SOLVENTS INDURSTRIAL HYGIENE REPORT

FOURTH QUARTER 1985

INTRODUCTION

1985 fourth quarter personnel monitoring surveys were conducted with the cooperation of 13 individuals working in Solvents. No particular job was emphasized, but sampling trended towards operations personnel particularly, outside operators (OT's and SOT's). Also included are surveys on the block millwright and laborer.

Sampling techniques were revised in 1985 in an attempt to gather statistics that would correlate HEX blood levels to perchloroethylene exposure.1 The revision consisted of wearing two (2) sample pumps during the survey period, one monitoring for RCL's, the other for HEXES.

In addition, there were two (2) excursion samples (T-94, crude V2 tank) and three (3) area samples (T-13 & T-26, D-13, C-59 OH exchanger vent to atmosphere) conducted, and their results are also listed in this report.

All samples collected were analyzed for the following compounds:

Carbon Tetrachloride	Perchloroethylene
Propylene Dichloride	2,3 Dichloropropene
Ethylene Dichloride	1,1,2 Trichloroethane (B-Tri)

The two (2) excursion samples were also analyzed for vinylidene chloride.

1. A separate report will be issued on this item.

MONITORING PROCEDURE

Calibrated Sipin SP-1 Personal sampler pumps were employed to monitor Solvents Block personnel. A prepackaged 600 millimeter dual section activated charcoal glass tube* was attached to each pump by a 2' length of Tygon tubing. The Charcoal sampler tube was then attached to the lapel of the worker to monitor his breathing zone. Each person was required to wear two pumps, as noted in introduction.

SAMPLE PREPARATION

Samples were desorbed by transferring the activated charcoal from the front section of each tube into a 25 ml glass vial with a mininert valved top containing 10 ml carbon disulfide. Vials were then shaken for 2 minutes prior to analysis.

SAMPLE ANALYSIS

A Perkin-Elmer, Model 3920 B, gas chromatograph equipped with a flame ionization ddetector was used for the analysis. This chromatograph was interfaced to a Hewlet-Packard, Model 21 MX computer which determined concentrations based on the integrated peak area.

Chromatographic constants are as follows:

Column: 6' x 1/8" ss 20% tricreasol phosphate on Chromasorb P 60/80 mesh.

Temperature:	Oven	85°C
	Injector	150°C
	Detector	150°C

Carrier Gas: Helium

Range: X1

Sample Size: 2 microliters

Elution Times:	CS2	1.92 minutes
	Carbon Tetrachloride	3.62 minutes
	Ethylene Dichloride	6.69 minutes
	Propylene Dichloride	7.81 minutes
	2,3 Dichloropropene	8.51 minutes
	Perchloroethylene	10.61 minutes
	1,1,2 Trichloroethane	19.66 minutes

*SKC, Lot 107 charcoal tubes, 400 mg front section, 200 mg back section.

CALCULATIONS

The parts per million of each chlorinated hydrocarbon were calculated by the Hewlett-Packard computer. The accuracy of these calculations was verified by daily calibration with known external standards. The parts per million by weight were then converted to parts per million time weighted average exposures by volume using a separate computer program which utilized the following equation:

$$\text{ppm (v) air} = \frac{(\text{wt. of CSs(g)})\ (.0821)(^{\circ}K)\ (\text{ppm from chromatogram})}{(MW)\ (L)}$$

Where: CS2 = used for disorption in grams.

.0821 = gas constant (converts grams to liters).

°K = degrees Kelvin (°C + 273) predominant ambient temperature during monitoring period.

MW = molecular weight of the specific chlorinated hydrocarbon.

L = liters of air sampled

RESULTS AND DISCUSSION

The area and personnel time-weighed 8-hour average monitoring data indicated acceptable levels well below the established threshold limit value. More emphasis on excursion monitoring is recommended to better define problem areas and to insure that we are employing proper protective equipment. The data also would serve to encourage the proper use of the protective equipment.

R C L FOURTH QUARTER 1985

PERSONNEL MONITORING EIGHT HOURS TWA

NAME	TIME	JOB	PER	TET	PDC	B-TRI	EDC	2,3 DCP
Chustz, G.	8hrs	P/T O.S.	.029	N/D	.016	N/D	N/D	N/D
Robique, R.	8hrs	Sample O.T.	.374	N/D	.037	N/D	N/D	N/D
McQuarter, J.	8hrs	P/T S.O.T.	.158	N/D	.044	N/D	N/D	N/D
Theriot, J.	8hrs	1,2,3 O.S.	.079	N/D	.066	N/D	.090	N/D
Landry. C.	8hrs	Sample O.T.	.670	N/D	.352	N/D	.087	N/D
Arnold, B.	8hrs	1,2,3 S.O.T	.213	N/D	.344	N/D	N/D	N/D
Hotard, R.	8hrs	S/S	.143	N/D	.042	N/D	.118	N/D
Anderson, A.	8hrs	1,2,3 S.O.T	.772	N/D	.193	N/D	.108	N/D
Landry, R.	8hrs	Sample O.T.	.562	N/D	.053	N/D	.079	N/D
Lee, E.	8hrs	1,2,3 O.S.	.216	.991	.125	N/D	N/D	N/D
Thibodeaux, W.	8hrs	CHL Maint.	N/D	*3.09	.188	N/D	N/D	N/D
White, H.	8hrs	Millwright	.344	1.33	.481	N/D	N/D	N/D
Hines, W.	8hrs	Laborer	.230	1.20	.159	N/D	N/D	N/D
AVERAGE			.292	.508	.162	N/D	.037	N/D

***NOTE: 50% OF TLV IS CONSIDERED DANGER LEVEL, ONE SAMPLE IS AT THIS LEVEL!!**

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EIGHT HOURS TWA

CONCENTRATION IN AIR (PPMV)

AREA SAMPLES

AREA	TIME	PER	TET	PDC	B-TRI	EDC	2,3 DCP
T-13 and 26	8hrs	1.76	N/D	1.2	N/D	N/D	N/D
D-13	8hrs	.073	.017	.041	N/D	N/D	N/D
C-59 OH EXCH VENT	8hrs	2.53	N/D	.793	N/D	N/D	N/D

EXCURSION SAMPLES

AREA	TIME	PER	TET	PDC	B-TRI	EDC	2,3 DCP	V2
T-94-1	15 min	N/D	N/D	N/D	1091.68	N/D	N/D	106.43
T-94-2	15 min	N/D	N/D	N/D	282.27	N/D	N/D	57.24

1-Job was hydroblasting T-94, it was shutdown due to insufficient respiratory protection, but was restarted with breathing air gas masks & protective clothing.
2-Next day during hydroblasting

AVERAGE EMPLOYEE EXPOSURE 1980 - 1985

(Levels in PPM)

	1980	1981	1982	1983	1984	1985	TLV
V 2	8.32*	.06	.07	.01	***		5*
TET	.48	.12	.85	.04	.06	.51	5
PDC	.32	.08	.66	.11	.05	.16	75
2,3	.11	.01	.02	.03	N/D	N/D	1
PER	.39	.56	.39	.27	.15	.29	50
B-TRI	1.04	.02	.24	.02	N/D	N/D	50
EDC					**.01	.04	10

*TLV lowered to 5 in 1985

**Not monitored for until 1984

***Not monitored for since 1984