

MAY 7, 2003

**Report on Visit to Union Carbide India Ltd., (UCIL) at  
Bhopal for the steps needed to remove of toxic waste**

**1.0 PREAMBLE**

In the meeting of the Group of Ministers on Bhopal Gas Leak Disaster, held on 07.05.2003, it was decided that the officers of Central Pollution Control Board (CPCB) should visit Bhopal and suggest steps required for removal of toxic waste from the environment, in and around of UCIL. Subsequently, on receipt of the communications in this regard received from the Ministry of Environment & Forests (dated 11.6.03 & 18.6.03), the Chairman, Central Board deputed Shri N.K. Verma, Additional Director, CPCB, Delhi to visit the site along with the officials of CPCB Zonal Office and the State Pollution Control Board. Shri N.K. Verma, Shri A. Sudhakar, EE, Zonal, Bhopal along with officials from M.P. Pollution Control Board, Dr. M.L. Gupta, SSO, Dr. V.B. Apale, C.C. and Dr. Alok Saxena, Scientist met Sh. S.K. Khare, Director, Bhopal Gas Relief & Rehabilitation Directorate, Bhopal and apprised him about the purpose of visit. The relevant documents were seen and the visit to the site was made by the officials of the Central & State Pollution Control Boards along with the officials from Bhopal Gas Relief & Rehabilitation Directorate. The issues involved are as follow:

- 1) Safe disposal of tar residues approximately 44 MT of sevin tar and 2.5 MT of Naphthol tar, which are stored in the premises of UCIL.
- 2) Contaminated area in the UCIL, which is approximately 1.15 hectare in different pockets within the industrial premises. (As per study conducted by NEERI, the soil is contaminated to a depth of 30-60 cm in respect of sevin, temik and alpha naphthol etc.)
- 3) De-commissioning of sevin & MIC plants, containing hazardous chemicals/waste



- 4) Semi-processed pesticides (18.386 MT of sevidol premix and floor dust containing carbaryl: 4.07–52.45%). which are required to be safely disposed-off.
- 5) Safe disposal of excavated contaminated soil – 127.0 MT presently stored in UCIL premises.
- 6) Protection measures needed for secured landfill developed (outside the industrial premises) and solar evaporation ponds (earlier used for storing effluent).

## 2.0 OBSERVATIONS

The observations made during the visit are as follows:

- a) **Storage of tar residues** - The tar residues stored in one of the shed (earlier used as a cycle stand), are kept in polythene bags and mild steel drums. The drums are corroded and bags torn-off. The guard wall of 30 cm height provided in the shed was collapsed on one side and the other side giving way to loose material. There is no signboard to indicate the quantity of stored material. The shed is easily accessible from any side due to low height (30 cm only) of guard wall.
- b) **Semi-processed pesticides** - Another large shed no. 6 (earlier used as Administrative Building and formulation plant) was visited. It is reported to be containing 18.36 MT of semi-processed pesticides. No plant and machinery was found in the shed.
- c) **Storage of hazardous waste** - Another adjoining shed was also seen where materials are stored in loose form on the floor as well as in the corroded drums and torn polythene bags. Some waste material (tar residues) is kept in trays. One of the walls is of 1-meter height only where



door shutter is corroded and lying on the floor. The shed is accessible to any one to come freely. The boundary wall, at a little distance from the shed is having hole for the people to come freely in the premises from the adjoining jhuggi-cluster.

- d) ***Sevin and MIC plant*** - These two plants, which have been constructed on iron structure, are separated by road and open to the sky. The structure as well as plant and equipment are corroded. In the sevin plant, the material (solid and tarry) is spread on the floor due to collapsing of one reactors. Thus, the hazardous material has been exposed, giving rise to contaminated run-off, finding its way to storm water drain. It is reported that this reactor collapsed in June 1999.
- e) ***Contaminated area*** - The contaminated stretch of land near the effluent treatment plant was seen. The boundary wall near this contaminated area is having free access and is not properly guarded. Cows were seen grazing in the premises. The pond near this contaminated area was also seen which was earlier used for effluent storage and evaporation. The pond has dried up.
- f) ***Storing of contaminated soil containing chemicals and waste*** -Nearby shed was also seen wherein contaminated soil (127 tonnes) containing chemicals and wastes are stored. The door of the shed is open on one side. On the other side, the panels of the door are missing giving free access to the shed. Little away from this shed, some of the portion of the boundary wall is having only fencing, wherein a way has been created by the people to come freely in the premises.
- g) ***Solar evaporation pond outside the premises and secured land*** - The sites of the secured landfill and the solar evaporation ponds (earlier used for effluent disposal) were seen. The secured landfill, as reported,



contains sediments of the solar evaporation pond, which is inorganic in nature (calcium & sodium salts of chloride & sulphate) with some organics. The area of the secured landfill is not fenced and not guarded at all. It is learnt that this area is partly owned by Govt. and partly by farmers, as per final decision taken by the Court. At secured landfill, the top covering of soil is excavated and the polythene lining is exposed and torn-off, at one place.

### 3.0 RECOMMENDATIONS

#### a) *Storing of Tar residues & security arrangement*

- i) Immediate steps should be taken for proper storing of tar residues preferably in plastic drums or thick polythene bags, with a raised wall and door(s) with locking arrangement. There should be a signboard for displaying stored material with quantity.
- ii) The tar residue in the sevin plant (due to collapsed reactor) should be immediately collected in drums and brought in one of the sheds.
- iii) The entire boundary wall should be repaired and well guarded with by the security personnel. Proper security of the area should be done to ensure that animals do not enter for grazing and to prevent people entering from nearby areas so as to avoid any contact with contaminated soil and hazardous waste.
- iv) Bhopal Gas Relief & Rehabilitation Directorate, Bhopal, which is in possession of the premises, should ensure proper security.

#### b) *De-commissioning of sevin and MIC plant*

- i) As the plant is lying unused since 1984 and badly corroded, the de-commissioning should be taken up without further delay so that spreading



of hazardous material/chemicals due to collapsing of equipment could be avoided.

- ii) Since this is a specialized job, the de-commissioning operation should be executed through an engineering company who is dealing in design and commissioning of chemical plants. The job may be assigned to a specialized engineering company belonging to Govt./ Public Sector like Engineers India Ltd.
  - iii) The time limit for de-commissioning needs to be fixed by the Central/State Govt. Since the de-commissioning will involve disposal of chemicals contained in the reactor, tanks, pipes etc., storing of such material, its treatment and disposal should be taken care by such agency.
- c) ***Safe disposal of tar residues, semi-processed pesticides and chemicals/ hazardous waste***
- i) All the hazardous material stored and to be generated during de-commissioning of the plant need proper treatment and disposal.
  - ii) Material with high calorific value such as tar residues and semi-processed pesticides/chemicals arising due to de-commissioning is to be disposed-off through an incinerator that can take care of dioxin destruction and removal of mercury vapor in off-gases through in-built air pollution control system with the incineration facility.
- d) ***Safe disposal of other contaminated waste and soil***
- i) Contaminated waste (non-incinerable) and soil need to be disposed off through secured landfill after treatment for immobilization/ detoxification of contaminants to the extent feasible. The site of such secured landfill could be within the industrial premises. However, there should be a buffer zone created between the secured landfill and the adjoining residential areas.



- ii) Secured landfill near the solar evaporation pond outside the premises needs proper attention and security so as to prevent damage to the landfill and the liner. Also, there is a need for buffer zone between surrounding residential areas and the secured landfill. Alternatively, this material may be transported within the industrial premise.

e) ***Monitoring of the contaminants in soil & ground/surface water***

- i) ***Monitoring of groundwater*** N M.P. Pollution Control Board should continue to monitor ground water quality within 2 km radius for the relevant parameters.
- ii) Monitoring of some of the samples beyond 2 km may also be done to check the quality and to compare with the samples collected from the wells near the factory.
- iii) ***Monitoring of surface water quality*** N The storm water collected in solar evaporation pond and in drains around the factory should be monitored periodically for the relevant parameters by the SPCB.
- iv) ***Monitoring of contaminants in soil around the factory premises*** N The monitoring of contaminant in soil in the area adjoining industrial premises may also be carried out by MPPCB, before & after rainy season.





PLATE 1 : Photograph showing storage of tar residues in a shed (earlier used to be a cycle stand). Polythene bags were found torn-off and drums corroded



PLATE 2 : Photograph showing storage of tar residues and other waste which are improperly kept in the shed





PLATE 3 : Photograph showing collapsed reactor and hazardous material spread on the floor of the plant, the run-off which is likely to find way into the storm water drain

