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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION II

JACOB K. JAVITS FEDERAL BUILDING

NEW YORK, NEW YORK 10278-0012

HUDSON RIVER PCBs SITE
REASSESSMENT RI/FS

SCIENTIFIC AND TECHNICAL COMMITTEE
THURSDAY, MAY 27, 1993
ALBANY, NEW YORK

MINUTES

On May 27, 1993, a meeting of the Scientific and Technical Committee (STC) for the Hudson River PCBs Site Reassessment RI/FS was held at the Sheraton in Albany, New York. The purpose of the meeting was to provide STC members with information regarding the PCB source from the General Electric (GE) Hudson Falls Site (a.k.a. the Bakers Falls source area), and to discuss the implications that it may have on the Reassessment. The following STC members attended the meeting:

Bill Nicholson	Mt. Sinai Med. Ctr.
Dan Abramowicz	GE Corporate R&D
Brian Bush	NYSDOH
Ron Sloan	NYSDEC
Bob Dexter	EVS Consultants
G-Y Rhee	NYSDOH
Jim Bonner	Texas A&M University
Donald Aulenbach	Consultant
Ken Darmer	Consultant
Leonard Frost	USGS-WRD
Anne Secord	USFWS
Richard Bopp	RPI
George Putman	SUNY - Albany

Also attending and participating were:

Doug Tomchuk	USEPA
Bill McCabe	USEPA
William Ports	NYSDEC
Kevin Farrar	NYSDEC
Bob Montione	NYSDOH
John Haggard	GE
Jim Rhea	O'Brien & Gere
John Brown	GE
Pete Lanahan	GE

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Approximately twenty observers also attended the meeting. The meeting was started by Doug Tomchuk who explained the purpose of the meeting. A copy of the meeting agenda is found as Attachment 1.

After Mr. Tomchuk's introductory remarks, General Electric Company representatives John Haggard and Jim Rhea from O'Brien and Gere made a presentation on how GE came to understand that the Bakers Falls area was contributing a new load of PCBs to the Hudson River, and how the source area was narrowed down to the Allen Mills structure next to the GE Hudson Falls Plant site. GE discussed the difficulties involved with sampling in the structure and the complicating factors in conducting this investigation. The data collected as part of the Bakers Falls investigation along with data from the Remnant Deposits monitoring and other sampling that GE conducted, has allowed GE to concluded the following (as stated in GE's summary of preliminary findings which is found as Attachment 2):

> --GE's analysis of water, sediment and fish data from the Upper Hudson shows that the old buried sediments at the river bottom are supplying ever decreasing amounts of PCBs to the fish. This occurs because PCBs in the buried sediments are not exposed to the food chain. Moreover, they have largely been dechlorinated by the natural bacteria present in the Hudson. Dechlorinated PCBs do not readily accumulate in fish.
>
> --The Bakers Falls Source is emitting PCBs of a different kind. These PCBs are unaltered (or non-dechlorinated) and are in the feeding zone. Therefore, they have a higher potential for accumulating in fish.
>
> --PCBs from the Bakers Falls Source are the predominant kind of PCBs found in fish sampled in the Upper Hudson River.
>
> --GE believes that eliminating the Bakers Falls Source will have a far more beneficial effect on fish in the Upper Hudson River than removing the sediment.

Kevin Farrar and Bill Ports from the New York State Department of Environmental Conservation (DEC) then made a presentation about the Remedial Investigation and Feasibility Study that is ongoing at the GE Hudson Falls Plant Site.

Mr. Farrar's presentation dealt mainly with the plant site. He explained where areas of contaminated soils were discovered due to spillage from rail unloading operations. In addition he covered some of the understanding, to date, of the geology of the area, including the bedrock, a clay layer that is found under portions of the site, and groundwater.

Mr. Ports presentation was abbreviated because Mr. Haggard covered the investigations regarding the pathways that PCBs may be taking to reach the river and certain areas of sediment during his presentation. An important concept that the DEC presentations stressed was that the PCBs are not entering the river in any **ONE** place, or phase, or way.

After the completion of the presentations, the floor was opened for discussion by the STC membership. Several clarifications were made. First, that Allen Mills is not the culprit. Second, that the PCBs in sediments are degraded, therefore, the non-degraded PCBs in the river did not originate from sediments. It was suggested that the PCBs could have been from soils which allowed very little biodegradation.

One theory of why the peaks first showed up in 1991 was that a bar screen structure in the upper raceway appeared to have recently fallen over. This occurrence lowered the water level in the Allen Mills structure, which in turn allowed groundwater movement through the structure, which could be carrying PCBs from the Hudson Falls site. It should also be noted that numerous parties considered the peaks in 1991 and 1992 to follow a seasonal trend (i.e., a summer pulse theory).

Jim Rhea mentioned that the non-altered PCBs (resembling an Aroclor 1242 pattern) in the water-column suggests that it is not from a dissolved groundwater flow. Therefore, he would suspect that the PCBs are moving in an oil phase. There were no chemical or biological alterations occurring either.

Doug Tomchuk asked a question about the biodegradation of PCBs in sediments if there is oil also present in those sediments. G-Y Rhee responded that he has found that oil does inhibit PCB-degradation.

It was discussed that by measuring PCB concentrations on whole water samples, that you actually have the dissolved, precipitated and oil phase fractions in one sample. Selective dissolution and bio-uptake patterns are being ignored. Then when the fish concentration is looked at, the comparison is to whole water. Jim Bonner suggested that EPA look at other tracers in oil, water and fish, (e.g., hoppane). It was mentioned that the oil used at the Hudson Falls plant was "near" Aroclor 1242.

Jim Rhea stated that the increase in fish concentrations from 1991 to 1992 is attributable to the Bakers Falls source. However, Bob Dexter advised that it is a little premature to make such a conclusion because of the increase in lipid content over that same time span.

There was some discussion regarding whether the USGS data would have picked up a seasonal trend that the data has suggested. It seemed generally agreed upon that the USGS data would have shown peaks as high as those found in 1991 and 1992.

Richard Bopp questioned how far back have we set the clock for the recovery of the river. He suggested that the half-life may be shorter than historically, and that there may be accelerated decline in fish tissue levels. Ron Sloan said that fish tissue data for the lower Hudson is forthcoming and that the 1993 fish samples have been collected. He also added that percent lipid changes in the fish tissue are not uncommon. He mentioned that carp are high in oil, and contain a high amount of PCBs, but that the PCB to lipid ratio is comparatively low when compared to largemouth bass.

LUNCH BREAK

Bill Nicholson set out five areas for the afternoon's discussions: 1) sources; 2) time course of release; 3) reentrainment; 4) fish; and, 5) implications for the Reassessment.

Sources:
The Bakers Falls source area may have contributed at the thousands of pounds/year level.

Ron Sloan made a short presentation on the increase in the relative amount of Aroclor 1016 to Aroclor 1254 in fish tissue in the upper Hudson. Then Dan Abramowicz made a presentation about the makeup of PCBs in fish tissue on a congener-specific basis. His conclusion is that the PCBs in fish tissue resemble the congeners in fresh Aroclor 1242 much more than they resemble the greatly degraded sediments. Brian Bush disagreed with a the use of one bioaccumulation factor for all the tetrachlorobiphenyls, as GE had done, and suggested that they look at Lindsey Wood's paper on bioaccumulation factors (1987). There was also some discussion that GE did also discharge Aroclor 1254 to the river. Dan Abramowicz said that the 1254 in the sediment would have be dechlorinated. John Brown stated that GE discharged a few percent of Aroclor 1254 and discussed differential accumulation. John also explained that the physiological state of the fish and its recent feeding history make are significant in describing the PCBs that are found in fish tissue.

Reentrainment:
The following question was posed: The remnant deposit area is not really a site of sedimentation because of flow conditions, therefore, how is this reach a source of release of contamination? Jim Rhea responded that they believe the release may actually be a dense phase oil (approximately 12 lbs/gal). This oil may be found in a "fluff" layer, or rapidly mobilized layer.

Bill Nicholson asked if it the majority of this material would be located in the remnant area or the Thompson Island Pool area. Jim Rhea responded that based on his observations in the 1992 high loading period, it would be both areas.

Dan Abramowicz added that another possibility is that it is hard to get total mass (PCB) when measuring directly below the source; stating that theoretically, measurements may become more accurate (as to total mass) because the downstream sample is more well-mixed.

There is also the possibility that the elevated PCB levels during high flow through the remnants is the exhibit of a storage phenomenon.

Richard Bopp stated that it was his observation that during the high flow event this spring there was scour going on, but that it wasn't as dramatic in particle transport in the upper Hudson when compared to what was coming in from the Hoosic, Batten Kill and Mohawk Rivers. He stated that the upper Hudson was much more spread out and mild in comparison; and, after some discussion, added that he could not rule out watershed influence to this event.

He continued to state that in his observation, this was not a "classic" scour event (30,000 cfs), and would like to see more high flow bank-side scour considered as a contributing factor. Richard Bopp concluded with the advice that were he doing modelling, he would include tributary/watershed and flooded bank-side deposit scour for consideration in transport.

A question was asked as to whether EPA is doing work on shear-stress analysis as part of the Reassessment. Doug Tomchuk responded that while this was included in the work plan and has been discussed as a possibility, due to the variability of use for the numbers this type of analysis would generate, EPA will determine its usefulness as modelling efforts progress.

Significance of Topics to the Reassessment

Bill McCabe began the discussion by stating that EPA would be meeting shortly with NYSDEC as a result of the data on the upper river source (as requested by GE). As this is a major source, the question is should we take care of this source now and put the reassessment on hold, or can we go forward as planned, given the magnitude of the problem. He continued that EPA has known all along that there was a problem with an additional upriver source (as per Phase 1 Report), and will this new information on the Bakers Falls source mask the information regarding the sediment contribution to the fish?

Richard Bopp stated that the new input should be stopped as soon as possible. As to the relationship between the new data and the reassessment, he continued that he felt that there are areas of the reassessment that address the short term and suggested a continuation of fish sampling; continuation of sediment sampling with short-lived radionuclides; post remedial sampling of Hudson Falls; and limited water column sampling to look directly at transport.

A question arose as to where we are in the sampling, comparing pre and post event sampling.

Richard Bopp replied that a total of 7 transects were planned, three of them taken prior to the April event, four to post date the remediation. All high resolution sediment coring was completed last summer. The fish monitoring could be folded into the ecological assessment, which hasn't yet taken place. In addition, both the coring and water sampling will also address the lower Hudson.

Jim Bonner stated that since the source has been there since 1985 he can not see it changing the reassessment picture. He added that EPA needs to confirm the data heard at the meeting, that the 400 kg/year coming from the upper source is equivalent to the load over the Troy Dam.

Brian Bush stated that while this is certainly significant, it would be naive to expect any immediate influence at the Troy Dam or in the estuary. But it may take a decade until it stops coming down that far after the tap is turned off.

Doug Tomchuk reminded the committee that EPA is conducting high resolution, congener specific fish analysis (with the assistance of NYSDEC and NOAA). This will be done in August 1993, and has been deemed very important to the Reassessment by EPA in light of the Bakers Falls data. He continued with picking up where Bill McCabe had left off, as to whether in the minds of the committee, the reassessment is greatly affected by the data from the Bakers Falls source.

A response came from one of the committee members that there may be some concern that a decision on the sediments could be made before a there is a real understanding of the feasibility of remediation of the Bakers Falls source.

Jim Bonner added that one of the first steps in remediating a Superfund site is turning off the source of contamination. It would be ludicrous to remediate the site, only to go back 10 years later, to find recontamination because the source was not eliminated and have to undergo a second remediation. He then cited that in his opinion, the PCB body burden in the fish is due

directly to the upstream source - eliminate the upstream source and the body burden will follow.

Dan Abramowicz added that the contribution from the upstream source is critical in that is lies in a bioavailable zone and that the chlorine level is very different than the chlorine level in the sediments. He added that since the ultimate goal of this project is to reduce the levels in fish, so the relative availability of that material spatially and because of chemical content is different from the sediments. Concluding that the data we have today says that this is a much stronger contributor to the burden in the fish than the dechlorinated sediments.

Bill Nicholson then commented that he did not feel that a major alteration in the reassessment is warranted.

Brian Bush stated that the bursting of the bar screen is typical of the kind of event that everyone has been predicting for years - namely, that PCBs laying around the river, anywhere, an event can happen to stir it up again and send it downstream. In his opinion, it would be horrendous for EPA to postpone the decision to remediate even further.

A question was posed to Doug Tomchuk as to whether it is possible under CERCLA to make a decision in a "phased" manner?

Doug responded that this could be a contingency decision, which has been done in the past by EPA.

Jim Bonner asked what is the criteria for remediation? Is it fish body burden or is it sediment PCB-level?

Doug Tomchuk stated that it is basically a risk based decision based on fish.

Jim Bonner reiterated that he feels that if it is fish body burden, then he has serious questions in view of the data regarding the upstream source and its importance to PCB levels in fish.

Brian Bush stated that in his view, the concentrations in fish is not the only consideration for remediation - citing a case of a beach in Poughkeepsie where PCB concentrations in sand is .1 ppm in bulk sand, in fine sand its 5 ppm., elaborating on human exposure; and additionally stating that the problem is not just in the 40 mile stretch between Troy and Ft. Edward, but goes all the way to Manhattan. He continued that the upstream source makes little difference to the lower river which has had a burden of PCBs for over 30 years.

A discussion then ensued between Brian Bush, Dan Abramowicz, Richard Bopp and Ron Sloan regarding fish concentrations, sediment quality throughout the upper and lower Hudson and their relationship to the upper river source. This conversation was concluded by Ron Sloan that even during the low point of fish concentrations, the levels were still several times higher than acceptable. Doug Tomchuk also stated that he felt that the evidence is still inconclusive that the Bakers Falls source has been a past primary contributor to PCB contamination in the Hudson over the years.

Jim Bonner made a recommendation that when the fish and sediment data is ready it should be looked at in the light of the conversations held at this STC meeting. Bill Nicholson concurred with this, and after some further discussion along these same lines, the meeting was concluded.

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SCIENTIFIC AND TECHNICAL COMMITTEE
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AGENDA

Welcome and Introduction (10 minutes)	Douglas Tomchuk, USEPA Project Manager
Presentation of General Electric's Data on the Bakers Falls Source (1 hour)	John Haggard, General Electric Dr. James Rhea, O'Brien & Gere
NYSDEC - GE Hudson Falls Plant Site Remedial Investigation/Feasibility Study (30 minutes)	Kevin Farrar, NYSDEC Bill Ports, NYSDEC
Discussion on the Implications of the Bakers Falls Source on the Reassessment (4 hours w/1-hour lunch break)	MEMBERS and Guest Speakers Facilitated by: Dr. William Nicholson Mt. Sinai Medical Center
Summary (15 minutes)	Dr. William Nicholson
Adjourn	

Observers will only be allowed to participate if the STC membership has a specific question of a particular observer.

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Baker's Falls PCB Source Investigation

Summary of Preliminary Findings
May 26, 1993

Discovery

– The Baker's Falls Source is not new, but its significance has become better understood only recently. GE discovered evidence of the Baker's Falls Source during routine water sampling in the Upper Hudson River in 1991. GE reported its findings to state and federal regulatory agencies and began an intensive search for the source.

– The Baker's Falls Source is located in the vicinity of GE's Hudson Falls plant. This location is north of Roger's Island and north of the remnant deposits, which GE capped in 1991. For many years, it was assumed that the PCBs in the river north of Roger's Island were coming from the then-uncapped remnant deposits. After the remnant deposits were capped, further water sampling revealed continuing levels of PCBs. With further testing, GE localized the source of these PCBs to the vicinity of an abandoned paper mill (Allen Mills) structure on the eastern riverbank. Refined analytical techniques, which have become available only in recent years, enabled GE researchers to determine that most of the PCBs found in upper river fish were coming from a source other than the buried sediment. Gas chromotography permits researchers to see that a buried PCB, which has been largely dechlorinated by river bacteria, has a different chemical signature from a PCB that has not been exposed to Hudson River sediment.

– During routine water monitoring in the Upper Hudson River, GE detected elevated levels of PCBs in September 1991 and again in August 1992. Since then, PCB concentrations have not returned to the elevated levels seen during these two episodes.

Progress in the Investigation

– GE intends to find and remediate the Baker's Falls Source. GE has taken the following actions:

- Engineers have gained access to the 150-year-old Allen Mills building on the eastern riverbank. This is a dilapidated building through which river water once flowed to drive a manufacturing process. An investigation inside the building is underway. Safety stairs and platforms have been constructed to ensure the safety of workers.
- A stone raceway that conducted water into and through the Allen Mills building has been drained. This was accomplished through the construction of a cement wall at the Baker's Falls Dam. When the water was drained, engineers found sediment contaminated with PCBs at the bottom of the raceway.
- With the water in the raceway drained, a rock wall along the eastern riverbank was exposed. Engineers noticed trickles of water from fractures in the rock wall. A small amount of water is coming from these fractures, and the water contains PCBs. GE is developing a plan to prevent it from entering the river.
- Nine monitoring wells are being installed along the riverbank above the raceway. These wells, which are being drilled to varying depths, will be checked to determine the source of the PCBs seen in the fractures.
- A geophysical investigation of the riverbank has been completed. This was conducted to identify any buried pipes or other conduits. Several such pipes were located and are being investigated.
- GE has begun an underwater investigation in the area between the Baker's Falls Dam and the Fenimore Bridge. This is being conducted to identify any possible source in this short stretch of the river.

Implications for the Hudson River

– GE's analysis of water, sediment and fish data from the Upper Hudson shows that the old buried sediments at the river bottom are supplying ever decreasing amounts of PCBs to the fish. This occurs because PCBs in the buried sediments are not exposed to the food chain. Moreover, they have largely been dechlorinated by the natural bacteria present in the Hudson. Dechlorinated PCBs do not readily accumulate in fish.

– The Baker's Falls Source is emitting PCBs of a different kind. These PCBs are unaltered (or non-dechlorinated) and are in the feeding zone. Therefore, they have a higher potential for accumulating in fish.

– PCBs from the Baker's Falls Source are the predominant kind of PCBs found in fish sampled in the Upper Hudson River.

– GE believes that eliminating the Baker's Falls Source will have a far more beneficial effect on fish in the Upper Hudson River than removing sediment.

Cooperation with Government Agencies

– GE continues to work closely with the EPA and the New York Department of Environmental Conservation.

– GE believes the Baker's Falls Source is the most significant factor in the Upper Hudson River and is slowing natural recovery of the river. Therefore, GE has asked EPA to expand the scope of the current reassessment to include information gathered in the Baker's Falls investigation. GE believes that all information related to the Baker's Falls Source and its impact on PCB levels in fish must be carefully evaluated.

For more information, please contact M. Peter Lanahan, Hudson River Project Manager, at (518) 458-6648.