SUMMARY OF SPECIAL C-8 SAMPLING PROJECT

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In response to the Summary of 1995 C-8 Blood Testing (Playtis, 1995) results, and subsequent 1996 Industrial Hygiene Follow-up Report (Playtis, 1996), an extensive sampling campaign for C-8 in air and on surfaces (wipe testing) was conducted in Teflon* areas. Areas/jobs that exhibited higher or lower than normal C-8 blood levels were studied in the follow-up report. Sampling priorities for this study were assigned based on the results of the follow-up. The investigation was conducted by Environmental Lab LSE Jennifer Nichols under the supervision of IH Lab Technician Becky Dines.

C-8 IN AIR MONITORING

Sample locations, results and any conclusions/pathsforward that were determined are attached (attachment 1). Sampling was conducted using either the Dupont Alpha 2 or P200A pumps with flows set in the range of 200mL/min, +/-5mL/min. Sampling media used was conditioned Tenax* sorbent tubes supplied by the Teflon* lab. Analysis was conducted by Teflon* Lab personnel per method WW3627. Six sets of sampled tubes (206 samples total), along with sample blanks, were analyzed approximately every two weeks.

Set 4, analyzed August 5, 1997, was found to have a high value for the blank sample submitted. Upon investigation by Jennifer Nichols and Chemist Steve Peck, it was found that approximately half of set 4 (including the blank sample) had been contaminated by an impure reagent. For this report, the amount of contaminant in the blank sample will be deducted from each contaminated sample and shown in ( ). After the deduction, a number of samples still exhibited levels worth noting.

The majority of the air samples were taken in FEP and Homopolymer Control Rooms where a considerable amount of the employee time is spent. Additional monitoring was conducted on roof HVAC units (at the intake) that supplied these control rooms. Because a possible route for C-8 exposure could be through the HVAC units, an investigation into these units was conducted and is attached (attachment 2). The focus was placed on the B-162 units because of their close proximity to the C-8 emissions stack located on B-124 (figure 1). Depending on prevailing wind patterns or weather conditions, it was observed that the emission from this stack looped down onto B-162. Weather conditions are summarized with the results (attachment 1); for more detail and observations see notebook S149 R located in Environmental Lab, B-3. The Monomer Control Room was added to the sampling list, although it was not originally a concern, because it has a roof intake that is close to the C-8 emission stack.

Additional samples were taken on the C-8 Recovery Operator while changing HVAC filters, in the FP&D wax room, FP&D Dryer Operators while cleaning the dryers, B-162 smoking area, and the FEP #3 slab drop while in use. Locations were chosen because of information from the industrial hygiene report, or from pathsforward from previous sampling not as extensive as this campaign.

C-8 SURFACE WIPE SAMPLING

Sample locations, results, and conclusions/pathsforward determined are attached (attachment 3). Sampling was conducted using one to three SKC Smear Tabs per location. The solvent used on the tabs was reagent quality methanol; reagent used in the analysis. A sampling template was cut to the size of 100cm(2). Sampling techniques were adapted from OSHA's 'Sampling for Surface Contamination Guidelines'. Pink latex rubber gloves topped with a new pair of clear latex gloves per each sampled area were used to prevent cross contamination between locations.

Forty-seven samples -- 31 from Homopolymers (includes roof samples) and 16 from FEP -- along with a blank sample were submitted for analysis. Analysis was conducted by Teflon* Lab personnel using method WW3627. A recovery study was set up on Pyrex* dishes and aluminum lab pans. Results indicate that as concentrations increase, the percent recovery decreases (figure 3). Many factors (such as evaporation, size of smear tab, dry time) may contribute to this. Because of the field variables (i.e., conditions in the area, type of surface sampled) setting up a thorough recovery study would be time consuming. If future wipe sampling campaigns are conducted and time permits, this should be considered in a pathforward.

The locations chosen for the wipe sampling were coordinated with locations chosen for the air samples. Control rooms (excluding FEP's previous oven and extruder control rooms which were in the process of removal), and the areas that surround the control rooms, were sampled. Additional locations included lunch/breakrooms, a lounge, a smoking area, an office area, warehouses and roof locations. The roof locations were also chosen to coordinate with the air samples and so that as little weather conditions as possible would have affected them (figure 2). Because of shutdown (non-routine work and extensive equipment replacement) sampling locations were limited to those which still exhibited surface 'dirtiness'. The type of material sampled was noted (along with results on attachment 3) and more detail with location sketches can be found in notebook S149 R located in the Environmental Lab, B-3.

Developing a limit, or concern level, for the dermal dose (amount absorbed through the skin) is not feasible due to the many variables involved. These include; amount of C-8 per a surface area, amount of area the skin is exposed to during a shift, fraction of C-8 that would be absorbed into the skin, and the fraction of C-8 that would be picked up from the surface. Calculating an estimated dermal dose could give a result that might deviate from a true value by several degrees. Therefore, this study is designed to identify and compare surface areas that have more residual C-8 than others.

ATTACHMENT 1: AIR SAMPLING RESULTS

This attachment contains individual charts for each sample location.

Information on each chart includes; sample date, result of the sample in moles per billion (MPB), wind direction in the morning and afternoon, weather conditions for that day, and any conclusions or pathsforward that were determined.

C-8 RECOVERY OPERATOR (TTF068/08PM) while changing HVAC filter

DATE	RESULT MPB	WIND MORN/AFTER	WEATHER
07-08-97	<0.01	NE/NE	CLEAR
07-17-97	0.12	NE/NE	CLEAR
08-05-97	0.06	S,SE/S,SE	CLEAR
08-08-97	<0.01	S,SW/SW	CLEAR

CONCLUSION/PATHFORWARD
* ADDITIONAL SAMPLING NEEDED
* VARY PERSONNEL TESTED

MONOMER CONTROL ROOM (TMO100)

DATE	RESULT MPB	WIND MORN/AFTER	WEATHER
07-21-97	<0.01	NE/NE	CLEAR
07-22-97	<0.01	SW/NW,S	CLOUDY
07-23-97	0.02	S/W	CLOUDY
07-24-97	<0.01	S/S	RAIN
07-25-97	0.02	S/E	CLOUDY
07-28-97	0.05	N/N,S	CLOUDY
07-29-97	(0.01)	S/N	CLEAR
07-31-97	(<0.01)	S/N,NW	CLEAR
08-04-97	<0.01	S/S,SE	STORMY
08-05-97	0.13	S,SE/S,SE	CLEAR
08-07-97	<0.01	S/N,NE	CLEAR
08-08-97	<0.01	S,SW/SW	CLEAR
08-12-97	<0.01	S,SE/E	RAIN
08-13-97	<0.01	S/SE	RAIN

CONCLUSION/PATHFORWARD * RESULTS CONSISTENT

* NO FURTHER SAMPLING NEEDED

RJZ021189

EID093259

EID137023

GRANULAR POLYKETTLE CONTROL ROOM (TTF060) area Sample

DATE	RESULT MPB	WIND MORN/AFTER	WEATHER
07-08-97	<0.01	NE/NE	CLEAR
07-09-97	1.91	E/NW	RAIN
07-10-97	<0.01	S/SW	CLEAR
07-11-97	0.11	S/S	CLEAR
07-21-97	<0.01	NE/NE	CLEAR
07-22-97	<0.01	SW/NW,S	CLOUDY
07-23-97	<0.01	S/W	CLOUDY
07-24-97	<0.01	S/S	RAIN
07-25-97	<0.01	S/E	CLOUDY
07-28-97	<0.01	N/N,S	CLOUDY
07-29-97	(1.80)	S/N,	CLEAR
07-31-97	(<0.01)	S/N,NW	CLEAR
08-04-97	<0.01	S/S,SE	STORMY
08-05-97	<0.01	S,SE/S,SE	CLEAR
08-07-97	<0.01	S/N,NE	CLEAR
08-08-97	<0.01	S,SW/SW	CLEAR
08-12-97	<0.01	S,SE/E	RAIN
08-13-97	<0.01	S/SE	RAIN

CONCLUSION/PATHFORWARD * TWO HIGH RESULT INDICATE MORE SAMPLING NEEDED.

* ONE HIGH RESULT WHILE RAINING, AND ONE HIGH RESULT WHILE CLEAR, INDICATES WEATHER NOT A FACTOR.

Blood levels going up

KZA021190

EID093260

EID137024

FP&D AUTOCLAVE CONTROL ROOM (TTF010)

DATE	RESULT MPB	WIND MORN/AFTER	WEATHER
07-09-97	<0.01	E/NW	RAIN
07-10-97	<0.01	S/SW	CLEAR
07-11-97	0.05	S/S	CLEAR
07-21-97	<0.01	NE/NE	CLEAR
07-22-97	<0.01	SW/NW,S	CLOUDY
07-23-97	0.02	S/W	CLOUDY
07-24-97	0.02	S/S	RAIN
07-25-97	0.04	S/E	CLOUDY
07-28-97	0.01	N/N,S	CLOUDY
07-29-97	(<0.01)	S/N	CLEAR
07-31-97	(<0.01)	S/N,NW	CLEAR
08-04-97	<0.01	S/S,SE	STORMY
08-05-97	<0.01	S,SE/S,SE	CLEAR
08-07-97	0.02	S/N,NE	CLEAR
08-08-97	<0.01	S,SW/SW	CLEAR
08-12-97	<0.01	S,SE/E	RAIN
08-13-97	<0.01	S/SE	RAIN

RJZ021191

CONCLUSION/PATHFORWARD * RESULTS CONSISTENT

* NO MORE SAMPLING NECESSARY

EID093261

FINE POWDER FINISHING (DRYER) CONTROL ROOM (TTF031)

DATE	RESULT MPB	WIND MORN/AFTER	WEATHER
07-09-97	<0.01	E/NW	RAIN
07-10-97	0.01	S/SW	CLEAR
07-11-97	0.06	S/S	CLEAR
07-21-97	0.76	NE/NE	CLEAR
07-22-97	0.02	SW/NW,S	CLOUDY
07-23-97	0.33	S/W	CLOUDY
07-24-97	0.05	S/S	RAIN
07-25-97	0.08	S/E	CLOUDY
07-30-97	(0.11)	S/S,SW	CLEAR
07-31-97	(<0.01)	S/N,NW	CLEAR
08-04-97	<0.01	S/S,SE	STORMY
08-05-97	<0.01	S,SE/S,SE	CLEAR
08-06-97	0.03	S/S,SE	CLEAR
08-07-97	0.04	S/N,NE	CLEAR
08-08-97	<0.01	S,SW/SW	CLEAR
08-12-97	<0.01	S,SE/E	RAIN
08-13-97	<0.01	S/SE	RAIN

CONCLUSION/PATHFORWARD * TWO HIGH RESULTS INDICATE MORE SAMPLING NEEDED

RJ2021192

EID093262

EID137026

FINE POWDER FINISHING DRYER OPERATOR (TTF102/08PI)

DATE	PAYROLL #	RESULT MPB
07-14-97	10008	<0.01
07-14-97	4872	2.43
07-25-97	4382	0.26
07-25-97	4824	0.18
08-06-97	10203	0.16
08-06-97	10177	0.06
08-12-97	10214	0.06
08-12-97	4382	<0.01 *
08-12-97	4824	<0.01 *

* ROUTINE WORK, DID NOT CLEAN DRYER

CONCLUSION/PATHFORWARD

* INCIDENT REPORT FOR 7/14 LEVEL INDICATES MECHANICAL INTEGRITY MAY HAVE BEEN RESPONSIBLE FOR ABOVE TLV RESULT
* PLACE HIGH PRIORITY ON FOLLOW-UP
* ADDITIONAL SAMPLING NEEDED WHEN DRYER IS BEING CLEANED

EID093263

EID137027

WAX ROOM (TTF028)

DATE	RESULT MPB	WIND MORN/AFTER	WEATHER
07-09-97	0.06	E/NW	RAIN
07-10-97	0.37	S/SW	CLEAR
07-11-97	0.40	S/S	CLEAR
07-21-97	0.42	NE/NE	CLEAR
07-22-97	0.28	SW/NW,S	CLOUDY
07-23-97	0.52	S/W	CLOUDY
07-24-97	0.43	S/S	RAIN
07-25-97	0.36	S/E	CLOUDY
08-04-97	0.41	S/S,SE	STORMY

CONCLUSION/PATHFORWARD

* CONSISTENT RESULTS
* GIVE ROUTINE SAMPLING FREQUENCY
* SUGGEST ADMINISTRATIVE CONTROL LIMITING TIME INSIDE

MM/21/94

EID093264

B162 2ND LEVEL OUTSIDE SMOKING AREA (TM0048)

DATE	RESULT MPB	WIND MORN/AFTER	WEATHER
07-09-97	0.43	E/NW	RAIN
07-10-97	0.26	S/SW	CLEAR
07-11-97	0.32	S/S	CLEAR
07-21-97	0.17	NE/NE	CLEAR
07-22-97	0.15	SW/NW,S	CLOUDY
07-23-97	0.23	S/W	CLOUDY
07-24-97	0.22	S/S	RAIN
07-25-97	0.23	S/E	CLOUDY
07-30-97	(<0.01)	S/S,SW	CLEAR
08-04-97	0.05	S/S,SE	STORMY
08-07-97	0.06	S/N,NE	CLEAR

CONCLUSION/PATHFORWARD

* RESULTS CONSISTENTLY CLOSE TO ACTION LEVEL
* MOVING SMOKING AREA SUGGESTED
* NO ADDITIONAL SAMPLING NEEDED

EID093265

N. OFFICES ROOF HVAC (TM0045)

DATE	RESULT MPB	WIND MORN/AFTER	WEATHER
07-09-97	0.10	E/NW	RAIN
07-10-97	'SPILLED'	S/SW	CLEAR
07-11-97	0.13	S/S	CLEAR
07-21-97	0.15	NE/NE	CLEAR
07-22-97	0.07	SW/NW,S	CLOUDY
07-23-97	0.11	S/W	CLOUDY
07-24-97	0.14	S/S	RAIN
07-25-97	(0.22)	S/E	CLOUDY

CONCLUSION/PATHFORWARD

* CONSISTENT RESULTS
* DO FOLLOW-UP AIR SAMPLING IN OFFICE IN N. HALLWAY

RJ/02196

EID093266

FP&D AUTOCLAVE CONTROL ROOM INTAKE (TM0045)

DATE	RESULT MPB	WIND MORN/AFTER	WEATHER
07-22-97	0.19	SW/NW,S	CLOUDY
07-23-97	0.51	S/W	CLOUDY
07-24-97	0.96	S/S	RAIN
07-25-97	2.90 -	S/E-	CLOUDY
07-29-97	(0.94)	S/N	CLEAR
08-05-97	0.30	S,SE/S,SE	CLEAR

CONCLUSION/PATHFORWARD
* HIGH RESULTS.
* RESULTS SUPPORT AREA'S CONTINUING EFFORTS TO REDUCE STACK EMISSIONS
* FOLLOW-UP SAMPLING CAMPAIGN AFTER REMEDIATION

EID093267

EID137031

WAX ROOM HVAC INTAKE (TM0045)

DATE	RESULT MPB	WIND MORN/AFTER	WEATHER
07-21-97	0.26	NE/NE	CLEAR
07-22-97	1.21	SW/NW,S	CLOUDY
07-23-97	1.08	S/W	CLOUDY
07-24-97	2.13	S/S	RAIN
07-25-97	0.69	S/E	CLOUDY
07-29-97	2.17	S/N	CLEAR
08-05-97	0.19	S,SE/S,SE	CLEAR

CONCLUSION/PATHFORWARD

* HIGH RESULTS
* RESULTS SUPPORT AREA'S CONTINUING EFFORTS TO REDUCE STACK EMISSIONS
* FOLLOW-UP SAMPLING CAMPAIGN AFTER REMEDIATION

EID093268

EID137032

MONOMER CONTROL ROOM HVAC INTAKE (TM0045)

DATE	RESULT MPB	WIND MORN/AFTER	WEATHER
07-21-97	0.11	NE/NE	CLEAR
07-22-97	0.17	SW/NW,S	CLOUDY
07-23-97	0.16	S/W	CLOUDY
07-24-97	0.39	S/S	RAIN
07-25-97	0.34	S/E	CLOUDY
07-29-97	(0.45)	S/N	CLEAR
08-05-97	0.07	S,SE/S,SE	CLEAR

CONCLUSION/PATHFORWARD

* COMPARING THE CONTROL ROOM RESULTS TO THESE RESULTS, SHOWS THE HVAC FILTERS ARE SERVING A NECESSARY FUNCTION
* FOLLOW-UP SAMPLING CAMPAIGN AFTER REMEDIATION

EID093269

RJZ021199

EID137033

NEW FEP CONTROL ROOM (TCP280)

DATE	RESULT MPB	WIND MORN/AFTER	WEATHER
07-14-97	0.03	NE/NE	CLEAR
07-16-97	0.02	NE/E	CLEAR
07-17-97	0.04	NE/NE	CLEAR
07-18-97	0.01	NE/NE	CLEAR
07-28-97	0.04	N/N,S	CLOUDY
07-29-97	(<0.01)	S/N	CLEAR
07-30-97	(0.01)	S/S,SW	CLEAR
07-31-97	(<0.01)	S/N,NW	CLEAR
08-04-97	<0.01	S/S,SE	STORMY
08-06-97	<0.01	S/S,SE	CLEAR
08-07-97	<0.01	S/N,NE	CLEAR
08-08-97	<0.01	S,SW/SW	CLEAR
08-12-97	<0.01	S,SE/E	RAIN
08-13-97	<0.01	S/SE	RAIN

CONCLUSION/PATHFORWARD * RESULTS CONSISTENT

* NO FURTHER TESTING NECESSARY

EID093270

EID137034

FEP EXTRUDER CONTROL ROOM (TCP268)

DATE	RESULT MPB	WIND MORN/AFTER	WEATHER
07-14-97	0.05	NE/NE	CLEAR
07-16-97	0.04	NE/E	CLEAR
07-17-97	0.04	NE/NE	CLEAR
07-18-97	0.04	NE/NE	CLEAR
07-28-97	0.45	N/N,S	CLOUDY
07-29-97	(<0.01)	S/N	CLEAR
07-30-97	(<0.01)	S/S,SW	CLEAR
07-31-97	(<0.01)	S/N,NW	CLEAR
08-04-97	<0.01	S/S,SE	STORMY
08-06-97	<0.01	S/S,SE	CLEAR
08-08-97	<0.01	S,SW/SW	CLEAR

CONCLUSION/PATHFORWARD * SOME HIGH RESULTS, HOWEVER CONTROL ROOM NO LONGER EXISTS (LOCATED IN NEW CR)

* NO FURTHER TESTING NEEDED

RJ2021201

EID093271

EID137035

FEP OVEN CONTROL ROOM (TCP231)

*POSITON 1 IS EAST-LARGE CONTROL PANEL DESK
*POSITON 2 IS WEST-SMALL CONTROL PANEL DESK

DATE	POSITION 1 MPB	POSITION 2 MPB	WIND MORN/AFTER	WEATHER
07-14-97	0.09	0.18	NE/NE	CLEAR
07-16-97	0.07	0.16	NE/E	CLEAR
07-17-97	4.31	0.08	NE/NE	CLEAR
07-18-97	0.06	1.59	NE/NE	CLEAR
07-28-97	0.19	0.07	N/N,S	CLOUDY
07-29-97	(0.17)	(0.25)	S/N	CLEAR
07-30-97	(0.12)	(<0.01)	S/S,SW	CLEAR
07-31-97	(0.03)	(0.07)	S/N,NW	CLEAR
08-04-97	0.02	0.03	S/S,SE	STORMY
08-06-97	0.05	0.02	S/S,SE	CLEAR
08-07-97	0.04	SPILLED	S/N,NE	CLEAR
08-08-97	<0.01	0.23	S,SW/SW	CLEAR

CONCLUSION/PATHFORWARD

* SOME HIGH RESULTS, HOWEVER CONTROL ROOM HAS BEEN MOVED TO NEW CONTROL ROOM
* NO FURTHER TESTING NEEDED

EID093272

EID137036

FEP POLYKETTLE CONTROL ROOM (TCP215)

*POSITON 1 IS CONTROL PANEL DESK
*POSITON 2 IS WET FINISH DESK

DATE	POSITION 1 MPB	POSITION 2 MPB	WIND MORN/AFTER	WEATHER
07-14-97	0.05	<0.01	NE/NE	CLEAR
07-16-97	<0.01	<0.01	NE/E	CLEAR
07-17-97	<0.01	0.01	NE/NE	CLEAR
07-18-97	<0.01	0.01	NE/NE	CLEAR
07-28-97	<0.01	<0.01	N/N,S	CLOUDY
07-29-97	(0.29)	(0.03)	S/N	CLEAR
07-30-97	(<0.01)	(0.01)	S/S,SW	CLEAR
07-31-97	(<0.01)	(0.04)	S/N,NW	CLEAR
08-04-97	0.48	0.12	S/S,SE	STORMY
08-06-97	<0.01	<0.01	S/S,SE	CLEAR
08-07-97	0.23	<0.01	S/N,NE	CLEAR
08-08-97	0.01	<0.01	S,SW/SW	CLEAR
08-12-97	<0.01	<0.01	S,SE/E	RAIN
08-13-97	<0.01	<0.01	S/SE	RAIN

RM021203

CONCLUSION/PATHFORWARD * RESULTS NOT CONSISTENT

* POSSIBLY MORE SAMPLING, BUT LOWER PRIORITY

EID093273

EID137037

#3 SLAB DROP WHILE IN USE (TCP237)

DATE	RESULT MPB	NOTES
07-28-97	0.37	ONLY RAN PART OF SAMPLE TIME
08-08-97	0.25	RAN ENTIRE SAMPLE TIME

CONCLUSION/PATHFORWARD

* CONSISTENT RESULTS
* MORE SAMPLING NECESSARY

SUMMARY OF PATHFORWARD ITEMS

* ADDITIONAL SAMPLING IS NEEDED ON C-8 RECOVERY OPERATOR (08PM) WHILE CHANGING FILTERS. THE FOUR SAMPLES TAKEN WERE ON THE SAME OPERATOR. EACH AREA HAS OPERATORS WHO CHANGE FILTERS. TESTING ADDITIONAL PERSONNEL/FILTER COMBINATIONS RECOMMENDED.

* SOME AREAS HAD A FEW HIGH RESULTS WHILE MIXED IN WITH LOW RESULTS. ADDITIONAL SAMPLING IN THOSE AREAS IS NEEDED. THEY INCLUDE:

  GRANULAR POLYKETTLE CONTROL ROOM (TTF060)

  FINE POWDER FINISHING (DRYER) CONTROL ROOM (TTF031)

  FEP POLYKETTLE CONTROL ROOM (TCP215)-low priority

* IN THE PAST, THE WAX ROOM (TTF028) HAS SHOWN HIGH RESULTS. THIS IS CONFIRMED IN THAT EIGHT OF THE NINE SAMPLES IN THIS STUDY WERE OVER THE ACTION LEVEL. ADMINISTRATIVE CONTROLS ARE SUGGESTED ON AMOUNT OF TIME SPENT INSIDE THE ROOM. RENEW FREQUENCY FOR ROUTINE SAMPLING.

* THE #3 SLAB DROP (TCP237) IS A DIFFICULT SAMPLE TO GET DUE TO ITS LIMITED OPERATION. IT HAD BEEN TARGETED IN THE PAST AS A TROUBLE AREA AND THESE RESULTS CONFIRM THERE IS APPRECIABLE LEVELS. IT WAS BROUGHT TO OUR ATTENTION THAT THE BEST TIME TO SAMPLE THIS LOCATION WOULD BE WHEN THE PRODUCTS 100 OR S100 ARE RUNNING AS THEY ARE FINE POWDERED AND RUN FAST. ADDITIONAL SAMPLING IS NEEDED DURING THESE CONDITIONS.

* THE B-162 SECOND LEVEL SMOKING AREA (TM0048) SHOWED CONSISTENT VALUES CLOSE TO THE ACTION LEVEL (0.28 MPB) INDICATING THE NECESSITY TO FIND AN ALTERNATE SMOKING AREA.

* ONE CONCERN IS THE FINE POWDER FINISHING DRYER OPERATOR (08PI) WHILE CLEANING THE DRYERS. ONE RESULT WAS HIGH (2.4 MPB) WHILE CLEANING DRYER #3. DRYER #3 CONTAINED A BELT (SHOULD MINIMIZE EXPOSURE) RATHER THAN THE PAPER USED ON DRYER #2. SINCE SHUTDOWN, BOTH DRYERS NOW CONTAIN THE BELT. INCIDENT REPORT, FDL970015, FOR THE HIGH RESULT INDICATED MECHANICAL INTEGRITY MAY HAVE BEEN RESPONSIBLE. THIS WAS THE ONLY SAMPLE TAKEN ON THE #3 DRYER, THEREFORE FOLLOW-UP SAMPLES ON THIS UNIT SHOULD BE DONE. A HIGH PRIORITY IS PLACED ON THIS FOLLOW-UP.

* THE ROOF SAMPLES DEMONSTRATE A NEED FOR BETTER CONTROLS ON THE C-8 STACK EMISSIONS AND/OR LIMITING THE TIME SPENT (WITHOUT A RESPIRATOR) ON THE ROOF. LOCATIONS CLOSEST TO THE STACK SHOWED LOWER LEVELS THAN THOSE TO THE SOUTH (FIGURE 4) DEMONSTRATING A LOOPING EFFECT OF THE EMISSION. AS STATED BEFORE, ON SEVERAL OCCASIONS WHEN I WAS ON THE ROOF I WITNESSED THE EMISSION LOOPING EFFECT (DEPENDING ON THE WEATHER). FOLLOW-UP SAMPLING CAMPAIGN SUGGESTED AFTER REMEDIATION.

* SAMPLING BROUGHT TO OUR ATTENTION BUT NOT ACCOMPLISHED IN THIS CAMPAIGN, INCLUDED THE JOB 90/50 PACKOUT BY THE WET FINISH OPERATOR. THIS PRODUCT IS INFREQUENTLY PRODUCED MAKING SAMPLES DIFFICULT TO GET. FUTURE SAMPLES FOR C-8 AND NUISANCE DUST ARE NEEDED.

* SPECIAL ATTENTION SHOULD BE PAID TO THE AREA WHERE FRESH C-8 IS STORED (OUTSIDE OF THE GRANULAR POLYKETTLE CONTROL ROOM). IN THE DEC. 18, 1996 MEMORANDUM (FOLLOW UP TO BLOOD TESTING) IT WAS CONCLUDED THAT THERE WAS NO DRIP PAN UNDER THE TANK'S SPIGOT AND ONE SHOULD BE PLACED THERE IMMEDIATELY. DURING AIR SAMPLING THERE WAS A BUCKET COLLECTING THE DRIP. DURING WIPE SAMPLING THE BUCKET WAS NO LONGER THERE AND WET C-8 WAS DRIPPING AND ACCUMULATING ON THE FLOOR. THIS IS A HIGH TRAFFIC AREA AND IT WOULD BE EASY TO TRACK DRIED C-8 INTO OFFICES, CONTROL ROOMS, ETC. NOT ONLY IS THE CATCH BUCKET VERY IMPORTANT, BUT IT IS RECOMMENDED TO FIX THE SPIGOT TO REMEDIATE THE DRIP.

ATTACHMENT 2: INVESTIGATION OF HVAC SYSTEMS

This attachment contains information on HVAC systems supplying the control rooms and other pertinent locations sampled.

The information was obtained by interviewing various Teflon* personnel as no known single person has a thorough knowledge of the HVAC units.

GRANULAR POLYKETTLE CONTROL ROOM (TTF060)

THIS CR HAS AN INTERNAL UNIT TO THE RIGHT AS YOU ENTER THE DOOR. AS YOU PASS INTO THE COMPUTER AREA YOU CAN SEE A VENT OF MAKE-UP AIR WHICH WAS TRACED INTO THE WAX ROOM VENTILATION SYSTEM.

FP&D AUTOCLAVE CONTROL ROOM (TTF010)

THIS CR'S SYSTEM IS LOCATED ON THE ROOF (FIG. 1). THE INTAKE IS LOCATED ON TOP OF THE RETURN FAN SYSTEM (AC UNIT IS CONNECTED TO THIS).

FINE POWDER FINISHING DRYER CONTROL ROOM (TTF031)

THIS CR'S SYSTEM IS INTERNAL WITH (SUPPOSIBLY) NO MAKE-UP AIR. THE CR IS LOCATED BETWEEN DRYER CORRIDORS. THERE IS A HVAC UNIT ON THE ROOF FOR THE DRYER AREA WHICH HAS ITS DUCT WORK RUNNING THROUGH THE CEILING UNIT OF THE CR. IT THEN BRANCHES OFF AND HANGS OVER TOP OF THE DRYERS ALONG EACH CORRIDOR. THERE IS A LARGE (SAUCER SIZE) HOLE IN THE CEILING OF THE CR WHICH COULD PROVIDE MAKE-UP AIR. THIS IS A SMALL CR WITH DOORS ON BOTH SIDES WHICH ARE FREQUENTLY USED.

WAX ROOM (TTF028)

THERE IS AN OUTSIDE DOOR WHICH IS FREQUENTLY LEFT OPEN FOR VENTILATION BUT OCCASIONALLY ITS BEEN SHUT. THE HVAC UNIT IS LOCATED ON THE ROOF (FIG. 1).

N. OFFICES ROOF HVAC

THIS UNIT IS ON THE SAME LEVEL AS OTHERS BUT, APPEARS TO SIT LOWER BECAUSE IT IS FLUSH WITH THE GROUND. IT IS CLOSEST TO THE C-8 STACK (FIG. 1).

MONOMER CONTROL ROOM (TM0100)

THERE IS A ROOF UNIT MARKED CCR AND COMPUTER #1 UNIT. A SECOND UNIT, WEST OF IT, IS MARKED COMPUTER #2 UNIT. THESE ARE DIRECTLY ACROSS FROM THE C-8 STACK (FIG. 1).

SMOKING AREA

THIS AREA IS ONE MORE LEVEL DOWN THAN THE SAMPLING AREA OF THE HVAC UNITS. THE C-8 STACK IS LOCATED DIRECTLY UP AND A LITTLE LEFT. THERE IS A SMALL VENT (12" X 12") LOCATED ABOVE BLOWING OUT. IT WAS TRACED TO THE MEN'S RESTROOM IN THE NORTH OFFICES HALLWAY (1ST ON RIGHT). IT IS SUPPLIED BY THE N. OFFICES ROOF HVAC.

NEW FEP CONTROL ROOM (TCP280)

THIS CR HAS AN INTERNAL UNIT WITH NO MAKE-UP AIR. ON A SAMPLE DROP OFF, I NOTED A PAINT FUME SMELL INSIDE THE CR. THE ODOR WAS NOT PRESENT JUST OUTSIDE THE CR IN THE EXTRUSION AREA.

FEP EXTRUDER CONTROL ROOM (TCP268)

THIS ROOM HAS TWO WINDOW UNITS THAT COMPRISE ITS SYSTEM.

FEP OVEN CONTROL ROOM (TCP231)

HVAC UNIT IS LOCATED ON THE OUTSIDE OF THE NORTH WALL OF THE CONTROL ROOM. IT IS BESIDE OF THE NUMBER TWO OVEN ENTRANCE AND SURROUNDED BY THE CONVEYER SYSTEM THAT CARRIES THE POWDER PRODUCT INTO THE OVEN (AREA GETS VERY DUSTY AT TIMES). IT APPEARS THAT MAKE-UP AIR COMES FROM A UNIT LOCATED JUST ABOVE THE AC. THERE IS WHITE RESIDUE ON THE INTAKE COVER.

FEP POLYKETTLE CONTROL ROOM (TCP215)

THIS CONTROL ROOM HAS A ROOF UNIT, LOCATION IS UNDETERMINED AT THIS POINT.

* NOTE: BOTH THE FEP OVEN CR AND THE FEP EXTRUDER CR WILL BE MOVING INTO THE NEW CONTROL ROOM DURING SHUTDOWN. THE EXTRUDER CONTROL ROOM WILL BE COMPLETELY REMOVED AND THE OVEN CONTROL ROOM WILL REMAIN TO HOUSE COMPUTER SYSTEMS.

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ATTACHMENT 3: SURFACE WIPE SAMPLING RESULTS

This attachment contains charts for samples in Homopolymers and Fep areas.

Information on each chart includes: a description of the location, the type of surface that was wiped, and the results reported in micrograms (ug).

HOMOPOLYMER (BLDG 162) AREAS

LOCATION	SURFACE	RESULTS(ug)
Fine Powder Finishing (Dryer) Control Room		
-top of monitor	plastic	62.2
-in Foreman's room adjacent to monitor room on top of cabinet in rear corner	painted metal	40.1
Dryer Area		
-behind Control Room at Clean Room end of dryers on top of cabinets	painted metal	310.2
-Dry Screen Room on blue switch boxes for moisture analyzer	painted metal	36.8
-in front of Dry Screen Room (Wax Room end) on small metal shelf on #2 Dryer side	metal	124.8
-along west wall by #3 Dryer on top of yellow breathing air box	painted metal	29.3
Packout Dispersion Area		
-at small control panel (across from stairwell doorway) on top of face shield box	clear plastic	27.2
Warehouse		
-behind the packout dispersion area on tan supply cabinet by desk	painted metal	31.1
Autoclave Control Room		
-on top of refrigerator	painted metal	23.2
-on top of long shelf that has monitors sitting on it	laminated wood	48.3
Autoclave/Polykettle Control Room area		
-on top of tan filing cabinet roughly in-between each Control Room	painted metal	28.6

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Polykettle Control Room Area		
-outside door on the stand that holds the fresh C-8 tank	metal	4476.8
-small white refrigerator to the left of mixing hood by C-8 tank	painted metal	77.4
Polykettle Control Room		
-on top of black coat rack inside door	painted metal	4.5
-on top of microwave	plastic covered	21.2
-doorknob, as you enter Control Room (roughly 100cm(2) area)	metal	1.1
Monomer Control Room		
-on top of monitor at far end (from door) of control panel	plastic	23.4
-on top of monitor in middle of control panel	plastic	8.4
-on top of monitor (under vent) in computer/monitor room adjacent to control area	plastic	15.3
Lunchroom		
-(in Monomer Control Room area) on top of beige refrigerator	painted metal	16.3
N. Offices area		
-(off of corridor by Monomer Control Room) last office on left (Ruth) on filing cabinet right of desk	painted metal	17.5
Womens Lounge		
-(across from door to smoking area) on top of microwave	plastic covered	26.9
Smoking area		
-on top of vent above the bench	metal	25.8
-collected sample of dust in vent (weighing 0.09351 grams)	-	11.0

C-8 Recovery Control Room -on top of small silver box on wall to the right as you enter	metal	154.8
C-8 Recovery Control Room area -positioned approximately in the middle of the entire area on only flat surface that was dirty	metal	82.8
Roof area (see figure 2) -at west end of Monomer Control Room hvac unit on top of small box underneath of larger safety switch box	metal	11.2
-on underside of the N. Offices hvac unit intake	metal	15.6
-on small ledge at bottom of Wax Room HVAC unit's intake	metal	16.4
-on base of the backside (wax unit side) of the FPDryer area and clave ingredient hood exhaust	metal	28.5
-on inside ledge of north end of AC part of the Autoclave Control Room HVAC unit	metal	29.7

FEP (BLDG. 163) AREAS

LOCATION	SURFACE	RESULTS(ug)
New Control Room -on top of monitor along dividing wall	plastic	1.9
#3 Slab Drop -inside on small ledge to left	painted metal	18.3
Oven Area -on top of breathing air station 34 black box in-between Oven #2 and conveyer system	painted metal	2.6
-on blue box on wall inbetween Oven #2 and the old Oven Control Room	painted metal	4.5
-on top of old Oven Control Room AC unit behind Control Room in front of conveyer system	painted metal	7.8
-on blue 'check scale' panel box in-between conveyer system and Oven #1	painted metal	4.7
-on top of storage cabinets along back wall across from Oven #3	metal	6.5
Warehouse -(warehouse along turnaround area) on top of box for safety glasses beside of door from turnaround area	painted wood	26.7
Extruder Area -on top of lockers against the wall beside of the old Extruder Control Room	painted metal	15.2
-on top of white exhaust vent on HVAC unit in southwest corner of area (to the side of doorway to hallway offices)	painted metal	13.8

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Dispersion Packout area -on top of desk/storage stand inbetween the Dispersion Packout pad and wash basin	metal	26.5
Dry Flake Packout area -on top of black air mask box at breathing air station 18	painted metal	8.2
Stairwell -(in-between Dispersion Packout and Dry Flake Packout leading to second floor) on ledge halfway up stairs	metal	25.5
Second Floor Polykettle Control Room -at far end (from door) of control area on top of box that houses two monitors	laminated wood	6.1
Fluff area -small blue box under large blue box on wall around corner from breakroom across from stetcher	painted metal	9.9
Breakroom -(across from Polykettle Control Room) on top of brown vending machine	painted metal	4.1
#1 Flake Storage Hopper -at front end of Polykettle Control Room	metal	83.4

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WIPE SAMPLING
CONCLUSIONS/PATHSFORWARD

* Homopolymers exhibited higher residual C-8 levels than FEP overall.
* Wipe samples were collected well into shutdown. Once Teflon* is up and running for a while, selecting a few locations sampled in this project to see how it would compare is recommended.
* Setting a routine frequency for wipe sampling is not necessary.

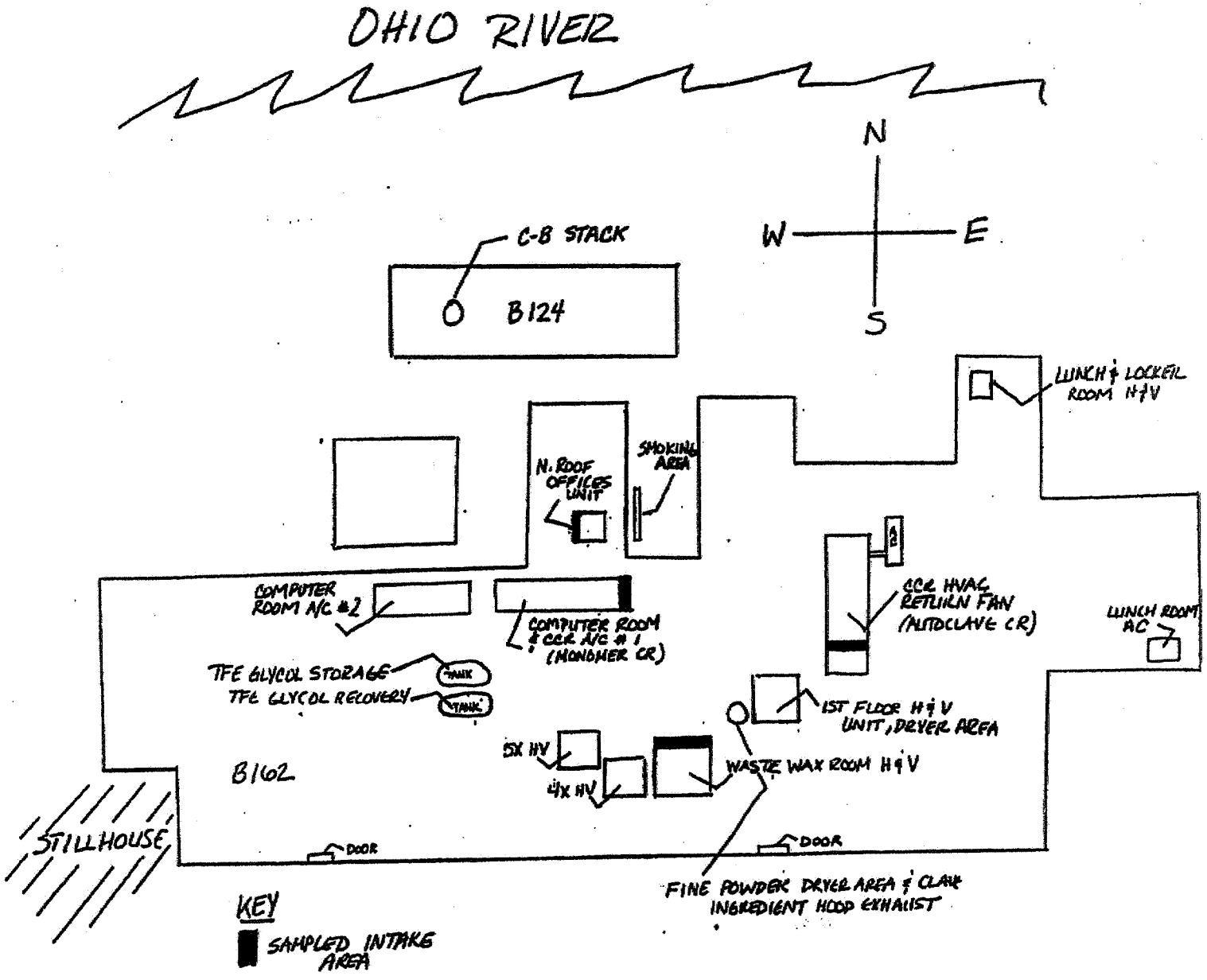

FIGURE 1: DRYER HVAC SAMPLING LOCATIONS (AIR)

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C-8 SAMPLING PROJECT PAGE 3 OF

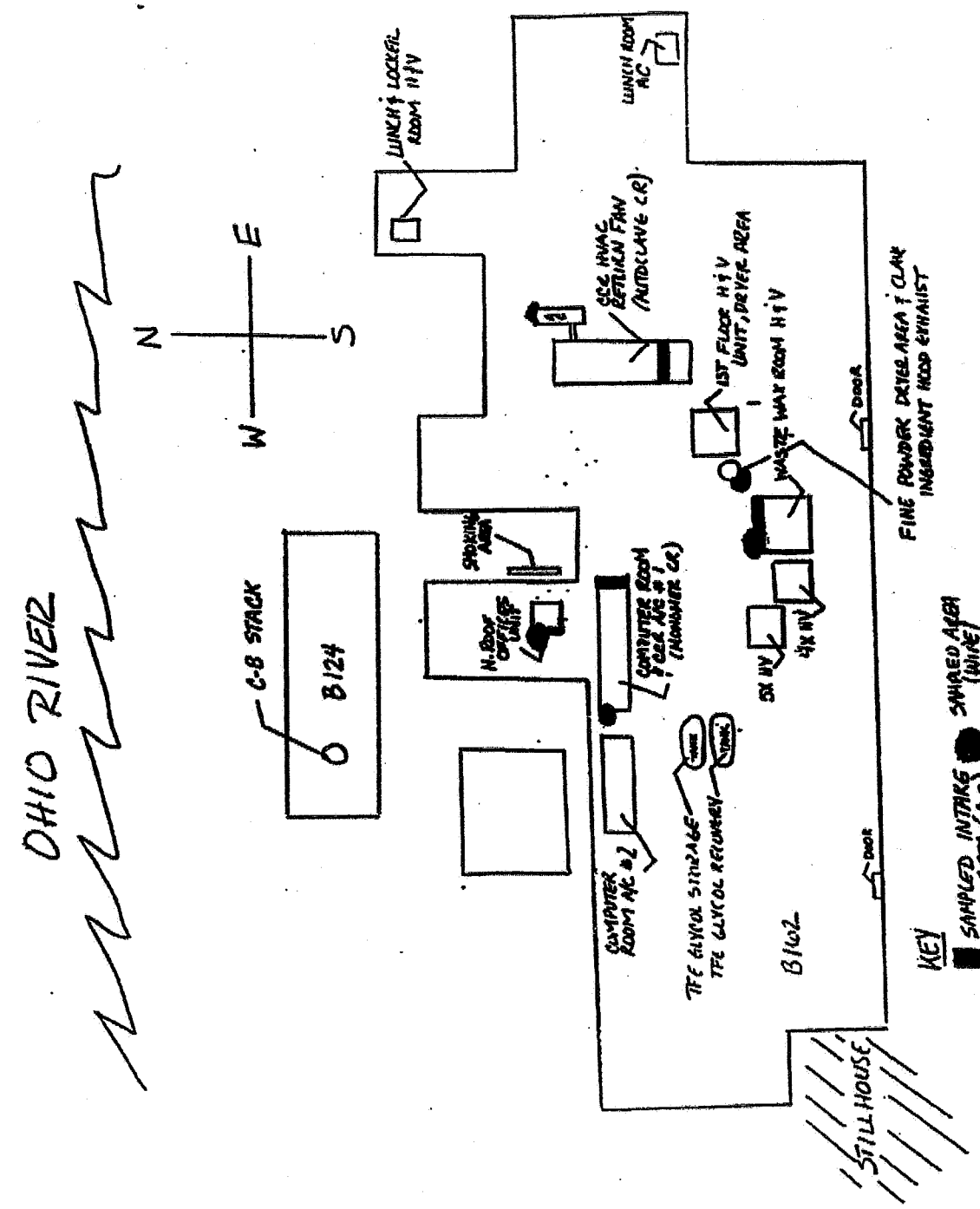

FIGURE 2: ROOF SAMPLING LOCATIONS (WIPE)

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MEDIA	uG SPIKED	uG RECOVERED	% RECOVERY	
GLASS	0	0.7	-	
GLASS	0	17.0	-	
GLASS	100	74.3	74%	79%
GLASS	100	83.3	83%	
GLASS	200	127.9	64%	66%
GLASS	200	134.6	67%	
GLASS	300	201.2	67%	65%
GLASS	300	190.8	64%	
GLASS	400	201.8	50%	57%
GLASS	400	254.3	64%	
GLASS	500	250.0	50%	54%
GLASS	500	286.5	57%	
GLASS	700	367.5	53%	43%
GLASS	700	235.6	34%	

*ALL THE ABOVE SAMPLES WERE LEFT TO DRY IN A DESSICATOR OVEN

GLASS	100	27.6	28%
GLASS	500	122.7	24%
TIN	100	51.6	52%
TIN	500	181.7	36%

*THE FOUR ABOVE SAMPLES WERE LEFT TO DRY IN A REGULAR HOOD

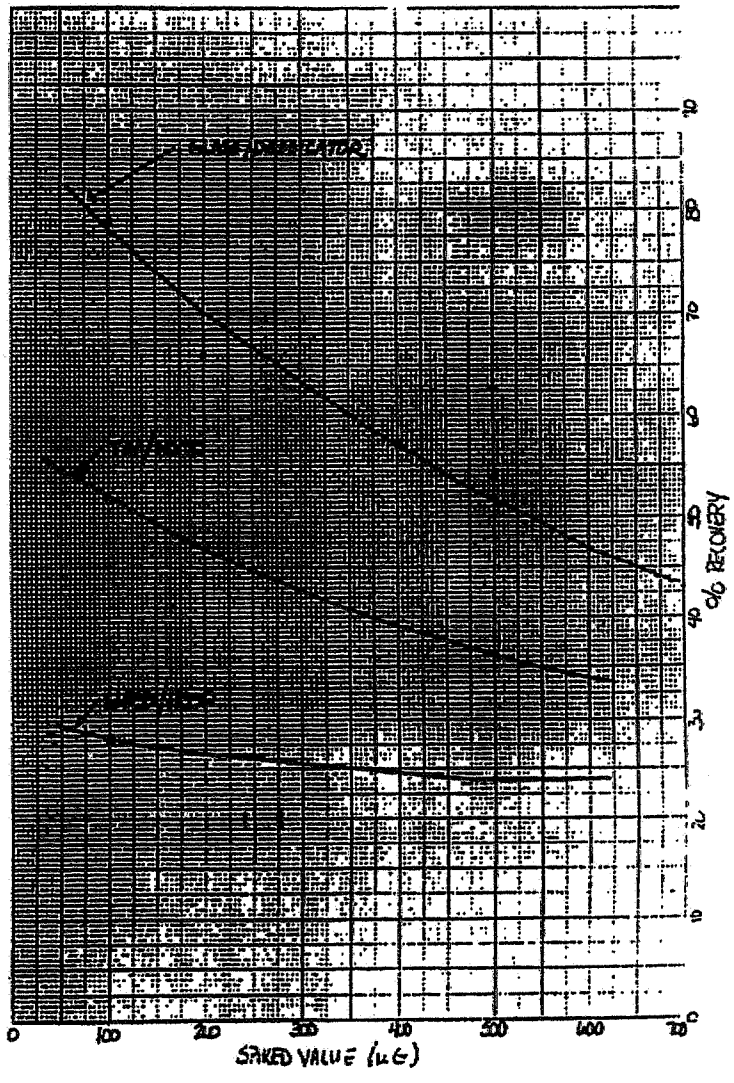

FIGURE 3: PERCENT RECOVERY OF WIPE SAMPLES

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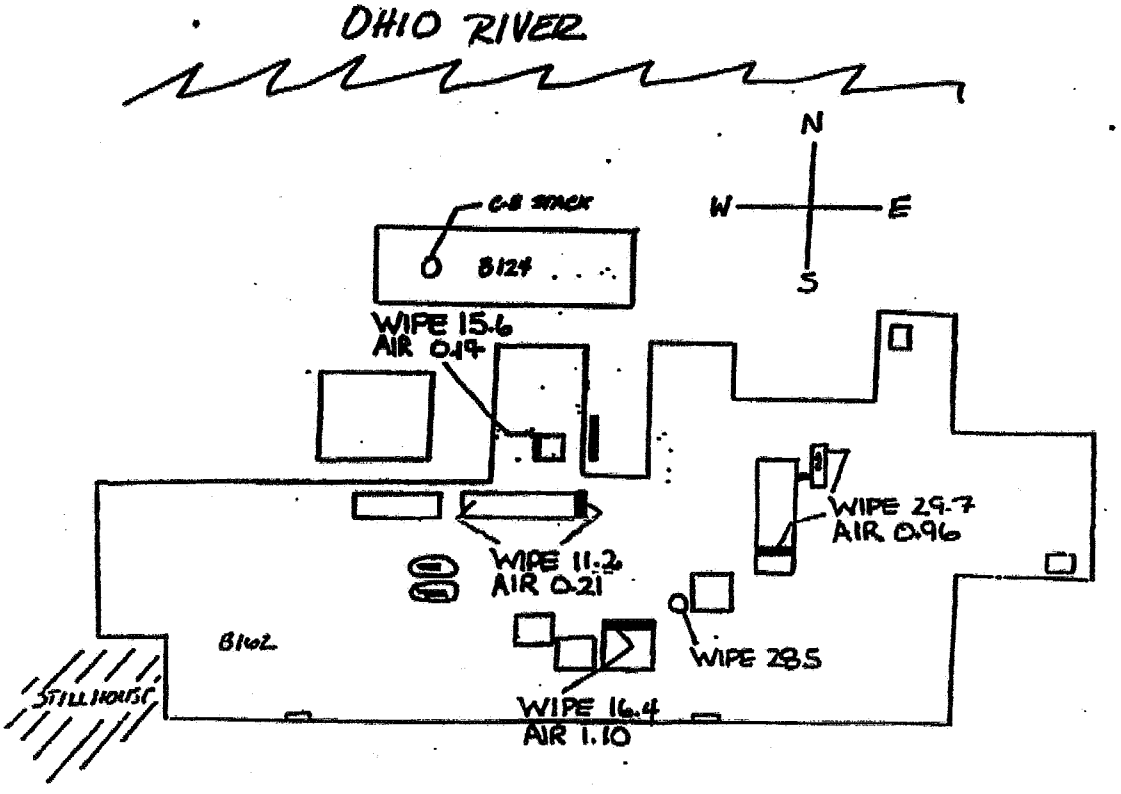
C-6 SAMPLING PROJECT PAGE 39 OF

FIGURE 4: AVERAGE VALUES AT ROOF LOCATIONS

*excludes contaminated samples

LOCATION	AIR(MPB)	WIPE(ug)
N.OFFICES	.17	15.6
MONOMER CR	.21	11.2
WAX ROOM	1.10	16.4
AUTOCLAVE CR	.96	29.7
HOOD EXHAUST	-	28.5



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