Talk given to Fed EPA 4/13/72

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As Plant Technical Services Superintendent, I have been associated with the in-plant PCB reduction program for the past 2 years. During this period we have had 1 - 2 full time chemical engineers working on the reduction program. They have been assisted by I & E and mechanical engineering TSD. Our plant environment control group consisting of 5 full time persons have also contributed a large portion of their time to this effort. With the support of Monsanto's top management, the Krummrich plant has assigned top priority to this reduction program. Let me assure you that activity and concerned effort has been high.

Our initial technical work was in two areas. First, sources of actual and potential PCB losses were identified and appropriate projects were undertaken. These projects had the objective of elimination or containment of the loss.

MONS 041391

1. Catch basins were installed in the producing department to contain accidental spills and aid the clean-up

2. Paving and curbing was installed around PCB storage and loading areas again to prevent accidental loss.

3. 5 separate projects were completed to the manufacturing equipment and facilities themselves to bring all known points of loss under tight control and to reduce the loss to their absolute practical minimum.

4. All heat transfer units in the plant (15 in total) were modified and changed to substitute non-PCB heat transfer fluids.

Our second area of technical effort has been in establishing a monitoring program. Here we have met with considerably less success. Let me illustrate.

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1. First we tried to balance our plant PCB uses with PCB levels entering the Sauget Village Municipal treatment facilities. We used our elaborate sampling system which has been highly successful in other plant collection applications. Our objectives was to use our main plant sewer outflows as a base to

back-track through our plant sewers to points of origin, but in no way could we obtain a balance. PCB levels were different by factors of 1.5 to 3.

2. We then did some experimentation.

a. We first ran profiles down each of the two main sewers leaving the plant. By this I mean we sampled four adjacent sewer boxes along each sewer line in as short space of time. Results went something like this: on one sewer, the third sample point down the line had 20 times less PCB than the other three points. On the other sewer line, the 4th sample point down the line had a 5½ times higher PCB level than the first three sample points. MONS 041393

b. We tried a second experiment. At one sewer box we sampled the sewer line at the top, bottom, sides and middle. We did this for both the sewer line entering and leaving the box. On the exit flow, we found

the highest level in the centre flow about 1½ to 2 times higher than the other points. On the bottom flow, the sample taken at the bottom of the pipe had a level 200 to 400 times higher than the other points.

c. We next took a number of samples both in-plant and in the spit stream to the Mississippi river and filtered a portion of the sample in the laboratory. In all cases the filtered samples showed a 70 to 90% reduction in PCB level when compared to the corresponding unfiltered samples.

3. The problem at this point became obvious. We were attempting to obtain representative samples where solids concentration was the most important variable in the samples. This problem was compounded by stratification of solids in the sewer lines themselves.

4. From this point we have gone through an evolution of sampling devices with the objective of obtaining what we feel is a truly representative sample from our sewers. At this time, this objective has not been fullfilled. A number of factors have involved,

a. do you point the sampler upstream or downstream ?.

b. do you pump the sample fast or slow ?

c. Where do you place the sampler in the sewer line ? middle ?. What is the sensitivity of moving slightly left or right or upstream ?.

d. and so forth.

Not all of these questions have been answered as yet but we are continuing our efforts to resolve them. I think it goes without saying, that is we reach very low discharge levels we are keenly aware of the need to obtain truly representative samples and accurate results in order to continue further carrying out an effective reduction program

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This bring us to where we are today.

1. ~~Essentially~~ Although all our in-plant sources of loss are essentially eliminated or contained through projects that have been completed we are continuing to change + modify our operation to further minimize potential losses.

2. Our on-going sampling control program is confined to the inflow and outflow from the Sauget Village Municipal treatment facilities as we feel this gives us the most accurate data.

3. We are continuing to improve and upgrade our technique of sampling.

4. In the producing department we are installing a Parshall flume which is a device to measure sewer flow. This will improve our ability to monitor and control of this point.

What are present level of losses?

1. From our KB manufacturing facilities they range from 2 to 4 ℓ/day at our current production rate of 3 to 3½ million #/month.

2. From the Municipal treatment facilities to the Mississippi River, losses are 5 or 10 ℓ/day average depending the type sampler used.

MONS 041396

Why the difference? (7) The problem is a gen[illegible]
We have been producing and using PCB at the Krummrich plant for over 30 years. We have a complicated old sewer system inside the plant. Although we have a continuing plant program to repair and upgrade plant sewers, at no time do we expect that the sewers are leak free. In fact it would be nearly impossible to tell. We are confident that this situation contributes significantly to the losses we see in the outflow to the river. ~~are due to cross flow between the ground water carrying contaminated solids and the sewer system. We have measured PCB levels as high as [illegible] in the ground water in the plant. This problem is compounded by the gradual rise in water table in the plant. [illegible] of industry in the immediate area [illegible] refining and American Zinc to name 2) [illegible] reduction of well water usage in the plant by switching to more economical cooling tower water contributes. In many areas of the plant, the water table is no more than 18" to~~

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~~2' down which is well above the depth of our~~

~~[illegible]~~ This source of loss will decline with time, ~~[illegible]~~ ~~[illegible] the major source for months, [illegible]~~ ~~[illegible]~~ In summary, let me say activity loss, is and will remain high in carrying out our PCB reduction program. It is my understanding that ~~However~~ the proposed standard is ~~zero~~ detectable loss to the river. Based on our experience, we feel that this is both unrealistic and unachievable. ~~I hope that I have given you some insight into the problems we face at the plant and that you will give these due consideration by ammending your proposal to some achievable #/day level in the outfall to the Mississippi River.~~

As a result of our efforts, we have reduced our losses, as mentioned before, to the 5 to 10 #/day range. We feel this a realistic range at this time considering the problems we face.

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