

# **Consultancy for In-Country Waste Oil Audit for Vanuatu**

**Prepared for Secretariat of the Pacific Regional  
Environment Programme (SPREP)**

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## Executive Summary

This report covers the Vanuatu component of a project involving waste oil audits in Fiji and Vanuatu to establish volumes of hydraulic and lubricating oils imported annually into these countries and to confirm the volumes of waste oil produced, stored or otherwise disposed. The work was carried out by Contract Environmental Ltd under a contract to the Secretariat of the Pacific Regional Environment Programme (SPREP), with funding provided by the French Development Agency. Most of the information required for the audit was obtained in a country visit to Vanuatu which took place from 22 to 26 October 2012 and was organised through the Department of Environmental Protection and Conservation (DEPC).

There are two major suppliers of lubricating and hydraulic oil in the country and a number of other minor suppliers. Based on Customs' import data, the total imports of lubricating and hydraulic oil are around 750,000 L per year.

It is estimated that there is at least 250,000 litres per year of potentially recoverable oil in Vanuatu. Approximately half of this volume is currently being collected in a well-managed system operated by Pacific Petroleum. The collected oil is shipped to India for processing and use as an industrial fuel, and the costs of collection and shipping are recovered through an increase in the price that Pacific Petroleum charge for oil. The system is currently only available to Pacific Petroleum customers.

The possible options for extending the Pacific Petroleum system to all other oil importers are discussed in section 4 of this report. The most likely approach would be the introduction of a universal levy for all oil imports, which was collected and administered by an independent agency.

Other aspects that should be considered are public awareness programmes in support of oil collection, the development of a network of waste oil collection depots, and the provision of appropriate storage and processing facilities for the waste oil, prior to shipping.

One area of concern identified in this study is that the current shipments to India are not subject to the relevant Basel Convention approval processes. SPREP may wish to consider providing advice to the Vanuatu government in relation to this matter. SPREP should also explore whether the Vanuatu government requires any assistance with the development of appropriate regulations or the provision of other relevant advice in support of the development of a national waste oil collection system.

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## 1. Introduction

### 1.1 Purpose

This report covers the Vanuatu component of a project involving waste oil audits in Fiji and Vanuatu to establish volumes of hydraulic and lubricating oils imported annually into these countries and confirm the volumes of waste oil produced, stored or otherwise disposed. The work was carried out by Contract Environmental Ltd under a contract to the Secretariat of the Pacific Regional Environment Programme (SPREP), with funding provided by the French Development Agency.

### 1.2 Scope of Work

The scope of work and the tasks to be performed were listed in the Terms of Reference as follows (in slightly modified form as the original TOR covered both Vanuatu and Fiji):

*The scope of work covers the whole of Vanuatu and the purpose is to establish the quantities of hydraulic oils and lubricants imported into Vanuatu annually, to identify the users of these oils, and to provide estimates of the waste oils generated that are potentially available for re-use.*

#### Tasks

- a) Visit Vanuatu to determine the information required for the audit;
- b) Assess by major suppliers, the volumes of hydraulic and lubricating oils imported into each country for internal use (over the last three years);
- c) Identify volumes of waste oils generated by the major users (over the last three years);
- d) Identify existing storage facilities and current stored oil volumes;
- e) Identify where possible, current waste oil disposal locations;
- f) Identify possible end-users in country or within the relevant distribution network for the waste oil;
- g) Provide sufficient information to complete the summary table provided; and
- h) Prepare an audit balance of new oils and waste oils.

### 1.3 Report Content and Layout

Section 2 of this report provides details of the annual oil imports to Vanuatu, based mainly on the data provided by the Customs agency.

The current programmes for waste oil collection and disposal are described in section 3, along with information on other relevant matters such as national legislation.

Section 4 provides some overall discussions and recommendations.

Finally, the organisational details for the Vanuatu visit and the notes taken during each meeting are given in an appendix.

## 2.0 Vanuatu Oil Imports

### 2.1 National Import Statistics

Import data was obtained from the Vanuatu Customs Department and is summarised below. Table 1 lists the annual imports by calendar year for lubricating oils, hydraulic fluids<sup>1</sup>, and diesel, while Table 2 provide a breakdown of the lubricating oil import data by importer.

**Table 1: Oil and Diesel Import Data for Vanuatu, 2009-2011**

	Annual Imports for 2009, Kg	Annual Imports for 2010, Kg	Annual Imports for 2011, Kg	Total Imports over 3 years, Kg	3 year avge, Kg/year
<b>Lubricating oils</b>	737,664	572,382	625,058	1935104	<b>645,034</b>
<b>Hydraulic fluids</b>	16,979	10,262	4,511	31,752	<b>10,584</b>
<b>Diesel</b>	28,332,730	30,492,3976	30,686.150	89,511,276	<b>29,837,092</b>

As shown in Table 1, the annual average imports of lubricating oils and hydraulic fluids combined are just over 650,000 kg per year, or about 750,000 litres, assuming a density of 0.87, while the average annual diesel imports are almost 30,000 tonnes.

The distribution of the lubricating oil imports between different importers, as shown in Table 2, is based on the total imports over three years. Altogether, the eleven importers listed in the table accounted for 88.3% of the total, while the remaining 11.7% of imports were distributed across about 75 other companies.

As indicated in Table 2, Pacific Petroleum was the dominant importer of lubricating oil over the three-year period. However their imports may have declined in 2012, because of the increasing market penetration by Trade Tools Direct. The 5.5% market share shown in the table is only based on their imports in 2011, which is when they started importing. Their estimate for the current year (see section 2.2) indicates that they are now importing similar quantities to Pacific Petroleum.

British Petroleum was the other significant importer over the three year period. However they ceased importing in May 2010 and no longer have a significant presence in Vanuatu.

<sup>1</sup> Brake and transmission fluids are included in the hydraulic oils category.

**Table 2: Lubricating Oil Imports by Individual Importers, 2009-2011 combined**

Importer	Total Imports, Kg	% Share of Total
Pacific Petroleum	1,290,638	66.7%
Trade Tools Direct	107,213	5.5%
British Petroleum (BP)	85,708	4.4%
Millennium Challenge	38,383	2.0%
Carpenter Motors	37,015	1.9%
Vanuatu Government	34,865	1.8%
Auto Right Spare Parts	32,238	1.7%
Santo Hardware	30,134	1.6%
King Motors	22,910	1.2%
Phillip Foster	20,499	1.1%
Flame Tree	8,800	0.5%

### Oil Filters

The total number of oil and fuel filters imported over the three year period (2009 – 2011) was 62,002 units, or an average of 22,067 per year. It was not possible to distinguish between oil and fuel filters because they are covered under the same Customs code. However, oil filters most likely account for the bulk of these imports because they would normally be changed much more frequently than fuel filters.

### Confidence Levels

The above data can be taken as having a high level of confidence because it is based on official Customs' data. All oil imports attract Customs' duty so the Department puts a significant amount of effort into ensuring that it captures all such imports. In addition, the data is subject to periodic external assessment by the Government Audit Office, primarily for accounting purposes.

## 2.2 Importer Estimates

It is interesting to compare the 2009-2011 Customs' data with the individual import figures provided by the two key players (see Appendix 1). Pacific Petroleum indicated that their lube oil sales over the previous 12 month period (ie. October 2011 to September 2012) had been approximately 280,000 litres for Efate and 100,000 litres for Espiritu Santo. This is down by about 25% on their annual average imports over the 2009 to 2011 calendar years (ie. 430,000kg/year, or 495,000 litres/year)

By comparison Trade Tools Direct stated that over the last year or so they had recorded sales volumes of 25,000 to 30,000 litres per month, or about 300,000 to 350,000 litres per year. This represents more than double their import volume in the 2011 calendar year (125,000 litres per year), and is consistent with their apparent current position as the main supplier to small volume users.

## 3.0 Waste Oil Recovery

### 3.1 Pacific Petroleum

Pacific Petroleum has a virtual monopoly on the supply of petroleum-based fuels in Vanuatu and they also appeared to have the majority share of major users of lubricating oil. Their largest customer is UNELCO, which operates power stations on the main islands of Efate and Santo. Other large users include the two main vehicle distributors (ASCO Motors, Carpenter Motors), and other vehicle and boat servicing companies. There are no large industrial users.

Pacific Petroleum operates a waste oil<sup>2</sup> take-back scheme for their customers (but only for their customers), and they are currently recovering up to around 125,000 litres per year, or about 30% of their past imports. This is quite a respectable recovery rate because it is generally recognised that only about 50% of the oil sold will end up as waste. (This figure is also consistent with the information provided by UNELCO who indicated that about half of the lube oil used in their engines was actually consumed in the engines).

Pacific Petroleum has a 20,000 litre storage tank at their terminal in Port Vila and when this is full they arrange for the waste oil to be shipped offshore. Prior to 2005 the oil was being sent to New Caledonia for use in a nickel smelter. However this practice was banned by the New Caledonia government<sup>3</sup>. In 2007, Pacific Petroleum started back-shipping the oil to Singapore using its own tanker, with the oil being passed on to unidentified users. (The first shipment was a two year stockpile of around 200,000 litres). Then in 2011 they were contacted by a representative of an Indian company who offered to buy the waste oil. Since then, Pacific Petroleum has been shipping the waste oil in 200 L drums, in shipping containers, directly to India, where it is processed and on-sold as an industrial fuel. They indicated that the costs of the operation are recovered through an increase in the price that they charge for oil.

The shipments of waste oil to India would appear to be in contravention of the Basel Convention, because Vanuatu is not a party to that Convention<sup>4</sup>. Neither Pacific Petroleum nor the Department of Environment were aware that these shipments would fall under the Basel Convention controls. The same issue does not apply to the Waigani Convention because that deals primarily with trans-boundary waste movements within the Pacific Islands region<sup>4</sup>.

**Confidence levels:** the oil export data (125,000 litres per year) can be taken as having a high level of confidence because it is based on actual shipping records held by Pacific Petroleum).

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<sup>2</sup> This most likely includes small amounts of hydraulic fluids as well, because there is no separate take-back scheme in operation for these wastes.

<sup>3</sup> Pacific Petroleum described this as a ban but were unable to elaborate on what form the ban had taken, who had applied it, or why. They were simply advised by their shipping agent that they could no longer send waste oil to New Caledonia

<sup>4</sup> Paragraph 5 of Article 4 of the Basel Convention requires that: *A Party (India) shall not permit hazardous wastes or other wastes to be .... imported from a non-Party (Vanuatu)*. The only ways in which these shipments could be allowed would be through Vanuatu either becoming a Party to the Basel Convention or entering into a bilateral agreement with India. The use of such bilateral agreements is also anticipated by Article 11 of the Waigani Convention.

### 3.2 Other Importers

The other major supplier, Trade Tools, sells oil to the retail trade and their customers are almost entirely individual users. They appear to have a very strong position in this part of the market because their oil is a lot cheaper than that offered by Pacific Petroleum. They have stores in Port Vila and on Santos. They do not operate any sort of take-back scheme, but indicated in-principle support for a collection program, while also being sceptical about the chances of it actually working.

No other oil recovery programs were identified.

Based on the recovery rate of 30% achieved by Pacific Petroleum, the potentially recoverable oil in Vanuatu should be at least 250,000 litres per year. In other words there is an estimated additional amount of at least 125,000 L of waste oil which is currently not being recovered. However the confidence level for this estimate is low.

### 3.3 Waste Oil Stockpiles

There are no known stockpiles. Pacific Petroleum export their waste oil as soon as the tank is full.

### 3.4 In-Country Use Options

UNELCO, the dominant electricity generator, indicated that they were unable to use waste oil as a supplementary fuel in their power stations.

There are no large industrial fuel users in Vanuatu<sup>5</sup>, so in-country co-firing of waste oil is not a significant option. However, there are several copra plants around the country, which may have the potential for using small amounts of waste oil. This option may be worth investigating further, especially on some of the minor islands.

### 3.5 Other Matters

DEPC advised that they had draft legislation before Parliament which should provide them with the necessary instruments to implement or enforce a waste oil management program, most likely through requiring all oil import approvals to be linked to having an acceptable waste management programme in place. It was hoped that this legislation would have been passed during the last parliamentary session, but it is still on the 'pending' list.

There have been several instances in the past few years of large volumes (i.e. tens of thousands of litres) of waste oil being disposed at the Port Vila landfill. The DEPC currently lacks the regulatory powers to control these disposal operations and has therefore found itself in the situation of having to simply act as an advisor on the possible remediation steps to be taken (eg. use of oil dispersants) after the disposal operations were made public. Landfill disposal is not an appropriate method for dealing with large quantities of waste oil but apparently at the time of these incidents it was the only option available.

<sup>5</sup>

The commercial/industrial sector in Vanuatu accounts for only 5% of total petroleum energy consumption, and the consumption by other sectors is transport, 52%, electricity, 33% and domestic, 9%; source: Overview of Potential CDM Project Opportunities in Vanuatu, Department of Meteorology and Climate Change, Ministry of Infrastructure and Public Utilities, Port Vila, Vanuatu, May 2012

## 4.0 Discussion and Recommendations

As indicated in section 3.2, it is estimated that there is at least 250,000 litres per year of potentially recoverable oil in Vanuatu. Approximately half of this volume is currently being collected in a well-managed system operated by Pacific Petroleum. The collected oil is shipped to India for processing and use as an industrial fuel, and the costs of collection and shipping have been incorporated into the sale price of new oil.

The primary barrier to including all other waste oil into the Pacific Petroleum system is cost – other importers would need to increase their prices and pass the additional revenue on to Pacific Petroleum, assuming that Pacific Petroleum continued to take the lead in this area. Alternatively, the programme could be funded through a universal levy on all oil imports, which was collected and administered by an independent agency.

One possible advantage of having the programme managed by an independent agency would be that the levy could be set at a rate that allowed funding of other support activities such as public awareness programmes and the development of a network of waste oil collection depots.

Another aspect that would need to be assessed is the provision of appropriate storage and processing facilities for the waste oil, prior to shipping. The 20,000 litre storage tank currently being used by Pacific Petroleum would probably be inadequate if the total quantities of oil being collected were doubled.

The lack of appropriate Basel Convention approval processes for the current shipments to India is a concern, and will need to be addressed. SPREP may wish to consider providing advice to the Vanuatu government in relation to this matter. SPREP should also explore whether the Vanuatu government requires any assistance with the development of appropriate regulations or the provision of other relevant advice in support of the development of a national waste oil collection system.

The following table provides a summary of the key information that was requested in the Terms of Reference:

**Table 3: Summary of Key Information on Waste Oil for Vanuatu**

ANNUAL OIL IMPORT VOLUME (LITRES/YEAR)	ANNUAL WASTE OIL VOLUME ESTIMATE (LITRES/YEAR)	CURRENT STOCKPILE OF WASTE OIL ESTIMATE (LITRES)	ORGANISED COLLECTION BY?
750,000	125,000 (known) <sup>6</sup>	none	Take-back scheme operated by Pacific Petroleum
DIRECT CONTAINER SHIPPING ROUTE TO FIJI?	SHIPPING COSTS to FIJI (APPROX. FOR A 20FT CONTAINER)	CURRENT REGULATORY DRIVERS?	PARTY TO BASEL/WAIGANI?
Yes	US\$2000	Currently under development	No/Yes

<sup>6</sup> As indicated in section 3.2, there may be a further 125,000 litres of waste oil arising each year, which is not being collected. The fate of these wastes is currently unknown.

## Appendix 1: Organisational Details and Meeting Summaries

### A1. Organisational Details

Visit dates: 22 to 26 October 2012.

Location: Port Vila

Primary contact: Mr Albert Williams, Director, Dept of Environmental Protection and Conservation.

The DEPC were very helpful in suggesting the most appropriate people to talk to and in organising some of the meetings. A list of the people visited, and their contact details, is given at the end of this section.

### A2. Meeting Summaries

#### A2.1 Pacific Petroleum

Pacific Petroleum was established in October 2006, following the acquisition by a group of investors of the activities of the Shell Group in French Polynesia, New Caledonia and Vanuatu. The company's headquarters are in New Caledonia. They still have strong links with Shell through a supply contract and technical assistance, and obtain their fuel and oil supplies from Singapore. In Vanuatu they have fuel depots and service stations on the main islands of Efate (Port Vila) and Espiritu Santo, and they also supply to other smaller islands.

The company appears to have a virtual monopoly on the supply of petroleum-based fuels in Vanuatu and they also seemed to have a dominant market position for all the major users of lubricating oil. Their largest customer is UNELCO, and other large users include the two main vehicle distributors (ASCO Motors, Carpenter Motors), and other vehicle and boat servicing companies. There are no large industrial users of fuel or oil in Vanuatu.

The company's records show current annual lube oil sales of 280,000 L on Efate and 100,000 L on Espiritu Santo. They estimated that they could have 70 to 80% of the lube oil market in Vanuatu, but the Custom's data obtained after the visit showed that this was not correct.

Pacific Petroleum operates a take-back scheme for their customers - but only for their customers - and they are currently recovering up to around 125,000 L per year. This is quite a respectable recovery rate because it is generally recognised that only about 50% of the oil sold will end up as waste. There is no charge for the take-back service, although the company aims to recover the overall costs through the original sale price.

Pacific Petroleum has a 20,000 L waste oil storage tank at their terminal in Port Vila. The tank stands on an open bunded concrete area and looks to be in good condition. The waste oil is delivered to the site in 40 gallon drums and is pumped into the tank, while the empty drums are stored on site for subsequent re-use. When the tank is full the oil is pumped back into drums (with water separation, if possible) in preparation for shipping. The company also collects sludge removed from its own and other companies' on site oil/water separation systems. From time to time this is treated by air exposure on a concrete pad and the dried residue is sent to the local landfill.

Prior to 2005 the waste oil was being shipped to New Caledonia for use in a nickel smelter. However this practice was 'banned'. It is not clear what form this 'ban' took, but whatever it was, waste oil imports are no longer accepted in New Caledonia. In 2007, Pacific Petroleum started back-shipping the oil to Singapore using its own supply tanker, with the oil being passed on to unidentified users. The first shipment was a two year stockpile of around 200,000 Litres. Then in 2011 they were contacted by an Indian company who offered to buy their waste oil. Since then, they have been shipping the waste oil in 200 L drums, in shipping containers, directly to India. They indicated that the operation was roughly cost neutral.

The Pacific Petroleum managers are very proud of their oil recovery efforts – and with good reason – and would be happy to see their competitors doing likewise. Their primary concern is that everybody should be operating on a level playing field.

#### **A2.2 Trade Tools**

Trade Tools operates a retail business out of two separate premises in Port Vila and one on Santo. They supply a wide range of tools and associated consumables for the trade and home handyman markets. They sell lube oil in retail-sized containers, mainly 1 or 2 litres in size. They have only been selling oil for the last year or so but have recorded sales volumes of 25 to 30,000 L per month, or about 300,000 to 350,000 L per year. They have a major sales advantage for small users in that they have been able to find a cheaper product that retails at about 50% less than the price charged by the companies supplied through Pacific Petroleum.

Trade Tools does not operate any sort of take-back scheme, but indicated in-principle support for a collection program, while also being sceptical about the chances of it actually working.

#### **A2.3 Paradise Agriculture Supplies**

This company was listed by the DEPC as a significant supplier of lube oil through their retail outlet in Port Vila. However, when I visited the store it was closed and I was advised by a neighbour that the company were no longer operating in Port Vila. However, they do have another store on Santo.

#### **A2.4 Other Suppliers**

There are a number of other minor importers and retailers of lube oil, but the clear message received from most of the people spoken to during this visit, including taxi drivers, government employees and vehicle service stations, was that Pacific Petroleum and Trade Tools were the two of most significance.

#### **A2.5 UNELCO**

In Vanuatu, the electricity supply and distribution assets are owned by the government but are managed and operated by approved contractors. The dominant operator is UNELCO, which is a private subsidiary company of GDF Suez. UNELCO has been supplying electricity and water in Vanuatu since 1939. It has power station operations on the islands of Efate (2), Malekula and Tanna. One of the power stations on Efate (Tagabe) is operated on a 30% coconut oil/diesel mix, and they also have a wind farm which produces about 9.5% of the electricity needed by Port Vila.

The Port Vila power station has two low/medium-speed diesel-powered generating units, and the annual oil consumption is around 26,000 L. The primary waste produced by the station is around 18,000 L per year of oil/sludge mixture, which is collected in a high efficiency oil water separator. This waste is stored on site in a 10,000 L tank prior to being transferred to drums and sent to Pacific Petroleum.

The Tagabe power station on Efate, and the two small units on Malekula and Tanna use high-speed engines with a combined annual oil consumption of about 60,000 L per year. The waste oil from these is mainly produced through the regular changes of engine oil, and the total output volume is roughly half of the total input (ie. half of the lube oil is consumed in the engines). The wind farm on Efate also produces a small amount of waste oil (<500 L/year) from routine maintenance.

#### A2.6 Other Power Generators

The only other approved operator is Vanuatu Utilities and Infrastructure Ltd, which has only been operating since January 2011. VUI operates a diesel powered station and a hydro power station, both on Santo. I was unable to track down any representatives of this company, but understand that their lube oil is supplied by Pacific Petroleum (and hence already covered by the take-back scheme). They are a relatively minor operator with a total annual gross generation of around 8,500 MWh, compared to the total annual generation by UNELCO of over 60,000 MWh.

### A3. List of Contacts

Albert Williams Director, DEPC Ministry of Lands and Natural Resources Private Mailbag 9063, Port Vila phone (678) 25302	Ben Leeshi Director of Customs and Inland Revenue Private Mailbag 012, Port Vila phone (678) 24544
Glen Niowenmal, Port Vila Terminal Manager, and David Saul HSSE/Quality and Services Manager Pacific Petroleum Company PO Box 121, Port Vila phone (678) 23683	Tanguy Kerzreho, Power Generation Manager, and John Davies, Chief Mecanician Union Electrique du Vanuatu (UNELCO) PO Box 6, Port Vila phone (678) 26000
Bob Radovanovich, Managing Director Trade Tools Direct PO Box 840, Port Vila phone (678) 22940	General Manager Paradise Agriculture Suppliers Port Vila