

LOUISIANA DIVISION INDUSTRIAL HYGIENE REPORT
AN OPERATING UNIT OF THE DOW CHEMICAL COMPANY
SOLVENTS/EDC1 INDUSTRIAL HYGIENE ACTIVITY REPORT - 1987

DEPARTMENT	FILE NUMBER	DATE
SOLVENTS/EDC1	LAD - SOLV/EDC - 87.01	6-03-88

AUTHOR	SIGNATURE
MICHAEL S. BROWN	_____

REVIEWER'S	SIGNATURE
WILLIAM E. LEDFORD	_____
BRUCE A. HEINZE	_____

SUMMARY OF 1987

PERSONNEL MONITORING WAS CONDUCTED ON 14 DOW OPERATIONS PERSONNEL AND ON 1 CONTRACT MAINTENANCE PERSONNEL. ALSO INCLUDED IN THE SURVEY ARE SAMPLES FROM 1 AREAS WITH POTENTIAL EXPOSURE PROBLEMS. SAMPLING IN 1987 CONCENTRATED ON POTENTIAL SHORT TERM EXPOSURES THAT OCCUR DURING PRODUCT LOADING PROCEDURES AND DURING PROCESS SAMPLING ROUNDS.

THE SAMPLING CONSISTS OF TWO PHASES, ROL'S AND HEXES, AND THE APPROVED METHOD FOR EACH OF THESE WAS USED.

ANALYSES ALSO CONFORMED TO APPROVED TECHNIQUES. SPECIFIC COMPOUNDS ANALYZED FOR IN THE ROL SURVEY INCLUDE : CARBON TETRACHLORIDE, ETHYLENE DICHLORIDE, ETHYL CHLORIDE, PERCHLOROETHYLENE, PROPYLENE DICHLORIDE, AND BETA-TRI (1,1,2 TRICHLOROETHANE). COMPOUNDS ANALYZED FOR IN THE HEX SURVEY WERE : HEXACHLOROETHANE, HEXACHLOROHEPTADIENE, AND HEXACHLOROBENZENE.

ANALYSES PERFORMED SUPPORT HISTORICAL DATA THAT INDICATES THERE ARE NO UNKNOWN EXPOSURE PROBLEMS. DATA ALSO CONFIRMS SOME ALREADY KNOWN POTENTIAL EXPOSURE PROBLEMS.

ADDITIONALLY, AN AREA NOISE SURVEY WAS CONDUCTED AND THE RESULTS WERE PRESENTED TO ALL EMPLOYEES DURING THE SOLVENTS/EDC 1 ANNUAL REVIEW OF ALL INDUSTRIAL HYGIENE CONCERNS (TOXIC CHEMICAL REVIEW, CONSEQUENCES OF OVEREXPOSURE, AND HEARING CONSERVATION PROGRAM).

GOALS FOR 1988 :

1. INCORPORATING MORE EMPLOYEES INTO OUR PROGRAM.
2. A GREATER SAMPLING FREQUENCY.
3. PERSONNEL NOISE SURVEY.
4. RESUME HEX WIPE SAMPLING.
5. IMPROVING PERSONAL ANALYTICAL AND SAMPLING TECHNIQUES.
6. QUICKER RETURN TIME ON EXPOSURE ANALYSIS INFORMATION.

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ADDITIONALLY, AN ALPHA NOISE SURVEY WAS CONDUCTED AND THE RESULTS WERE PRESENTED TO ALL EMPLOYEES DURING THE SOLVENTS/EDC 1 ANNUAL REVIEW OF ALL DOW DATA WITHIN THE TOPICS (TOXIC CHEMICAL REVIEW, CONSEQUENCES OF CHEMICAL ACCIDENT, AND HEARING CONSERVATION PROGRAM).

GOALS FOR 1988 :

1. INCORPORATING MORE EMPLOYEES INTO OUR PROGRAM.
2. A GREATER SAMPLING FREQUENCY.
3. PERFORMING NOISE SURVEY.
4. RESUME AIR PIPE SAMPLING.
5. IMPROVING PERSONAL ANALYTICAL AND SAMPLING TECHNIQUES.
6. QUICKER RETURN TIME ON EXPOSURE ANALYSIS INFORMATION.

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SAMPLING AND ANALYTICAL PARAMETERS

SAMPLING PROCEDURE FOR ROL'S AND HEXES

SAMPLING WAS PERFORMED USING THE ANATOLE J. SIPIN COMPANY PERMISSIBLE PERSONNEL SAMPLING PUMP, MODEL # SP-1. THESE PUMPS WERE CALIBRATED TO 100 CC'S PER MINUTE FLOW USING THE DUPONT CONSTANT FLOW SAMPLER CALIBRATOR GRADUATED BUBBLE CYLINDER. CALIBRATION WAS PERFORMED BEFORE AND AFTER SAMPLES WERE TAKEN TO INSURE ACCURACY.

COLLECTION TUBE HOLDERS WERE CONNECTED TO THE SAMPLER BY A 2' (FOOT) SECTION OF TYGON TUBING. FOR ROL SAMPLING, A 4" (INCH) DUAL SECTION ACTIVATED CHARCOAL GLASS TUBE (SKC, LOT 120, 400 MG FRONT SECTION AND 200 MG BACK SECTION), WAS USED. FOR HEX SAMPLING, A 3" (INCH) DUAL SECTION PORAPACK QS GLASS TUBE (SKC, SPECIAL LOT, 100 MG FRONT SECTION AND 60 MG BACK SECTION), WAS USED.

TO INSURE REPRESENTATIVE SAMPLING, THE EMPLOYEES MONITORED WERE REQUIRED TO WEAR THE TUBE HOLDER ON THE COLLAR OF THEIR SHIRT. THIS ALLOWED THE SAMPLE TO BE TAKEN IN THE ACTUAL "BREATHING ZONE" OF EACH INDIVIDUAL.

SAMPLE PREPARATION

ROL SAMPLES WERE PREPARED BY DRY ICE CHILLING 10 ML'S OF CS2 IN A 25 ML GLASS VIAL, WITH A MININERT VALVED TOP, AND THEN ADDING THE 600 MG OF CHARCOAL FROM THE SAMPLE TUBE. THE SAMPLE WAS THEN ALLOWED TO COME TO ROOM TEMPERATURE AND WAS ALLOWED FOR ONE HOUR. A 2 ML GLASS VIAL WITH A SEPTUM TOP WAS THEN FILLED WITH THE SAMPLE AND LOADED INTO A HEWLETT-PACKARD 7673A AUTO-INJECTOR CAIQUSEL. THE CAIQUSEL WAS INTERFACED WITH A HEWLETT-PACKARD 7673A CONTROLLER. THEN ALLOWED THE LIQUIDIZED SAMPLE TO BE INJECTED INTO A HEWLETT-PACKARD 5790 G.C.

HEX SAMPLES WERE PREPARED BY PLACING THE 100 MG OF PORAPACK PACKING INTO A 25 ML GLASS VIAL, WITH A MININERT VALVED TOP, AND THEN ADDING 10 ML'S OF HEXANE. THE VIAL WAS THEN SHAKEN FOR ONE HOUR TO ALLOW FOR MAXIMUM EXTRACTION. A ONE MICROLITER SAMPLE IS WITHDRAWN AND THEN IT IS IMMEDIATELY INJECTED INTO A HEWLETT-PACKARD 5790 GAS CHROMATOGRAPH.

ANALYTICAL

ROL ANALYSES WERE DONE USING A HEWLETT-PACKARD 5890 GAS CHROMATOGRAPH, EQUIPPED WITH A FLAME IONIZATION DETECTOR, AND INTERFACED TO A HEWLETT-PACKARD 7673A CONTROLLER. THE G.C. DETERMINED SAMPLE CONCENTRATIONS BASED ON THE INTEGRATED PEAK AREA. THE SAMPLE CONCENTRATION DATA WAS STORED ON FLOPPY DISK IN A HEWLETT-PACKARD 5890 G.C. COMPUTER. INSTRUMENT CONDITIONS ARE AS FOLLOWS :

COLUMN : TOTAL LENGTH - 40 METERS, IN TWO SECTIONS.
 FIRST COLUMN - MODEL # OV 1701, 25 METERS, .5 ML MEGABORE, 3 MICRON FILM, FUSED SILICA.
 SECOND COLUMN - MODEL DB-5, 15 METERS, .5 ML MEGABORE, 5 MICRON FILM, FUSED SILICA.

TEMPERATURE PROGRAM : DETECTOR - 200 DEGREES
 (TEMPERATURE) : INJECTOR - 250 DEGREES
 OVEN - INITIAL TEMPERATURE : 6 MINUTES AT 50 DEGREES
 2.83 MINUTE RAMP UP AT 30 DEGREES A MINUTE TO 135 DEGREES
 FINAL TEMPERATURE : 1.17 MINUTES AT 135 DEGREE
 ATTENUATION : 1
 SAMPLE SIZE : 3 MICROLITERS
 ELUTION TIMES : ETOL 1.983
 MINUTES : CS2 2.770
 TET 4.321
 CDD 6.998
 PDC 8.370
 PER 10.740
 D-TBI 10.682
 CARRIER GAS : HELIUM
 INJECTION SPLIT FLOW : 150 CC/MINUTE
 GAS FLOW : HELIUM 12.5 CC/MINUTE (COLUMN)
 GAS PRESSURE : HELIUM 10.5 PSI
 HYDROGEN 23.0 PSI
 AIR 21.0 PSI

ANALYTICAL (CONT.)

HEX ANALYSES WERE DONE USING A HEWLETT-PACKARD MODEL 5790 GAS CHROMATOGRAPH EQUIPPED WITH AN ELECTRON CAPTURE DETECTOR. THIS CHROMATOGRAPH WAS INTERFACED TO A SPECTROPHYSICS MODEL 4100 COMPUTER/INTEGRATOR WHICH DETERMINED CONCENTRATIONS BASED ON THE INTEGRATED PEAK AREA. INSTRUMENT CONDITIONS ARE AS FOLLOWS :

COLUMN : MODEL # 035, 30 METERS, .32 MILLIMETER I. D., 1 MICRON FILM, CAPILLARY.

TEMPERATURE PROGRAM : DETECTOR - 200 DEGREES
(DEGREES CENTIGRADE) INJECTOR - 200 DEGREES
OVEN - 4 MINUTES AT 200 DEGREES
8 MINUTE RAMP UP AT 10 DEGREES A MINUTE TO
280 DEGREES
.5 MINUTES AT 280 DEGREES

ATTENUATION : 1 CARRIER GAS : HELIUM
SAMPLE SIZE : 1 MICROLITER INJECTION SPLIT : 10 TO 1

ELUTION TIMES : 3.00 HCE GAS FLOWS : HELIUM 1 CC/MINUTE (COLUMN)
(MINUTES) 3.65 HCBZ NITROGEN .60 CC/MINUTE (MAKEUP)
9.09 HCBZ GAS PRESSURE : HELIUM 50 PSI
NITROGEN 10 PSI

ANALYTICAL EQUATIONS

$$\text{HCL EQUATION: } \frac{\text{PPM VOLUME OF HCL IN AIR} = \frac{(\text{WEIGHT OF CS}_2 \text{ IN GRAMS}) (.0821) (\text{DEGREES K}) (\text{PPM FROM CHROMATOGRAM})}{(MW) (L)}}$$

WHERE : CS₂ = CARBON DICHLORIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

$$\text{HEX EQUATION: } \frac{\text{PPB VOLUME OF HEXES IN AIR} = \frac{(MG) (24.45) (1000)}{(L) (MW) (RR)}}$$

WHERE : MG = MICROGRAMS FROM INTEGRATOR DATA
24.45 = LITERS OCCUPIED BY 1 MOLE OF GAS AT STANDARD CONDITIONS
L = LITERS OF AIR SAMPLED
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
RR = RECOVERY RATE OF COMPONENT

SOLVENTS / EDC 1
1987 NOISE LEVEL SURVEY
POTENTIAL NOISE EXPOSURE SOURCES

PLANT EQUIPMENT	SOUND LEVEL (dba)
PLANT AIR (3/4 " BLEED WIDE OPEN)	132 db
47C # STEAM TRAP (AR-40 A & B)	112 db
K-40 A	106 - 102 db
AR-40 A & B (ON LINE)	105 db
K-520 DECK	105 - 100 db
C-500 INLET CONTROL VALVE	104 db
AKCL TO C-TRAIN CONTROL VALVE	104 db
K-40 B	102 - 100 db
DR-40 A & B	102 db
K-3 E HOT GAS BYPASS CONTROL VALVE	102 db
WS-40	101 db
BL-740	100 db
RIVER WATER PUMPS (SOLVENTS)	98 - 95 db
D-2 C DUMP CONTROL VALVE (OPENING)	97 db
K-3 E GROUND LEVEL	95 - 93 db
NORTH R-1 E BOTTOMS PUMPS	95 db
AR-40 A & B (OFFLINE)	95 db
E-550'S	94 - 90 db
M-520'S	92 db
M-810'S	92 db
WEST C-12 BOTTOMS PUMP	92 db
K-3 E LIQUID (CREOS) INJECTION CONTROL VALVE	92 db
RIVER WATER PUMPS (EDC 1)	92 - 88 db
R-20	92 db
ETHYLENE TO R-1 D CONTROL VALVE	92 db
R-201 C	91 db
R-201 B & A	91 - 85 db
EAST C-11 A BOTTOMS PUMPS	90 db
ETHYLENE TO R-1 D CONTROL VALVE	90 db
C-11 E & F	90 db
D-20 A BOTTOMS	89 db
R-1 D OVERHEAD PUMPS	88 db
SOUTH C-11 A BOTTOMS PUMP	88 db
C-14 A BOTTOMS CONTROL VALVE	88 db
R-201 A	87 db
SOUTH D-22 A	87 db
EAST R-1 E	87 db
C-14 B OVERHEAD PUMPS	86 db
E-541'S	86 db
WEST R-1 D	85 db
R-1 C INLET	84 db
C-81	84 db
NORTH IRON DRUM	83 db
R-1 C TO C-1 C	81 db
WS-40	80 db
AF-40	79 db

HAZARD TOOLS (IMPACT NOISE)	SOUND LEVEL (dba)
HAMMER (ON METAL)	116 db
HAMMER (ON STEEL CHISEL)	106 db
HAMMER (DRIVING NAIL)	103 db
HAMMER (ON WOOD CHISEL)	95 db

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NOISE SURVEY (CONT.)

POWER TOOLS

SOUND LEVEL (dba)

SIDE SPINDER (FIBER DISC ON METAL)	110 db
PIPE GRINDER	108 db
CIRCULAR SAW (CUTTING WOOD)	107 db
PIPE CUTTER, LG. (FAST SPEED)	95 db
PIPE CUTTER, SM.	95 db
PIPE CUTTER, LG. (MED. SPEED)	90 db
PIPE CUTTER, LG. (SLOW SPEED)	85 db

HEAVY EQUIPMENT AND MACHINERY

SOUND LEVEL (dba)

CHERRY PICKER (FULL THROTTLE)	102 db
PORTABLE AIR COMPRESSOR (DOORS OPEN)	102 db
WELDING MACHINE (FULL THROTTLE)	101 db
CHERRY PICKER (IDLE)	96 db
WELDING MACHINE (IDLE)	96 db
PORTABLE AIR COMPRESSOR (DOORS CLOSED)	90 db
TOW MOTOR	90 db
FLG. BARN OFF	90 db

MISCELLANEOUS

SOUND LEVEL (dba)

GATE CRANE	94 db
PHONE ALARM	93 db
HOL LAD CONT. HORN	90 db
PAINTERS WORKROOM (EDC 1)	82 db
PAINTERS ALARM (SOLVENTS)	82 db
REPAIRS ALARM (SOLVENTS)	82 db
LANDING CRANE VENT HOOD	80 db
COMPUTER ROOM (SOLVENTS)	75 db
PAINTERS ALARM (EDC 1)	72 db
PARTING LOT (SOLVENTS)	66 db
CONTROL ROOM (EDC 1)	58 db

10/19/87

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CONTRACT ASBESTOS SAMPLE RESULTS

DATE	SAMPLE#	PERSONNEL	DESCRIPTION	DUR(MIN)	VOLUME(L)	FIB/CC>5MICRON	8-HR TWA FIB/CC PLANT
12/15/87	8681	*436-74-3503	INSUL-REMOVING TRANSITE OFF BLDG; WET METHOD USED	355	781.000	0.020	0.015 SOLVENTS
11/23/87	8670	*439-98-0392	INSUL. REMOVING ASB. WET METHOD USED	325	654.875	0.022	0.015 SOLVENTS
11/24/87	8672	*436-74-3503	INSUL - STRIPPING ASB. FROM PIPE IN RACK; WET METHOD	339	759.360	0.004	0.003 SOLVENTS
12/14/87	8680	*439-98-0392	INSUL-REMOVING TRANSITE OFF BLDG; WET METHOD USED	355	807.625	0.015	0.011 SOLVENTS
11/12/87	8280	*437-02-3320	INSUL - REMOVING ASB. WET METHOD USED	373	872.820	0.051	0.040 SOLVENTS
12/05/87	8678	AREA	DOWNWIND; NORTH OF CONTROL RM.; WET METHOD USED	118	166.380	0.013	0.003 SOLVENTS

DOW CHEMICAL LAD
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

SAMPLE DATE (MM/DD/YY) : 10/21/87 TIME START : 9:00 AM
SAMPLE NUMBER : 1 TIME STOP : 9:20 AM
SAMPLE TIME (MIN.) : 20 MIN.
SAMPLE VOLUME (L) : 1.84 PUMP START FLOW : 100 CC/MIN.
SAMPLE TYPE (A, S, P) : S PUMP STOP FLOW : 100 CC/MIN.
(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE :
RESPIRATOR USED (1 - 7) : 3
8 OR 12 HOUR SHIFT : 8
SHIFT (DAY, NIGHT, EDO) : DAY
EMPLOYEE I. D. # : 434082
JOB DESCRIPTION : LOADING A 1000 GALLON PER T/T.

RESPIRATOR TYPES : 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA:

ANALYTICAL RESULTS

COMPOUND	DR #	IHS	STEL	MDL	ANALYSIS	8 HOUR	STEL	TLV/TWA	TLV/TWA	AREA
ETCL	0002-3701	1000	0	.01	<.01					
TET	0002-3654	5	0	.01	<.01					
EDC	0001 9371	10	0	.01	<.01					
PDC	0001 9943	75	110	.01	.206			.31		
EDC	0002-3690	50	200	.01	3.999			3.97		
D-TET	0002-3607	10	0	.01	<.01					

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

RCL EQUATION : PPM VOLUME OF RCL IN AIR =

(WEIGHT OF CS2 IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE . CS2 = CARBON DISULFIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

MB-06/03/89

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DOW CHEMICAL LAB
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

SAMPLE DATE (MM/DD/YY) : 10/21/87 TIME START : 10:00 AM
SAMPLE NUMBER : 2 TIME STOP : 10:40 AM
SAMPLE TIME (MIN.) : 40 MIN.
SAMPLE VOLUME (L) : 3.69 PUMP START FLOW : 100 CC/MIN.
SAMPLE TYPE (A, S, P) : S PUMP STOP FLOW : 100 CC/MIN.
(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE :
RESPIRATOR USED (1 - 7) : 3
8 OR 12 HOUR SHIFT : 8
SHIFT (DAY, NIGHT, EDO) : DAY
EMPLOYEE I. D. # : 434213
JOB DESCRIPTION : LOADING A 3470 GALLON TET T/T.

RESPIRATOR TYPES : 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

ANALYTICAL RESULTS

COMPOUND	DR #	IHG	STEL	MDL	ANALYSIS	8 HOUR	STEL	AREA
					RESULT	TLV/TWA	TLV/TWA	
ETCL	0002-3701	1000	0	.01	<.01			
THP	0002-3484	5	0	.01	2.992		1.6	
EDC	0001-9531	10	0	.01	<.01			
EDC	001-9947	75	110	.01	1.034		.75	
PER	0002-1409	50	200	.01	7.136		3.53	
1-TET	0002-3487	10	0	.01	<.01			

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

REL EQUATION : PPM VOLUME OF RCL IN AIR =

(WEIGHT OF CS2 IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE : CS2 = CARBON DISULFIDE USED FOR DESORPTION
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DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

MD 06/01/88

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DOW CHEMICAL LAB
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

SAMPLE DATE (MM/DD/YY) : 10/23/87 TIME START : 8:00 AM
SAMPLE NUMBER : 3 TIME STOP : 1:00 PM
SAMPLE TIME (MIN.) : 300 MIN.
SAMPLE VOLUME (L) : 28.77 PUMP START FLOW : 100 CC/MIN.
SAMPLE TYPE (A, S, P) : P PUMP STOP FLOW : 100 CC/MIN.
(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE :
RESPIRATOR USED (1 - 7) : 3
8 OR 12 HOUR SHIFT : 8
SHIFT (DAY, NIGHT, EDO) : EDO
EMPLOYEE I. D. # : 433555
JOB DESCRIPTION : CHARGING PER FILTERS.

RESPIRATOR TYPES : 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

ANALYTICAL RESULTS

COMPOUND	DR #	IHS	STEL	MDL	RESULT	TLV/TWA	TLV/TWA	AREA
ETCL	0002-3701	1000	0	.01	<.01			
YET	0002-3694	5	0	.01	<.01			
EDC	0001-9943	10	0	.01	.998	.11		
EDC	0001-9943	75	110	.01	.873	.03		
EDC	0002-3698	50	200	.01	19.597	1.19		
EDC	0002-3697	10	0	.01	<.01			

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RCL EQUATION : PPM VOLUME OF RCL IN AIR =
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(MW) (L)

WHERE : CS2 = CARBON DISULFIDE USED FOR DESORPTION
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MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

RE: 06/05/88

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DOW CHEMICAL LAB
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

SAMPLE DATE (MM/DD/YY) : 10/27/87 TIME START : 9:55 AM
SAMPLE NUMBER : 4 TIME STOP : 10:15 AM
SAMPLE TIME (MIN.) : 20 MIN.
SAMPLE VOLUME (L) : 1.78 PUMP START FLOW : 100 CC/MIN.
SAMPLE TYPE (A, S, P) : S PUMP STOP FLOW : 100 CC/MIN.

(A=AREA, S=SHORT TERM, P=PERSONNEL)

IF AREA, DESCRIBE :

RESPIRATOR USED (1 - 7) : 3

8 OR 12 HOUR SHIFT : 8

SHIFT (DAY, NIGHT, EDC) : DAY

EMPLOYEE I. D. # : 434213

DE DESCRIPTION : LOADING A 1000 GALLON TET T/T WITH A LEAKING
EXTERNAL LOAD VALVE.

RESPIRATOR TYPES : 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

ANALYTICAL RESULTS

COMPOUND	DR #	THC	STEL	MDL	RESULT	TLV/TWA	TLV/TWA	AREA
ETCL	0002-3701	1000	0	.01	<.01			
TEL	0002-3154	5	0	.01	7.401		5.17	
EDC	0002-5531	10	0	.01	<.01			
PER	0101-5213	75	110	.01	.203		.40	
PER	0002-3492	10	200	.01	0.935		4.11	
E TRI	0002-3687	10	0	.01	<.01			

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

RCL EQUATION :

PPM VOLUME OF RCLs IN AIR =

(WEIGHT OF CS₂ IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAPH)

(MW) (L)

WHERE : CS₂ = CARBON DISULFIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

RE POLYMER

DO 077446
CONFIDENTIAL

DOW CHEMICAL LAB
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 14 / 17

SAMPLE DATE (MM/DD/YY) : 10/27/87 TIME START : 1:40 PM
SAMPLE NUMBER : 5 TIME STOP : 2:10 PM
SAMPLE TIME (MIN.) : 30 MIN.
SAMPLE VOLUME (L) : 3.07 PUMP START FLOW : 100 CC/MIN.
SAMPLE TYPE (A, S, P) : S PUMP STOP FLOW : 100 CC/MIN.
(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE :
RESPIRATOR USED (1 - 7) : 3
ON OR 12 HOUR SHIFT : 8
SHIFT (DAY, NIGHT, EDO) : DAY
EMPLOYEE I. D. # : 434213
JOB DESCRIPTION : "BUCKET TEST" ON TET T/T.

RESPIRATOR TYPES : 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

ANALYTICAL RESULTS

COMPOUND	DE #	IHG	STEL	MDL	ANALYSIS	6 HOUR	STEL	AREA
					RESULT	TLV/TWA	TLV/TWA	
ETOL	0002-3701	1000	0	.01	4.01			
TET	0002-3454		0	.01	447.374		309.48	
LOS	0001-0501	10	0	.01	4.01			
EDC	0001-0043	75	110	.01	.5		.45	
PER	0002-3608	50	500	.01	5.094		3.10	
D-TR	0002-3687	10	0	.01	4.01			

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

RCL EQUATION : PPM VOLUME OF RCL IN AIR =

(WEIGHT OF CS2 IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE : CS2 = CARBON DISULFIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREE CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

EDC 10/27/87

DO 077447
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DOW CHEMICAL LAD
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
ROL DATA ENTRY FORM

NAME : LUCKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 12 / 17

SAMPLE DATE (MM/DD/YY) : 11/05/97 TIME START : 6:30 AM
SAMPLE NUMBER : 7 TIME STOP : 2:30 PM
SAMPLE TIME (MIN.) : 480 MIN.
SAMPLE VOLUME (L) : 64.86 PUMP START FLOW : 100 CC/MIN.
SAMPLE TYPE (A, S, P) : P PUMP STOP FLOW : 100 CC/MIN.
(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE :
RESPIRATOR USED (1 - 7) : 3
S ON 12 HOUR SHIFT : 8
SHIFT (DAY, NIGHT, EDO) : DAY
EMPLOYEE I. D. # : 434037
JOB DESCRIPTION : LOADING COORDINATOR PERFORMING NORMAL DAILY
DUTIES INCLUDING CATCHING PRELOAD SAMPLES.
RESPIRATOR TYPES : 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

ANALYTICAL RESULTS

COMPOUND	DR #	ING	STEL	MDL	ANALYSIS	8 HOUR	STEL	AREA
					RESULT	TLV/TWA	TLV/TWA	
ETHL	0000-3701	1000	0	.01	<.01			
TET	0002-3654	5	0	.01	44.032	1.40		
EDC	0001-2531	10	0	.01	1.295	.06		
PDC	0001-0743	75	110	.01	.682	.03		
PEP	0002-3698	50	200	.01	64.425	1.90		
ETHL	0002-3687	10	0	.01	<.01			

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

ROL EQUATION : PPM VOLUME OF ROLS IN AIR =

(WEIGHT OF CS2 IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE : CS2 = CARBON DISULFIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

MD:06/12/95

DO 077449
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DOW CHEMICAL LAB
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

SAMPLE DATE (MM/DD/YY) : 11/25/87 TIME START : 7:00 AM
SAMPLE NUMBER : 8 TIME STOP : 7:20 AM
SAMPLE TIME (MIN.) : 20 MIN.
SAMPLE VOLUME (L) : 1.91 PUMP START FLOW : 100 CC/MIN.
SAMPLE TYPE (A, S, P) : S PUMP STOP FLOW : 100 CC/MIN.
(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE :
RESPIRATOR USED (1 - 7) : 3
8 OR 12 HOUR SHIFT : 8
SHIFT (DAY, NIGHT, EDO) : DAY
EMPLOYEE I. D. # : 433928
JOB DESCRIPTION : MONITORING THE DRAINING OF ORGANICS FROM V-201
INTO V-201 SUMP.

RESPIRATOR TYPES : 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

ANALYTICAL RESULTS

COMPOUND	DP #	IHG	STEL	MDL	ANALYSIS	8 HOUR	STEL	TLV/TWA	TLV/TWA	AREA
ETOL	0002-3701	1000	0	.01	<.01					
TEY	0002-3654	5	0	.01	2.79			2.00		
EDC	0001-0531	10	0	.01	<.01					
EDC	0001-0543	75	110	.01	.552			.81		
PER	0002-3690	50	200	.01	3.976			3.05		
D TMI	0002-3637	10	0	.01	<.01					

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

RCL EQUATION : PPM VOLUME OF RCLs IN AIR =

(WEIGHT OF CS2 IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE : CS2 = CARBON DISULFIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

MP:06/03/02

DO 077450
CONFIDENTIAL

DOW CHEMICAL LAD
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

SAMPLE DATE (MM/DD/YY) : 11/25/87 TIME START : 7:00 AM
SAMPLE NUMBER : 9 TIME STOP : 11:00 AM
SAMPLE TIME (MIN.) : 240 MIN.
SAMPLE VOLUME (L) : 27.16 PUMP START FLOW : 100 CC/MIN.
SAMPLE TYPE (A, S, P) : A PUMP STOP FLOW : 100 CC/MIN.
(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE : V-201 SUMP
RESPIRATOR USED (1 - 7) :
8 OR 12 HOUR SHIFT :
SHIFT (DAY, NIGHT, EDO) : DAY
EMPLOYEE I. D. # :
JOB DESCRIPTION : MONITORING THE DRAINING OF ORGANICS FROM V-201
INTO V-201 SUMP.
RESPIRATOR TYPES : 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

ANALYTICAL RESULTS

COMPOUND	DR #	ING	STEL	MDL	RESULT	TLV/TWA	TLV/TWA	AREA
ETOL	0002-1701	1000	0	0.01	0.01			
DET	0002-3654	5	0	0.01	687.402			51.76
EDC	0002-2571	10	0	0.01	19.958			2.34
TDC	0003-0043	75	110	0.01	91.860			9.41
DET	0012-3191	50	200	0.01	185.073			12.93
M TRI	0002-3687	10	0	0.01	<0.01			

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

RCL EQUATION : PPM VOLUME OF RCLs IN AIR =
(WEIGHT OF CS₂ IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)
(MW) (L)

WHERE : CS₂ = CARBON DISULFIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

ME:06/03/89

DO 077451
CONFIDENTIAL

DOW CHEMICAL LAD
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

SAMPLE DATE (MM/DD/YY) : 12/03/87 TIME START : 12:45 PM
SAMPLE NUMBER : 10 TIME STOP : 1:00 PM
SAMPLE TIME (MIN.) : 15 MIN.
SAMPLE VOLUME (L) : 1.57 PUMP START FLOW : 100 CC/MIN.
SAMPLE TYPE (A, S, F) : S PUMP STOP FLOW : 100 CC/MIN.
(A=AREA, S=SHORT TERM, F=PERSONNEL)
IF AREA, DESCRIBE :
RESPIRATOR USED (1 - 7) : 3
8 OR 12 HOUR SHIFT : 12
SHIFT (DAY, NIGHT, EDS) : DAY
EMPLOYEE I. D. # : 434213
JOB DESCRIPTION : CATCHING P/T PROCESS SAMPLES.

RESPIRATOR TYPES : 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

ANALYTICAL RESULTS

COMPOUND	DR #	IHS	STE	MOL	RESULT	TLV/TWA	TLV/TWA	AREA
ETOL	0002-3701	1000	0	.01	<.01			
YCL	0002-3454	5	0	.01	7.068		9.21	
EDC	0001-0531	10	0	.01	<.01			
DOT	0001-0743	75	110	.01	.091		.60	
PCP	0013-0702	50	200	.01	4.608		5.17	
B-TRI	0002-3687	10	0	.01	<.01			

NOTE - ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

RCL EQUATION : PPM VOLUME OF RCLs IN AIR =

(WEIGHT OF CS₂ IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE : CS₂ = CARBON DISULFIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
= LITERS OF AIR SAMPLED

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DO 077452
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DOW CHEMICAL LAD
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MINE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 15 / 17

SAMPLE DATE (MM/DD/YY) : 12/03/87 TIME START : 6:00 AM
SAMPLE NUMBER : 11 TIME STOP : 3:15 AM
SAMPLE TIME (MIN.) : 15 MIN.
SAMPLE VOLUME (L) : 1.63 PUMP START FLOW : 100 CC/MIN.
SAMPLE TYPE (A, S, P) : S PUMP STOP FLOW : 100 CC/MIN.
(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE :
RESPIRATOR USED (1 - 7) : 3
C OR 12 HOUR SHIFT : 12
SHIFT (DAY, NIGHT, EDD) : DAY
EMPLOYEE I. D. # : 434213
JOB DESCRIPTION : CATCHING P/T PROCESS SAMPLES.

RESPIRATOR TYPES : 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

ANALYTICAL RESULTS

COMPOUND	DR #	IRS	STEL	MDL	ANALYSIS	8 HOUR	STEL	RESULT	TLV/TWA	TLV/TWA	AREA
ETCL	0002-3701	100	0	.01	<.01						
TET	0002-3454	5	0	.01	1.786		2.18				
LOC	0001-0071	30	0	.01	<.01						
TL	0001-3947	75	110	.01	.474		.82				
PER	0002-3459	50	200	.01	5.275		5.97				
C TO	0002-3687	10	0	.01	<.01						

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

RCL EQUATION : PPM VOLUME OF RCL IN AIR =

(WEIGHT OF CS₂ IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAPH)

(MW) (L)

WHERE : CS₂ = CARBON DISULFIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

MD:06/03/08

DO 077453
CONFIDENTIAL

DOW CHEMICAL LAB
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 11 / 17

SAMPLE DATE (MM/DD/YY) : 12/03/87 TIME START : 6:40 AM
SAMPLE NUMBER : 12 TIME STOP : 7:00 AM
SAMPLE TIME (MIN.) : 20 MIN.
SAMPLE VOLUME (L) : 2.16 PUMP START FLOW : 100 CC/MIN.
SAMPLE TYPE (A, S, P) : S PUMP STOP FLOW : 100 CC/MIN.
(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE :
RESPIRATOR USED (1 - 7) : 3
8 OR 12 HOUR SHIFT : 12
SHIFT (DAY, NIGHT, EDO) : DAY
EMPLOYEE I. D. # : 433945
OR DESCRIPTION : CATCHING EDC PROCESS SAMPLES.

RESPIRATOR TYPES : 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

ANALYTICAL RESULTS

ANALYSIS	8 HOUR	STEL	TLV/TWA	TLV/TWA	AREA
EDC	0002-3701	1000	0	0.01	<0.01
TET	0002-3454	5	0	0.01	<0.01
EDC	0001-0531	10	0	0.01	3.995
TET	0001-0531	75	110	0.01	0.314
EDC	0002-0432	50	200	0.01	4.030
TET	0002-0432	10	0	0.01	<0.01

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

RCL EQUATION : PPM VOLUME OF RCL IN AIR =

(WEIGHT OF CSD IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAPH)

(MW) (L)

WHERE : CSD = CARBON DISULFIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

12/06/02/88

DO 077454
CONFIDENTIAL

DOW CHEMICAL LAD
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

SAMPLE DATE (MM/DD/YY) : 12/03/87 TIME START : 1:25 PM
SAMPLE NUMBER : 13 TIME STOP : 1:30 PM
SAMPLE TIME (MIN.) : 05 MIN.
SAMPLE VOLUME (L) : .58 PUMP START FLOW : 100 CC/MIN.
SAMPLE TYPE (A, S, P) : S PUMP STOP FLOW : 100 CC/MIN.
(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE :
RESPIRATOR USED (1 - 7) : 3
8 OR 12 HOUR SHIFT : 12
SHIFT (DAY, NIGHT, EDD) : DAY
EMPLOYEE I. D. # : 433945
JOB DESCRIPTION : CATCHING EDC PROCESS SAMPLES. *FINISHED PNL.*

RESPIRATOR TYPES : 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

ANALYTICAL RESULTS

COMPOUND	DE #	1HG	STEL	MDL	RESULT	TLV/TWA	TLV/TWA	ARCA
ETCL	0002-3701	1000	0	.01	<.01			
DET	0002-3754	5	0	.01	<.01			
EDC	0001-0511	10	0	.01	1.25		6.85	
PDC	0001-9743	75	110	.01	.788		3.72	
PER	0007-7889	50	200	.01	4.951		16.19	
M-TBI	0002-3687	10	0	.01	<.01			

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

RCL EQUATION : PPM VOLUME OF RCLs IN AIR =

(WEIGHT OF CS2 IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE : CS2 = CARBON DISULFIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

MS:06/03/88

DO 077455
CONFIDENTIAL

DOW CHEMICAL LAD
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
HEX DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

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=====
SAMPLE DATE (MM/DD/YY) : 12/22/87          TIME START : 9:00 AM
SAMPLE NUMBER           : 14                TIME STOP  : 2:00 PM
SAMPLE TIME (MIN.)      : 300
SAMPLE VOLUME (L)       : 34.99             PUMP START FLOW : 100 CC/MIN.
SAMPLE TYPE (A, S, P)   : P                PUMP STOP FLOW  : 100 CC/MIN.
(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE      :
RESPIRATOR USED (1 - 7) : 5
2 OR 12 HOUR SHIFT     : 9
SHIFT (DAY, NIGHT, EDC) : DAY
EMPLOYEE I. D. #       : LABORER
JOB DESCRIPTION        : CLEANING UP HEX SPILL AT D-13.
=====
```

RESPIRATOR TYPES : 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

ANALYTICAL RESULTS

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=====
COMPOUND :      DE 4      : IHB : MDL : ANALYSIS : 8 HOUR TLV : AREA :
-----
HEX      : 0002-3643 : 100% : .02% : 90.7      : 275.97      :      :
-----
MCHX     : 0009-2375 : 20%  : .02% : 40.9      : 123.13      :      :
-----
HDI 7    : 0002-5310 : 150% : .02% : 2.34      : 6.38        :      :
=====
```

KEY : @ = BPM, % = PPE, * = PPD IN BLOOD
ALL RESULTS IN PPB UNLESS OTHERWISE NOTED.

HEX EQUATION : PPB VOLUME OF HEXES IN AIR =

(MG) (24.45) (1000)

(L) (MW) (RR)

WHERE : MG = MICROGRAMS FROM SAMPLE DATA
24.45 = LITERS OCCUPIED BY 1 MOLE OF GAS AT STANDARD CONDITIONS
L = LITERS OF AIR SAMPLED
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
RR = RECOVERY RATE OF COMPONENT

MB:06/03/88

DO 077456
CONFIDENTIAL

DOW CHEMICAL LAD
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
HEX DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

SAMPLE DATE (MM/DD/YY) : 12/22/87 TIME START : 9:00 AM
SAMPLE NUMBER : 15 TIME STOP : 2:00 PM
SAMPLE TIME (MIN.) : 300
SAMPLE VOLUME (L) : 35.73 PUMP START FLOW : 100 CC/MIN.
SAMPLE TYPE (A, S, P) : A PUMP STOP FLOW : 100 CC/MIN.
(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE : D-13
RESPIRATOR USED (1 - 7) :
8 OR 12 HOUR SHIFT :
SHIFT (DAY, NIGHT, EDO) : DAY
EMPLOYEE I.D. # :
JOB DESCRIPTION : 10 FEET FROM CLEAN UP OF HEX SPILL AT D-13.

RESPIRATOR TYPES : 1=NONE, 2=MOUThBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

ANALYTICAL RESULTS

COMPOUND : VR # : IHB : MDL : ANALYSIS : 8 HOUR TLV : AREA :

HEX : 0002-3643 : 100% : .02% : 22.3 : 64.64:

MED : 0007-2375 : 20% : .02% : 7.51 : 21.54:

MDL : 0002-5310 : 150% : .02% : .06 : .16:

KEY : C = PPM, * = PPB, \$ = PPB IN BLOOD
ALL RESULTS IN PPB UNLESS OTHERWISE NOTED.

HEX EQUATION : PCB VOLUME OF HEXES IN AIR =

(MG) (24.45) (1000)

(L) (MW) (RR)

WHERE : MG = MICROGRAMS FROM SAMPLE DATA
24.45 = LITERS OCCUPIED BY 1 MOLE OF GAS AT STANDARD CONDITIONS
L = LITERS OF AIR SAMPLED
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
RR = RECOVERY RATE OF COMPONENT

MD:06/03/88

DOW CHEMICAL LAB
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

SAMPLE DATE (MM/DD/YY) : 12/30/87 TIME START : 6:00 AM
SAMPLE NUMBER : 16 TIME STOP : 10:00 AM
SAMPLE TIME (MIN.) : 240 MIN.
SAMPLE VOLUME (L) : 31.86 PUMP START FLOW : 100 CC/MIN.
SAMPLE TYPE (A, S, P) : P PUMP STOP FLOW : 100 CC/MIN.
(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE :
RESPIRATOR USED (1 - 7) : 1
8 OR 12 HOUR SHIFT : 12
SHIFT (DAY, NIGHT, EDO) : DAY
EMPLOYEE I. D. # : 433914
JOB DESCRIPTION : P/T OUTSIDE S.O.T. PERFORMING NORMAL DAILY JOE
DUTIES INCLUDING ROUNDS.
RESPIRATOR TYPES : 1=NONE, 2=MOUHTBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

ANALYTICAL RESULTS

COMPOUND	DP	AREA	STEL	MDL	RESULT	TLV/TWA	TLV/TWA	AREA
ETCL	0002-3701	1000	0	.01	<.01			
FEF	0002-3654	5	0	.01	<.01			
EDC	0001-2331	10	0	.01	<.01			
PED	0001-2943	75	110	.01	.38	.03		
PEF	0002-3678	10	200	.01	4.128	.23		
B-TRI	0002-3687	10	0	.01	<.01			

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

RCL EQUATION : PPM VOLUME OF RCLs IN AIR =

(WEIGHT OF CS₂ IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE : CS₂ = CARBON DISULFIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

MB:06/05/88

DO 077458
CONFIDENTIAL

DOW CHEMICAL LAB
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
ROL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

SAMPLE DATE (MM/DD/YY) : 12/30/87 TIME START : 6:00 AM
SAMPLE NUMBER : 17 TIME STOP : 10:00 AM
SAMPLE TIME (MIN.) : 240 MIN.
SAMPLE VOLUME (L) : 26.17 PUMP START FLOW : 100 CC/MIN.
SAMPLE TYPE (A, S, P) : P PUMP STOP FLOW : 100 CC/MIN.
(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE :
RESPIRATOR USED (1 - 7) : 1
8 OR 12 HOUR SHIFT : 12
SHIFT (DAY, NIGHT, EDO) : DAY
EMPLOYEE I. D. # : 431530
JOB DESCRIPTION : P/T INSIDE O.S. PERFORMING NORMAL DAILY JOB
DUTIES INCLUDING OUTSIDE ROUNDS.
RESPIRATOR TYPES : 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

ANALYTICAL RESULTS

COMPOUND	DR #	ING	STEL	MDL	ANALYSIS	8 HOUR	STEL	AREA
					RESULT	TLV/TWA	TLV/TWA	
ETPL	0002-3703	1000	0	.01	<.01			
TET	0002-3654	5	0	.01	<.01			
EDC	0001-3531	10	0	.01	<.01			
EDC	0001-7540	75	110	.01	.412	.04		
PEP	0002-3698	50	200	.01	3.453	.24		
2 TRI	0002-3687	10	0	.01	<.01			

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

ROL EQUATION : PPM VOLUME OF ROLS IN AIR =

(WEIGHT OF CS₂ IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE : CS₂ = CARBON DISULFIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

MS:06/03/89

DO 077459
CONFIDENTIAL

DOW CHEMICAL LAB
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
HEX DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

```
=====
SAMPLE DATE (MM/DD/YY) : 12/30/87          TIME START : 6:00 AM
SAMPLE NUMBER           : 18                TIME STOP  : 10:00 AM
SAMPLE TIME (MIN.)      : 240
SAMPLE VOLUME (L)       : 24.4              PUMP START FLOW : 100 CC/MIN.
SAMPLE TYPE (A, S, P)   : P                PUMP STOP FLOW  : 100 CC/MIN.
(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE      :
RESPIRATOR USED (1 - 7) : 1
8 OR 12 HOUR SHIFT     : 12
SHIFT (DAY, NIGHT, EDO) : DAY
EMPLOYEE I. D. #       : 433625
JOB DESCRIPTION         : INSIDE AHCL O.S. PERFORMING NORMAL DAILY JOB
                        : DUTIES.
=====
```

RESPIRATOR TYPES: 1=NONE, 2=MOUHTBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

ANALYTICAL RESULTS

```
=====
CONSEQUENCE : DR # : IHB : MDL : ANALYSIS : 8 HOUR TLV : AREA :
-----
HCE          : 0002-3643 : 100% : .02% : .22 : .95 : :
HCEB         : 0009-2375 : 20%  : .02% : 1.12 : 4.84 : :
HCEZ         : 0002-5310 : 150% : .02% : .17 : .66 : :
=====
```

KEY : @ = TPA, * = PPA, \$ = PPD IN FLOOD
ALL RESULTS IN PPD UNLESS OTHERWISE NOTED.

KEY EQUATION :
$$\text{PPB VOLUME OF HEXES IN AIR} =$$

(MG) (24.45) (1000)

(L) (MW) (RR)

WHERE : MD = MICROGRAMS FROM SAMPLE DATA
24.45 = LITERS OCCUPIED BY 1 MOLE OF GAS AT STANDARD CONDITIONS
L = LITERS OF AIR SAMPLED
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
RR = RECOVERY RATE OF COMPONENT

MD:06/03/82

DO 077460
CONFIDENTIAL

DOW CHEMICAL LAD
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

SAMPLE DATE (MM/DD/YY) : 12/30/87 TIME START : 6:00 AM
SAMPLE NUMBER : 19 TIME STOP : 10:00 AM
SAMPLE TIME (MIN.) : 240 MIN.
SAMPLE VOLUME (L) : 26.04 PUMP START FLOW : 100 CC/MIN.
SAMPLE TYPE (A, S, P) : A PUMP STOP FLOW : 100 CC/MIN.
(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE : C-2
RESPIRATOR USED (1 - 7) :
8 OR 12 HOUR SHIFT :
SHIFT (DAY, NIGHT, EDO) : DAY
EMPLOYEE I. D. # :
JOB DESCRIPTION :

RESPIRATOR TYPES : 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

ANALYTICAL RESULTS

CONCENTRATION	DP #	INC	STEL	NEL	RESULT	TLV/TWA	TLV/TWA	AREA
ETOL	0002-3901	1000	0	.01	4.01			
TET	0002 3454	5	0	.01	26.259			1.97
ENC	0001 2571	10	0	.01	1.175			.14
ED	0001-9743	75	110	.01	.158			.02
PEL	0002 1139	50	200	.01	9.489			.66
B TRI	0002-3697	10	0	.01	4.01			

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

RCL EQUATION : PPM VOLUME OF RCLs IN AIR =

(WEIGHT OF CS₂ IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE : CS₂ = CARBON DISULFIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

MS:06/03/88

DO 077461
CONFIDENTIAL

DOW CHEMICAL LAD
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

=====

SAMPLE DATE (MM/DD/YY) :	12/30/87	TIME START :	6:00 AM
SAMPLE NUMBER :	20	TIME STOP :	10:00 AM
SAMPLE TIME (MIN.) :	240 MIN.		
SAMPLE VOLUME (L) :	28.52	PUMP START FLOW :	100 CC/MIN.
SAMPLE TYPE (A, S, P) :	P	PUMP STOP FLOW :	100 CC/MIN.

(A=AREA, S=SHORT TERM, P=PERSONNEL)

IF AREA, DESCRIBE :

RESPIRATOR USED (1 - 7) : 1

8 OR 12 HOUR SHIFT : 12

SHIFT (DAY, NIGHT, EDO) : DAY

EMPLOYEE I. D. # : 433625

JOB DESCRIPTION : INSIDE AHCL O.S. PERFORMING NORMAL DAILY JOB
DUTIES WITH NO OUTSIDE ROUND.

RESPIRATOR TYPES : 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

=====

ANALYTICAL RESULTS

=====

COMPOUND :	DE # :	ING :	STEL :	MDL :	ANALYSIS :	8 HOUR :	STEL :	AREA :
RESULT :	TLV/TWA :	TLV/TWA :	AREA :					
ETCL : 0002-3701 :	1000 :	0 :	.01 :	<.01 :				
TET : 0002-3654 :	5 :	0 :	.01 :	<.01 :				
EDC : 0001-8531 :	10 :	0 :	.01 :	.935 :	.10 :			
EDC : 0001-9943 :	75 :	110 :	.01 :	.475 :	.04 :			
PER : 0002-3698 :	50 :	200 :	.01 :	3.268 :	.21 :			
D TRI : 0002-3687 :	10 :	0 :	.01 :	<.01 :				

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

RCL EQUATION : PPM VOLUME OF RCL IN AIR =

(WEIGHT OF CS2 IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE : CS2 = CARBON DISULFIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

MB 06/03/88

DO 077462
CONFIDENTIAL

DOW CHEMICAL LAD
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

=====

SAMPLE DATE (MM/DD/YY) : 12/30/87	TIME START : 6:00 AM
SAMPLE NUMBER : 21	TIME STOP : 10:00 AM
SAMPLE TIME (MIN.) : 240 MIN.	
SAMPLE VOLUME (L) : 26.05	PUMP START FLOW : 100 CC/MIN.
SAMPLE TYPE (A, S, P) : P	PUMP STOP FLOW : 100 CC/MIN.

(A=AREA, S=SHORT TERM, P=PERSONNEL)

IF AREA, DESCRIBE :
RESPIRATOR USED (1 - 7) : 1
8 OR 12 HOUR SHIFT : 12
SHIFT (DAY,NIGHT, EDO) : DAY
EMPLOYEE I. D. # : 431633
JOB DESCRIPTION : INSIDE EDC O.S. PERFORMING NORMAL DAILY JOB
DUTIES WITH NO OUTSIDE ROUND.

RESPIRATOR TYPES : 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE, ...
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

=====

ANALYTICAL RESULTS

=====

COMPOUND	DR #	IHS	STEL	MDL	ANALYSIS	8 HOUR	STEL	TLV/TWA	TLV/TWA	AREA
ETOL	0002-3701	1000	0	.01	<.01					
TEY	0002-3654	5	0	.01	<.01					
EDC	0001-8531	10	0	.01	<.01					
PDC	0001-9943	75	110	.01	.584		.06			
PEP	0002-3498	50	200	.01	3.994		.27			
D TRI	0002-3497	10	0	.01	<.01					

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

RCL EQUATION : PPM VOLUME OF RCLS IN AIR =

(WEIGHT OF CS2 IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE : CS2 = CARBON DISULFIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

MB:01/03/97

DO 077463
CONFIDENTIAL

DOW CHEMICAL LAD
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
ROL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 12 / 17

SAMPLE DATE (MM/DD/YY) : 12/30/87 TIME START : 6:00 AM
SAMPLE NUMBER : 22 TIME STOP : 10:00 AM
SAMPLE TIME (MIN.) : 240 MIN.
SAMPLE VOLUME (L) : 24.86 PUMP START FLOW : 100 CC/MIN.
SAMPLE TYPE (A, S, P) : P PUMP STOP FLOW : 100 CC/MIN.
(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE :
RESPIRATOR USED (1 - 7) : 1
8 OR 12 HOUR SHIFT : 12
SHIFT (DAY, NIGHT, EDO) : DAY
EMPLOYEE I. D. # : 433366
JOB DESCRIPTION : INSIDE EDC O.S. PERFORMING NORMAL DAILY JOB
DUTIES INCLUDING AN OUTSIDE ROUND.
RESPIRATOR TYPES : 1=NONE, 2=MOUHTBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

ANALYTICAL RESULTS

COMPOUND	DR #	PHG	STEL	NOL	ANALYSIS	8 HOUR	STEL	AREA
					RESULT	TLV/TWA	TLV/TWA	
ETCL	0002-3701	1000	0	.01	<.01			
TET	0002-3654	5	0	.01	<.01			
EDC	0001-0531	10	0	.01	<.01			
THC	0001-7513	75	110	.01	.546	.06		
TEC	0001-7198	50	200	.01	4.735	.34		
BUTP	0002-0607	10	0	.01	<.01			

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

ROL EQUATION : PPM VOLUME OF ROLS IN AIR =
(WEIGHT OF CS2 IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)
(MW) (L)

WHERE : CS2 = CARBON DISULFIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREE K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

MR:05/07/00

DO 077464
CONFIDENTIAL

DOW CHEMICAL LAD
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
HEX DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

```
=====
SAMPLE DATE (MM/DD/YY) : 12/30/87          TIME START : 6:00 AM
SAMPLE NUMBER           : 23                TIME STOP  : 10:00 AM
SAMPLE TIME (MIN.)      : 240
SAMPLE VOLUME (L)       : 21.46             PUMP START FLOW : 100 CC/MIN.
SAMPLE TYPE (A, S, P)   : P                PUMP STOP FLOW  : 100 CC/MIN.
(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE      :
RESPIRATOR USED (1 - 7) : 1
6 OR 12 HOUR SHIFT     : 12
SHIFT (DAY, NIGHT, EDO) : DAY
EMPLOYEE I.D. #        : 431530
JOB DESCRIPTION         : P/T INSIDE O.S. PERFORMING NORMAL DAILY JOB
                        : DUTIES.
RESPIRATOR TYPES : 1=NONE, 2=MOUTHRIT, 3=COMFO II, 4=FULL FACE,
                  : 5=BREATHING AIR, 6=DUST MASK, 7=SCBA.
=====
```

ANALYTICAL RESULTS

```
=====
COMPOUND :      OF #      : IHB : MDL : ANALYSIS : 8 HOUR TLV : AREA :
-----
PCB      : 0002-3643 : 100% : .02% : .3      : 1.49      :      :
PCB      : 0009-0375 : 20%  : .02% : 1.11    : 5.45      :      :
PCP7     : 0001-5010 : 150% : .02% : .15     : .67       :      :
=====
```

KEY : @ = PPM, % = PPD, \$ = PPB IN BLOOD
ALL RESULTS IN PPB UNLESS OTHERWISE NOTED.

```
=====
HEX EQUATION :                PPB VOLUME OF HEXES IN AIR =
                                     (MG) (24.45) (1000)
                                     -----
                                     (L) (MW) (RR)
=====
```

WHERE : MG = MICROGRAMS FROM SAMPLE DATA
24.45 = LITERS OCCUPIED BY 1 MOLE OF GAS AT STANDARD CONDITIONS
L = LITERS OF AIR SAMPLED
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
RR = RECOVERY RATE OF COMPONENT

MB:06/03/88

DOW CHEMICAL LAB
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
HEX DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 13 / 17

=====

SAMPLE DATE (MM/DD/YY) :	12/30/87	TIME START :	6:00 AM
SAMPLE NUMBER :	24	TIME STOP :	10:00 AM
SAMPLE TIME (MIN.) :	240		
SAMPLE VOLUME (L) :	29.42	PUMP START FLOW :	100 CC/MIN.
SAMPLE TYPE (A, S, P) :	P	PUMP STOP FLOW :	100 CC/MIN.

(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE :
RESPIRATOR USED (1 - 7) : 1
S OR 12 HOUR SHIFT : 12
SHIFT (DAY, NIGHT, EDC) : DAY
EMPLOYEE I. D. # : 433914
JOB DESCRIPTION : P/T OUTSIDE S.O.T. PERFORMING NORMAL DAILY JOB
DUTIES INCLUDING ROUNDS.
RESPIRATOR TYPES : 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

=====

ANALYTICAL RESULTS

=====

COMPOUND :	DR # :	IHG :	MDL :	ANALYSIS :	B HOUR TLV :	AREA :
HCE	: 0002-3443	: 100%	: .02%	: .29	: 1.05	:
HCB	: 0009-2375	: 20%	: .02%	: 1.63	: 5.84	:
HCBT	: 0002-5310	: 150%	: .02%	: .14	: .45	:

KEY : C = ppm, S = ppb, * = ppb IN FLOOD
ALL RESULTS IN PPB UNLESS OTHERWISE NOTED.

HEX EQUATION : PPB VOLUME OF HEXES IN AIR =

(IHG) (24.45) (1000)

(L) (MW) (RR)

WHERE : IHG = MICROGRAMS FROM SAMPLE DATA
24.45 = LITERS OCCUPIED BY 1 MOLE OF GAS AT STANDARD CONDITIONS
L = LITERS OF AIR SAMPLED
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
RR = RECOVERY RATE OF COMPONENT

MB:06/03/88

DOW CHEMICAL LAD
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
HEX DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

=====

SAMPLE DATE (MM/DD/YY) :	12/30/87	TIME START :	6:00 AM
SAMPLE NUMBER :	25	TIME STOP :	8:00 AM
SAMPLE TIME (MIN.) :	120		
SAMPLE VOLUME (L) :	12.68	PUMP START FLOW :	100 CC/MIN.
SAMPLE TYPE (A, S, P) :	A	PUMP STOP FLOW :	100 CC/MIN.

(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE : D-13
RESPIRATOR USED (1 - 7) :
9 OR 12 HOUR SHIFT :
SHIFT (DAY,NIGHT, EDO) : DAY
EMPLOYEE I. D. # :
JOB DESCRIPTION : MONITORING FROM SAME PLACE AS ON 12/22/87,
SAMPLE # 15.
RESPIRATOR TYPES : 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE,
5-BREATHING AIR, 6=DUST MASK, 7=SCBA.

=====

ANALYTICAL RESULTS

=====

COMP. NO. :	DR # :	1HG :	MDL :	ANALYSIS :	8 HOUR TLV :	AREA :
NO1	: 0000-3643	: 100%	: .02%	: 46	:	: 3.85
NO2	: 0009-2775	: 20%	: .02%	: 2.6	:	: 21.6
NO11	: 0002-5310	: 150%	: .02%	: .2	:	: 1.5

KEY : @ = PPM, * = PPD, # = PPD IN BLOOD
ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

HEX EQUATION : PPB VOLUME OF HEXES IN AIR =

(MG) (24.45) (1000)

(L) (MW) (RR)

WHERE : MG = MICROGRAMS FROM SAMPLE DATA
24.45 = LITERS OCCUPIED BY 1 MOLE OF GAS AT STANDARD CONDITIONS
L = LITERS OF AIR SAMPLED
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
RR = RECOVERY RATE OF COMPONENT

MB:06/03/88

DO 077467
CONFIDENTIAL

DOW CHEMICAL LAD
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
HEX DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 6 / 17

=====

SAMPLE DATE (MM/DD/YY)	: 12/30/87	TIME START	: 6:00 AM
SAMPLE NUMBER	: 26	TIME STOP	: 10:00 AM
SAMPLE TIME (MIN.)	: 240		
SAMPLE VOLUME (L)	: 22.33	PUMP START FLOW	: 100 CC/MIN.
SAMPLE TYPE (A, S, P)	: A	PUMP STOP FLOW	: 100 CC/MIN.
(A=AREA, S=SHORT TERM, P=PERSONNEL)			
IF AREA, DESCRIBE	: TOX		
RESPIRATOR USED (1 - 7)	:		
8 OR 12 HOUR SHIFT	:		
SHIFT (DAY, NIGHT, EDO)	: DAY		
EMPLOYEE I. D. #	:		
JOB DESCRIPTION	:		

RESPIRATOR TYPES: 1=NONE, 2=MOUTHEIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUOT MASK, 7=SCBA.

=====

ANALYTICAL RESULTS

=====

COMPOUND	DF	%	IHS	MDL	ANALYSIS	8 HOUR TLV	AREA
NOE	0003-3642	: 100	: .02%	.29	:	:	1.38:
NOE	0009 2375	: 20*	: .02%	2.4	:	:	11.32:
NOE	0002 5710	: 1504	: .02%	.12	:	:	.51:

=====

KEY : C = CPM, % = PPB, \$ = PPB IN BLOOD
ALL RESULTS IN PPB UNLESS OTHERWISE NOTED.

=====

KEY LOCATION : PPB VOLUME OF HEXES IN AIR =

(MG) (24.45) (1000)

(L) (MW) (RR)

WHERE : MG = MICROGRAMS FROM SAMPLE DATA
24.45 = LITERS OCCUPIED BY 1 MOLE OF GAS AT STANDARD CONDITIONS
L = LITERS OF AIR SAMPLED
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
RR = RECOVERY RATE OF COMPONENT

MB:06/03/89

DO 077468
CONFIDENTIAL

DOW CHEMICAL LAD
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

SAMPLE DATE (MM/DD/YY) : 12/31/87 TIME START : 6:00 AM
SAMPLE NUMBER : 27 TIME STOP : 10:00 AM
SAMPLE TIME (MIN.) : 240 MIN.
SAMPLE VOLUME (L) : 27.36 PUMP START FLOW : 100 CC/MIN.
SAMPLE TYPE (A, S, P) : A PUMP STOP FLOW : 100 CC/MIN.
(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE : D-2C
RESPIRATOR USED (1 - 7) :
8 OR 12 HOUR SHIFT :
SHIFT (DAY, NIGHT, EDO) : DAY
EMPLOYEE I. D. # :
JOB DESCRIPTION :

RESPIRATOR TYPES : 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE, 5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

ANALYTICAL RESULTS

COMPOUND	DR #	ING	STEL	MDL	RESULT	TLV/TWA	TLV/TWA	AREA
ETCL	0002-3701	1000	0	.01	<.01			
TET	0002-3701	5	0	.03	<.01			
EDC	0001-0831	10	0	.01	<.01			
PDC	0001-0943	75	110	.01	.474			.10
PER	0002-3400	50	200	.01	3.303			.44
MDL	0002-3497	10	0	.01	<.01			

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

RCL EQUATION : PPM VOLUME OF RCLs IN AIR =

(WEIGHT OF CS₂ IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE : CS₂ = CARBON DISULFIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

DOW CHEMICAL LAD
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

=====

SAMPLE DATE (MM/DD/YY) :	12/31/87	TIME START :	6:00 AM
SAMPLE NUMBER :	28	TIME STOP :	10:00 AM
SAMPLE TIME (MIN.) :	240 MIN.		
SAMPLE VOLUME (L) :	26.36	PUMP START FLOW :	100 CC/MIN.
SAMPLE TYPE (A, S, P) :	A	PUMP STOP FLOW :	100 CC/MIN.

(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE : C-1C
RESPIRATOR USED (1 - 7) :
8 OR 12 HOUR SHIFT :
SHIFT (DAY, NIGHT, EDC) : DAY
EMPLOYEE I. D. # :
JOB DESCRIPTION :

RESPIRATOR TYPES : 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

=====

ANALYTICAL RESULTS

=====

COMPOUND :	DR # :	ING :	STEL :	MDL :	ANALYSIS :	8 HOUR :	STEL :	TLV/TWA :	TLV/TWA :	AREA :
RESULT :	TLV/TWA :	TLV/TWA :	AREA :							
ETCL : 0002-3701 :	1000 :	0 :	.01 :	<.01 :						
TET : 0002-3454 :	5 :	0 :	.01 :	<.01 :						
EDC : 0001-8531 :	10 :	0 :	.01 :	<.01 :						
PDC : 0001-9943 :	75 :	110 :	.01 :	.356 :					.08 :	
PER : 0002-3498 :	50 :	200 :	.01 :	4.175 :					.56 :	
E-TRI : 0002-3627 :	10 :	0 :	.01 :	<.01 :						

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

RCL EQUATION : PPM VOLUME OF RCLs IN AIR =

(WEIGHT OF CS2 IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE : CS2 = CARBON DISULFIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

MB:06/01/88

DO 077470
CONFIDENTIAL

DOW CHEMICAL LAD
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

=====

SAMPLE DATE (MM/DD/YY) : 12/31/87	TIME START : 6:00 AM
SAMPLE NUMBER : 29	TIME STOP : 10:00 AM
SAMPLE TIME (MIN.) : 240 MIN.	
SAMPLE VOLUME (L) : 26.16	PUMP START FLOW : 100 CC/MIN.
SAMPLE TYPE (A, S, P) : A	PUMP STOP FLOW : 100 CC/MIN.

(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE : R-1C
RESPIRATOR USED (1 - 7) :
8 OR 12 HOUR SHIFT :
SHIFT (DAY, NIGHT, EDC) : DAY
EMPLOYEE I. D. # :
JOB DESCRIPTION :

RESPIRATOR TYPES : 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

=====

ANALYTICAL RESULTS

=====

COMPOUND	DE. #	INS	STEL	MOL	ANALYSIS	8 HOUR	STEL	AREA
					RESULT	TLV/TWA	TLV/TWA	
ETCL	0002-3701	1000	0	.01	<.01			
TET	0002-3554	5	0	.01	<.01			
EDC	0001-9571	10	0	.01	<.01			
PDC	0001-9943	75	110	.01	.801			.16
PER	0102-3492	50	200	.01	6.814			.94
P TRI	0002-3427	10	0	.01	<.01			

NOTE : ALL RESULTS 14 PPM UNLESS OTHERWISE NOTED.

RCL EQUATION : PPM VOLUME OF RCL IN AIR =

(WEIGHT OF CS2 IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE : CS2 = CARBON DISULFIDE USED FOR DESORPTION
 .0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
 DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
 MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
 L = LITERS OF AIR SAMPLED

RD:06/05/89

DO 077471
CONFIDENTIAL

DOW CHEMICAL LAB
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

=====

SAMPLE DATE (MM/DD/YY) :	12/31/87	TIME START :	6:00 AM
SAMPLE NUMBER :	30	TIME STOP :	10:00 AM
SAMPLE TIME (MIN.) :	240 MIN.		
SAMPLE VOLUME (L) :	24.10	PUMP START FLOW :	100 CC/MIN.
SAMPLE TYPE (A, S, P) :	A	PUMP STOP FLOW :	100 CC/MIN.

(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE : C-59
RESPIRATOR USED (1 - 7) :
8 OR 12 HOUR SHIFT :
SHIFT (DAY, NIGHT, EDO) : DAY
EMPLOYEE I. D. # :
JOB DESCRIPTION :

RESPIRATOR TYPES : 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

=====

ANALYTICAL RESULTS

=====

COMPONENT :	DR # :	ING :	STEL :	MDL :	ANALYSIS :	8 HOUR :	STEL :	AREA :
					RESULT :	TLV/TWA :	TLV/TWA :	
ETOL	0002-3701	1000	0	.01	<.01			
CEY	0002-3654	5	0	.01	<.01			
THE	0001-8531	10	0	.01	<.01			
PDE	0001-7743	75	110	.01	.817			.18
PCR	0002-3698	50	200	.01	2.907			.44
E TRI	0002-3407	10	0	.01	<.01			

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

RCL EQUATION : PPM VOLUME OF RCLS IN AIR =

(WEIGHT OF CS2 IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE : CS2 = CARBON DISULFIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

PPM CS2 = 1.00

DO 077472
CONFIDENTIAL

DOW CHEMICAL LAB
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 11 / 17

SAMPLE DATE (MM/DD/YY) : 12/31/87 TIME START : 6:00 AM
SAMPLE NUMBER : 31 TIME STOP : 9:00 AM
SAMPLE TIME (MIN.) : 180 MIN.
SAMPLE VOLUME (L) : 20.02 PUMP START FLOW : 100 CC/MIN.
SAMPLE TYPE (A, S, P) : A PUMP STOP FLOW : 100 CC/MIN.
(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE : TOX
RESPIRATOR USED (1 - 7) :
8 OR 12 HOUR SHIFT :
SHIFT (DAY, NIGHT, EDD) : DAY
EMPLOYEE I. D. # :
JOB DESCRIPTION :

RESPIRATOR TYPES : 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

ANALYTICAL RESULTS

CONCENTRATION	OR #	TIME	STEL	MDL	RESULT	TLV/TWA	TLV/TWA	AREA
ETOL	0002-3701	1000	0	.01	<.01			
TOT	0002-3554	5	0	.01	<.01			
ITI	0011-5021	10	0	.01	<.01			
PDE	0001-0945	75	110	.01	.252			.08
PER	0002-3698	50	200	.01	4.344			1.04
ETOL	0002-3477	10	0	.01	<.01			

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

RCL EQUATION : PPM VOLUME OF RCLs IN AIR =

(WEIGHT OF CS₂ IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE : CS₂ = CARBON DISULFIDE USED FOR DESORPTION
C = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

REVISED 11/87

DO 077473
CONFIDENTIAL

DOW CHEMICAL LAB
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MINT BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 14 / 17

SAMPLE DATE (MM/DD/YY) : 12/31/87 TIME START : 6:00 AM
SAMPLE NUMBER : 32 TIME STOP : 10:00 AM
SAMPLE TIME (MIN.) : 240 MIN.
SAMPLE VOLUME (L) : 25.33 PUMP START FLOW : 100 CC/MIN.
SAMPLE TYPE (A, S, P) : A PUMP STOP FLOW : 100 CC/MIN.
(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE : C-13
RESPIRATOR USED (1 - 7) :
8 OR 12 HOUR SHIFT :
SHIFT (DAY, NIGHT, EDC) : DAY
EMPLOYEE I. D. # :
JOB DESCRIPTION :

RESPIRATOR TYPES : 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE;
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

ANALYTICAL RESULTS

COMPOUND	DP #	IHS	STEL	MDL	ANALYSIS	8 HOUR	STEL	AREA
					RESULT	TLV/TWA	TLV/TWA	
ETL	0002-3403	1000	0	0.01	0.01			
TET	0001-3454	5	0	0.01	<0.01			
EDC	0002-3531	10	0	0.01	5.271			1.26
PDC	0001-2543	75	110	0.01	<0.01			
PER	0002-3498	50	200	0.01	1.977			0.28
ETHL	0002-3487	10	0	0.01	<0.01			

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

RCL EQUATION : PPM VOLUME OF RCLs IN AIR =

(WEIGHT OF CS2 IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE : CS2 = CARBON DISULFIDE USED FOR DESORPTION
(.0821) = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

DO 077474
CONFIDENTIAL

DOW CHEMICAL LAB
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
FLASK : 16 / 17

SAMPLE DATE (MM/DD/YY) : 12/31/87 TIME START : 6:00 AM
SAMPLE NUMBER : 33 TIME STOP : 10:00 AM
SAMPLE TIME (MIN.) : 240 MIN.
SAMPLE VOLUME (L) : 25.50 PUMP START FLOW : 100 CC/MIN.
SAMPLE TYPE (A, S, P) : P PUMP STOP FLOW : 100 CC/MIN.
(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE :
RESPIRATOR USED (1 - 7) : 3
8 OR 12 HOUR SHIFT : 12
SHIFT (DAY, NIGHT, EDO) : DAY
EMPLOYEE I. D. # : 434213
JOB DESCRIPTION : SAMPLE O.T. FOR P/T AND EDC INCLUDING ANALYSIS
AND OUTSIDE ROUNDS.
RESPIRATOR TYPES : 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

ANALYTICAL RESULTS

COMPOUND	DR #	ING	STEL	MDL	ANALYSIS	8 HOUR	STEL	AREA
					RESULT	TLV/TWA	TLV/TWA	
STEL	0002-3713	1000	0	.01	<.01			
TET	0003-3658	5	0	.01	<.01			
END	0001-3511	10	0	.01	1.954	.23		
BDC	0001-9943	75	110	.01	1.303	.14		
PER	0002-3698	50	200	.01	5.138	.37		
2-PRI	0002-3601	10	0	.01	<.01			

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

RCL EQUATION : PPM VOLUME OF RCL IN AIR =

(WEIGHT OF CS₂ IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE : CS₂ = CARBON DISULFIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

12/31/88, J.L.

DO 077475
CONFIDENTIAL

DOW CHEMICAL LAB
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

SAMPLE DATE (MM/DD/YY) : 12/31/87 TIME START : 6:00 AM
SAMPLE NUMBER : 34 TIME STOP : 10:00 AM
SAMPLE TIME (MIN.) : 240 MIN.
SAMPLE VOLUME (L) : 23.99 PUMP START FLOW : 100 CC/MIN.
SAMPLE TYPE (A, S, P) : A PUMP STOP FLOW : 100 CC/MIN.
(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE : R-1E
RESPIRATOR USED (1 - 7) :
8 OR 12 HOUR SHIFT :
SHIFT (DAY, NIGHT, EDO) : DAY
EMPLOYEE I. D. # :
JOB DESCRIPTION :

RESPIRATOR TYPES : 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

ANALYTICAL RESULTS

COMPOUND	DR #	1HG	STEL	MDL	ANALYSIS	8 HOUR	STEL	AREA
					RESULT	TLV/TWA	TLV/TWA	
ETCL	0002-3701	1000	0	.01	<.01			
YET	0002-3654	5	0	.01	<.01			
EAP	0001-2532	10	0	.01	1.564			.40
EDC	0001-9943	75	110	.01	<.01			
EDP	0002-3692	50	200	.01	<.01			
ETRI	0002-3671	10	0	.01	<.01			

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

TEL EQUATION : FPM VOLUME OF RCLS IN AIR =

(WEIGHT OF CS2 IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE : CS2 = CARBON DISULFIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

PI - 6/10/1988

DO 077476
CONFIDENTIAL

DOW CHEMICAL LAB
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

SAMPLE DATE (MM/DD/YY) : 12/31/87 TIME START : 6:00 AM
SAMPLE NUMBER : 35 TIME STOP : 10:00 AM
SAMPLE TIME (MIN) : 240 MIN.
SAMPLE VOLUME (L) : 30.39 PUMP START FLOW : 100 CC/MIN.
SAMPLE TYPE (A, S, P) : P PUMP STOP FLOW : 100 CC/MIN.
(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE :
RESPIRATOR USED (1 - 7) : 3
8 OR 12 HOUR SHIFT : 12
SHIFT (DAY, NIGHT, EDO) : DAY
EMPLOYEE I. D. # : 433624
JOB DESCRIPTION : TOX S.O.T. WORKED ON D-700 FEED TO TOX PLUGGING
PROBLEM.
RESPIRATOR TYPES : 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

ANALYTICAL RESULTS

COMPOUND	DR #	IHG	STEL	NDL	ANALYSIS	8 HOUR	STEL	AREA
					RESULT	TLV/TWA	TLV/TWA	
ETOL	0002-3701	1000	0	.01	<.01			
TET	0002-3654	5	0	.01	5.984	.39		
TDC	0001-8531	10	0	.01	2.12	.21		
PDC	0001-9943	75	110	.01	5.827	.56		
PER	0002-3493	50	200	.01	7.725	.46		
D TEL	0002 3487	10	0	.01	<.01			

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

RCL EQUATION : PPM VOLUME OF RCLS IN AIR =

(WEIGHT OF CS2 IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE : CS2 = CARBON DISULFIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
= LITERS OF AIR SAMPLED

ME:06/03/88

DO 077477
CONFIDENTIAL

DOW CHEMICAL LAD
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
HEX DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

=====

SAMPLE DATE (MM/DD/YY)	: 12/31/87	TIME START	: 6:00 AM
SAMPLE NUMBER	: 36	TIME STOP	: 10:00 AM
SAMPLE TIME (MIN.)	: 240		
SAMPLE VOLUME (L)	: 28.37	PUMP START FLOW	: 100 CC/MIN.
SAMPLE TYPE (A, S, P)	: P	PUMP STOP FLOW	: 100 CC/MIN.

(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE :
RESPIRATOR USED (1 - 7) : 1
8 OR 12 HOUR SHIFT : 12
SHIFT (DAY, NIGHT, EDC) : DAY
EMPLOYEE I. D. # : 433624
JOB DESCRIPTION : TOX S.O.T. WORKED ON D-700 FEED TO TOX PLUGGING PROBLEM.
RESPIRATOR TYPES: 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE, 5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

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ANALYTICAL RESULTS

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COMPOUND :	DP #	:	IHS	:	MOL	:	ANALYSIS	:	8 HOUR TLV	:	AREA	:
NOE	: 0002-3643	:	100	:	.02%	:	.31	:	1.16	:		:
DEED	: 0009-2375	:	20%	:	.02%	:	1.73	:	6.42	:		:
DDP2	: 0002-3643	:	150%	:	.02%	:	.12	:	.61	:		:

ALL RESULTS IN PPB UNLESS OTHERWISE NOTED.

EL. CORRECTION : PPB VOLUME OF HEXES IN AIR =

(MG) (24.45) (1000)

(L) (MW) (RR)

WHERE : MG = MICROGRAMS FROM SAMPLE DATA
24.45 = LITERS OCCUPIED BY 1 MOLE OF GAS AT STANDARD CONDITIONS
L = LITERS OF AIR SAMPLED
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
RR = RECOVERY RATE OF COMPONENT

MB:06/03/88

DO 077478
CONFIDENTIAL

DOW CHEMICAL LAB
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
HEX DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

=====

SAMPLE DATE (MM/DD/YY)	: 12/31/87	TIME START	: 6:00 AM
SAMPLE NUMBER	: 37	TIME STOP	: 10:00 AM
SAMPLE TIME (MIN.)	: 240		
SAMPLE VOLUME (L)	: 25.90	PUMP START FLOW	: 100 CC/MIN.
SAMPLE TYPE (A, S, P)	: P	PUMP STOP FLOW	: 100 CC/MIN.

(A=AREA, S=SHORT TERM, P=PERSONNEL)

IF AREA, DESCRIBE :
RESPIRATOR USED (1 - 7) : 1
8 OR 12 HOUR SHIFT : 12
SHIFT (DAY, NIGHT, EDC) : DAY
EMPLOYEE I. D. # : 434213
JOB DESCRIPTION : SAMPLE O.T. FOR P/T AND EDC INCLUDING ANALYSIS AND OUTSIDE ROUNDS.

RESPIRATOR TYPES : 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

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ANALYTICAL RESULTS

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COMPOUND :	DE # :	IHG :	MDL :	ANALYSIS :	8 HOUR TLV :	AREA :
-----	-----	-----	-----	-----	-----	-----
HCE	: 0002-3643	: 100%	: .02%	: .74	: 3.04	:
-----	-----	-----	-----	-----	-----	-----
HCEB	: 0009-0315	: 20%	: .02%	: .41	: 1.67	:
-----	-----	-----	-----	-----	-----	-----
HCEC	: 0002-0316	: 150%	: .02%	: .22	: .81	:
-----	-----	-----	-----	-----	-----	-----

KEY : @ = PPM, * = PPE, \$ = PPE IN BLOOD
ALL RESULTS IN PPE UNLESS OTHERWISE NOTED.

HEX EQUATION : PPE VOLUME OF HEXHS IN AIR =

$$\frac{(MG) (24.45) (1000)}{(L) (MW) (RR)}$$

WHERE : MG = MICROGRAMS FROM SAMPLE DATA
24.45 = LITERS OCCUPIED BY 1 MOLE OF GAS AT STANDARD CONDITIONS
L = LITERS OF AIR SAMPLED
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
RR = RECOVERY RATE OF COMPONENT

MB:06/03/88

DO 077479
CONFIDENTIAL

DOW CHEMICAL LAB
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

SAMPLE DATE (MM/DD/YY) : 12/31/87
SAMPLE NUMBER : 38
SAMPLE TIME (MIN.) : 60 MIN.
SAMPLE VOLUME (L) : 7.94
SAMPLE TYPE (A, S, P) : S
(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE :
RESPIRATOR USED (1 - 7) : 3
8 OR 12 HOUR SHIFT : 8
SHIFT (DAY, NIGHT, EDO) : DAY
EMPLOYEE I. D. # : 433928
JOB DESCRIPTION : WORKING WITH LAB LOADER ON 3385 GALLON TET T/T.

TIME START : 1:00 PM
TIME STOP : 2:00 PM

PUMP START FLOW : 100 CC/MIN.
PUMP STOP FLOW : 100 CC/MIN.

RESPIRATOR TYPES : 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

ANALYTICAL RESULTS

COMPOUND	DR #	ING	STEL	MDL	ANALYSIS	8 HOUR	STEL	AREA
					RESULT	TLV/TWA	TLV/TWA	
ETCL	0002-3701	000	0	.01	<.01			
TET	0002-3654	5	0	.01	33.651		8.26	
EDC	0001-8531	10	0	.01	<.01			
PDC	0001-9943	75	110	.01	.481		.16	
PER	0002-3699	50	200	.01	1.553		.36	
P TRI	0002-3687	10	0	.01	<.01			

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

RCL EQUATION : PPM VOLUME OF RCLs IN AIR =

(WEIGHT OF CS2 IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE : CS2 = CARBON DISULFIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
.L = LITERS OF AIR SAMPLED