

## Chemicals found in the 2 samples taken downwind on industries in SIPCOT Cuddalore

### Salient Features:

- Total of 15 chemicals found in two samples
- 4 out of 15 chemicals are known to cause cancer in animal and humans
- 11 out of 15 chemicals have been found exceeding the safe levels prescribed by the US EPA or any other standards. (For more details on the chemicals found in each sample see the individual sample report below)

<b>S No.</b>	<b>Name of the chemical</b>	<b>Found at location</b>	<b>Levels detected (ug/m3)</b>	<b>Safe Level (ug/m3)</b>	<b>Number of times above health-based screening levels</b>	<b>Is it a carcinogen?</b>
1.	Carbon Disulphide	Sample 1 Sample 2	9.3	3 (Texas Long Term screening levels)	3.1	No
2.	Methyl Mercaptan		5.8	2.1 (EPA Region 6 Screening Level)	2.76	No
3.	Ethanol		45	--	--	No
4.	Acetone	Sample 1 Sample 2	1900	370 (EPA Region 6 Screening Level)	5.13	No
5.	Isopropyl Alcohol	Sample 1 Sample 2	880	785 (Texas Long Term screening levels)	1.12	No
6.	Methylene Chloride		470	4.09 (EPA Region 6 Screening Level)	114.9	<b>Yes</b>
7..	n-Hexane		88	210 (EPA Region 6 Screening Level)	--	No
8..	Chloroform		29	0.0840 (USEPA Region 6 Screening Levels)	345.2	<b>Yes</b>
9.	Trichloroethene	Sample 1 Sample 2	5.1	1.10 (USEPA Region 6 Screening Levels)	4.63	<b>Yes</b>
10	Toluene		41	400 (USEPA Region 6 Screening Levels)	--	No

<b>S No.</b>	<b>Name of the chemical</b>	<b>Found at location</b>	<b>Levels detected (ug/m3)</b>	<b>Safe Level (ug/m3)</b>	<b>Number of times above health-based screening levels</b>	<b>Is it a carcinogen?</b>
11.	Dimethyl Disulphide		8.4	--	--	--
12.	Dimethyl Sulphide		86	0.3 (Texas Long-Term Screening Levels)	286.6	No
13.	Hydrogen Sulphide	Sample 2	6.8	1.0 ( <i>USEPA Region 6 health based screening levels</i> )	6.8	No
14.	Bromomethane	Sample 2	40	5.2 ( <i>USEPA Region 6 health based screening levels</i> )	7.69	<b>Yes</b>
15.	4-Methyl-2-Pentanone	Sample 2	100	83 ( <i>USEPA Region 6 health based screening levels</i> )	1.2	No

## **Interpretation of sample taken near the SIPCOT canteen in Cuddalore**

**Date of Sampling:** 10 February 2007

**Time of Sampling:** .10:47 pm

**Location:** Opposite SIPCOT Canteen, on the service road in between Aurobindo Pharma, Tantech Agro Chemicals and Shasun Chemicals.

**Wind direction:** North East to South West

**Description of sampling conditions and location:** The sample was taken by the SACEM monitors. An acidic odour ranked at about 5 was reported from the area, the monitors also reported throat irritation and headache as a result of the odour.

### **Results:**

- 12 chemicals were found – Ethanol, Acetone, Isopropyl Alcohol, Methylene Chloride, Carbon Disulphide, n-Hexane, Chloroform, Trichloroethene, Toluene, Methyl Mercaptan, Dimethyl Sulphide, Dimethyl Disulphide.
- 8 out of the 12 chemicals exceed the US EPA region 6 screening levels or any other screening levels in United States.
- Three chemicals – Chloroform, Methylene Chloride and Trichloroethene – are known to cause cancer in humans and/or animals. All these chemicals are above safe levels.
  - Chloroform was 345 times above the US EPA Region 6 Screening level.
  - Methylene Chloride was 114.9 times above the US EPA Region 6 Screening level.
  - Trichloroethene was 4.63 times above the US EPA Region 6 Screening level.
- Out of the 12 chemicals found – 11 target the eyes and the skin, 10 target the Central Nervous System, 8 target the respiratory system, 5 target the kidneys, 4 target the liver and 2 target the Peripheral Nervous System, Cardiovascular System, reproductive system, blood and heart.

**List of Chemicals found:**

S No	Name of Chemical	Levels detected (ug/m3)	Safe Level (ug/m3)	Number of times above health-based screening levels	Type of odour	Health Effects	Target Organs	Carcinogen
1.	Carbon Disulphide	9.3	3 ( <i>Texas Long Term screening levels</i> )	3.1	A sweet ether-like odour	Dizziness, headache, poor sleep, weakness, exhaustion, anxiety, weight loss, coronary heart disease; gastritis; kidney, liver injury; eye, skin burns; dermatitis; reproductive effects	Central nervous system, peripheral nervous system, cardiovascular system, eyes, kidneys, liver, skin, reproductive system	No
2.	Methyl Mercaptan	5.8	2.1 (EPA Region 6 Screening Level)	2.76	A disagreeable odour like garlic or rotten cabbage	Irritation eyes, skin, respiratory system; convulsions	Eyes, skin, respiratory system, central nervous system, blood	No
3.	Ethanol	45	--	--	A pungent, fruity odour	Irritation eyes, nose, throat; eye, skin burns; dermatitis; conjunctivitis; cough; central nervous system depression;; in animals: kidney, reproductive, teratogenic effects; [potential occupational carcinogen]	Eyes, skin, respiratory system, kidneys, central nervous system, reproductive system	No
4.	Acetone	1900	370 (EPA Region 6 Screening Level)	5.13	A fragrant, mint-like odour	Irritation eyes, nose, throat; headache, dizziness, central nervous system depression; dermatitis	Eyes, skin, respiratory system, central nervous system	No
5.	Isopropyl Alcohol	880	785 ( <i>Texas Long Term screening levels</i> )	1.12	Odour of rubbing alcohol	Irritation eyes, nose, throat; drowsiness, dizziness, headache; dry cracking skin	Eyes, skin, respiratory system	No

S No	Name of Chemical	Levels detected (ug/m3)	Safe Level (ug/m3)	Number of times above health-based screening levels	Type of odour	Health Effects	Target Organs	Carcinogen
6.	Methylene Chloride	470	4.09 (EPA Region 6 Screening Level)	114.9	A chloroform-like odour	Irritation eyes, skin; weakness, exhaustion, drowsiness, dizziness; numbness, tingle limbs; nausea; [potential occupational carcinogen]	Eyes, skin, cardiovascular system, central nervous system  <b>Cancer Site</b> [in animals: lung, liver, salivary & mammary gland tumours]	Yes
7..	n-Hexane	88	210 (EPA Region 6 Screening Level)	--	A gasoline-like odour	Irritation eyes, nose; nausea, headache; muscle weakness; dermatitis; dizziness	Eyes, skin, respiratory system, central nervous system, peripheral nervous system	No
8..	Chloroform	29	0.0840 (USEPA Region 6 Screening Levels)	345.2	Pleasant odour	Irritation of eyes, skin; dizziness, mental dullness, nausea, confusion; headache, weakness, exhaustion; enlarged liver [potential carcinogen]	Liver, kidneys, heart, eyes, skin, Central nervous system  <b>Cancer Site:</b> [in animals: liver and kidney cancer]	Yes
9.	Trichloroethene	5.1	1.10 (USEPA Region 6 Screening Levels)	4.63	A chloroform-like odour	Irritation eyes, skin; headache, visual disturbance, weakness, exhaustion, dizziness, tremor, drowsiness, nausea, liver injury; [potential occupational carcinogen]	Eyes, skin, respiratory system, heart, liver, kidneys, central nervous system  <b>Cancer Site</b> [in animals: liver & kidney cancer]	Yes
10	Toluene	41	400 (USEPA	--	Sweet pungent	Irritation of eyes, nose, weakness and exhaustion,	Eyes, skin, respiratory system, Central	No

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			Region 6 Screening Levels)		benzene like odour	confusion, muscle fatigue, liver injury, kidney damage	nervous system, liver and kidney	
11.	Dimethyl Disulphide	8.4	--	--	--	--	--	--
12.	Dimethyl Sulphide	86	0.3 (Texas Long-Term Screening Levels)	286.6	NA	Irritation eyes, skin, respiratory system	Eyes, skin, respiratory system, Central Nervous System, blood	No

## **Interpretation of sample taken near the entrance of Eachangadu village in Cuddalore**

**Date of Sampling:** 10 February 2007

**Time of Sampling:** .11:16 pm

**Location:** Near the electricity post at the entrance of the Eachangadu village

**Wind direction:** North East to South West

**Description of sampling conditions and location:** The wind speed was gentle. The monitors reported a strong mosquito coil odour ranked at 6 from this area while taking the sample. Headache and eye burning was also reported as a consequence of the odour.

### **Results:**

- 7 chemicals were found – Hydrogen Sulphide, Bromomethane, Acetone, Isopropyl Alcohol, Carbon Disulphide, Trichloroethene and 4-Methyl-2-Pentanone.
- 5 out of the 7 chemicals exceed the US EPA region 6 screening levels or any other screening levels in United States.
- Two chemicals – Trichloroethene and Bromomethane – are known to cause cancer in humans and/or animals. Both these chemicals are above safe levels.
  - Trichloroethene was 1818 times above the US EPA Region 6 Screening levels.
  - Bromomethane was 7.69 times above the US EPA Region 6 Screening levels.
- Out of the 7 chemicals found – all of them target the eyes, 6 target the skin and the Central Nervous System, 5 target the respiratory system, 3 target the kidneys and the liver, 2 target the Cardiovascular System and 1 targets the reproductive system, the Peripheral Nervous System, and the heart.

**List of Chemicals found:**

S No	Name of Chemical	Levels detected (ug/m3)	Safe Level (ug/m3)	Number of times above health-based screening levels	Type of odour	Health Effects	Target Organs	Carcinogen
1.	Hydrogen Sulphide	6.8	1.0 (USEPA Region 6 health based screening levels)	6.8	--	Irritation eyes, respiratory system; coma, convulsions; conjunctivitis, eye pain, discharge of tears, abnormal visual intolerance to light, dizziness, headache, weakness, exhaustion, irritability, insomnia; gastrointestinal disturbance	Eyes, respiratory system, central nervous system	No
2.	Bromomethane	40	5.2 (USEPA Region 6 health based screening levels)	7.69	A chloroform like odour at high temperatures	Irritation eyes, skin, respiratory system; Central Nervous System depression; liver, kidney disease, cardiac arrest, [Potential occupational carcinogen]	Eyes, skin, respiratory system, liver, kidneys, Cardiovascular System, Central Nervous System	Yes
3.	Acetone	30	370 (USEPA Region 6 Screening Levels)	--	A fragrant, mint-like odour	Irritation eyes, nose, throat; headache, dizziness, central nervous system depression; dermatitis	Eyes, skin, respiratory system, central nervous system	No
4.	Isopropyl Alcohol	120	-- (USEPA Region 6 Screening	--	Odour of rubbing alcohol.	Irritation eyes, nose, throat; drowsiness, dizziness, headache; dry cracking skin	Eyes, skin, respiratory system	No



S No	Name of Chemical	Levels detected (ug/m3)	Safe Level (ug/m3)	Number of times above health-based screening levels	Type of odour	Health Effects	Target Organs	Carcinogen
			Levels)					
5.	Carbon Disulphide	5.1	3 (Texas Long-Term Screening Levels)	1.7	A sweet ether-like odour	Dizziness, headache, poor sleep, weakness, exhaustion, anxiety, weight loss; gastritis; kidney, liver injury; eye, skin burns; dermatitis; reproductive effects	central nervous system, peripheral nervous system, cardiovascular system, eyes, kidneys, liver, skin, reproductive system	No
6.	Trichloroethene	2000	1.10 (USEPA Region 6 Screening Levels)	1818.18	A chloroform-like odour	Irritation eyes, skin; headache, visual disturbance, weakness, exhaustion, dizziness, tremor, drowsiness, nausea, liver injury; [potential occupational carcinogen]	Eyes, skin, respiratory system, heart, liver, kidneys, central nervous system  <b>Cancer Site</b> [in animals: liver & kidney cancer]	Yes
7.	4-Methyl-2-Pentanone	100	83 (USEPA Region 6 health based screening levels)	1.2		Irritation eyes, skin; headache, drowsiness; dermatitis	Eyes, skin, central nervous system	No