

CHAPTER 3 ENVIRONMENTAL MONITORING PLAN

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3.1 Approach

It is normal practice for environmental monitoring to be carried out in relation to major construction projects, and frequently this will be done in all phases, including the period before the project is built, during the construction process, and after completion when the development is in operation. The purpose of the monitoring is to:

- Collect data describing the environment at the project site before the development is constructed. This provides the baseline of existing conditions before any disturbance, with which any future monitoring can be compared;
- Observe the construction operation to ensure that all activities are carried out in the manner prescribed in the Specifications, and elsewhere in the Contract Documents. These documents include measures aimed at protecting the environment, so this monitoring ensures that these are adhered to;
- Record environmental conditions during the period in which the development is being built, which are compared with the baseline to determine the environmental effects of the construction process. This reveals whether mitigation measures aimed at reducing the impact of construction are having the desired effect;
- Record environmental conditions when the completed project is operating, to determine the impact of the functioning development, and again to reveal whether mitigation measures to reduce its impact are proving successful.

Monitoring may thus confirm that the outcome of the project is as was predicted by the EIA report and that its environmental impacts are acceptable, or it may indicate certain areas where impacts are more adverse than expected, or where the mitigation measures are not sufficiently effective. This is one of the most important aspects of monitoring as it enables additional actions to be taken to further reduce the impact of the development if the monitoring shows this to be necessary.

The monitoring measures related to this project originated from two sources:

- The Environmental Permit, which specifies certain monitoring measures in both the Mitigation Measures and in some of the additional Permit Conditions;
- The Environmental Management Plan (Chapter 2 of this report) included the monitoring measures required by the Environmental Permit, and added others, recommended as a result of this study.

This chapter brings together the monitoring recommended by both of these sources

into a single Environmental Monitoring Plan for the project.

The approach to the Monitoring Plan is similar to that of the Environmental Management Plan. It takes the Mitigation Measures and Permit Conditions in turn, and explains the monitoring that will be carried out in relation to each. In each case the account commences with a table summarizing the Mitigation Measure or Permit Condition and its objectives, and listing the action involved in implementing the measure, as explained in Chapter 2. The table then indicates the monitoring necessary to ensure that the actions are implemented and that the mitigation is effective, and indicates who will be responsible for each activity. There is then a text explaining the reasons for specifying the monitoring measures and responsibilities, and explaining how the monitoring should be conducted. Each account then closes with a summary of what each monitoring measure should involve.

The document is thus the Environmental Monitoring Plan that CEPA will conduct to determine the impact of the port on the environment, and to confirm the success of the mitigation measures and environmental permit conditions in reducing impacts to acceptable levels.

3.2 Monitoring of Environmental Protection in the Construction Period

3.2.1 Re-vegetation and Wildlife Rescue

(1) Description of Measure and Monitoring Required

**Table 3.2.1 Mitigation Measure No.1:
Re-vegetation and Wildlife Rescue**

SUMMARY OF MEASURE			
<p>Actions to reduce the ecological impact of removing vegetation and soil from the borrow site: Re-vegetation: Plant trees within the port and elsewhere in La Unión province to compensate for trees lost during the borrow works, to screen the port from view and filter dust. Wildlife rescue: Preserve some elements of wildlife from the borrow area by capture of mammals, reptiles and amphibians, and release to the adjacent undisturbed area.</p>			
MONITORING: DESIGN STAGE			
By	Action	Monitoring	By
JICA Team	Contract Docs require vegetation retained at port perimeter. 0.5 ha of further planting shown on drawings		
CEPA	Identify areas for 22.5 ha of planting elsewhere in La Unión province		
	Prepare Specification for planting, appoint qualified contractor	Suitability of Specification	MARN
	Prepare Specification for wildlife relocation, appoint contractor	Suitability of Specification and contractor	MARN
Ecological Contractor	Capture wildlife, release in designated area	Capture/release operation	CEPA, MARN
MONITORING: CONSTRUCTION PERIOD			
Vegetation Contractor	Plant trees, maintain areas	Site planting, maintenance. Offsite planting maintenance	ECW CEPA

(2) Monitoring Rationale

1) Environmental Clerk of Works (ECW)

As project proponent, CEPA will appoint a Contractor to construct the port and a Consultant to supervise the process. The Supervising Consultant will be required to provide a Environmental Clerk of Works (ECW) to be on site during the construction period to ensure that all environmental measures are implemented as prescribed in the documents and drawings that comprise the Construction Contract. Some of the environmental monitoring during the construction phase will be the responsibility of the Port Contractor, and the ECW will oversee this work to ensure that it is carried out as specified.

2) Port Environmental Unit (PEU)

CEPA themselves will be responsible for monitoring during port operations, and this will be implemented primarily by the Port Environmental Unit (PEU) described in Chapter 2, which CEPA will establish towards the end of the construction period.

3) Re-vegetation

CEPA will request assistance from MARN in developing a specification for the 22.5 ha of tree planting they will carry out in areas outside the port, and in establishing the appropriate maintenance regime (watering, fertilizing, weeding and re-planting dead or ill-growing specimens).

During the construction period, the ECW will monitor the planted areas within the port to ensure that they are planted and maintained according to the Specifications, and CEPA will do the same for the off-site areas. Once the port is operating CEPA will continue maintaining the green areas within the port.

4) Wildlife Rescue

CEPA will also seek assistance from MARN in determining the groups of animals to be rescued from the borrow area, and in specifying how the capture and release operation will be carried out. CEPA will use this information to prepare a Specification for the operation, after which they will appoint a suitable contractor or specialist. As shown in Table 3.2.1, MARN will be requested to approve the persons identified by the contractor to handle the animals (who must be properly qualified and experienced in order to prevent undue distress to the animals), and to supervise the capture and release operation.

Capture and release is likely to involve a variety of well-recognized techniques appropriate for the species present, including net capture and capture under cover boards for amphibians, and the use of baited non-lethal traps for mammals and reptiles. The operation will be conducted three times in the two months before construction is due to commence, to prevent excessive re-colonization as will happen if the area is left undisturbed.

(3) Action Required – Design Stage

1) Re-vegetation

CEPA will:

- Request advice from MARN on the planting and maintenance regime to be used for the 22.5 ha outside the port species, numbers, watering, after-care, fertilizer application, etc.
- Prepare a Specification for the planting and maintenance, and request MARN for review and comment

2) Wildlife Rescue

CEPA will:

- Request advice from MARN on animals to be captured, techniques to be used, locations for traps, frequency of trapping, duration and timing of capture operation, handling precautions, etc;
- Prepare a Specification for the capture and release operation, and request MARN for review and comment;
- Request MARN approval for persons proposed by contractors or specialist to conduct the capture and release operation;

(4) Action Required – Construction Period

1) Re-vegetation within the port

The ECW will:

- Visit all areas within the port during planting and ensure that contractor is following the Specification. In particular the number of each species planted and planting pattern will be checked, plus mulching, watering, use of supporting stakes, fertilizer usage and weed clearing;
- Visit all areas once per month in the 6 months after planting. At each site monitor the state of health and growth of the tree, replacement of any dead trees with healthy specimens of same species, plus mulching, watering, use of supporting stakes, fertilizer usage and weed clearing.

2) Re-vegetation outside the port

CEPA will:

- Visit all areas outside the port during planting and ensure that contractor is following the Specification. In particular the number of each species planted and the planting pattern will be checked and proper planting and maintenance;
- Visit all areas once per month in the 6 months after planting. At each site monitor the state of health and growth of the tree, replacement of any dead trees with healthy specimens of same species and proper planting and maintenance.

3.2.2 Environmental Management During the Borrow Operation

(1) Description of Measure and Monitoring Required

**Table-3.2.2 Mitigation Measure No.3:
Environmental Management During the Borrow Operation**

SUMMARY OF MEASURE			
The borrow operation involves extensive digging and transport of soil which could generate a large amount of dust. Soil surfaces will be watered during the dry season to reduce dust, with the water being drained into a lagoon in the reclamation area to settle out suspended solids. Air pollution from vehicles and machinery will be reduced by regular maintenance.			
MONITORING: DESIGN STAGE			
By	Action	Monitoring	By
JICA Team	Contract Docs require watering, drainage ditches, vehicle maintenance, turbidity monitoring outside lagoon.		
MONITORING: CONSTRUCTION PERIOD			
Contractor	Borrow operation with watering and vehicle maintenance as in Tech Spec.	Correct watering, drainage, vehicle maintenance.	ECW
	Monitor turbidity 500 m from lagoon overflow.	Turbidity monitoring as specified	ECW

(2) Monitoring Rationale

The ECW will monitor the correct implementation of the requirements of the Specification, the main elements of which are:

- Watering daily to reduce dust in the dry season;
- Drainage of all water into the lagoon forming the reclamation area;
- Correct installation of the geotextile membrane and soil lining the inside of the rock bunds to prevent escape of turbid water;
- Implementation of regular vehicle maintenance.

The Contractor will monitor suspended sediment 500 m from the overflow from the reclamation area, which is the point at which the water returns to the channel. This is part of an extensive program of turbidity monitoring throughout the channel, described in Sections 3.2.5 and 3.2.8 below. The ECW will supervise this monitoring and review the results to determine whether further action is necessary.

(3) Action Required – Construction Period

The ECW will:

Observe the borrow operation to ensure that it is conducted in the manner prescribed in the Specification. In particular the following will be monitored:

- Retention of all drained water in the lagoon at the reclamation area (including rain runoff).

- Construction of the lagoon (enclosed by bunds) is completed before any material is deposited in reclamation area;
- Geotextile membrane and soil is properly installed around the entire inner surface of the bunds;
- Vehicles and machinery are maintained following the manufacturers' specifications.

Visit the sites at which water quality is monitored, and ensure that this is carried out as described below.

Contract Documents require the Contractor to:

- Monitor Turbidity and Suspended Solids once per day in the sea 500 m from the overflow from the reclamation area, for at least a month before reclamation begins and use the data to determine the ambient (average) value of SS at this station (T7, Figure 2.2.9);
- Monitor Turbidity at the same station once per day throughout the reclamation operation;
- Report to CEPA immediately if SS rises more than 200 ltr above ambient, and await further instructions.

3.2.3 Disposal of Waste from the Borrow Operation

(1) Description of Measure and Monitoring Required

**Table 3.2.3 Mitigation Measure No.4:
Disposal of Waste from the Borrow Operation**

SUMMARY OF MEASURE			
Topsoil cannot be used for reclamation because it is biodegradable, so any that can be used for other projects will be transported to sites specified by La Unión Municipality.			
MONITORING: DESIGN STAGE			
By	Action	Monitoring	By
JICA Team	Contract Docs specify reuse of topsoil.		
MONITORING: CONSTRUCTION PERIOD			
Contractor	Separate and transport usable topsoil; transport remainder plus vegetation to landfill.	Correct separation, transport of topsoil, and transport to landfill of the remainder.	ECW

(2) Monitoring Rationale

The Contractor will liaise with La Unión Municipality to determine whether any projects elsewhere in the province require topsoil (eg for agriculture or landscaping), and if so the Port Contractor will transport the necessary quantities to the identified sites. The Specification also requires the Contractor to transport any waste to soil, vegetation and other material from the borrow site to a landfill operated by La Unión Municipality.

Monitoring will be necessary to ensure that the re-cycling of topsoil and landfilling of waste, are carried out as agreed by La Unión Municipality. Activities within the port will be observed by the ECW, and those outside the port will be monitored by CEPA.

(3) Action Required – Construction Period

The ECW will:

- Observe waste management by the contractor at the borrow site, ensuring that it is as prescribed in the Specification. In particular the ECW will ensure that:
 - Reasonable attempts are made to identify and separate topsoil suitable for re-use in construction elsewhere;
 - All other waste material is transported to the prescribed landfill.

CEPA will:

- Monitor transport and disposal of borrow waste by the contractor, ensuring that it is as agreed by La Unión Municipality. In particular they will ensure that:
 - Transportation of all material is along prescribed routes and not through the centre of La Unión City.

3.2.4 Dismantling and Removal of Existing Infrastructure

(1) Description of Measure and Monitoring Required

**Table 3.2.4 Mitigation Measure No.5:
Dismantling and Removal of Existing Infrastructure**

SUMMARY OF MEASURE			
Safe removal of infrastructure from the port site, including potentially hazardous materials.			
Asbestos: Appropriate handling and disposal of asbestos in the ceiling of Warehouse No. 5, to prevent harm to human health.			
Pipes: Identification and appropriate disposal of contents of pipes on site, to avoid spillage and prevent pollution.			
Other infrastructure: Disposal of remaining demolition rubble at a municipal landfill.			
MONITORING: DESIGN STAGE			
By	Action	Monitoring	By
JICA Team	Tech Spec requires safe removal of asbestos and pipe contents, and safe disposal.		
CEPA	Tech Spec Requires disposal of inert rubble in municipal landfill.		
	Determine pipe locations and contents if drawing are available.		
MONITORING: CONSTRUCTION PERIOD			
Contractor	Remove and dispose of asbestos, pipe contents, other infrastructure and demolition rubble as in Tech Spec.	Correct removal and disposal of all materials.	ECW CEPA

(2) Monitoring Rationale

The Specification for the dismantling of infrastructure on the site prescribes measures to be taken to demolish the dock and on-land structures safely. This includes use of protective clothing and equipment to handle asbestos when dismantling the ceiling of Warehouse No.5, and safe disposal of material. Handling and disposal of pipe contents is also specified. Remaining inert demolition rubble will be taken to the municipal landfill by arrangement with La Unión Municipality.

Monitoring will be required to ensure that all procedures are properly followed, and this will be the responsibility of the ECW for activities on site (demolition) and CEPA off site (transport, landfill construction and waste deposition).

(3) Action Required – Construction Period

The ECW will:

- Visit the site during the dismantling of Warehouse No.5 to ensure that all procedures in the Specification are followed explicitly. In particular the following will be checked:
 - Wearing of protective suits and equipment by all persons at both the dismantling and disposal sites;

- Removal of protective gear at the end of each shift with the minimum generation of dust;
- Dismantling the ceiling without breaking the panels;
- Transport of all asbestos-containing materials to a suitable disposal site;
- Visit the locations of all pipe-work in the existing port during the dismantling operation and ensure that the procedures in the Specification are followed;
- Visit other locations in the port during infrastructure dismantling and ensure that procedures in the Specification are followed.

CEPA will:

- Observe the transportation of disposal material;
- Visit the landfill during deposition of asbestos and pipe contents and ensure that specified procedures are followed. In particular the following will be checked:
 - Transportation of materials to the appropriate landfill;
 - Wearing of protective clothing and respirators by all persons in the vicinity of material containing asbestos;
 - Proper deposition of asbestos and pipe contents.

3.2.5 Environmental Protection During Dredging

(1) Description of Measure and Monitoring Required

**Table 3.2.5 Mitigation Measure No 8:
Environmental Protection During Dredging**

SUMMARY OF MEASURE			
Control the spread of suspended sediment by monitoring turbidity around the dredging, disposal and reclamation sites, and ceasing operations if Trigger Levels are exceeded. Distribute information about exact location of dredging and disposal sites, train workers in the environmental effects of dredging to raise awareness, and develop an oilspill contingency plan and carry booms, skimmers and absorbents on the dredger to deal with accidental spills of fuel or oil.			
MONITORING: DESIGN STAGE			
By	Action	Monitoring	By
JICA Team	Contract Docs: dredging, disposal, reclamation in specified areas. Turbidity monitoring 12 stations, stop work if trigger levels are exceeded.		
	Contract Docs: train workers in impacts of dredging, prepare oilspill contingency plan, carry equipment.		
MONITORING: CONSTRUCTION PERIOD			
CEPA	Distribute information about exact location of dredging and disposal sites.		
Contractor	Dredging, disposal, monitoring, training, oilspill plan as in Specification	Correct dredging, disposal, monitoring, training, oilspill equipment	ECW
		Review monitoring results, decide if work should cease	CEPA, MARN

(2) Monitoring Rationale

The rationale for proposing turbidity monitoring, the selection of stations and the various trigger levels of suspended sediment that would require the operation to cease if they were exceeded, are explained in full in Section 2.2.6 above.

Dredging, disposal and reclamation will be carried out in defined areas only, these having been specified in the Contract Documents and Design Drawings. The operations will also be controlled by GPS to ensure accurate positioning of all equipment. The Documents require the Contractor to monitor Turbidity and Suspended Sediment daily at 12 stations for at least a month before dredging begins, and to use the data to determine the relationship between the two parameters, and background (average) values of SS at each station. Turbidity will then be monitored daily at the same stations throughout the dredging operation, and the Contractor will report the results to CEPA weekly, or immediately if any trigger level is exceeded. CEPA will review the results and discuss with MARN to decide if the instruction to cease dredging should be given. If this occurs, operations will not re-commence until background levels are reached again.

The monitoring stations are shown in Figure 2.2.9, and stations and trigger levels are shown in Table 2.2.9. Three stations are at the disposal site, to prevent plumes moving inshore, back towards the dredged channel, and offshore towards the sea border with Nicaragua. Two stations are inshore of the outer approach channel to protect fishing grounds along the coast. One station is 500 m from the overflow from the reclamation area to ensure that as much silt as possible is retained within the bunded area; and one station is north-east of the inner channel to prevent significant plumes traveling towards mangrove swamps on the opposite side of the channel. Trigger levels at all of these stations are 200 ltr above ambient, a level which numerical modeling of the plumes (Figures 2.2.5, 2.2.7 and 2.2.10) indicates should be achievable with reasonable precautions.

The remaining five stations are in the north of La Unión Bay, where there are fish and shrimp nursery grounds and locally important beds of mollusks that are in need of special protection. Three stations are along the southern boundary of the nursery grounds, where the trigger level of 100 ltr above ambient is an increase in SS that animals living in a naturally turbid environment should be able to withstand. The two final stations are near the beds of clams and mussels where the trigger level of 60 ltr above ambient has been set because the mollusks could be vulnerable to higher levels because they feed by filtering material from the water.

The Contract documents also require the Contractor to develop an oilspill contingency plan and carry the necessary equipment to enable any hazardous liquids spilled from the dredger to be contained and dealt with rapidly and effectively. He is also required to provide training to all workers in the environmental effects of dredging.

The monitoring carried out by the ECW in relation to this measure will be essentially observations to ensure that dredging, disposal and reclamation are carried out as described in the specifications in the correct areas, and that the turbidity monitoring is carried out as specified, at the correct stations and with the required frequency.

(3) **Action Required – Construction Phase**

Contract Documents require the Contractor to:

- Monitor turbidity every day for at least a month before the dredging begins, 50 cm below the surface at the 12 stations shown in Figure 2.2.5 and Table 2.2.9;
- Take a water sample from 50 cm below the surface at each station and send to an accredited laboratory for analysis of Suspended Sediment (SS);
- From the data collected, calculate the overall relationship between turbidity and SS, and the background (average) value of SS at each station;

- Monitor turbidity every day throughout the dredging and disposal operation, 50 cm below the surface at the 12 stations;
- Submit the results of the turbidity monitoring to CEPA every week, and immediately if any trigger value (shown in Table 2.2.9) is exceeded;
- Cease dredging immediately if instructed to do so by CEPA, and do not re-start until instructed;
- Provide training to all personnel involved in the dredging operation to raise awareness of the environmental impacts of dredging and sediment disposal;
- Prepare a contingency plan for the containment and treatment of any fuel or oil spilled from the dredger, and equip the dredger with booms, skimmers and other necessary pollution prevention equipment;
- Implement the contingency plan to treat any pollutants spilled into the water, and inform CEPA of any such incidents immediately.

The ECW will:

- Visit the reclamation, dredging and disposal site periodically throughout the operation to ensure that all procedures in the Specification are being followed. In particular the following will be checked:
 - Dredging and disposal only in specified areas;
 - Turbidity monitoring 50 cm below the surface every day at 12 stations;
 - Correct use of Turbidity monitoring equipment;
 - Correct recording and reporting of Turbidity and SS results;
 - Oilspill equipment present on dredger and used to treat any spills.

CEPA will:

- Compare SS monitoring results with the trigger levels and discuss with MARN periodically;
- Inform MARN if any trigger level is frequently exceeded;
- Advise the Contractor immediately if the operation is to be suspended, and subsequently when work can re-start;

3.2.6 Sanitary Infrastructure for Construction Workers

(1) Description of Measure and Monitoring Required

**Table 3.2.6 Mitigation Measure No 9:
Sanitary Infrastructure for Construction Workers**

SUMMARY OF MEASURE			
There will be several hundred workers on the construction site, who will be provided with adequate toilet, washing, safety and medical facilities to maintain health and safety and prevent sewage pollution. Wastewater will be treated to El Salvador Standards.			
MONITORING: DESIGN STAGE			
By	Action	Monitoring	By
JICA Team	Contract Docs: provide adequate toilets, washrooms, first aid; dispose of waste to national standards.		
MONITORING: CONSTRUCTION PERIOD			
Contractor	Provision of facilities and disposal of waste as in Specifications.	Provision and usage of facilities; waste disposal.	ECW

(2) Monitoring Rationale

The ECW will check that the toilet and first aid facilities are provided as self contained septic tanks with waste treated according to salvadorean standards.

(3) Action Required – Construction Period

The ECW will:

- Visit the construction site once per month to ensure that toilet, washing and medical facilities are provided as required by the Specification. In particular the following will be checked:
 - Number of toilets and washrooms;
 - Functioning and cleanliness;
 - Usage by workers;
 - Frequency and method of waste disposal;
 - Adequacy of sanitary and medical supplies.

3.2.7 Project Promotion

(1) Description of Measure and Monitoring Required

**Table 3.2.7 Mitigation Measure No 12:
Project Promotion**

SUMMARY OF MEASURE			
Raising awareness and support for the project from the La Union population by holding public meetings and setting up information boards at the site and in the city.			
MONITORING: DESIGN STAGE			
By	Action	Monitoring	By
CEPA	Set up information boards at site and in La Unión City, continue to hold public meetings (4 more).		
MONITORING: CONSTRUCTION PERIOD			
CEPA	Maintain information boards and hold three more public meetings.		

(2) Monitoring Rationale

This measure deals with awareness raising, and comprises measures to better inform the public about the project, via meetings and information boards. CEPA will continue the program they have already begun of holding meetings with the public, and will hold one more meeting in the design stage, and three during the construction period. They will also erect two signboards as required by this measure. CEPA have agreed to implement these measures, and no monitoring is necessary.

3.2.8 Disposal of Dredged Material to Onshore Dumping Areas

(1) Description of Measure and Monitoring Required

**Table 3.2.8 Mitigation Measure No 16:
Disposal of Dredged Material to Onshore Dumping
Areas**

SUMMARY OF MEASURE			
Limiting the use of dredged material to reclaim new land near the port, to prevent the unnecessary loss of intertidal/nearshore habitat, disposing of excess material offshore instead.			
MONITORING: DESIGN STAGE			
By	Action	Monitoring	By
JICA Team	Contract Docs: reclaim 24 and 11 ha around port with dredgings; monitor turbidity 500 m from overflow.		
MONITORING: CONSTRUCTION PERIOD			
Contractor	Inner channel dredging, reclamation, disposal, monitoring as specified.	Dredging, reclamation, disposal, monitoring as specified. Results of turbidity monitoring.	ECW CEPA

(2) Monitoring Rationale

The rationale for the monitoring of turbidity in the channel including near the overflow from the reclamation area has been explained in Sections 2.2.6, 2.2.9 and

3.2.5 above. The monitoring is specified in full in the Contract Documents and the ECW will ensure that it is carried out as specified, and CEPA will review the results, and in discussion with MARN will decide when reclamation needs to cease if the trigger level of 200 ltr above ambient is exceeded, 500 m from the overflow. If this level is exceeded repeatedly then the Contractor will have to take action to retain more of the fine material within the reclamation area, and this could include special counter measure such as constructing additional bunds within the area to prolong the retention time of the water, and the use of silt curtains at the overflow point(s) as shown in Figure 2.2.3.

(3) Action Required – Construction Period

Contract Documents require the Contractor to:

- Monitor turbidity as described in Section 3.2.6 above, which includes Station T7 500 m from the overflow weir from the reclamation area;
- Submit the results of the turbidity monitoring to CEPA every week, and immediately if any trigger value (shown in Table 2.2.9) is exceeded;
- Cease dredging immediately if instructed to do so by CEPA, and to no re-start until instructed.

The ECW will:

- Visit the reclamation, site periodically throughout the operation to ensure that all procedures in the Specification are being followed. In particular the following will be checked:
 - Disposal only in specified areas;
 - No reclamation south of Punta Gorda;
 - Turbidity monitoring 50 cm below the surface every day at station T7;
 - Correct use of Turbidity monitoring equipment;
 - Correct recording and reporting of Turbidity and SS results.

CEPA will:

- Compare SS monitoring results with the T7 trigger level of 200 ltr;
- Inform MARN if the trigger level is frequently exceeded;
- Advise the Contractor immediately if the operation is to be suspended, and subsequently when work can re-start.

3.2.9 Re-settlement of Inhabitants of the Borrow Area

(1) Description of Measure and Monitoring Required

**Table 3.2.9 Environmental Permit Condition No. 12:
Re-settlement of Inhabitants of the Borrow Area**

SUMMARY OF PERMIT CONDITION			
CEPA have organized the re-settlement of former inhabitants of the borrow site to new accommodation.			
MONITORING: DESIGN STAGE			
By	Action	Monitoring	By
CEPA	60 families amicably re-settled	Conduct poll to check satisfaction with housing	CEPA

(2) Monitoring Rationale

CEPA re-settled the former inhabitants of the borrow site in December 2001 and will conduct a poll of the residents to ensure that they are satisfied with their new accommodation.

(3) Action Required – Design Stage

CEPA will:

- Conduct an opinion poll of residents to determine the degree of satisfaction with their new accommodation;
- Take action to remedy any reasonable complaints.

3.2.10 Completion of La Unión Bypass

(1) Description of Measure and Monitoring Required

**Table 3.2.10 Environmental Permit Condition No 13:
Completion of La Unión Bypass**

SUMMARY OF PERMIT CONDITION			
Construction traffic will use part of the route of La Unión Bypass before it is completed so that heavy traffic will not have to pass through the narrow congested streets of La Unión City.			
MONITORING: DESIGN STAGE			
By	Action	Monitoring	By
JICA Team	Contract Docs specify alternative transportation routes		
CEPA	Agree detail of the arrangement with MOP		
MONITORING: CONSTRUCTION PERIOD			
Contractor	Transport construction machinery and materials via specified route		

(2) Monitoring Rationale

The agreed alternative routes along part of the bypass is specified in the Contract Documents, and CEPA will agree the details of the arrangement with MOP during the design stage. Usage of this route will provide much more convenient access to the

port than if vehicles were to pass through the city, so monitoring should not be necessary to ensure that this is done.

3.2.11 Control Development of Improvised Canteens

(1) Description of Measure and Monitoring Required

**Table 3.2.11 Environmental Permit Condition No. 15:
Control Development of Improvised Canteens**

SUMMARY OF PERMIT CONDITION			
To maintain the clean and modern appearance of the port, and prevent the accumulation of refuse, local traders will be prevented from establishing <i>ad hoc</i> canteens around the site during construction and when the port is operating. This may require legislation and police action. CEPA will request La Unión Municipality to provide an alternative site nearby, with services and proper facilities.			
MONITORING: DESIGN STAGE			
By	Action	Monitoring	By
Engineer	Contract Docs require Contractor to provide site canteen for workers.		
CEPA	Request La Unión Municipality to pass laws forbidding stalls near port and to provide an alternative licensed site.		
MONITORING: CONSTRUCTION PERIOD			
Contractor	Provide site canteen.		
La Unión Police	Remove stalls outside port.	Presence of stalls outside site.	ECW
MONITORING: OPERATIONAL PHASE			
La Unión City	Provide site with services, and license food vendors.	Presence of stalls outside port.	PEU
CEPA	Provide canteen, restaurant in port.		

(2) Monitoring Rationale

CEPA will liaise with La Unión Municipality and Police Department to ensure that laws are passed and enforced preventing stallholders from establishing premises outside the port so that they will not detract from the appearance of the site. The Contract Documents require the contractor to provide inexpensive canteens on site where workers can obtain food, and CEPA will do the same when the port is operating. CEPA will also request La Unión Municipality to license food vendors to set stalls.

3.2.12 Worker Safety and Wildlife Conservation

(1) Description of Measure and Monitoring Required

**Table 3.2.12 Environmental Permit Condition No. 16:
Workers Safety and Wildlife Conservation**

SUMMARY OF PERMIT CONDITION			
Although wildlife will be removed from the borrow site, workers may encounter animals during construction and when the port is operating, so training will be provided in conservation measures. As the fauna includes venomous snakes, training will also be provided in avoidance and treatment of snakebites, and antiserum will be available on site.			
MONITORING: DESIGN STAGE			
By	Action	Monitoring	By
JICA Team	Contract Docs: train workers in snakebites and provide antiserum		
MONITORING: CONSTRUCTION PERIOD			
Contractor	Provision of antiserum, training in snakebites	Training, and antiserum on site	ECW
CEPA	Training in value and conservation of wildlife.		
MONITORING: OPERATIONAL PHASE			
CEPA	Provision of antiserum, medical care, and training in snakebites		
CEPA	Training in value and conservation of wildlife once a year.		

(2) Monitoring Rationale

The Tender Documents will require the Port Contractor to provide all workers with training in the avoidance and treatment of snakebites, to be given by qualified medical persons, and to maintain a supply of antiserum on site. Compliance with this requirement will be monitored by the ECW.

The other aspects of this measure require CEPA to make the same provisions regarding snakebites when the port is operating, and for CEPA to request MARN to provide training to workers once per year during construction and operational phases, in the conservation of wildlife. No monitoring will be necessary to ensure completion of these elements.

(3) Monitoring Requirements

The ECW will:

- Inspect the medical facilities provided by the Contractor and ensure that up to date snakebite antiserum is present on site, stored according to manufacturer's instructions;
- Observe on-site training and ensure that this includes training in the avoidance and treatment of snakebites.

3.2.13 Comply with Relevant Laws

(1) Description of Measure and Monitoring Required

**Table 3.2.13 Environmental Permit Condition No. 18:
Comply with Relevant Laws**

SUMMARY OF PERMIT CONDITION			
Port construction and operation involves many activities that could be hazardous, and a port is a place where illegal activities could occur. Several measures ensure that all activities comply with relevant laws. Designs have been prepared to specifications established in national, and/or international standards, ensuring the highest quality of safety and performance. Contract Documents require the Contractor to comply with all relevant laws, and CEPA will prepare an Operations Manual specifying how all procedures are to be conducted in the functioning port; these will be checked by CEPA Legal Dept to ensure legal compliance. Government Customs and Immigration officers will be housed in the port to inspect cargoes, passports and vessels.			
MONITORING: DESIGN STAGE			
By	Action	Monitoring	By
JICA Team	Port designs follow El Salvador, Japanese or US design manuals		
	Contract Docs require Contractor to comply with applicable El Salvador laws		
MONITORING: CONSTRUCTION PERIOD			
Contractor	Port built to specifications, in compliance with all laws, to highest standards of safety and performance	Observe activities to detect any non-compliance	Consultant
MONITORING: OPERATIONAL PHASE			
CEPA	Prepare Operations Manual specifying all procedures, in compliance with law	Check of manual for legal compliance	CEPA Legal Dept
Port Operator	Operations as prescribed in Manual	Observe, audit activities to detect any non-compliance	CEPA Port Manager

(2) Monitoring Rationale

The designs, drawings, reports and other documents produced by the project have referred to national and international standards, and have been subject to rigorous Quality Assurance checks, ensuring that the highest standards are met. The Contract Documents require the Contractor to be familiar with all relevant El Salvador laws and to ensure that all activities are in full compliance. This will be monitored by the Consultant supervising construction, who will also need to be fully conversant with national laws relating to construction to detect any incidences of malpractice.

During the operational phase CEPA will design a Port Operations Manual (POM) specifying how all activities in the functioning port are to be conducted, and they will ensure that these all comply with the relevant laws by subjecting both draft and final versions to careful scrutiny by the CEPA Legal Department. It will then be the responsibility of the CEPA Manager of the port (which he may delegate) to ensure

that all operations follow the procedures in the manual explicitly and thus maintain legal compliance. This will be observed during routine site inspections and subject to an annual formal audit.

Finally illegal immigration and the handling of prohibited cargoes and materials will be detected and prevented by the activities of the Government Immigration and Customs officials, who will be housed in the port.

(3) Action Required – Construction Period

The Contract Supervisor will:

- Inspect the construction site daily, observing site practices to ensure that all are in compliance with El Salvador law.

(4) Action Required – Operational Phase

CEPA will:

- Submit draft and final versions of the Port Operations Manual to thorough scrutiny by the CEPA Legal Department to detect any procedure that is not in strict compliance with El Salvador law;
- Make the Port Manager responsible for monitoring the implementation of the Operational Procedures by *ad hoc* site inspections and annual audits;
- Take action in cases where procedures are not adhered to.

3.3 Monitoring of Environmental Protection in Operational Phase

3.3.1 Solid Waste Management

(1) Description of Measure and Monitoring Required

**Table 3.3.1 Mitigation Measure No. 6:
Solid Waste Management**

SUMMARY OF MEASURE			
Waste from ships is not the responsibility of the Port Authority, and is dealt with by shipping agents, who normally employ a local contractor to collect and treat the waste. Waste from port operations is the responsibility of CEPA, and as this will consist of relatively small quantities of office type waste it will also be deposited at the municipal landfill. CEPA will produce a Waste Management Plan for the Port and will require all companies operating in the port to produce and implement their own Plans.			
MONITORING: OPERATIONAL PHASE			
CEPA	Prepare Port Waste Management Plan and require operators to implement their own Plans. Provide trash containers, collection truck, arrange for Municipality to collect waste from outside of port.		
Port Operators	Management of waste according to waste management plans of operation and port.	Correct waste deposition, collection and disposal.	PEU

(2) Monitoring Rationale

The Port Operations Manual will contain a Port Waste Management Plan, and CEPA will require all companies operating in the port adhere to the WMP, and to develop and apply their own Plans. It is likely that CEPA will appoint a local company to provide waste management services for the port, which will include the provision of closable steel bins to all companies, and the collection of waste. CEPA will arrange for La Unión Municipality to collect waste from outside the port, which they will transport to the municipal landfill.

The Port Environmental Unit will monitor the application of the waste management plans, during the course of their routine site inspections, and by annual audits.

(3) Action Required – Operational Phase

The PEU will:

- Periodically inspect each premises used by companies periodically to observe whether waste management procedures, as specified by the Port Waste Management Plan and the individual Waste Management Plans of each of the concessionary companies, are being properly implemented. In particular the following will be observed:
 - Any waste separation and recycling measures;

- Treatment of biodegradable waste;
- Usage of bins provided;
- Cleanliness of premises;
- Evidence of pests.

Observe the waste management service provided by the local contractor, in the course of routine site inspections. In particular the following will be checked:

- Type and number of bins provided;
 - Removal of contents at the specified frequency;
 - Orderly transfer to the trucks of La Unión Municipality;
 - Overall appearance of the port site, ensuring that no garbage is allowed to accumulate outside the bins.
- Conduct formal audits of each company every year to ensure compliance with their own Waste Management Plan and that of the port.

3.3.2 Liquid Waste Management

(1) Description of Measure and Monitoring Required

**Table 3.3.2 Mitigation Measure No 7:
Liquid Waste Management**

SUMMARY OF MEASURE			
The port will not handle any liquids in bulk so the only area where hazardous liquids will be handled (oil and fuel) is in the vehicle maintenance workshop. Drainage from this area will be passed to an oil-water separator and treated to El Salvador discharge standards.			
MONITORING: DESIGN STAGE			
By	Action	Monitoring	By
JICA Team	Oil separator designed to treat liquid to El Salvador standards. Port drainage system will pass runoff from vehicle workshop to separator.		
MONITORING: OPERATIONAL PHASE			
Contractor	Construction of separator and drainage system as designed.	Construction of separator and drainage system as designed. Weekly analysis of oil and grease in separator effluent.	Supervisor PEU
CEPA	Develop oilspill contingency plan, train staff, provide equipment.		

(2) Monitoring Rationale

The port drainage system has been designed to collect and transport all runoff from the area of the vehicle maintenance workshop to an oil-water separator, which has been designed to treat waste to El Salvador discharge standards (Table 2.3.3). The Supervising Consultant will ensure that the separator and drainage system are constructed as specified.

During the operational phase CEPA will appoint qualified personnel to prepare an oilspill contingency plan for the port, provide the necessary equipment and train staff in implementing the oil containment and treatment measures. This will then be applied to deal with any spillages in the vicinity, whether from the port, visiting vessels or other sources. The Port Environmental Unit will check the correct functioning of the oil-water separator by taking a sample of effluent every week and sending it to an accredited laboratory for analysis of oil and grease.

(3) Action Required – Construction Period

The Supervising Consultant will:

- Ensure that the port drainage system and oil-water separator are constructed as specified in the design drawings and documents;

3.3.3 Occupational Health and Safety

(1) Description of Measure and Monitoring Required

**Table 3.3.3 Mitigation Measure No. 11:
Occupational Health and Safety (OHS)**

SUMMARY OF MEASURE			
Construction and operation of a port involves many activities that could be hazardous, so procedures and equipment will be required to protect the health and safety of workers. Contract Documents require the Contractor to implement an OHS Plan during construction, and CEPA will prepare an OHS plan for the port operations.			
MONITORING: DESIGN STAGE			
By	Action	Monitoring	By
JICA Team	Contract Docs require Contractor to operate OHS plan and provide safety equipment.	Approval of OHS Plan.	CEPA
MONITORING: CONSTRUCTION PERIOD			
Contractor	Implement OHS plan, provide safety equipment.	Work practice, application of OHS procedures.	Supervisor
MONITORING: OPERATIONAL PHASE			
CEPA	Prepare Port OHS plan, instruct companies, employees to comply, provide equipment for CEPA staff.	Provision of equipment, compliance with procedures.	Port Manager

(2) Monitoring Rationale

The Contract Documents require the Port Contractor to prepare and submit as part of his tender an OHS plan for the construction process, and this will be scrutinized by CEPA as one of the conditions used for selecting the preferred bidder. The Construction Supervisor will then ensure that this is followed throughout the construction period.

CEPA themselves will prepare an OHS plan for the port operations, which will be an annex to the Port Operations Manual. All concessionary companies, visiting vessels, haulage and container handling companies and their employees will be required to

comply, as will all CEPA employees. Equipment will be provided by the companies, and by CEPA for their own staff, and usage will be mandatory. Monitoring the application of the procedures and provision and usage of the equipment will be the responsibility of the Port Manager, who may delegate this to member(s) of his staff.

(3) Action Required – Design Stage

CEPA will:

- Scrutinize the OHS plans of all bidders for the Port Construction Contract and ensure that the plan of the preferred bidder will provide the necessary protection to workers.

(4) Action Required – Construction Period

The Construction Supervisor will:

- Observe the working practices of the Contractor and his workers and ensure that they comply at all times with the approved OHS Plan;
- Ensure that all workers wear safety equipment prescribed by the plan for the appropriate activities.

(5) Action Required – Operational Phase

The Port Manager will:

- Observe the activities of concessionary companies and others on site to ensure that practices set down in the Port OHS Plan are properly adhered to;
- Conduct annual audits of the operations of each concessionary company to monitor the application of OHS procedures to ensure that procedures set out in the Port OHS Plan are being correctly applied. Professional OHS auditors may be engaged for this purpose if necessary;
- Ensure that the necessary safety equipment is provided by the companies, and by CEPA, and is worn when required by all workers.

3.3.4 Port Environmental Unit

(1) Description of Measure and Monitoring Required

**Table 3.3.4 Mitigation Measure No. 13:
Port Environmental Unit**

SUMMARY OF MEASURE			
Most port activities could damage the environment if procedures are not followed or if mitigation measures are not implemented. A small unit of experts will be formed to carry out the monitoring specified in this plan, to ensure that procedures are adhered to and pollution control measures are effective, and to monitor the environmental impacts of the port.			
MONITORING: OPERATIONAL PHASE			
By	Action	Monitoring	By
CEPA	Establish and equip PEU.		
PEU	Monitor port activities and environment, report to CEPA. Develop and monitor port EMS.	Adequacy of PEU reports, data and recommendations.	CEPA MARN

(2) Monitoring Rationale

CEPA will establish a Port Environmental Unit comprising a qualified Manager and Specialist, and will provide equipment and facilities necessary for the Unit to carry out the various monitoring activities allocated to it in this Monitoring Plan. The PEU will report their findings to CEPA on a monthly basis, and more frequently if environmental problems are detected. They will also work with consultants or Specialist appointed by CEPA to develop an Environmental Management System (EMS) for the port, comprising procedures which all port concessionary companies will be required to follow to minimize their impacts on the environment.

External monitoring of the activities of the PEU will be provided by MARN, who will be requested for assistance in the appointment of staff and specification of equipment when the PEU is established. They will also be consulted regarding the data collected by the PEU during the course of their activities.

(3) Action Required – Operational Phase

CEPA will:

- Request assistance from MARN in the selection of PEU staff and specification of equipment, facilities and monitoring methods;
- Request assistance from MARN regarding the content of monthly monitoring reports provided by the PEU, and in the interpretation of the results of analyses and necessary remedial action to deal with any potential environmental problems.

The PEU will:

- Conduct all items of monitoring as indicated elsewhere in this Environmental Monitoring Plan, to monitor the correct implementation of specific mitigation measures, to ensure that they are functioning in the intended manner, and to determine the environmental effects of the port;
- Establish a program of routine ambient environmental monitoring, involving taking samples of air, soil and water at three locations in the port (the same locations each month), and analyzing relevant determinands, including:
 - Air: Particulate matter;
 - Seawater: BOD₅, COD, Turbidity, TSS, Dissolved Oxygen, oil and grease, total and fecal coliforms.

Take a sample of effluent from the WWTP and oil-water separator every month and analyze for:

- WWTP: pH, BOD₅, COD, TSS, total and fecal coliforms;
- Oil Separator: Total oil and grease;
- Conduct as many of these analyses as possible, and employ an external laboratory where necessary;
- In addition make daily observations of water, air and soil within the port for visual evidence of pollution, and ad hoc observations of working practices to ensure that none carry a risk of damaging the environment. In particular the following will be observed:
 - Waste management practices;
 - Handling and storage of bulk solids;
- Carry out formal audits of the operations of each concessionary company once per year for the correct application of the procedures of the port EMS;
- Report to CEPA monthly on the results of all observations, tests and analyses, highlighting any notable occurrences, and suggesting remedial action for cases where discharge limits or ambient levels are exceeded.

3.3.5 Environmental Measures in Port Operations Manual

(1) Description of Measure and Monitoring Required

**Table 3.3.5 Mitigation Measure No. 14:
Environmental Measures in Port Operations Manual**

SUMMARY OF MEASURE			
The PEU will develop an Environmental Management System (EMS) for the port, which specifies how the port and its various operations manage their impact on the environment. All port operators, users, vessels and other visitors will be required to comply with the procedures.			
MONITORING: OPERATIONAL PHASE			
By	Action	Monitoring	By
PEU CEPA	Prepare Port EMS. Require all concessionaires and vessels to comply.	Port activities, compliance with procedures.	PEU

(2) Monitoring Rationale

The procedures of the Port Operations Manual (POM) will be mandatory for all companies operating in the port and their employees, including those of CEPA. The PEU will develop an Environmental Management System for the port (EMS), the manual for which will be part of the POM. This will contain procedures designed to reduce the environmental impact of the port, and these will also be mandatory. The PEU will observe the activities of the port to monitor compliance with the EMS procedures and will report transgressions to CEPA. Once per year they will formally audit the compliance of all concessionaires with the EMS;

(3) Action Required

The PEU will:

- During site inspections observe working practices to ensure adherence to procedures specified by the port EMS.
- Carry out formal audits of the operations of each concessionary company once per year for the correct application of the procedures of the port EMS.

3.3.6 Control of Emissions from Bulk Solids Handling

(1) Description of Measure and Monitoring Required

**Table 3.3.6 Mitigation Measure No. 14:
Control of Emissions from Bulk Solids Handling**

SUMMARY OF MEASURE			
The port is likely to handle a number of solids in bulk, including fertilizer, grain, raw sugar, and maize and soybean flour, all of which could be polluting if spilled, particularly into the water where they could cause eutrophication, depleting oxygen. Spillage and dust can be greatly reduced by the use of appropriate handling methods. This equipment will be provided by the Port Operator, and CEPA will use environmental protection as one of the bid evaluation criteria, ensuring a high degree of dust prevention.			
MONITORING: CONSTRUCTION PERIOD			
By	Action	Monitoring	By
CEPA	Provide draft POM and EMS to all bidders for port operation concession and use environmental protection as evaluation criterion.	Amount of environmental protection offered by measures in bids.	CEPA
MONITORING: OPERATIONAL PHASE			
Port Operator	Bulk solids handling using infrastructure specified in bid, following procedures in Manual.	Bulk solid handling, storage, compliance with POM, EMS. Weekly dust monitoring.	PEU

(2) Monitoring Rationale

CEPA will provide all bidders for the port operations concession with copies of the draft Port Operations Manual and EMS, and will require bidders to explain in their proposals the measures they will take to ensure compliance. They will then use environmental protection as one of the criteria against which bids will be evaluated.

Once the operation is underway, the methods of handling solids will be observed by the PEU, who will also record compliance with the EMS procedures.

(3) Action Required – Construction Period

CEPA will:

- Evaluate bids for the port operations concession on the basis of the degree of environmental protection they will provide.

(4) Action Required – Operational Phase

The PEU will:

- During site inspections observe working practices relating to the handling of bulk solids, to ensure adherence to procedures specified by the POM and EMS;
- Carry out formal audits of the activities of the port operator once per year for the correct application of the procedures of the Port EMS;
- Establish one station within the port for the routine monitoring of particulate matter present in the air every month. Ensure that the analysis includes the

differentiation of particle types so that sources can be identified and remedial action taken if necessary;

- Report to CBPA monthly on the results of the air quality monitoring, and recommend remedial action if particles of any bulk solids are recorded in significant quantities.

3.3.7 Operation of Liquid Treatment Plants

(1) Description of Measure and Monitoring Required

**Table 3.3.7 Environmental Permit Condition No. 9:
Operation of Liquid Treatment Plants**

SUMMARY OF PERMIT CONDITION			
Pollution control facilities in the port will include an oil-water separator and two sewage treatment plants, which have been designed to treat effluent to El Salvador discharge standards. CEPA will employ a qualified technician to operate the plants and to record basic parameters of the effluent. Samples for more detailed analysis will be taken by the PEU.			
MONITORING: DESIGN STAGE			
By	Action	Monitoring	By
JICA Team	Oil separator and WWTP designed to treat to El Salvador standards. Contract Docs require Contractor to prepare O&M Manuals for plants.		
MONITORING: CONSTRUCTION PERIOD			
Contractor	Construction of oil-water separator, WWTP and connecting pipe-work. Preparation of O&M Manuals.	Separator and WWTP built as specified, O&M described in manuals.	Supervisor
CEPA	Appoint technician to operate plants. Provide monitoring equipment.		
MONITORING: OPERATIONAL PHASE			
Technician	Separator and WWTP operating to design standard. Effluent monitoring.	Plants operating as in O&M manual. Effluent monitoring.	PEU

(2) Monitoring Rationale

The oil-water separator and the WWTP plants have been designed to treat the waste material producing effluents that meet El Salvador discharge standards (Tables 2.3.3 and 2.3.8). The Construction Supervisor will ensure that both are built as specified, and that as required by the Contract Documents, the Contractor produces Manuals describing in detail the operation and maintenance of both plants.

CEPA will operate the plants, and be responsible for keeping the plants in full working order, following the procedures set down in the O&M Manuals. Samples of effluent for more detailed analysis (WWTP: BOD₅, COD, TSS and total and fecal coliforms; Oil-water separator: total oil and grease) will be taken every month by the PEU and sent to an external laboratory for analysis.

(3) Action Required – Construction Period

The Construction Supervisor will:

- Inspect the construction site daily, ensuring that the oil-water separator and WWTP are constructed as designed;
- Check drafts of the O&M Manuals submitted by the Contractor and ensure that they describe in detail all procedures required to keep both plants in full working order.

(4) Action Required – Operational Phase

The PEU will:

- During site inspections observe activities at the oil separator and WWTP to ensure that procedures set down in the O&M Manual are followed;
- Ensure that the technician provides results every month of the observations of effluent pH, temperature, flow rate and visual quality;
- Take samples every month of the effluent from the oil -water separator and send these to an approved external laboratory for analysis of total oil and grease;
- Take samples every month of the effluent from the WWTP and send these to an approved external laboratory for analysis of pH, BOD₅, COD, TSS and total and faecal coliforms;
- Review the results of all laboratory analyses and observations made by the technicians and PEU staff, and report to CEPA on any results which could indicate a malfunction of the facility;
- Report to CEPA monthly on the results of all analyses and observations, highlighting any notable occurrences, and suggesting remedial action if discharge limits are exceeded.

3.3.8 Maintenance of Treatment Plants

(1) Description of Measure and Monitoring Required

**Table 3.3.8 Environmental Permit Condition No. 10:
Maintenance of Treatment Plants**

SUMMARY OF PERMIT CONDITION			
In addition to the design and operational measures discussed in Section 4.4.8, the water treatment plants also require regular maintenance and removal and disposal of waste, to keep them in full working order. Maintenance requirements will be included in the O&M Manual for each plant, and CEPA will appoint a local contractor to remove and dispose of sludge in compliance with El Salvador law.			
MONITORING: CONSTRUCTION PERIOD			
By	Action	Monitoring	By
Contractor	Prepare O&M Manuals for oil separator and WWTP.	Quality of O&M procedures.	Supervisor
MONITORING: OPERATIONAL PHASE			
Technician	Oil separator and WWTP maintained as in Manual.	Observe maintenance.	PEU
Waste Contractor	Removal and disposal of oil and sewage sludge as in contract.	Observe waste removal and disposal.	PEU

(2) Monitoring Rationale

The measures necessary to maintain the oil separator and WWTP will be included in the O&M Manuals for the plants, and the maintenance will be conducted by the technician. The PEU will monitor the implementation of the necessary maintenance in the course of their activities on site.

CEPA will liaise with La Unión Municipality and the National Administration of Water Supply and Sewerage to determine the appropriate means of disposal of oil and sewage sludge, and will then prepare contracts and engage a local company to remove and dispose of the waste as agreed. The PEU will also observe these activities to ensure that procedures set down in the contract are followed.

(3) Action Required – Operational Phase

The PEU will

- During site inspections observe activities at the oil separator and WWTP to ensure that maintenance procedures set down in the O&M Manual are followed;
- Observe also the activities of the contractor employed to remove and dispose of sewage and oil sludge to ensure that these are in compliance with the requirements set down in the contract. In particular the following will be checked:
 - Frequency of waste removal;
 - Procedures, equipment and vehicles used to remove and transport waste;

- Route, site and method of disposal.

3.3.9 Prevent Rodents Entering the Port from Ships

(1) Description of Measure and Monitoring Required

**Table 3.3.9 Environmental Permit Condition No. 14:
Prevent Rodents Entering the Port from Ships**

SUMMARY OF PERMIT CONDITION			
Poor loading and pest-control at other ports could mean that rats are present in the holds of ships visiting La Unión port, and these will need to be prevented from disembarking to avoid proliferation of pests and the introduction of alien species. This will be done by requiring all ships to use metal discs on mooring ropes to prevent the passage of rats.			
MONITORING: OPERATIONAL PHASE			
By	Action	Monitoring	By
CEPA	Include in POM requirement to use discs on mooring ropes. Appoint pest control contractor.	Observe usage of discs, pest populations in port.	PEU
Local Contractor	Control pests in port.	Observe presence of pests and control measures.	PEU

(2) Monitoring Rationale

CEPA will include in the Port Operations Manual a procedure making the usage of anti rat discs mandatory at all times when a vessel is moored, and the PEU will observe the usage of the discs during their activities in the port. CEPA will also appoint a local company to control rats and other pests in the port and the PEU will observe the actions they take and will monitor the presence of pests in the port to ensure that the control measures are effective.

(3) Action Required – Operational Phase

The PEU will:

- In the course of normal activities in the port observe the usage of anti-rat discs by vessels to ensure that discs are present on all ropes at all times;
- Report any transgressions to the Port Manager;
- During site inspections observe the activities of the pest-control contractor to ensure that these are as specified in Contract Documents;
- Make observations and conduct surveys of the pest population of the port to determine the effectiveness of the control measures. This should employ standard ecological mammal and insect traps to capture samples of pest species, from which the size of populations should be estimated;
- Report to CEPA on the results of the various observations, drawing conclusions as to the effectiveness of the pest control measures, and if necessary suggesting remedial measures.