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SUMMARY OF THE RESULTS OF GENERAL ELECTRIC CO.'s 1996-1997 UPPER HUDSON RIVER/THOMPSON ISLAND POOL RESEARCH PROGRAM

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The United States Environmental Protection Agency's (EPA's) Data Evaluation and Interpretation Report (DEIR) (1996) represented a major milestone in EPA's Hudson River PCBs Reassessment. Its conclusions, however, were based on assumptions that were not sufficiently supported by data and that constituted hypotheses that had never been adequately tested by actual measurement of current conditions and physical processes in the upper river, and particularly in the Thompson Island Pool (TIP).

In August 1996, General Electric Company (GE) offered to conduct further research at its own expense to answer the fundamental questions posed by the unexplainably high PCB levels measured at the Thompson Island Dam (TID). Regrettably, EPA declined the opportunity to participate in this research program.

Understanding the source of PCBs passing over the TID is critical to EPA's Reassessment process. Thus, in order to fill the data gaps in the DEIR and to test hypotheses that have been put forward by both EPA and GE, GE proceeded with an extensive research program in the TIP in 1996 and 1997. The focus of GE's research was to account for the implausibly high estimated loadings from the TIP sediments to the water passing over the TID that could not be accounted for by diffusion of PCBs from the sediments.

GE's 1996-1997 TIP Research Program tested several hypotheses that had been advanced to explain the implausibly high estimated loadings from the TIP sediments to the water column. First, GE examined EPA's hypothesis that there were physical mechanisms, in addition to diffusion, that could theoretically

move PCBs from the sediments into the water column - namely, the inflow of groundwater and resuspension of sediments. Based on actual measurements of groundwater inflow rates, GE determined that groundwater inflow rates are at least ten times too low to account for the implausibly high estimated loadings from the TIP. Likewise, based on actual measurements of suspended solids throughout the TIP, GE determined that resuspension of sediments could not account for the estimated PCB loadings.

Second, GE conducted studies to assess the possibility that PCB oil and/or oily sediments from the vicinity of the GE Hudson Falls Plant site had been transported to the TIP in undissolved form but escaped detection in previous water column measurements at Roger's Island. To test this hypothesis, GE (1) conducted experiments using tracers designed to simulate PCB oil transport from Hudson Falls; (2) measured bed load and water column PCBs for evidence of transport during high flow events; (3) measured PCB transport during the periodic flooding of the Baker's Falls plunge pool caused by spring floods and maintenance operations at the Adirondack Hydroelectric Corp. Facility on the western side of Baker's Falls; and (4) conducted transect surveys across the TIP to search for areas of elevated PCB levels which might indicate areas of sediment with elevated PCB concentrations or locations of external sources.

GE's studies showed that, while some transport of undissolved PCBs may have occurred in years prior to 1997, such transport was not a significant factor contributing to the estimated PCB loadings from the TIP. These studies also showed that, while localized areas of higher water column PCB concentrations existed in the TIP at the time of the surveys, these concentrations were caused by limited flushing in the areas observed due to river hydrodynamics and were not the result of elevated loadings from the sediments. These areas were thus ruled out as an explanation for the implausibly high estimated PCB loadings from the TIP.

Third, the research program examined GE's hypothesis that the shoreline sampling station at the TID was not representative of PCBs being transported from the TIP. To test this hypothesis, transect sampling was conducted immediately upstream and downstream of the TID. Samples from a transect about 1000 feet upstream of the TID had concentrations significantly lower than PCB concentrations in samples taken from the shoreline sampling station. Similarly, samples in the main flow of the river immediately downstream were significantly lower than samples taken from the shoreline sampling station and were remarkably consistent with the lower levels found in the upstream sampling locations. This sampling was repeated on 11 occasions from September 1996 to September 1997 with consistent results.

Based on these results, GE has concluded that previous estimates by GE and EPA (2-3 pounds per day) of PCB loading from the TIP were erroneous due to a sampling bias at the shoreline sampling station; that the bias was likely caused by low flow conditions near the shoreline that do not accurately reflect flow across the TID; and that the summer average PCB load from the TIP during low flow conditions is on the order of 1 pound per day. Most importantly, this year-long study demonstrated that the TIP PCB load is derived from surface sediments throughout the entire TIP, and not from high concentration, dechlorinated sediments buried or at the surface in localized hot spots. This finding is critical to fashioning a remedial solution that addresses the source of PCBs affecting fish.

CONCLUSIONS

GE's comprehensive 1996-1997 TIP Research Program demonstrated that:

- the PCB load from the TIP is significantly lower than previously estimated (1 pound per day);

- the PCB load from the TIP is derived predominately from surface sediments throughout the entire TIP and not high concentration, dechlorinated sediments buried or at the surface in the localized hot spots (EPA's DEIR ignores this fundamental distinction);
- surface sediments below the TID contribute in similar fashion to PCB levels seen at Schuylerville; contrary to the DEIR, PCBs from the TIP are not transported in pipeline fashion to the lower river;
- the PCBs in the surface sediments are relatively undechlorinated compared to the PCBs in the localized hot spots and the PCBs detected in the fish are relatively undechlorinated compared to the PCBs in the localized hot spots;
- the PCBs detected in the fish on a congener basis closely resemble the relatively undechlorinated PCBs in the surface sediments in the upper river; this leads GE to conclude that releases of PCBs that have occurred in the recent past from the area of GE's Hudson Falls Plant site are the predominant source of PCBs to fish and that buried, localized PCB hot spot deposits are not a major source of PCBs to fish.
- the hypotheses set forth by EPA in the DEIR are flawed because they do not recognize
    - the importance of surface sediments to the TIP loading;
    - the contributions of PCBs from surface sediments below the TIP;
    - the necessity of additional data gathering to reflect GE's successful efforts to stop the release of PCBs from the vicinity of the Hudson Falls plant site and to resolve uncertainties in the source of PCBs entering the lower river;
    - the crucial role of a properly calibrated model to assess the effectiveness of remedial work conducted by GE at the plant sites and whether additional remedial work would be effective in accelerating the reduction of PCB levels and toxicity in fish already occurring through source control, sedimentation and dechlorination.

There is a need for additional research to confirm the results of GE's 1996-1997 research effort and to properly calibrate the models that are currently being developed by both EPA and GE. GE is fully committed to this research effort. We again extend an invitation to EPA to participate in this vital research. The stakes for all stakeholders are simply too high to rely on EPA's untested assumptions in light of river data that show EPA's hypotheses do not reflect actual conditions. The subjective evaluations based on limited data that pervade EPA's DEIR and constrain EPA's modeling effort detract from EPA's obligation to complete a scientifically credible Reassessment. Especially critical is NYSDEC/GE's current collaborative effort to collect fish data to confirm the natural recovery of the river as a result of GE's source control programs and natural processes.