Port Reception Waste Facilities Review – Vanuatu

The Commonwealth Marine Litter Programme

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Executive Summary

The Commonwealth Marine Litter Programme (CLiP) is an initiative delivered by the Centre for Environment Fisheries and Aquaculture Science (Cefas) and funded by the United Kingdom's Department for Environment, Food and Rural Affairs. The initiative supports five developing countries across the Commonwealth to develop national litter action plans focusing on preventing plastics entering the ocean.

In 2018, CLiP contracted Asia Pacific Waste Consultants (APWC) to carry out a review on the adequacy of waste reception facilities at targeted international and domestic ports in Vanuatu. This report outlines the findings from a review and gap analysis on the adequacy of waste reception facilities (for commercial, fishing, cruise liner and other vessels) in the country's two largest ports: Port Vila on the Island of Efate and the Port of Santo on the Island of Espiritu Santo.

To effectively review ship-generated waste in Vanuatu, the types and frequency of vessels at the port of Port Vila, Port of Santo and a number of domestic ports were explored as well as a review of fishing intensity in Vanuatu waters. The single greatest impact on ship-based marine litter is garbage generated on ships, including plastics (contaminated and clean), fishing gear waste, and domestic waste such as paper, cardboard, fluorescent lamps, synthetic material, foils, metal cans, lids, glass, and pantry packaging waste.

The review found that little capacity currently exists to service ship-generated oily wastes and sewage for either international or domestic shipping. For garbage and quarantine wastes, international shipping is serviced by basic measures which need to be improved. Little capacity exists for garbage management from domestic shipping by any of the responsible parties (ports, city councils and provincial authorities).

The review found that there are three main groups of port and shipping activities requiring focus if all waste types generated through shipping are to be effectively managed. These are:

- International ships conducting port calls that primarily involve inbound/outbound movements with modest time in ports and the EEZ
- International/national flagged fishing vessels that spend considerable time in the EEZ with or without port calls
- The large domestic fleet that ferries goods and people through Vanuatu

These three groups are important given their size and their potential to pollute through poor waste management practices. It is important to determine how much ship-generated waste they produce in Vanuatu waters, how much is appropriately disposed, and how much is lost to the environment. Gaps in data and infrastructure should be quantified and addressed, and increased efforts given to capacity building and awareness.

Estimates in this review found that around 13% of garbage generated on almost 350 ships berthed at the ports of Port Vila and Santo is actually landed. For locally based foreign and Vanuatu-flagged fishing vessels operating in Vanuatu waters, the estimate for the proportion of ship-generated garbage being landed in regional port waste reception facilities (Fiji) is approximately 20% of the waste generated. FFA National Fisheries Observers report that 13% of the total reported MARPOL garbage offences for long-liners occurred in Vanuatu waters.

The discrepancy between garbage generation estimates and actual waste disposed of at port is a significant but not unsurprising finding that is frequently mentioned in literature and should be taken into consideration in discussions related to the impact of shipping waste on the generation of marine litter in Vanuatu.

This report includes the findings of a detailed gap analysis conducted for each port, using assessment criteria mandated by the International Maritime Organisation (IMO). The assessment found reception facilities for oily wastes and sewage to be less than satisfactory at both ports. Garbage disposal is assessed as less than satisfactory at the port of Port Vila and the Port of Santo, with many areas requiring improvement. Overall, both ports received an assessment of less than satisfactory.

Noting the challenges faced by Vanuatu and many other Pacific island countries in providing adequate waste reception facilities for ships, the report outlines several recommendations to improve waste reception facilities at both locations, and to assist in meeting obligations under international, national and local laws.

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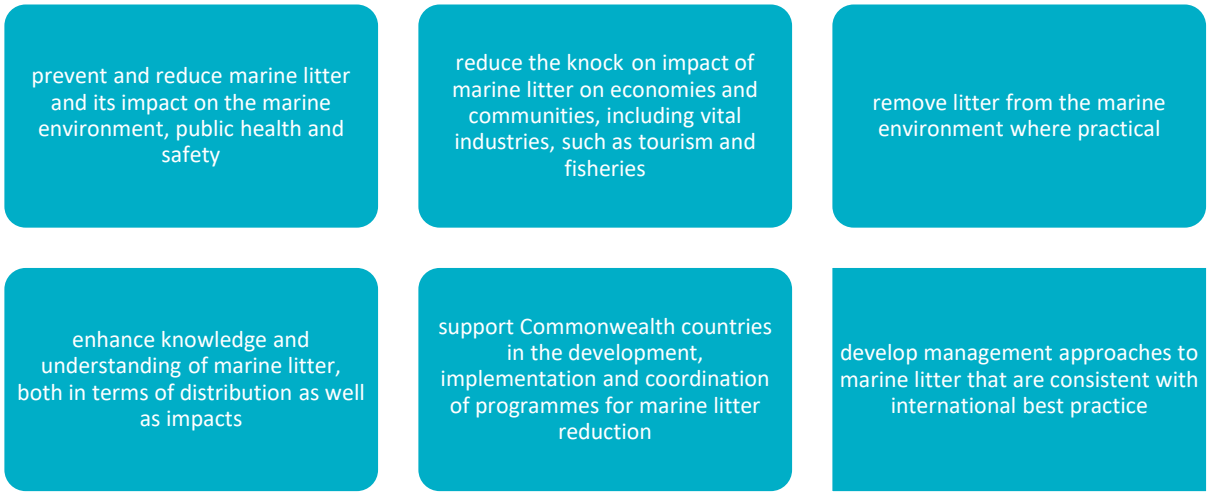
1 Background

The Commonwealth Marine Litter Programme (CLiP) is an initiative delivered by the Centre for Environment Fisheries and Aquaculture Science (Cefas) and funded by the United Kingdom's Department for Environment, Food and Rural Affairs. The initiative supports five developing countries across the Commonwealth in developing national litter action plans focusing on preventing plastics from entering oceans.

CLiP's main objectives are as follows:

Figure 1 CLiP Objectives



In 2018, CLiP contracted Asia Pacific Waste Consultants (APWC) to carry out a review of the adequacy of waste reception facilities at targeted international and domestic ports in Vanuatu. The aim of the review is to collect information on ship-generated waste, port reception facilities and waste reception handling plans, and to develop recommendations to reduce the leakage of ship-based sources of waste into the environment.

Image 1 Cages and oil pans for burning ship-generated waste at the private fisheries wharf in Luganville

2 Scope

This report outlines the findings of a review and gap analyses on the adequacy of waste reception facilities (for commercial, fishing, cruise liner and other vessels) at the port of Port Vila and the Port of Santo, Vanuatu.

The analysis provides an overview of the waste reception services currently provided at the two international ports, identifies gaps in this service with reference to the International Convention for the Prevention of Pollution from Ships (MARPOL), and outlines recommendations on how these gaps can be addressed.

The gap analyses conducted at these two sites took place in November 2018, and the findings have been prepared in accordance with the International Maritime Organization's (IMO) Guidelines for Ensuring the Adequacy of Port Waste Reception Facilities as outlined in Resolution MEPC.83 (44).

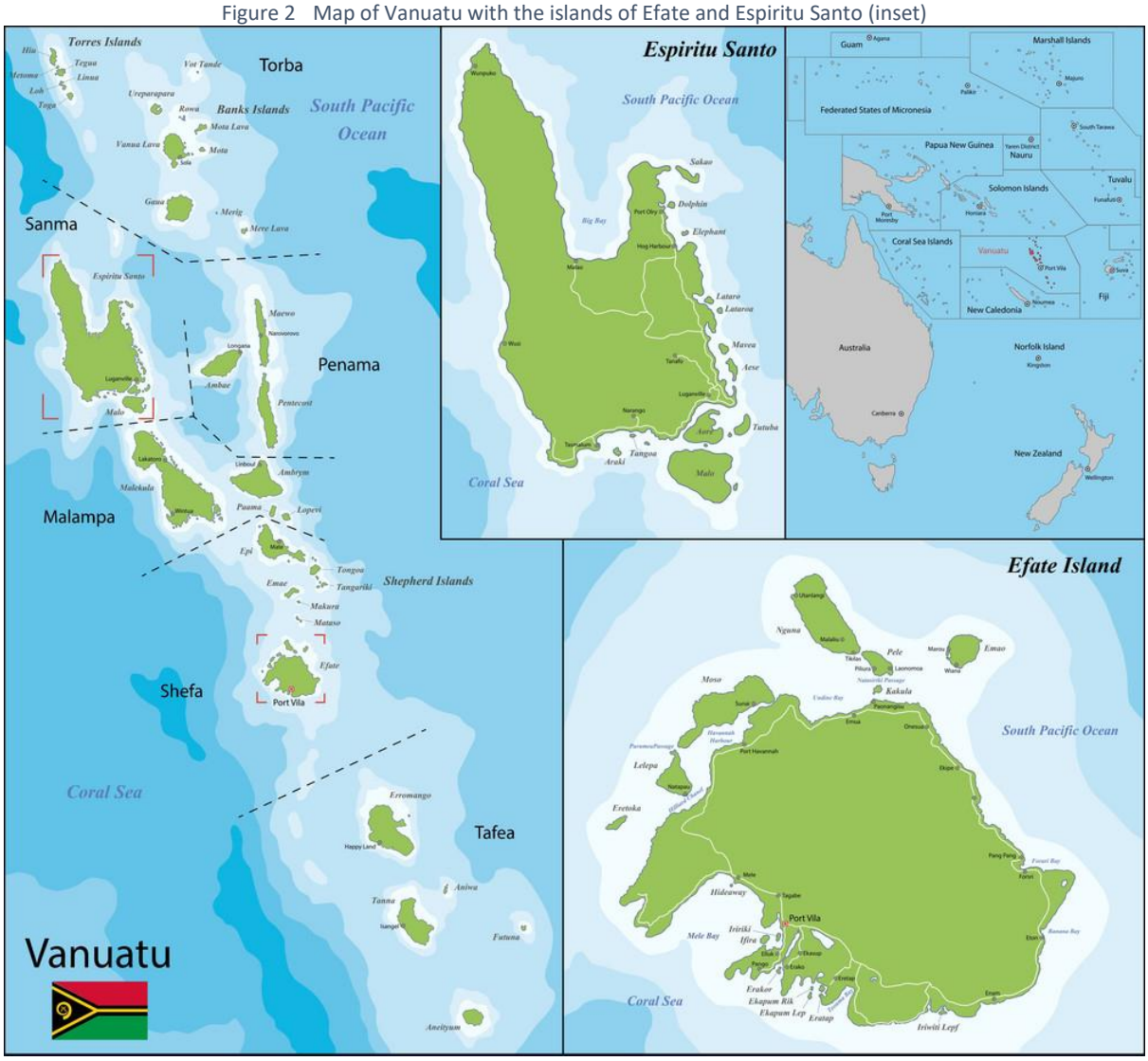
Given that MARPOL does not apply to waste generated by land-based operations at the terminal or wharf, these analyses consider only waste generated by vessels resulting from their compliance with the Convention.

Image 2 Wharf area and international terminal, Port of Santo – P&O cruise liner port call

3 Country Information

Vanuatu — officially the Republic of Vanuatu — is a Pacific island nation located in the South Pacific Ocean. The archipelago, which is of volcanic origin, is some 1,750 kilometres (1,090 miles) east of northern Australia, 540 kilometres (340 miles) northeast of New Caledonia, east of New Guinea, southeast of the Solomon Islands, and west of Fiji. There are 82 islands with an estimated population of 275,901 (2017).

Figure 2 Map of Vanuatu with the islands of Efate and Espiritu Santo (inset)



In the 1880s, France and the United Kingdom claimed parts of the archipelago, and in 1906 agreed on a framework for jointly managing the archipelago as the New Hebrides through a British–French condominium. An independence movement arose in the 1970s and the Republic of Vanuatu was founded in 1980.

There are two major international ports in Vanuatu acting as cargo hubs for the country. One is located in Port Vila, Efate, Shefa Province; and the second in Luganville, Santo, Sanma Province.
Inter-island shipping to small ports across Vanuatu also occurs from these two ports.

Figure 3 Aerial view of the port of Port Vila and the international container terminal

There are four international ports for the purposes of providing customs and immigration clearances for yachts, as show below:

Figure 4 Vanuatu international ports

- Port of Port Vila
- Port of Santo
- Vanua Lava, Torba Province
- Tanna, Tafea Province

In addition to the international ports, cruise vessels moor at anchorage at:

Figure 5 Vanuatu additional cruise vessel mooring points

- Mystery Island, off Aneityum Island, Tafea Province
- Champagne Beach, Santo, Sanma Province
- Pangi, Pentecost, Penama Province (April to June for diving season only)

Figure 6 Aerial view of the Port of Santo showing the international terminal and domestic government wharf

4 Legislative Context

4.1 Multilateral Environmental Agreements

Vanuatu is party to numerous multilateral environmental agreements (MEAs) of relevance to the management and reduction of waste, pollution control and marine litter, as shown in Table 1.

Table 1 Vanuatu's participation in MEAs and conventions related to waste and shipping

Multilateral agreements and conventions	Status
Basel Convention on Control of Transboundary Movements of Hazardous Wastes and Their Disposal	Accession. Entry into Force 13/01/2019
Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade	Accession. Entry into Force 14/01/2019
Stockholm Convention on Persistent Organic Pollutants	Ratified
The Waigani Convention to Ban the Importation into Forum Island Countries of Hazardous and Radioactive Wastes and to Control the Transboundary Movement of Hazardous Wastes within the South Pacific Region	Ratified
Montreal Protocol on Substances that Deplete the Ozone Layer	Ratified
MARPOL 73/78: International Convention for the Prevention of Pollution from Ships, 1973 as modified by the Protocol of 1978 (Annexes I, II, III, IV, V, and VI)	Ratified
London Convention on the Prevention of Marine Pollution by the Dumping of Wastes and Other Matter	Ratified
Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Protocol)	Ratified
Intervention on the High Seas in Cases of Oil Pollution Casualties (Convention 1969)	Ratified
Intervention on the High Seas in Cases of Oil Pollution Casualties (Protocol 1973)	Ratified

Multilateral agreements and conventions	Status
Protocol to the International Convention on Civil Liability for Oil Pollution Damage of 29 November 1969 (1976)	Ratified
International Convention on Civil Liability for Oil Pollution Damage 1969 (renewed 1992)	Ratified
International Convention on the Protocol of 1976 to Amend the International Fund for Compensation for Oil Pollution Damage, 1971	Ratified
Protocol of 1992 to Amend the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1971	Ratified
International Convention on Oil Pollution Preparedness, Response and Co-operation Convention 1990	Ratified
Protocol on Preparedness, Response and Co-operation to pollution Incidents by Hazardous and Noxious Substances, 2000 (OPRC/HNS) 2000	Ratified
International Convention on Civil Liability for Bunker Oil Pollution Damage (BUNKER) 2001	Ratified
International Convention on the Control of Harmful Anti-fouling Systems in Ships (AFS Convention) 2001	Ratified
Small Island Developing States Accelerated Modalities of Action (SAMOA Pathway)	Ratified

While Vanuatu's commitment to all these MEAs is important to preventing degradation of the natural environment and preventing marine debris, of crucial importance to this analysis are the regulations underpinning the International Convention for the Prevention of Pollution from Ships, known as MARPOL.

The relationship between MARPOL and its regulations related to port reception facilities (PRF) is explored in detail below.

4.1.1 The International Convention for the Prevention of Pollution from Ships (MARPOL)

The key international convention addressing pollution of the marine environment by ships is the International Convention for the Prevention of Pollution from Ships, known as MARPOL.

The MARPOL Convention was adopted in November 1973 at the IMO with additional protocols and amendments incorporated over time. The Convention includes regulations aimed at preventing and minimising both accidental and routine pollution from ships and, at the time of writing, includes six technical annexes.

MARPOL outlines specific obligations with regard to the provision of waste reception facilities. The onus for meeting these obligations is on government authorities rather than on ships or private companies. These obligations are designed to ensure that ships are able to legally dispose of their waste, thus preventing illegal discharge to the marine environment and/or inappropriate land disposal.

Specific regulations of relevance to the issues of waste reception facilities (WRPs) are outlined in Table 2 below.

Table 2 MARPOL regulations of relevance to waste reception facilities

Annex I Regulations for the Prevention of Pollution by Oil (entered into force 2 October 1983)
This Annex covers prevention of pollution by oil from operational measures as well as from accidental discharges. Of relevance to this report is Regulation 38.1, which requires the Government of each Party to provide facilities for the reception of oily residues and mixtures at oil-loading terminals, repair ports, and in other ports in which ships have oily residues to discharge. Such facilities must be adequate to meet the needs of the ships using them without causing undue delay. Regulations 38.2 and 38.3 expand on this basic requirement with reference to sludge tanks, oily bilge waters and certain other residues which are not permitted to be discharged en route.
Annex II Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk (entered into force 2 October 1983)
Annex II details the discharge criteria and measures for the control of pollution by noxious liquid substances (NLS) carried in bulk. Regulation 18.1 requires the Government of each Party to ensure that ports and terminals involved in bulk NLS cargo handling or NLS tanker repairs have adequate facilities for the reception of residues and mixtures containing noxious liquid substances.
Annex III Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form (entered into force 1 July 1992)
This Annex contains general requirements for the issuing of detailed standards on packing, marking, labelling, documentation, stowage, quantity limitations, exceptions and notifications on substances identified as marine pollutants in the International Maritime Dangerous Goods Code.
Annex IV Prevention of Pollution by Sewage from Ships (entered into force 27 September 2003)
Annex IV focuses on requirements to control pollution of the sea by sewage. It prohibits the discharge of sewage into the sea, except when the ship has an approved sewage treatment plant or when the ship is discharging comminuted and disinfected sewage using an approved system at an approved distance. Regulation 12.1 requires the Government of each Party to ensure the adequate provision of facilities at ports and terminals for the reception of sewage, without causing delay to ships.
Annex V Prevention of Pollution by Garbage from Ships (entered into force 31 December 1988)
This Annex looks at different types of garbage and specifies the distances from land and the manner in which they may be disposed of. Notably, this Annex incorporates a complete ban on the disposal of all forms of plastics into the sea.
Annex VI Prevention of Air Pollution from Ships (entered into force 19 May 2005)
Annex VI sets limits on sulphur oxide and nitrogen oxide emissions from ship exhausts and prohibits deliberate emissions of ozone-depleting substances. Regulation 17.1 requires the Government of each Party to ensure the provision of facilities adequate to meet the needs of ships using its repair ports for the reception of ozone-depleting substances and equipment containing such substances. It further requires that reception facilities are provided for exhaust gas cleaning residues in enclosed ports, harbours and estuaries.

4.1.2 Special provisions in MARPOL for Small Island Developing States (SIDS)

In recognition of the unique challenges that SIDS experience in providing adequate waste reception facilities for ships, the IMO specifies that providing such facilities at a regional level (as opposed to the national level) may be permitted. The MARPOL Convention provides a legal basis for such regional arrangements in unique circumstances.

In 2014 the Secretariat of the Pacific Regional Environment Programme (SPREP) and the Australian Maritime Safety Authority (AMSA) developed a proposal for a *Pacific Regional Reception Facilities Plan*. The Plan was endorsed by parties at the 12th meeting of the *Convention for the Protection of the Natural Resources of Environment of the South Pacific Region and Related Protocols* (the Noumea Convention) on 26 September 2014. It was subsequently approved in May 2015 by the IMO's Marine Environment Protection Committee at MEPC68 and officially came into effect in May 2016.

Assessments conducted to inform the development of the plan identified all but five ports in the Pacific region as being ports with limited facilities (PLFs) that do not meet 'adequacy' criteria as defined by the IMO. As such, the plan proposes that adequate reception facilities should be provided on a regional basis. It identifies the following locations as potential Regional Ships' Waste Reception Centres that could serve the needs of the ships visiting not only those ports but also other ports connected by international shipping traffic:

Figure 7 Identified regional ships' waste reception centres

Samoa	Papua New Guinea	New Caledonia	Tahiti	Fiji
• Port of Apia	• Port Moresby	• Noumea	•Papeete	•Suva

The endorsement of the Pacific Regional Reception Facilities Plan by the IMO ensures that Pacific Island governments can continue to meet their MARPOL obligations, despite most ports in the region failing to comply with waste reception facility standards.

While Pacific island countries such as Vanuatu are now relying on such arrangements, and with many international vessels being instructed not to discharge wastes in Vanuatu but at other larger ports such as in Fiji, there is currently little data on the effectiveness of this arrangement in preventing leakage of ship-generated waste.

4.2 National regulations and strategy

The following regulations address solid waste management and control of pollution, including waste from shipping, in Vanuatu:

4.2.1 *Ports Act 1980*

Vanuatu's Ports Act (revised 1988) establishes the Port Authorities and creates powers for the General Manager, Harbour Master and others to manage the port. The Act also includes powers to levy dues on vessels using the port. The Authority can also levy dues on goods passing through the port, and rates for the use of port land, services, equipment and storage.

4.2.2 Ozone Layer Protection Regulations

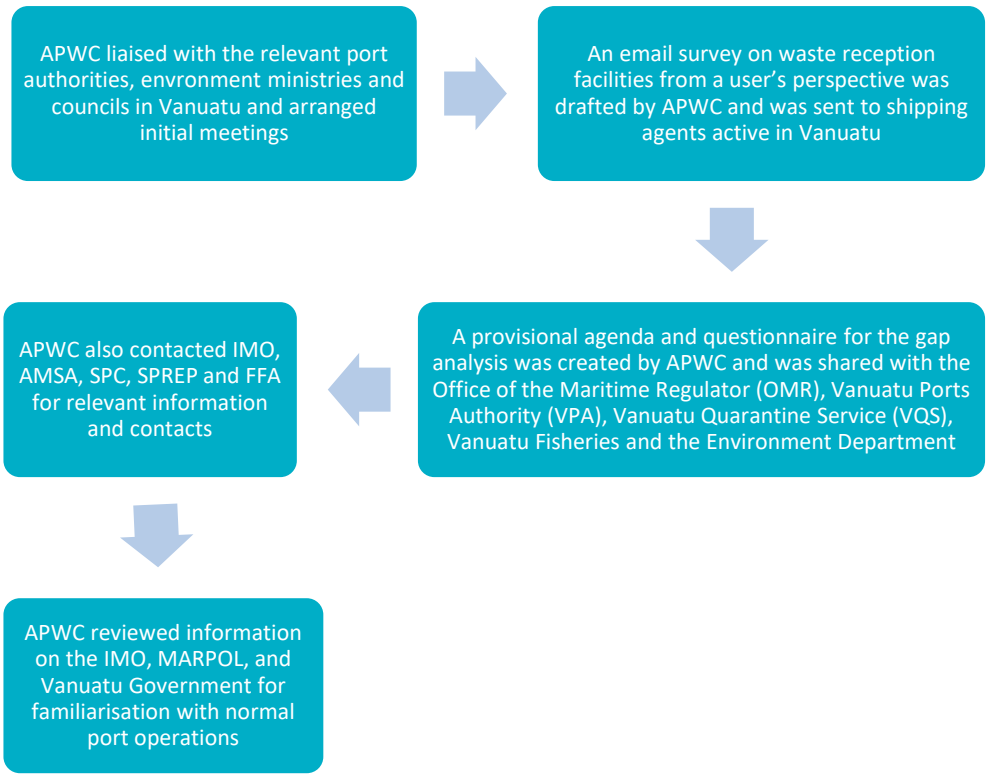
Vanuatu's *Ozone Layer Protection Act No. 27 of 2010* (Amendment) Act No. 3 of 2014 implements the Montreal Protocol to the Vienna Convention for the Protection of the Ozone Layer 1987 (the Montreal Protocol). It provides requirements for the handling of ozone-depleting substances, including licensing, storage, disposal and fees.

5 The Review Process

5.1 Preparation

In preparation for the review and analysis, several activities were carried out in advance of the in-country port visits:

Figure 8 Pre-visit planning activities



Following the review process, it was determined that the in-country visits and assessments should focus on Port Vila (on the island of Efate) and the Port of Santo (on the island of Espiritu Santo). These two ports differ considerably in their proximity to major services. The two ports also differ in scale, with the port of Port Vila being the major container terminal for Vanuatu while the Port of Santo is dominated by a combination of agricultural and tourist vessels.

5.2 Port visits

The port audit team conducted on-site work in Vanuatu in November 2018. Visits were conducted in two stages, with visits to the island of Efate and the port of Port Vila taking place from 5 to 16 November and visits to the island of Santo and the Port of Santo taking place from 17 to 21 November.

Field site visits were conducted in both locations in Vanuatu. Interviews were conducted with key stakeholders for ports and waste management, including the private sector and other relevant institutions such as the Vanuatu Maritime Training Centre.

6 Ship-generated waste in Vanuatu

To effectively review ship-generated waste in Vanuatu, the types and frequency of vessels at the port of Port Vila and the Port of Santo were explored, along with a review of the waste types generated by these vessel types.

6.1 Type and frequency of vessels

Port data obtained for 2018 for Port Vila (Table 3) and the Port of Santo (Table 4) indicate a total of 224 vessels visited Port Vila in 2018 and 85 vessels visited the Port of Santo in the same period.

At the port of Port Vila, cruise liners accounted for the largest segment of traffic, with almost half (47%) of total traffic. By contrast, cruise liners accounted for only 11% of total traffic at the Port of Santo where container vessels accounted for the largest segment (42%). It is noted this is a temporary trend due to works on a new cruise terminal on Santo having temporarily reduced cruise liners from 50 visits a year to less than 15. This is expected to normalise in 2020 with a return to approximately 50 vessels a year.

Table 3 Port data log 2018: Port Vila

Vessel	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cruise liner	14	8	14	10	9	6	6	4	9	8	10	8
Container vessel	-	4	3	8	4	5	4	5	5	3	7	5
Bulk	2	4	3	2	2	2	2	3	4	4	2	5
RoRo	-	-	1	-	1	-	1		3	4	5	4
Tanker		1	1	1	1	1	1	1	1	1	1	1
Fishing vessel	-	-	-	-	-	-	-	-	-	-	-	-
Logging ship	-	-	-	-	-	-	-	-	-	-	-	-
Long-liner	-	-	-	-	-	-	-	-	-	-	-	-
Luxury craft	-	-	-	-	-	-	-	-	-	-	-	-
Unknown	-	-	-	-	-	-	-	-	-	-	-	-
Total	16	17	22	21	17	14	14	13	22	20	25	23

Table 4 Port data log 2018: Port of Santo

Vessel	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cruise liner	1	-	2	2	-	2	-	-	-	-	2	1
Container vessel	1	6	3	4	2	4	2	3	3	4	2	2
Bulk	1	-	3	2	3	4	1	3	4	1	4	2
RoRo	1	-	-	-	-	-	-	-	1	3	3	3
Tanker	-	-	-	-	-	-	-	-	-	-	-	-
Fishing vessel	-	-	-	-	-	-	-	-	-	-	-	-
Logging ship	-	-	-	-	-	-	-	-	-	-	-	-
Long-liner	-	-	-	-	-	-	-	-	-	-	-	-
Luxury craft	-	-	-	-	-	-	-	-	-	-	-	-
Unknown	-	-	-	-	-	-	-	-	-	-	-	-
Total	4	6	8	8	5	10	3	6	8	8	11	8

International and domestic shipping conducting port calls (i.e. commercial vessels, cruise liners, naval vessels), as well as those operating in Vanuatu's Economic Exclusion Zone (EEZ) without landing (i.e. international fishing vessels), all contribute to the potential volumes of ship-generated waste produced in Vanuatu's territory. This contribution needs to be estimated to enable effective waste management to be undertaken.

In 2018, the port of Port Vila received a reported 224 international port calls (commercial shipping and cruise liners), while the Port of Santo reported 85 international port calls (see Table 3 and Table 4). Estimates for domestic intra-island shipping port calls for Port Vila and Port of Santo are 202 and 780 respectively; these are in the 20 to 500 tonne range.

The Vanuatu Government also operates an international (Vanuatu-flagged) fishing fleet of 75 long-liners and three purse-seiners which operate in both the Vanuatu EEZ as well as other international waters. Vanuatu has approximately 32 officers participating in the National Observer Program where they record transgressions to MARPOL regulations, including those related to ship-generated waste.

The Vanuatu government also permits up to 75 foreign-flagged fishing vessels (mostly Chinese) and 40 locally based vessels to fish within the zone. While the Vanuatu-flagged vessels are well represented by National Observers, coverage of many of the foreign-flagged vessels is poor. As a result, there is minimal information available on how effectively these foreign-flagged vessels manage their wastes in accordance with MARPOL requirements.

6.2 Ship-generated waste types

A list of the types of waste generated by ships is outlined in the table below.

Table 5 Waste types generated by ships

Oily wastes	
Description	Oily wastes generated through shipping include oily bilge water, oily residues (sludge), oily tank washings (slops), and some types of operational wastes such as used cooking oil, used lubricants and oily rags.
Drivers	The generation of oily wastes varies and depends on factors such as the size of the ship, engine room design, preventative maintenance, age of the components on the ship, type of engine, the age of the engine, type of fuel burnt, engine running hours per day and (in the case of slops) the number of oil tank cleanings and the type of fuel carried.
Vessels	While the type and volume of oily waste generated varies between vessels, all vessels produce some oily resides (sludge).
Noxious liquid substances (NLS)	
Description	The IMO defines NLS as those which, if discharged into the sea from tank cleaning or de-ballasting operations, are deemed to: present a major hazard to either marine resources or human health (Category X); present a hazard to either marine resources or human health or cause harm to amenities or other legitimate uses of the sea (Category Y); or present a minor hazard to either marine resources or human health (Category Z).

Drivers	Efficiency and methods used in cleaning and offloading cargo.
Vessels	Waste from NLS is only generated through the carriage of chemicals in bulk.
Sewage	
Description	Sewage is defined as drainage and other wastes from any form of toilets and urinals; drainage from medical premises, via wash basins, wash tubs and scuppers located in such premises; drainage from spaces containing living animals; or other waste waters when mixed with the drainages outlined above.
Drivers	Drivers for the generation of sewage include: the number of crew members, passengers or livestock; the type of toilets; the length of voyage; and the type of sewage treatment, comminuting or disinfection facilities on board.
Vessels	All vessels potentially have sewage on board.
Garbage	
Description	Garbage generated on ships includes plastics (contaminated and clean), fishing gear waste, and domestic waste such as paper, cardboard, fluorescent lamps, synthetic material, foils, metal cans, lids, glass, pantry packaging waste, etc.
Drivers	The main drivers are the number of crew and passengers and the types of products used by crew and passengers.
Vessels	All vessels generate garbage. • Cruise ships generate very large amounts of domestic garbage due to the number of persons on board. Cruise ships also generate high volumes of food wastes and food and beverage packaging as well as medical wastes and certain small hazardous items such as batteries, aerosol cans and photo processing chemicals. • General cargo vessels produce smaller amounts of domestic garbage, but garbage such as dunnage and other cargo-related waste is more significant. • Tankers produce similar volumes of domestic garbage as for general cargo ships. • Fishing vessels generate fishing gear waste such as damaged nets, lines and other fishing gear in addition to domestic garbage.
Ozone-depleting substances (ODS)	
Description	Ozone-depleting substances are used on board ships in air-conditioning appliances or cooling equipment on reefers. They can also be contained in mobile equipment (fridges, mobile air conditioners).
Drivers	Presence of appliances and technologies that emit ODS.
Vessels	Only vessels equipped with appliances and technologies that emit ODS.

In the context of Vanuatu, it is important to note that wastes associated with the bulk carriage of NLS and ODS are largely inconsequential due to the nature of the vessels using the ports. However, all vessels – regardless of their size, purpose or cargo – produce some form of oily waste, sewage and garbage. The volumes of these waste types is highly dependent on the vessel type.

6.3 Shipping wastes and marine litter

All shipping waste types have the potential for negative human health and environmental consequences. Garbage is the most detrimental, ship-based source of marine litter. For fishing vessels, the incidence of plastic marine litter increases.

Of all the waste types, data related to Annex V waste types (garbage and plastics) has universally proven to be the most unreliable.

A study conducted by independent research and consultancy organisation CE Delft (2017) for the European Maritime Safety Agency compared actual waste quantities from ships with reported waste quantities. The findings correlate with other similar studies, in that notified versus landed waste quantities were most accurate for MARPOL Annex I waste types (related to oil) and were least accurate for MARPOL Annex V waste types (garbage and plastics), with a differential of between 20% and 600%.

Such findings are further supported by Western and Central Pacific Fisheries Commission (WCPFC, 2015) garbage reporting, which estimated an average of 27% of the garbage generated is landed. Preliminary findings from a 2018 FFA report suggest landed waste may be as low as 11% of waste generated in several Pacific ports.

Fishing vessels reporting under the National Fishing Observers Program on garbage and other waste management activities, and violations through the Generation 6 SPC/FFA Observer GEN-6 Forms from 2003–2015, showed more than 10,000 violations, primarily from purse-seiners but also long-liners (WCPDC, 2015).

Plastic discharge constituted 71% of these violations, and 71% of the incidents were from fishing vessels flagged by nations distant from the actual fishing area. Thirteen per cent (13%) of the incidents from long-liners and 1% from purse-seiners occurred in Vanuatu waters.

MARPOL requirements do not apply for domestic vessels in Vanuatu waters and no data was found for quantities of ship wastes (including garbage) produced, numbers of passengers on ships or days vessels are on the water. The volumes generated would be expected to be considerable, with more than 200 registered ships of 30 to 120 tonnes conducting potentially thousands of ship movements moving large amounts of people and goods brought into the international ports to all corners of the archipelago.

6.4 Estimation of actual versus notified garbage from vessels in Vanuatu

For the purpose of this review, information on shipping activities has been collected from a variety of sources and activities combined with methodologies used in previous port reception facility waste audits, in order to estimate shipping waste generation. Garbage estimates are based on an assumption of 2 kilograms per person per day for non-cruise ships and 3 kilograms per person per day for cruise ships. It was also assumed that ships would spend an average of three days at sea prior to calling at Port Vila.

Table 6 Calculation of estimated garbage quantities, port of Port Vila and Port of Santo

Vessel	Average number of people on board	Average days at sea prior to port call	Annual visits	Garbage generated (kg/person/day)	Garbage generated per ship visit (kg)	Annual garbage generated (kg)
Non-cruise	25	3	193	2	150	28,950
Cruise liners	2,000	3	116	3	18,000	2,088,000
Long-liners	8	14	317*	2	224	71,008
Total:						2,187,956

*trips within Vanuatu's EEZ

A different average number of days is applied for fishing vessels, following information from the FFA report (2018) stating that average days in the Pacific Islands (including Vanuatu) for purse-seiners is 28 days at sea followed by seven days in port, while for long-line vessels it is 14 days at sea followed by three days in port.

As outlined in Table 6, the total annual generation of garbage by vessels visiting the ports of Port Vila and Santo was estimated at 2,187,956 kilograms, with most from cruise liners. By comparison, Quarantine department data for 2018 for the ports of Port Vila and Port Santo estimate that approximately 277,056 kilograms of garbage is received in port each year for international shipping (see Appendix A).

These findings would suggest only around 13% of the total garbage generated by ships on their voyages prior to calling at the port of Port Vila and the Port of Santo is actually being landed, with the remaining 87% being withheld for disposal at regional ports, destroyed on vessels by incineration or dumped at sea.

For the fishing vessels operating in Vanuatu's EEZ which do not make port calls in Vanuatu but instead travel to regional port reception facilities in Fiji, it is estimated they generated 72 tonnes of garbage with 14 tonnes (20%) being landed. The generation is estimated using fishing vessel data presented in Section 6.5.

6.5 Other estimations of garbage from fishing vessels in Vanuatu

The Republic of Vanuatu Fisheries Department (2018) report to the WCPFC Scientific Committee (WCPFC-SC14-AR/CCM-28) states 78 national and internationally flagged long-line vessels made an estimated 317 trips in Vanuatu's EEZ during 2017.

Based on average numbers of crew (eight for long-liners/pole-liners), the previously reported generation of 2 kilograms of garbage per person per day, and an average trip period of 14 days (from a recent FFA report), the overall garbage generation estimate for national fishing vessels and foreign fishing vessels based in Vanuatu waters can be estimated at 71 tonnes per year.

The FFA (2018) report estimated that long-line vessels landing garbage in Suva did so at a rate of 0.40 kilograms per person per day. This would equate to approximately 14 tonnes of garbage per year for the national and foreign-flagged long-line fleet operating in Vanuatu's EEZ.

Compared with the estimate of 71 tonnes of garbage generated in the Vanuatu EEZ, approximately 20% is landed at regional port reception facilities and the remaining 57 tonnes (80%) generated is either burned or dumped at sea.

This estimate does not account for the garbage produced by other Vanuatu and foreign-flagged fishing vessels operating across multiple EEZs.

6.6 Situation with domestic shipping and garbage estimation in Vanuatu

Vanuatu is a large Melanesian island country, with a population of 275,000, a land area of about 12,189 square kilometres with six large islands and 80 smaller islands spread across a sea area of 710,000 square kilometres. More than 80% of the population lives in rural villages of a few hundred.

Domestic shipping is therefore vital to the country's transport sector, providing access between the six main islands and smaller island groups. Shipping is also a means of transportation in rural areas where road coverage is poor. Passengers use maritime transport for social, educational, health, and commercial purposes. Goods are freighted between the outer islands and Port Vila, for both interprovincial trade and export. Imports include consumer goods, building materials and fuel.

More than 480 registered domestic vessels in the 20 to 500 tonne range service this need, including 243 passenger, cargo, fishing, tug and pilot operation vessels, 64 cargo and passenger vessels and 175 coastal cargo vessels. A typical voyage will involve long distances from the main centres and export gateways (such as international ports) to remote islands and coasts and vice versa.

Based on the information above it is apparent that large amounts of wastes would be generated from domestic shipping (including garbage), however the lack of data prevents any estimates from being generated at this time.

7 Gap Analysis – Port of Port Vila

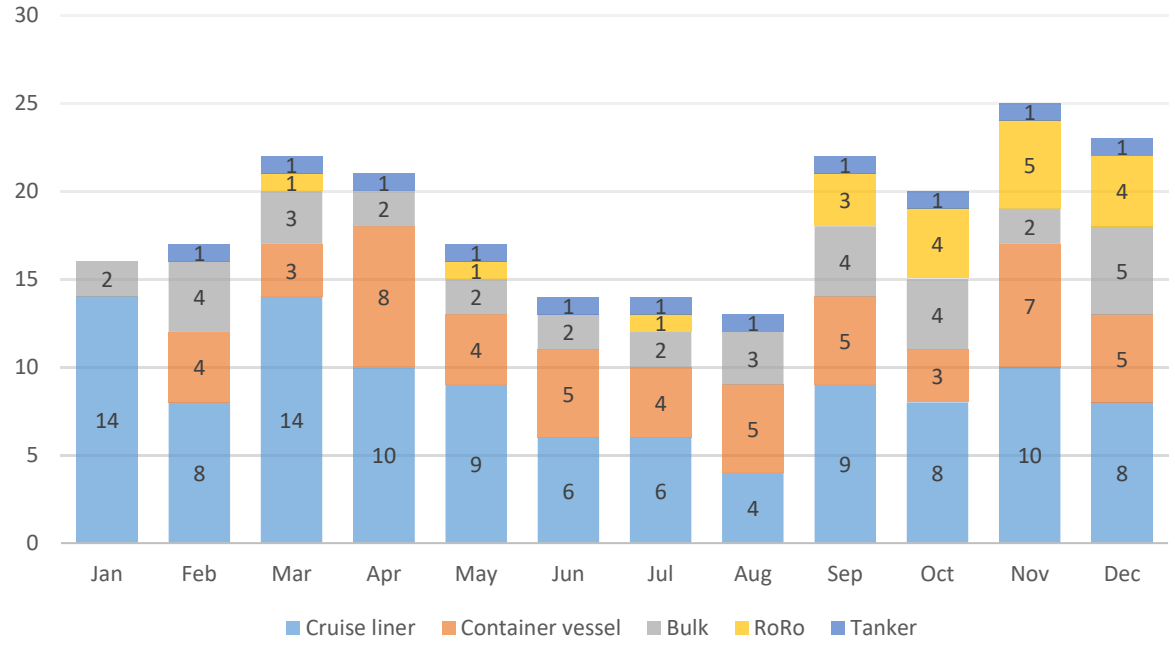
7.1 Overview

Port Vila is the main port of entry into Vanuatu, with more than 200 international vessels visiting per year moving over 2,200 twenty-foot equivalent unit (TEU) containers. However, wharf infrastructure is currently limited. Until recently there was only one multi-purpose berth to service cargo ships, cruise vessels and tankers. Cargo ships had to give way to cruise vessels and were required to sit at anchorage until the cruise ships departed, causing delays in cargo and petroleum services. The new multi-purpose wharf has now been constructed adjacent to the former Star Wharf and provides a dedicated berth for international cargo ships, as well as a smaller berth for the more than 200 annual domestic inter-island cargo ship movements.

The Ports and Marine Department manage this wharf and South Sea Shipping is the agent for the cruise ships. Ifira Wharf and Stevedoring has transitioned to the new Lapetasi Wharf from October 2017. The old Star Wharf will become the new Lapetasi Wharf for cargo ships only (international and domestic). The Ports and Marine Department will manage the wharf pilots and regulatory requirements. Ifira Wharf and Stevedoring will manage the stevedoring and cargo handling. Unfortunately, the new construction did not include any additional infrastructure for the management of sewage and waste.

In 2018, the port of Port Vila accommodated 224 vessels in total, with an average of 18.6 per month. Figure 9 depicts the number of vessels received at the port for each month of 2018, by vessel type.

Figure 9 2018 port log data: port of Port Vila



7.2 Summary of Waste Reception Facilities: Port Vila

The port of Port Vila provides reception facilities for garbage and quarantine wastes, with limited facilities available to support the reception of sewage and used lubricating oil, both of which are services available to domestic vessels only. In the case of used oil, the facilities are further limited to an extended producer responsibility (EPR) scheme run by one producer.

Reception facilities for oily wastes and sewage from international vessels are not available. Facilities to receive wastes from NLS are also not present, but it is worth noting that bulk NLS vessels do not visit the port. A summary of waste reception facilities at the port of Port Vila is outlined in Table 7 below.

Table 7 Summary of Waste Reception Facilities: port of Port Vila

Type of waste	Can waste be received?	Type of reception facility	Any limitations in capacity?	Service provider
Oily				
Oily tank washings	No	-	-	-
Dirty ballast water	No	-	-	-
Oily bilge water	No	-	-	-
Oil sludges	No	-	-	-
Used lubricating oil	Limited – domestic only	Loaded in 200 litre drums, manual offload	Limited to one supplier which has a take-back scheme	Private supplier
Noxious liquid substances	No	-	-	-
Sewage	Limited –domestic only	Road tanker	Tanker volume	Private service
Garbage	Yes	Airport incinerator Open incineration Deep burial	Vehicle size and volume	Quarantine service/agent
Quarantine wastes	Yes	Airport incinerator Open incineration Deep burial	Vehicle size and volume	Quarantine service/agent

7.3 Demand for Waste Reception Facilities

The demand for waste reception facilities for international shipping at the port of Port Vila is moderate, with more than 200 international vessels making port calls in 2018. However, this is mostly not catered for due to a lack of infrastructure and services to adequately manage wastes that are generated on land, let alone further wastes from shipping. The one exception is the acceptance of 'dry garbage', mostly from cruise liners and visiting naval vessels.

As a result, the port of Port Vila does not accept most of the waste generated by international shipping, instead using the Pacific Regional Reception Facilities arrangements discussed in Section 4.1.2. This effectively means that ships are expected to retain most of their wastes on board, mostly for disposal in Fiji but potentially at other ports.

Demand for waste reception facilities at the port of Port Vila is detailed in Table 8. It should be noted that the data is limited to waste generated and landed from those international vessels making port calls, and does not account for waste generated from international fishing vessels in Vanuatu waters (which are meant to dispose of such wastes in Fiji or other ports under the regional arrangements).

The effectiveness of these arrangements in accounting for wastes and preventing leakage are unknown, as is information on compliance.

Image 3 New international container terminal at the port of Port Vila

The available data is also unable to account for waste generated and disposed of by the considerable domestic intra-island fleet which make almost a thousand port calls per year to Port Vila and Luganville alone, often on multi-day trips, with little infrastructure to service these vessels.

Demand for port waste reception facilities at Port Vila is likely to increase if plans proceed for a fish processing factory to be established in Vila, which would have up to 100 international fishing vessels unloading and resupplying.

Table 9 Demand for waste reception facilities: port of Port Vila

				Number of requests for waste collection				
Ship type	Number of ship visits (2018)	Average range of dead weight (tonnes)	Average number on board	Oily wastes	NLS	Sewage	Garbage	Quarantine
Oil tankers	11	unknown	25	0	0	0	0	0
Crude oil tankers	0	-	-	-	-	-	-	-
Combination carriers	0	-	-	-	-	-	-	-
Chemical tankers	0	-	-	-	-	-	-	-
General cargo	19	unknown	25	0	0	0	0	0
Container carriers	53	unknown	25	0	0	0	0	0
Bulk carriers	35	unknown	25	0	0	0	0	0
Passenger ships	106	unknown	2000	0	0	0	24	24
Livestock carriers	0	-	-	-	-	-	-	-
Fishing vessels	0	-	-	-	-	-	-	-
Recreational craft	0	-	-	-	-	-	-	-
Other	12	-	50	-	-	-	12	12

7.4 Assessment of Waste Reception Facilities

This section presents the detailed assessment of each waste type.

7.4.1 Oily wastes

The assessment of waste reception facilities for oily wastes at the port of Port Vila is detailed in Table 10. The assessment found that the reception of oily waste from international ships is not available at the port of Port Vila, nor at any other location in Vanuatu. However, some domestic vessels offload used oils/oily wastes under limited conditions under a take-back scheme run by one oil/fuel supplier. This supplier will accept its returned end-of-life products, but not used oils that were provided by other suppliers.

Given there is currently no means of treatment or disposal of oily wastes in Vanuatu, any potential oily waste received from ships would need to be stored. The situation of waste oil storage is however very serious, with growing stockpiles due to low oil prices. There is, however, potential for oily wastes to be shipped for use in Fiji as a fuel replacement in the steel works and battery smelter.

Image 4 Main port area at the port of Port Vila – French naval vessel offloading quarantine waste and donated goods

Table 10 Assessment of waste reception facilities for oily waste: port of Port Vila

		Yes	No
1	How are the oily wastes disposed of:		
	separation of oil and water then recycling		X
	land disposal		X
	recycled		X
	incineration		X
	other		X
2	Are there restrictions on receipt or collection of oily wastes by service providers:		
	minimum quantity	X	
	maximum quantity	X	
	discharge rate (m^3 /hour)	X	
	vessel type	X	
	vehicle access to berth	X	
	other	X	
3	Are oily waste reception facilities available:		
	24 hours a day, 7 days per week	N/A	
	24 hours a day, 5 days per week	N/A	
	Business hours only, 7 days per week	N/A	
	Business hours only, 5 days per week	N/A	
4	Is prior notice for receipt of oily wastes required:		
	0 hours	N/A	
	12 hours	N/A	

		Yes	No
	24 hours	N/A	
	48 hours	N/A	
5a	Is the waste receipt service available:		
	at no cost	N/A	
	at a cost incorporated into standing port use charge	N/A	
	at a cost charged in addition to other services	N/A	
5b	Is the cost:		
	reasonable in terms of service	N/A	
	a disincentive	N/A	
	other (specify)	N/A	
6.	Is a waste collection service available:		
	at all berths	N/A	
	at most berths	N/A	
	at only one berth	N/A	
	to vessels anchored within the port	N/A	
	to vessels anchored outside the port	N/A	
	other	N/A	

Based on the assessment conducted, the provision of waste reception facilities for oily waste at the port of Port Vila was found to be:

1	**Less than satisfactory**	2	Satisfactory	3	Fully meets requirements

Given that every ship visiting Vanuatu could be expected to have some oily waste on board, reception facilities for oily wastes are inadequate to the needs of ships using the port. This includes not only the international ships in Vanuatu waters but also the considerable domestic shipping fleet, which is both poorly regulated and has limited services, with the exception of a voluntary and limited take-back scheme for oils as discussed above.

Management approaches could be used to address oily wastes from both international and domestic shipping in Vanuatu waters through expanded EPR schemes or introduction of advanced recycling fees for oil products.

7.4.2 Noxious Liquid Substances (NLS)

The assessment of waste reception facilities for NLS at the port of Port Vila is detailed in Table 11. The assessment found that chemical tankers do not visit the port of Port Vila, so there is currently no demand for reception of NLS cargo residues.

Table 11 Assessment of waste reception facilities for NLS: port of Port Vila

		Yes	No
1	Where is the NLS disposed of:		
	directly from the ship to a mobile facility		X
	ships to a holding tanks prior to being pumped out		X
	other (specify)		X
2	Are there any restrictions on receipt or collection of NLS wastes by service providers:		
	minimum quantity	X	
	maximum quantity	X	
	discharge rate (m^3 /hour)	X	

		Yes	No
	vessel type	X	
	vehicle access to berth	X	
3	Are NLS reception facilities available:		
	24 hours a day, 7 days per week	N/A	
	24 hours a day, 5 days per week	N/A	
	business hours only, 7 days per week	N/A	
	business hours only, 5 days per week	N/A	
	other (specify)	N/A	
4	Is prior notice for receipt of NLS required:		
	0 hours	N/A	
	12 hours	N/A	
	24 hours	N/A	
	48 hours	N/A	
5a	Is the waste receipt service available:		
	at no cost	N/A	
	at a cost incorporated into standing port use charge	N/A	
	at a cost charged in addition to other services	N/A	
5b	Is the cost:		
	reasonable in terms of service	N/A	
	a disincentive	N/A	
	other (specify)	N/A	
6.	Is a waste collection service available:		
	at all berths	N/A	
	at most berths	N/A	
	at only one berth	N/A	
	to vessels anchored within the port	N/A	
	to vessels anchored outside the port	N/A	
	other	N/A	

Based on the above, and the fact that NLS bulk carriers do not visit the port, the provision of waste reception facilities for NLS at the port of Port Vila was found to be:

1	Less than satisfactory	2	Satisfactory	**3**	**Fully meets requirements**

7.4.3 Sewage

The assessment of waste reception facilities for sewage at the port of Port Vila is detailed in Table 12. The assessment found that sewage is only accepted from domestic vessels at the port of Port Vila due to the quarantine risk associated with sewage discharge from international vessels and the significantly limited treatment (settling and evaporation pits) available in Port Vila for sewage delivered by truck.

For domestic vessels, sewage can be transferred directly from the ship to a mobile facility prior to being pumped out, however this is on a voluntary basis, only where it is privately organised, and is practised by a few operators only (Ocean Logistics). The Vanuatu Government operates a septic treatment system near Port Vila (adjacent to the Bouffa landfill) where sewage from residential pump-

out and potentially domestic vessels can be disposed. This facility was upgraded in 2015 under an Australian government project.

Table 12 Assessment of waste reception facilities for sewage: port of Port Vila

		Yes	No
1	Where is the sewage disposed of?		
	Directly to a reticulated sewerage system		X
	Directly to a mobile facility	X	
	Ships to holding tanks then pumped to a mobile facility	X	
	Ships to on-site treatment facility to sewerage system		X
	other (specify)	X	
2	Are there any restrictions on receipt or collection of sewage wastes by service providers:		
	minimum quantity		X
	maximum quantity	X	
	discharge rate (m^3 /hour)		
	vessel type	X	
	vehicle access to berth		
3	Are sewage reception facilities available:		
	24 hours a day, 7 days per week		
	24 hours a day, 5 days per week		
	business hours only, 7 days per week		
	business hours only, 5 days per week	X	
	other	X	
4	Is prior notice for receipt of sewage required:		
	0 hours		
	12 hours		
	24 hours		
	48 hours	X	
5a	Is the sewage receipt service available:		
	at no cost		
	at a cost incorporated into standing port use charge		
	at a cost charged in addition to other services	X	
5b	Is the cost:		
	reasonable in terms of service	X	
	a disincentive		
	other (specify)		
6.	Is a waste collection service available:		
	at all berths	X	
	at most berths		
	at only one berth		
	to vessels anchored within the port		
	to vessels anchored outside the port		
	other		

Based on the above, the provision of waste reception facilities for sewage at the port of Port Vila was found to be:

1	**Less than satisfactory**	2	Satisfactory	3	Fully meets requirements

As every ship visiting Vanuatu could be expected to have some sewage on board, the lack of reception facilities for sewage from international arrivals leads to an assessment of 'less than satisfactory' for

this section. Vanuatu is a port of call for cruise ships and naval vessels, both of which have significant needs for sewage reception, particularly for longer stays in port. This may soon be extended to fishing vessels with the planned development of a fish processing factory in Port Vila.

Other findings of relevance are as follows:

Figure 10 Port Vila: other relevant observations: sewage

The receipt of domestic sewage by service providers is limited by the capacity of the road tankers used for sewage transport. The maximum capacity is generally 7,000 litres.

Sewage reception facilities for domestic vessels are generally available during business hours, five days a week. However, access can be arranged in the event of an emergency.

The Vanuatu Port Authority requires all information from ships (such as provisioning, pilotage, arrival and departure details, and waste disposal requests) 48 hours in advance.

Figure 11 The sewage treatment pond at the Bouffa landfill on Efate

7.4.4 Garbage Disposal

The assessment of waste reception facilities for garbage disposal at the port of Port Vila is detailed in Table 13. The assessment found that garbage can generally be accepted from all international vessels berthing in port, including yachts and fishing vessels, and that garbage is subject to appropriate quarantine and disposal procedures.

Table 13 Assessment of waste reception facilities for garbage disposal: port of Port Vila

		Yes	No
Garbage disposal – on shore			
1	Where is the garbage disposed:		
	Local government dump/landfill	X	
	Private dump/landfill		
	Transfer station		
	Materials recycling facility		

		Yes	No
	Don't know		
2	Where are quarantine wastes disposed:		
	incinerator	X	
	sterilisation		
	deep burial	X	
	normal landfill		
Garbage disposal – ship to shore			
3	Are there any restrictions on receipt or collection of garbage wastes:		
	minimum quantity		
	maximum quantity		
	vessel type		
	vehicle access to berths		
4	Are garbage waste reception facilities available?		
	24 hours a day, 7 days per week	X	
	24 hours a day, 5 days per week		
	business hours only, 7 days per week		
	business hours only, 5 days per week		
	other (specify)		
5	Is prior notice for receipt of waste required:		
	0 hours		
	12 hours		
	24 hours		
	48 hours	X	
6a	Is the waste receipt service available:		
	at no cost		
	at a cost incorporated into standing port use charge		
	at a cost charged in addition to other services	X	
6b	Is the cost:		
	reasonable in terms of service	X	
	a disincentive		
	other		
7	Is a waste collection service available:		
	at all berths	X	
	at most berths		
	at only one berth		
	to vessels anchored within the port		
	to vessels anchored outside the port		
	other		

Based on the above, the assessment of the provision of waste reception facilities for garbage disposal at the port of Port Vila was found to be:

1	Less than satisfactory	**2**	**Satisfactory**	3	Fully meets requirements

At the port of Port Vila, garbage is generally only accepted from some cruise liners and visiting yachts, and is generally restricted to dry garbage only. This garbage is subject to appropriate quarantine and disposal procedures at a cost of 4,000 VT per cubic metre. While a large fishing fleet operates in Vanuatu waters, these vessels do not make landfall in Vanuatu and instead make port calls in Fiji and American Samoa. Container ships sometimes dispose of broken pallets in Vanuatu. It has been noted

by agents that cost may be a reason for deciding not to land garbage in Vanuatu. Tankers moored at the offshore discharge point do not currently land garbage. Other findings of relevance are as follows:

Figure 12 Port Vila: other relevant observations: garbage disposal

During the field visit, Port Vila Council advised that the Japanese style, semi aerobic landfill (Fukuoka Method) at Bouffa meets Japanese landfill standards but not the stricter US EPA standards. Deep burial is only conducted during wet periods and the normal practice is open low temperature burning near the landfill which produces smoke and contaminants contrary to best practice.

The small incinerator near the Bauerfield International Airport is managed and operated manually by Quarantine officers with the waste self burning as the instrumentation and fuel injection stopped working a number of years ago. It therefore operates at low temperature producing smoke and contaminants contrary to best practice.

The medical waste incinerator located at the Port Vila Hospital could potentially be used for both quarantine and medical waste from ships at port but is currently used for domestic healthcare waste only.

It has been noted by agents that cost may be a reason for deciding not to land garbage in Vanuatu. Tankers moored at the offshore discharge point do not currently land garbage.

The Quarantine (Biosecurity Act) 2013 prohibits the landing of waste without permission from an authorised officer.

Quarantine bins are only provided when it is known quarantine waste will be unloaded from the ship. Security is afforded by normal port security arrangements. Quarantine wastes are immediately disposed of under the direction of a quarantine officer.

Bins are not permanently labelled. While they do have lids, some of the bins are damaged with splitting on the side leaving gaps. Quarantine waste bags, however, are not covered during transportation from the port to the incinerator, but they are secured.

There is no signage.

7.4.5 Waste Management System

The assessment of the waste management system at the port of Port Vila is detailed in Table 14. The assessment found that a waste management plan has not been developed specifically for waste from ships. It should be noted however, that there is a short section on pollution in the Port Operations

Procedures and a National Waste Management Strategy that addresses relevant types of waste. Additionally, a separate Port Emergency Plan exists.

Table 14 Assessment of waste management system: port of Port Vila

		Yes	No
1	Has a waste management plan (WMP) been developed and implemented for ship wastes?		X
2	Is the WMP part of an overall environmental management system (EMS) for the port?		X
3	Are marinas and fishing harbours covered by the port EMS or required to develop their own EMS?		X
4	Does the WMP provide a brief summary of the types of wastes received and the collection and disposal facilities/services?		X
5	Does the WMP address and provide management objectives for:		X
6	Operations:		X
	Facility management		X
	Maintenance		X
	Signage		X
	Infrastructure		X
	Contractual arrangements		X
	Emergency response		X
	Seasonal variations		X
	Training and education		X
	Delegation of responsibilities and accountability		X
	Compliance with regulatory conditions, including auditing		X
7	Technical standards:		X
	Facility requirements		X
	Incorporation of new technologies		X
	Cleaning requirements		X
	Maintenance of equipment to technical standards		X
8	Environmental considerations:		X
	Prevention of pollution to surface waters		X
	Noise emissions		X
	Visual impacts		X
	Odour emissions		X
	Special considerations due to surrounding environment (e.g. proximity to wetland or mangrove areas)		X
	Coastal processes (e.g. extreme tides)		X
9	Plans for future expansion/upgrades:		X
	Oily wastes		X
	Noxious liquid substances (NLS)		X
	Sewage		X
	Garbage		X
	Recycling of wastes		X
	Quarantine wastes		X
10	Are contact details held for all waste service providers?	X	
11	Are the service providers licensed/approved as required by legislation?	X	
12	Are a copy of the licences on file?	X	
13	Are a copy of the licences for the waste disposal facilities used by the service providers held on file?	X	
14	Have receipts for waste disposal been sighted/copies held on file?		X
15	Are alternative waste service providers or disposal facilities available (e.g. spare drums, waste oil recyclers)?		X

		Yes	No
16	Is there a procedure for choosing waste disposal service providers (e.g. list of preferred contractors)?		X
17	Are the details of back-up facilities available on file?		
18	Does the WMP include an emergency response plan?		X
19	Is the plan adequate in that it addresses at least the following issues?		
	spillage of liquid	X	
	spillage of solids	X	
	leakage of gas	X	
	fire or explosion	X	
	emergency contacts	X	
	other (specify)	X	
20	Is information recorded on the quantities of each waste stream which are received, date of receipt, disposal contractor and method of disposal or treatment? (Data sighted/copies attached)		
	Oily wastes		
	Noxious liquid substances		X
	Sewage		X
	Garbage	X	
	Recycling of wastes		X
	Quarantine wastes	X	
21	Are there variations in the quantities of each waste stream received?:		
	in any one month (e.g. due to shipping variations)	X	
	in any one year (e.g. due to seasonal effects)		X
	over a number of years (e.g. due to industry growth)		
	don't know		
22	Is this information analysed on an on-going basis to detect changes in usage (both short term season variations and long-term growth or reductions) and assist in formulating future plans? (Graphs sighted)		X
23	Is on-going consideration given to changes in demand for waste reception facilities?		X
24	Do plans exist for future upgrades, extensions or reductions to the waste reception facilities?		X
25	Is there an on-going process for reviewing existing facilities and determining changes that may be required to meet adequacy, timing or waste generation demands?		X
26	Are there provisions for audits against the WMP (at least within two (2) years of implementation and thereafter every three (3) years?		X
27	Is there provision for periodic review of the WMP?		X
28	Are the relevant requirements of the MARPOL 73/78, UNCLOS and IMO generally adhered to by the users of the port?	X	
29	Is there information on the state and local regulations regarding (please list legislation if known):		
	Waste management	X	
	Pollution of water	X	
	Pollution of air	X	
	Noise emissions	X	
	Discharges to sewer	X	
	Storage of dangerous goods	X	
30	Is there information on waste minimisation hierarchy i.e. avoid/ reduce/ reuse/ recycle/ reprocess?		X
31	Is an open and co-operative relationship maintained between the port authority and the relevant authorities and agents?		X
32	Are there channels of communication and consultation with relevant organisations to ensure that particular changes in demand are considered in providing waste reception facilities? (Give examples of consultation methods)		X

		Yes	No
33	Do training programmes for port employees (both of the port authority and users) include a section on waste management and the facilities provided at the port?		X
34	Is there a section in the WMP or a separate document which is included in agreements with port users and specifies requirements for the usage of port waste reception facilities?		X
35	Is clear and visible signage for waste reception facilities present and includes:		X
	advice at initial vessel contact point of waste reception facilities:		X
	direction to receptacle or disposal point location:		X
	labelling of all receptacles and disposal points:		X
	contact numbers:		X
	emergency procedures:		X
	translation into other languages as required:		X
36	Are there information sheets/leaflets available for each waste reception facility?		X
37	Is this information conveyed to ships?		

Based on the above, the provision of the waste management systems at the port of Port Vila was found to be:

1	**Less than satisfactory**	2	Satisfactory	3	Fully compliant

Image 5 Quarantine waste from the port of Port Vila being incinerated near Bauerfield International Airport

Other findings of relevance are as follows:

Figure 13 Port Vila: other relevant observations: waste management system

The National Waste Strategy covers a summary of disposal facilities, however, it does not cover collection of commercial waste. Commercial operators are required to arrange for transport of their waste to disposal sites.

Technical standards were not considered in the context of the Quarantine waste incinerator on site at the port, and the open burning at the landfill site. No documentation was available for the quarantine waste incinerator, which is not properly operational. The landfill site meets Japanese standards, having been funded by Japanese aid.

The National Environment Sector Plan 2013 2016 includes a strategy for waste which includes a number of relevant actions to improve waste management technology and systems in Vanuatu. While this is currently aimed at domestic waste, it is suggested that ships waste may be able to be included in the scope.

The National Waste Management Strategy and National Oil Spill Contingency Plan provide relevant guidance related to the prevention of pollution to surface waters.

The WMP does not address and provide management objectives for plans for future expansion/upgrades. This should be addressed as there are preliminary plans for future port development to build a new port for general shipping and to preserve the existing port for cruise ships only.

Licensing is required for all waste contractors with a requirement to renew this annually. Quarantine staff, however, often perform the collections, transport and destruction role without licensing.

The relationship between the port authority and the relevant authorities and agents is not clear, as the system in Vanuatu is evolving with the designation of a new Office of the Maritime Regulator and a very understaffed Environment Department. There is an urgent need to develop a plan delineating responsibilities and co ordination in order to foster collaboration among the agencies.

Individually, the Vanuatu Port Authority and Quarantine services carry out their duties diligently and understand the contract details of other agencies, however there are no apparent regular co ordination and consultation mechanisms existing that allow planning to occur.

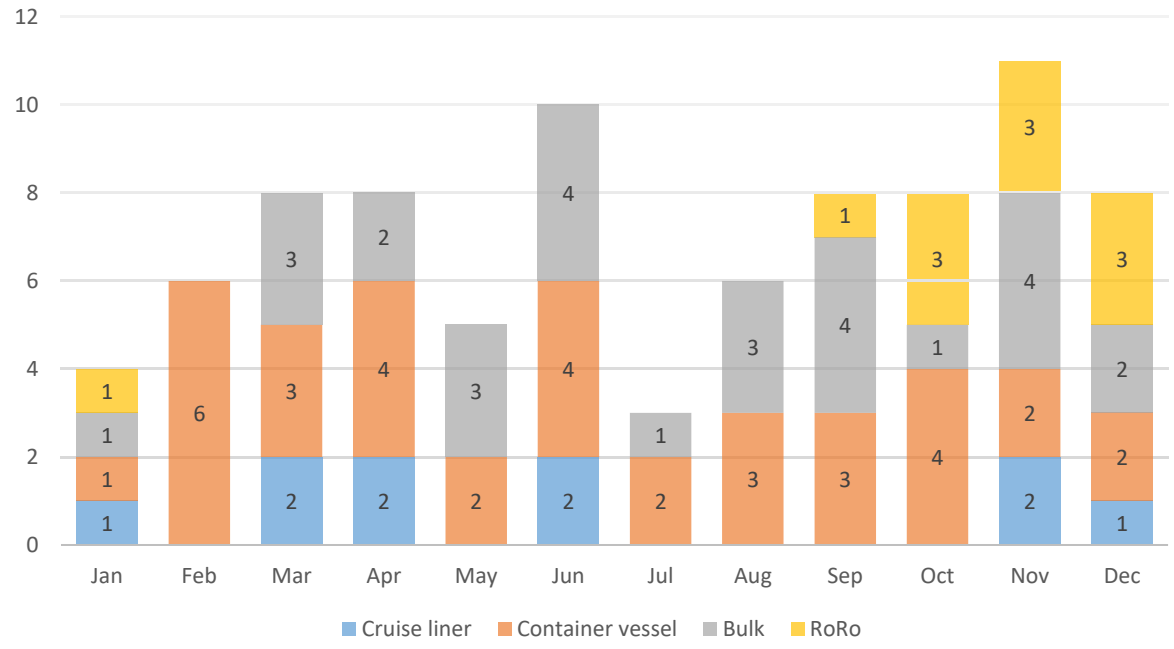
8 Gap Analysis – Port of Santo

8.1 Overview

The international wharf at the Port of Santo is owned by the Vanuatu Government. It is a multi-purpose port for cargo and cruise ships and is equipped with two large warehouses on the wharf to store copra from the weather. Renovation has recently been completed to enable simultaneous berthing of two container ships, or one large cruise ship. The port receives up to 100 international ship visits per year and has a berth of 360 metres and depth of 22 metres. The domestic wharf, Simonsen, which is also owned by the Government of Vanuatu, is located next door. The domestic wharf has only a small capacity and is able to serve only one cargo vessel at a time.

In 2018, the Port of Santo accommodated 85 international vessels in total, with an average of seven per month. Figure 14 depicts the number of vessels received at the port for each month of 2018 by vessel type. The figure for cruise liners is currently very low but is expected to rebound significantly in 2020 now that the international terminal has been improved and is able to accommodate larger cruise liners.

Figure 14 2018 port log data: Port of Santo



8.2 Summary of Waste Reception Facilities: Port of Santo

The Port of Santo provides reception facilities for garbage and dry solid quarantine waste materials. Sewage reception is limited and restricted to domestic vessels only. Facilities to receive NLS waste types are not available, but as is the case with the port of Port Vila, bulk NLS vessels do not visit the port. The summary of waste reception facilities at the Port of Santo is outlined in Table 15.

Table 15 Summary of waste reception facilities: Port of Santo

Type of waste	Can waste be received?	Type of reception facility	Any limitations in capacity?	Service provider
Oily				
Oily tank washings	No	No	No	No
Dirty ballast water	No	No	No	No
Oily bilge water	No	No	No	No
Oil sludges	No	No	No	No
Used lubricating oil	No	No	No	No
Noxious liquid substances	No	No	No	No
Sewage	Limited domestic only	Land application on private property	Capacity of pump-out tanker	Pump-out by vacuum tanker
Garbage	Yes – limited to dry solid materials	Open burning at a private dump site	Limited to truck size	Quarantine services/shipping agent
Quarantine wastes	Yes – limited to dry solid materials	Open burning at a private dump site	Limited to truck size	Quarantine services/shipping agent

Image 6 Image of the government domestic wharf (Simonsen) adjacent to the Port of Santo

8.3 Demand for Waste Reception Facilities

Demand for waste reception facilities at the Port of Santo is detailed in Table 16. As previously mentioned, it should be noted that the data is limited to waste generated and landed from those international vessels making port calls and does not account for waste generated from international

fishing vessels in Vanuatu waters, nor does it account for waste generated and disposed of by the significant domestic intra-island fleet.

Demand for port waste reception facilities at the Port of Santo is likely to increase with an expected rebound in the number of cruise liners since the completion of the new receival port and the increased size of these vessels.

Table 16 Demand for waste reception facilities: Port of Santo

				Number of requests for waste collection				
Ship type	Number of ship visits (2018)	Average range of dead weight (tonnes)	Average number on board	Oily wastes	NLS	Sewage	Garbage	Quarantine
Oil tankers	0	-	-	-	-	-	-	-
Crude oil tankers	0	-	-	-	-	-	-	-
Combination carriers	0	-	-	-	-	-	-	-
Chemical tankers	0	-	-	-	-	-	-	-
General cargo	10	unknown	25	0	0	0	0	0
Container carriers	36	unknown	25	0	0	0	0	0
Bulk carriers	28	unknown	25	0	0	0	0	0
Passenger ships	10	unknown	2,000	0	0	0	12	12
Livestock carriers	0	-	-	-	-	-	-	-
Fishing vessels	0	-	-	-	-	-	-	-
Recreational crafts	0	-	-	-	-	-	-	-
Other	0	-	-	-	-	-	-	-

8.4 Assessment of Waste Reception Facilities

This section presents the detailed assessment forms for each waste type.

8.4.1 Oily wastes

The assessment of waste reception facilities for oily wastes at the Port of Santo is detailed in Table 17. As for the port of Port Vila, the reception of oily waste from international ships is not permitted at the Port of Santo. Border security staff advised the review team that some domestic vessels offload used oils/oily wastes at the Port of Santo under limited conditions. The situation of waste oil storage is very serious, however, with evidence waste oil is burnt in 'pans' with no other apparent arrangements for oily waste to be correctly managed.

Table 17 Assessment of waste reception facilities for oily waste: Port of Santo

		Yes	No
1	How are the oily wastes disposed of:		
	separation of oil and water then recycling		X
	land disposal		X
	recycled		X
	incineration		X
	other		X

		Yes	No
2	Are there restrictions on receipt or collection of oily wastes by service providers:		
	minimum quantity	N/A	N/A
	maximum quantity	N/A	N/A
	discharge rate (m^3 /hour)	N/A	N/A
	vessel type	N/A	N/A
	vehicle access to berth	N/A	N/A
	other	N/A	N/A
3	Are oily waste reception facilities available:		
	24 hours a day, 7 days per week	N/A	N/A
	24 hours a day, 5 days per week	N/A	N/A
	Business hours only, 7 days per week	N/A	N/A
	Business hours only, 5 days per week	N/A	N/A
4	Is prior notice for receipt of oily wastes required:		
	0 hours	N/A	N/A
	12 hours	N/A	N/A
	24 hours	N/A	N/A
	48 hours	N/A	N/A
5a	Is the waste receipt service available:		
	at no cost	N/A	N/A
	at a cost incorporated into standing port use charge	N/A	N/A
	at a cost charged in addition to other services	N/A	N/A
5b	Is the cost:		
	reasonable in terms of service	N/A	N/A
	a disincentive	N/A	N/A
	other (specify)	N/A	N/A
6.	Is a waste collection service available:		
	at all berths	N/A	N/A
	at most berths	N/A	N/A
	at only one berth	N/A	N/A
	to vessels anchored within the port	N/A	N/A
	to vessels anchored outside the port	N/A	N/A
	other	N/A	N/A

Based on the assessment conducted, the provision of waste reception facilities for oily waste at the Port of Santo was found to be:

1	**Less than satisfactory**	2	Satisfactory	3	Fully meets requirements

8.4.2 Noxious Liquid Substances (NLS)

The assessment of waste reception facilities for NLS at the Port of Santo is detailed in Table 18. As with the port of Port Vila, the assessment found that chemical tankers do not visit Vanuatu, so there is currently no demand for reception of NLS cargo residues at the Port of Santo.

Table 18 Assessment of waste reception facilities for NLS: Port of Santo

		Yes	No
1	Where is the NLS disposed of:		
	directly from the ship to a mobile facility		X
	ships to a holding tanks prior to being pumped out		X

		Yes	No
	other (specify)		X
2	Are there any restrictions on receipt or collection of NLS wastes by service providers:		
	minimum quantity	N/A	
	maximum quantity	N/A	
	discharge rate (m^3 /hour)	N/A	
	vessel type	N/A	
	vehicle access to berth	N/A	
3	Are NLS reception facilities available:		
	24 hours a day, 7 days per week	N/A	
	24 hours a day, 5 days per week	N/A	
	business hours only, 7 days per week	N/A	
	business hours only, 5 days per week	N/A	
	other (specify)	N/A	
4	Is prior notice for receipt of NLS required:		
	0 hours	N/A	
	12 hours	N/A	
	24 hours	N/A	
	48 hours	N/A	
5a	Is the waste receipt service available:		
	at no cost	N/A	
	at a cost incorporated into standing port use charge	N/A	
	at a cost charged in addition to other services	N/A	
5b	Is the cost:		
	reasonable in terms of service	N/A	
	a disincentive	N/A	
	other (specify)	N/A	
6.	Is a waste collection service available:		
	at all berths	N/A	
	at most berths	N/A	
	at only one berth	N/A	
	to vessels anchored within the port	N/A	
	to vessels anchored outside the port	N/A	
	other	N/A	

Based on the above, and the fact that NLS bulk carriers do not visit the port, the provision of waste reception facilities for NLS at the Port of Santo was found to:

1	Less than satisfactory	2	Satisfactory	**3**	**Fully meets requirements**

8.4.3 Sewage

The assessment found limited sewage reception facilities are available and these exist for domestic vessels only. Sewage is transferred directly from the ship to a mobile facility prior to being pumped out to a sewage discharge site in Santo on private property for free. The assessment of waste reception facilities for sewage at the Port of Santo is detailed in Table 19.

Image 7 Luganville sewage discharge site in Santo

Table 19 Assessment of waste reception facilities for sewage: Port of Santo

		Yes	No
1	Where is the sewage disposed of:		
	Directly to a reticulated sewerage system		
	Directly to a mobile facility	X	
	Ships to holding tanks then pumped to a mobile facility		
	Ships to on-site treatment facility to sewerage system		
	other (specify)		
2	Are there any restrictions on receipt or collection of sewage wastes by service providers:		
	minimum quantity		
	maximum quantity	X	
	discharge rate (m^3/hour)		
	vessel type		
	vehicle access to berth		
3	Are sewage reception facilities available:		
	24 hours a day, 7 days per week		
	24 hours a day, 5 days per week		
	business hours only, 7 days per week		
	business hours only, 5 days per week	X	
	other		
4	Is prior notice for receipt of sewage required:		
	0 hours		
	12 hours		
	24 hours		
	48 hours	X	
5a	Is the sewage receipt service available:		
	at no cost		
	at a cost incorporated into standing port use charge		
	at a cost charged in addition to other services	X	
5b	Is the cost:		

		Yes	No
	reasonable in terms of service		
	a disincentive	X	
	other (specify)		
6.	Is a waste collection service available:		
	at all berths		
	at most berths		
	at only one berth	X	
	to vessels anchored within the port		
	to vessels anchored outside the port		
	other		

Based on the above, the provision of waste reception facilities for sewage at the Port of Santo was found to be:

1	**Less than satisfactory**	2	Satisfactory	3	Fully meets requirements

8.4.4 Garbage Disposal

The assessment of waste reception facilities for garbage disposal at the Port of Santo is detailed in Table 20.

Table 20 Assessment of waste reception facilities for garbage disposal: Port of Santo

		Yes	No
Garbage disposal – on shore			
1	Where is the garbage disposed of:		
	Local government dump/landfill		
	Private dump/landfill	X	
	Transfer station		
	Materials recycling facility		
	Don't know		
2	Where are quarantine wastes disposed of:		
	incinerator	X	
	sterilisation		
	deep burial		
	normal landfill		
Garbage disposal – ship to shore			
3	Are there any restrictions on receipt or collection of garbage wastes:		
	minimum quantity		
	maximum quantity	x	
	vessel type		
	vehicle access to berths	X	
4	Are garbage waste reception facilities available:		
	24 hours a day, 7 days per week		
	24 hours a day, 5 days per week		
	business hours only, 7 days per week	X	
	business hours only, 5 days per week		
	other (specify)		
5	Is prior notice for receipt of waste required:		
	0 hours		
	12 hours		
	24 hours		

		Yes	No
	48 hours	X	
6a	Is the waste receipt service available:		
	at no cost		
	at a cost incorporated into standing port use charge		
	at a cost charged in addition to other services	X	
6b	Is the cost:		
	reasonable in terms of service	X	
	a disincentive		
	other		
7	Is a waste collection service available:		
	at all berths		
	at most berths		
	at only one berth	X	
	to vessels anchored within the port		
	to vessels anchored outside the port		
	other		

Based on the above, the provision of waste reception facilities for garbage disposal at the Port of Santo was found to be:

1	**Less than Satisfactory**	2	Satisfactory	3	Fully meets requirements

At the Port of Santo, garbage is generally only accepted in very limited quantities, mostly from cruise liners but sometimes from containers vessels and bulk carriers which offload broken pallets. It is generally restricted to dry garbage, which is subject to appropriate quarantine and disposal procedures at a cost of 4,000 VT per cubic metre.

Image 8 Garbage disposal site and incinerator for waste from the Port of Santo

Other findings of relevance are as follows:

Figure 15 Port of Santo: other relevant observations: garbage disposal

During the field visit, Quarantine officers provided a tour of the low temperature incinerator. It was in poor condition and located next to a dump site on private property approximately 30 minutes from the port, along with poorly contained incinerator ash. Such low temperature burning would produce smoke and contaminants contrary to best practice.

Quarantine waste burning is conducted manually by Quarantine officers. The waste has been dumped at a private property for a number of years free of charge since Council withdrew permission for such burning practices at the Luganville landfill.

The Quarantine (Biosecurity Act) 2013 prohibits the landing of waste without permission from an authorised officer.

Quarantine bins are only provided when it is known quarantine waste will be unloaded from the ship, security is afforded by normal port security arrangements, quarantine wastes are immediately disposed of under the direction of a quarantine officer.

Bins are not permanently labelled. While they do have lids, some of the bins are damaged with splitting on the side leaving gaps. Quarantine waste bags, however, are not covered during transportation from the port to the incinerator but they are secured.

There are no signs for waste.

8.4.5 Waste Management System

The assessment of the waste management system at the Port of Santo is detailed below.

Table 21 Assessment of waste management system: Port of Santo

		Yes	No
1	Has a waste management plan (WMP) been developed and implemented for ship wastes?		X
2	Is the waste management plan part of an overall environmental management system (EMS) for the port?		X
3	Are marinas and fishing harbours covered by the port EMS or required to develop their own EMS?		X
4	Does the WMP provide a brief summary of the types of wastes received and the collection and disposal facilities/services?		X
5	Does the WMP address and provide management objectives for:		
6	Operations:		
	Facility management		X
	Maintenance		X
	Signage		X
	Infrastructure		X
	Contractual arrangements		X
	Emergency response		X
	Seasonal variations		X
	Training and education		X
	Delegation of responsibilities and accountability		X
	Compliance with regulatory conditions, including auditing		X
7	Technical standards:		
	Facility requirements		X
	Incorporation of new technologies		X
	Cleaning requirements		X
	Maintenance of equipment to technical standards		X
8	Environmental considerations:		
	Prevention of pollution to surface waters	X	
	Noise emissions		X
	Visual impacts		X
	Odour emissions		X
	Special considerations due to surrounding environment (e.g. proximity to wetland or mangrove areas)	X	
	Coastal Processes (eg. extreme tides)	X	
9	Plans for future expansion/upgrades:		
	Oily Wastes		X
	Noxious Liquid Substances		X
	Sewage		X
	Garbage		X
	Recycling of wastes		X
	Quarantine wastes		X
10	Are contact details held for all waste service providers?	X	
11	Are the service providers licensed/approved as required by legislation?	X	
12	Are a copy of the licences on file?	X	
13	Are a copy of the licences for the waste disposal facilities used by the service providers held on file?	X	
14	Have receipts for waste disposal been sighted/copies held on file?		X

		Yes	No
15	Are alternative waste service providers or disposal facilities available (e.g. spare drums, waste oil recyclers)?		X
16	Is there a procedure for choosing waste disposal service providers (e.g. list of preferred contractors)?		X
17	Are the details of back-up facilities available on file?		X
18	Does the WMP include an emergency response plan?		X
19	Is the plan adequate in that it addresses at least the following issues?		
	spillage of liquid		X
	spillage of solids		X
	leakage of gas		X
	fire or explosion		X
	emergency contacts		X
	other (specify)		X
20	Is information recorded on the quantities of each waste stream which are received, date of receipt, disposal contractor and method of disposal or treatment? (Data sighted/copies attached)		
	Oily wastes		X
	Noxious liquid substances		X
	Sewage		X
	Garbage		X
	Recycling of wastes		X
	Quarantine wastes		X
21	Are there variations in the quantities of each waste stream received?		
	in any one month (e.g. due to shipping variations)	X	
	in any one year (e.g. due to seasonal effects)	X	
	over a number of years (e.g. due to industry growth)	X	
	don't know		
22	Is this information analysed on an on-going basis to detect changes in usage (both short term season variations and long-term growth or reductions) and assist in formulating future plans? (Graphs sighted)		X
23	Is on-going consideration given to changes in demand for waste reception facilities?		X
24	Do plans exist for future upgrades, extensions or reductions to the waste reception facilities?		X
25	Is there an on-going process for reviewing existing facilities and determining changes that may be required to meet adequacy, timing or waste generation demands?		X
26	Are there provisions for audits against the WMP (at least within two (2) years of implementation and thereafter every three (3) years?		X
27	Is there provision for periodic review of the WMP?		X
28	Are the relevant requirements of the MARPOL 73/78, UNCLOS and IMO generally adhered to by the users of the port?	X	
29	Is there information on the state and local regulations regarding (please list legislation if known):		
	Waste management	X	
	Pollution of water	X	
	Pollution of air	X	
	Noise emissions	X	
	Discharges to sewer	X	
	Storage of dangerous goods	X	
30	Is there information on waste minimisation hierarchy i.e. avoid/ reduce/ reuse/ recycle/ reprocess?		X
31	Is an open and co-operative relationship maintained between the port authority and the relevant authorities and agents?		X

		Yes	No
32	Are there channels of communication and consultation with relevant organisations to ensure that particular changes in demand are considered in providing waste reception facilities? (Give examples of consultation methods)		X
33	Do training programmes for port employees (both of the port authority and users) include a section on waste management and the facilities provided at the port?		X
34	Is there a section in the WMP or a separate document which is included in agreements with port users and specifies requirements for the usage of port waste reception facilities?		X
35	Is clear and visible signage for waste reception facilities present and includes:		X
	advice at initial vessel contact point of waste reception facilities:		X
	direction to receptacle or disposal point location:		X
	labelling of all receptacles and disposal points:		X
	contact numbers:		X
	emergency procedures:		X
	translation into other languages as required:		X
36	Are there information sheets/leaflets available for each waste reception facility?		X
37	Is this information conveyed to ships?		

Based on the above, the waste management system at the Port of Santo was assessed as being:

1	**Less than satisfactory**	2	Satisfactory	3	Fully compliant

9 Conclusion and recommendations

9.1 Summary of waste reception assessments

The assessment found reception facilities for oily wastes and sewage to be less than satisfactory at both ports, disposal methods are in general not in accordance with best practice. Garbage disposal is satisfactory at the port of Port Vila and unsatisfactory at the Port of Santo. While both locations were assessed as meeting requirements for the reception of residues from NLS, it should be noted that these facilities are not required. As outlined in Table 22, both ports received an assessment of less than satisfactory overall.

Table 22 Summary of waste reception assessments for the port of Port Vila and the Port of Santo

Waste type	Port of Port Vila	Port of Santo
Oily waste	(1) Less than satisfactory	(1) Less than satisfactory
Noxious liquid substances	(3) Meets requirements	(3) Meets requirements
Sewage	(1) Less than satisfactory	(1) Less than satisfactory
Garbage disposal	(2) Satisfactory	(1) Less than satisfactory
Waste management system	(2) Satisfactory	(1) Less than satisfactory
Overall	**(1) Less than satisfactory**	**(1) Less than satisfactory**

9.2 Recommendations

Noting the challenges faced by Vanuatu and many other Pacific island countries in providing adequate waste reception facilities for ships, recommendations have been made in order to:

- Improve waste reception facilities at both locations
- Assist in meeting obligations under international, national and local laws
- Minimise the leakage of ship-based sources of waste into the environment.

The recommendations are as follows:

Figure 16 Summary of recommendations

Each recommendation is discussed in detail below.

9.2.1 Develop a National Port Reception Facility Waste Management Plan

It is recommended that a plan be developed that defines roles, assigns tasks, sets standards and provides an interface for communication and co-ordination between stakeholders. It should integrate all the requirements for port and shipping wastes to ensure Vanuatu meets its obligations under international, national and local laws. It can also help highlight were human resource and capability gaps exist so that responses can be made to address these, matched to processes and timelines. It is also recommended that the plan is expanded to include both international and domestic shipping, and marinas.

This recommendation has been discussed with stakeholders in government including Fisheries, the port authorities, quarantine services, Environment department, councils and the Office of the Maritime Regulator as well as the Vanuatu Maritime training college and private sector representatives such as Ocean Logistics. Stakeholders are supportive of this recommendation.

9.2.2 Extend waste requirements for international shipping to include domestic shipping

It is recommended that waste management requirements for international shipping be extended to cover the significant amount of domestic shipping. Domestic shipping is poorly regulated with very limited services. This should particularly focus on garbage (including plastic), sewage and oily wastes. This could build on the work by early self-starters such as Ocean Logistics, which has voluntarily transposed IMO requirements onto its domestic fleet through developing ship-specific standard operating procedures (SOPs) meeting IMO equivalent standards for wastes.

This is also a specific focus of the Office of the Maritime Regulator. Assistance can be given to develop enabling legislation, engage with the shipping industry and work with other maritime entities. This can be achieved through processes such as the governing council meetings, where integrated actions to combat marine debris and wastes are developed and translated from strategy into projects. Such a focus also has the support of the Vanuatu Port Authorities.

This recommendation has been discussed with stakeholders in government including Fisheries, the port authorities, quarantine services, Environment department, councils and the Office of the Maritime Regulator as well as the Vanuatu Maritime training college and private sector representatives such as Ocean Logistics. Stakeholders are supportive of this recommendation.

9.2.3 Link to existing maritime training and regional initiatives

There is great potential to extend waste management training relevant to both domestic and international shipping through links with the existing mandatory maritime courses and National Fisheries Observer courses provided by the Vanuatu Maritime College. This would introduce improved waste management practices to the more than 400 Vanuatu mariners a year currently trained, and build a skill base for the 32 national fisheries observers to conduct improved reporting on waste.

There are two other regional initiatives of relevance to improved port and ship waste management co-ordinated by the Secretariat of the Pacific Community (SPC). These are the Pacific Domestic Ship Safety Initiative (PDSSI) and the Green Ports Program. Both can be used to promote better waste management through advancing infrastructure improvements for waste at ports and on ships, as well as building awareness, supporting training and further development of a waste services industry.

This recommendation has been discussed with national stakeholders as well as with the governing council representatives and SPC. These stakeholders are interested in this recommendation and have requested that CLiP present at the next governing council meeting planned for February 2019.

9.2.4 Improve arrangements for waste management for international and domestic shipping

There are a number of infrastructure and arrangement improvements recommended for oily wastes, sewage and garbage management from ports and shipping. These need to be considered as part of the overall management of waste streams generated from both land and ship sources (international and domestic shipping) and should be included in the National Port Reception Facility Waste Management Plan (see Section 9.2.1).

The recommended improved arrangements are summarised as follows:

Figure 17 Summary of improvement recommendations for waste management

Each is discussed in detail below.

9.2.4.1 *Improve oily waste reception facilities*

There are few avenues available to dispose of oily wastes and concern that much of the oily waste from domestic vessels is disposed of or lost at sea or in harbours. Only Ocean Logistics is known to collect and dispose of oily wastes on land.

There is no option for international vessels to dispose of oily wastes, meaning waste must be stored until it can be disposed of at a 'regional port' capable of receiving oily wastes, such as the Port of Suva in Fiji.

For smaller international vessels with limited storage capacity and longer residence time in Vanuatu waters, this increases the risk that oily waste will be disposed of within Vanuatu waters (along with other wastes).

The take-back systems in Vanuatu, although very limited at this stage, should be supported to include the full range of ship-generated oily wastes from both international and domestic shipping. This will assist in addressing the above concerns and better managing the loss of such wastes to the environment.

While these systems are predominantly linked with land-based sources of oily wastes (power stations, commercial, vehicles etc.), port and ship sources could be linked to this as part of a comprehensive oily waste management system, building on other successful approaches in the Pacific.

This is expected to be a largely industry-led approach, with government creating and maintaining an enabling environment. If there is no viable domestic use for these wastes, regional outlets for oily wastes such as those in Fiji (steel works, lead smelter) will be necessary.

It is recommended that the results and approaches for the SPREP-administered GEPAS UPOPS project, which generated a used oil management plan in 2014, should also be considered and linked to the new National Port Reception Facility Waste Management Plan (see Section 9.2.1).

9.2.4.2 *Improve sewage reception facilities*

There is concern that much of the sewage from domestic vessels is disposed of or lost at sea and in harbours.

There are no toilets at domestic ports in Vanuatu, and while pump-out sewage tankers can access the ports, there are no standard arrangements for such a service. The international terminal has a critical lack of sewage collection and treatment also and facilities are for port staff only. No capacity exists for international sailors, tourists from cruise ships or naval personnel regularly visiting the ports.

There is currently no option for sewage disposal for international vessels, which means they must store sewage until they can dispose of it to a regional port equipped to receive it, such as the Port of Suva in Fiji. The only alternative is disposal of sewage at sea.

For smaller international vessels with limited storage capacity and longer residence time in Vanuatu waters, this increases the risk that sewage will be disposed of within Vanuatu waters (along with other wastes). However, there is potential for certain volumes of sewage to be landed and treated or disposed of using the current systems. This should be included in overall port and country plans for sewage treatment.

The planned establishment of a fish factory in Port Vila will increase waste infrastructure requirements, with many of the 100 fishing vessels operating in the Vanuatu EEZ starting to make port calls for offloading their catch and resupplying at other ports.

As with the management of waste oil in Vanuatu, the management of ship-generated sewage needs to be integrated as part of the land-based system and linked with the expansion of port activities, such as the planned fish factory and the resumption of the full number of cruise liners visiting Santo (predicted to rise from 18 in 2018 to 70 by 2020).

It is therefore recommended that a Ports Sewage Plan be developed for both domestic and international ports and shipping and that it be linked to the National Port Reception Facility Waste Management Plan (see Section 9.2.1). The Ports Sewage Plan should identify and prioritise actions and infrastructure such as further enabling ship sewage pump-out, establishing toilets on wharves, introducing fees and charges, regulation, ship audits and enforcement.

9.2.4.3 Improve garbage management and disposal

While the quarantine services effectively manage the removal of limited dry waste from international shipping, transportation is typically in open vehicles. Materials may be lost on route to the disposal site, with bags typically tied down with ropes. This should be rectified by using enclosed caged trays.

Recording of waste data is also poor and should be corrected through training, appropriate templates and provision of software and hardware. Data should be regularly reported via a system linked to the National Port Reception Facility Waste Management Plan (see Section 9.2.1).

The disposal sites are generally unsecured and quite distant from the ports. This creates chain of custody issues and adds time and transport costs for quarantine staff who directly conduct the work or supervise contractors. For Port of Santo, the use of private property for free by a government agency is not ideal in terms of propriety and governance.

Disposal by open burning or burning in incinerators does disinfect the waste, but also produces air pollutants and products of incomplete combustion. This is poor practice which does not meet best available technology or best environmental practice. It is potentially harmful to human health and the environment and is contrary to the Stockholm Convention.

These disposal sites problems could be addressed through the establishment of a modern, high-temperature incinerator or disinfection unit at the international ports. It should be noted, however, that Pacific Island nations have in general struggled to maintain such equipment in a suitable operational state.

Waste awareness campaigns, signs and infrastructure, such as large bins, are absent from domestic ports, with smaller wheelie bins only provided. It is recommended these are provided for in the National Port Reception Facility Waste Management Plan (see Section 9.2.1). Domestic shipping needs to be the target of a specific garbage management plan with emphasis on awareness-raising, best practice training and regulation.

9.2.5 Improve data collection for shipping waste in Vanuatu waters

Data was collected indirectly for international shipping through gathering commercial data based on the number of port calls made by international shipping vessels. Previously published estimates for numbers of passengers on board and waste generation per person were included. This is the general approach used by all port reception waste facility audits, as the resources and time required to measure ship-generated wastes directly would be considerable.

Data from Quarantine on the number of international shipping vessels requesting waste disposal in Vanuatu territory was also used. This is based on rough estimates made by visually determining the volume of waste. Data is recorded manually, is not required to be reported on, and is not subject to audit, creating uncertainty as to its accuracy. No data is collected by Vanuatu authorities or any other authority for international shipping vessels operating in Vanuatu waters but not landing, so their impact is unknown. This also applies to domestic shipping vessels conducting intra-island trade.

It is therefore recommended that data collection is improved for waste generated on ships for all three groups of shipping:

Figure 18 Ship types targeted for improved data collection

The focus should be on those with port registration. Improved data collection should prioritise the highest risk groups for waste leakage from ship to sea and where there is the least information available.

For international vessels making port calls it is recommended that further audits are conducted on the ships' garbage management plans and garbage record book. These are required for all ships of 100/400 GT and above and every ship certified to carry 15 persons or more. The garbage management plan must include written procedures for minimising, collecting, storing, processing and disposing of garbage. The garbage record book must include the date, time, position of the ship and description of the garbage. The estimated amount incinerated or discharged must be logged and signed. Appendix 2 of MARPOL Annex V provides a standard form for a garbage record book.

It is recommended that there is an enhanced audit project for international fishing vessels which builds on the work already conducted by the National Fishing Observers Program. This program reported on garbage and other waste management activities and violations under the Generation 6 SPC/FFA Observer GEN-6 Forms from 2003–2015 as discussed in Section 6.3. This could include targeted high-resolution audits similar to those conducted by APWC on land in collaboration with FFA, which is currently also working in this area. Vanuatu's 32 National Fisheries Observers could play an important role in improving data collection.

High resolution audits are also recommended to address marine litter and other pollution impacts from the domestic fleet, combined with other activities that the Office of the Marine Regulator and other stakeholders are already progressing. This could also build on other approaches used by IMO (such as garbage management plans and garbage record books).

9.2.6 Consider the effectiveness of Regional Port Reception Facility Arrangements

A Regional Port Reception Facility Plan was launched in 2015 for the Pacific and is the current approach used by many. The small amount of data on its efficacy is not conclusive. The limited capability of ports to track ship waste generation and disposal across jurisdictions is a complicated matter which may be contributing to waste leakage from vessels as discussed in Section 6.3.

FFA has been examining this in relation to international fishing vessels operating across multiple economic exclusion zones. This was instigated in response to concerns about waste leakage resulting from variable practices from different flagged vessels, variable observer coverage and reporting, and the low volumes of garbage being landed. FFA is considering how a viable system may be developed to address this.

An over-reliance on port reception facilities combined with limited investment in infrastructure and regulation may contribute to leakage of garbage into Vanuatu's waters from international vessels with little capacity to store wastes for long periods.

The lack of port waste reception infrastructure available to domestic vessels is also likely to contribute to waste leakage.

The effectiveness of the Regional Port Reception Facility Arrangements should be reviewed, with an emphasis on leakage.

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Appendix A: Agent survey questions

Agents survey questions and contact details

Questions

1. What kinds of ships do you manage?
2. Approximately what number and/or proportion of your ships would request
    a. Garbage
    b. Oily waste
    c. Sewage
    d. Noxious liquid substances prewash
    e. Solid bulk cargo residues (dry or contained in hold wash water)
    f. Ozone depleting substances
    g. Exhaust gas cleaning system residues
    h. Antifouling systems waste
    i. Ballast tank sediments
3. Do you have any views on why your ships might or might not choose to deliver waste to shore in port?
4. How/with whom do you make arrangements for waste reception?
5. Have you had any particular difficulties in making these arrangements?
6. Overall, are you satisfied with waste reception facilities in port?

Appendix B: Questionnaire

QUESTIONNAIRE ELEMENTS

Derived from *RESOLUTION MEPC.83(44), adopted on 13 March 2000: GUIDELINES FOR ENSURING THE ADEQUACY OF PORT WASTE RECEPTION FACILITIES*

Contents

Section A Assessment Details

Auditor	Organisation & Address	Contact Details Phone: Fax:	Date

Name of Port and Location	
Name and Contact Details of Port Representatives	**Name:** **Position:** **Organisation:** **Address:** **Telephone/Fax:** **e-mail:**
	Name: **Position:** **Organisation:** **Address:** **Telephone/Fax:** **e-mail:**
	Name: **Position:** **Organisation:** **Address:** **Telephone/Fax:** **e-mail:**

Section B Summary of Waste Reception Facilities Provided

Type of waste	Can Waste be Received (Y or N)	Type of Reception Facility (Fixed, Road Tanker or Barge)	Any Limitations in Capacity (m^3)	Service Provider (Port, Private Contractor, State Authority or Other) Indicate the number of service providers
Oily[8]				
Oily tank washings				
Dirty ballast water				
Oily bilge water				
Oil Sludges				
Used lubricating oil				
Noxious Liquid Substances[9]				
Category A				
Category B				
Category C				
Category D				
Sewage				
Garbage[10]				
Category 1				
Category 2				
Category 3				
Category 4				
Category 5				
Quarantine Wastes				

Ship Type*	No of ship visits during the period of review	Average Range of dead weight (Tonnes)	Average No. of Persons on Board	Number of Requests for Waste Collection				
				Oily Wastes	Noxious Liquid Substances	Sewage	Garbage	Quarantine Wastes
Oil Tankers								
Crude oil tankers								
Combination carriers*								
Chemical Tankers								
General Cargo								
Container Carriers								
Bulk Carriers								
Passenger ships								
Livestock Carriers								
Fishing Vessels								
Recreational Crafts								
Other								

*The ship types marked with an asterisk (*) are defined in the Annexes to MARPOL 73/78. The other types of ships have been indicatively inserted as their operations may influence the reception facilities required.

Section D Assessment of Waste Reception Facilities

Question		Yes	No
1	How are the oily wastes disposed of? (Please give details, on separate sheet, if available) separation of oil and water then recycling land disposal recycled incineration other (specify)		
2	Are there any restrictions on receipt or collection of oily wastes by service providers? (Please give details if available) Minimum quantity Maximum quantity Discharge rate (m^3 /hour) Vessel type Vehicle Access to Berth Other (specify)		
4	Are oily waste reception facilities available – 24 hours a day, 7 days per week 24 hours a day, 5 days per week Business hours only, 7 days per week Business hours only, 5 days per week		
5	Is prior notice for receipt of oily wastes required – 0 hours 12 hours 24 hours 48 hours		
6	.1 Is the waste receipt service available: At no cost at a cost incorporated into standing port use charge at a cost charged in addition to other services .2 Is the cost: reasonable in terms of service a disincentive other (specify)		
7	Is a waste collection service available: At all berths At most berths At only one berth to vessels anchored within the port To vessels anchored outside the port Other (specify)		
Comments:			

Based on the above, please provide an assessment of the provision of waste reception facilities:
1 - Less than satisfactory 2 - Satisfactory 3 - Fully meets the requirements

Section D 2 Noxious Liquid Substances (NLS)

Question		Yes	No
1	Where is the NLS disposed of? (Please give details if available) Directly from the ship to a mobile facility Ships to a holding tanks prior to being pumped out Other (specify)		
2	Are there any restrictions on receipt or collection of NLS wastes by service providers? (Please give details if available) Minimum quantity Maximum quantity Discharge rate (m^3 /hour) Vessel type Vehicle Access to Berth		
3	Are NLS reception facilities available - 24 hours a day, 7 days per week 24 hours a day, 5 days per week Business hours only, 7 days per week Business hours only, 5 days per week Other (specify)		
4	Is prior notice for receipt of NLS required - 0 hours 12 hours 24 hours 48 hours		
5	Is the waste receipt service available: at no cost at a cost incorporated into standing port use charge at a cost charged in addition to other services		
7	Is a waste collection service available: At all berths at most berths At only one berth To vessels anchored within the port To vessels anchored outside the port Other (specify)		
Comments:			

Based on the above, please provide an assessment of the provision of waste reception facilities:

1 - Less than satisfactory **2 - Satisfactory** **3 - Fully meets the requirements**

Section D 3 Sewage

	Question	Yes	No
1	Where is the sewage disposed of? (Please give details if available) Directly to a reticulated sewerage system Directly to a mobile facility Ships to holding tanks then pumped to a mobile facility Ships to on-site treatment facility to sewerage system Other (specify)		
2	Are there any restrictions on receipt or collection of sewage wastes by service providers? (Please give details if available) Minimum quantity Maximum quantity Discharge rate (m^3 /hour) Vessel type Vehicle Access to Berth		
3	Are sewage reception facilities available - 24 hours a day, 7 days per week 24 hours a day, 5 days per week Business hours only, 7 days per week Business hours only, 5 days per week Other (specify)		
4	Is prior notice for receipt of sewage required - 0 hours 12 hours 24 hours 48 hours		
5	Is the waste receipt service available: At no cost At a cost incorporated into standing port use charge At a cost charged in addition to other services		
7	Is a waste collection service available to : At all berths at most berths At only one berth Vessels anchored within the port Vessels anchored outside the port		
Comments:			

Based on the above, please provide an assessment of the provision of waste reception facilities:

1 - Less than satisfactory 2 - Satisfactory 3 - Fully meets the requirements

Section D 4 Garbage Disposal – On Shore

Question	Yes	No
1 Where is the garbage disposed of? (Please give details if available) Local Government dump/landfill Private dump/landfill Transfer Station Materials Recycling Facility Don't know		
2 Where are quarantine wastes disposed of? (Please give details if available) incinerator sterilisation deep burial normal landfill		
Garbage Disposal – Ship to Shore		
3 Are there any restrictions on receipt or collection of garbage wastes? (Please give details if available) Minimum quantity Maximum quantity Vessel type Vehicle Access to Berths		
4 Are garbage waste reception facilities available - 24 hours a day, 7 days per week 24 hours a day, 5 days per week Business hours only, 7 days per week Business hours only, 5 days per week		
5 Is prior notice for receipt of waste required - 0 hours 12 hours 24 hours 48 hours		
6 Is the waste receipt service available: at no cost at a cost incorporated into standing port use charge at a cost charged in addition to other services		
7 Is a waste collection service available : at all berths at most berths at only one berth to vessels anchored within the port to vessels anchored outside the port		
Comments:		

Based on the above, please provide an assessment of the provision of waste reception facilities:

1 - Less than satisfactory 2 - Satisfactory 3 - Fully meets the requirements

Section D 5 Waste Management System

	Question	Yes	No
1	Has a waste management plan (WMP) been developed and implemented for ship wastes?		
2	Is the waste management plan part of an overall environmental management system (EMS) for the port?		
3	Are marinas and fishing harbours covered by the port EMS or required to develop their own EMS?		
4	Does the WMP provide a brief summary of the types of wastes received and the collection and disposal facilities/services?		
5	Does the WMP address and provide management objectives for:		
6	*Operations:* Facility Management Maintenance Signs Infrastructure Contractual arrangements Emergency Response Seasonal Variations Training and Education Delegation of Responsibilities and Accountability Compliance with regulatory conditions, including auditing		
7	*Technical Standards*: Facility Requirements Incorporation of new technologies Cleaning requirements Maintenance of equipment to technical standards		
8	*Environmental Considerations:* Prevention of pollution to surface waters Noise Emissions Visual impacts Odour Emissions Special considerations due to surrounding environment (eg. proximity to wetland or mangrove areas) Coastal processes (e.g. extreme tides)		

9 *Plans for future expansion / upgrades:* Oily Wastes Noxious Liquid Substances Sewage Garbage Recycling of wastes Quarantine wastes		
10 Are contact details held for all waste service providers?		
11 Are the service providers licensed/approved as required by legislation?		
12 Are a copy of the licences on file?		
13 Are a copy of the licences for the waste disposal facilities used by the service providers held on file?		
14 Have receipts for waste disposal been sighted / copies held on file?		
15 Are alternative waste service providers or disposal facilities available (eg spare drums, waste oil recyclers)?		
16 Is there a procedure for choosing waste disposal service providers (eg list of preferred contractors)?		
17 Are the details of back-up facilities available on file?		
18 Does the WMP include an emergency response plan?		
19 Is the plan adequate in that it addresses at least the following issues? Spillage of liquid Spillage of solids Leakage of gas fire or explosion Emergency contacts Other (specify)		
20 Is information recorded on the quantities of each waste stream which are received, date of receipt, disposal contractor and method of disposal or treatment? (Data sighted/copies attached) Oily wastes Noxious Liquid Substances Sewage Garbage Recycling of wastes Quarantine wastes		
21 Are there variations in the quantities of each waste stream received? In any one month (e.g. due to shipping variations) In any one year (e.g. due to seasonal effects) Over a number of years (e.g. due to industry growth) Don't know		
22 Is this information analysed on an on-going basis to detect changes in usage (both short term season variations and long-term growth or reductions) and assist		

in formulating future plans? (Graphs sighted)		
23 Is on-going consideration given to changes in demand for waste reception facilities?		
24 Do plans exist for future upgrades, extensions or reductions to the waste reception facilities?		
25 Is there an on-going process for reviewing existing facilities and determining changes that may be required to meet adequacy, timing or waste generation demands?		
26 Are there provisions for audits against the WMP (at least within 2 years of implementation and thereafter every 3 years?)		
27 Is there provision for periodic review of the WMP?		
28 Are the relevant requirements of the MARPOL 73/78, UNCLOS and IMO generally adhered to by the users of the port?		
29 Is there information on the state and local regulations regarding (please list legislation if known): Waste management Pollution of water Pollution of air Noise emissions Discharges to sewer Storage of dangerous goods Local Government requirements		
30 Is there information on waste minimisation hierarchy, i.e. avoid/reduce/ reuse/recycle/reprocess?		
31 Is an open and co-operative relationship maintained between the port authority and the relevant authorities and agents?		
32 Are there channels of communication and consultation with relevant organisations to ensure that particular changes in demand are considered in providing waste reception facilities? (Give examples of consultation methods)		
33 Do training programmes for port employees (both of the port authority and users) include a section on waste management and the facilities provided at the port?		
34 Is there a section in the WMP or a separate document which is included in agreements with port users and specifies requirements for the usage of port waste reception facilities?		
35 Is clear and visible signage for waste reception facilities present and includes: advice at initial vessel contact point of waste reception facilities: direction to receptacle or disposal point location: labelling of all receptacles and disposal points: contact numbers: emergency procedures:		

translation into other languages as required:		
36 Are there information sheets/ leaflets available for each waste reception facility?		
37 How is this information conveyed to ships?		

Comments:

Based on the above, please provide an assessment of the waste management systems:

1 - Less than satisfactory 2 - Satisfactory 3 - Fully meets the requirements

Section E Assessment of Adequacy of Service

Organisation:	Representative Interviewed:	Contact Details Address: Phone: Fax:	Interview Date:

In the view of the representative interviewed, what overall rating would be given for the waste reception service?:

1 - Less than satisfactory 2 - Satisfactory 3 - Fully meets the requirements

Please provide details of the good aspects of the waste reception services:

Please provide details of the deficiencies of the waste reception services:

Based on the above, please provide an assessment of the adequacy of waste reception service:

1 - Less than satisfactory 2 - Satisfactory 3 - Fully meets the requirements