PROTOCOL

AKWESASNE BREAST MILK MONITORING PROGRAM

BACKGROUND

Akwesasne is a native American community located along the St. Lawrence River near Massena. It occupies approximately 14,000 acres in New York, Ontario, and Quebec and is inhabited by 7,000 Mohawks. The population has become increasingly alarmed about the effects of pollution on their environment and health, given the industrialization of the area after the opening of the St. Lawrence Seaway in 1954. One issue is fluoride pollution from two aluminum plants along the River. A more recent problem is the contamination of sediment, surface soil and water from the illegal disposal of PCBs and other chemicals by a nearby industry at sites now designated by the Environmental Protection Agency for remediation under Superfund. Superimposed upon these local concerns is the pollution of the St. Lawrence River Basin in general by DDT, mirex, methyl mercury, and other contaminants.

There is evidence that these chemicals have affected the local flora and fauna. High levels of fluoride have been found in vegetation, for example, and dental fluorosis has been observed in cattle from Cornwall Island (1). Elevated fat concentrations of PCBs have been detected in moles, frogs, turtles and other animals taken near the dumpsites and in fish collected from the River (2). Studies of human health effects, however, have been negative. An investigation of dental defects among Mohawk children, for instance, determined that the probable cause was the use of the antibiotic tetracycline and not fluoride exposure (3). Another study found that the concentrations of inorganic fluorides in urine and blood were no greater among Akwesasne residents than in persons who drink fluoridated water; physical examinations, radiologic and pulmonary function studies, and laboratory tests did not reveal

any health conditions attributable to fluoride (4). Similar results were obtained in analyses of methyl mercury, PCBs, and mirex (5). The authors nevertheless recommended that the consumption of contaminated fish, be limited, especially among children, women of childbearing age, and pregnant and nursing women. This recommendation was based in the potential of PCBs, methyl mercury, and mirex to cause adverse reproductive effects in humans or animals (6-8).

OBJECTIVES

The purpose of this study is to investigate the concentrations of polychlorinated hydrocarbons in the breast milk of Mohawk women. Although breast milk contamination is a measurement of absorption and not a health effect, it is relevant to the question of adverse reproductive outcomes, since they are dependent upon dose and because breast milk is the major source of exposure to environmental contaminants among breastfed infants (9).

The objectives are two-fold: 1) to determine if the concentrations of PCB congeners, total PCB, p,p-DDE, hexachlorobenzene and mirex in milk samples are greater among Akwesasne residents compared to a semi-rural control population of women from other areas of New York, and 2) to identify residential, occupational, dietary, and other factors which correlate with contaminant levels. The samples will also be screened for "dioxin-like" activity using an *in vitro* bioassay. In addition, fat content and total milk solids will be analyzed to assess the general nutritional value of the milk.

METHOD

Program Participants

Volunteers will be recruited by Katsi Cook, a Mohawk midwife, from a registry obtained through WIC and other outreach programs of all pregnant and

lactating women at Akwesasne. She will stress a positive theme when approaching the women by reassuring them that the testing is being done to help them feel confident in their decision to nurse (Appendix A). Those who agree to participate will be asked to sign an informed consent form (Appendix B).

Ms. Cook will interview the participants at their homes two to four weeks post-partum, using a standard instrument (Appendix C) to acquire data regarding sociodemographic characteristics, height, weight, and residential, occupational, and reproductive histories, as well as diet and health habits before, during, and after their last pregnancy. An appointment will then be made for a return visit, at which time a breast milk sample will be taken. During the week before the sampling date, the women will be asked to complete a diary (Appendix D) listing all food that they consume.

Controls

Comparative data will be collected from women who live in areas of New York State other than the St. Lawrence River-Great Lakes Basin. For convenience, rural locations within a 100 mile radius of Albany will be selected. Under consideration is Essex County. Volunteers will be recruited through contacts with the Albany Regional Office and the local WIC clinic. Instead of matching the controls to Mohawk women on factors such as age and parity, potential confounding influences will be controlled for in the analysis (cf page 6).

Staff from the Bureau of Environmental Epidemiology and Occupational Health will interview the control women two to four weeks post-partum using a version of the same instrument that will be employed for the Mohawk mothers. A dietary diary and a signed informed consent form will also be obtained.

Sampling Procedure and Chemical Analysis

The milk samples will be obtained after the second morning nursing (generally 9 to 11 AM). That period is usually when the fat content of human breast milk is the highest, and since polychlorinated hydrocarbons are lipoplilic, sampling at that time is expected to yield maximal concentrations for each individual (10). At least 25 g will be collected through the use of the Marshall - Kaneson breastpump. A second sample will be similarly collected from each participant after an interval of one to two months, at which time a second dietary diary will also be requested. They will be stored in glass vials with Teflon caps and frozen until delivery to the Wadsworth Center for Laboratories and Research.

After weighing, each sample will be extracted with benzene and ethanol. Three further extractions with benzene and hexane will follow. The extracts will then be bulked, evaporated, and additional hexane added as necessary to obtain a volume of 25 ml. The fat content will be determined by evaporating 5 ml in a tared aluminum pan. Total milk solids will be measured by evaporating 1 ml. After the evaporation of another 10 ml to approximately 2 ml, Florisil clean-up and gas chromatography will be performed to determine the concentrations of 75 PCB congeners, total PCB p,p-DDE, hexachlorobenzene and mirex (11). Quality assurance will be maintained by analyzing gas chromotography controls every fifth analysis and cow milk controls containing known concentrations of PCB within each run, or for long runs, every tenth sample. (See appendix E).

The laboratory also plans to analyze 10 ml of milk for "dioxin-like" activity with a short-term bioassay. The assay is based on an *in vitro* model of the *in vivo* chloracne response to dioxin exposure (12). It uses the keratinization of epithelial cell cultures known to be induced by chlorinated

dibenzo-p-dioxins as an endpoint. This endpoint is evaluated by eye, using intensity of the keratin-specific stain, Rhodamine B, as a marker. The procedure is useful as a rapid, semi-quantitative screen for dioxin. If a sufficient number of samples show positive activity, it may be worthwhile to analyze samples for the presence of 2,3,7,8-tetrachlorodibenzeno-p-dioxin and 2,3,7,8-tetrachlorodibenzofuran by mass spectrometry. The remaining milk will be refrozen and archived for any future analyses, e.g., fluoride or methyl mercury.

The release of the results for the Mohawk women will be coordinated through Dr. Ben Kelly, a staff physician with the St. Regis Mohawk Health Services. Personal physicians will be the conduit for information to the control mothers. Data provided will include contaminant concentrations (expressed on both a whole milk and fat basis) and also levels of fat and total milk solids for each sample. Comparative data from other New York (13) and U.S. surveys (14, 15) will be provided for reference purposes. Information regarding any health risks associated with specific contamination levels is being compiled in conjunction with the Bureau of Toxic Substances Assessment and will be transmitted with the results. Each woman will be notified when her results are mailed to Dr. Gorman or her personal physician and will be urged to meet with him or her to discuss them. To maintain credibility with and motivation among the program participants, turnaround time for the analysis and mailing of results will be 6 weeks or less.

Statistical Analysis

T-tests for independent samples will be used to determine whether the mean concentrations of PCB congeners, total PCB, p,p-DDE, hexachlorobenzene and mirex in the breast milk of the Mohawk population differ significantly

(two-tailed p 0.05) from those in the comparison group. Logarithmic transformations will be performed if necessary to normalize the distributions and stabilize the variances. Analysis of covariance will be employed to adjust for potential confounders such as maternal age and fat content (16).

Analyses will also be conducted to identify any variables that are significantly related to breast milk contaminant levels within the Mohawk and control populations. The risk factors of interest include location and duration of residence, parity and other reproductive characteristics, diet, and health habits such as cigarette smoking. The concentrations of contaminants found in samples of soil, water, fish, and wildlife taken by the Bureau of Toxic Substances Assessment or the Department of Environmental Conservation will be incorporated with the questionnaire data whenever possible to help quantity exposure. Analysis of variance will be the primary statistical technique for categorical variables, while parametric and non-parametric correlation coefficients will be calculated for continuous factors. Methods such as covariance adjustment and partial correlation will be used to control for potential confounders.

To identify which factors may be responsible if a significant difference between the Mohawk and control populations is observed, the chi-square test will be used to compare occupational histories, reproductive experiences, diet, and health habits. If associations are found, e.g., Mohawk women may be more likely to consume local fish and game, and if the variables in question are also significant correlates of breast milk contamination levels, then multiple regression analyses of the various contaminants will be performed incorporating such variables into the models to control for their effects (17).

Sample Size

Preliminary estimates indicate a likely study enrollment of three Mohawk and three control women per month. After one year, a difference between the Mohawk and control populations of approximately 7% in the mean concentration of a given pollutant will be detectable with a power of 80% and a two-tailed type I error rate of 5%, assuming a relative standard deviation of 10%. At least three years of data, however, would probably be necessary before detailed analyses of breast milk contamination levels by residence, diet, reproductive experience, and other factors would be feasible, given the likelihood of small cell frequencies.

CONFIDENTIALITY

The data collected for this study are protected from disclosure by Section 206 (1)j of the Public Health Law. Personal identifiers will be used only to locate study subjects. The front page of the mail questionnaire contains such identifiers, but it will be separated from the remaining pages upon receipt by the New York State Department of Health. The later pages contain only an identification number. All information will be kept in locked file cabinets and will be accessible only to authorized study personnel.

SIGNIFICANCE

The proposed investigation is significant for two reasons. Firstly, it provides both the Mohawk and control mothers with an important service by empirically assessing some factors pertaining to the quality of their breast milk. Such information may be helpful to a mother in her decisions concerning whether and how long to nurse her baby and may alleviate anxiety and its possible adverse effect on the mother-infant pair (18). Secondly, the study assists in the development of a database to help assess the impact of

environmental pollution at Akwesasne by collecting body burden data indicative of absorption. Breast milk has not been studied in any previous examination of the health and well-being of Awkwesasne residents. If high levels of contaminants are found, then follow-up studies of the infants may be warranted. It is a collaborative project involving the St. Regis Mohawk Health Services, the Environmental Health Branch of the St. Regis Band Council, and the Woman's Dance Health Project of the Seventh Generation Fund, and it reflects the public health concerns of the community.

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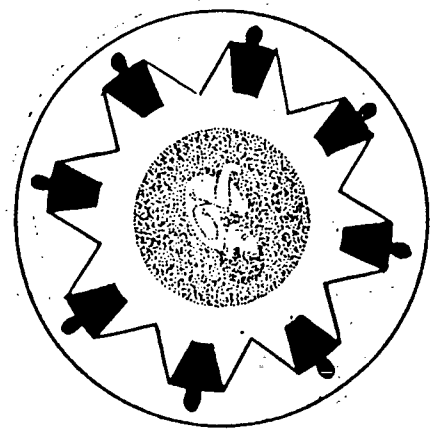
APPENDIX A

The Akwesasne Mother's Milk Project is a joint effort of the St.Regis Mohawk Health Services, the Environmental Health Branch of the St.Regis Band Council, and the Akwesasne Envoronment/ MMP Seventh Generation Fund.

Akwesasne Mother's milk Project



...a mohawk women's research project for the health of our future generations

Purpose:

1. To assure Mohawk mothers of the quality of their milk.

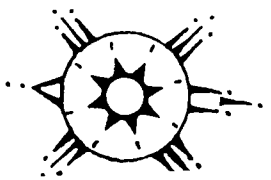
2. To develop a data base of information on mother's milk at Akwesasne to be included in ongoing environmental health studies.

Methods:

1. Once you register to participate,we will contact you by phone or mail to arrange a visit with you in your home.This is a good time to ask any questions you may have about breastfeeding or baby care.

2. A sample of your breastmilk will be collected in a small specimen bottle by hand expression or breast pump,whichever is most comfortable for you.

3. We will need to do an interview with you which asks questions like,What do you eat? Where have you lived? Have you been occupationally exposed to any known contaminants?



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WE NEED YOUR PARTICIPATION :

- If you're pregnant,or are a nursing mother, please register with the project by completing the form on the next page.

- If you have a friend or relative who is pregnant or breastfeeding,please give her a copy of this pamphlet.

- If you are interested in more information on the project,or in more information on environmental and reproductive issues, please fill in the form.

Confidential

All information obtained during the interviews and milk sample collection will be kept confidential. Each participant will be kept informed of the research process,and will receive a copy of the results of the testing of her milk sample.

Date _____

Name _____

Address _____

_____

Phone _____

[] I am pregnant and my due date is _____.

[] I am breastfeeding now and my baby is _____months old.

[] Yes,I would like more information about environmental and reproductive health issues.

If you have any questions about breastfeeding,please contact:

Beverly Cook, R.N. Clinic
Wendy Wolf, Nutritionist
Louise Cook, R.N. Medical Outreach

Phone: 358-2272

APPENDIX B

Participant Informed Consent Form - Akwesasne Breast Milk Monitoring Program

Participant's Name: _____

Participant's Address: _____

_____

The New York State Department of Health, the St. Regis Mohawk Health Services, the Environmental Health Branch of the St. Regis Band Council, and the Women's Dance Health Project of the Seventh Generation Fund are jointly conducting a medical research study of environmental contamination in the breast milk of women who reside at Akwesasne. We would like you to participate by providing us with samples of your breast milk on two occasions, one to two months apart. We will also ask you to complete a 20 minute interview. It includes questions about your occupational, reproductive, residential, social and dietary histories. We will then request that you complete a diary listing all the foods that you consumed during the week before you gave us a milk sample.

Dr. David Gorman of the St. Regis Mohawk Health Services will be given a copy of the results of the chemical analysis of your milk. It will include levels of PCB's, DDE, hexachlorobenzene, and mirex. We also plan to screen for 'dioxin-like' activity by using a newly developed technique. The fat content and the total amount of solids in your milk will also be provided to Dr. Gorman. We will inform you of the date that we mail these results and recommend that you meet with him to discuss them.

Although you and your family may not benefit form this study, your participation may help to improve medical knowledge of environmentally related illness in the future.

Any information you provide will remain strictly confidential and be used for medical research purposes only. At no time will your name be mentioned and any reports that result from this research will involve statistical information only. Your participation is completely voluntary and no penalty will be involved if you choose not to participate. You have the right to receive answers to any questions you may have concerning this study and may discontinue participation at any time.

Signature of Participant: _____

Date: _____

APPENDIX C

AKWESASNE MOTHER'S MILK PROJECT

Interviewer_____

Date of Interview_____

I.D.Number of Participant_____

AKWESASNE MOTHER'S MILK PROJECT

Demographic

1. Name of Mother:_____ Medical Records I D.#_____

2. Location of Residence:_____

3. Mailing Address:_____
_____

4. Home Phone:_____ Work Phone_____

5. Date of Birth:_____
(month) (day) Year

6. Height _____ft _____in (without shoes) Weight_____lbs (with indoor clothing, before last pregnancy)

7. Number of years of school completed_____

8. Current Marital Status: Married____, Divorced_____,
Separated____, Widowed _____
Never Married

9. If currently married : Name of Spouse_____

10. Source of Health Care:_____

11. Permission for Release of Information:

I hereby authorize the Akwesasne Breastmilk Project to access information from my WIC chart, Clinic chart, or other medical files solely for the purposes of this study.

Signed_____Date_____

I.D.#_____

Health Habits

Now I would like to ask you some questions about your use of tobacco, alcohol, coffee, and medications for the periods before and during your last pregnancy and since your last child was born. Did you:

	a) Before Last pregnancy	b) During Last pregnancy	c) Since last child was born
12) Smoke cigarettes?	Yes No If yes, what was the avg # /day? _____	Yes No _____	Yes No _____
13) Drink Beer?	Yes No If yes, what was the avg # of 12 oz glasses, bottles, cans/wk? _____	Yes No _____	Yes No _____
14) Drink Wine?	Yes No If yes, what was the avg # of 4 oz glasses/wk? _____	Yes No _____	Yes No _____
15) Drink Liquor or Mixed Drinks?	Yes No If yes, what was the avg # of drinks with 1 1/2 oz of liquor/wk? _____	Yes No _____	Yes No _____
16) Regular Coffee?	Yes No If Yes, what was the avg # of 8 oz cups/day? _____	Yes No _____	Yes No _____
17) Decaffeinated Coffee?	Yes No If yes, what was the avg # of 8 oz cups /day? _____	Yes No _____	Yes No _____
18) Use Prescription Medications?	Yes No If yes, for each medication used: What kind of medication was it? _____ What was the avg # of times/wk? _____	Yes No _____ _____	Yes, No _____ _____

I.D.Number_____

19. Residence History: Starting with your present residence and working backwards, please indicate every residence you have lived at since birth,and the number of years you lived at each address.

Dates of Reference (yrs.)		Indicate house numbers under area of Reserve or indicate other address							What was the source of drinking water? (circle type)				
		Area on Reserve											
From:	To:	Cornwall Island	Snye	St. Regis	Raqt. Pt.	U.S. West	U.S. East	other address	Well	River	Village	Rain-Water	Other
									shallow deep	St. Law. Racgt. St. Reg.			
									shallow deep	St. Law. Racgt. St. Reg.			
									shallow deep	St. Law. Racgt. St. Regis			
									shallow deep	St. Law. Racgt. St. Regis			
									shallow deep	St. Law. Racgt. St. Regis			
									shallow deep	St. Law. Racgt. St. Regis			
									shallow deep	St. Law. Racgt. St. Regis			
									shallow deep	St. Law. Racgt. St. Regis			
									shallow deep	St. Law. Racgt. St. Regis			
									shallow deep	St. Law. Racgt. St. Regis			

19. Residence History (continued): I.D. Number_____

Did work or school take you off the Reservation for long periods of time? Yes___ No___ If yes:

Calendar Years	# of months away	How often returned?

20. Did you ever visit or come in contact with the General Motor Central Foundry Site? Yes ___ No___

If yes, what did you do there?_____

When? _____ _____
Month Year

How long? _____Months

21. Employment History

I.D.Number _____

Starting with your present or most recent job outside the home and working backwards, please indicate every job that you have held for a year or more.

Period in years From	To	Type of Industry Trade, and company Name	Job or Position	Description of Work	Exposures to Hazardous Materials? (If yes, specify)

22. Reproductive History:

I.D.Number_____

Now I need to ask you some questions about each of your pregnancies, starting with the first and including any miscarraiges, stillbirths, or abortions.

			IF LIVE BIRTH							IF DECEASED		
Pg. #	What was pg. outcome? (circle one)	What was date of delivery or termination?	Child's first name	Sex	Place of Birth (Hospital, city, state, location of home delivery)	Baby's birth weight, length	Delivery complication or problems in first year of life (Birth Defects)	Was the child breast-fed? If yes, How long (# weeks)	Is child still living?	Date of Death mo/da/yr	Place of Death	Cause of Death
1	L M S A											
2	L M S A											
3	L M S A											
4	L M S A											
5	L M S A											
6	L M S A											

Answer Key: L=Live A=Abortion P=Prematurity LBW=Low Birth Weight Unk.=Unknown
M=Miscarraige Pg.=Pregnancy
S=Stillbirth

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I.D. Number_____

Now I would like to ask you some additional questions about your last child.

23. If you breast feed your child, number of times per day: _____

24. Do you bottle feed your last child? Yes___ No___
If no, go to question #28.

25. If yes, type of formula: Concentrated, ready to feed, powder

26. number of times per day_____

27. how much each time: _____oz.

28. Do you feed your last child any canned or bottled baby food? Yes___ No___

If yes, specify:	type	# of times/day	oz./time
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____

29. Do you feed your last child any other food? Yes___ No___

If yes, specify:	type	# of times/day	oz./time
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____

I.D. Number_____

30. Dietary History

Please indicate how frequently you ate the following foods in the periods before, during your last pregnancy, and since your last child was born, and where you usually obtain them.

Food	Average # of times/week, month, year			Usual Source	
	a) Before last pregnancy	b) During last pregnancy	c) Since last child was born	Supermarket	Local (Specify)
Meats including beef, pork, lamb, veal, luncheon meats					
Poultry including chicken, cornish hen, etc.					
Organ meats including liver, kidney, heart, spleen, etc.					
Wild life animals					
Duck					
Pheasant					
Goose					
Deer					
Rabbit					
Muskrat					
Other					
Fish					
Trout					
Bass					

GMM 006 1371

I.D. Number_____

Food	Average # of times/week,month,year a)Before last pregnancy	b) During last pregnancy	c)Since last child was born	Usual Source Supermarket	Local (Specify)
Perch					
Bullhead					
Pike					
Pickerel/Walleye					
Sturgeon					
Other					
Milk					
Eggs					
Fruits					
Vegetables					

Appendix D

DAILY FOOD RECORD

Date:

Circle day of week:

SUN MON TUES WED THURS FRI SAT

Please fill out one of these forms every day. Write down everything you eat, including all meals, snacks and beverages. Also, please indicate the approximate times you ate, the amounts of each food eaten, and the main ingredients of foods whose composition is not apparent from their names, for example, salads, soups and casseroles. Finally, please check off in the column at right where each food or ingredient was obtained.

Time	Foods enter Major Ingredients Amount	Local garden	Local field, forest or stream	Super-market	other (specif
	Breakfast:				
	Lunch/dinner:				
	Dinner/supper:				

Appendix E

QUALITY ASSURANCE PROCEDURES FOR HUMAN MILK ANALYSIS

IN THE HEALTH RISK ASSESSMENT AT AKWESASNE

The methods to be used have been published in the Journal of the Association of Official Analytical Chemists, Vol 65, pg 555 (1982) and Vol 66, pg 246 (1983). They are outlined below.

Control of the gas chromatograph. The electron capture detector of the chromatograph is calibrated using a 1:1:1:1 mixture of EPA pesticide repository Aroclor mixtures (Aroclors 1221, 1016, 1254 and 1260) which has been quantitatively analysed using 29 individual PCB congeners. The remaining 50 congeners were estimated by extrapolation of their response factors from a line of least squares best fit. Fluctuations in electron capture detector sensitivity are controlled by an automatic recalibration after each fourth specimen analysis. Reporting software gives the presentation shown in Fig. 1. If Total PCB deviates more than 10% from the expected value, the subsequent four specimens are reanalysed; if an individual congener deviates more than two times from the expected standard deviation for that congener, it is recalculated using peak height measurement. The standard deviation for each congener is determined when a new capillary column is installed, approximately once every three months. Quality control charts will be plotted daily for the sum of all PCB (Total PCB) and three commonly found PCB congeners (2,4,-dichlorobiphenyl, 2,4,5,2',4',5'-hexachlorobiphenyl, 2,3,4,5,2',4',5',-heptachlorobiphenyl).

Control of sample extraction. Values of PCB in this region have a mean of approximately 25 ng/g with a standard deviation of 15 ng/g. Standard human serum spiked with Aroclor 1260 is available from the National Bureau of Standards (NBS) at 106 $\pm$ 1.3 ng/g. Because of the difficulty of producing

properly characterised biologically bound standard material, the simple expedient of reconstituting NBS serum and then diluting it with cow milk will be used to produce quality control milk samples at 25 ng/g. One such sample will be processed with each batch of ten milk samples or for smaller batches one per batch. The method yields a recovery of 85 $\pm$ 8% for Total PCB. If the recovery of the quality control sample is less than 70%, then the entire batch will be rerun after trouble shooting has returned the recovery for the quality control sample to 85%. If there is an insufficient quantity of any particular sample to permit it's being rerun, its value will be adjusted arithmetically to a recovery of 85%. The interview containing information regarding diet, occupation, residential history and other risk factors will be separated from the milk samples before analysis to permit a determination of PCB concentration which is blind to exposure status.

SAMPLE TYPE: QUALITY CONTROL

DATE ANALYZED: 05/18/86
VIAL NUMBER: 2
DILUTION FACTOR: 1.000

SAMPLE NAME: MIX PR-1 200PPB

PCB SUBSTITUTION PATTERN	PPB DETECTED	% DEV. FROM AMT APPLIED	#	PCB SUBSTITUTION PATTERN	PPB DETECTED	% DEV. FROM AMT APPLIED
2	86.188	5.44	#	245/26	7.378	-1.05
2/3	19.802	0.03	#	234/25	3.347	-14.28
26	1.923	14.14	#	P,P'DDE	11.200	10.13
4	41.187	3.73	#	234/2-	7.283	-2.35
25	2.053	-0.51	#	234/23	25.348	-8.31
24	2.583	1.04	#	236/34	4.612	-7.77
3/3	8.173	-1.24	#	2356/23	11.735	-3.62
23/34+23	14.73-	1.15	#	2356/23	3.327	[illegible]
2/4	31.742	-1.77	#	236/245(234/236)	13.621	1.13
25/3	21.840	-1.20	#	24/34	0.000	-100.00
HEXACHLOROBENZENE	5.171	3.42	#	2345/25(CL5B)	1.532	9.43
24/2	7.857	-0.45	#	234/236(2356/236)	3.455	-1.51
23/2	9.800	0.00	#	2356/236(245/34)+2356/246	5.785	-0.26
25/4	6.332	-16.32	#	145/34(2346/236)	10.177	-3.13
4'4	13.193	-5.35	#	2346/235(235/245)	3.457	3.03
246/2	1.217	1.23	#	235/245(CL5D)	5.235	3.24
25/34+236/2	7.293	1.49	#	234/34	2.063	-72.33
34/3(CL3A)	8.142	3.11	#	145/245	127.025	245.37
24/25(CL3B)	1.317	-24.71	#	234/235(CL6A)	2.473	-0.36
25/4(2/4'3)	16.373	-1.71	#	2356/34(CL6B)	4.333	-2.91
23/3	3.232	-1.12	#	2345/23	0.000	-100.00
24/4	16.327	-1.44	#	234/245	25.763	-3.14
23/4	14.099	0.38	#	2356/235(2346/34)	5.059	-1.91
25/25	22.772	-2.25	#	234/234	5.341	0.77
24/25	14.947	-1.02	#	2356/245	11.465	-2.94
23/25	11.309	-1.75	#	2346/245	13.983	-4.64
24/24	5.725	1.44	#	2345/246	5.891	-1.92
23/24(CL4A)	5.124	1.12	#	2356/234	0.000	-100.00
23/23+234/2(CL4B)	3.970	-1.71	#	2346/234(245/345)	4.579	1.25
236/3(CL4C)	11.341	1.37	#	2345/2356+246/345(23456/235)	12.512	331.25
236/4(CL4D)	15.631	1.23	#	MIREX	3.394	-5.02
235/25(CL5A)	10.135	1.11	#	2345/34	4.742	1.31
OCTACHLOROSTYRENE	4.733	-1.31	#	2345/235	2.991	-1.31
234/26	7.384	-1.71	#	2345/245	27.051	-2.69
236/23	9.332	-1.33	#	2345/234	12.029	0.23
25/34	13.342	-2.37	#	2346/2356	13.859	116.55
245/4	2.961	-1.06	#	CL7	1.525	-58.79
24/34	4.413	-1.17	#	2345/2346	2.913	-19.43
34/23	4.995	-3.04	#	23456/245	5.214	24.14
236/236	3.273	-1.74	#	23456/234	3.337	1.12
245/25	17.271	-4.57	#	2345/2345	173.384	2596.63
245/24	3.726	-1.31	#			

TOTAL CL1: 132.760 CL2: 93.353 CL3: 116.925 CL4: 152.031
CL5: 129.740 CL6: 224.831 CL7: 38.713 CL8: 211.064

TOTAL PCB: 1129.577
DEVIATION FROM AMT APPLIED: 24.370 %

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