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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Re: Hudson River PCB Reassessment RI/FS

COMMENTS OF THE GENERAL ELECTRIC COMPANY ON THE TAMS PHASE 1 - WORK PLAN

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The General Electric Company submits these comments on the January 1991 Review Copy of the Phase 1 Work Plan for the Hudson River PCB Reassessment RI/FS prepared for the U.S. Environmental Protection Agency by TAMS Consultants, Inc.

I. INTRODUCTION

The Work Plan is deficient because:

(a) It does not provide for timely and adequate field work and, thus, will result in the use of stale and incomplete data in characterizing the site and constructing models, thus violating the specific requirements of the National Contingency Plan (NCP) and applicable EPA guidance documents.

(b) Contrary to accepted scientific principles it calls for the conduct of a quantitative risk assessment using old data not representative of current conditions and trends, before the necessary prerequisites of field sampling and analysis are met, thus further violating the logic and sequencing mandated by the NCP and relevant guidances. This will result in an irrelevant numerical cancer risk estimate which will mislead the public.

(c) It violates the NCP requirement that risk assessments be performed using site specific information and fails to include tasks which would allow even a premature risk assessment to be correctly performed.

Last June GE volunteered to conduct the reassessment RI/FS in a way that would produce a scientifically valid result. Contrary to the national EPA policy which calls for PRP's to conduct RI/FS activities, in October EPA declined GE's offer pointing to "the unique circumstances of this site -- its extraordinary complexity and scope...". In so doing, EPA made a commitment to the public to do the job itself in an exemplary, state of the art manner. The Work Plan does not live up to that commitment. It underestimates the importance and complexity of the project and does not contain adequate specifics on the tasks it does identify. The Work Plan is deficient, is inconsistent with the NCP and must be significantly modified to rectify these fatal defects.

Even apart from the special commitment EPA made with respect to the Hudson River PCB Site, if a PRP submitted an RI/FS work plan to EPA in connection with another site that resembled this Work Plan, it would be immediately rejected as incomplete and inconsistent with the NCP and

guidances. EPA should not apply a different standard to itself.

The Purpose of the RI/FS

The basic purpose of the RI/FS is to reassess the "no action" decision made in the 1984 ROD to determine if that decision should be modified given current circumstances. It is not to reiterate the then available data base, but to describe and analyze the situation as it exists now and estimate what is likely to occur in the future. If the 1984 ROD is to be modified, the RI/FS must convincingly show what has changed and why that change should lead to a modified ROD. Old data is useful to the extent it actually represents current conditions and to evaluate trends to the extent it does not. The goal of the reassessment cannot be attained, however, without a clear picture of the existing state of the site and the application of scientific tools to predict changes over time and under a variety of conditions. While the proposed Phase 1 Work Plan contains many statements which appear to recognize this requirement, it does not set forth a detailed logical series of steps which are consistent with those statements, nor does it provide for the timely collection, proper validation and appropriate use of newly collected data as required by the NCP and EPA guidances.

Phase 1 is intended to be a very brief (3-1/2 month) desk top exercise in gathering and analyzing existing data to identify data gaps which need to be filled by subsequent field studies in Phase 2. While this seems to be logical and appropriate, the proposed Work Plan itself goes beyond the proper scope of Phase 1 in two significant ways:

(a) The Plan calls for a "description of the current nature and extent of PCB contamination" as a conclusion to its Task 1, (p. 2-2) (emphasis supplied). This is utterly impossible given the immense size of the 46 mile long site, its dynamic nature, the sparsity of existing data points and the staleness of most of the data. This conclusion, to have any validity and credibility, must be deferred until after the completion of Phase 2 field studies.

(b) Task 4 appears totally out of sequence and unscientific to the extent it produces a quantitative estimate of human health risks (p. 2-9). At this stage of the process, the applicable EPA guidance schedules only a preliminary exposure assessment, not a risk assessment, in order to establish data quality objectives, and the Plan correctly describes this activity as a Phase 1 task (p. 2-10). To attempt a quantitative risk

assessment as part of Phase 1 is to conduct a meaningless paper exercise that violates the NCP, EPA guidances and EPA policy on risk communication, with the possibility that the public will be misled by the irrelevant risk projections.

To be scientifically adequate, to be consistent with the NCP, and to prevent misleading the public, the Phase 1 Work Plan must be modified as follows:

(1) Defer to the end of Phase 2 the task of complete site characterization and human health risk assessment so that they will be based upon valid data truly representative of existing conditions properly projected into the future;

(2) Spell out in greater detail the tasks needed to collect, evaluate and organize the existing data base in order to identify data gaps and establish data quality objectives for Phase 2; and

(3) Develop an overall strategy for field work needed to complete characterization of the site, to construct and run models simulating site dynamics, and to conduct

a scientifically defensible risk assessment.

It should be specifically noted that additional collection efforts suggested by GE need not result in unreasonable delays in EPA's overall schedule for the reassessment. It is true that if EPA and its contractor miss the prime sampling seasons in 1991, some sampling may have to be conducted in the spring and early summer of 1992. Some data gaps are already obvious to all parties such as wetland identification, sediment characterization, river bathymetry, etc., EPA should not wait until its currently scheduled start of Phase 2 (August 1, 1991) to collect needed information that is seasonally dependent.

Whatever additional time is needed, however, to do the job scientifically and lawfully is entirely justified by the importance and complexity of the Hudson River site and the potentially huge costs, possibly exceeding any measurable benefits, that could occur from a rush to judgment. In fact, the short additional time needed to make the Hudson reassessment RI/FS a scientifically defensible study pales in comparison to the remedial investigation times experienced by PRPs, at other Superfund Sites, e.g. two to four years.

II. CHARACTERIZATION OF THE SITE IS IMPOSSIBLE IN PHASE 1

The description of Task 1 begins with the statement:

> "For the current ROD Reassessment it is necessary to fully define the current status and identify future trends of PCBs in the river". (p. 2-1)

GE agrees. GE disagrees, however, with the assumption in the Work Plan's description of Task 1 that this is an easy task that can be performed quickly principally with existing data and with minimal additional data collection.

1. The 1984 Thompson Island Pool Investigation Does Not Accurately Characterize the Site

The Work Plan's belief that "the 1984 Thompson Island Pool investigation" (p.2-1) provides a data source capable of adequately characterizing the site is misplaced. That investigation only produced data for a five mile reach of the 40 mile long site. Even in this reach that data is of suspect validity and utility, as the following discussion illustrates.

Historical Hudson River sediment data exhibits extreme variability of reported PCB concentrations by location. Under conditions of high variability, a small number of high values can be misleading in determining overall average concentrations or total mass estimates. This problem is exacerbated by the polygonal technique used by

NYSDEC in analyzing the 1984 sediment concentrations to identify "hot spots" and compute the mass of PCBs present. The DEC's polygonal technique, which uses arithmetic average concentrations to represent highly skewed data and ignores nondetectable analytical results, has significantly overestimated the quantities of PCBs in upper-river sediments. This technique, and the conclusions derived from it, should not be used in the RRI/FS.

A scientifically valid method for estimating PCB volume and distribution is essential for the RRI/FS. We suggest that a well recognized geostatistical procedure known as "kriging" be used to provide a proper picture of the spatial distribution of PCBs within the river. EPA itself has developed a computer program, the GEO-EAS software package, that employs this technique to estimate the amount and distribution of contaminants.

However, even good technique cannot overcome bad data, and the 1984 data are no longer representative of current conditions due to the passage of time and to changes in the river. Furthermore, the 1984 data points are too far apart and the results of analysis too variable to be usable in making a meaningful estimate of PCB distribution and volumes based upon geostatistical techniques.

The following example demonstrates the unreliability of the 1984 data in representing present

conditions. Based upon its 1984 sediment sampling program, NYDEC mapped an area of the river bottom, known as "polygon 5", and identified it as a major location of PCBs. Based on one core with two samples, with PCB concentrations of 39.7 and 6587.8 ppm, respectively, DEC determined that this 1414 sq. meter area contained an average PCB concentration of 2437 ppm and a mass of 1723 kg of PBCs -- about 8% of all of the PCBs estimated to be present in the five mile reach of the river known as the Thompson Island Pool!

In 1990 GE resampled polygon 5 by taking cores on 20' centers. With 30 sampling points, GE's samples showed a range of PCB from 2.4 to 45.9 ppm with an average of 17.5 ppm. Using the DEC method of estimating mass (which we believe to be inappropriate) merely to compare results, less than 15 kg of PCBs would be calculated to be in polygon 5. The comparative data is illustrated in the following table:

	No. of Sample Points	Range of PCB Concentration (ppm)	Average PCB Concentration (ppm)	Calculated Mass(kg)
1984 Survey	2	39.7-6587.8	2437	1723
1990 Survey	30	2.4-45.9	17.5	13.5

GE is prepared to discuss this data with EPA, at its request.

This example demonstrates the total invalidity of using the 1984 sampling program and the DEC polygonal technique as a basis for determining (a) the mass of PCBs in

the river, (b) the location of PCBs in the river, (c) the transport and fate of PCBs in river sediments, (d) the exposure of biota to PCBs in the river, (e) areas of the river bottom appropriate for remedial action or (f) technologies which can feasibly be used to carry out any such remedial action.

2. The Impact of the Remnant Deposits Remediation Is Not Yet Known

The 1984 ROD called for the remediation of the "remnant deposits", just north of the Thompson Island Pool at the northern boundary of the Superfund Site. This remediation work conducted by GE principally occurred in 1990 with the remainder of the work to be completed by May 1991. All of the existing water quality, fish and sediment data predates the remnant deposit remediation. Presumably EPA directed that the remnant deposits be remediated to reduce the PCB flux in the river and human exposure to PCBs in the river. If EPA was correct, then the historic data is no longer representative of existing conditions even if nothing else happened since 1984. Nothing in the Work Plan accommodates this very significant change in circumstances. It is thus impossible to adequately characterize the unremediated portion of the site, which is downstream from the remnant deposits, without first taking water, sediment, fish, air and other samples from the site in its condition after the capping of the remnant deposits.

* * *

If the most detailed body of available data is of suspect reliability and utility, and if an EPA upstream remediation has occurred since the data available for Task 1 has been collected, and if only superficial quality assurance of data will be undertaken in Task 1, and if the whole purpose of the Task 1 exercise is to prepare a sampling plan for Phase 2 data collection, then it is illogical and contrary to EPA guidances for the Work Plan to provide:

> "At the completion of [Task 1], a description of the current nature and extent of PCB contamination (waste types or media concentration, and distribution) will be presented in the Phase 1 Report." (p. 2-2)

or

> "Historical and recent data will be evaluated to assess the current health/environmental risks posed by the PCBs in the river" (p. 2-1)

Furthermore, the Work Plan (p. 2-2, Par. B) calls for "general adherence to EPA Contract Laboratory Program (CLP) protocols". If this is so, it is unlikely that old data, such as the 1977-78 and 1984 sediment study results, can be used for site characterization or risk assessment except perhaps as information to estimate trends.

The most that can be hoped for from Task 1 is a preliminary collection and organization of existing data, a plan to do a detailed quality assurance evaluation of that

data, the identification of data gaps and a plan to fill those data gaps. Task 1 must be modified to recognize the limited scope of what is scientifically and legally possible so that these items are its sole product.

III. THE PROPOSED MODELING REQUIRES MORE DATA AND A BETTER UNDERSTANDING OF SITE DYNAMICS

The Work Plan in Tasks 2 and 3 recognizes the need for a technique to evaluate trends and alternative scenarios in the highly dynamic river environment. For dealing with both the physical and biological transport of PCBs through the system, the Work Plan proposes the use of mathematical models. While a well-constructed mathematical model may be the best available tool to predict changes in the river and biota over time, several aspects of the Work Plan modeling proposal deserve comment.

First, the Work Plan identifies the model as a device to fill data gaps (bottom p. 2-4 and top 2-5). A valid model, however, cannot be constructed without adequate data to which it can be calibrated. Nor is a model a substitute for data. What should be done is to obtain current data to validate and calibrate a model (which must also be calibrated with data representative of past conditions when such data exist) and use this model to forecast future conditions. The model should not be used to fill data gaps which can readily be filled by field work; empirical data is always preferable to calculated data.

Second, the existing data that is proposed as a foundation for the model is suspect. The Work Plan several times refers to the concentration of PCBs in "hot spots" (p.

2-6, 2nd par; p. 2-8, 2nd par). The Work Plan also proposes to limit sediment transport modeling to the Thompson Island Pool because "much of the contaminated sediment is found there" (p. 2-8). As noted above in the discussion on site characterization, this is an assumption based on old data no longer representative of current conditions and too sparse even to allow an accurate estimate of historic conditions, and modeling that relies on this assumption would be in error.

Third, any modeling of PCB transport must recognize the affinity of PCBs for fine-grained sediments and organic material rather than treating the sediment mass uniformly. Also, any meaningful sediment transport model must take into account both cohesive and cohesiveless sediments. The Work Plan does not demonstrate that there will be a determination of the distribution of PCBs on fine-grained sediments or organic material in contrast to PCB concentrations on coarse material, or that the model will be able to model the dynamics of cohesive sediments and not just cohesiveless sediments.

Fourth, none of the Work Plan's discussion of modeling takes notice of the fact that the fate and transport of PCBs varies greatly depending upon the specific congeners that are involved. Some PCBs volatize, dissolve, biodegrade, adsorb on sediments and bioaccumulate more

readily than others. They also present differing human health risks. Any model based on PCBs in general, rather than on what congeners (or at least homologs) are involved, will be inherently inaccurate. The models must be able to differentiate among PCB congeners, and the data used to validate, calibrate and run these models must be developed on that basis as well. This is especially important for the Hudson River where mostly lightly chlorinated PCBs from Aroclors 1016 and 1242 were used and where natural dechlorination is occuring. Use of values derived from heavily chlorinated PCBs such as Aroclor 1260 would be erroneous.

Finally, Task 2 of the Work Plan (p. 2-4) describes what seems to be the development of a "management model", based upon simplified, statistical methods using observed ratios to simulate PCB bio-uptake and bioaccumulation. While this short-cut technique may be appropriate for some applications, it is not for a site as complex and dynamic as the Hudson River. The fact is that the PCB concentrations in the river are still declining rapidly with total water column PCB concentrations showing a 50% reduction every three years. Under such conditions, ratios of concentrations between the water column and other media are not an accurate measure of PCB transport through the food web. The following discussion illustrates the point.

If PCB concentrations in the water column remained constant with time, we would eventually expect to reach an equilibrium ratio of the PCB concentration in fish to that in water. This ratio is known as the bioaccumulation factor, or BAF, and for near equilibrium conditions it can be a useful way to evaluate responses to concentration changes. Now, however, assume a rapid decrease in water column PCB concentration. If the rate of decrease in water column concentration is greater than the rate at which fish concentrations can respond, the apparent BAF will begin to increase. This does not mean that the fish have become more sensitive to water column concentrations. Rather, it is an indication of the lag between water and fish concentrations.

Upper Hudson River data now indicate this natural attenuation response with fairly drama ic increases in the apparent BAFs as water column concentrations are decreasing. While this is a favorable indication of natural attenuation, it greatly limits the use of BAFs as a meaningful predictor of future Hudson River PCB trends. In this regard, BAFs are not a substitute for proper modeling of PCB fate and we therefore recommend that the Phase 1 Work Plan not rely on BAFs as a predictive tool.

IV. THE PROPOSED QUANTITATIVE HUMAN HEALTH RISK ASSESSMENT IS OUT OF SEQUENCE VIOLATING GOOD SCIENTIFIC PRACTICE AND THE NCP

The National Contingency Plan requires that an RI include

> "a site-specific baseline risk assessment" (§300.430(d)(4)) (emphasis supplied).

The site specific baseline risk assessment is to be based upon "data developed" during the RI (§300.430(d)(4)) including

> "field investigations to assess the following factors:
>
> (i) Physical characteristics of the site, including important surface features, soils, geology, hydrogeology, meteorology, and ecology;
>
> (ii) Characteristics or classifications of air, surface water, and ground water;
>
> (iii) The general characteristics of the waste, including quantities, state, concentration, toxicity, propensity to bioaccumulate, persistence, and mobility;
>
> (iv) The extent to which the source can be adequately identified and characterized;
>
> (v) Actual and potential exposure pathways through environmental media;
>
> (vi) Actual and potential exposure routes, for example, inhalation and ingestion; and
>
> (vi) Other factors, such as sensitive populations, that pertain to the characterization of the site or support

the analysis of potential remedial action alternatives." (§300.430(d)(2)).

The Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual (EPA/540/1-89/002: December 1989) ("RAGS") and other guidance documents referenced in the Work Plan (p. 2-9) expands upon the NCP. They contain very specific requirements for data to be considered suitable and sufficient for a human health risk assessment. These requirements cannot be met in Phase 1. Therefore, conducting a quantitive risk assessment in Phase 1 is premature and out of sequence. Even if it were timely to conduct the risk assessment, the Work Plan does not correctly or completely set forth a protocol for it which is scientifically and lawfully proper.

1. The Data Is Not Yet Available For A Valid Risk Assessment

The Work Plan calls for the use of

> "the currently available data to provide a quantitative evaluation of the health risks associated with human exposure to PCBs from the upper Hudson River" (P.2-9)[1]

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1 The Work Plan (P. 2-3) calls for the identification of "other possible contaminants which pose possible concerns for the river"... "in order to evaluate the baseline risks..." Doing a quantitative assessment in Phase 1 inputting PCBs as the only chemical is completely inconsistent with this provision of the Work Plan.

Simple logic dictates that actually conducting a quantitative human health risk assessment in Phase 1 is out of sequence since both the Phase 1 gathering of existing data and the Phase 2 filling of data gaps are needed and relevant inputs to the risk assessment process. The NCP and associated guidance documents confirm this logic. What is consistent with the objectives of Phase 1 is to conduct a preliminary exposure assessment, the product of which is not the generation of risk numbers, but the identification of what the key parameters are, which of those can be determined using existing data or realistic assumptions, which require data collection, and which must be provided by the models once the models are validated and calibrated to current data. (see Chapter 4 of RAGS).

This sequencing error would exist if the Work Plan were for any Superfund risk assessment. However, the error is especially egregious given two factors that differentiate the Hudson site: (a) EPA's written assurance that it intends to produce the highest quality and most objective RI/FS possible, and (b) the dramatic, continually changing site conditions reported in the existing data base.

The historical data show steadily decreasing trends in PCB concentrations in river water, sediments, air and fish, with order of magnitude changes in some media in relatively short periods. Total water column concentrations

now exhibit a trend of 50% reduction every three years or so. Continuation of that trend would result in water column concentration reductions of 90% in ten years and a 99.9% reduction in 30 years. The data also show continuously changing congener distribution patterns with lightly chlorinating PCBs predominating in upper river sediments and more heavily chlorinated PCBs in lower river sediments. These dynamics affect the hazard identification, exposure scenarios and toxicity valuation components of the baseline risk assessment for the Hudson River site. For example, a constant concentration of PCBs of a specific Aroclor type in a single location cannot be used, for example, in postulating a Reasonable Maximum Exposure for risk assessment purposes.

A scientifically defensible assessment cannot be accomplished using static concentrations and compositions projected over a 30 or 70 year exposure period since a steady state is already known to be a gross misrepresentation of future conditions.

2. Proper Exposure Scenarios Cannot be Quantified In Phase 1

The Phase 1 Work Plan recognizes that site specific factors, in addition to those relating to contaminant characterization, must be identified in order to develop the current and future exposure scenarios. The Work Plan does not contain, however, a discrete set of tasks to generate that site specific information other than looking at

"available literature and guidance methods" (p. 2-11). A simple example will illustrate what is needed. If the qualitative risk assessment performed in Phase 1 confirms the 1984 NUS conclusion that fish consumption presents the most significant risk to human health, without site specific data gathering on this pathway, a meaningful quantitative risk assessment cannot yet be performed. First, the critical elements must be identified (Where will people fish? What fish will they catch? What fish will they eat? At what frequency?, etc.). Second, existing data relating to these elements must be gathered and evaluated. Third, data gaps must be identified. Fourth, field work or modeling must be carried out to fill the gaps. Then, and only then, can a quantitative baseline risk assessment be performed.

Thus, the Work Plan for Phase 1 should explain how receptors for each pathway from the various exposure media (e.g. water, fish, air, etc.) will be identified and how exposure frequency and duration will be established. An excellent vehicle for comment and feedback at the end of Phase 1 would be a qualitative presentation of the anticipated exposure scenarios, along with the proposed assumptions. By not committing to a quantitative risk estimate value in Phase 1, EPA then avoids the risk of losing credibility with the public which often occurs with continued revisions of quantitative risk estimates. Such a Phase 1 presentation of information would include specific reference

to literature-based assumptions and a list of the site-specific data needed in Phase 2 to credibly support each proposed exposure scenario. A few examples follow:

(1) If crop uptake is a preliminary concern, there might be a limited PCB analysis of selected crops grown along the upper Hudson to see if concentrations warrant any further consideration of crop uptake as a credible concern.

(2) If there are people using water directly from the Upper Hudson River (without treatment) as a water supply, a site-specific survey of such users might be appropriate this summer to see what credible exposures might exist. This same effort could also include swimming and wading surveys to identify where such activities might reasonably occur.

This approach is consistent with EPA's Guidance for Data Usability in Risk Assessment, Interim Final, Directive 9285.05.

In addition to baseline exposure scenarios, the Phase 1 Work Plan should also consider preliminary exposure scenarios for dredging and land based handling and disposal

of river sediments. Again, this would not be a quantitative risk assessment in Phase 1 but rather a proposed exposure scenario with identification of data needs for Phase 2. Early consideration of these exposure scenarios related to remediation would allow proper consideration of risk for proposed remedial actions during the FS. There does not appear to be sufficient time in EPA's reassessment schedule to later evaluate such remedial exposures, much less collect supporting data, before the ROD. Therefore, Phase 1 should address remedial action exposure scenarios.

Finally, regarding exposure, the Phase 1 Work Plan does not indicate how sources of PCBs will be distinguished. It is essential to know what proportion of any total exposure is related to the NPL site and thereby responsive to site remediation. There may well be sources of PCB exposure in air that are not derived from the river itself. Similarly, any other sources of PCBs to the lower river would need to be identified and quantified to properly characterize that portion of exposure unrelated to the upper river NPL site. Without this source differentiation for each exposure scenario, the subsequent evaluation of risk reduction for various remediation schemes can be quite misleading.

3. The Needed Toxicity Assessment Cannot Be Made In Phase 1

The Work Plan acknowledges that "the toxicity of PCB congeners has been shown to vary between congeners" (P. 2-11), but then goes on to propose a quantitative risk assessment in Phase 1 that does not account for this scientific fact.

To achieve the most accurate risk estimates, a PCB risk assessment would consider each PCB congener as a unique and separate chemical. Short of that, it is possible, at this time, to apply the results of published Aroclor-specific animal test studies which provide the best match for Aroclors actually used in the Upper Hudson; dominantly Aroclor 1242 and 1016 with very much smaller contributions of Aroclor 1254. T ere is widespread evidence of natural PCB dechlorination in the river itself. This further indicates that the appropriate focus of the risk assessment should be on the lower chlorinated Aroclors.

In order to rapidly facilitate Aroclor-specific risk assessments, GE has funded an independent program to reread the pathology slides for all five of the key PCB animal feeding studies and has invited EPA to observe this work. The rereading will employ uniform pathology and nomenclature and evaluate both the qualitative and quantitative aspects of these major studies. The rereading should be completed by early June 1991 with an initial report

of results about one month thereafter. Since the studies involved differing PCB mixtures (Aroclors), the reread should provide Aroclor-specific cancer potency factors. Additionally, it is expected that the Aroclor 1260 potency factor now used as the basis for EPA's generic PCB risk assessment policy will be shown to be incorrect because of the use of more refined pathological methodologies. Any quantitative risk assessment calculations for the Hudson site should await the results of these straightforward and highly relevant studies. Therefore, Phase 1 should collect and organize the existing data on PCB toxicity and identify for Phase 2 the data gaps that exist and a plan for filling those gaps.

* * *

By jumping to a quantitative baseline risk assessment out of sequence the Work Plan is violating its own internal logic, proper scientific method, the NCP and RAGS. No possible benefit can result. Time and other resources will be wasted and the product will have the potential to mislead and confuse issues that should be resolved by good facts and good science. Answers to the crucial issues should not be dictated by an arbitrary schedule or default assumptions about the facts.

V. CONCLUSION

The Phase 1 Work Plan should be modified to be internally consistent, to conform to good scientific methods and to comply with the requirements of the NCP and EPA guidances. The Preliminary Reassessment Report called for in Task 6 should then contain the following Sections:

Section A - Summary of Existing Upper and Lower River Data and Identification of Data Needed to Characterize the Site.

Section B - Description of Proposed Aquatic Food Web Bioaccumulation Model and Identification of Data Needed to Validate and Calibrate the Model.

Section C - Description of Proposed PCB Transport Model and Identification Data Needed to Validate and Calibrate the Model.

Section D - Outline of Process for Evaluating Human Health Risks from the Site and Data Quality Objectives to be Met In Conducting a Baseline Risk Assessment.

Section E - Description of Existing Ecological Setting and Identification of Data Needed to Complete Such Description.

Section F - Inventory of Potential ARARS and TBCs.

Section G - Initial Screening of Remedial Technologies and Identification of Data or Studies Needed to Evaluate Them.

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