

Translated from French

Republic and Canton of Geneva  
Department of the Interior, Agriculture and Environment

Jean-Claude Landry  
Cantonal Ecotoxicologist  
Division of Operations and Intervention

**MISSION**  
**PORT OF DJIBOUTI**

photo

4 April 2002

OCHA/ESB/2002/14  
GE.02-01035 (E) 020502 030502

At the request of the Joint UNEP/OCHA Environment Unit, I visited Djibouti from 9 to 28 March 2002.

Initially, my mission was to assess the risks of copper chrome arsenate contamination in various parts of the port of Djibouti.

After an initial inspection of the area, I decided to change the terms of reference of my mission: the priority was to make the containers secure, retrieve contaminated soil and address the problems posed by five lorries carrying a dozen containers which were leaking. There were two dangers: the possibility of rain at the beginning of April, and strong winds in the summer. The rain could cause the pollutants to be dispersed into the soil and the sea, while the winds could spread dust throughout the town. Hence there was a need to avert in record time, and at all costs, a serious threat to sea water, drinking water and fish, and also potentially to human health.

#### **The facts**

I took part in the meetings of the crisis unit chaired by the Secretary-General of the Ministry of the Environment, Mr. Aboubaker Doualé Waïs, held to draw up an emergency plan and then to implement (or supervise) operations.

For that purpose, a temporary containment had been constructed on “site No. 5”, where the Ethiopian lorries were parked and the retention tank and various other items were stored.

To date, almost 4,000 cubic metres of contaminated soil have been impounded there.

photo

no caption

#### **Sites 1 to 5 have been treated as follows:**

Site No. 1: Along quay No. 1, in the container terminal, with sluicing of the asphalt surfaces from box No. 55 to box No. 83 (and recovery of the water);

photo

caption: Site No. 1 after treatment

Site No. 2: Area in the container terminal where containers with toxic products inside are placed;

photo

caption: Site No. 2 before clean-up

photo

caption: Site No. 2 during clean-up

photo

caption: Site No. 2 after clean-up

Site No. 3: Customs bonded area, along the road and inside closed warehouses;

photo

caption: Site No. 3 after clean-up

Site No. 5: Over 10,000 square metres at terminal 15.

photo

caption: Site No. 5 during clean-up

The 15 leaking containers were placed in eight retention tanks constructed by the port. At the end of the operation, I can estimate that 600 tons of this pesticide are held in the 15 containers.

photo

photo

no caption

no caption

The five Ethiopian lorries were put back in working order and rinsed in an area specially designed and created for this operation.

photo

photo

Caption: Ethiopian lorries

Caption: Rinsing of lorries

The temporary containment was constructed. It was filled with contaminated soil and levelled. It was temporarily covered with sheets of plastic, weighted down with pit run.

photo

caption: Construction

photo

caption: During filling

The leaked substances which had been recovered in the retention tanks were as far as possible placed in plastic receptacles, which will have to be stored in a container earmarked for this purpose.

photo

no caption

A container was cut open and used as a dump for all kinds of wastes, including contaminated tarpaulins and plastic sheets.

photo

no caption

### **Equipment supplied**

#### **Public health**

The following was supplied to the Djibouti authorities:

- 435 doses of Chemet, an antidote for arsenic and heavy metals, packed by the Geneva University Cantonal Hospital.

#### **Personal equipment**

- 20 Tyvek protective garments;
- 270 3M 3µm protective masks;
- 400 pairs of latex gloves  
purchased by the Republic and Canton of Geneva.

The equivalent of \$10,000 in Djibouti francs was made available by UNDP to address urgent and immediate financial problems and make cash payments where needed.

### **Logistical support**

The logistical support team in Geneva was composed of the following, in addition to the United Nations representatives:

- Division of Operations and Intervention:
  - Mr. Jean-Marc Pache
  - Ms. Danielle Bertola Reymond
  - Ms. Danielle Straumann
  - Mr. Claude Calame
  - Mr. Pierre-Yves Leuba;
- Geneva City Fire and Assistance Service:
  - Lt.- Col. Olivier Légeret
  - Capt. Raymond Wicky;
- Geneva International Airport Security Service:
  - Capt. Luc Amiguet;
- Geneva University Cantonal Hospital:
  - Dr. Jean-Sébastien Landry, head of clinic;
  - Dr. Louis Loutan, Chair of the Social Commission;

- Swiss Toxicology Centre in Zurich
- External Affairs Service, Department of the Economy, Employment and External Affairs:
  - Ms. Sylvie Cohen;
- Department of the Interior, Agriculture and the Environment:
  - Mr. Robert Cramer, State Councillor
  - Mr. Claude Convers, Secretary-General;
- and all those who are unknown to me and whom I thank heartily.

**Observations on the urgency of the situation**

On 20 March, at around 7 p.m., with the officer in charge of the port, we installed two additional retention tanks on site No. 5. In this way we were able to move four new containers. They were handled in two stages. The purpose of the operation was to place the containers which were leaking most at the bottom of the tanks, and to place above them those which appeared to be in the best condition. During this operation, some pesticide suddenly escaped. This was most probably due to the breakage of a plastic receptacle. Luckily no one was under the container at the time or in the area where the pesticide was spilled.

This means, in my view, that:

When the containers are exposed to the sun, the temperature of the substances inside rises during the day to levels probably above 80° C. The receptacles are placed on pallets. The pallets are stacked on top of one another, two or three deep according to information we have received. The weight of the upper pallets causes substantial compression of the liquid contained in the plastic receptacles in the bottom of the container. Under the effect of the high temperature, the liquids expand and thus increase pressure on the sides of the receptacles. The plastic softens. We know that it loses a substantial part of its mechanical properties at temperatures above 60-65° C. Each day this mechanical process resumes. The effects are such that the receptacles will not resist for much longer.

As a result, any movement of a container causes a risk of breakage of the receptacles inside. Hence the decanting or refilling of the drums must be carried out with the greatest care. Thus is an urgent matter, as the hot period of the summer is approaching.

**The increased fragility of the receptacles as a result of compression and rising temperatures is aggravating the risk.**

I set out below a series of recommendations for further work.

**Recommendations**

There are eight of these.

**1. Restoration of the sites**

The sites which have been decontaminated have become more fragile because all the soil has been removed down to the layer of landfill containing large stones and coarse sand.

It is all as if preparations were being made for a skin transplant following a serious accident by removing the epidermis and leaving the flesh bare. It goes without saying that if leaking containers were once again placed on this surface, the contamination would be irreversible and final. It is as if corrosive substances were placed on bare skin.

Yet on site No. 1 in the container terminal, immediately after our decontamination operation, containers were once again placed on the entire available surface. At least two of them are leaking. The strip of land along the sea has not been rehabilitated.

On site No. 2, the four containers which were there before the operation have been put back!

These sites need to be rehabilitated **IMMEDIATELY** by covering the surface with a sheet of Bidim, a 10-cm layer of levelled pit run and a layer of bituminous coating at least 10 cm thick. This constitutes restoration of these two sites, not sealing.

Ideally, ditches and a waste water recovery pit should be constructed. A procedure for monitoring and operating the system should be introduced and periodically checked.

Site No. 5 should be dealt with in the same way as the first two. Placing a bituminous coating is not a priority.

**2. Site security**

The conventional security measures and the related procedures - to be put down on paper - must enter into force immediately. In particular, there must be a **DAILY** inspection, and precautionary measures will be taken as appropriate for any situation considered to be unacceptable.

As of now retention tanks can be constructed in which any leaking container can be placed; the party responsible will be billed for the service provided, handling costs and depreciation costs for this infrastructure.

### 3. Containment area

This 800-square-metre area is intended to be temporary. If it remains for over 2 months (two months), it should be provided with a permanent cover. The summer winds are formidable in the region and the present light cover will not prove solid enough.

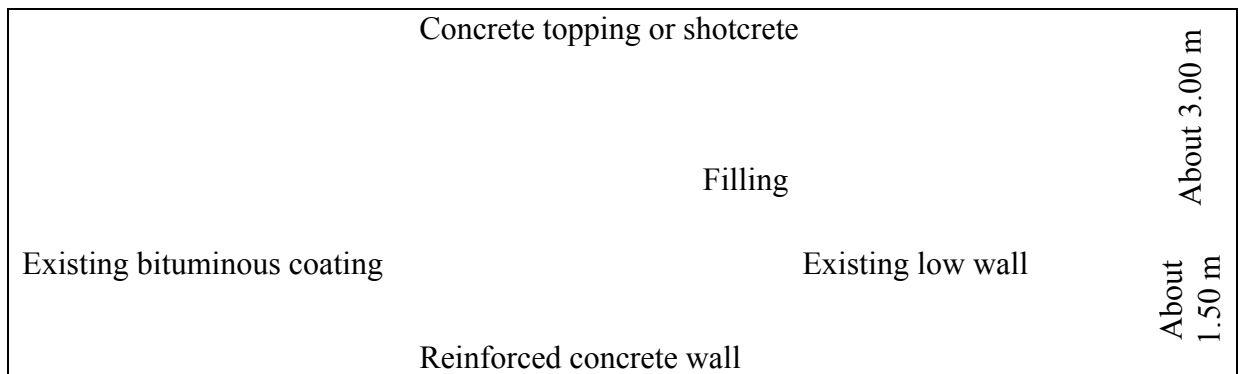
Two solutions may be contemplated:

1. Cover the contaminated material with concrete topping. This topping would be made of CP250 concrete with a wire-mesh armature, adjusted to provide a slope and ensure watertightness.

(a)	Upper surface	800 sq m	
	Unit price	4 000 DF/sq m	3 200 000 DF
(b)	Concrete topping on earth bank	450 sq m	
	Unit price	4 500 DF/sq m	2 000 000 DF
(c)	Miscellaneous and contingencies		800 000 DF
	Total		6 000 000 DF

2. Containment wall 3 m high above the ground in reinforced concrete, including a 1-m footing, with lug.

**Figure**



(a)	Concrete topping as in 1		3 200 000 DF
(b)	Wall 130 linear metres		
	Unit price	200 000 DF/lm	
	including filling behind the wall		26 000 000 DF
(c)	Miscellaneous and contingencies		800 000 DF
	Total		30 000 000 DF

In either case, site organization costs will be in line with local rates.

Containment of the materials by means of a wall would not appear to be technically justified.

If storage is to be planned outside the site, FIBC packaging should be considered and an ad hoc site constructed.

#### **4. Container handling**

The port of Djibouti has no infrastructure for the refilling of copper-chrome arsenate drums. If such an operation is to be carried out in the port, it will be necessary to construct a watertight retention tank with enough room to work inside, a waste water collection network, a pit for the recovery of rinsing water and the raw product, and a system for treating these wastes. Containers for damaged soiled drums should be available.

Logistics should also be operational: an effective unit should be established.

Ready access to large quantities of water should be available. A decontamination zone for the personnel will be constructed and appropriate equipment made available. This zone will be composed of three separate compartments: the contaminated zone, the decontamination zone and the cleaned-up zone.

This decontamination operation can take place only on site No. 5, where a new contamination incident is unthinkable. Transporting containers containing damaged drums outside this site will involve substantial risks - new, sudden and major leakages as a result of rupture of the drums under the effect of high temperatures and pressure. The mechanical properties of the plastics have been placed under great strain in recent months.

This operation can take place only once a written procedure has been drawn up and confirmed by all parties involved.

A bailiff must be made available as of now to record all the evidence which the Republic of Djibouti may need in future court proceedings.

#### **5. Communication plan**

Throughout my mission, I emphasized that a communication plan should be drawn up. The plan will make it possible to keep track of information and closely follow progress in the decanting and refilling operations. It will play a role in encouraging the efficient conduct of the work, as it will specify the schedule of operations.

In communication with the media, the following journalistic criteria will be taken into account:

1. Identification: does the public relate to the information?
2. Double uncertainty:
  - Concerning causes
  - Concerning consequencesAre there grounds for doubts?
3. Appropriation of the risk: an authority, an institution is in the dock.
4. Suspicion that information is being withheld.  
Are there grounds for doubt? Presumption of guilt.
5. Distortion. The previous line is disowned (the steps taken are very effective, everything is under control, but a new disaster has occurred) and emotional targets (one person died).

**6. Port fire personnel**

These should be trained and their leadership should be capable of anticipating the evolution of events and the logistics needed.

For the time being and as an immediate step, order needs to be restored in the station.

An organizational chart should be drawn up for the emergency services and made known to all the officers.

A functional organizational chart will inform the fire service which procedures are applied and who should be asked for adequate resources.

An order of the day should be drawn up and tasks assigned to each person.

The equipment currently available to the station should be maintained and replaced. As it is, it does not allow any effective action which might stand a chance of being crowned with success.

The store should be reorganized: compartment shelving to be introduced, ease of access, etc.

Frequent, weekly exercises should train the fire personnel to handle the equipment efficiently.

## **7. Port procedures**

The procedures relating to storage, decanting of products, security, checks and inspection will be drawn up, confirmed by the management, communicated to the forwarding agents and persons concerned.

These procedures should clearly indicate the penalties which will be applied in cases of non-compliance.

## **8. Decrees for the application of the Environment Act**

The framework law cannot be enforced at the moment as decrees for application have not been issued. This gap needs to be remedied.

## **9. Intervention plans**

### **9.1 ORSEC plan**

The plan for the organization of emergency services contains provision for the overall organization of emergency services, but it is not known.

It does not spell out specific emergency plans other than those dealing with oil.

Updating is needed.

Staff exercises and full-scale exercises should be held at least once a year.

A service responsible for planning of operations and interventions should be set up.

### **9.2 Specific intervention plan**

None exists. It should be drawn up.

### **9.3 Plan of internal operations**

One exists but it has not been approved by the Authority, let alone circulated. That should be done as soon as possible.

## **Final provisions**

This document cancels and replaces the handwritten document of 28 March 2002.

## **Conclusion**

Time is our principal enemy.

In order to move forward rapidly, precautionary measures are needed.

- The problem of decanting and repackaging of the drums stored in the 15 containers is a priority. There is a clear and heightened risk of an accident.
- The containment should be completed before the summer winds arrive.

The legal procedures will be long and risky. One fact remains: the expenditure incurred will be reimbursed by the person or persons responsible in accordance with the polluter-pays principle.

The Republic of Djibouti is strong enough to rely on itself. It will succeed.

That is my conclusion.

My mission is over.

Djibouti, 28 March 2002, 8.15 p.m.  
Geneva, 4 April 2002, 1.50 p.m.

(Signed)

-----