02-0789

GE
159 Plastics Avenue
Pittsfield, MA 01201
USA

September 11, 2007

Ms. Susan Svirsky
U.S. Environmental Protection Agency
c/o Weston Solutions, Inc.
10 Lyman Street
Pittsfield, MA 01201

Re: GE-Pittsfield/Housatonic River Site
Rest of River (GECD850)
Dispute Resolution on Certain Conditions and Directives in EPA's "Conditional Approval" Letters for GE's Model Input Addendum and Supplement

Dear Ms. Svirsky:

Pursuant to Special Condition II.N.1 of the Reissued RCRA Corrective Action Permit (the Permit) issued by the U.S. Environmental Protection Agency (EPA) to the General Electric Company (GE) in 2000, GE hereby notifies EPA of GE's objections to certain conditions and directives set forth in: (1) EPA's letter of May 24, 2007 providing "conditional approval" of GE's April 16, 2007 Model Input Addendum (MIA) to its Corrective Measures Study (CMS) Proposal for the Rest of River; and (2) EPA's letter of August 28, 2007 providing "conditional approval" of GE's August 3, 2007 Supplement to the MIA. As you will recall, GE and EPA previously agreed to extend the time period under the Permit for GE to invoke dispute resolution on EPA's May 24, 2007 letter until 14 days after GE received EPA's response to the MIA Supplement.

By this notice, GE is invoking dispute resolution under Special Condition II.N.1 of the Permit with respect to certain conditions and directives in EPA's letters of May 24 and August 28, 2007, relating to the boundary conditions for application of EPA's PCB fate, transport, and bioaccumulation model in the CMS. Those specific conditions and directives, as well as GE's objections to them, the bases for GE's position, and the positions that GE believes should be adopted, are set forth in the attached Statement of Position. However, as also noted in that Statement, GE expressly reserves all its rights to contest these or any of the other conditions and directives in EPA's letters of May 24 and August 28, 2007 – including GE's right, pursuant to Special Condition II.N.5 of the Permit, to raise any of its objections in a challenge to EPA's modification of the Permit to select corrective measures for the Rest of River, as well as any other rights that GE has under the Permit, the Consent Decree, or applicable law to raise such objections in the future.

As you know, the first stage of dispute resolution under the Permit involves discussions between the parties to attempt to resolve the disputes. GE looks forward to having such discussions with

EPA during the next two weeks in an effort to reach a mutually agreeable resolution of the disputed issues.

Very truly yours,

Andrew T. Silfer, P.E.
GE Project Coordinator

Attachment

cc: Dean Tagliaferro, EPA
Timothy Conway, EPA
Holly Inglis, EPA
Rose Howell, EPA (without attachment)
Susan Steenstrup, MDEP
Anna Symington, MDEP
Jane Rothchild, MDEP
Thomas Angus, MDEP
Dale Young, MA EOEA
Susan Peterson, CDEP
Michael Carroll, GE
Jane Gardner, GE
Roderic McLaren, GE
Kevin Mooney, GE
James Bieke, Goodwin Procter
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GENERAL ELECTRIC'S STATEMENT OF POSITION ON OBJECTIONS TO CERTAIN CONDITIONS AND DIRECTIVES IN EPA'S CONDITIONAL APPROVAL LETTERS FOR GE'S MODEL INPUT ADDENDUM AND SUPPLEMENT

September 11, 2007

INTRODUCTION

On February 27, 2007, the General Electric Company (GE) submitted to the U.S. Environmental Protection Agency (EPA) a Corrective Measures Study Proposal (CMS Proposal) for the "Rest of River" area of the Housatonic River, pursuant to Special Condition II.E of the Resource Conservation and Recovery Act (RCRA) Corrective Action Permit that was issued by EPA to GE on July 18, 2000 (the Permit) as part of the comprehensive settlement embodied in the Consent Decree (CD) for the GE-Pittsfield/Housatonic River Site. The CMS Proposal described GE's proposed study of potential remedial actions to address polychlorinated biphenyls (PCBs) within the Rest of River, which is located downstream of the Confluence of the East and West Branches of the River (the Confluence). As required by the Permit, the CMS Proposal stated that GE would use EPA's PCB fate, transport, and bioaccumulation model to evaluate the potential remedial alternatives for sediments (including erodible riverbanks). It noted, however, that certain inputs to the model would be specified in more detail in an addendum to the CMS Proposal, called the Model Input Addendum (MIA).[1]

GE submitted the MIA to EPA on April 16, 2007. The MIA specified a number of the input parameters and values that GE proposed to use in applying EPA's model to the sediment remedial alternatives in the CMS. However, for one key input – the upstream boundary condition for PCBs entering the Rest of River from the East Branch – the MIA included a proposal for supplemental PCB sampling of sediments and surface water in the East Branch to provide data to assist in developing this boundary condition; and it stated that following review

[1] EPA issued a letter to GE on April 13, 2007, stating that it was providing "conditional approval" of the CMS Proposal subject to numerous conditions and directives. Following dispute resolution, EPA modified some of the conditions in that letter in a letter dated May 22, 2007, and GE agreed not to proceed with that dispute resolution proceeding while reserving its rights.

of those data, GE would submit an additional deliverable presenting the results of that sampling and describing the proposed current and future boundary condition values for the East Branch. On May 24, 2007, EPA issued a letter providing "conditional approval" of the MIA and containing a number of conditions and directives. GE and EPA subsequently agreed to extend the time period for GE to invoke dispute resolution on that letter under the Permit until 14 days after GE received EPA's response to GE's future deliverable relating to the East Branch boundary conditions.

On August 3, 2007, GE submitted a Supplement to the MIA summarizing the results of the sediment and water column sampling that had been proposed in the MIA and proposing current and future PCB boundary condition values for the East Branch. On August 28, 2007, EPA issued a letter "conditionally approving" the MIA Supplement, again with additional conditions and directives.

Pursuant to Special Condition II.N.1 of the Permit, GE is invoking dispute resolution on certain requirements set forth in EPA's conditional approval letters for the MIA and MIA Supplement. Specifically, GE disputes: (1) EPA's directive, in Comment 2.3 of its August 28, 2007 letter, to assume continued reductions in future PCB concentrations for the East Branch boundary condition, using a 52-year half-life, after the assumed time period for taking account of future remediation affecting the East Branch; (2) EPA's directive, in its May 24, 2007 letter, to reduce the initial PCB concentration for the West Branch boundary condition to reflect assumed decreases in PCBs in the West Branch between the PCB data collection and the start of the model simulations; and (3) EPA's directive, in its May 24, 2007 letter, to represent the starting PCB concentration in other tributaries of the River due to atmospheric sources with a value back-calculated from application of EPA's Rest of River bioaccumulation model to a reference waterbody. For the reasons set forth below, these requirements are unjustified and arbitrary and must be reconsidered by EPA.

At this time, GE is invoking dispute resolution only as to the specific directives identified in this Statement of Position. GE expressly reserves all of its arguments and all its rights to contest these or any of the other conditions and directives in EPA's May 24 and August 28, 2007 letters – including its right, pursuant to Special Condition II.N.5 of the Permit, to raise

any of its objections in a challenge to EPA's modification of the Permit to select corrective measures for the Rest of River, as well as any other rights that GE has under the Permit, the CD, or applicable law to raise such objections in the future.

GE POSITION

Background

In order to use the EPA model to conduct a comparative evaluation of the remedial alternatives for sediments, it is necessary to establish boundary conditions to estimate the PCB loads entering the Rest of River from outside that area under both current and future conditions. The most significant of these is the East Branch PCB boundary condition (i.e., the PCB load entering the Rest of River area from the East Branch of the River) both under current conditions and following completion of ongoing remedial actions. Other outside contributors of PCBs to the Rest of River include the West Branch and other tributaries to the Rest of River.

During its model development, EPA considered and began to develop an "Upstream Model" to project the future PCB load entering the Rest of River from the East Branch, but it did not complete that model. Instead, during model calibration and validation, EPA specified PCB loads from the East Branch, as well as the West Branch, using a data-based approach (including equations developed from relationships between particulate-phase PCB concentrations and river flow rate), as described in EPA's Final Model Documentation Report (EPA, 2006b, App. B.2). As discussed in the CMS Proposal and as EPA recognized in its Responsiveness Summary to the Peer Review of Model Validation (EPA, 2006a, p. 6-7), while this approach was appropriate for specifying PCB loads for the model calibration and validation, it cannot be used for the simulation of future conditions in the Rest of River, because it does not account for reductions in PCB loading that have resulted and will result from the various remedial measures conducted and to be conducted by GE and EPA within and near the East Branch, as well as those to be conducted by GE in the West Branch.

Since EPA did not develop these boundary conditions in a way that can be used in the CMS, it was necessary for GE to develop approaches to specify these boundary conditions for use in

the model projections. Given time constraints, it was not feasible for GE to develop a model of such conditions. Moreover, any specifications of future conditions are uncertain; such conditions cannot be known with certainty until the remaining remediation work has been completed, the system has reached equilibrium, and water column data can be obtained. Nevertheless, since such conditions need to be specified to conduct the model simulations, GE developed boundary conditions for the various external sources of PCBs to the Rest of River, using best professional judgment regarding changes in conditions. These sources included the East Branch, the West Branch, and the other tributaries. For each of these boundary conditions, however, EPA has directed GE to make certain changes that are unfounded, as shown below.

1. EPA's Directive To Apply a Half-Life to the Future East Branch PCB Boundary Condition Is Unrealistic and Arbitrary.

GE's Proposal and EPA's Directives

In the MIA, GE proposed to base the East Branch boundary condition on water column particulate-phase PCB concentrations. To account for future reductions in PCB load to the East Branch following planned remediation projects affecting the East Branch, GE proposed to reduce the estimated current particulate-phase PCB boundary value linearly over a 10-year period to estimate the future concentration. To assist in developing the boundary condition, GE also proposed in the MIA to collect additional water column and surface sediment data from the East Branch, and then to submit an additional deliverable presenting the results of that sampling and proposing specific current and future boundary condition values for the East Branch. EPA's May 24, 2007 conditional approval letter for the MIA specified a number of conditions relating to the development of the East Branch boundary condition. These included a requirement to exponentially reduce the future East Branch boundary condition for the duration of the model projections after the 10-year transition period, using an assumed PCB half-life of 20 years, based, EPA said, on the half-life that GE had proposed for the West Branch boundary condition. EPA stated, however, that it might modify its requirements upon review of GE's upcoming deliverable.

Following collection of the supplemental sampling data, GE submitted the MIA Supplement on August 3, 2007. In addition to summarizing the results of that sampling, GE proposed its approach to specifying the current and future East Branch PCB boundary conditions. Specifically, GE developed a current boundary condition based on the supplemental water column data, with separate components for low-flow and high-flow conditions. For the future condition, GE noted that this condition is dependent on the remaining PCB sources to the East Branch – notably the areas that have been or will be remediated to the cleanup standards deemed protective of human health and the environment under the CD (or GE's Administrative Consent Order with the Massachusetts Department of Environmental Protection), but which will still contain some residual amounts of PCBs (as recognized by those standards). GE explained further that this condition cannot be estimated with confidence, since the relative contribution of PCBs to the East Branch from the various potential sources is unknown and there is no reliable way to predict quantitatively the extent of reductions in those contributions from future remediation. Accordingly, GE proposed to apply a qualitative approach for estimating the future condition by applying reduction factors to the current condition. Based on a qualitative assessment of the likely principal remaining sources under both low-flow and high-flow conditions and the potential reductions in PCB loads that may occur from future remediation activities, GE estimated, as a matter of professional judgment and solely for the purpose of developing a boundary condition to use in the CMS model simulations, that the additional remediation activities would result in an approximate 90% reduction in PCB loads at the East Branch boundary during low-flow periods and an approximate 50% reduction during high-flow periods.

GE also explained in the MIA Supplement that EPA's prior directive to apply a half-life to the future East Branch particulate-phase PCB concentration following the 10-year transition period is not appropriate. GE noted that the use of a half-life is a simple means of simulating natural recovery processes in a riverine system (i.e., burial in depositional environments, scour losses downstream, and dilution with upstream clean solids). GE observed further that while it had proposed use of such a half-life for the West Branch, that was because the proposed remediation for the West Branch would reduce PCBs from the only major remaining sources (the sediments and lower bank soils adjacent to Dorothy Amos Park) to non-detect or very low

levels. As a result, use of a half-life would appropriately reflect the anticipated natural recovery rate of sediments within the West Branch following that remediation. By contrast, GE pointed out that the principal post-remediation sources to the East Branch would likely be upland soil sources in areas adjacent to or near the East Branch that have been or will be remediated to standards that contemplate the presence of residual PCBs. Those upland sources are not subject to the types of natural recovery processes that occur in the dynamic system of a river. Rather, the available PCB mass in the surface soils in those areas is not expected to decline appreciably following remediation, making use of a half-life inappropriate.

In its August 28, 2007 conditional approval letter, EPA concurred with GE's proposal to assume a 90% reduction in East Branch PCB concentrations during low-flow conditions. EPA also concurred that assuming a 50% reduction during high-flow conditions is one reasonable approximation of the effects of ongoing remediation. However, due to uncertainties in this estimate, EPA also required GE to conduct model simulations based on the assumption of a 75% reduction in high-flow PCB concentrations over the first 10 years of the simulations. With respect to the use of a half-life, EPA acknowledged that application of a half-life to the East Branch boundary condition to represent natural attenuation similar to that proposed for the West Branch may be inappropriate because "the inputs are largely derived from upland soil sources which are not affected by the same natural recovery processes that occur in riverine systems." Nonetheless, EPA directed GE to apply a half-life of 52 years to exponentially reduce the PCB concentrations at the East Branch boundary for the duration of the model simulation projections following the 10-year transition period from current to future conditions. In support of its position, EPA stated that its directive to apply a half-life to the East Branch boundary condition "was not based solely on the concept of natural attenuation due to riverine processes, but also on the assumption that implementation of Best Management Practices (BMPs), improved stormwater management, and/or other means of controlling discharges of contaminants from the facility to the river will be implemented during the period of the model simulations." EPA also stated that inputs from any residual contamination in Unkamet Brook sediments following remediation would be subject to natural riverine recovery processes.

Response to EPA's Arguments

EPA recognizes that the natural recovery processes that occur in the dynamic system of a river do not apply to the upland soil areas that will form the principal PCB sources to the East Branch following the completion of the ongoing and planned remediation projects. Nonetheless, EPA has directed GE to apply a half-life to the future East Branch boundary condition, claiming support based on other factors.

However, EPA's reliance on the implementation of BMPs, stormwater management controls, and other discharge controls at the GE facility is unjustified and does not support the requirement to reduce the assumed PCB concentrations in the East Branch at an exponential rate indefinitely after the 10-year transition period. While BMPs and other controls may be implemented at the GE facility, those controls would not produce an indefinite and continuing exponential decline. As discussed in the MIA Supplement (p. 4-7), GE already considered such BMPs/controls in its assessment of the reductions that are likely to occur over the 10-year transition period. Furthermore, since the model simulations for active remedial alternatives will start upon the commencement of the assumed remediation, the 10-year transition period within those simulations will not even begin until several years in the future, thus allowing more than 10 years from now for BMPs and potential stormwater/discharge controls to be implemented at the GE facility and their effects to be seen in the River. It is not reasonable or realistic to require GE to assume that implementation of such BMPs/controls will cause PCB concentrations in the East Branch to continue to decline indefinitely thereafter. This is particularly true since such BMPs and stormwater/discharge controls would address only a portion of the potential PCB sources. As EPA concedes, PCBs will continue to enter the East Branch from the other remediated soil sources, which are not subject to natural recovery processes.

Moreover, while it is true that the remediated Unkamet Brook sediments will be subject to riverine natural recovery processes, those sediments are only one of numerous post-remediation soil/sediment sources of PCBs to the East Branch, as EPA itself notes in its August 28, 2007 letter (in Condition 2.1). In fact, as indicated by the information in the MIA Supplement, when high-flow as well as low-flow conditions are considered, the remediated

Unkamet Brook sediments are unlikely to constitute a significant PCB source to the East Branch. Thus, it would not be expected that the natural recovery processes in Unkamet Brook after remediation would cause any significant change in the overall PCB boundary condition after the end of the 10-year period, which is driven mainly by contributions from the remediated soil sources during high-flow conditions.

For these reasons, EPA's requirement to apply a half-life that would result in the continued exponential reduction in the estimated particulate-phase PCB concentrations at the East Branch boundary indefinitely after the end of the 10-year transition period is unrealistic and should be withdrawn.

2. EPA's Directive To Reduce the Initial West Branch PCB Boundary Condition Based on Assumed Pre-Remediation Natural Recovery Is Unsupported and Inconsistent with EPA's Own Boundary Condition.

In the MIA, GE proposed to base the current PCB boundary condition for the West Branch on the boundary condition specified in the EPA model, which was based on loading equations developed from river flows and particulate-phase PCB concentrations. It then proposed to specify the future condition by applying a reduction factor of 0.3, the ratio between the average current sediment concentration and the expected average future sediment concentration following GE's planned remediation of the main PCB source in the West Branch (the sediments and lower bank soils adjacent to Dorothy Amos Park). In addition, as noted above, given that that remediation would largely remove the principal remaining source of PCBs in the West Branch, GE proposed to further reduce the future West Branch boundary condition by applying a 20-year half-life to reflect the natural recovery of this stream.

In its May 24, 2007 letter, EPA directed GE to reduce the ***starting*** water column PCB boundary concentration to be used in the model projections by a factor of 0.3 (representing approximately one-half of a 20-year half-life) on the ground that the West Branch water column PCB concentration data used in developing EPA's current boundary condition "were collected approximately 10 years prior to the start of the remediation simulation."

This directive is unwarranted. GE's proposed approach assumed that the natural recovery in the West Branch would not occur until ***after*** completion of GE's proposed remediation for the sediments and lower bank soils adjacent to Dorothy Amos Park, anticipated to occur in 2008. By contrast, EPA's approach assumes that the PCB concentrations in the West Branch have been naturally declining, at a rate equivalent to a 20-year half-life, during the 10 years between collection of the water column data in the late 1990s and implementation of GE's proposed remediation. There are no data to support that assumption, and such natural recovery, at least at the rate of a 20-year half-life, would not be expected given the continued presence of the major source adjacent to Dorothy Amos Park. Indeed, EPA's own West Branch boundary condition did not include any decline over the period of 1979-2004 because no sediment remediation activities were conducted over that period. EPA has provided no basis for why this non-declining condition should not also apply from the late 1990s until the implementation of the upcoming sediment/lower bank remediation. Thus, EPA's requirement to apply an extra reduction factor to account for an assumed decrease during this period is arbitrary and should be withdrawn.

3. EPA's Directive To Represent the Tributary PCB Boundary Condition Based on Back-Calculation from Application of Its Model to a Waterbody for Which the Model Was Not Developed, Rather Than Based on Measured Data, Is Unfounded.

In the MIA, GE proposed to establish a PCB boundary condition for the tributaries originating outside the 1 mg/kg isopleth that discharge into the main stem of the River downstream of the Confluence. Due to the absence of known sources of PCBs within the watersheds of these tributaries, this boundary condition was developed to reflect inputs from atmospheric sources of PCBs, based on available data. GE's proposed initial boundary condition for these tributaries was 0.3 ng/L. This value was derived from a review of 16 studies that sampled PCBs in precipitation and remote waterbodies having no known sources of PCBs. In addition, GE back-calculated a water column PCB concentration associated with measured fish tissue concentrations from a reference site within the Housatonic River watershed, Threemile Pond, using a bioaccumulation factor (BAF) derived from an EPA guidance document. The literature studies indicated a range of 0.3 to 0.5 ng/L, while the BAF back-calculation indicated a range of 0.1 to 0.2 ng/L. GE selected a value in the middle of that overall range (0.3 ng/L). In

addition, GE proposed to apply an exponential decay using a 10-year half-life to reflect long-term trends in atmospheric PCB concentrations within the northeastern United States, as cited in the literature.

In its May 24, 2007 letter, EPA stated that GE's proposed approach of applying a BAF to the Threemile Pond fish data to estimate a water column concentration was "unnecessarily simplistic," and that GE's proposed use of the literature studies was not acceptable because of the "high variability" in those data. Instead, EPA applied the PCB bioaccumulation model that it had developed for the Rest of River, which is known as the Food Chain Model (FCM), to Threemile Pond to back-calculate a water column concentration of 0.110 ng/L. EPA directed GE to use that value, stating that the "FCM-based back-calculation has the lowest overall degree of uncertainty for the establishment of a tributary boundary condition." However, EPA did approve GE's proposed use of the literature-derived 10-year half-life for this boundary condition.

EPA's contention that the back-calculation with the FCM has less uncertainty than using the literature approach, supplemented with the BAF method, is unsupported and incorrect. The FCM was not developed or calibrated for Threemile Pond; hence, there is no assurance that it accurately represents the food web of the pond or the relative levels of PCBs in the water and sediment of the pond. In developing the FCM for the Rest of River, EPA configured and calibrated the model separately for each sub-reach to represent the feeding preferences among the simulated species on a sub-reach basis. EPA did not provide any details or information on the model configuration or specific parameter values that were used to represent Threemile Pond, so it is impossible to assess its calculations. We note, however, that the inputs to the FCM that most strongly influence its predicted fish tissue concentrations are the PCB exposure concentrations in the sediments and the water column. Thus, the back-calculated water column concentrations are highly dependent on the input sediment concentrations. The 1999 EPA sediment data collected from Threemile Pond were all non-detect (except for one anomalous result[2]), with a majority (15 out of 20) having relatively high detection limits in the range of

[2] PCBs were detected in one sample at a concentration of 27.5 mg/kg, but that anomalous result appears to be an outlier and/or incorrectly attributed to the Pond (e.g., a mislabeled sample from the River).

0.5 to 1.0 mg/kg. Accordingly, the input sediment concentration for the FCM calculation, and hence the resulting predicted water column concentration, are highly uncertain.

By contrast, the literature data, despite their variability, provide direct measurements of PCBs in water and no conversion from fish tissue is needed. In addition, GE's back-calculation of water column concentrations in Threemile Pond was derived from measured fish tissue concentrations (based on EPA data), rather than FCM-predicted concentrations (which, in turn, are dependent on unknown sediment concentrations, as well as numerous uncertain model parameters that may not be applicable to Threemile Pond). Thus, contrary to EPA's assertion, the combined use of the literature data and the BAF approach actually has less uncertainty than the FCM back-calculations. Moreover, it was inconsistent for EPA to preclude GE from using the literature studies on background PCB levels for purposes of specifying a boundary condition, but to accept the use of such studies for specifying the future trend (i.e., a 10-year half-life).

For these reasons, EPA's directive regarding the tributary boundary condition does not have a sound basis and should be withdrawn.

REFERENCES

EPA, 2006a. *Responsiveness Summary to the Peer Review of Model Validation: Modeling Study of PCB Contamination in the Housatonic River.* Prepared by Weston Solutions, Inc., West Chester, PA, for the U.S. Army Corps of Engineers, New England District, and the U.S. Environmental Protection Agency, New England Region. November 2006.

EPA, 2006b. *Final Model Documentation Report: Modeling Study of PCB Contamination in the Housatonic River.* Prepared by Weston Solutions, Inc., West Chester, PA, for the U.S. Army Corps of Engineers, New England District, and the U.S. Environmental Protection Agency, New England Region. November 2006.