Monsanto

FROM (NAME & LOCATION) J. F. Queeny Plant

DATE Sept. 21, 1970

SUBJECT Aroclor Use at JFQ

REFERENCE

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SUMMARY

PCB type Aroclors are used or handled in 4 departments at JFQ. Losses to the plant waste effluent greatly exceed Monsanto's self imposed limitation of 10 ppb and immediate corrective action is required to meet the 12/31/70 deadline for compliance. Every means possible must be taken to prevent these Aroclors from entering our waste effluent or being absorbed in the ground. Tank washings will be sent to the toxic dump and used material will be destroyed by incineration at WGK. The magnitude of volatile losses to the atmosphere will be determined.

INTRODUCTION

Considerable emphasis has been focused recently on polychlorinated biphenyl losses to the environment. PCB's are manufactured in the U.S. exclusively by Monsanto Company. These chemicals are a chief constituent of a series of Monsanto products marketed under the name Aroclor. Aroclors are used in a number of other products including paints, paper coatings, and a number of functional fluids.

PCB's are believed to hamper reproduction in birds and act as a low-level poison in the environment. Some are highly resistant to degradation. Consequently, there is concern over their possible buildup in the environment.

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WHERE AROCLORS ARE USED AT JFQ

Aroclors are used in only four locations at the Queeny Plant. These include:

A. W Building

1. Center section - Aroclor heater
2. Yard - Aroclor heater
3. Leader - Aroclor heater

B. TSCl Department

1. Aroclor heater for the old ortho column reboiler.
2. Aroclor heater for the new detoluene still reboiler.
3. Aroclor seal fluid for the Nash compressor on the HCl recovery system.

C. Phthalyl Chloride

1. Combination reactor heating and cooling system.

D. Central Drumming

Aroclors 1232, 1242, 1248, and 5442 are used as raw materials in numerous blended products.

The following is a list of current products containing Aroclors.

Product Number	Product Name	Aroclor Used
80401	Pydraul - 625	5442
80404	Pydraul - AC	5442
80405	Pydraul - F-9	1248
80406	Pydraul - 150	1242
80409	Pydraul - 979	1232
80413	Pydraul - 230	1232 - 1242
80422	Santosafe 300	1242 - 1248
80448	MCS 153	1232 - 1242
80458	Pydraul - 320	1242 - 1248
80467	Pydraul - 312	1242
80474	Pydraul - 135	1232 - 1242 - 1248
80475	Pydraul - 540	1242 - 1248 - 5442

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DISCUSSION OF AROCLOR USE

The W Building has three Aroclor heater systems all of which are using Aroclor 1248. The small homemade unit located in the center section of the building is no longer used except as a backup system on rare occassions. It is expected to be dismantled for safety reasons in the near future. The system known as the "yard unit" is a 1 M BTU unit located south of the X Building. This particular unit was said to have an excellent maintenance record. Addition of makeup Aroclor to this system is extremely rare.

The principle source of Aroclor loss from the W Building is the "leader unit". This is a 3 M BTU unit located south of the BBB Building. This unit has a bad history of losses. Considerable difficulty has been experienced with pump seals in the system. Last year the pump seals failed five times which resulted in the loss of approximately 800 gallons of Aroclor 1248. After the last failure a filter was installed on the pump lubricating line in an effort to prolong the seal life.

Precautionary measures are taken in the department during changeover to insure against losses. Equipment is drained to cans and the Aroclor is returned to the system whenever possible. If contaminants were present, the material was drummed for toxic dump disposal.

The TSCl Department also has two Aroclor heating systems. There is an old system on the ortho column reboiler which was Aroclor 1248. There is also a system for the detoluene still reboiler using Aroclor 1248. These systems are normally very tight requiring makeup very infrequently. One incident of Aroclor contamination by TSCl occurred this year after one of the heat exchangers was rodded out. At that time a considerable amount of 1248 was disposed of due to contamination. The method of disposal was not definitely determined. However, indications are that it was probably sewered.

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DISCUSSIONS OF AROCLOR USE

Aroclor 1232 is used as the seal fluid for a Nash compressor in the HCl recovery system. This system seems to be a constant source of losses. Aroclor tends to buildup regularly in a portion of the systems' instrumentation. This buildup requires periodic drainage. The Aroclor is drained to a pump catch-pan which goes to the sewer. Estimated losses from the TSCl department year-to-date are 4,400 lbs. of A-1232 and 1,800 lbs. of A-1248.

The Phthalyl Chloride Department has one Aroclor 1248 system which is used for both heating and cooling of a reactor. Heating is accomplished by the use of bayonet heaters directly in the reactor jacket. The Aroclor is circulated through an external heat exchanger for cooling of the reactor. Losses are about 1000 lbs./yr.

The procedures and precautions taken to prevent losses at CLHS are considered to be inadequate for the handling of all products including Aroclors. Considerable improvement particularly in the handling of Aroclors is required immediately. Considerable spillage occurs when handling Aroclors from tank trucks. Much less occurs when using tank cars but despite requests tank cars are not always available. Blend tanks are not washed at the conclusion of operations and succeeding blends are contaminated with small quantities of Aroclors. The magnitude of the loss from this department to the city sewer is unknown. No satisfactory means of sampling the waste effluent has as yet been devised.

In general Aroclors numbered up through 1242 are considered at least partially degradable and are not as serious a longterm environmental hazard as others. Aroclors 1254, 1260, and 1262 are very undesirable.

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Use of 1254 and 1260 in our plant has been terminated. A substitute which is not considered a "bad actor", Aroclor 5442, is now being used. Aroclor 1248 is not one of the worst Aroclors but it is worthy of considerable concern.

SAMPLED SEWER LOSSES

Ten day continuous composite samples were taken on the north and south trunk sewers for Aroclor analysis in early June. These samples indicate the losses from the W Building and TSCl, Phthalyl Chloride Departments respectively, during this period. Results of these analyses and the theoretical average losses based on annual Aroclor consumption are as follows:

Component / Sample	Measured			Theoretical	
	PCB (ppb)	Flow (gpm)	Loss (lbs./day)	PCB (ppb)	Loss (lbs./day)
North trunk sewer	46.5	554	0.31	3867	25.7
South trunk sewer	147.0	2460	4.34	1244	36.7

The extremely large difference between the theoretical and measured losses may in part result from sampling errors. Since Aroclors have a high specific gravity, it is possible that the sample is not representative and that only the soluble portion is being detected.

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SAMPLED SEWER LOSSES

Monthly composite samples of the main sewer effluent are being taken. The results of these analyses are:

Month	PCB PPB	Flow GPM	Loss Lbs./Day
June	46	4338	2.40
July	43.5	4621	2.41

DISCUSSION

According to Paul Hodges, the tentative maximum PCB limit (set by Monsanto) for our waste effluent is 10 ppb. This level is to be reaced by 12/31/70. Our losses currently are as large as experienced at manufacturing sites. Immediate steps are required if we are to meet requirements by the deadling.

ACTIONS REQUIRED

The following actions are required to reduce losses to targeted level by 12/31/70. Production and PC&D have the overall responsibility that required actions are taken. TSD has the responsibility for providing assistance as required.

1. Every effort must be made to prevent even the smallest drip from entering our waste effluent or being absorbed in the ground. Drip pans, containers, and curbing must be provided at all locations where a potential loss can occur.

   Responsibility: J. Stepp, D. Abresch, C. Schrock, R. Wagner for their respective departments with assistance from TSD.

   Completion Date: 12/31/70

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ACTIONS REQUIRED - (continued)

2. Contact of Aroclor with water is to be avoided wherever possible since the material is soluble in the 50-300 ppb range depending upon the specific Aroclor involved.

   Responsibility: J. Stepp, D. Abresch, C. Schrock, R. Wagner, with assistance from TSD as required.

   Completion Date: 12/31/70

3. Blend tanks at CLHS should be washed at end of a run and all tank washings containing Aroclors must be sent to the toxic dump.

   Responsibility: PC&D

   Completion Date: 10/31/70

4. Aroclors which are no longer usable are to be sent to WGK for disposal. They are to be clearly marked "Aroclor For Incineration".

   Responsibility: Production

   Completion Date: Immediate

5. Operating Instructions are to be revised immediately and operating and maintenance people instructed in the proper handling and disposition methods for Aroclors.

   Responsibility: Production, PC&D

   Completion Date: Immediate

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FUTURE WORK

1. Sample sewer from CLHS and determine magnitude of loss by 10/31/70.

2. Provide monthly composite samples of plant waste effluent for PCB analysis.

3. Follow up monthly to see that necessary corrective measures are taken.

4. Determine magnitude of volatile PCB losses to the atmosphere by 10/31/70.

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