

RECYCLING

LUBRICATING OILS

Introduction

Increasing concern about the environment makes the reuse/recycling of resources a necessity. Used oil is such a resource. Of the approximately 1 billion litres of lubricating oils that

- hydraulic fluid
- metal working fluid (cutting, grinding, and quenching)
- insulating fluid or coolant (transmission fluid)

Contaminants can originate from chemicals

synthetic motor oils generally pose few problems.

Who are the generators of used oil?

The (Canadian Petroleum Products Institute) CPPI divides oil consumers/generators into four market sectors:

- *Group 1* do it yourself oil changers (DIYs)
- *Group 2* farm and rural
- *Group 3* large industry (urban and remote)
- *Group 4* small urban generators (fast lubes, service stations, etc.)

Groups 3 and 4 generate about 80% of all the used oils (400 million litres per year) but usually have their own collection systems or access to an outside service. The result is that a fairly high percentage of the oil generated by these sectors is reused. Used oil generation in Groups 1 & 2 amounts to a relatively low 100 million litres, but almost all of this is lost due to the limited

availability of oil return/collection facilities and a lack of information on proper disposal practices.

What happens to recoverable used oil after generation?

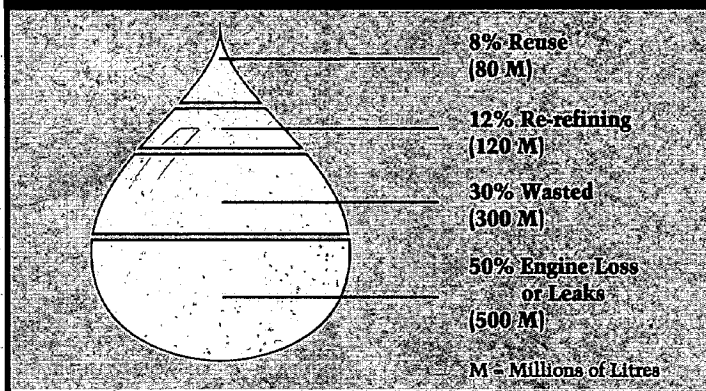
The fate of recoverable used oil is demonstrated in the case of used crankcase oil. Crankcase oil constitutes 45 percent of all recoverable lubricating oils, or 229 million litres. Current management practices for this oil, based on a study of industry and individuals, are shown on the following page. Values may differ somewhat between provinces.

How does used oil affect the environment?

Most of the concern about used oil relates to poor oil management practices. Four examples are given below:

- *Throwing oil in the garbage*, which may result in groundwater contamination if it goes to landfills with inadequate liners

FATE OF CANADIAN OIL BASED ON TOTAL SALES (CPPI, 1990)



are sold in Canada each year, about one half can be recovered for reuse. However, currently only 200 million litres are actually being recovered. The balance is lost during use or disposed of in environmentally inappropriate ways. Used oils may contain small quantities of hazardous substances that can threaten air, soil and groundwater quality in areas where careless disposal prevails.

What oils are being targeted and what substances do they contain?

Used oil can be defined as oil that has picked up foreign substances, or contaminants. This can occur before, during or after use. Typical examples of used oil are:

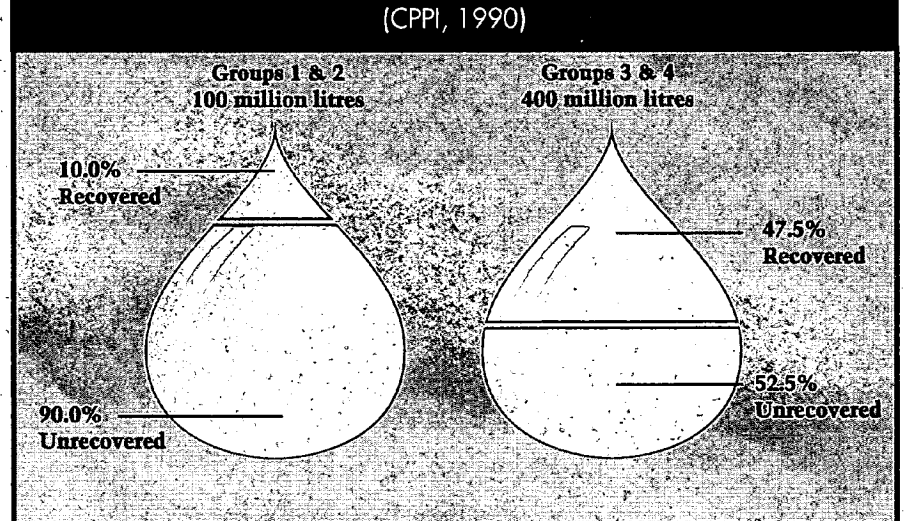
- lubricants (engines, turbines, gears)

added to oils to improve their performance, from physical or chemical changes during use, or from mixing with other oily fluids or liquid wastes during disposal. Examples of possible contaminants are:

- Trace metals and chlorinated solvents
- Gasoline and products of incomplete combustion
- PAH's (polynuclear aromatic hydrocarbons)
- Glycols, water and PCB's

Certain synthetic oils are incompatible with regular oil and may complicate used oil recovery. This, however, applies mainly to industrial synthetics,

REUSABLE OIL LOSSES (CPPI, 1990)



- *Storm sewer disposal* which may create oil sheens that have negative effects on biota and may cause clogging of lines and pumps
- *Road oiling*, which may kill plants and grasses in the immediate vicinity of use and contaminate groundwater through the release of petroleum hydrocarbons
- *Burning as fuel in small commercial boilers*, which is generally safe except in the case of high contaminant levels or inadequate pollution control devices.

Waste oils should **never** be thrown in the garbage, nor should they be mixed with other wastes. In cases of severe contamination, approved hazardous waste treatment, incineration and land-filling of the *residual* may be necessary.

Why are these recycle/recovery options often not implemented?

- The first component of a successful recycling program is a successful collection system. Present collection systems are inconvenient,

- The rarity and inconvenience of collection-recycling programs often makes it easier for do-it-yourself oil changers to dump the oil than to recover it.
- People are unaware of the environmental impacts of used oil.

What regulations exist to control the management of used oil?

The provinces have jurisdiction over used oil management through regulations and guidelines that apply to disposal practices and facilities. The scope of these regulations vary from province to province. *The Transportation of Dangerous Goods Act* applies to the movement of used oils that have been contaminated with hazardous substances, requiring documentation and safe handling

Canada. Part of this plan calls for:

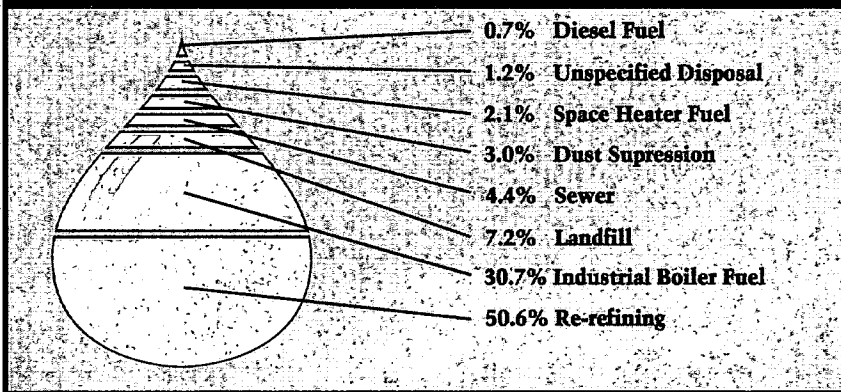
- Mandatory provision of used oil deposit/collection facilities by CPPI member-industries and all other vendors of lubricants to target the used oil produced by Groups 1 & 2, permitting the return of used oil to the point of purchase for recycling or recovery.
- The development of an awareness program to encourage the public to return their used oil instead of disposing of it.

Provinces and territories are all taking steps to start used oil collection programs based on the Plan and are at various stages of program development. Part of these programs may include a new regulation that requires vendors to take back used oil from their customers.

Convenient access to collection facilities and a public awareness program to encourage the return of used oil to the point of purchase are essential to the success of these programs and to the removal of waste oils from our environment.

DISPOSAL PRACTICES FOR RECOVERABLE CRANKCASE OILS

(CH2M, 1992)



What are the recommended management options for used oil?

Ideal options would be:

- *Recycling* - any treatment that completely restores the original lubricating properties of the oil (re-refining)
- *Recovery* - approved methods of combustion that utilize the oil's heating value (eg. cement kilns and industrial boilers that are equipped with approved pollution control devices to remove gaseous contaminants where required).

and availability to do-it-yourself oil changers in urban and rural areas is limited.

- Service stations and repair shops that have access to collection systems often do not like to accept offsite-generated oils because of the possibility of contamination and increased collection cost.
- Although re-refined oils meet performance specifications, they are often mistakenly believed to be inferior to virgin oils.
- In most provinces, vendors do not have return options on their oils, nor do they assume any responsibility for the fate of the oil.

from generator to receiver.

What is Canada doing to change the system?

The federal and provincial Departments of Environment work together to achieve common environmental goals through an organization called the Canadian Council of Ministers of the Environment (CCME). CCME has produced a "Code of Practice for Used Oil Management in Canada", which is available to the public on request.

The CPPI used this code to prepare the *Used Oil Action Plan* for the recovery of used oil in

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ISBN : 0-919074-93-6
CAT. CCME : EPC-UO55E



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Canadian Council of Ministers of the Environment / Le Conseil canadien des ministres de l'environnement