



OECS SOLID AND SHIP-GENERATED WASTE MANAGEMENT PROJECT

PROJECT STATUS REPORT

September to December 2001

1.0 Project Background

The Solid Waste Management Systems in the OECS sub-region comprising Antigua and Barbuda, Commonwealth of Dominica, Grenada, St. Kitts and Nevis, St. Lucia and St. Vincent and The Grenadines which were predominantly operated by Government and Parastatal Institutions have experienced numerous challenges in recent years.

The main prevailing institutional constraints to effective waste management are summarized as follows:-

- Limited absorption capacity of existing institutions;
- Inadequate or ineffective legislative instruments;
- Lack of effective enforcement of relevant existing legislation;
- Under-capitalized infrastructure;
- Inefficient and poorly defined administrative responsibilities.

Although the related environmental problems are not overwhelming, the linkages between sustainable development and the environment are clearly evident. To safeguard public health, the quality of the environment and thus protect our tourism base in particular, the participating States of the OECS are extremely interested in undertaking policies and programmes to protect the environment including improvement in waste management which was given top priority.

The World Bank acting in the role of catalyst, has succeeded in bringing together the six OECS Countries to jointly address this most urgent environmental problem facing them and working closely with OECS Governments, developed the OECS Solid and Ship-generated Waste Management Project for mobilizing International and Regional Agencies to assist the OECS Countries in developing a coordinated regional environmental strategy supported by action plans at both the regional and national levels.

The Project comprises a number of national components, which are similar for each of the OECS Countries, and a regional component, which covers issues common to all. The regional component is implemented by the OECS through the Natural Resources Management Unit (NRMU) based in Saint Lucia.

The objective of the Project is to protect the environmental integrity of coastal and marine systems in the Caribbean Sea, supporting the Recipients in their efforts to enforce the MARPOL 73/78 Convention through: (i) reducing pollution of international and territorial waters by improving the monitoring, collection, treatment and disposal of solid

waste; (ii) establishing an appropriate legal and institutional framework for the management of solid waste; and (iii) designing plans and programmes to improve collection, treatment and disposal of liquid waste and identifying regional opportunities for recycling of solid waste.

The Project was originally scheduled to have been completed by December 2000. However, since a number of the targets had not been achieved by that date, the Project was extended to February 2002. The regional component has been further extended until October 2002. The regional component in the second phase of the Project has now been streamlined so that it can better serve the needs of the individual Solid Waste Management Entities (SWMEs). Consequently, the regional and national components of the project are now synchronized. Over the life of this second phase the project will therefore focus primarily on the following:

- a) support for project implementation, monitoring and evaluation;
- b) formulation and adoption of harmonized policy, legal and institutional frameworks for the management of waste, consistent among the participating member states;
- c) development of waste diversion opportunities, including a waste reduction programme;
- d) increased public support for waste management through sustained public awareness campaigns;
- e) the closing of existing dump sites and/or the building of new sanitary landfills;
- f) the implementation of a bio-medical waste programme;
- g) training in solid waste management operations, including exchanges and attachments between the SWMEs; and
- h) the production of manuals and work instructions for various waste management operations, including preventative maintenance of equipment.

2.0 Status of Implementation

During the last quarter of 2001 various initiatives were undertaken through the project at the national and regional levels. This present report covers the status of implementation of the various initiatives being undertaken under the project at both levels.

2.1 Regional Component.

- 1) A range of Technical Assistance (TA) and training needs to the SWMEs have been facilitated and coordinated by the NRMU. Due to the relatively

short space of time available for completion of the programme, and to reduce the number of contracts to be administered, technical activities continue to be bundled into manageable lots. The fastest procurement methods allowable by the World Bank have been employed. The status of development and implementation of these TA activities are summarized in Annex 1.

2) NRMU has hired Mr. Mike Cowing, a solid waste management specialist, for the period November 15, 2002 to February 28, 2002 . Mr. Cowing has been providing useful technical assistance to the SWMEs especially those in Dominica and St. Kitts-Nevis.

3)a) During the reporting period work commenced on the development and implementation of a Biomedical Waste Management Plan in Dominica. During the first quarter of 2002 contracts have been issued to two (2) consultants for similar activity in St. Kitts and Nevis, Grenada and St. Vincent and the Grenadines. To date work has been completed on the following:

- Audit of Biomedical Waste Management Practices in Dominica and St. Kitts and Nevis and;
- A Review and Recommendation of Waste Treatment Technologies in Dominica and St. Kitts and Nevis.

Consultation is encouraged and there is close coordination among the consultants to allow for consistency in the content and quality of the outcome of the consultancies. Country specific reports already submitted are available under separate cover. The required outputs of the consultancies are all similar and details are covered in Annexes 2A and 2B.

b) The treatment of biomedical waste is a key component for successful implementation of Biomedical Waste Management Plans. In St. Lucia the Technical Specifications and Tender documents for an autoclave facility have been submitted to NRMU and the St. Lucia Solid Waste Management Authority. In the other participating countries steam sterilization (autoclaving) with shredding is expected to be the chosen treatment technology .

c) In the few months ahead a regional technical workshop on Biomedical Waste Management will be convened. This workshop will not only serve as additional training but will ensure uniformity among the participating member states in the implementation of the Biomedical Waste Management Plans.

- 4) In St. Kitts-Nevis the Shore-Generated Waste Management Bill received a first reading in November 2001. The Attorney General's office is expected to submit the Ship-Generated Waste Management Bill to cabinet for presentation to parliament during the early part of the first quarter of 2002. In Antigua and Barbuda both the Shore and Ship-Generated legislation is expected to be parliament ready by the end of February, 2002.
- 5) A regional one week waste characterization training and demonstration workshop was held in Antigua and Barbuda during the week of October 22, 2002. Two representatives from each of the SWME's attended. A draft report is available under separate cover. SWMEs in Dominica, Grenada, St. Kitts-Nevis and St. Vincent and the Grenadines are expected to complete waste characterisation studies with the aid of a consultant during the first quarter of 2002. In Grenada the exercise is also expected to include Scoping of Requirements to Prepare a National Waste Management Strategy. The Terms Of Reference(TOR) for these studies are currently under preparation.
- 6) Through the NRMU Dominica has been provided with the services of an international procurement specialist. The design of the Materials Recovery Facility (MRF) for the Fond Colet landfill is now complete. Construction of the MRF is now in progress. Details of the MRF design is covered in Annex 3.
- 7) With the assistance of the NRMU and the Saint Lucia Solid Waste Management Authority the St. Christopher-Nevis Solid Waste Management Corporation completed a survey to ascertain the attitudes and beliefs of Kittitians and Nevisians to solid waste management practices. The results of the survey are being used as a baseline to evaluate the success of future awareness and sensitization campaigns on solid waste management.
- 8) As part of waste recovery and reduction strategies the NRMU facilitated a week long composting workshop during the week of January 28, 2002, in St. Vincent and the Grenadines. A second workshop is due to commence in St. Kitts-Nevis April, 2002. Details of the output of this activity is included as Annex 4.
- 9) Public awareness and sensitisation is continuing in participating member states on both a national and regional level. Through teleconferencing members of the Solid Waste Environmental Educators Network (SWEEN) are able to interact and consult with each other all at once, allowing for effective coordination of Public Awareness Strategies.
- 10) Contracts have been prepared for two consultants to develop Preventative Maintenance Programmes for Solid Waste Management Equipment in the six (6) participating OECS states. Details on the expected outputs are covered in Annex 5.
- 11) On November 9, 2001, a scoping meeting was held to begin formulation of the

Development of an OECS Strategy on the Management of Used Oil. A key output of the meeting was the formation of a working group to help the development of the strategy. The first meeting of the working group was held on January 15, 2002. A report on the Scoping Meeting is included as Annex 6; the Conclusions And Recommendations of the first meeting of the Working Group is included as Annex 7. The Terms Of Reference of the Working Group is outlined in Annex 8.

2.2 National Components

The status of implementation of the National Components is summarized by country in the tables on the following pages. It should be noted that reports were not received for St. Vincent and the Grenadines and Grenada.

3.0 Conclusion

NRMU will continue to provide technical assistance to the participating member states under the regional component of the project during the recent extension until October, 2002. Participating member states must however on a national basis implement measures to ensure sustainability of all aspects of the project.

Summary Status Report (Fourth Quarter-2001)

Country: Antigua-Barbuda

Activity	Status	Comments
Formulation of Legislation	Draft Solid Waste Management Act complete; consultancy for Marine Waste Management scheduled to start this quarter.	Both land based and marine legislation will be submitted to Cabinet as soon as the Marine waste Act is complete by end Feb2002
Procurement of Equipment	Complete except for Barge which is due on February 28 2002	All WB equipment except the Barge is on island; 5 compactor trucks procured under EIB will be shipped at the end of the month. This accounts for all equipment except that associated with the operation and construction of the landfills.
Implementation of 4Rs Initiatives	There is a focus on composting and a number of community projects have been initiated	Await composting training programmes that have been postponed from December 2001
Implementation of Cost Recovery Measures - Environmental Levy etc.	Levy is in place. Neither haulage or tipping fees – although legislated - are in place	A sub-committee of the NSWMA is presently reviewing potential cost recovery measures. Some changes should occur during 2002. Monthly household subscriptions is one of the options being examined.
Marine Waste Tracking	No action	Await regional initiative
Biomedical Waste Management	The existing system has been refined and continues to function reasonably well.	
Public Awareness/Education	On-going.	There are signs that there is a positive public shift in awareness of the importance of solid waste management and also importantly many signs that there is compliance with messages and entreaties.
Landfill Construction and Operation	Landfill construction due to start this quarter. Funding is in place, a contractor has been selected and contracts should be signed by 15Jan2002 for construction to start 15Feb2002	Await no-objection from EIB to sign contract.
Waste Characterization	Waste characterization study and training completed by OECS consultants.	Draft report received and commented on.

Summary Status Report (4th Quarter 2001)

Country: St. Kitts and Nevis

Activity	Status	Comments
Formulation of Legislation	<ul style="list-style-type: none"> < Shore-Generated Waste Management Bill received first reading in National Assembly (November 2001) < Ship-Generated Waste Management Bill received “no objection” from SWMC; lead Ministry for seeing process through National Assembly now identified as the Min. CWPU < Chambers of Attorney-General willing to recommend to Cabinet that Bill be presented to National Assembly, if no response from Min. CWPU to the contrary by January 31, 2002 	Dr. Liverpool served as Legal Consultant (regional Component)
Procurement of Equipment	<ul style="list-style-type: none"> < All the equipment ordered (via WB/GET) now on islands save for the Barges < Issues related to Letters Of Credit etc resolved 	OECS–NRMU recently advised SWMC/A’s of potential difficulties with delivery of barges according to schedule as a result of Grenada situation. Matter yet to be resolved and decision communicated to SWMC/A’s by OECS-NRMU
Implementation of 4-Rs Initiatives	<ul style="list-style-type: none"> < Engaged in discussions re development of entrepreneurial initiatives/ businesses with local and foreign enterprises re recycling < recycling still identified additionally as a component for regional approach (volumes, quantity, economy of scale etc.) < initiated a system to facilitate the “reuse” of certain materials from the disposal site (Conaree). Agreed to expand the variety of 	< SWMC provides support through invitation/participation in workshops/training opportunities

	<ul style="list-style-type: none"> < materials/equipment that may be reused/retrieved < identified possible partners for the pilot composting initiative 	<ul style="list-style-type: none"> < area at landfill site secured for demonstration compost station
Implementation of Cost Recovery Measures -Environmental Levy etc.-	<ul style="list-style-type: none"> < Environmental Levy remains the only source of income < Among the recommended additional cost recovery measures are payment for bulk collection/disposal from industrial, commercial and institutional waste prior to the construction of landfill; rental of equipment; 	<ul style="list-style-type: none"> < Operations of SWMC very vulnerable to the haphazard/uncertain transfer of funds re environmental levy (especially cruise passengers). Arrears now in the region of EC\$1,094,141.20 < Arrears 2000 - \$442,105.20 < Jan – Oct 2001 -\$652,036.00
Marine Waste Tracking	<ul style="list-style-type: none"> < A component to be initiated by the OECS-NRMU 	
Biomedical Waste Management	<ul style="list-style-type: none"> < No particular medical waste technology decided upon to date < Awaiting the feedback from the OECS-NRMU following the Technical Consultancy to advise on possible options. The Technical Report to guide way forward still outstanding. < Sought and obtained clarification re the position of WB on this matter < SWMC presented Ministry of Health with possible choices 	<ul style="list-style-type: none"> < Options seem to be between incinerator and autoclave < Major issues are cost, timely procurement, specifications, size, maintenance/training of local personnel, < See copy of communication forwarded to Ministry of Health and Environment on the matter
Public Awareness/Education	<ul style="list-style-type: none"> < Initiated the Radio Series (twice weekly) entitled “Waste Matters” as of November 2001; focuses on community education/awareness and community action plus information dissemination < Produces and airs, twice daily, a variety of Public Service Announcements (PSA’s) 	<ul style="list-style-type: none"> < Popular request to convert radio editions into a TV version

	<ul style="list-style-type: none"> < Produced and aired a TV documentary entitled “Waste Matters: The Conaree Story” (15 min) which focuses on the history and development of the proposed landfill site on St. Kitts < Constructed a model of proposed Sanitary Landfill for display at strategic points at the AIR AND SEA PORTS < Negotiated medium term contract with radio/tv station and local communication enterprises for the production of programmes < published the instruments re the Solid Waste Management Attitudinal Survey < Conducted a number of on the job/ orientation/awareness sessions particularly for staff/personnel to whom the business of solid waste management is also a novel idea < commissioned a song with which to identify solid waste related activity 	<ul style="list-style-type: none"> < collaborated with CEHI in the production of a documentary ▪ survey to be completed before end of first quarter 2002 ▪ priority given to landfill-based staff and litter wardens < to respond to recommendation to “jazz up” song through local popular band to reach target/the teens and early 20's.
Landfill Construction and Operation	<ul style="list-style-type: none"> < Add-loan (USD 5.8 mm) received from CDB < Received “no objection” from CDB to recommended construction firm (January 2002) < Formal signing of contract scheduled for February 5, 2002 < Mobilization in progress < Construction to be completed six months after February 5 (August 2002) < Enhancement/improvement effected to Landfill Sites provided under separate cover 	<ul style="list-style-type: none"> < Local Legal Department to provide CDB Legal Department with opinion to expedite eventual drawing down on add-loan < President of recommended construction firm (Spring Point Management of Canada) already on island. Office Space and accommodation already secured

Waste Characterization	< Three members of staff attended the regional work shop in Antigua < local session yet to be scheduled in conjunction with the OECS-NRMU	

SUMMARY STATUS REPORT (Oct. – Dec. 2001)

COUNTRY: ST. LUCIA

ACTIVITY	STATUS	COMMENTS
Formulation of Legislation	Still with the Attorney General's (AG) Chambers	Indication given that high priority is being placed by AG's Office. Shore legislation finalized, Ship Legislation in process of finalization.
Procurement of Equipment	Landfill Compactor, Weighbridge, Landfill Monitoring Equipment, Tire Shredder, Waste Oil Storage Containers, Autoclave to be procured	The tenders for procurement of equipment is being prepared for the World Bank. Procurement Specialist next visit expected in March 2002.
Implementation of 4 Rs Initiatives	Composting Strategy developed	To be implemented following the regional Master Composters Training Course.
Implementation of Cost Recovery Measures - Environmental Levy	Lobby in progress to receive full receivables of environmental levy	Cost recovery plan developed and submitted to Ministry of Finance.
Marine Waste Tracking	On going	Discussions in progress.
Biomedical Waste Management	Ongoing	Procurement of waste treatment technology will be finalized by the 1 st quarter of 2002. Site specific plans on going for Victoria Hospital. Model to be introduced at six major Health Centres.
Public Awareness/Education	Ongoing	New initiatives slated for January 2002 e.g. 'Carry A Bag Day', Newsletter updated, Workshops in progress

Landfill Construction & Operation	Ongoing	Anticipated delivery of final construction slated for March 2002
Waste Characterization	To be done	Both Disposal Sites scheduled to be done in January 2002

**OECS SOLID AND SHIP-GENERATED WASTE MANAGEMENT PROJECT
SUMMARY STATUS REPORT : FOURTH QUARTER 2001**

COUNTRY: Dominica

ACTIVITY	STATUS	COMMENTS
Formulation of Legislation	On going	Solid Waste Management Legislation passed on January 7, 2002. Ship-generated Waste Management Legislation under formulation. Technical Assistance for this exercise will be provided by the OECS NRMU.
Procurement of Equipment	On going	It is anticipated that all procurement activities will be substantially completed by February 28, 2002. See attached addendum.
Implementation of 4Rs Initiatives	It is anticipated that the OECS Solid Waste Management Project will provide technical assistance for a pilot composting program	Composting is considered the principal, if not the only viable, waste diversion option at the juncture. Attended Master Composting Training Workshop in February, 2002.
Implementation of Cost Recovery Measures	To be fully implemented when landfill is	Only the Visitor Environmental Levy and charges for the reception of ship-generated waste are presently applied.
Marine Waste Tracking	Will be executed by the Maritime Administration Unit in accordance with the New Maritime Act to be enacted shortly	It is also anticipated that provisions for the comprehensive Management of Ship-generated waste will be incorporated in the Maritime Act. Said Maritime Act will be enacted by April 30, 2002.
Biomedical Waste Management	Funding will be provided by CDB for the procurement of a Bio-medical Waste Incinerator	Technical Assistance for concomitant study will be provided by the OECS NRMU.
Public Awareness	Effectively suspended until receipt of balance of funding from the OECS Solid and Ship-generated Waste Management Project - Regional Component, in the sum of US\$20 898.40	Still awaiting draw down of proposed funding.
Landfill Construction and Operation	Formal request for necessary supplemental funding submitted to the EU	Implementation effectively suspended until receipt of supplemental funding. It is anticipated that said funding will be received by or before May 31, 2002. Contingent upon the above, construction will commence by August 1, 2002.

ACTIVITY	STATUS	COMMENTS
Environmental Levy	On-Going	
Waste Characterization	Technical Assistance for implementation to be provided by the OECS NRMU (OECS – Solid and Ship-generated Waste Management Project - Regional Component)	It is anticipated that waste characterization study will commence within the first quarter of 2002.

STATUS OF EQUIPMENT PROCUREMENT AS OF 31ST DECEMBER 2001

DESCRIPTION OF EQUIPMENT	DONOR AGENCY	STATUS
Skip Hoist Truck – Nos. 1	IDA/IBRD	Received
Hoist Truck – Nos. 1	-do-	-do-
Tipper Truck (10 cubic yard) – Nos. 1	-do-	-do-
Crawler Tractor – Nos. 1	-do-	-do-
Containers for the Reception of Ship-Generated Waste – Nos. 90	GET	-do-
Equipment for Materials Recovery Facility	IDA/IBRD	Expected to be completed by February 28, 2002
Weigh-bridge	-do-	-do-
Waste Oil Storage Containers	-do-	-do-
Tire Slicer	-do-	-do-
Bin Washer/Well	-do-	-do-
Barge for the reception of Ship-Generated Waste	GET	-do-
Equipment for waste collection and transport	CDB	Expected to be completed by December 31, 2002
Bio-medical Waste Treatment Equipment	CDB	Expected to be completed by June 30, 2002

- No additional equipment to be procured

Annex 1



OECS SOLID AND SHIP-GENERATED WASTE MANAGEMENT PROJECT REGIONAL COMPONENT - EXECUTED BY THE OECS-NRMU

STATUS OF TECHNICAL ASSISTANCE REQUESTED BY PIUs, As Of February 11, 2002						
TYPE OF TECHNICAL ASSISTANCE REQUESTED	ANB	DOM	GND	SKN	SLU	SVG
A. LEGAL						
A.1 Formulation of Legislation: Shore-Generated Waste	2			1		
A.2 Formulation of Legislation: Ship-Generated Waste	2	2	2	2		2
B. TECHNICAL						
B.1 Waste Characterisation Studies	1	3	3	3		3
B.2 Technologies for Composting	1	1	1	1	1	1
B.3 Conduct of survey on attitudes and expectations				1		
B.4 Implementation of Cost Recovery Strategies			2	2	2	2
B.5 Development of a National Action Plan for Waste Diversion	2	2	2	2	2	2
B.6 Development of Marine Waste Tracking System					4	
B.7a Development of a Bio-medical Waste Management Plan		2	2	2	1	2
B.7b Implementation of a Bio-medical Waste Management Plan		2	3	2	3	3
B.8 Development of Equipment Maintenance Manuals	3	3	3	3	3	3
B.9 Development of Integrated SWM Plan			4			4
B.10 Design of MRF		1				
B.11 Construction of MRF		2				
B.12 Upgrading Existing Work Sites		3		3		
B.13 Assist With Supervision Of Construction Of New Landfills		3		3		
B.14 Review Waste Collection Services		3		3		
C. CAPACITY BUILDING						
C1. Capacity Building - Ministries of Health		3	3	3	3	3
C2. Training attachments on Landfill Operations			3			1
C3. Regional Training Course - Solid Waste Operations	3	3	3	3	3	3
C3. Waste Characterisation Training and Demonstration Prog.	1	1	1	1	1	1
D. PUBLIC AWARENESS AND SENSITISATION						
D.1 Development and Implementation of Public Awareness Strat.	2	2	2	2	2	2
E. MONITORING AND EVALUATION						
E.1 M&E of Solid Waste Management System				4	4	4
WORKSHOPS/MEETINGS						
F1. Regional Tehnical Meeting on Solid Waste Mgmt. Operations	3	3	3	3	3	3
F2. Second Regional Roundtable on Project Implementation	3	3	3	3	3	3

Type of Activity
 Activity to be implemented in-house

1- Completed

2- In Progress

3- To Commence Shortly

4- Not Yet Initiated

Blank Space-Country Did Not Request Technical Assistance In Specified Area

Annex 2A
Activities to be Undertaken For The Development and Implementation Of
Biomedical Waste Management Plans

Specific activities to be undertaken by the consultant shall include:

A. An Audit of Bio-medical Waste Management Facilities

An audit of the existing waste management practices as well as a review of the present domestic waste management system of Dominica will be conducted. Information to be gathered will include a review of present regulations, policies and procedures with large and small healthcare facilities. A report presenting the current status of biomedical waste management on Dominica will be generated.

B. Review of Existing Medical waste Treatment Technologies

A review and recommendation of available waste treatment technologies considering the outcome of the waste audit and practical as well as economic and environmental impacts of the technologies reviewed relative to Dominica. This will include operating criteria for Bio-Hazardous Wastes Treatment Technologies.

C. The Development of a National Biomedical Waste Management Plan

A National Biomedical Waste Management Plan will be developed based on the findings of the audit and discussions with key personnel on the island. The plan should allow for the integration of all facilities generating biomedical waste on the island. Standards for the Biomedical Waste Management Plan will be based on accepted international practices and systems at the current time. Appropriate systems should be developed using these Standards as a benchmark for the project. The plan will include but not limited to the following:

- . Definitions of Biomedical and other Bio-Hazardous Wastes /Regulations and Policy.
- . In-House Bio-Hazardous Waste Management (including contingency planning and spill control/responses).
- . Transportation of Biomedical Waste (including contingency planning and spill control/responses).
- . Bio-Hazardous Waste Treatment Technologies.
- . Operation of a Bio-Hazardous Waste Management Plan to include Occupational Health and Safety guidelines.

This will include the development of a procedure manual, signage templates, layout plans, drawings, schedules and other literature as required to provide the means to manage the system. System design from waste generation to final landfill disposal should be described. This should include audit trail documentation throughout the system from generation to disposal of waste. Procedures should be comprehensively produced for the main hospital as a model

for the smaller facilities. This model will be used to develop the systems at other health care facilities in the country and be able to integrate these facilities into the national system at the required standard.

- . Identification of Training Requirements.
- . Procedures and guidelines for handling other hazardous wastes.
- . A conceptual treatment facility design and operation.
- . An overview of specialized landfill design requirements for disposal of biomedical waste
- . A budget for the implementation of the plan.

This will include procurement needs and sources with budget costs. An estimate on various materials and equipment requirements for the process, including processing equipment, such as that required for the chosen waste treatment technology, appropriate containers and bags, etc. will be provided. Ideally the actual ordering of the required equipment will take place during system delivery, to enable systems to be established with the required equipment available. This would be ideal prior to training delivery. Responsibility for actual procurement will fall with appropriate agencies within the country with funds separate from this consultancy.

- . A specification of personnel resources, organizational structure and responsibilities for successful implementation of the plan.
 - Specific job titles and descriptions should be provided and integrated with existing structures and resources in the lead hospital. Where appropriate and possible specific individuals should be identified for the various roles.
 - Definitions of responsibilities, duties, and codes of practice for each of the different categories of personnel of the hospital who, through their daily work, will generate waste and be involved in the segregation, storage, and handling of the waste. Where special practices are required, e.g. for radioactive waste or hazardous chemical waste, the stage at which attendants or ancillary staff become involved in waste handling shall be clearly defined.

D. Training Programme/Implementation and Monitoring.

A training programme will be developed and undertaken based on the findings of the waste audit and current waste management practices. Training will focus on the operatives within the system and will include on-site training. Training requirements for each job within the recommended structure will be designed and tailored to fit existing personnel resources and abilities. Training delivery requirements and strategies will be prepared. Training requirements for individuals that perform essential functions within the management plan but are currently outside the medical structure will also be described and undertaken. This will include individuals, such as waste collectors and truck drivers, landfill site operators, etc. who will require specialized training prior to system implementation. Training programmes will be coordinated with key personnel

with the long term goal to be full implementation of the Biomedical Waste Management Plan. Educational methods such as Train The Trainer programmes will be implemented.

Annex 2B

Requirements for the Report on the Current Status of Bio-medical Waste Management and the National Bio-medical Waste Management Plan

A. Report on Current Status of Bio-medical Waste Management

The report should include:

- . A description of waste types and sources.
- . A description of current systems and practices, including, control systems, facilities and equipment in place.
- . A description of the personnel structure employed in the biomedical waste management function and current level of training. Training requirements for each job within the recommended structure should be described. Training delivery requirements and strategies should be prepared. All potential candidates expected to require training should be identified during this consultancy.
- . A detailed description of the lead facility and systems currently employed.

B. National Bio-medical Waste Management Plan

The plan should be based on accepted international standards and practices at the current time and should be appropriate for St. Vincent and the Grenadines. It should be recognized that the country may have different and diverse requirements and abilities to reach the Standards defined. Before the final plan a draft should be submitted to allow for review so as to determine appropriateness. This review will include a national consultation on the Biomedical Waste Management Plan.

The Plan should include the following:

1. Requirements Definition and System Design

The current situation should be assessed and the requirements for establishing a system that meets standard should be specified. This should include the following:

- Specification and Design

System design (including the appropriate medical waste treatment technology) from waste generation to final landfill should be described. This will be the national biomedical waste management plan.

With the lead hospital as the focus, a procedures/training manual will be prepared. The manual should provide for daily usage and should be able to be updated in a controlled fashion as it develops. The manual should be intended for hands on usage for each operative in the system and for training purposes. The manual design should focus on ease of use and clarity, as well as durability.

Documentation for systems control, including forms for audit trail, signing sheets, ownership transfer, check procedures, etc. should be prepared.

With the lead hospital as the focus, signage for different stations and functions within the process should be designed. Possible collection schedules should be given.

Requirements to ensure safe delivery of waste to designated landfill site in the country should be specified. An overview of specialized landfill design requirements should be included and advice provided for locating disposal sites for biomedical waste.

- A definition of equipment requirements

Procurement needs and sources with budget costs for ALL hospitals and medical facilities should be provided. Recommendations for development of procurement systems should be made if required.

- A specification of personnel resources, structure and responsibilities for the lead hospital.

Specific job titles and descriptions should be provided and integrated with existing structures and resources. Where appropriate and possible specific individuals would be identified for the various roles in the recommended structure.

2. Summary of requirements for the main facility

- Location and organization of collection and storage facilities should be given.
- The central storage point in the facilities should be identified.
- Design specifications
 - The recommended type of bag holder to be used in the wards and departments.
 - The recommended type of trolley or wheeled container to be used for bag collection.
 - Various sharp containers to be used.
 - Recommended medical waste treatment technology with possible sources and cost.
- Required material and human resources
 - An estimate of the number and cost of bag holders and collection trolleys.

- An estimate of the number of sharps containers and health care waste drum containers required annually, categorized into different sizes if appropriate.
- An estimate of the number and cost of yellow and black plastic bags to be used annually.
- An estimate of the number of personnel required for waste collection.
- An estimate of the number of red bags to be used annually.
- Responsibilities
 - Definitions of responsibilities, duties, and codes of practice for each of the different categories of personnel of the hospital who, through their daily work, will generate waste and be involved in the segregation, storage, and handling of the waste.
 - A definition of the responsibilities of hospital and other health care facility attendants and ancillary staff in collecting and handling waste, for each ward and department; where special practices are required, e.g. for radioactive waste or hazardous chemical waste, the stage at which attendants or ancillary staff become involved in waste handling shall be clearly defined.
- Procedures and practices
 - Simple diagrams (flow charts) showing procedure for waste segregation from various biomedical waste generators.
 - The procedures for segregation, storage, and handling of wastes requiring special arrangements, such as autoclaving.
 - Outline of monitoring procedures for waste categories and their destination.
 - Contingency plans, containing instructions on storage or evacuation of healthcare waste in case of breakdown of the treatment unit or during closure for planned maintenance.
 - Emergency procedures to cover spill control/responses in-house or during transportation.
- Training and Manuals
 - A Procedures Manual shall be submitted as part of the plan, and a Training Programme, based on this Manual, shall be delivered.

Annex 3

DOMINICA SOLID WASTE MANAGEMENT CORPORATION (DSWMC)

Report by M J Cowing - DFID Technical Cooperation Officer

Visit from 24th - 25th September 2001

Introduction

1. At the request of the OECS-NRMU, DFID's Technical Cooperation Officer (TCO), Mike Cowing, visited Dominica from 24th - 25th September 2001 to provide technical assistance to DSWMC. This visit coincided with the visit of Dr. Donald Strombom, DSWMC's Procurement Consultant.
2. This initial visit was for the purpose of providing technical assistance on DSWMC's proposed Material Recovery Facility (MRF) to be located at the Fond Colet Landfill Site. Particular attention was to be paid to the following:
 - The procurement of MRF equipment;
 - The design of the MRF; and
 - The general layout of the service area of the Fond Colet Landfill Site.
3. Meetings were conducted with Mr Oliver Brown, the General Manager, Mr Robert Douglas, the Project Engineer/Operations Manager and Dr Strombom, the Procurement Consultant.
4. In addition, a number of site visits were undertaken, including to the proposed Fond Colet Landfill, the existing disposal site at Stock Farm and the Scrap Metal Site at Jimmit.
5. This report presents the findings and recommendations from this visit. The views expressed here are those of the author and do not necessarily reflect the views of the donor agency supporting the activity or the OECS-NRMU.

Review

Procurement of MRF Equipment

6. DSWMC intend to purchase a range of equipment for the MRF- details of which are provided within Report No.1 of the Procurement Consultant.
7. However, during the review process it became apparent that greater consideration needed to be given to the suitability/applicability of a number of these items. In addition, a number of other items which would be extremely useful, such as a macerator for green waste, a Hazardous Waste Storage Area, replacement parts for the obsolete tracked loader and oil storage containers for service stations were not included on the original list.
8. The findings and recommendations of the review of the equipment list are provided within Table 1 at the end of this brief report.

Design of the MRF

9. The Project Engineer/Operations Manager had reviewed a number of preliminary designs for the layout of the MRF. However, due to the proposed changes to the MRF equipment, as discussed in Table 1, the design of the facility can be significantly simplified.
10. It is recommended that the design of the MRF should be as simple and robust as is practicable. It is proposed therefore, that the new layout shall comprise the following:
 - As previously envisaged, the facility should be a very simple structure comprising a reinforced concrete slab and roof and shall be built in such a fashion as to facilitate its future expansion;
 - It shall not comprise any mechanical or electrical conveyor belts to facilitate waste picking - as is the norm within 'dirty' MRFs where recyclables are extracted from mixed waste consignments. Rather, it shall handle, as far as is practicable, pre-sorted materials which have been separated at source (this process will be aided by the future introduction of a landfill levy with an exemption for recyclable materials);
 - It shall comprise a small number of dedicated bays which shall contain the treatment equipment for the following waste streams:
 - Tyres;
 - Cardboard and high grade paper; and
 - Green waste.
 - In addition, two additional service bays shall be provided for the following activities:
 - Washing and maintenance of bins/containers; and
 - Maintenance and repair of landfill plant such as the crawler tractor (to protect the concrete floor from damage from the metal tracks, it is recommended that a protective layer of shredded tyres should be used).
 - The facility shall be sized to provide sufficient capacity for the storage of recyclable materials following their initial processing. This is of particular relevance to the baled paper and cardboard;
 - Rather than being a 'drive-through' facility, vehicles delivering recyclable material shall simply reverse up to the appropriate bay and manually deposit their consignments;
 - After processing, the recyclable materials shall be stored within existing 4yd³ containers which offer the following advantages:
 - They can be simply manually loaded by a laborer with a shovel;
 - They are presently in use for the storage and collection of domestic waste and are hence readily available;
 - They can be maneuvered around the facility by the forklift truck; and

- They are compatible with the existing waste collection fleet for transportation to the tipping cell, or alternative designated final location.

Layout of the Fond Colet Landfill

11. A site inspection confirmed the suitability of the general area designated for the location of the MRF within the Fond Colet Landfill.
12. Further, it appears to be quite a simple exercise to cut and fill the general area in preparation for the facility's construction.
13. A draft site layout for the service area of the site had been prepared by the Project Engineer/Operations Manager. This has been reviewed and it is recommended that it be amended in the following way:
 - The site office and the weighbridge should be located together rather than separately. This will provide the following advantages:
 - It will speed up the reception process by minimising the number of times a vehicle has to stop when initially entering the site;
 - It will facilitate the routine inspection of waste consignments during the weighing-in process; and
 - It will assist the clerk in controlling site traffic and providing instructions to drivers regarding the designated routing of their vehicles.
 - The weighbridge and site office should be located as close to the entrance of the site as is practicable;
 - Access to the MRF should be after the weighbridge and office. This will assist with the following:
 - the control and use of the facility;
 - the subsequent disposal of non recyclables should the need arise; and
 - the weighing and quantification of recyclable materials handled.
 - The location of the wheelwasher should take in to account the following:
 - It should be within view of the weighbridge and site office to facilitate supervision and management of the facility;
 - It should be as near to the exit as practicable to minimise the amount of mud/silt potentially carried onto the public highway; and
 - It should be adjacent to the site road, as opposed to on the site road. This will allow flexibility in the use of the facility. For example, during dry periods it may be unnecessary for vehicles to wash their wheels prior to leaving the site. This will provide operational cost savings and will speed up the turn-around time for vehicles using the disposal site.
 - In addition to the above items, it is recommended that provision be made for a Hazardous Waste Storage Area to cater for the periodic identification of hazardous

waste items such as unidentified drums of chemicals. This will provide safe storage while suitable long-term disposal options, which may involve shipment overseas, can be evaluated. Again, this can be a very simple structure and should include, as a minimum, the following features:

- A secure fence to prevent public access to the items contained within;
- Good ventilation to prevent the build up of fumes and vapors;
- A hard standing to minimise any infiltration; and
- A perimeter bund to contain any spills.

Recommendations

Procurement of MRF Equipment

- The following items should be retained on the list of items to be procured:
 - Vertical baler (if agreement can be reached on market for materials in Martinique - if not, delete item);
 - Forklift truck;
 - Waste Oil Storage Tank;
 - Weighbridge;
 - Tyre Slicer; and
 - Bin Washer.
- The following items should be deleted from the list of equipment to be procured:
 - Glass crusher; and
 - Magnetic Separator.
- The following items should be added to the list of equipment to be procured (depending upon funds available):
 - Macerator for green waste;
 - A Hazardous Waste Storage Area within the landfill;
 - Replacement parts for the obsolete tracked loader; and
 - Waste oil storage containers for service stations.

Design of the MRF

- The design of the MRF should be as simple and robust as is practicable and shall comply with the recommendations within the appropriate section of this report.

Layout of the Fond Colet Landfill

- The Fond Colet Landfill provides a suitable location for the MRF and other associated facilities. The layout of the site service area should be modified in accordance with the recommendations contained within this report.

• **Table 1. DSWMC Procurement of MRF Equipment**

ITEM	OBSERVATION	RECOMMENDATION
1. Glass Crusher	<ul style="list-style-type: none"> • Observations at the existing landfill suggest that there is only a small volume of glass within the waste stream. • Prices offered regionally for glass cullet are particularly depressed and are unlikely to offset handling and freighting costs. Consequently, DSWMC recognise that there is no viable market for the material and envisage landfilling it after it is crushed. • It was observed that glass was the primary product targeted by the waste-pickers at the existing Stock Farm site. Some items, such as beer bottles, have a financial value through reclaim of the deposit placed upon them at purchase, while other items, such as spirit bottles, have a re-use value for bottling secondary products such as those from the agricultural sector. Crushing and landfilling this commodity would deprive the waste-pickers of their livelihoods. 	<ul style="list-style-type: none"> • Delete the glass crusher from the list of items to be purchased. • Re-allocate funds towards the purchase of additional items such as: <ul style="list-style-type: none"> ➢ A macerator/chipper for green waste; ➢ A Hazardous Waste Storage Area within the landfill; ➢ Spare parts for the obsolete tracked loader; and ➢ Waste oil storage containers for service stations.
2. Vertical Baler	<ul style="list-style-type: none"> • Again, the market for cardboard and high quality paper is, at the time of writing, depressed. However, DSWMC report that they have had dialogue with colleagues in Martinique who have indicated that they may be interested in purchasing this material from them. 	<ul style="list-style-type: none"> • Retain the baler on the list of items to be purchased. • Seek to formalise agreement with colleagues in Martinique for purchase of these products. If markets cannot be guaranteed, delete item and reallocate funds to additional priority items as identified in item 2 of this table.
3. Magnetic Separator/ Conveyor	<ul style="list-style-type: none"> • These items tend to be expensive pieces of equipment and are probably unnecessarily sophisticated for DSWMC intended use. • Again, DSWMC recognised the absence of a viable markets for these recyclables and envisaged probably having to landfill the retrieved material. • Further, DSWMC already have a significant stockpile of derelict vehicles for which they have no immediate 	<ul style="list-style-type: none"> • The Magnetic Separator/Conveyor should be deleted from the list of equipment to be purchased. • Reallocated towards the purchase of additional items as identified in item 2 of this table.

	outlet. This site, located at Jimmit, is a significant eyesore and is likely to be causing marine pollution through the leaching of hydrocarbons and coolants.	
4. Forklift Truck	<ul style="list-style-type: none"> This item is recognised as having a number of applications within the facility including moving baled paper/cardboard waste and the 4yd³ skip bins which will be used for 	<ul style="list-style-type: none"> The forklift truck should be retained on the list of items to be purchased.
ITEM	OBSERVATION	RECOMMENDATION
4. (continued)	intermediate storage of treated materials.	
5. Waste Oil Storage Container	<ul style="list-style-type: none"> Management of waste oil has been identified as particularly problematic within Dominica. It is reported that waste oil generated within workshops and garages is routinely discharged via drains, while the electricity generating company is generating a significant and increasing volume of waste waste oil. Provision of a central storage container would be compatible with either disposing of the waste oil via Antigua's Landfarm or via Shell's treatment centre in Trinidad. This component is presently being evaluated at a regional level. Utilisation of a central storage tank would be enhanced by a series of purpose built waste oil storage containers at petrol service stations. Storage of waste oil within oil drums is not recommended as it frequently causes localized environmental problems due to leakages and spillage. In addition, the drums are difficult to handle and transport. 	<ul style="list-style-type: none"> The Waste Oil Storage Tank should be retained within the list of items to be procured. Some fifteen (15) small storage units should be purchased for use at service stations.
6. Weighbridge.	<ul style="list-style-type: none"> This is an essential item for the efficient operation of the new landfill site. 	<ul style="list-style-type: none"> The weighbridge should be retained within the list of items to be procured. Its use will be optimized by locating it in front of the site office.
7. Tyre Slicer.	<ul style="list-style-type: none"> DSWMC estimates that presently they handle some 	<ul style="list-style-type: none"> The Tyre Slicer should be retained within the list of

	<p>5,000 used tyres per month.</p> <ul style="list-style-type: none"> • In the absence of a regional treatment centre the shredded tyres can be landfilled, used as cover material and for the protection of the concrete pad within the MRF. 	<p>items to be procured.</p> <ul style="list-style-type: none"> • The Tyre Slicer should be located within a dedicated bay within the MRF.
8. Bin Washer	<ul style="list-style-type: none"> • The Bin Washer will be an essential item for the efficient running of the landfill and the waste collection service by keeping community storage bins clean and odour free. 	<ul style="list-style-type: none"> • The Bin Washer should be retained within the list of items to be procured. • The Bin Washer should be located within a dedicated bay within the MRF. Due consideration should be given to the drainage requirements for this item within the design of the MRF.

Annex 4

Scope of Services Required For Master Composting Training

The consultant will be required to:

- i. Design a One-week Master Composter Training Course for the OECS Countries;
- ii. Undertake a review of the profiles of the course participants and ensure that the course content and method of delivery are relevant and appropriate;
- iii. Develop an appropriate BYC training kit for the OECS, which will include:
 - A Backyard Composting training manual;
 - A Backyard Composting booklet for public distribution;
 - Two (2) Posters;
 - A Backyard Composting brochure;
 - An electronic slide show.
- iv. Deliver two (2) training Courses, one in December 2001 in St. Kitts and Nevis, and one in January 2002 in St. Vincent and the Grenadines. The outlines of these training courses are provided in Appendix A. The courses are to include:
 - Lectures;
 - Discussions;
 - Small-group activities;
 - Classroom and home-work assignments;
 - Practical demonstrations;
 - Field Trips.
- v. Prepare a Final Report on the overall execution of the Training Programme, which will include a description of the activities undertaken, a summary of the evaluation of the performances of the participants and recommendations on follow-up activities.

The following outputs are to be provided by the Consultants:

1. Two(2) sets of the electronic versions of BYC kits for the OECS. These are to be submitted to the OECS-NRMU
2. Seventy-five (75) BYC kits for distribution to course participants, Solid Waste Management Entities in participating countries and the OECS-NRMU.
3. Delivery of two(2), one-week Master Composter Training courses in the OECS.
4. A Final Report on the overall execution of the Training Programme, including a description of the activities undertaken, a summary of the evaluation of performances of the participants and recommendations on follow-up activities.

Annex 5

AGREEMENT FOR THE DEVELOPMENT OF PREVENTATIVE MAINTENANCE PROGRAMMES FOR SOLID WASTE MANAGEMENT EQUIPMENT FOR GRENADA, ST. VINCENT AND THE GRENADINES, ANTIGUA AND BARBUDA, DOMINICA, ST. KITTS AND NEVIS AND ST. LUCIA

The **outputs** will include the following:

1. A **Report** for each participating country, on the Maintenance of Solid Waste Management Equipment. Each report is to include, but not be limited to the following:
 - a. Complete listings of equipment being used by the SWMEs as well as equipment expected to be procured before February 28, 2002.
 - b. Descriptions and assessments of existing facilities, institutional arrangements, and institutional capacities for maintenance of existing and proposed Solid Waste Management Equipment.
 - c. Recommendations, on the requirements for the upgrading of existing maintenance facilities or for the establishment of new facilities;
 - d. Recommendations on an institutional strengthening programme for implementation of an effective preventative maintenance programme. Within such programmes, consideration is to be given to the training required to upgrade the skills of existing staff;
 - e. A listing of the appropriate tool stocks required to sustain maintenance schedules;
 - f. A listing of appropriate consumable and non-consumable spare parts that need to be stocked;
 - g. The identification of economies of scale that can be realised by bulk purchasing by all of the participating SWMEs;
 - h. A broad outline of the components of the Preventative Maintenance Manual.
2. For each country, a detailed, easy-to-use, **Manual** which provides clear and practical recommendations on the implementation of a maintenance programme for Solid Waste Management Equipment already procured by the SWMEs as well as equipment likely to be procured by February 28, 2002. Each Manual will be specifically tailored to the needs of the SWME of the country. The manuals shall among other things, provide:
 - a. A schedule of all preventative maintenance operations to be undertaken for each equipment item;
 - b. Electronic and hard-copy templates for the record keeping in relation to the maintenance of the Solid Waste Management Equipment. These templates should be formulated using Microsoft Word, Excel or the

Preventative Maintenance Software approved by the OECS-NRMU and the participating SWMEs;

- c. Schedules relating to the procurement of the spare parts and tools required in the maintenance programme. These are to be provided in electronic and hard-copy formats.

Annex 6

REPORT ON SCOPING MEETING ON THE MANAGEMENT OF USED OIL IN THE OECS

BAY GARDENS HOTEL, ST. LUCIA, NOVEMBER 09, 2001

1.0 Introduction

The member states of the OECS, in the course of identifying the key environmental and waste management issues that they need to address, have identified hazardous waste management as a priority issue for attention. Used oil has in turn been identified as one of the hazardous waste materials requiring immediate attention. The meeting was representative of an important early step in the development and implementation of a Strategy for the Management of Used Oil in the OECS. The objective of the meeting was three fold:

- i) To identify the elements of an OECS strategy for the Management of Used Oil;
- ii) To identify Stakeholders and their respective roles and;
- iii) To make recommendations on the way forward for the development and implementation of the OECS strategy for the Management of Used Oil.

The meeting was facilitated by the OECS Natural Resource Management Unit (NRMU) and undertaken through the Regional Component of the OECS Solid and Ship-generated Waste Management Project. Financial support is being provided to this project by the Global Environmental Trust Fund, through the World Bank. Mr. Jimmy Emmanuel (Special Assistant to the Director General) opened the meeting on behalf of the Acting Director General of the OECS. The remarks delivered by Mr. Emmanuel is included as Annex 1. Present at the meeting were various stakeholders from the private sector, government agencies, solid waste management entities, regional and international agencies and the OECS-NRMU. The meeting agenda is attached as Annex 2 and a list of participants is contained in Annex 3.

2.0 Presentations

Presentations were made on the Shell Care Initiative, Land Farming, the provisions of the Basel Convention and on the objectives noted above as discussed by groups formed at the meeting.

2.1 The Shell Care Initiative - Presentation by Mr. Andrew Hephner, Shell Antilles Caribbean and Central America and Ms. Joy Austin and Mr. Christopher Ross, Oil Mop Environmental Services Limited.

Shell Antilles

- Noted that there was a growing awareness of product stewardship
- Cited re-fractionation and burning in cement kilns as preferred used oil disposal options. Re-fractionation was described as being environmentally acceptable, robust and cost effective.
- It was noted that although large power companies account for about two thirds of used oil in the OECS private generators such as motorists presented the greatest challenge to collection.
- It was emphasised that policy options for used oil should consider:
 - . Funding for collection and disposal (can be sold as bunker fuel but the cost of processing used oil was 2 USD per imperial gallon)
 - . An import or environmental levy on oil and oil products
 - . Deposit/Refund system
 - . Education/Public Awareness
 - . Legislation and enforcement for improper disposal
- Shell Care is already in implementation at power companies in Anguilla, Tortola, Grenada and St. Vincent and the Grenadines.

Oil Mop Environmental Services

- Provided a description of the Shell Care Recycling Process
- Noted the potential for offering their services to the OECS as the company is currently handling only 3% of the potential oil recycling market since in Trinidad most of the power generators are gas turbine.

2.2 Land Farming - Presentation by Mr. Royce Stroud of The West Indies Oil Company on Land Farming in Antigua (See Annex 4).

- Stressed again that small generators present the greatest challenge to collection
- Suggested that suppliers establish a return system for used oil so as to minimize the problem of collection.
- The cost of vacuuming used oil out of 55 gallon drums from small generators was noted at 4 ECD per gallon.

2.3 Provisions of The Basel Convention - Presentation by Ms. Sharon Laurent of CARIRI/ Caribbean Sub-regional Centre for the BASEL Convention.

- It was noted that an Advisory Council Meeting has been held which discussed the sub-regional centre's current work programme activity on hazardous waste inventories and lead acid batteries. Used oil was also identified as a concern for future activity.
- A regional hazardous waste inventory is expected to commence early 2002.
- Noted that Grenada as an OECS territory has not signed the Basel Convention and that provision must be made for the inclusion of Grenada.
- Expressed concern on the classification of hazardous waste. However noted that in 2002 the new Brussels nomenclature will come into effect.
- Noted that in the management of used oil the OECS territories should seriously examine the issue of transportation between member states, as in the OECD countries there is no movement of hazardous waste. The presentation by Ms. Sharon Laurent is listed as Annex 5.

2.4 Presentation on Objectives

2.4.1 Elements of an OECS Strategy for the Management of Used Oil

- i) Identification of sources and quantities of used oil
- ii) Harmonized policy and legislation through the OECS
- iii) Compliance with international conventions
- iv) Education and awareness
- v) Appropriate technologies for collection and disposal
- vi) Cost Recovery
- vii) Stakeholder consultation
- viii) Information and tracking
- ix) Monitoring Evaluation System
- x) Funding Sources for implementation of the project
- xi) Integration of land based and marine sources of oil
- xii) Update database and systems for oil management
- xiii) Pilot projects related to the management of used oil
- xiv) Identification of mechanisms to implement private and public sector partnerships
- xv) Targets to be set on the quantity and quality of used oil
- xvi) Regional cooperation in addressing the management of used oil
- xvii) Assessment of existing capacities such as institutional, policy making, regulatory, enforcement, existing management systems
- xviii) Implementation of waste minimization strategies

2.4.2 Identification of Stakeholders and the definition of their respective roles

Stakeholders should include international, regional and national agencies that may impact on the success of the project. International agencies fund national projects and give effect to policy. At the national level there should be both private and

public sector participation. The importance of involving small generators was noted, as they are a more difficult group to get into compliance.

2.4.3 Recommendations on the way forward for the development and implementation of the OECS Strategy for the Management of Used Oil.

- i) The launching of a workshop to include organizations such as CARIRI, CEHI, IMO, SBC. National representatives should be established to coordinate the project at the national level. For each national response it was suggested that a model outline be drafted.
- ii) Assessment at the country level of activities such as collection, transportation and technology. This should include an assessment of 'adequate' or 'best' practices. It was pointed out that some of this assessment has already been done.
- iii) A regional workshop to discuss reports on the project and other specific issues.
- iv) The formation of a committee to oversee the development and implementation of matters pertaining to the management of used oil in the OECS.

3.0 Conclusion

The meeting was seen as a positive step towards managing the problem of used oil in the OECS. An important development was the formation of a working group comprising members from regional and government agencies, and the public and private sector to oversee the development and implementation of the OECS strategy for the management of used oil. The composition of the working group is listed in Annex 6.

Collection from small generators was seen as critical to the success of the programme and it was agreed that suppliers be encouraged to set up a system for the return of used oil particularly by small generators.

**REMARKS TO BE DELIVERED BY MR. JIMMY EMMANUEL
ON BEHALF OF THE ACTING DIRECTOR GENERAL
AT THE SCOPING MEETING ON
THE MANAGEMENT OF USED OIL IN THE OECS
BAY GARDENS HOTEL, ST. LUCIA
NOVEMBER 09, 2001**

On behalf of the Acting Director General of the OECS, I wish to welcome you to this Scoping Meeting on the Management of Used Oil in the OECS.

This meeting represents an important early step in the development and implementation of a Strategy for the Management of Used Oil in the OECS and the OECS Secretariat, through its Natural Resources Management Unit (NRMU), is pleased to be the facilitator of this meeting.

The member states of the OECS, in the course of identifying the key environmental and waste management issues that they need to address, have identified hazardous waste management as a priority issue for attention. Used oil has in turn been identified as one of the hazardous waste materials requiring immediate attention.

The concerns of the OECS countries about the management of used oil were highlighted as recently as last September during the Regional Roundtable forum on the implementation of the OECS Solid and Ship-Generated Waste Management Project, that was in Grenada. At that forum, the participating countries mandated the OECS-NRMU to facilitate the development of a strategy for the management of used oil within the sub-region. Today's

meeting is therefore an attempt to commence the consultation and discussion process that will lead to the development and implementation of a strategy on the management of used oil.

In facilitating this meeting and in acting on behalf of the OECS countries on the issue of the management of used oil, we recognise that efforts have already begun on the Wider Caribbean effort to address issues related to used oil. We encourage and support these efforts and wish to make it clear that it is our desire for the OECS initiative to be undertaken in a manner that will complement and support the Wider Caribbean initiative. In that regard, we recognise the role of the Caribbean Environmental Health Institute (CEHI) and the Caribbean Industrial Research Institute (CARIRI) in the wider Caribbean initiative, and we bid a special welcome to the representatives of these sister regional institutions.

We also recognise the complexity and broad scope of the issue of the management of used oil. These are to a certain extent related to the many sectors, interest groups and agencies that in one way or another impact upon this issue. We therefore wish to ensure that the concerns and points of view of all major stakeholders are taken into consideration, and the diversity of interests represented by the participants at this meeting is a welcome feature that will certainly contribute to the success of this initiative.

This meeting is being undertaken through the Regional Component of the OECS Solid and Ship-generated Waste Management Project, and the OECS Secretariat wishes to acknowledge and reiterate its thanks for the financial support provided to this project by the Global Environmental Trust Fund,

through the World Bank. We also recognise the presence of the representative of the Caribbean Development Bank at this meeting. The CDB is a supportive partner in the implementation of this project, as it is contributing significantly to the national components of several countries involved in this project.

Finally, I wish to reiterate my words of welcome to you, on behalf of the Acting Director General of the OECS, and I wish to pledge the continued support of the OECS Secretariat to the efforts of our member states in addressing this important environmental issue.

Thank you.

Waste Oil Disposal Project Project Description

West Indies Oil Company (WIOC) installed a project to safely dispose of waste oils and oily sludge from power generation stations, service stations, hotels, auto dealers, etc. which were causing environmental problems in Antigua. The following briefly describes the methods employed.

WIOC collects waste oils from island sources by truck or the generator of the waste oils may deliver them directly to the refinery. Trucks are unloaded into an existing 78,000 barrel (3.2 million USG) tank. Samples are analyzed by the refinery laboratory to test for chlorinated solvents, heavy metals, benzene, and PCB's since these are considered hazardous materials. We land treat oily sludge that has been screened for these materials.

Water contained in the oily wastes is separated and processed through the refinery's wastewater treatment facilities. These facilities are designed to recover traces of oil before releasing clean water into the sea. Effluent will meet environmental standards for release.

The oil will be disposed of by "land treatment" or "land farming". This is an established, EPA approved procedure that has been used successfully in the United States since the 1950's. It attracted increasing attention in the 1970's and according to the U.S. Environmental Protection Agency (EPA), there were approximately 200 active sites in 1983. Roughly 50% were utilized by the petroleum industry to dispose of tank bottoms and other oily wastes. The writer knows personally of several that are still very active (the Hess refineries in St. Croix and Port Reading, NJ for two).

Following are two quotes contained in an American Petroleum Institute document published in 1985 (Land Treatment – Safe and Efficient Disposal of Petroleum Waste – 4/85-6500-5M):

From the EPA: "Land treatment is one alternative for handling hazardous wastes that simultaneously constitutes treatment and final disposal of the wasteMany wastes currently being disposed by other methods without treatment could be treated and rendered less hazardous by land treatment"

From Dr. Raymond C. Loehr – Civil Engineering Department – University of Texas: "Land treatment is an engineered controlled process that uses biology and physics and chemistry to degrade and immobilize wastes. It uses sound scientific and engineering principles that are comparable to those commonly used in conventional wastewater treatment plants."

In land treatment, oily wastes are spread in a thin layer onto a designated plot of land and cultivated into the soil with farm equipment. Organisms commonly present in the soil feed on the basically organic waste, breaking it down into water and carbon dioxide. The

application/cultivation process can be repeated many times on the same plot. Any trace metals that might be in the oily waste will be immobilized in the top 12-18" of soil (zone of incorporation)

WIOC has employed the services of two prominent environmental professionals to assist in the design of the land treatment area. These are: Mr. Paul Rubbe, Piscataway, NJ (formerly Chief Environmental Engineer in the Hess St. Croix refinery with hands-on experience with their land treatment operation and others) and Mr. Rex Meyer, GeoMonitoring Services, Fulshear, TX (281-375-5101) who has been instrumental in working with major oil companies in establishing new treatment areas, including a 70-acre field in Texas. Mr. Meyer conducted very successful laboratory tests to determine the suitability of Antigua soil and climate. The Antigua climate is ideal because of the relatively constant temperatures, sun, and moderate rainfall.

One concern that some might have is the possible migration of oil and heavy metals into the soil and sea. WIOC is taking the following extra steps to address this concern:

- There is no known water aquifer running below the refinery. Bore samples taken at 15 feet below the surface do not indicate the presence of any water.
- Each 100' x 200' designated area will be prepared by digging a pit 6' below the surface. The soil will be compacted. Once compacted, the naturally-occurring clay soil is almost impervious. Under normal circumstances, this would be an adequate barrier to migration.
- A layer of geo-textile cloth will be placed on top of the compacted clay, followed by an 18 mm synthetic liner and another layer of geo-textile cloth.
- A sump will be placed in each corner on top of the cloth to collect all water that percolates through the treatment zone. Water collected will be co-mingled with storm water collected from the surface of the designated area and processed through the refinery wastewater treatment system.
- The pit will be re-filled to a depth of 4'. The active treatment zone will be the top 12-18" of soil.

Waste oil will be distributed in a thin layer on top of the prepared area. The area will then be tilled to mix the oil with the soil to create maximum exposure to the climate and organisms. Regular tests will be conducted and adjustments made as needed to maintain ideal conditions. This might include the addition of fertilizer or similar treatment. The soil will be sampled to track the degradation of the hydrocarbon. As the oil degrades, additional oil will be applied based on monitoring results.

For further information, please contact Royce Stroud at 268 462 0440, or by fax at 268 462 1938 and email at wioegm@candw.ag

Scoping Meeting on the Management of Used Oil in the OECS

Bay Gardens Hotel, St. Lucia
November 9, 2001

PROVISIONAL AGENDA

- 10:00 a.m. **Opening Session**
Introductory Remarks – Dr. Vasantha Chase, OECS-NRMU
Remarks - Representative of the Director General of The OECS
Introduction of Participants.
- 10:15 a.m. **Presentations**
Presentation by Shell Antilles Caribbean and Central America and Oil
Mop Environmental Services Ltd on *The Shell Care Initiative* – Ms. Joy
Austin, Mr. Andrew Hephher and Mr. Christopher Ross.
- 10:45 a.m. Presentation by The West Indies Oil Company on the Land Farming
Programme in Antigua - Mr. Royce Stroud.
- 11:15 a.m. Presentation by CARIRI/ Caribbean Sub-regional Centre for the BASEL
Convention - Ms. Sharon Laurent.
- 11:45 a.m. **Group Discussions :**
 - Elements of an OECS Strategy for the Management of Used Oil;
 - Identification of Stakeholders and the definition of their respective roles;
 - Recommendations on the way forward for the development and implementation of the OECS Strategy for the Management of Used Oil.
- 12:45 p.m. **LUNCH**
- 2:00 p.m. **Plenary**
Towards the Development and Implementation of an OECS Strategy for
the Management of Used Oil
- 3: 30 p.m. **Closing Remarks:** Dr. Vasantha Chase, OECS-NRMU

**ORGANISATION OF EASTRN CRIBBEAN STATES
NATURAL RESOURCES MANAGEMENT UNIT**

SCOPING MEETING ON THE MANAGEMENT OF USED OIL IN THE OECS

November 9, 2001

Bar Gardens Hotel, St. Lucia

**LIST OF PARTICIPANTS
PRIVATE SECTOR**

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Scoping meeting on the Management of Used Oil in the OECS

Bay Gardens Hotel St Lucia

November 9th, 2001

Caribbean Subregional Centre
for the Basel Convention Implementation

Project Leader
Sharon Laurent

The background to the Basel Convention which was 10 years old in 1999.

The Basel Convention provides for a legal framework of international law for the environmentally sound management of hazardous wastes (ESM), their minimization, and the control of their transboundary movements. Parties to the Convention have developed or are in the process of developing procedures and national plans to manage hazardous wastes that include the promulgation of legal frameworks and the facilitation of non legally binding incentives to operationalize ESM, including minimization of waste generation and cleaner production approaches, as well as the use of technically sound, economically affordable and socially acceptable technologies.

As of 11 April 2001, 145 countries and one economic integration organization, among them 29 countries in Latin America and the Caribbean, have ratified the Basel Convention.

Countries in the Caribbean Region who have ratified the Basel Convention are Belize, Bahamas, Cuba, Dominican Republic, Guyana, Barbados and Trinidad and Tobago, OECS countries who have signed and ratified are Antigua and Barbuda, St. Kitts and Nevis, Dominica, St. Lucia, St. Vincent and the Grenadines. Countries that have expressed interest in the Convention are Jamaica, and Curacao.

It should be noted that the countries of the Caribbean basin have signed and ratified , Venezuela, Columbia, Panama, Costa Rica, Nicaragua, El Salvador, Guatemala, Honduras, and Mexico. Haiti and the United States of America have signed but not ratified. Great Britain, France and Holland have also signed and ratified as a result their dependant territories are also covered by the Convention..

The Secretariat of the Basel Convention has carried out a number of regional and national activities in the region.

National hazardous waste studies have been carried out by Basel Consultants for several countries in the OECS prior to 1996.

The Secretariat also held a regional workshop in St Lucia in 1996 which identified a number of issues and prepared 10 project proposals. The workshop endorsed the creation of the Subregional Centre at CARIRI and pressed for an early implementation of a plan of activities.

Based on these proposals funding was sourced to mount a training programme in detection and management of Asbestos containing materials and development of national policy for Management and disposal of asbestos containing materials in 1998, a Symposium on *Prevention of Degradation of the Quality of Inland Water Systems and of the Marine Environment from the Adverse Effects of the Generation of Hazardous Wastes* in 1999 and the conduct of hazardous chemicals and hazardous materials inventories in 6 countries between 1999 and 2001. A national workshop on the implementation of the Convention was held in Cuba in 1997. A training programme on hazardous waste inventories and reporting systems for Party representatives will be held in the first quarter of 2002.

A review of the 10 proposals prepared in 1996 by the Regional Advisory Council Meeting in October of 2001 recognized that the one topic outstanding is the management of hospital wastes. Several proposals addressing contaminated bays and harbours have been handled under UNEP-GEF funding.

A regional project on the management of spent lead acid batteries was launched in May of this year to identify the situations at this time in several countries in the Caribbean and Central America as well as in Venezuela and Columbia with the objective of developing possible disposal options that will be environmentally sound and will protect the health of the communities.

The Recommendations of the Symposium on *Prevention of Degradation of the Quality of Inland Water Systems and of the Marine Environment from the Adverse Effects of the Generation of Hazardous Wastes*

"The Symposium participants urge all countries of the Caribbean Subregion to ratify the Basel Convention.

- 1) Support for the International Maritime Organization in assisting countries to accede to the MARPOL Protocol by establishing receiving facilities and enacting appropriate national legislations.

The following are identified as priority issues for integration of hazardous waste concerns into proposals currently being prepared in the region. The lead agencies are identified.

- 1) Integrated management of fresh water and coastal zone resources (CEHI)
- 2) Quality of drinking water (CEHI)

- 3) Regional environmental information systems – integration and standardization of hazardous waste information. (Sub-regional Centre to follow up with CCA and other agencies)
- 4) Regional study of used oil to address the management aspects of Land Based Sources and ship borne use and disposal. (CEHI)
- 5) Regional hazardous waste inventory programme
 - National capability
 - Information management
 - Review of receiving, transshipment and disposal systems. (recycling) (Basel Sub-regional Centre at CARIRI)
- 6) Lead – regional activity to identify the sources, forms, and to identify methods of preventing pollution and adverse human health effects. (UWI, St Augustine)
- 7) Asbestos – a regional activity to implement national planning and management programmes. (CEHI)
- 8) Support to focal points of Basel convention in national awareness and education campaigns. (Basel Sub-regional Centre at CARIRI)"

The environmentally sound disposal of hazardous materials and wastes is an objective of the Basel Convention. Oily waste or used oil is dealt with under two Conventions. The MARPOL Convention deals specifically with ship generated waste. Countries signatory to the MARPOL Convention are required to install port facilities to receive used oil generated between the last port of call and their ports. Once received this used oil then must be disposed of in the receiving country and is considered hazardous waste. If exported it is still classified as hazardous waste as it is not being generated between two ports of call. The Basel Convention requires that any disposal of hazardous waste is carried out in a manner which does not result in the creation of another hazardous waste stream. To support such activity the Technical Committee has developed several publications including the BASEL Technical Guidelines on Hazardous Waste: Waste Oils From Petroleum Origins and Sources and BASEL Technical Guidelines on Used Oil Re-Refining or other Re-uses of Previously Used Oil.

Steps have already been taken to manage used oil in the Caribbean. Following on the 1999 Symposium both the Government of St Lucia and the Caribbean Environmental Health Institute have continued to develop a project proposal for a regional project. This regional proposal has been discussed with the Secretariat of the Basel Convention and the Subregional Centre.

The OECS initiative may wish to review the recommendations of the regional project of the Wider Caribbean Initiative on Ship-Generated Waste which suggested a strategy and action plan for source reduction, recycling, and recovery of ship generated waste. I am

advised that in 2000 a proposal was made by WCIS that nodes be created for collection of such waste with plans for centralized recycling.

At this time consideration needs to be given to the existing regulatory framework in the region and at the national level to determine if it will support any proposed activities which are found to be possible after a review of the technical issues and the economic situations. The Basel Secretariat has identified several possible sources of funding for project activity and wishes to ensure that there is complimentary support from the private sector both at the national and regional levels.

Proposed Used Oil Working Group

- | | | |
|----|---|-------------------------------|
| 1. | Dobrene O'Marde (NSWMA) | Leewards |
| 2. | Shanta King (CEHI) | Regional Agencies |
| 3. | Christopher Corbin
(Min. of Planning, St. Lucia) | Windwards/Government Agencies |
| 4. | Wilson Sifflet (St. Lucia Distillers) | Private Sector |
| 5. | Christopher Ross (Oil Mop) | Private Sector |
| 6. | Andrew Hephher (Shell Antilles) | Private Sector |
| 7. | Dr. Vasantha Chase (OECS-NRMU) | Coordinator |

Annex 7

OECS SOLID AND SHIP-GENERATED WASTE MANAGEMENT PROJECT

FIRST MEETING OF THE WORKING GROUP ON THE DEVELOPMENT OF AN OECS STRATEGY FOR THE MANAGEMENT OF USED OIL

**HELD AT THE OFFICES OF THE OECS NATURAL RESOURCES
MANAGEMENT UNIT, MORNE FORTUNE, CASTRIES, ST. LUCIA
ON JANUARY 15, 2002**

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

Present were:

1. Ms. Joy Austin – Oil Mop Environmental Services, Trinidad
2. Ms. Shanta King – Caribbean Environmental Health Institute, St. Lucia
3. Mr. Vern Cenac - Shell Antilles and Guinas Ltd., St. Lucia
4. Mr. Christopher Corbin – Ministry of Planning, Development Environment and Housing, St. Lucia
5. Mr. Dorbrene O'Marde – National Solid Waste Management Authority, Antigua and Barbuda
6. Mr. Wilson Sifflet – St. Lucia Distillers Ltd., St. Lucia
7. Mr. Michael Cowing – Consultant to the OECS-NRMU, St. Lucia
8. Mr. Peter Norville - Consultant to the OECS-NRMU, St. Lucia
9. Mr. Laurianus Lesfloris – Solid Waste Management Authority, St. Lucia

Apologies were received from Mr. Christopher Ross (Oil Mop Environmental Services) and Mr. Andrew Hephher (Shell Antilles and Guinas Ltd.), who were represented by Ms. Joy Austin and Mr. Vern Cenac respectively.

Summary of Conclusions and Recommendations:

1. The title of the Working Group, which was established at the Scoping Meeting on the Development of an OECS Strategy for the Management of Used Oil on November 09, 2001 in St. Lucia, was changed to: "Technical Advisory Committee on the Development of an OECS Strategy for Management of Used Oil".
2. The Committee reviewed the draft Terms of Reference drafted by Peter Norville, and agreed to the addition of one item. The finalised Terms of Reference are appended.

3. Funding for the development of the Strategy is largely expected from the OECS-NRMU, through the regional component of the OECS Solid and Ship-Generated Waste Management Project.
4. Peter Norville is to conduct research to identify strategies developed for the OECS or the Caribbean that may be used as guides for the development of the Used Oil Strategy.
5. The Strategy is to include an Action Plan to promote environmentally sound and sustainable management of used oil in the OECS. This Action Plan is to contain a series of short, medium and long-term measures that need to be implemented.
6. Peter Norville and Vern Cenac are to jointly draft a framework for the structure of the Strategy. This framework is to be presented to the next meeting of the Committee.
7. Christopher Corbin is to draft a sample Cabinet Note to be distributed to all participating countries by the end of January 2002. The Cabinet Note is intended to inform each Cabinet of Ministers of the ongoing initiative to develop the OECS Strategy on the Management of Used Oil.
8. The Committee members agreed that, as representatives of the various interest groups with an interest in the management of used oil, they would provide updates on the work of the committee to the constituent members of the interest groups that they each represent.
9. Shanta King is to draft a questionnaire to be circulated to the participating countries. That questionnaire is intended to obtain basic information on issues of relevance to the development of the strategy, including those relating to existing laws, policies, institutional arrangements and used oil management programmes. In developing the questionnaire, consideration is to be given to the results from a previous questionnaire circulated to OECS countries in relation to the handling of spent chemicals. The draft questionnaire is to be circulated to committee members by January 28, 2002. Comments on the draft questionnaire are to be provided by February 15, 2002. The finalised questionnaires are then to be immediately circulated and the completed questionnaires are to be returned by February 28, 2002. The OECS-NRMU is to coordinate distribution and collection of the questionnaires.
10. Shanta King and Peter Norville are to jointly prepare a summary report on the findings from the completed questionnaires. This summary is to be presented to the next meeting of the Committee
11. Dorbrene O'Marde is to draft Terms of Reference for a study on Economic Issues related to the Management of Used Oil in the OECS. The findings of this study are to be reflected in the Strategy. The Terms of Reference are to be discussed at the next meeting of the committee.

12. Joy Austin and Wilson Sifflet are to jointly prepare a submission on the most appropriate technologies for used oil management and the standards that can be applied in the OECS. Consideration will then be given to incorporating these technologies and standards into the Strategy. This submission is to be reviewed at the next meeting of the committee.
13. The Committee agreed to arrange for the Strategy to be ready, in at least a draft form, for presentation to the next meeting of the OECS Ministers of Environment, which is scheduled for September 2002. At any rate, the Strategy should be completed before the end of the OECS Solid and Ship-Generated Waste Management Project in October 2002.
14. The Committee agreed that Public Awareness and Public Education activities were critical to the success of the Strategy and that these were needed:
 - a) during the process of development of the Strategy; and
 - b) during the implementation of the Strategy.
15. The Committee agreed to hold its next meeting at the same venue on March 15, 2002.

Annex 8

TERMS OF REFERENCE FOR THE WORKING GROUP ON THE DEVELOPMENT OF AN OECS STRATEGY FOR THE MANAGEMENT OF USED OIL

The principal responsibilities of the Working Group are to:

1. Provide support and advice to the OECS-NRMU on development of an OECS Strategy for the Management of Used Oil;
2. Develop an appropriate programme of action aimed at the formulation of the strategy in a cost-effective manner and within a reasonable time-period;
3. Assist in the monitoring, supervision and review of activities involved in the development of the strategy;
4. Liaise with all relevant stakeholders on activities related to the development of the strategy;
5. Provide input into Public Awareness activities conducted in support of activities related to the development of the strategy;
6. Contribute to the mobilization of the resources required to facilitate the development of the strategy.
7. Develop recommendations for the implementation of the strategy.
8. Develop recommendations for monitoring and evaluating the implementation of the strategy.