid wastes into the new drums as shown in Figure 3.3. Sufficient void space will be left in each drum to allow expansion should the wastes experience warm conditions during transport. Only those waste materials that are in drums of an approved type in good condition will not be repackaged.

The new drums will then be placed in fully welded steel, leak-proof bins. These standard Carpentaria steel bins are 1.45m(L) x 1.15m(W) x 1.0m(H) and are constructed of 16 gauge mild steel and designed to allow safe handling with forklifts. They have sufficient capacity to contain the volume of all liquids in the drums plus an additional third. Five millimetre plywood will be placed on the inside floor of the bin to prevent the scuffing of drums (steel to steel) and absorbent material will also be placed in the bin to absorb any leakage of fluids. Four 205 litre drums will be placed in each bin. A steel lid will then be fixed to the bin with silicon sealer and steel roofing screws.

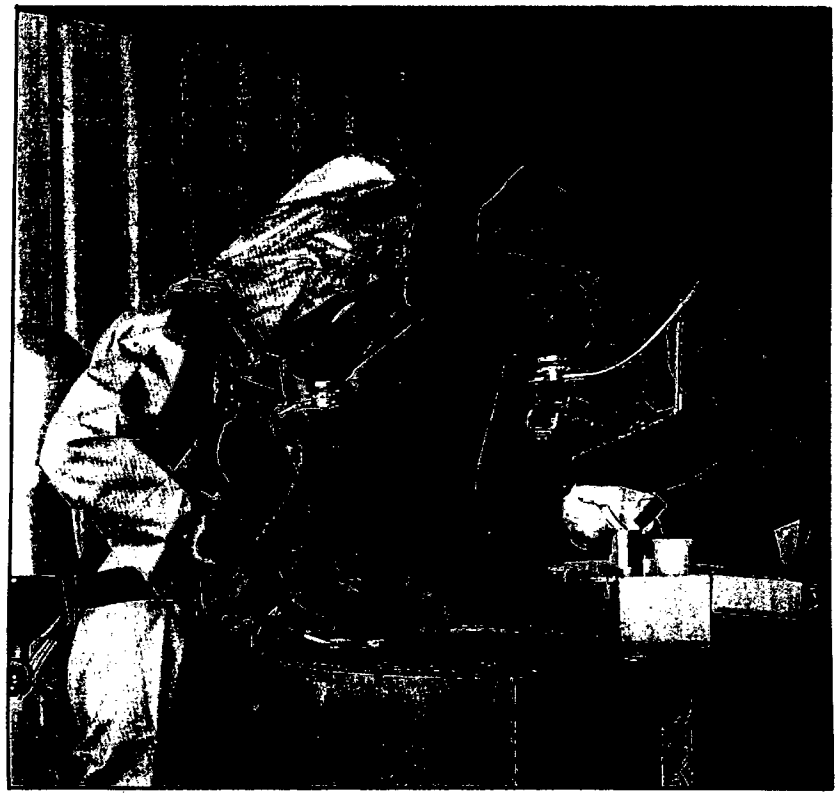
All of the waste materials currently held by SECWA are already packaged in steel bins similar to those described above. These will be accepted for transport in their present state provided that they are in excellent condition and show no sign of leakage or external waste contamination. Otherwise they will be repackaged before they will be accepted for transport by Carpentaria Environmental Services.

The steel bins will then be loaded into shipping containers at their current storage location (Figure 3.4). The loading of each shipping container will be planned so that the total weight of the container will not exceed 24 tonnes or the certified maximum gross weight of the container. Sixteen standard Carpentaria bins fit securely into a 6m international shipping container.

All of the liquid waste will therefore be packaged with triple containment: the new heavy duty 205 litre drums, which will be within the leak-proof steel bins, which will be contained within a shipping container. All packaging will be performed prior to the wastes being transported by truck.

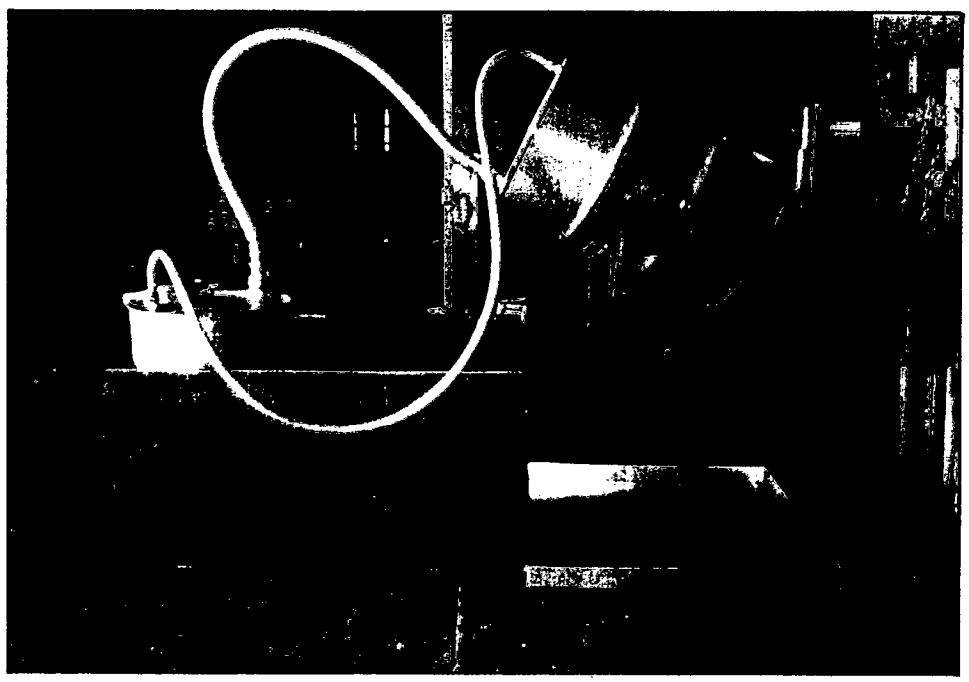
Solids Waste Materials

Solid waste materials include solid pesticides, PCB solids, and PCB contaminated equipment. Smaller items of this type will be packaged in the same way as the liquids



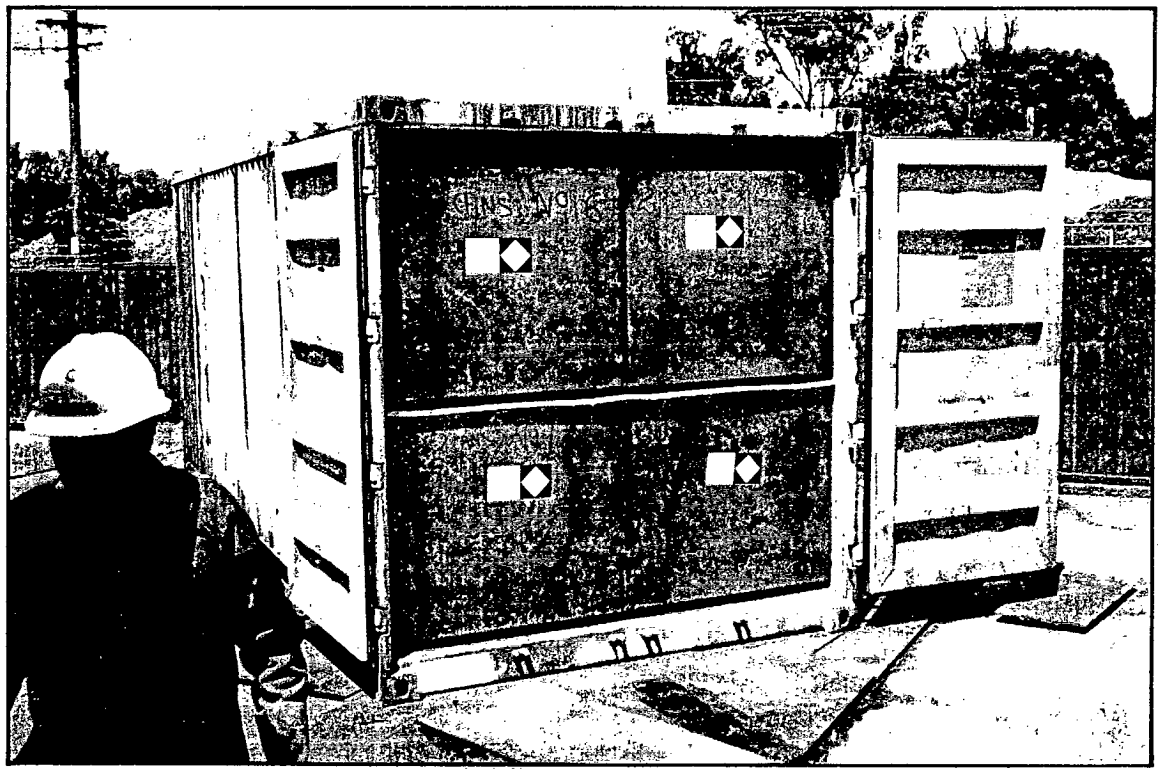
Staff suitably dressed for the inspection &
handling of certain toxic & hazardous chemicals

PROTECTIVE CLOTHING FOR HANDLERS
FIGURE 3.2

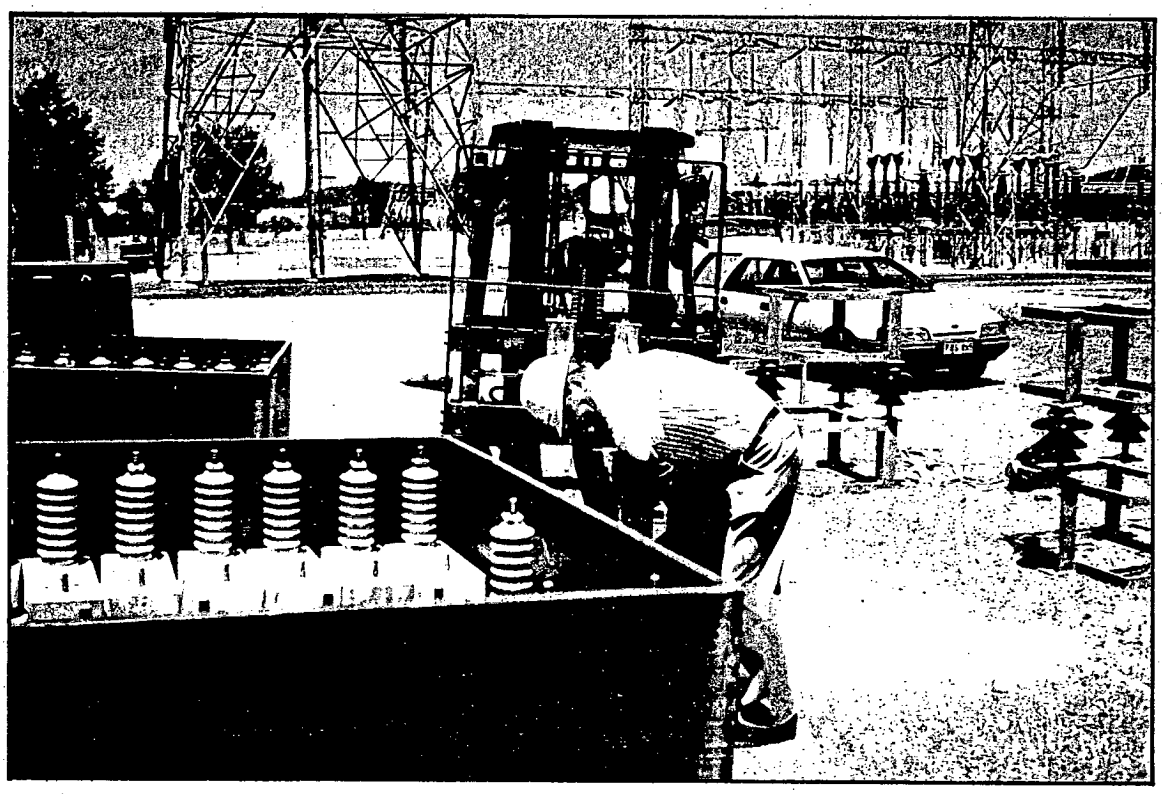


Liquid transfer equipment and drum tilting device
with catchment for unlikely spillage

TRANSFER SYSTEM FOR LIQUID WASTES
FIGURE 3.3



PACKAGING OF STEEL BINS INTO SHIPPING CONTAINER
FIGURE 3.4



PACKING OF CAPACITORS INTO STEEL BINS
FIGURE 3.5

but items exceeding the capacity of a 205 litre drum will be packaged directly into the fully welded steel leak-proof bins as described above.

Carpentaria also proposes to crush the old empty containers left over after the repackaging of waste materials and to place these into bins for export and incineration. However, the owners of the waste may apply to the EPA for approval to dispose of these empty containers by other means.

Very large items such as large transformers will be drained and then placed into steel bins (Figure 3.5). The bins will have the capacity to contain all of the liquid that was in the equipment although this liquid will have been drained. The drained PCBs will be packaged as described above. The transformers will then be secured within the tray with packing and steel strapping as illustrated in Figure 3.6. The trays containing the equipment will then be loaded and secured within the shipping containers.

Where drummed liquids are to be transported in the same shipping container as larger items in open bins, the two types of waste materials will be separated with an internal wall made of timber.

Small Holdings of Waste

This proposal is tailored to meet the immediate needs of the holders of large tonnages of waste materials in the first instance and to then attend the need of other holders who have small quantities of waste materials. Small quantities are defined as amounts from 1kg packages up to 10 tonnes. The larger holdings of waste represent the majority of the waste identified in Western Australia, that is about 1000 tonnes.

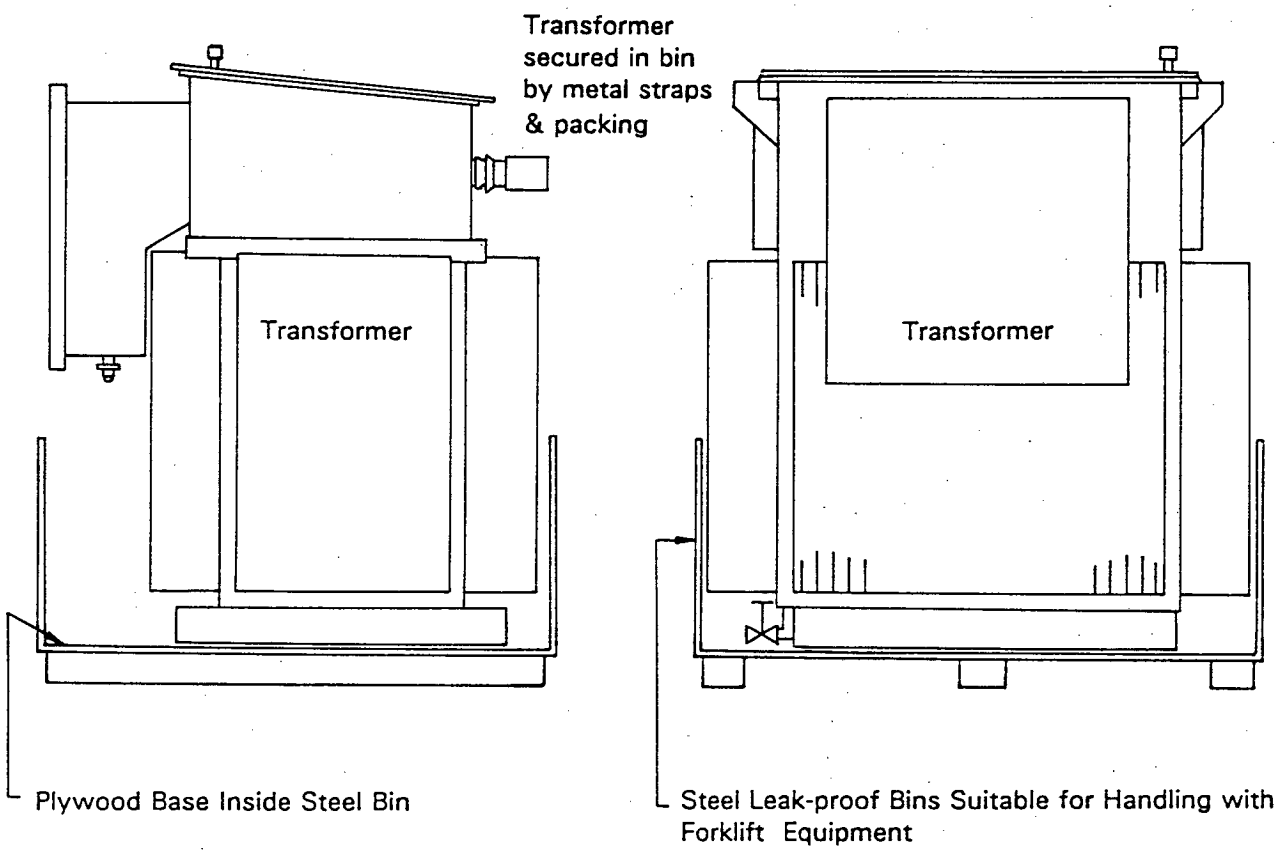
The procedure for the collection and destruction of the smaller quantities shall be designed to significantly improve the packaging of the waste at its current storage site and then to provide for safe transportation, consolidation at an interim storage location and shipment. This storage depot has yet to be obtained. Prior to any use of such a depot, use the location will be referred to the EPA for approval. It is proposed that any such depot will meet the requirements of the Victorian Dangerous Goods (Storage and Handling) Regulations, 1989 or equivalent Western Australian regulation should they be in existence.

The procedure will be as follows:

- The waste materials will be repackaged as described in previous sections on the site where the waste is currently stored. Repackaged waste will be placed in the steel bins.

- The steel bins then will be transported by Carpentaria to an interim store.

  At the time of collection, the bins will be placed into a steel 6m container and secured. This container will be of the International Shipping type but will be specifically used for domestic transport in Western Australia. The container will be secured to the carrying/transport vehicle by container twist locks.



PACKING ARRANGEMENT FOR CONTAMINATED TRANSFORMERS
FIGURE 3.6

Therefore, the triple-containment criteria will be maintained for the transport to the approved interim storage.

- At the interim store, the steel bins will be unloaded from the transport containers and placed into groupings which will be segregated according to the classes and quantities of packaged wastes. The interim storage is described in Section 3.3.3.

- When sufficient quantities of compatible wastes are accumulated to comprise a container load (minimum 10 tonnes), the wastes will be packed into an international shipping container and be delivered to the Port of Fremantle for export.

3.2.2 Labelling

205 Litre and Oversize Drums

All drums containing waste chemicals will have the required labelling specified by the Dangerous Goods (Road Transport) Regulations 1983 and the Australian Code for the Transport of Dangerous Good by Road and Rail. Examples of the types of labelling required are given in Appendix 2. The labels specify:

- the correct technical name for each chemical,
- the UN number for the chemical,
- the appropriate class label and subsidiary risk labels,
- the name and address in Australia of the consignor of the waste, and
- the words "In Transport Emergency Dial 000, Police or Fire Brigade".

Additional labelling is required for storage of poisons and pesticides listing their active ingredients, warnings regarding their toxicity and first aid measures to be taken if exposed to the chemicals. Carpentaria Environmental Services has sought and obtained exemption from these requirements from the Department of Health as the wastes are to be destroyed rather than stored.

The drums will also have the following information permanently affixed onto them. These details will be required for Carpentaria's Audit Control system (Section 5):

- Contents
- Details of Owner
- Location Where Packed
- Date Packed
- Drum No. as assigned by Carpentaria's operational procedures.

Steel Leak-proof Bins and Large Items in Open Bins

All of the bins packed with 205 litre drums of waste materials and all of the bins containing oversize equipment will be labelled with one label on each side showing the following information:

- the correct technical name,
- the UN number for the waste,
- the appropriate class label and subsidiary risk label or labels,
- the name of the consignor of the waste,
- the words "In Transport Emergency Dial 000, Police or Fire Brigade",
- details of the owners of the waste,
- location where packed,
- date packed,
- bin number as assigned by Carpentaria's operational procedures.

Shipping Containers

The International Maritime Dangerous Goods Code which encompasses the International Convention for Safety of Life at Sea, requires additional labels on the international shipping containers. These will be:

i) Class 9 label for PCB, in addition to the Class 6.1A for inland transport in Australia.

ii) Marine pollutant label for PCBs.

iii) Pesticides labelled as per their respective Classes, including any subrisk designations.

Class labels will be of types shown in Appendix 2, they will be diamond shaped and measure 250mm x 250mm. This labelling is required to be identifiable after at least 3 months immersion in the sea.

3.2.3 Inspection

All bins and containers will be inspected prior to their transport to ensure that they are all free from spills or leaks and are properly marked and labelled. The inspection will be carried out by the staff of Carpentaria Environmental Services. Officers from the Department of Mines and the Health Department may also inspect the containers prior to transportation.

3.3 Transport

3.3.1 Overview

All of the materials will be transported by truck to the Port of Fremantle for export. The rationale for road transport in given in Section 3.3.2. Road routes will vary depending on the locations of the wastes but in all cases the shortest route compatible with good road conditions will be taken.

The waste materials will be triple contained by drums within welded steel bins, inside shipping containers prior to transport by truck. If there are insufficient volumes of waste material at one particular location for the filling of a shipping container the

wastes will be transported as separate items within the welded steel bins, within a steel container on appropriately equipped and placarded vehicles and taken to a location where a container is being loaded and included in that container load or alternatively to an approved interim storage location.

All of the transport operations will be carried under the control of Carpentaria Environmental Services trained staff and operators licensed by Western Australian Authorities to carry Dangerous Goods. These staff will ensure that the wastes are suitably packaged and labelled as specified by the Dangerous Goods (Road Transport) Regulations 1983 and the Australian Code for the Transport of Dangerous Goods by Road and Rail, and will ensure that all of the requirements for safe handling and transport are met. The operations may also be checked by inspectors from the Health Department, Department of Occupational Health, Safety and Welfare, Explosives and Dangerous Goods Division of the Mines Department, and the Environmental Protection Authority.

3.3.2 Rationale for Road Transport

In 1988, the EPA determined that rail was the preferred method of transport for waste PCBs and agricultural chemicals in Western Australia (EPA, 1988). However, the EPA revised this position in 1991 (EPA, 1991) in response to a proposal from the Health Department of Western Australia to transport PCBs and agricultural pesticides by road to the proposed storage facility east of Mt Walton. The EPA's current position is based on its conclusion that road transport is sufficiently safe for these waste materials given the relatively small quantities involved, the high integrity of packaging which will ensure that no spillages can occur even in the event of accidents, the scattered location of the present storage sites, and adherence by the Proponent to the requirements of the Dangerous Goods (Road Transport) Regulations 1983. The EPA also requires road transport to involve an escort vehicle, trained crews, emergency response equipment (clothing, shovels, empty containers), and radio communications with an operations centre.

3.3.3 Interim Storage

Some holdings of waste materials will be too small to fill shipping containers by themselves and there will be a need to consolidate them. This will be applicable to the smaller holdings of waste materials. The packing of small holdings is described in Section 3.2.1.

Trucks will deliver packaged small holdings from around the Perth Metropolitan Region and country areas to a transport storage depot for temporary storage and final containerisation. The location of the storage depot has yet to be determined. This temporary depot will require approval by the EPA and the Department of Mines prior to use.

The movement of wastes will be coordinated so that wastes are kept at the depot for as short a period as possible. The waste materials will be held in groupings not exceeding 25 tonnes with each grouping separated by at least 5 metres from every other stack. The maximum amount of packaged wastes at the storage depot will not exceed 30

tonnes (2 containers) of PCB and 20 tonnes of pesticides at any one time. Flammable pesticides and non-flammable PCBs will be stored in groupings separately. If PCBs with flammable pesticides are identified these will be stored in a separate stack

The depot will be an enclosed warehouse surrounded by a fence. It will have power, water and communications equipment and:

- a ready access route to the stacks from the entrance and exit gates of the compound and around each of the stacks,
- sufficient equipment to enable rapid cleanup of any spills or leaks of waste up to a quantity equal to 100% of the quantity of waste materials held at the depot,
- a clearly marked designated area which will be bunded for the storage of any leaking or damaged containers,
- fire protection as required by the relevant regulations and as recommended by the WA Fire Brigades Board,
- dedicated facilities for the decontamination of personnel in addition to usual ablution facilities.

These specifications comply with the Victorian Dangerous Goods (Storage and Handling) Regulations 1989.

3.3.4 Prior Notification

Prior notification of the quantities of wastes being transported in each consignment will be given to the Environmental Protection Authority, the Department of Mines, Police and Fire Brigade. The notification will also include point of departure, destination, description, route to be travelled, and estimated departure and arrival times.

3.3.5 Route Selection and Rationale

The trucks will take the shortest route from the storage depot or other current storage area to the Port of Fremantle. The roads selected are in good condition and are suitably controlled by traffic lights at busy intersections.

The transport vehicles will not remain stationary or be parked in any public place within a town or city between the storage locations and the port except for stops for refuelling requirements and rests for the driver between the Pilbara and Fremantle. These will be done away from built up areas if at all possible.

The specific truck routes for transport of the waste materials are as follows:

- SECWA - Hope Valley

  From Everette Way to McLaren Avenue and left into Hope Valley Road. Right into Rockingham Road/Stock Road, left into Leach Highway, right into Stirling Highway and left into Tydeman Road to the Fremantle Port Container Facility.

- SECWA - Cockburn

  From Power Avenue left into Russell Road, right into Rockingham Road/Stock Road, left into Leach Highway, right into Stirling Highway and left into Tydeman Road to the Fremantle Port Container Facility.

- SECWA - Welshpool

  From Furnace Road right into Kurnall Road, right into Welshpool Road, left into Leach Highway to Fremantle, right into Stirling Highway and left into Tydeman Road to the Fremantle Port Container Facility.

- Merredin and Eastern Areas

  West along the Great Eastern Highway to Perth, left into the Tonkin Highway, right into Leach Highway to Fremantle, right into Stirling Highway and left into Tydeman Road to the Fremantle Port Container Facility.

- Katanning and the South West

  Katanning to Kojonup and then Albany Highway to Armadale Road/Forrest Road, right into Stock Road right into Stirling Highway and left into Tydeman Road to the Fremantle Port Container Facility.

- Wongan Hills

  Wongan Hills to Goomalling to Northam and south along Great Northern Highway to Perth, left into Roe Highway, right into Tonkin Highway, left into Leach Highway to Fremantle, right into Stirling Highway and left into Tydeman Road to the Fremantle Port Container Facility.

- Pilbara

  Either North West Coastal Highway or Great Northern Highway to Perth, left into Roe Highway, right into Tonkin Highway, left into Leach Highway to Fremantle, right into Stirling Highway and left into Tydeman Road to the Fremantle Port Container Facility.

- Welshpool Area

  Into Welshpool Road and then towards Leach Highway, left into Leach Highway to Fremantle, right into Stirling Highway and left into Tydeman Road to the Fremantle Port Container Facility.

3.3.6 Truck Frequency

An estimated total of about 70 truck movements will be required to transport all of the waste materials held by the Pilbara mining companies, SECWA and the Department of Agriculture to the Port of Fremantle. This estimate is based on a 15 tonne load for each truck/trailer. The specific timing of packaging and transport will be determined by contractual arrangements with the current owners of the waste materials and by strategic considerations such as the availability of personnel and the arrival times of ships. Timing will be arranged so that the waste materials can be transported from their current storage location to the Port of Fremantle and placed on board ship efficiently. It is expected that all of the wastes will be transported within a 24 month period although the actual transport will occur within a small number of short time periods.

3.3.7 Safety

The trucks will be driven by drivers licensed to carry Dangerous Goods of the relevant classes. They will therefore be competent and fully trained in the operation of safety equipment and in dealing with emergency situations involving chemical leakage and fire as this is a requirement of gaining a licence. The vehicles used to transport the wastes will be certified as roadworthy as defined by the Dangerous Goods (Road Transport) Regulations, 1983 no more than 12 months prior to the transport of the wastes.

All trucks will have the following safety equipment;

- a readily accessible approved dry chemical fire extinguisher,
- three double sided reflector signals, and
- Emergency Procedure Guides published by the Standards Association of Australia giving instructions on how to deal with vehicle fires and spillage of the types of wastes carried.
- chemically resistant gauntlet gloves,
- an electrical torch,
- a full face shield,
- chemically resistant boots,
- chemically resistant overalls,

- an eyewash kit ready for use, and

- approved respiratory equipment.

The trucks will also be accompanied by an escort vehicle. This is in accordance with the Commonwealth Guidelines for the Handling and Storage and Transport of PCBs. This escort vehicle will carry an additional set of safety equipment as carried by the truck plus the following;

- self contained breathing apparatus,
- absorbent material such as vermiculite,
- shovel,
- heavy duty polyethylene bags,
- heavy duty metal container,
- solventless hand cleaner, and
- signs as per hazard Class 6.1.

The driver of the escort vehicle will be competent and adequately trained to deal with emergency situations involving chemical leakage and fire. During the transport of the waste materials the load will be inspected every 2 hours to ensure no spills have developed. Both the escort and the truck will be equipped with radios so that constant radio communication will be available. This radio equipment can also be used to summon assistance. Mobile telephones will also be in all escort vehicles.

3.3.8 Receival at Port

The Port of Fremantle has been selected as the Port through which the waste materials will be exported. This is primarily because Fremantle is the only specialised container port in Western Australia that has equipment to load the containers that will carry the waste materials. Fremantle is also central with regard to the distribution of the waste materials and the use of this port will minimise the length of road transport.

Once the shipping vessel of the selected shipping line has been nominated, its Estimated Time of Arrival at Fremantle will be monitored. In accord with the practice of the Port of Fremantle and the movements of containers to the United Kingdom, cargoes for shipment are pre-received at the wharf immediately prior to the arrival of the ship. This procedure allows the confirmation of all containers for shipment and their placement into an allocated secured wharf area to effect timely, orderly and safe load sequencing of the containers and their correct stowage on the ship.

Containers will be delivered to the Port by Carpentaria for a period of up to a maximum of 3 days prior to the cut off for cargo receival. This period will be minimised as much as is practical to prevent the cargo from standing for a longer time than necessary. The containers will have all the appropriate Export Documentation and Consents of the Australian Customs Service and will be accepted by the Port and placed in a Customs and Port Operator's Secure Area. This area would be under 24 hours surveillance.

After the commencement of loading, the containers will be moved to the ships by specialised container handling equipment.

3.3.9 Stowage, and Segregation

The International Maritime Dangerous Goods Code divides dangerous goods into categories with regard to stowage and segregation. The location of the packaged wastes will be decided upon by the ships stowage planner with the above Code in mind. This will ensure that other materials which may be chemically incompatible will be segregated to prevent reaction in the event of any mishap.

3.3.10 Insurance

The Proponent maintains adequate insurance cover for the prudent operation and management of its business. This policy has been extended to cover the financial consequences of an accident while carrying out the type of services described in this proposal. The insurances maintained by the company are:

- Workers' Compensation insurance to cover all of the Proponent's employees, as prescribed by legislation.

- Motor Vehicle insurance covering third party liability for bodily injury (including death), or property damage arising out of the performance of the services.

- Material Damage insurance for plant, equipment and materials owned by the Proponent and used in its business operations.

- Legal Liability insurance arising from claims occurring against the Proponent (jointly or severally) in the course of business. This also covers loss of or damage to property and/or loss of life and personal injury.

This policy is extended to include the assured's liability for pollution as a consequence of the wreck of a vessel, vehicle, aircraft or other mode of transport or the discharge or escape, actual or threatened of oil or other polluting substance from premises or a vessel, container vehicle, or other mode of transport and/or the cost of action reasonably taken to prevent liability to the extent that they are a result of such accidents.

The Sum Insured is $100,000,000 for any one occurrence or series of occurrences arising out of the one event, but is unlimited with regard to the number of events while the policy is current.

4. POTENTIAL IMPACTS OF A SPILL AND THEIR MANAGEMENT

4.1 Introduction

The proposal detailed in this Public Environmental Review has been designed to minimise the potential of any waste materials coming into contact with humans or the general environment. This in effect acts to minimise the potential impacts posed by the waste materials. Primarily this will be achieved by ensuring that all liquid and most solid waste materials are triple contained prior to any transport. Some solids will be double packaged. Previous sections describe the proceedures for repackaging to ensure that all waste materials are properly packaged and labelled according to the relevant regulations. In this way the potential for the release of the waste materials to the environment is minimised in the event of any mishap during transportation.

Despite the care taken to minimise accidents the Proponent recognises the need to be prepared for any event that may result in the release of waste materials to the environment or allow humans to come into direct contact with the waste. It is stressed, however, that this is an extremely unlikely event. The following section describes these potential environmental impacts together with a full description of the actions that will be taken in the event of a spill to minimise these potential impacts.

4.2 Potential Environmental Impacts

4.2.1 Background

The waste materials described in this proposal belong to a group of chemicals known as chlorinated organic compounds. Few of these compounds occur naturally but over 60000 synthetic chlorinated organic compounds have been produced over the past 50 years. Many of these are simple and reactive, however, some of the high molecular weight compounds of this group have great chemical stability and as a result take a long time to degrade (ANZEC, 1991). The waste materials described in this proposal contain chlorinated organic compounds of this type.

4.2.2 Chlorinated Organic Compounds in the Environment

The chemical stability of chlorinated organic compounds such as PCBs and organochlorine pesticides are such that they are very persistent in the environment, that is they do not break down into simpler chemical compounds over time. Consequently they can be widely dispersed by physical and biological agents throughout the natural environment and still retain their chemical structure and properties.

The PCBs and organochlorine pesticides have a low solubility with regard to water but are soluble in fatty substances such as those found in the tissues of living organisms. As a result, they tend to accumulate in the fatty tissues of organisms, a process called bioaccumulation. Organisms can bioaccumulate chlorinated organic compounds by one of two pathways, as follows;

- Bioconcentration, where organisms take up minute traces of the compounds from the environment and concentrate it in their bodies.

- Biomagnification, where organisms feed on others that have taken up the compounds via bioconcentration, thereby receiving a relatively large dose of the compound. This is magnified up the food chain as one organism consumes others resulting in higher nett doses being consumed. This relationship is illustrated in Figure 4.1.

Persistent chlorinated organic compounds such as PCBs are excreted slowly by vertebrates such as birds, reptiles, and mammals such as man. Consequently once the substances enter the body they tend to remain and accumulate in the body's fatty tissue. If fat tissue is utilised during stressful periods a large amount of chlorinated organic compound may suddenly be mobilised affecting the organism's functioning.

Research has indicated that exposure to chlorinated pesticides and PCBs via bioaccumulation can result in a wide range of affects in animals including death, the inhibition of growth, reductions in the success rates of reproduction, and behavioural abnormalities. Animals high in the food chain such as birds of prey are especially susceptible.

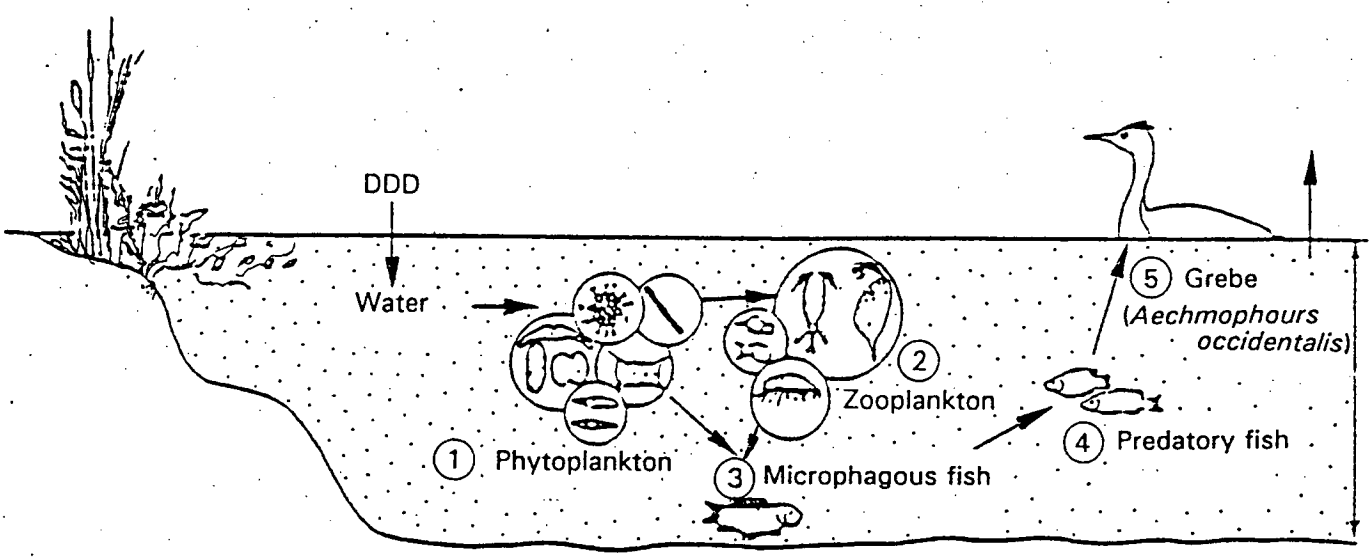
Therefore it is very important that the potential for release of the waste materials dealt with in this proposal is minimised.

4.2.3 Impact of Chlorinated Organic Compounds to Humans

A primary pathway of human exposure to chlorinated organic compounds is via the ingestion of food principally based on the processes discussed in the previous section relating to animals and bioaccumulation. However, exposure can also be via the purposeful application of chemicals such as pesticides onto foodstuffs. Unless a person is exposed to the chemical compounds over an extended period of time they would not experience chronic affects such as those described in the previous sections. The routes of exposure considered in this section only relate to exposure as a result of a spill of the waste materials, that is direct contact via absorption through the skin or by inhalation.

As the chemicals concerned do not easily vaporise and thus cannot easily be inhaled and can be easily washed off if direct contact occurs there is little chance of direct intake of high concentrations of the waste materials. This is especially true of the waste materials in this proposal as they are mostly contaminated solids. Direct exposure to high concentrations of these compounds can result in what are known as acute effects to human health. Essentially these are short term effects that the body experiences soon after exposure such as vomiting, headache and dizziness. The most common cases of acute poisoning have arisen from the consumption of grossly contaminated foods.

It can be concluded from the above that personnel involved in the handling of the waste materials are of principal concern during any accident. It is important to ensure that personnel do not become exposed physically to the wastes. In the event of a spill the general public will not be permitted to approach the site of any accident in order to



CASE STUDY: Clear Lake, California, contaminated by DDD, a chlorinated organic insecticide (Ramade, 1987)

FEEDING LEVEL	1	2	3	4	5
	Water	Phytoplankton	Zooplankton	Microphagous fish (fish that eat micro-organisms)	Predatory fish	Fish eating birds (e.g. grebes, pelicans, shearwaters, gulls, ospreys)
	0.014ppm	5ppm	6 ppm	7 to 9ppm	22 to 221ppm	2500ppm

ppm = parts per million

TRANSFER & MAGNIFICATION OF CHLORINATED ORGANIC POLLUTANTS IN THE FOOD CHAIN **FIGURE 4.1**

prevent physical exposure. The following sections describe how direct exposure will be prevented.

4.3 Emergency Procedures

The Western Australian Hazardous Materials Emergency Management Scheme (WAHMEMS) specifies procedures for coping with hazardous materials emergencies in Western Australia such as spills, or collisions or fires involving vehicles carrying the waste materials. It specifies the responsibilities of the relevant government departments, the owners of the material and the consignors. Procedures of this scheme will be observed in the event of any emergency involving the waste materials that are to be transported for export.

In the event of an emergency the following actions to minimise the spread of waste materials into the environment and to prevent humans coming into direct contact with the waste materials will be carried out:

1) If safe to do so personnel will attempt to control the spread of liquids from any damaged or spilled containers.

2) Safety equipment carried in the truck and escort vehicle (Section 3.3.7) will be used to prevent wastes from spreading from the truck. Spilled material will be prevented if at all practicable from entering sewers, streams or bodies of water as a priority.

3) As soon as practical the emergency will be reported to the nearest fire brigade or police station. The relevant contact persons at the Mines Department, Health Department and the Environmental Protection Authority will also be notified.

The drivers will also place hazard signs around the disabled truck and activate the flashing hazard lights of the truck and escort vehicle. They will prevent people going closer than a safe distance toward the truck and will prevent ignition sources from coming within a safe distance. This will be done until the police arrive to take over this role. Appropriately trained personnel from the emergency services will then deal with any situation should they not consider that the situation is not completed controlled by Carpentaria personnel.

4.4 Small Spillages

It is possible but unlikely that small spillages may occur when the waste materials are being repackaged or being loaded. If a spillage does occur the following action will be taken to limit the spill:

- the area will be isolated with barricades and only trained personnel involved in the cleanup will be allowed to enter,

- a trained person or crew, wearing protective clothing, will clean up the spill,

- a first priority will be the containment of liquids and especially the prevention of liquids reaching drains, sewers or open water,
- cleanup of the spill will then proceed using materials that will be available at the site of the repackaging,
- all materials exposed to the wastes including absorptive materials, soils and cleanup equipment will either be cleaned using solvents or placed in new 205L steel drums, which will be suitably labelled,
- all structures contaminated with wastes will be cleaned with solvents, and
- all personnel and equipment will be decontaminated.

The spillage site will be constantly manned or suitably secured until the cleanup has been completed.

4.5 Staff Monitoring

Although every precaution will be taken to prevent the exposure of personnel involved with the transport and handling of the waste materials the Proponent will ensure that the health of personnel is monitored. This will include medical checks and tests as advised by the Department of Occupational Health Safety and Welfare of WA to ensure that they are not personally contaminated with the wastes which they have been handling and packaging.

5. Audit Trail

5.1 Introduction

It is normal practice for an operation such as the one proposed to fully document the whole process of repackaging of the waste materials through to ultimate destruction. This is a requirement of the authorities of both the exporting and importing countries. The document trail for the transport and export of the waste materials is presented in Figure 5.1.

Carpentaria Environmnetal Services will also have an audit system which will allow the verification of the location and existence of the waste materials at any particular time. This will be of use especially when authorities wish to have information on the progress of the transport of the waste materials and their destruction. Utimately the formal documentation system and the Carpentaria system will allow authorities and the owners of the waste materials to be confident that the wastes have been destroyed and that all aspects of the proposal have been carried according to all requirements.

5.2 Documentation

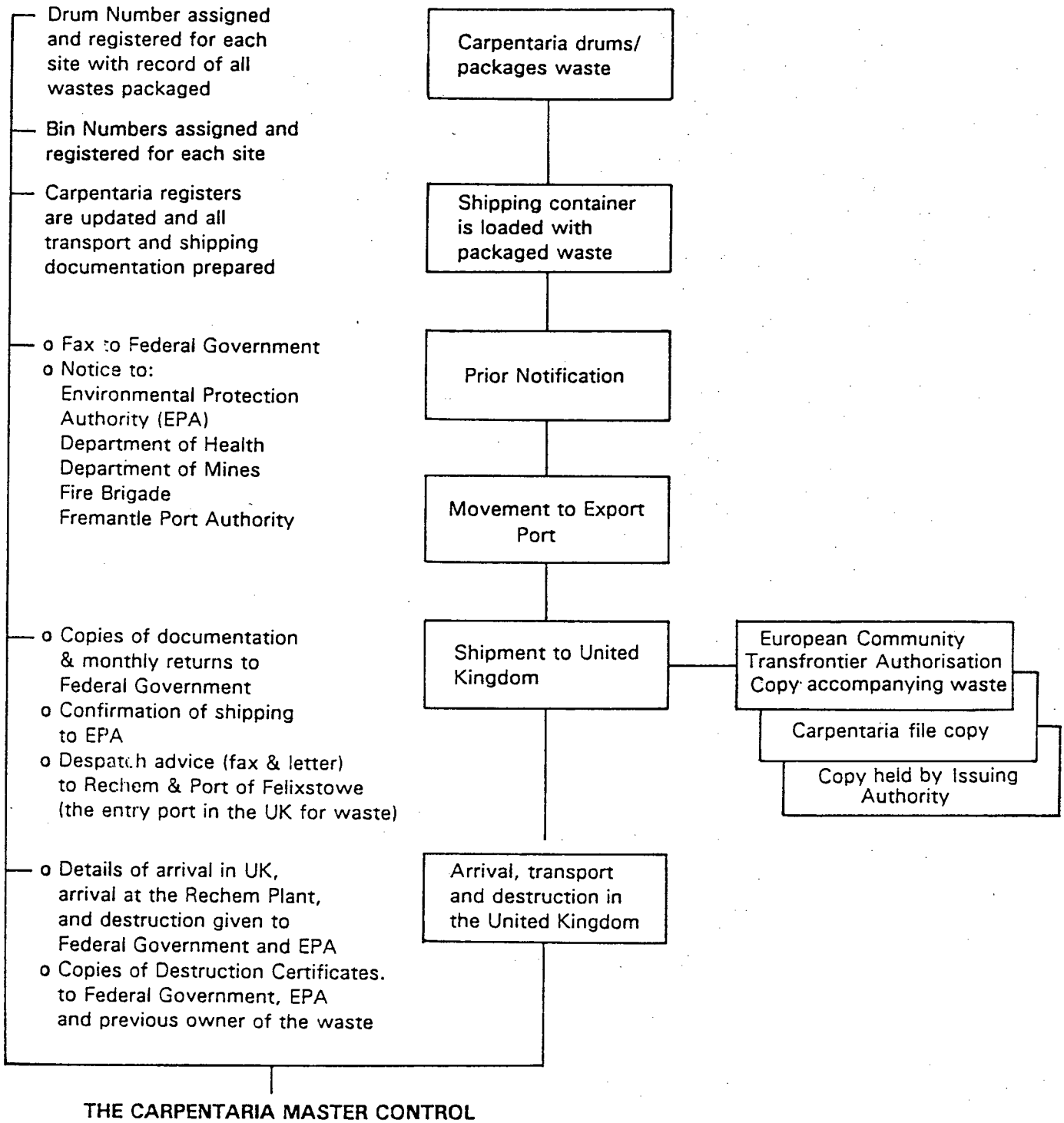
5.2.1 Formal Documentation

Each truck will have a shipping document which will accompany the load of containerised waste materials. A copy of this document will also be carried by the escort vehicle and will comprise:

- Port of Fremantle Standard Export Cartnote
- A Shippers Letter of Instruction/Interim Wharf Receipt
- An Emergency Procedure Guide - Transport
- A Container Packing Certificate and a Notice of Intention to Ship Dangerous Goods - Forms MO 41/1 and 41/2 as required by the Australian Maritime Safety Authority.
- A copy of the European Transfrontier Approval Document.

These documents contain the following information.

- correct technical name for each waste material,
- appropriate class and subsidiary risk designation,
- UN number and packaging group for the waste material,
- name of the consignor of the waste material,



AUDIT SYSTEM
FIGURE 5.1

- aggregate packaged weight for each class of waste material,
- type of outer packaging for the transport of the goods e.g. 16 bins packed with 64 x 205 litre drums, and
- the gross container weight.

The shipping documents will be presented to the responsible person at the Port of Fremantle prior to the packaged waste material being unloaded from the truck into the Customs controlled secure wharf area.

5.2.2 Carpentaria Documentation

Carpentaria Environmental Services will have their own auditing system that will allow the company to keep track of all quantities of wastes and their location and ownership. The system will also allow an assessment report to be prepared on any particular container and its contents at any time should it be involved in a mishap. This audit trail will be coordinated with the other documentation required for the transport, export and destruction of the waste materials.

The following measures will be carried out to enable the smooth operation of the export and destruction of the wastes:

i) When a drum is packaged with waste, that drum will be numbered and the details of the waste packed therein duly noted on a Company Drum Register.

ii) As the steel bins are packed with drums, the waste packed into each of the bins will be duly noted and the bin assigned a number/coding for the particular client/job. These bin numbers also will be recorded in a Carpentaria Waste Register.

iii) When any waste is placed in a temporary store, a storage register will be maintained for that temporary storage location. The register will detail the drum numbers and/or bin numbers held in storage and details of the waste contained therein.

iv) When containers are packed for export, a container load plan will be prepared detailing the position within the container of the waste and the relevant bin numbers (which are related to drum numbers).

v) All container despatches from Australia will be notified to the Port of Felixstowe in the United Kingdom and to Rechem Environmental Services so that they are aware of impending arrivals and can monitor movements accordingly. Waste materials will go from this port to the two receiving incinerators accompanied by the relevant documentation.

The Carpentaria audit system will allow the reporting of the current state and location of any of the waste materials at any time. This can be supplied to any client with regard to their particular waste materials or to any relevant authority upon request.

5.2.3 Other Documentation

Carpentaria Environmental Services will also be required to notify a number of government authorities in Australia of the progress of the waste transport and destruction at strategic times as follows:

The following authorities will need to be formally notified;

- The EPA, Department of Mines, Police, and Fire Brigade prior to the departure of the containerised waste materials by truck from their current storage locations,

- The Australian Maritime Authority prior to the shipment of any packaged waste materials

- The Commonwealth Minister for The Environment five working days prior to the date of shipment from Australia and a formal report at the end of each month together with documents relating to shipment and certificates of destruction.

These notifications will link into and be dependent on the audit trail.

6. PUBLIC PARTICIPATION AND CONSULTATION

The Proponent has initiated preliminary discussions with the Social Impact Unit and the main conservation groups in Western Australia, namely Greenpeace, Conservation Council of Western Australia and the Australian Conservation Foundation (West Australian Branch). In these discussions the general proposal as covered by this Public Environmental Review, was described.

While no formal or written response has been received by Carpentaria from these organisations, the main points of concern and policy as conveyed verbally by the respective organisations were:

Greenpeace

i) Greenpeace Policy states that they are against both the incineration of wastes (in Australia and overseas) and the export of waste from Australia.

Their representative stated that the export of waste would reduce the need by Australia to establish or develop alternative disposal methods for the handling of its own waste problems.

ii) Greenpeace held a view that the people of Pontypool did not want the waste sent there for incineration.

Carpentaria tabled a signed Transfrontier Authority Document approving the acceptance of 450 tonnes of PCB packaged waste from the State Energy Commission of Western Australia. This document was signed by the Torfaen Borough Council, the council that covers the Pontypool area.

iii) While the representative provided a policy statement that Greenpeace was completely against the incineration of the waste, no alternative was offered other than to leave the waste where it is currently stored until some other alternative disposal method is found.

Conservation Council of Western Australia and the Australian Conservation Foundation

Carpentaria held a meeting with representatives of these organisations and the main points noted were:

i) The organisations consider that the export of the waste to the United Kingdom may be seen as just moving the problem from Australia to the UK.

Carpentaria tabled the signed Transfrontier Authority Document mentioned above and this approval was duly noted.

However, the representatives advised of a resident of Pontypool who regularly communicates with the Western Australian Government and other agencies in

Australia claiming that the people of Pontypool are against acceptance of the waste due to apparent health problems.

ii) They commented that it is more the ethical/moral situation that they are concerned with as the technical position of destruction by high temperature incineration was an accepted disposal method of intractable wastes.

iii) They advised that when Carpentaria's proposal is placed before the public they will call a meeting of their groups and Carpentaria would be invited to attend to address the concerns and questions raised.

7. CONCLUSIONS

This Public Environmental Review presents a proposal to transport PCBs and pesticides wastes to the Port of Fremantle from temporary storage locations throughout Western Australia for export and ultimately destruction by high temperature incineration in the United Kingdom. In planning this transport operation the Proponent has gone to great lengths to minimise the potential for accidental release of the waste materials to the environment and to prevent direct contact of those waste materials by the personnel who will handle and transport them. Important features of the proposal are:

- conformity to all State, Federal and International Regulations relating to the transport and export of the waste materials,
- minimisation of the handling and transport of the waste materials,
- triple containment of the waste materials within drums, welded steel bins and shipping containers, and
- establishment of contingency plans and emergency responses to limit the extent of a spill of the waste materials in the unlikely event that it did occur.

As a result of the above it is concluded that the risks posed to the general environment and to humans have been minimised as far as practically achievable. Any residual risk associated with the proposal and the destruction of the waste materials by high temperature incineration is considered to be small compared to the risks of continuing to store the material at numerous locations throughout the State in its current packaging. On this basis it is considered that the very minor risks posed to the environment by this proposal are acceptable.

8. COMMITMENTS

Commitments represent the Proponent's solutions to potential environmental problems posed by the proposal. Essentially they are promises by the Proponent regarding the way in which certain aspects of the proposal will be carried out.
Carpentaria Environmental Services commit to carrying out the following commitments:

1. The Proponent will perform the packaging, handling and transport of the waste materials in conformance to the relevant Local, State, Federal and International Regulations that pertain to the operation. This will be done to the satisfaction of the Government Authorities who are responsible for these regulations, the EPA and the owners of the waste materials.

2. The Proponent accepts responsibility for the waste materials, even though ownership of the waste materials has not changed, from when the packaging and transport of the waste materials has commenced through to the presentation of the Certificate of Destruction of the wastes to the owner. This will be done to the satisfaction of the EPA and the Federal Department of Arts, Sport, the Environment, Tourism and Territories.

3. The Proponent commits to the triple containment of the waste materials prior to transport of the material where the nature of the waste materials will allow. This will be done to the satisfaction of the owners of the waste, the EPA and all other relevant Government Authorities.

4. The Proponent commits, in the case of mishap involving the waste, to performing emergency procedures including the clean-up of any spill to the satisfaction of the owners of the waste, the EPA and all relevant Government Authorities.

5. The Proponent commits to seeking approval for any interim storage facility that may be required for the consolidation of small holdings of waste material. This will be done to the satisfaction of the EPA.

6. The Proponent commits to establishing an audit trail for the transport operation to the satisfaction of the owners of the waste and the EPA.

7. The Proponent commits to reporting the progress of the waste materials transport operation to the owners of the waste materials and the relevant Government Authorities at their request. This will be done to the satisfaction of the EPA, the owners of the waste materials and other relevant Government Authorities.

8. The Proponent commits to modifying the modus operandi of the transport operation should the EPA deem that unforeseen circumstances have arisen that require such changes in operation. This will be done to the satisfaction of the EPA.

REFERENCES

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ANZEC, 1991. Persistent Chlorinated Organic Compounds in the Marine Environment. Public Information Paper.

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Ramade, 1987. Ecotoxicology John Wiles and Sons. Chechester.

APPENDIX 1

EPA GUIDELINES

DRAFT GUIDELINES FOR CARPENTARIA'S PUBLIC ENVIRONMENTAL REPORT ON EXPORT AND DESTRUCTION OF INTRACTABLE WASTES

These guidelines identify issues that should be addressed within the Public Environmental Review (PER). They are not intended to be exhaustive and the proponent may consider that other issues should also be included in the document.

The PER should facilitate public review of the key environmental issues (biophysical and social). The PER is intended to be a brief document: its purpose should be explained, and the contents should be concise and accurate as well as being readily understood. Specialist information and technical description should be included where it assists in the understanding of the proposal. It may be appropriate to include ancillary or lengthy information in technical appendices.

Where specific information has been requested by a Government Department or a Local Authority, this should be included in the document.

1. SUMMARY

The PER should contain a brief summary of:

- ownership (title) of wastes;
- need for the proposal;
- packaging, labelling and handling of the intractable wastes;
- safety aspects of the transportation of the waste by road;
- rationale for routes selected;
- emergency response measures in cases of spillage;
- potential environmental (including appropriate social) impacts of spillage;
- compliance with regulations for transport and export of dangerous goods;
- timetable for transport of product; and
- commitments and conclusions.

2. INTRODUCTION

The PER should include an explanation of the following:

- identification of proponent and responsible authorities;
- background and objectives of the proposal;
- brief details of the scope and timing of the proposal;
- relevant statutory requirements and approvals; and
- scope, purpose and structure of the PER.

3. NEED FOR THE PROPOSAL

The PER should explain why the proponent believes that the proposal is the best option for destruction of these wastes. Alternatives should be briefly considered.

4. TRANSPORT

There should be a clear description of the methods of removal, transportation and export using diagrams or maps where appropriate. A quantified description of the amount of waste to be transported should be provided, if possible. Otherwise an estimate should be made with a rationale to accompany it.

The following aspects of transport should be described:

- ownership (title) of wastes;
- handling of wastes;
- safety aspects of the transportation of waste by road;
- rationale for routes selected;
- emergency response measures in cases of spillage on road and during ship transport;
- potential environmental (including appropriate social) impacts of spillage;
- storage facilities on route if applicable;
- compliance with regulations for transport of dangerous goods and export of hazardous wastes (State and Commonwealth); and
- timetable for transport of product.

5. PACKAGING AND LABELLING

In the case of a spill, it is important that the emergency services are able to identify the spilled material and any other unspilled materials. To this end the procedures to be used for labelling/ identification should be outlined.

6. EMERGENCY RESPONSE IN THE EVENT OF SPILLAGE

The major single issue is emergency response in the event of a spill. To this end, the PER should include:

- maximum volume of spillage which could occur at any one time;
- emergency response measures in cases of spillage; and
- training of drivers to cope with emergencies;

7. POTENTIAL ENVIRONMENTAL IMPACTS AND MANAGEMENT

This section should describe the likely impact on the environment and people in the case of a spill. The PER should also indicate approaches that would be adopted to ameliorate and manage impacts.

8. AUDIT TRAIL

It is important that during at all stages of transport and destruction of wastes that an audit of all wastes be kept. To this end, the proponent should outline how this audit system would work and be carried out, who would manage it , and how reporting would take place.

9. PUBLIC PARTICIPATION AND CONSULTATION

A description should be provided of public participation and consultation activities undertaken by the proponent in preparing the PER. This section should be cross referenced with the "environmental management" section which should clearly indicate how community concerns have been addressed. Where these concerns are dealt with via other Government agencies or

procedures, outside the Environmental Protection Authority's process, these can be noted and referenced.

10. CONCLUSION

ADDITIONAL INFORMATION

GUIDELINES

A copy of these guidelines should be included in the document.

REFERENCES

All references should be listed.

APPENDICES

Where detailed technical or supporting documentation is required, this should be placed in appendices.

COMMITMENTS

Where an environmental problem has the potential to occur the proponent should cover this potential problem with a commitment to rectify it. Where appropriate, the commitment should include (a) who will carry out the activity, (b) what is the nature of the activity, (c) when the activity will be carried out and (d) to whose satisfaction the activity will be carried out, and when appropriate (e) where the activity will be carried out.

Commitments should be numbered.

GLOSSARY

A glossary should be provided in which all technical terms, and unfamiliar abbreviations and units of measurement are explained in everyday language.

HOW TO MAKE A PUBLIC SUBMISSION

The PER should include instructions to the public how it can make a submission. These instructions should be at the beginning of the document.

APPENDIX 2

EXAMPLES OF LABELLING

UN No. 2315

POLYCHLORINATED BIPHENYLS (PCB's)

HAZARDOUS WASTE

Carpentaria
INTERNATIONAL
A DIVISION OF CARPENTARIA TRANSPORT PTY. LIMITED.
(Incorporated in Queensland)

Head Office: 9 NEWSTEAD AVE., NEWSTEAD,
QLD., 4006 AUSTRALIA (07) 257 1255

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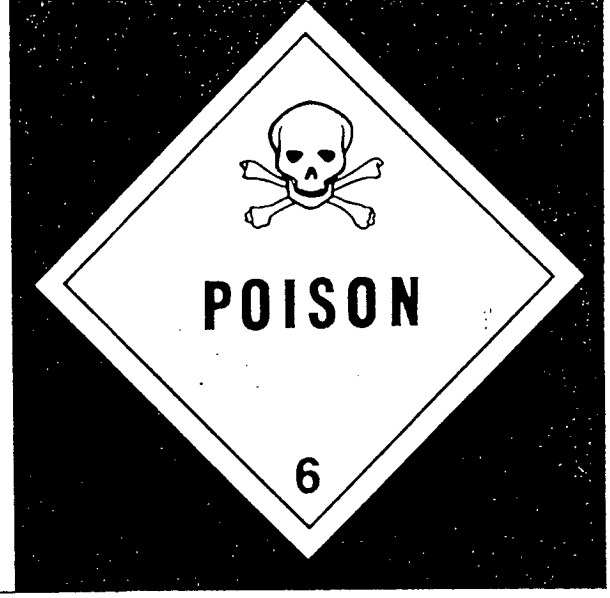
POLICE OR FIRE BRIGADE



UN No. 2761

PESTICIDES, ORGANOCHLORINE, SOLID, TOXIC, N.O.S.

HAZARDOUS WASTE

Carpentaria
INTERNATIONAL
A DIVISION OF CARPENTARIA TRANSPORT PTY. LIMITED.
(Incorporated in Queensland)

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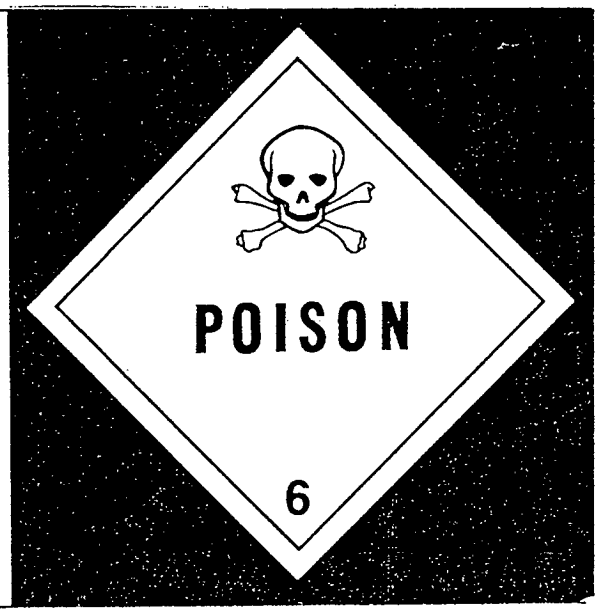
QLD., 4006 AUSTRALIA (07) 257 1255

IN TRANSPORT EMERGENCY DIAL 000
POLICE OR FIRE BRIGADE



UN No. 2996

PESTICIDES, ORGANOCHLORINE, LIQUID, TOXIC, N.O.S.

HAZARDOUS WASTE

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POLICE OR FIRE BRIGADE

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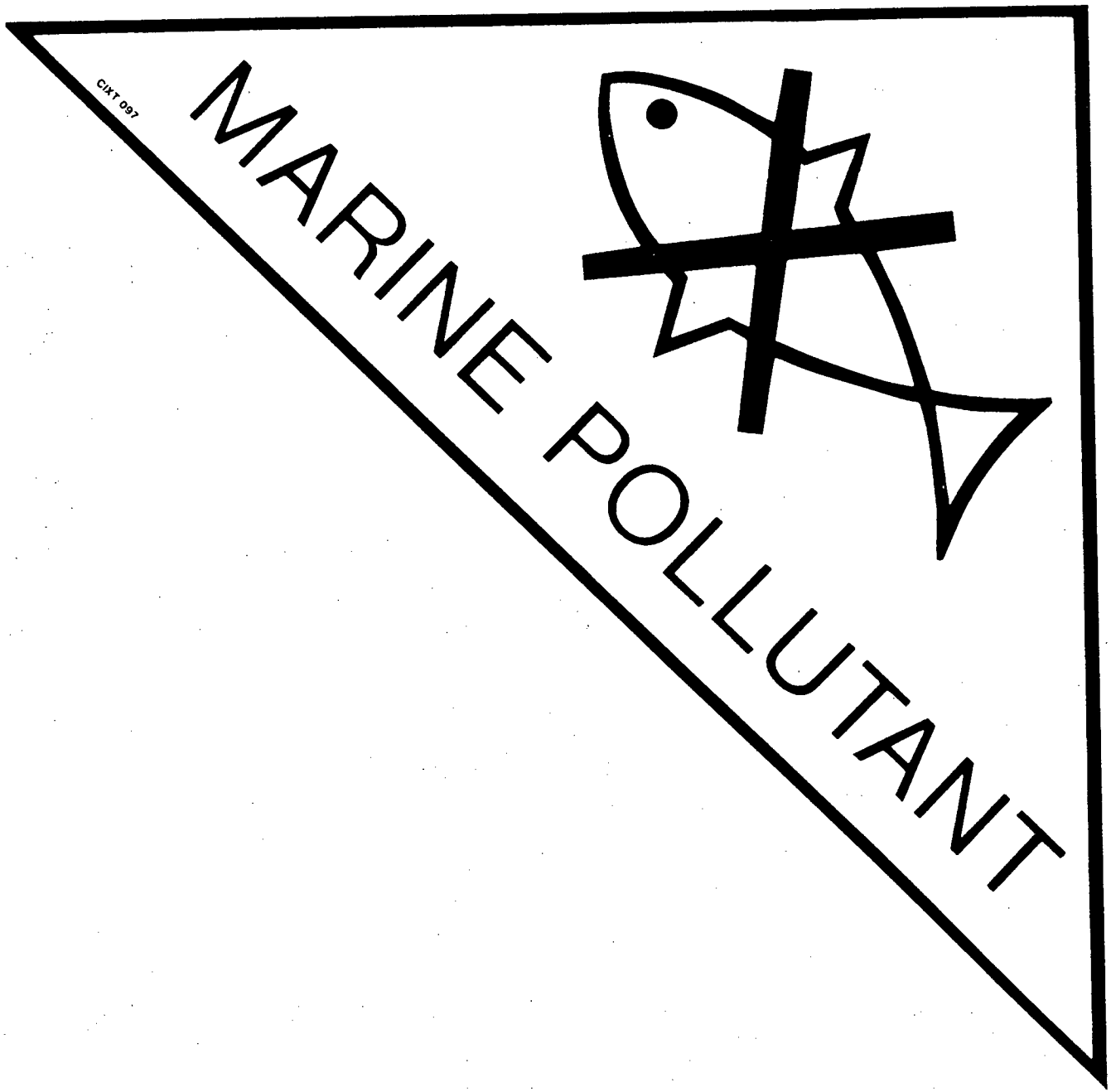
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MARINE POLLUTANT