Kleppinger -- June 11, 1981

ITEM: Kleppinger's involvement with respect to the Bloody Run Landfill started in approximately October of 1978. I was retained by a law firm which was retained by Mead Corporation to look into problems experienced by Occidental Petroleum Corporation and its subsidiaries, including Hooker Chemical Company, which might not have been disclosed in their SEC filings, that is, contigent liabilities. The initial evaluation of an undisclosed contingent liability was with respect to Montague, Michigan. Following Montague, we began to focus on Niagara Falls. The reasons were twofold. First of all, we became aware of the fact that Lake Ontario had been extensively contaminated with mirex for which Hooker chemical denied responsibility. However, mirex was never used in the New York Canadian areas as a pesticide, although it did have one use as a fire retardant in New York State. However, the distribution patterns could not explain the particular use in New York State in its entirety. Thus, we became convinced that there was a source of mirex that had been undisclosed by Hooker and undetected by the Environmental Protection Agency in the middle of 1970's. Secondly, we became convinced that disposal practices at the Love Canal simply involved taking whatever mixture of wastes that were being generated and dumping them in an available hole. We also knew that the Love Canal had been closed in 1953, and thus the logical question which could be asked is, if Hooker's disposal practices were finding an available area and dumping their miscellaneous waste stream, and if this miscellaneous waste stream had not changed significantly, then there must be additional major dumpsites in the Niagara Falls area. We also determined that Hooker, only since the middle 1970's, had been disposing of its wastes at approved offsite disposal facilities. Both of these lines of inquiry soon led us to the Bloody Run Landfill as potentially a major undisclosed liability of Hooker Chemical. In analyzing the potential for environmental problems and the cost to cure them at Bloody Run, it was necessary to determine two factors. The first concern was what was there, and what was its nature in terms of toxicity, in terms of environmental threats. We soon determined that vast amounts of chlorinated organics including some of the most highly toxic known to man, had been disposed of at Bloody Run. We also determined that these toxic materials were getting into the environment at least by discharge to Bloody Run. To determine how best to contact and control this particular site, it was necessary to examine the geohydrology of the region. The seminal study on the geohydrology of the region is that by Johnston. Reference whatever. As, in dealing with the Montague situation, we had to establish whether Frank Rovers's plan of control was adequate. In both cases, Montague and Bloody Run, Mr. Rovers had proposed to simply provide a clay cap. First of all, while a clay cap is defined as impermeable, it is not, it does leak a certain amount of water which can be calculated. Furthermore, it not leaking significantly high amounts of water as natural sandy soils, for example, might do, is dependent upon it being maintained for the life of the hazard so that cracks and fissures (fishers?) do not development. For example, one

major problem is that if the clay drys out, which is compacted on top of the landfill, it will shrink and crack, and those cracks will not reseal. This is a major problem that has to be dealt with in any secure landfill design. But back to the main thrust of the comments. In order to determine whether a simply cap on top of a hazardous waste dump will contain it, one needs to know what the bottom is. If there is a natural geologic bottom or it can be provided by engineering means, then one can assume with adequate construction, adequate safeguards, and longterm perpetual care and monitoring, that the containment strategy has a chance of success. However, in the case of Montague, we were able to show at hearings in Ohio in front of the Ohio Securities Commission in approximately September of 1978, wherein Mr. Rovers testified and wherein Mr. Scott Swartz will obtain for Barbara Morrison a copy of Mr. Rovers's transcript for quoting at this point, that the cover it over technique in Montague was not adequate. This again, because the bottom was not present. In the case of Montague, it was 100 and some feet of sand, and no engineering controls co[illegible]vided to seal the site on the bottom. Indeed, [illegible] of Natural Resources chose to agree with this strategy and reject [illegible] Frank Rovers's "cover it over" plan. Indeed, an engineering report was done for Mead by Fred Hart Associates on the Montague situation, and this engineering report was used as the basis of the Attorney General's lawsuit against Hooker Chemical, and indeed, the complaint which was filed copies large sections of that report. The situation we then faced in October and November of 1978, was to determine whether an analogist situation existed at Bloody Run and whether in fact a Frank Rovers's designed cap could be utilized to safely contain these materials. As a sidenote, it should be pointed out that while the amount of contamination at Bloody Run is significantly higher, particularly with respect to TCDD, the quality of material is very similar. For example, I understand that TCDD was found in low amounts at Montague, and that the bulk of the Montague waste consists of derivatives of C56, many of which are also, of course, at Bloody Run. Furthermore, the situation at Bloody Run is analogous to the situation at Montague in that the wastes were typically piled on the ground and covered with available materials if there was cover material. In Montague, much of the material was poke(?) covered either by bline sludge bottoms(?) or with fly ash. Thus, to get back to the main argument, the difficulty we faced in 1978 was to determine whether a bottom existed or could be made to exist under the Bloody Run Landfill. We arrived at the same conclusion we arrived at in the case of Montague which was that it was not possible. That either the material should be withdrawn and put in a containment vault, or it should be withdrawn and incinerated. In fact, the decision was that it was impossible to contain the material onsite in any reasonable technical and engineering fashion given the longterm nature of the hazard these materials represented. I was personally responsible for developing and overseeing technically the Hart Report on the subject which drew these conclusions. Since 1978 and the first few months of 1979, when Occidental Petroleum and Mead Corporation settled their lawsuit, I have followed the Bloody Run situation with a great deal of interest. Since that time I have reviewed various documents and do not find any information which contradicts the conclusions I arrived at in 1978 with respect to the need for and the inability to put a bottom on the existing landfill. For example, even the Connostogo Rovers' boring

of whatever show significant void spaces in the bedrock. Furthermore, it should be noted that when drilling the bedrock, most of the wells "lost circulation" of the drilling water. This simply means that the drilling water rather than going back up to the surface found void spaces and cracks in the permeable bedrock and fractured bedrock through which it could easily be discharged. Leachate will do the same thing. A void space is simply a hole in the rock. It can be there during the initial geologic development of the rock or occur later through dissolving of certain chemical constituents of the rock. For example, acids which Hooker disposed of in the landfill, it when in contact with the bedrock, would probably eat holes in the bedrock itself. The Lockport Dolomite is a fractured bedrock. The fractures exist both in the vertical direction, as well as in the horizontal direction. These ladders are the so called bedding plains. In each case, they represent channels through which leachate can flow. Unless each and every one of these channels can be absolutely sealed off over the life of the hazard, then leachate from the site will leave the site and enter Lake Ontario either through movement toward the conduits of the New York State Power Authority to the east, or toward the Niagara River Gorge to the west, or toward the actual Power Project Canal to the north. In my opinion, there is no practical way of sealing off the underlying porous bedrock at this site for the life of this hazard. Thus, one arrives at the conclusion that the material must be removed and put in an environment where it can be sealed.

There are a number of other additional points which should be made at this juncture. First of all, while it may be possible to determine some flow patterns in the bedding plains at a point in time, this does not mean that the directions of flow will not drastically change during the life of the particular hazard. That is to say, for example, a monitor well or interception well placed on one side of the landfill which is supposedly downgradient based on measurements of groundwater flow in certain bedding plains in the rock may in fact change the flow in the bedding plains, may in fact change, during the life of this particular hazard. Thus, the groundwater in those bedding plains would no longer be monitored and/or intercepted.

On beyond the general regional stability of the groundwater flow, because of the interconnected and random nature of the horizontal and the vertical fractures in the Lockport Dolomite, it can be stated that there is absolutely no assurance given to any combination of monitoring wells or pumping wells that all potentially contaminated conduits, that is, horizontal and vertical fractures, have been intercepted, and thus, are either tested or reclaimed. An interesting analogy is in EPA's own document on procedures manual, Page 51, figure 10, which in fact shows groundwater flowing in fractures in two separate directions. Also note for example, in Figure 9, that if a monitor well is not located at the junction to the upper right hand corner of monitor well C, it will not intercept the flow traveling along that fracture line. The same is shown by EPA for solution porosity. This on Page 53.

In the Lockport Dolomite, we have essentially fracture porosity with some solution porosity. That is to say, we have both types.

Fracture porosity is those openings in rocks which are formed by actual fracturing of the rock. These tend to be relatively narrow and tend to extend in long distances. Solution porosity in acquifers occurs when soluable components of the rock are solubolized. For example, a solution porosity phenomena carried to its greatest extent results in the Blue Ridge Caverns. The actual water infiltrating the rock which is slightly acid due to the acid nature of rain water, will dissolve the basic in general carbonate structure of various limestones and dolomites. This leaves holes in the rock literally that have been dissolved out. That is, the solution porosity. They can be both horizontal and vertical. They tend to follow fracture lines, and can be almost any size. For example, the recent sink hole phenomena in Florida that we have been hearing about is a result of a large solution cavity collapsing in the underlying bedrock. Sink holes are caused by the collapse of these very large solution cavities underneath the surface. As the underground underlying bedrock is hollowed out by acid waters, the supporting overburden is no longer supported, and in fact it collapses into the hole, and what is left is a "v" shaped hole at the surface which can be quite large. One which recently opened in Florida swallowed a car dealership, several homes, and a swimming pool before it stopped collapsing.

Johnston's report notes the existence of this sink hole phenomena in the Lockport Dolomite in the Town of Niagara. We should reference that to the Johnston report specific page.

For example in the present case, for example, if there is an undetected sink hole developing underneath or near the Bloody Run Landfill, and if it is slowly being enlarged, at some point in time there will undoubtedly be a collapse of the entire landfill into the sink hole. We should quote here in this point several of the statements on pages -- starting about on Page 49 of that procedures manual on the problems of monitoring and controlling infractured and solution-type bedrock. "There is no assurance that the wells will intercept the contaminant broom(?)."

Page 33 of the Government response, Kleppinger comment. First of all, it is obvious that the government has a lack of understanding with respect to the Montague situation. Contrary to what the government says there is dioxin at Montague. I understand that it has been found, although there does not seem to be a reasonable explanation for why it is there given the processes that produced the waste at Montague. It was not reported by Hooker to be there, but I understand during later testin it was found. The testing was under the auspices of the Michigan Depart ment of Natural Resources, and they would have the details. It's been within the last two years.

Talk to Gary Klepper - (517) 373-8147.

The government's charge about there being no landfill at Montague but there was one at Hyde Park, I think is a blatent misrepresentation of the situation. EPA defines the landfill as an engineering fill which requires certain things such as daily cover, etc. It is not simply whether you happen to cover everything at some point in time with dirt or not. I should point out that given the Rovers's approach, if that

had not been stopped at Montague, then by the government definition, that would then have been a landfill and not amenable to removal. On beyond this, there is the problem at Montague that in fact much of the material was covered. It was covered by fly ash and furthermore, was covered in some areas with a bline sludge(?).

On beyond this, it must be recognized that the materials that were disposed of at Montague were toxic. They were C56 residues which are the same materials which were disposed of at Bloody Run. These are the same materials which evidently have been bioaccumulated in Lake Ontario as mirex in part.

It should be checked on the Rovers's transcript or directly with Randy Mott, but I believe that in Montague the Rovers's idea was to move some of the materials so as to minimize the area of clay cap.

There is another problem with the government response in that it assumes one would have to actually remove the bedrock. This is not necessarily true. What would happen after the surface soils and contamination were removed, would be to dig a large trench into the bedrock to intercept all the contaminated bedding plains and counterpump and reverse the groundwater flow so that it flows all to the center of what was in the old fill which should, over a period of time, move the contamination back into the collection sumps for treatment. Indeed, if the permit to mine bedrock was valid and bedrock at the site was mined, upon removal we may find that there is a significant excavation of bedrock already which once it was emptied of fill material would serve to cause the ground water to counterflow. Reference: Armagost's bedrock excavation permit.

In fact, due to the fact that the materials at Montague were much more highly concentrated, it probably is less of a risk to remove and move materials at Bloody Run than at Montague. Given that soils were used during at least part of the fill at Bloody Run, one can expect mench(?) of the toxic materials to be adsorbed onto these soils and not to be released if slow and careful excavation takes place.

To summarize, there is dioxin at Montague. There was a landfill by the definition that the government seems to be using in this response, although necessarily by their published definitions of what constitutes a landfill. Furthermore, one would not excavate significant quantities of bedrock, but only enough to intersect all the potentially contaminated bedding plains and provide a counterpumping operation to collect materials which have gotten into the bedding plain. Furthermore, the risk of exposure during excavation transportation and reburial can be minimized by the fact that by moving a relatively few homes, the site can be relatively isolated. This assumes that the fill would be conducted in an area owned by PASNE behind the Bloody Run fill where there appears to be a significant amount of available land for the construction of a clay vault or the incinceration of the material.

One would have to argue further that the chemicals at Bloody Run are not presently "underground." Although one would have to agree that proper containment will protect the environment and people, the government again does not show that their system provides containment. The underground comment refers to the fact that the fill is some 20 feet above ground at this point, as well as potentially below ground. Furthermore, below ground may only be a few feet to bedrock along part of the site.

This is a response to Page 31. The government simply begs the issue. There is not stategy on the part of EPA to determine the approac to control of hazardous waste sites. As noted in my earlier piece, ther are only a limited number of approaches. We feel that if the company, that is Hooker, wishes to use a containment strategy, we can now demonstrate that the containment strategy cannot be effective on the site for which it has been chosen to be implemented. That is, you cannot contain waste which is placed on top of a sponge and that's in fact what we have with respect to the Lockport Dolomite.

Now, the choice of whether to implement a remedy within another strategy, such as destruction by incinceration or not, is still open and obviously could not be determined until the complete dimensions of the problem are determined. But it is sufficient to say at this point that the containment strategy which has been selected in this case, will ultimately fail and fail to contain the waste. These wastes cannot be contained in a box with no bottom, and they must be contained for all time because of their perpetual toxicity.

On beyond this point, it also begs the issue with respect to EPA, that they do not have the data at this point to draw proper conclusions. This consent decree is not needed to determine additional sampling analysis and monitoring data. EPA has significant authority under 3013 and funds and authority under Superfund to do the job. On beyond that, this particular situation has been known to EPA since late 1978. It took the almost one year to bring a legal action, that is in 1979, and we are now approaching two years since the complaint was filed, and still nothing has been done. If it is that critical to sign a consent decree to gathe more data, I would argue that EPA should have done it long before now. They have known about this particular problem for almost 3 years.

To look at this particular problem from another direction, it is no necessary to approach the Bloody Run problem from this stepped strategy that EPA seems to be locked into. There is more than enough presently known to conclude that a containment strategy which utilizes the existing site and leaves the chemicals in place cannot and will not work. But it must work given -- What this means is that any containment strategy which is selected, absolutely must work for an extensive period of time. Why EPA is allowing the selection of the containment strategy which cannot work is beyond this expert or a rational comprehensive to quote old BM.

This is a response to Page 57, Number 47, government response. We have already noted up the digging up of the landfill would be highly impractical. If the only alternative is to allow this highly toxic material to continue to leach into Lake Ontario over the next few generations then it becomes exceedingly practical in my opinion.

If EPA is worried about the re-exposure of the people, note that they seem to have given us that significant exposures have already occurred due to the initial dumping which was uncontrolled and which generated significant amounts of air pollution as based on verbal report of nearby employees, nearby residents with respect to odors, etc., and with NIOSH findings of materials in the dust of various nearby facilitie it is at least possible to say that the new exposures will be much less

than the original Hooker exposures. In any event, the whole matter is academic because the limited number of people who are potentially exposed in nearby the fill can be removed from the site. Furthermore, Hooker is practicing techniques in Montague to control the revolitilization of various toxic organic chemicals while the re-entombment takes place.

The government's response is also wrong in another regard with respect to incineration. While it is true that it's less expensive to burn highly concentrated wastes than it is to burn less concentrated wastes, it is not technically infeasible to do same.

In the Fred C. Hart Report which I technically oversaw as part of the Mead case, we calculated the cost of re-entombment and the cost of incineration. In general, it turns out that incineration, even giving the low BTU heat values of the contaminated soils, is either somewhat less expensive or not significantly more expensive than clay vault containment given one proviso. The proviso is that clay vault containment expenses in the engineering analysis include longterm perpetual care and monitoring. That is to say, that incineration has a high capital and operating cost up front, but once the material is destroyed, it is destroyed and gone forever. However, in any containment system, the facility must be maintained and monitored and leachate treated, and leachate will be generated forever, forever in this case because of the indeterminate lifetime of the hazard of the materials. When one looks at the real cost of doing that, one finds that incineration and entombment costs are not that much different.

What has to be done, for example, to really reflect the cost of containments is to set up a trust fund which yields each year the estimated costs of longterm care, monitoring, leachate treatment, insurance, etc., etc., which said trust fund which is depleted over the life of the hazard. In this case, the trust fund would have to be set up such that it was never depleted because we assume that the life of the hazard is forever. Not only that, but because of inflation in the cost of long term perpetual care and monitoring leachate treatment, etc., the actual trust fund itself must be set up so that the net generation of interest that is net of inflation, equals the annual cost. For example, if we assume that the annual cost is $1.00 and one might say, ahah!, we would set up a $10.00 trust fund at 10% interest. But that is not true in thi case because the net interest rate these days runs around 1%, that a $100.00 trust fund would have to be set up for each dollar of longterm perpetual care and monitoring. The net interest rate -- you're not listening to me Barbara -- is -- she's like my ex-wife -- she never listens to me -- not a damn thing I ever say. The net interest rate is that interest rate which is calculated on the actual interest rate less the inflation rate. Historically, net interest rates run about 1%.

Thus, to insure longterm perpetual care and monitoring of the new clay vault which we recommend be constructed if Hooker insists upon following the containment strategy, that's a big if, a separate trust fund should be set up which will deliver the needed funds for yearly perpetual care and operating expenses of the new tomb.

There's a very clear analogy between what one does in terms of burying one's relatives and providing a perpetual care and maintenance fund to mow the grass, etc., at cemetaries. It's an exactly identical strategy. Otherwise, we may end up 30 or 40 or 50 or 100 years out with no more Hooker and no more Occidental and the public responsible for maintaining this particular tomb.

The next point is Page 80, it's on something entitled settlement. The government seems to believe in the Gertrude Stein poem a rose is a rose is a rose. In this case, a leachate collection system is a leachate system is a leachate collection system. It ain't. What we require is an effective leachate collection system, not a leachate collection system. As has been shown, the government's approach does not provide an effective longterm leachate collection system which we argue cannot in any event be provided on this site because of the nature of the Lockport Dolomite.

For example, in my consultation with Johnston, he indicated that as an -- on the 9th of June -- he indicated that based on my description of the location and of the Bloody Run Landfill, that in fact the groundwater at the site might be moving toward the conduits. These are the conduits through which the water flows to the PASNE project. They start just north of the "S" area Hooker dump on the upper Niagara River and end between the discharge power plant and the pump storage lagoon in the PASNE power channel. They are cut into bedrock and pictures of the conduits during construction can be seen in Johnston's book. He appined(?) that from a regional pattern, he thought that all of the groundwater in the area would end up in the conduits and thus into the lower Niagara River and into the Lake Ontario complete with any contained material, ie., chemical contaminants.

Thus the point with respect to this particular settlement discussion, is that in fact the government may have located the groundwater collection system such as it is, as we have already shown that A is inadequate over the longterm and B inadequate over the short term, which about covers it, they may in fact have even located it on the wrong side of the landfill if flow is toward the conduits and Johnston suggests in his conversations. The conduits are located to the east of the landfill.

Another completely erroneous statement on its face is contained in this statement, it notes ". . . installation of a tile drain system 15 feet below the top of the bedrock, to address contamination below the 15 foot level and offsite." How ridiculous can you get? BM's word is asinine. It's ridiculous because the tile drain system can only collect leachate which intersects the drain system, and obviously, if the drain system is not dug below 15 feet, it can't intersect contamination below 15 feet because there's no drain system there.

Water does not run uphill. One can go to nearby Niagara Falls, if the government wishes, to learn this fundamental lesson about water and how it moves down. They also may sit under an apple tree where we can arrange for some Newtonian apples to bing off their heads until they get the understanding of gravity and water always flowing downhill.

I am willing to take bets for any amount of money that groundwater in solution cavities in fractures will not move uphill. The capillary action which might overcome the downward force of gravity is absent in these situations.

Conversaton with Johnston: On June 9, 1981, I located Mr. Johnston, or Dr. Johnston, whatever, check in the book, and held a telephone consultation with him. I described who I was and who I was working for with respect to the Bloody Run situation. I briefly described the location of the Bloody Run landfill, the kind and amounts of material which went into it, and the understanding that the materials were probably in contact with bedrock. I then asked him, based on that above data set, whether he could conclude, based on his extensive knowledge of the Lockport Dolomite, that the Lockport Dolomite could serve as an effective bottom to a containment box for the Bloody Run landfill. His response was "Oh, hell no!!!" I asked him what sort of remedial technology he would perscribe in that case and whether it was possible to seal off the Lockport Dolomite to intercept any leachate. He indicated that he did not feel that it was possible to seal off the Lockport Dolomite and that the flow in the Lockport at that location was probably into the conduits and that anything that got into the Lockport Dolomite would sooner or later end up in the conduits and thus in Lake Ontario. I then asked his opinion without havin previously expressed an opinion of my own as to appropriate remedial technology, what should be done. He indicated that "If it was up to me, I would dig it up and haul it off."

In my opinion, Johnston would make an excellent court appointed witness since the structure of the Lockport Dolomite is key to the arguments as to whether containment can or cannot work at this site, and he is the resident expert as agreed to by both sides who have quoted his work as knowing the Lockport Dolomite.

Johnston's book: Note the pictures of the seepage through the Lockport Dolomite. Indeed, one picture shows how ice has accumulated, that is there is heavy water flow out of certain areas, whereas immediately adjacent to it in the bedding plain, there's no flow out. There's no icicles. In some areas there's light, in some areas there's heavy, and some areas there's no flow, and these areas change within a matter of inches. Thus, can see, for example, that if one drilled a monitor well into the bedding plain at a dark point, one would get no water, and thus contamination. And if one drilled a few inches away into the plain bedding plain at the same point, one would get water and any contained contaminants. This, of course, also neglects the argument that more than one bedding plain might be contaminated, ie., if you're in one bedding plain and you don't get it, that doesn't mean it's not contaminated in another bedding plain.

ITEM: Impermeable clay cap?? First of all, clay is not impermeable. It is simply relatively impermeable or less permeable than other materials such as sand. It's simply a matter of how you propose to look at it. As in the old story of the bottle is half full or the bottle is half empty. Clay will transmit significant amounts of water if the area of clay is extensive and if the hydraulic head across the clay is extensive. This argument, of course, assumes that the clay is of a uniform layer. That will be discussed later.

It is possible, given certain basic assumptions as to the permeability of the clay, as to its thickness, as to its porosity and as to its -- the hydraulic head across the clay layer, to calculate how much water on an annual basis could infiltrate the so called impermeable clay cap. Based on past calculations that were not particularly rigorous but only designed to an order of magnitude, I would estimate that this is in the tens to hundreds of thousands of gallons a year over the 15 acre site. However, it is possible and detailed to calculate this number and it should be.

I want to point out at this time that this is the best of all possible worlds. This is the least amount of water that can infiltrate under optimum best conditions with no glitches and with everybody having performed exactly 100% correct and with the clay layer having been put on uniformly in appropriate fashion over every square inch of the 15 acres. As we know, this probably won't be the case. That water goes somewhere. The analogy is a glass of water, which if you continue to drip water into the glass, it sooner or later will overflow. In this case, if you continue to drip water into the glass, it will sooner or later come out the open bottom, or move along laterally and come out the sides or most likely a combination of both.

You should point out that this is why a containment strategy which is effective, needs to have longterm perpetual care and monitoring and leachate collection. Leachate will always be produced by infiltration through a "impermeable clay cap." Thus, in a properly designed system, you do have a bottom which can serve as a collection vessel for water which infiltrates through the clay cap through the hazardous waste, and becomes contaminated. That is why you have to design an appropriate bottom in the box which includes an impermeable bottom and a leachate collection system to minimize hydraulic head on the impermeable bottom.

On beyond that, there are significant things that can happen to clay. One argument for removing the waste from the Hyde Park Landfill is that it will be properly and appropriately compacted in the new fill, and thus one will not get settlement. Settlement acts likes a small sink hole opening up under the site, it cracks the clay layer, causes it to move down if the settlement is sufficient. Thus, the clay must be continuously repaired or cracks will be created. It is possible to say that re-entombment will create less settlement problems than the existing fill.

Right now in the Hyde Park Landfill there's empty drums corroding and collapsing, etc., etc., etc., whereas in the new fill that would be compacted as it is implaced.

On beyond this issue is the fact that clay is effective as an impermeable device and retains its integrity not only so long as it doesn't move, but so long as it remains wet. If clay drys out, it will crack. All of us remember seeing river bottoms in the summer how they crack. Once the clay has cracked because it has dried out, say on a particularly hot summer, the fissures(?) will allow water once the rain comes to perculate directly into the fill. Again, this is why it must be properly designed and financial considerations provided for maintaining the clay cap if in fact this should happen to occur.

It should be pointed out that with the existing fill, there's a groundwater mound created, that is to say, that there is a head created inside the fill by the leachate which is pushing down on the bedrock with a hydrostatic head of probably 10 to 20 feet, that is potentially most of the heights of the fill. And in fact in landfills it's a wellknown phenonmia that you create a "mound of water" and it is exactly as it says it is, a mound of water which is created in the center of the fill because it can't move out the sides and decreases toward the sides as the pressure is relieved on the sides but the area at the center of the fill and at the bottom of the fill "sees" a hydrostatic head equal to most of the height of the fill. In this case, some 20 feet, above ground level that is. When you have no bottom in this situation, and a high hydrostatic head, obviously the rate at which contaminated leachate is forced into the porous underlying bedrock is a function of the hydrostatic head, the pressure. The higher the pressure, the more contaminated leachate gets forced into the openings. Thus, in this case, we have a relatively high hydrostatic head on the bottom of the box.

In this case, of course, the bottom of the box is of more of a sponge and than an absolute solid bottom allowing the leachate to run out. In the case of a new tomb, the bottom would have a leachate collection system which would serve to relieve the hydrostatic head on the new solid clay bottom.

ITEM: EPA and DOJ are touting this as a model settlement. I was told by Barry Trilling, a government attorney, in a phone conversation, that after he left DOJ that he and DOJ and EPA considered this a model settlement which could be applied to any hazardous waste situation, and was the best possible approach to resolving these problems. When I asked him why Montague was not a better system, he simply said, well, it's different circumstances. However, one would argue that if this is a model situation, how the hell can there be different circumstances arrive at a different answer.

On beyond this, in a case I am working on as a technical expert on the industrial side, that is, [illegible] EPA v. Metal Bank of America, et al. With respect to a small amount of PCB's as a result of an underground oil spill, EPA provided the attorney in this case, Mr. John Mattioni of Philadelphia, (215) 629-1600, with a copy of the Bloody Run consent decree, proposed oonsent decree, as a model which could be utilized in develpping a proposed consent decree in the Metal Bank case.

In this case, even though the agreement has yet to be ratified by the court as being used by EPA as a proposed model for settlement in another hazardous waste case. Interestingly enough, in the Metal Bank of America case, the governments' first proposed remedial strategy was to dig the entire site up and haul it to a landfill. In this case, the site after our proposed remediation technique which contains something like 20 pounds of PCB's, not 80 thousand tons of hazardous waste. To put the 20 pounds of PCB's in perspective, some 20 pounds a day of PCB's not from this source flow by the site in the Delaware River every day, each and every day. The estimated control cost of the containment strategy as implemented by EPA in this case, was over 30 million dollars.

Note that in this case EPA and the Department of Justice proposed for 20 pounds of PCB's that since a bottom could not be provided to the box, that the site to be entirely dug up and removed. Furthermore, in this case, the site would have had to been removed to another state since there is no nearby area wherein a landfill clay vault could be constructed. One wonders why EPA and DOJ have not followed this strategy in the case of Hooker wherein significantly more hazardous waste of a much more hazardous nature is present, and which is demonstratively impacted in the potentially impacting the Lake Ontario. As a matter of common knowledge in the field.

In general, it can be stated that it is common knowledge in the field of hazardous waste control and remediation that EPA and DOJ intend to utilize this settlement as a model across the country for all sites. Thus, it takes on additional importance as to the adequacy of this settlement on beyond the concern over the future of Lake Ontario.