Phase 1 Intermediate Design Report Hudson River PCBs Superfund Site

Attachment C – Phase 1 Intermediate Design Performance Standards Compliance Plan Scope

General Electric Company
Albany, New York

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Tables (placed in text)

1. Introduction

This *Phase 1 Intermediate Design Performance Standards Compliance Plan Scope* (Phase 1 ID PSCP Scope) provides a general description of the actions that General Electric Company (GE) will undertake during Phase 1 of the Remedial Action (RA) for the Upper Hudson River to implement the Engineering Performance Standards (EPS), the Quality of Life Performance Standards (QoLPS), and the water quality requirements (WQ requirements) issued by the United States Environmental Protection Agency (EPA) for Phase 1 of the RA. The EPS consist of 1) the Resuspension Performance Standard, 2) the Residuals Performance Standard, and 3) the Productivity Performance Standard, and are set out in a five-volume document titled *Hudson River PCBs Superfund Site Engineering Performance Standards,* issued by EPA in April 2004.

The QoLPS consist of performance standards governing 1) air quality, 2) odor, 3) noise, 4) lighting, and 5) navigation, and are set out in a document titled *Hudson River PCBs Superfund Site Quality of Life Performance Standards*, issued by EPA in May 2004.

The WQ requirements consist of: 1) requirements relating to in-river releases of constituents not subject to the EPS, as set forth in *Substantive Requirements Applicable to Releases of Constituents not Subject to Performance Standards;* 2) the substantive requirements for discharges to the Hudson River and Champlain Canal, as set forth in *Substantive Requirements of State Pollutant Discharge Elimination System Permit for Potential Discharges to Champlain Canal (land cut above Lock 7)*; and 3) *Substantive Requirements of State Pollutant Discharge Elimination System Permit for Potential Discharge to the Hudson River*. These three sets of requirements are contained in a single document in the form of a letter to GE with enclosures that EPA issued on January 7, 2005.

This Phase 1 ID PSCP Scope will form the basis for the *Phase 1 Performance Standards Compliance Plan* (Phase 1 PSCP), to be prepared as part of the *Remedial Action Work Plan for Phase 1 Dredging and Facility Operations* (Phase 1 RA Work Plan). The Phase 1 PSCP will set forth further details as to how the EPS, the QoLPS, and the WQ requirements will be implemented during Phase 1 and will be consistent with this Phase 1 ID PSCP Scope.

This Phase 1 ID PSCP Scope is an attachment to the *Phase 1 Intermediate Design Report* (Phase 1 IDR). Each section provides, for each performance standard or WQ requirement, an overview of the standard or requirement established by EPA, and describes the actions that will be taken to implement that standard or requirement.

Actions that GE will take to implement the EPS, the QoLPS, and the WQ requirements also are set forth in other attachments to the Phase 1 IDR, including the *Phase 1 Intermediate Design Remedial Action Monitoring Scope* (Phase 1 ID RA Monitoring Scope) (Attachment A to the Phase 1 IDR), and the *Phase 1 Intermediate Design Remedial Action Community Health and Safety Program Scope* (Phase 1 ID RA CHASP Scope) (Attachment B to the Phase 1 IDR). Where actions to implement the EPS, the QoLPS or the WQ requirements are specified in those attachments, this Phase 1 ID PSCP Scope incorporates those documents by reference.

During Phase 1, equipment modifications or additions that are not reasonably available from a schedule or cost standpoint will not be required, recognizing that substitutions for major equipment approved in the Phase 1 Final Design or being used in Phase 1 may be impractical. However, in the event that reasonable changes can be made to address achievement of the performance standards during the Phase 1 dredge season, GE will propose such changes to equipment or operations for EPA review and approval. During Phase 1, EPA will consider any information that GE may submit regarding impacts to schedule and project costs when the Agency reviews GE's proposals, if any, for modification of the EPA-approved Phase 1 Final Design based on field conditions or experience.

2. Resuspension Performance Standard

This section of the Phase 1 ID PSCP Scope discusses the Resuspension Performance Standard. It provides an overview of the resuspension standard as set forth in the EPS (e.g., Volume 2), and specifies the routine monitoring requirements (Section 4.2 of Volume 2 of the EPS), the contingency monitoring (Section 4.2 of Volume 2 of the EPS) and other responses (Section 4.5 of Volume 2 of the EPS) in the event of an exceedance of an action level, the notification and reporting requirements, and the special studies (Section 4.4 of Volume 2 of the EPS) to be conducted. Some of these requirements are specified in the Phase 1 ID RA Monitoring Scope; in such cases, the requirements are incorporated by reference.

2.1 Overview of Standard

The Resuspension Performance Standard specifies a routine monitoring program and three action levels – Evaluation, Control, and Standard Levels. These action levels apply to polychlorinated biphenyls (PCBs) and/or total suspended solids (TSS) in surface water at either near-field stations (located within 300 meters [m] of the dredging activities) or far-field stations (located more than 1 mile downstream of dredging activities). As described in more detail below, these action levels will be used to trigger additional monitoring or contingency actions during the RA beyond those required by the routine monitoring program. These action levels are also summarized in Table 2-1 of Volume 1 of the EPS and Section 4.0 of Volume 2 of the EPS. The monitoring program is described in the Phase 1 ID RA Monitoring Scope and will be detailed in the *Phase 1 Remedial Action Monitoring Quality Assurance Project Plan* (Phase 1 RAM QAPP) to be prepared as part of the RA work plans.

Evaluation Level

Under the EPS (Section 4.1.1 Volume 2, pp. 87-92), the Evaluation Level would be exceeded if any of the following conditions occurs:

- "The net increase in Total PCB mass transport due to dredging-related activities at any downstream far-field monitoring station exceeds 300 g/day for a seven-day running average."
- "The net increase in Tri+ PCB mass transport due to dredging-related activities at any downstream far-field monitoring station exceeds 100 g/day for a seven-day running average."

- "The sustained suspended solids concentration above ambient conditions at a far-field station exceeds 12 mg/L. To exceed this criterion, this condition must exist on average for 6 hours or a period corresponding to the daily dredging period (whichever is shorter). Suspended solids are measured continuously by turbidity (or an alternate surrogate) or every three hours by discrete samples."
- "The sustained suspended solids concentration above ambient conditions at a location 300 m downstream (i.e., near-field monitoring) of the dredging operation or 150 m downstream from any suspended solids control measure (e.g., silt curtain) exceeds 100 mg/L for River Sections 1 and 3 and 60 mg/L for River Section 2. To exceed this criterion, this condition must exist on average for six hours or for the daily dredging period (whichever is shorter). Suspended solids are measured continuously by surrogate or every three hours by discrete samples."
- "The sustained suspended solids concentration above ambient conditions at the near-field side channel station or the 100 m downstream station exceeds 700 mg/L. To exceed this criterion, this condition must exist for more than three hours on average measured continuously or a confirmed occurrence of a concentration greater than 700 mg/L when suspended solids are measured every three hours by discrete samples."

Control Level

Under the EPS (Section 4.1.2 Volume 2, pp. 93-95), the Control Level would be exceeded if any of the following conditions occurs:

- "The Total PCB concentration during dredging-related activities at any downstream far-field monitoring station exceeds 350 ng/L for a seven-day running average."
- "The net increase in Total PCB mass transport due to dredging-related activities at any downstream far-field monitoring station exceeds 600 g/day on average over a seven-day period."
- "The net increase in Tri+ PCB mass transport due to dredging-related activities at any downstream far-field monitoring station exceeds 200 g/day on average over a seven-day period."
- "The sustained suspended solids concentration above ambient conditions at a far-field station exceeds 24 mg/L. To exceed this criterion, this condition must exist for a period corresponding to the daily dredging period (six hours or longer) or 24 hours if the operation runs continuously (whichever is shorter) on average. Suspended solids are measured continuously by surrogate or every three hours by discrete samples."
- "The sustained suspended solids concentration above ambient conditions at a location 300 meters downstream (i.e., near-field monitoring) of the dredging operation or 150 meters downstream from any suspended solids control measure (e.g., silt curtain) exceeds 100 mg/L for River Sections 1 and 3 and 60

mg/L for River Section 2. To exceed this criterion, this condition must exist for a period corresponding to the daily dredging period (6 hours or longer) or 24 hours if the operation runs continuously (whichever is shorter) on average. Suspended solids are measured continuously by surrogate or every three hours by discrete samples."

- "The net increase in PCB mass transport due to dredging-related activities measured at the downstream far-field monitoring stations exceeds 65 kg/year Total PCBs or 22 kg/year Tri+ PCBs."

Standard Level

Under the EPS (Section 4.1.3 Volume 2, p. 98), the Standard Level is "a confirmed occurrence of 500 ng/L Total PCBs, measured at any main stem far-field station. To exceed the standard threshold, an initial result greater than or equal to 500 ng/L Total PCBs must be confirmed by the average concentration of four samples collected within 48 hours of the first sample. The standard threshold does not apply to far-field station measurements if the station is within one mile of the remediation."

Adjustments of PCB Load Criteria

The Resuspension Performance Standard (EPS, Section 4.1.3 Volume 2, pp. 97-98) also specifies that adjustments can be made to the allowable total PCB load criteria based on the results of the following:

- "The production rate will be reviewed on a weekly basis. The allowable Total PCB load loss for the season will be adjusted if this target rate is not met…."
- "The allowable seven-day Total PCB load loss thresholds will be revised if the production rate varies from the anticipated value or the operation schedule differs from that assumed for this report. The revision is to be calculated once per dredging season (i.e. the 7-day running average criterion is set once per season)."

The allowable seven-day Total PCB mass load loss will be calculated using the equations in Section 4.1.2.7 (pp. 97-98) of Volume 2 of the EPS. EPA will review the total project mass load (currently set at 650 kg) after the dredge area delineation for Phase 2 is complete. If appropriate, EPA will increase or decrease the total allowable project load proportionally to the total project mass load.

2.2 Routine Monitoring

GE will conduct the routine near-field and far-field monitoring described in Sections 2.2 through 2.4 of the Phase 1 ID RA Monitoring Scope, as such monitoring relates to PCBs, TSS, and other parameters specified in the Resuspension Performance Standard.

2.3 Contingency Monitoring

In the event that the routine monitoring shows an exceedance of the Evaluation Level, the Control Level, or the Standard Level for PCBs or TSS, GE will conduct the contingency monitoring specified for the exceedance at that level in accordance with Sections 2.2, 2.4.1, and 2.5 of the Phase 1 ID RA Monitoring Scope.

2.4 Contingency Actions/Responses

If the monitoring indicates an exceedance of the Evaluation Level, the Control Level, or the Standard Level, GE will undertake the associated contingency actions and engineering responses as outlined below.

Evaluation Level

In the event that the monitoring shows an exceedance of the Evaluation Level, an engineering evaluation as outlined in Section 4.5 of Volume 2 of the EPS will be considered in an effort to determine the cause of the exceedance. If performed, the engineering evaluation will begin upon receipt of data confirming an exceedance of the Evaluation Level. As part of this evaluation, investigative measures may be implemented to determine the cause of the exceedance. If GE determines that such measures are appropriate, it will propose such investigative measures to the EPA field representative. The selection of investigative measures will depend on specific project circumstances and may include one or more the following different actions:

- Visual observations of operations;
- Discussions with project personnel;
- Review of operations records;
- Examination of the integrity of containment barriers (if in use);
- Examination of sediment transport pipeline (if in use);

- Examination of barge loading system and barge integrity;
- Examination of resuspension associated with tugs, barges, and other support vessels; and
- Additional monitoring and/or sampling.

Following the engineering evaluation (where conducted), if the cause of the exceedance can be identified and is project-related, potential engineering solutions will be considered and may be recommended. The engineering evaluation and results will be presented to EPA in an Engineering Evaluation Report. That Engineering Evaluation Report also will include recommendations regarding an engineering solution, if any, to address the cause, except as follows: If the engineering solution involves a refinement in operations or equipment that is consistent with, and would not require a modification of, the EPA-approved design or the RA Work Plan, GE may implement the solution in consultation with the EPA field representative, and then document the implementation of that solution in the Engineering Evaluation Report. In any other case, GE will implement the engineering solution in accordance with the EPA-approved Engineering Evaluation Report.

Control Level

If the monitoring shows an exceedance of the Control Level, an engineering evaluation will be conducted, as outlined in Section 4.5 of Volume 2 of the EPS beginning upon receipt of data confirming the exceedance, in an effort to determine the cause of the exceedance. As specified in the Resuspension Performance Standard (Section 3.4.4 of Volume 2 of the EPS), a Control Level exceedance of a TSS criterion must be confirmed by far field PCB measurements before actions other than increased monitoring are required. If investigative measures are warranted to determine the cause of the Control Level exceedance, such investigative measures will be proposed to the EPA field representative. The selection of investigative measures will depend on specific project circumstances and may include, but are not limited to, the measures described above under *Evaluation Level.*

If the Control Level is exceeded, potential engineering solutions will be evaluated to address the exceedance, and the implementation of an engineering solution will be proposed unless the EPA field representative determines that no engineering solution is necessary to address the Control Level exceedance (for example, if the exceedance is not sustained or is mitigated by implementation of a non-project-related action). The possible engineering solutions to be considered include the following:

- Initiate mandatory engineering evaluation and continual adjustments to dredging operations until the Evaluation Level or better is attained.
- Evaluate and identify any problems.
- Consider changes in resuspension controls, dredge operation, or dredging equipment.
- Consider implementing additional or different resuspension controls.
- Consider changing location and rescheduling more highly contaminated areas for later in the year (applies to May and June only), if other options are not effective.
- Temporarily cease operations if required.

An Engineering Evaluation Report will be prepared and submitted, which contains the results of this engineering evaluation, the proposed engineering solution and a proposed schedule for implementing that solution, except as follows: if the solution involves a refinement in operations or equipment that is consistent with, and would not require a modification of, the EPA-approved design or the RA Work Plan, then GE shall implement the solution in consultation with the EPA field representative and the implementation of that solution will be documented in the Engineering Evaluation Report. In all other cases, the engineering solution will be implemented in accordance with the EPA-approved Engineering Evaluation Report. If the cause of the exceedance was not identified by the engineering evaluation, the Engineering Evaluation Report will include a course of action for continued monitoring and evaluation to determine the cause of the exceedance. GE will consult with EPA on a regular basis until the cause and solution are determined, or until EPA orders a temporary halt to the operation(s) that caused the exceedance or until EPA determines that further evaluation is not necessary.

Standard Level

If the monitoring shows an initial occurrence of a PCB concentration in excess of the Standard Level, GE will promptly notify EPA, but no later than 3 hours after receipt of the data. If subsequent sampling confirms an exceedance of the Standard Level, GE will: 1) again promptly notify EPA, but no later than 3 hours after data receipt; 2) temporarily halt dredging and other river-based operations that caused the exceedance; 3) perform an engineering evaluation; and 4) develop an engineering solution as described above under *Control Level*. GE will also develop a schedule for reinitiating dredging and other river-based operations that were suspended with an objective of minimizing the time that dredging is temporarily shut down. Following such evaluation, GE will present the results of the engineering evaluation to EPA in an Engineering Evaluation Report, along with the proposed engineering solution (or a course of action for continued monitoring and study to further evaluate the cause of the exceedance) and a proposed schedule for implementing that solution and reinitiating dredging,

except as follows: if the solution involves a refinement in operations or equipment that is consistent with, and would not require a modification of, the EPA-approved design or the RA Work Plan, GE will implement the solution in consultation with the EPA field representative, and then document the implementation of that solution in the Engineering Evaluation Report, along with a schedule for the reinitiation of dredging. In all other cases, GE will implement the engineering solution in accordance with the EPA-approved Engineering Evaluation Report. Dredging will be reinitiated, upon EPA approval, once the exceedance has been mitigated, in accordance with the schedule in the approved Engineering Evaluation Report. If the cause of the exceedance was not identified during the engineering evaluation, the Engineering Evaluation Report presented to the EPA will include a course of action for continued evaluation to determine the cause of the exceedance. GE will consult with EPA on a regular basis until the cause and solution are determined, or until EPA determines that further evaluation is not necessary.

General

The time frames for engineering evaluations and implementation of engineering solutions in compliance with the Resuspension Standard are discussed in the EPS Volume 2, Section 4.5.1 except as modified below. The time frames to initiate and complete engineering evaluations and implementation of the engineering solutions will be estimated in the remedial design. The time frames for completion of the engineering evaluations and implementation of engineering solutions (if any) will be variable, depending on the circumstances surrounding the exceedance. EPA may modify these time frames during Phase 1 depending on the circumstances surrounding the exceedance. The actual schedule to be implemented in the field will be subject to EPA review. It is anticipated that engineering evaluations will begin immediately upon receipt of data indicating the exceedance of a criterion. It is similarly anticipated that the required engineering contingencies should begin as soon as possible so as to minimize PCB releases. At a minimum, engineering contingency actions should begin within a week of an exceedance, assuming conditions remain in exceedance (EPS, Vol. 2, p. 133). In the case of a temporary halt of the operations, an evaluation should be completed with 5 days. In the event of a temporary cessation, every effort should be made to correct the problem and minimize the length of time of the stoppage (EPS, Vol. 2, p. 132).

During Phase 1, equipment modifications or additions that are not reasonably available from a schedule or cost standpoint will not be required, recognizing that substitutions for major equipment approved in the Phase 1 Final Design or being used in Phase 1 may be impractical. However, in the event reasonable changes can be made to address achievement of the performance standards during Phase 1, GE will propose such changes to equipment

or operations for EPA review and approval. During Phase 1, EPA will consider any information that GE may submit regarding impacts to schedule and project costs when the Agency reviews GE's proposals, if any, for modification of the EPA-approved Phase 1 Final Design based on field conditions or experience.

During implementation of Phase 1, in the event that there is an exceedance of the Evaluation Level, the Control Level or the Standard Level that requires or warrants an engineering solution (as described above), the engineering solution(s) performed may include routine maintenance, operational changes, equipment or process modifications, additions of equipment, or a temporary halting of certain operations – all depending on the specific circumstances.

2.5 Notifications and Reporting

GE will conduct the notification and reporting activities specified in the Executive Summary of Volume 1 of the EPS and in the Section 2.7 of the Phase 1 ID RA Monitoring Scope and the CHASP that will be developed, subject to EPA review and approval.

2.6 Special Studies

Four special studies related to PCB resuspension and monitoring will be performed. Details for two of the special studies: near-field release mechanism and non-target area downstream contamination are described in Section 8 of the Phase 1 ID RA Monitoring Scope. The third study, to determine the relationship between TSS and turbidity is currently being discussed with EPA and a work plan has been submitted for EPA review and approval. Once approved, GE will perform the study. The results of the study will be provided as part of the Phase 1 RAM QAPP.

The last study is for determining the potential use of automated water samplers at the far-field stations (see Section 2.3 of Phase 1 ID RA Monitoring Scope). A work plan for testing automated samplers has been submitted for EPA review and approval. Upon approval, GE will perform this study. Details on the potential use of automated samplers during Phase 1 dredging will be provided in the Phase 1 RAM QAPP.

3. Residuals Performance Standard

This section of the Phase 1 ID PSCP Scope discusses the Residuals Performance Standard. It provides an overview of the residuals standards as set forth in the EPS (e.g., Volume 3), and specifies the routine monitoring requirements, contingency monitoring and other responses in the event of an exceedance of an action level (Section 3 of Volume 3 of the EPS), the required actions (Section 4.5 of Volume 3 of the EPS), the notification and reporting requirements (Section 4.8 of Volume 3 of the EPS), and the special study (Section 4.7 of Volume 3 of the EPS) under this standard.

3.1 Overview of Standard

The Residuals Performance Standard describes action levels for Tri+ PCBs (PCBs with three or more chlorines) in surface sediment that remains after dredging. The action levels will apply to a Certification Unit (CU), which is described in Section 3.2 of the Phase 1 ID RA Monitoring Scope and in Section 3.3 of this Phase 1 ID PSCP Scope. The action levels in the Residuals Performance Standard are summarized in Table C3-1.

The various actions to be taken based on the results of residual sediment sampling are described in Section 3.4.

Table C3-1 - Summary of the Performance Standard for Dredging Residuals

Case	Certification Unit Arithmetic Average (mg/kg Tri+ PCBs)	No. of Sample Results =15 mg/kg Tri+ PCBs AND < 27 mg/kg Tri+ PCBs	No. of Sample Results ≥ 27 mg/kg Tri+ PCBs	No. of Re-Dredging Attempts Conducted	Required Action (when all conditions are met)*
A	Avg. = 1	= 1	0	N/A	Backfill certification unit (where appropriate); no testing of backfill required.
B	N/A	= 2	N/A	< 2	Re-dredge sampling nodes and re-sample.
C	N/A	N/A	1 or more	< 2	Re-dredge sampling node(s) and re-sample.

Case	Certification Unit Arithmetic Average (mg/kg Tri+ PCBs)	No. of Sample Results =15 mg/kg Tri+ PCBs AND < 27 mg/kg Tri+ PCBs	No. of Sample Results ≥ 27 mg/kg Tri+ PCBs	No. of Re-Dredging Attempts Conducted	Required Action (when all conditions are met)*
D	1 < avg. = 3	= 1	0	N/A	Evaluate 20-acre area-weighted average concentration. If 20-acre area-weighted average concentration = 1 mg/kg Tri+ PCBs, place and sample back-fill. **If 20-acre area-weighted average concentration > 1 mg/kg, follow actions for Case E below.
E	3 < avg. = 6	= 1	0	< 2	Construct sub-aqueous cap immediately OR re-dredge. Construct cap so that arithmetic avg. of uncapped nodes is = 1 mg/kg Tri+ PCBs, no nodes > 27 mg/kg Tri+ PCBs, and not more than one node > 15 mg/kg Tri+ PCBs.
F	avg. > 6	N/A	N/A	0	Collect additional sediment samples to re-characterize vertical extent of contamination and re-dredge. If certification unit median > 6 mg/kg Tri+ PCBs, entire certification unit must be sampled for vertical extent. If certification unit median = 6 mg/kg Tri+ PCBs, additional sampling required only in portions of certification unit contributing to elevated mean concentration.
G	avg. > 6	N/A	N/A	1	Re-dredge. ***
H	avg. > 1 (20-acre avg. > 1)	= 2	= 1	2	Construct sub-aqueous cap (if any of these arithmetic average/sample result conditions are true) as described in Case E and two re-dredging attempts have been conducted OR choose to continue to re-dredge.

Notes:

* Except for Case H, where any of the listed conditions will require cap construction.

** Following placement of backfill, sampling of 0 to 6 inch backfill surface must demonstrate average concentration = 0.25 mg/kg Tri+ PCBs. If backfill surface average concentration is > 0.25 mg/kg, backfill must be dredged and replaced or otherwise remediated with input from EPA.

*** GE shall not install a Cap Type B without receiving EPA approval to cease re-dredging attempts, except for CUs where the average concentration in the CU is less than 6 mg/kg Tri+ PCB and the only non-compliant areas are due to exceedances of the prediction limits.

3.2 Sampling and Analysis Requirements

Following the completion of dredging in a CU, GE will verify that the design cut lines have been achieved and conduct the sampling and analysis of sediment residuals described in Sections 3.3 and 3.4 of the Phase 1 ID RA Monitoring Scope.

3.3 Evaluation of Sampling Data

The sediment sampling results will be used to evaluate the CU by: 1) converting the analytical results for Total PCBs to Tri+ PCBs, using the procedure described in Section 3.4 of the Phase 1 ID RA Monitoring Scope; and then 2) comparing the following values (rounded to whole numbers) to the action levels specified in Section 3.1, above.

- Arithmetic average Tri+ PCB concentration in the CU (or portion of the CU) under evaluation;
- Individual node sample Tri+ PCB concentration in the CU (or portion of the CU) under evaluation;
- Median Tri+ PCB concentration in the CU (or portion of the CU) under evaluation; and
- Area-weighted arithmetic average concentration in a moving 20-acre area consisting of the CU under evaluation, and the two, three, or four most recently dredged CUs within 2 river miles of the current CU (measured along the centerline of the river).

Arithmetic Average of CU

The arithmetic average Tri+ PCB concentration in the CU (or portion of the CU) under evaluation will be calculated by dividing the sum of the individual Tri+ PCB concentrations by the total number of individual sample locations. When calculating the CU arithmetic average, the following procedures will be applied:

- Non-detect sample results will be included in the arithmetic average calculation at a value of ½ the detection limit.
- If no sample is available from a grid node due to field difficulties that cannot be resolved (e.g., outcropping of bedrock), the arithmetic average will be calculated without counting that sample node.
- Following re-dredging of all or part of a CU, the arithmetic average will be subsequently re-calculated by substituting the new sample results from the re-dredged nodes.

- If a subaqueous cap is constructed, the arithmetic average will be calculated using the sample results from the nodes in the uncapped area (i.e., the extent of the capped area and its PCB levels will not be included in the calculation of the arithmetic average).
- The maximum of any duplicate results will be used to determine compliance with the Residuals Performance Standard.
- EPA split sample data will be considered if they are available prior to EPA concurrence on the Dredging Completion Approval Form for the CU under evaluation.

20-Acre Arithmetic Average

The 20-acre arithmetic average Tri+ PCB concentration will be calculated, using the 20-Acre Area-Weighted Average equation on p. 54 of Volume 3 of the EPS, by summing the area-weighted average Tri+ PCB concentrations in the CUs making up the 20 acre area, and dividing the total by the actual total acreage of the CUs.

The 20-acre evaluation unit will be composed of the CU under evaluation and the additional CUs (as necessary to provide a total area of approximately 20 acres) in which dredging was most recently completed, and which are located within 2 miles, measured along the centerline of the river, of the current CU. For purposes of calculating the area of the 20-acre unit, the total areas of these additional CUs will be included regardless of how they were closed. For purposes of calculating the average Tri+ PCB concentration in the 20-acre unit, the pre-backfill arithmetic average for any CU where backfill was placed will be utilized. Similarly, in CUs where a subaqueous cap is placed, for purposes of calculating the average Tri+ PCB concentration in the 20-acre unit, the capped CU's average concentration will be re-calculated based on the sample results from the nodes in the uncapped portion of the CU. The total acreage of the CUs will be used. If a CU is entirely capped, it will not be included in any 20-acre averaging calculations.

3.4 Required Actions

The Residuals Performance Standard requires confirmation that the design dredging cut lines as determined by the procedures described in Section 3.3 of the Phase 1 IDR have been achieved and collection of surface sediment samples has been completed. The need for and type of response actions required to be taken in a CU after confirmation that the design cut lines have been achieved will be based on comparing both the arithmetic

average Tri+ PCB concentrations (calculated according to the procedures described above in Section 3.3) and also the individual sample node concentrations to the criteria specified in the Residuals Performance Standard. For the purposes of the response actions that follow, removal to the design cut lines will be defined as those specified in the final design and verified through bathymetric measurement and will comprise the first inventory removal pass. Should average CU concentrations following the first inventory pass exceed 6 mg/kg Tri+ PCB, the dredge cut lines will be revised and a second inventory removal will be made. Following bathymetric verification of the second inventory removal (if required), this will complete the inventory removal steps. Subsequent removal will be referred to as residual re-dredging. Post-inventory sampling results will dictate the appropriate response actions to be undertaken are described below.

The Residuals Performance Standard contains five required actions:

1. Backfill and demobilize (including testing of backfill if necessary).
2. Jointly Evaluate a 20-Acre Average.
3. Re-dredge or Construct Subaqueous Cap at a CU.
4. Re-dredging Required.
5. Capping.

Response 1 – Backfill and Demobilize

As outlined in Section 4.5.3 of Volume 3 of the EPS, if the Tri+ PCB average of a CU is = 1 mg/kg, no node has a Tri+ PCB sample result = 27 mg/kg, and not more than one node has a Tri+ PCB sample result of = 15 mg/kg, backfill will be placed (where appropriate) and equipment will be demobilized. (The criteria for determining when it is appropriate to place backfill, for purposes of the Residuals Performance Standard, are discussed in Section 3.5.) Under this response, backfill testing after placement will not be performed.

In addition, a portion of a contiguous CU may be backfilled after the cut lines are met if: 1) dredging proceeds in a downstream direction in the CU, and EPA has approved the completion of dredging in all CUs that are upstream of the portion of the contiguous CU; 2) the arithmetic average Tri+ PCB concentration of the samples collected from that portion of the CU is 1 mg/kg or less; 3) all nodes sampled within that portion of the CU have Tri+ PCB concentrations less than 15 mg/kg; and (4) GE has determined that it has adequate measures in place to minimize recontamination of that dredged portion of the CU. The EPA field representative will evaluate the

adequacy of the measures in place to minimize recontamination and may indicate the need for additional sampling.

Backfill (where appropriate) and Sample Backfill Surface

In CUs where the average Tri+ PCB concentration is > 1 mg/kg and = 3 mg/kg, and the average Tri+ PCB concentration in the 20-acre evaluation area including the CU is = 1 mg/kg, backfill will be placed as described above. After confirmation of proper placement of the backfill, sampling will be conducted as described in Section 3.5 of the Phase 1 ID RA Monitoring Scope (under "Backfill Samples"). If the average surface Tri+ PCB concentration in the backfilled areas is = 0.25 mg/kg, then the CU will be closed. If the average concentration is > 0.25 mg/kg, the EPA field representative will be consulted, the area(s) will either be re-dredged and the backfill replaced, or an additional lift of backfill will be placed in the area(s) causing the average concentration to exceed 0.25 mg/kg, as described in Section 3.4 (Response 2). Where appropriate, backfill will be placed in a CU (or portion of a CU). In general, the backfill thickness will be 12 inches to address residuals; in some instances, no backfill may be placed, and in others, more than one foot may be placed. The details regarding the backfill type and thickness in specific locations will be determined during Final Design.

Response 2 – Jointly Evaluate a 20-Acre Average

As outlined in Section 4.5.3 of Volume 3 of the EPS, if the average Tri+ PCB concentration of samples collected in a CU is > 1 and < 3 mg/kg, no individual node has a Tri+ PCB sample result = 27 mg/kg, and not more than one individual node has a Tri+ PCB sample result = 15 mg/kg, the 20-acre area described above will be evaluated as follows:

For the 20-acre average, if the area-weighted arithmetic average of the individual means from the certification unit under evaluation and the three previously dredge certification units (within two miles of the current unit) is = 1 mg/kg Tri+ PCBs, backfill will be placed where appropriate and sampling performed to confirm that the average backfill surface Tri+ PCB concentration is = 0.25 mg/kg. Sampling of backfill will follow the procedures described in Section 3.5 (under Backfill Samples) of the Phase 1 ID RA Monitoring Scope; the development of an average concentration will follow procedures described in Section 3.3 above. If the concentration of the upper 6 inches of backfill is > 0.25 mg/kg Tri+ PCBs, GE will, in consultation with the EPA field representative, either 1) re-dredge and replace the backfill in the non-compliant area, or 2) place an

additional lift of backfill (no less than 6 inches in thickness) in those areas that caused the average concentration to exceed 0.25 mg/kg, considering hydraulic conditions. Following actions 1) or 2) above, the backfill will be sampled again and the area-weighted concentration of the CU under evaluation will be recalculated.

If the area-weighted arithmetic average of the individual means from the certification unit under evaluation and the three previously dredge certification units (within two miles of the current unit) is > 1 mg/kg, the area will be re-dredged or a subaqueous cap will be placed at the specific areas within the CU that caused the non-compliant average concentration. GE will decide whether to re-dredge or to cap a non-compliant area based on engineering judgment in the field and evaluation of the sediment data for that CU. GE's decision shall take into account potential impacts on dredging productivity as appropriate, consistent with Section 3.5, Volume 3 of EPS).

For the startup of Phase 1, the cumulative mean can be calculated using the area-weighted average equation provided in EPS Volume 3, Section 4.5.2 in lieu of the 20-acre area-weighted arithmetic average, given that the first three CUs will not have a sufficient number of previously dredged CUs to allow for calculation of such 20-acre area-weighted arithmetic average (see Attachment A of Volume 3 of the EPS).

Response 3 – Re-dredge or Construct Subaqueous Cap at a CU

As outlined in Section 4.5.3 of Volume 3 of the EPS, if the Tri+ PCB average is > 3 mg/kg but = 6 mg/kg, no Tri+ PCB sample result is = 27 mg/kg, and not more than one Tri+ PCB sample result is = 15 mg/kg, the non-compliant area will be re-dredged or a subaqueous cap will be constructed. The process for determining whether a non-compliant area will be re-dredged or capped will be as described above under Response 2.

If re-dredging is selected, the surface sediment of the re-dredged area will be sampled in accordance with the re-dredging residuals sampling procedures in Section 3.5 of the Phase 1 ID RA Monitoring Scope (if concentrations are high, the core should be advanced a depth of 2 feet, where possible) and the CU will be re-evaluated. If subaqueous capping is selected, the capped area will be selected such that the arithmetic average Tri+ PCB concentration of the uncapped nodes is 1 mg/kg or less and no individual node has a Tri+ PCB concentration = 15 mg/kg.

Response 4 – Re-dredging is Required

1. Specific Nodes with Discrete Exceedances

   Regardless of the average Tri+ PCB concentration, if two or more samples within a CU have Tri+ PCB concentrations = 15 mg/kg, the non-compliant area will be re-dredged and the non-complaint nodes re-sampled in accordance with Section 4.5.3 of Volume 3 of the EPS. If one or more sample(s) has Tri+ PCB concentration = 27 mg/kg, such sampling node(s) will be re-dredged and re-sampled. Any re-sampling will comply with the re-dredging residuals sampling procedures in Section 4 of Volume 3 of the EPS and Section 3.5 of the Phase 1 ID RA Monitoring Scope. Under this response, no more than two residual re-dredging attempts will be required. After these node-specific re-dredging efforts are completed, the CU will be re-evaluated as described in Section 3.3 of this Phase 1 ID PSCP Scope.

2. CU Average > 6 mg/kg

   If two inventory removal attempts have been completed and the Tri+ PCB average for a CU is still > 6 mg/kg, up to two residual re-dredging attempts will be performed in the non-compliant areas. If after two residual passes the average is still > 6 mg/kg, GE will petition EPA to place a cap over the non-compliant area.

Response 5 – Capping

As outlined in Section 4.5.3 of Volume 3 of the EPS, if after two re-dredging attempts, a CU has a Tri+ PCB average > 1 mg/kg (and the 20-acre area-weighted arithmetic average is > 1 mg/kg), two or more samples show Tri+ PCB concentrations = 15 mg/kg, or one or more samples show Tri+ PCB concentration = 27 mg/kg, a subaqueous cap may be constructed, where conditions allow. In such a case, the area to cap will be selected such that the arithmetic average concentration of the uncapped nodes is 1 mg/kg Tri+ PCB or less and no individual uncapped node has a concentration = 15 mg/kg Tri+ PCB.

Extent of Non-Compliant Area

To determine the extent of the non-compliant area subject to further response action (e.g., re-dredging, capping) as described above, the procedures set forth in Section 4.5.5 of Volume 3 of the EPS and further discussed

below will be followed. The extent of a non-compliant area around a single node sample will be determined using the following equation (repeated for each surrounding node) (as set forth in the EPS, Volume 3, pp. 58 to 59):

$$d_r = \frac{d * (C_1 - 1)}{(C_2 - C_1)}$$

where:

d_r = the distance (in feet) to the edge of the non-compliant area (i.e., from the C_1 to C_2 nodes)

d = the distance (in feet) between nodes (typically 80 feet)

C_1 = the concentration (in mg/kg Tri+ PCBs) at the elevated node under consideration

C_2 = the concentration (in mg/kg Tri+ PCBs) at a compliant node surrounding C_1

When calculating the extent of the non-compliant area using the preceding formula, the following procedures will apply:

- The distance which defines the non-compliant area will be at least half the distance between the nodes.
- The non-compliant area will be contained within a boundary that has sides perpendicular to the axes between the sampled nodes.
- The non-compliant area will not extend beyond the polygon created by connecting the surrounding nodes.
- The non-compliant area will not extend beyond the boundary of the CU.

Where the arithmetic average Tri+ PCB concentration in a CU following a dredging pass exceeds an applicable action level, the procedures for determining the extent of the non-compliant area will depend on whether the post-dredging data indicate the average Tri+ PCB concentration in the CU is greater than 6 mg/kg.

Where the arithmetic average Tri+ PCB concentration in the CU is > 1 mg/kg but < 6 mg/kg, the horizontal extent of non-compliant areas subject to further response action will be delineated by applying the criteria set forth in the preceding paragraph to the individual sample nodes with the highest Tri+ PCB concentrations (ensuring removal of those = 27 mg/kg and 15 mg/kg and others as necessary), and then recalculating the average Tri+ PCB concentration in the CU, until that average concentration is = 1 mg/kg. In making these recalculations, the concentration at nodes to be re-dredged will be considered to be at the average Tri+ PCB

concentration of the nodes in the CU that will not be re-dredged or capped, and nodes to be capped will not be considered in calculating the average. The vertical extent of non-compliant areas will be determined based on the dredge equipment, thickness of the disturbed layer, and other pertinent information. The minimum vertical extent of non-compliant areas in this situation will be no less than 6 inches for purposes of establishing dredge cut lines for re-dredging purposes. If the disturbed layer is thicker than 6 inches, the vertical extent of dredging will be determined based on analysis of samples from depths greater than 6 inches, unless the cut lines will require dredging to bedrock or glacial clay.

Where the arithmetic average concentration in a CU exceeds 6 mg/kg Tri+ PCB, the following procedures will be followed in accordance with Section 4.5.3 of Volume 3 of the EPS: First, as described in Section 3.5 of the Phase 1 ID RA Monitoring Scope, deeper core samples (> 6 inches) will be taken from the archived samples (or collected if not archived) in successive 6-inch segments and analyzed for PCBs as necessary to characterize the depth to the first 6-inch sediment layer with = 1 mg/kg Total PCBs. This depth will be the vertical extent of contamination used as the basis for developing the dredge prism for further removal in the area surrounding that node. If the median concentration also exceeds 6 mg/kg Tri+ PCB, these deeper samples will be taken from areas throughout the CU. However, upon EPA approval, only a subset of the CU could be re-sampled if Tri+ PCB levels in the sampled nodes within the excluded portion if the CU are < 1 mg/kg. In this case, this discrete area will be considered a compliant area, and the remainder of the CU will be considered the non-compliant area subject to further dredging to remove the additional PCB inventory.

If the average Tri+ PCB concentration in the CU exceeds 6 mg/kg but the median concentration is < 6 mg/kg Tri+ PCBs, the deeper samples will be taken only from the sampling locations where the 0-6 inch concentration is greater than 1 mg/kg Tri+ PCBs. In this case, the latter locations will constitute the non-compliant area.

Based on physical conditions encountered in the field (e.g., bedrock, glacial clay), the extent of the non-compliant area may be modified subject to the approval of EPA.

3.5 Reporting

GE will submit the weekly progress reports and the individual CU-specific reports (to follow EPA approval of the backfill/cap installation at that CU) described in Sections 4.8 of Volume 3 of the EPS and Section 3.6 of the Phase 1 ID RA Monitoring Scope.

3.6 Special Study

The data that will be collected to address the special study to characterize residual sediment strata and thickness in accordance with the EPS Volume 3 Attachment B is described in Section 3.3 of the Phase 1 ID RA Monitoring Scope.

4. Productivity Performance Standard

This section discusses the Productivity Performance Standard. It provides an overview of the productivity standards as set forth in the EPS, describes how the design will establish a production schedule, specifies the monitoring and reporting requirements (Section 4.2 of Volume 4 of the EPS), and outlines the responses in the event that the production schedule is not being met (Section 4.3 of Volume 4 of the EPS).

4.1 Overview of Standard for Phase 1

The Productivity Performance Standard specifies the following annual minimum and target cumulative volumes of sediment (*in situ* volumes, exclusive of re-dredging volumes) to be removed, processed, and shipped off-site each year during Phase 1 (EPS, Section 4.1 of Volume 4, see also Table 4-1 of Volume 4):

- "The minimum volume of sediment to be removed, processed, and shipped off site during Phase 1 shall be 200,000 [cubic yards (cy)]. Phase 1 must be designed and scheduled to meet the target removal of 265,000 cy."
- "For a period of at least one month during Phase 1, the minimum production rate shall be the rate required to meet the Phase 2 Performance Standard in order to demonstrate the capabilities of the dredging equipment and the sediment processing and transportations systems." (For Phase 2, the standard specifies a required annual removal volume of 490,000 cy and a target annual removal volume of 530,000 cy.)
- "Stabilization of shorelines and backfilling of areas dredged during Phase 1, as appropriate, shall be completed by the end of the calendar year and prior to the spring high flow period on the river. Processed sediment shall not be stockpiled and carried over to Phase 2 for disposal."

The Productivity Performance Standard includes three action levels: Concern, Control, and Standard. These action levels are to be based on a comparison of the actual production rate to what is referred to as the scheduled productivity. The scheduled productivity for a dredging season will be defined in the RA Work Plan for that season, as described in Section 4.2.

Concern Level

The Concern Level is defined in the EPS (Volume 4, p. 30) as a situation during dredging operations in which "the monthly dredging productivity falls below the scheduled productivity for that month by 10 percent or more."

Control Level

The Control Level is defined in the EPS (Volume 4, p. 30) as a situation during dredging operations in which "the monthly productivity falls below scheduled productivity by 10 percent or more for two or more consecutive months."

Standard Level

The Standard Level is defined in the EPS (Volume 1, p. 69) as a situation in which the "[a]nnual cumulative volume fails to meet production requirements."

4.2 Design Activities to Establish Production Schedule

A production schedule has been developed for Phase 1 using the target annual removal volumes described for Phase 1 in Section 4.1 above. Specifically, as discussed in Section 3.3.1, Phase 1 is being designed to meet the Phase 1 target removal volume of 265,000 cy, and includes in the design a minimum of one month of dredging at the anticipated Phase 2 production rate – namely, 530,000 cy/yr. This monthly volume may be revised during Phase 1 Final Design considering the Phase 2 target removal volume and the number of operational days during the construction season (including hours per day and days per week).

The RD will use the dredge areas and target removal volumes from the EPA-approved Dredge Area Delineation Reports, as modified in the IDRs and FDRs, to develop dredging production schedules, which will be documented in the RA Work Plans. For purposes of developing the production schedules in the RD, the overall production schedule for a dredging season will include the removal of sediment as specified in the dredge prisms shown in the FDR, along with the installation of backfill and caps and stabilization of impacted shorelines prior to the end of the dredging season, which will be weather-dependent. The production schedule

will also include a schedule for sediment processing and shipment off-site for disposal prior to the end of the calendar year. This production schedule may be subject to further revision by the contractor selected to perform the dredging; any revised production schedule will be provided in proposed revisions to the Phase 1 RA Work Plans, as the case may be, and will be subject to EPA approval. However, changes in the production schedule made by the contractor will not result in a revision in the volume to be dredged in any construction season as indicated in the Final Design Reports (FDRs). The actual dredging production rate during each phase of the project will be compared to the production schedule provided in the relevant RA Work Plan to determine whether the Concern, the Control, or the Standard Level has occurred. For purposes of establishing whether the Concern, the Control, or the Standard Level has occurred, the following rules will apply:

- The dredging production rate will be based on the actual volume dredged, which will be measured as *in situ* cy and will include the volume of sediment removed to achieve the removal limits specified in design, including any volume associated with overcut, side slope removal, overdredging allowance, and dredging for navigational purposes. For purposes of the Productivity Performance Standard, the volume dredged will not include sediment removed outside the dredge cut lines shown or specified in the Final Design, sediment removed during re-dredging to capture dredging residuals, additional material removed solely to facilitate cap/backfill placement, sediment removed from non-target areas (if any), or non-compliant backfill that is removed.
- For comparisons to monthly production schedule, the actual *in situ* volume dredged that month will be compared to the *in situ* volume scheduled for that month in the production schedule to be included in the RA Work Plan for the dredging season.
- For comparisons to the annual production schedule, the actual *in situ* volume dredged and processed will be compared to the *in situ* volume scheduled for that season in the production schedule to be included in the RA Work Plan for that season.

4.3 Routine Monitoring and Reporting

The specific activities to monitor the actual dredging productivity will be provided in the FDR. The monitoring activities also will be specified in the *Construction Quality Assurance Plan* (Construction QA Plan), which will be part of the RA Work Plan. Reporting will be in accordance with Section 4.2 of Volume 4 of the EPS and will include daily, weekly, monthly and annual reports, providing the volume of sediment dredged, which will be measured or estimated as *in situ* cy, as described above.

- Data for daily dredging operations will be maintained to evaluate productivity performance. The data to be collected will be relevant to the design, the specific equipment, and the contracting approach used for the project, and will include the following for each dredge: dredge operating hours and shifts per day; downtime for repairs to the dredge plant; downtime waiting for support equipment (e.g., barge, clogged pipeline, pipeline booster pump malfunction, etc.); downtime due to project and non-project vessel traffic; downtime to re-set the dredge and the number of re-sets per day; downtime associated with EPS-related shutdowns; downtime associated with QoLPS-related shutdowns; and the estimated average width, length, and depth of the dredge cut to estimate the volume of *in situ* sediment removed. The actual report form to be used will be provided in the FDRs and Phase 1 Construction QA Plan, and will include records of productivity data (e.g., estimated total cy of material processed, shipped off-site, and staged on-site), and be available on site.

- Weekly reports will be prepared providing information on the following:
  - Locations dredged;
  - Number of hours of actual dredging time per dredge and gross volume dredged each day and each week;
  - Cumulative amount dredged for the season;
  - Number of barges loaded and transported for off-loading, and approximate volume in each;
  - Time required for off-loading barges (if used);
  - Information on re-dredging efforts (locations, approximate volume, and time expended);
  - Total tonnage of material processed, shipped off-site, and stored on-site;
  - Concentration and mass of PCBs in processed sediments;
  - Volume of water treated and returned to river; and
  - Delays encountered in the project, the reasons for the delays, and the hours lost to production due to the delays.

- Monthly summaries will be prepared and submitted to EPA by the 15th of the following month, providing the same information listed above for each week during the month, season, and overall project. The monthly reports will also compare productivity on a weekly, monthly, seasonal, and project-total basis to the production schedule specified in the relevant RA Work Plan.
- Following the completion of Phase 1, GE will submit a report to EPA that compiles the relevant data from Phase 1.

- On-site records will also be kept of the following:
  - Locations of backfill and sediment caps placed;
  - Volumes of backfill or capping material placed and hours spent in placing backfill and sediment caps; and
  - Locations and details of shoreline work, including shoreline dredging and restoration rates.

4.4 Required Response Actions

If monitoring indicates an occurrence of the Concern or Control Level, GE will take the response actions required in Section 2.3.2.2 of Volume 1 of the EPS and described below.

During implementation of Phase 1, in the event that the production rate falls below the scheduled productivity, measures to make up the shortfall (in whole or in part) will be evaluated, including but not limited to increasing the hours and/or days of operation or utilizing available equipment to increase throughput.

During Phase 1, equipment modifications or additions that are not reasonably available from a schedule or cost standpoint will not be required, recognizing that substitutions for major equipment approved in the Phase 1 Final Design or being used in Phase 1 may be impractical. However, in the event reasonable changes can be made to address achievement of the performance standards during Phase 1, GE will propose such changes to equipment or operations for EPA review and approval. During Phase 1, EPA will consider any information that GE may submit regarding impacts to schedule and project costs when the Agency reviews GE's proposals, if any, for modification of the EPA-approved Phase 1 Final Design based on field conditions or experience.

Concern Level

In the event that the Concern Level occurs, GE will: 1) notify EPA in its monthly report; 2) complete an assessment to determine the cause of the shortfall and whether there are any practical means to make up the shortfall or otherwise increase productivity within the next 2 months; and 3) present the results of that assessment and, if warranted, a proposal for such measures to EPA. GE will implement measures, as approved by EPA, to make up the shortfall or otherwise increase productivity, to the extent practical and subject to the general considerations described above. Activities that GE will consider for increasing productivity will include increasing work schedule, if not already operating 24 hours a day, 7 days a week, modifying the dredge

plan, staging additional sediment at the processing facility, and other contingencies that are specified in the FDR.

Control Level

In the event that the Control Level occurs, GE will: 1) notify EPA; and 2) provide a report/action plan to EPA explaining the reasons for the shortfall and describing the steps underway or to be taken to increase production, subject to the general considerations described above. The objective will be to erase the shortfall by the end of the dredging season, if the shortfall can practically be erased. GE will implement measures, as approved by EPA, to make up the shortfall or otherwise increase productivity, to the extent practical and subject to the general considerations described above. Activities to be considered for increasing productivity will include increasing work schedule, if not already running 24 hours a day, 7 days a week, modifying the dredge plan, staging additional sediment at the processing facility, and other contingencies that are specified in the FDR.

5. Performance Standards for Air Quality, Odor, Noise, and Lighting

This section discusses the QoLPS for air quality, odor, noise, and lighting. It provides an overview of the quality-of-life standards as set out in the QoLPS, describes the design analyses to be performed to assess achievement of the standards, and specifies the routine monitoring requirements, contingency monitoring and other responses in the event of an exceedance of an applicable standard or other trigger level, requirements for responding to complaints, and notification and reporting requirements. Most of these requirements are specified in the Phase 1 ID RA Monitoring Scope and/or the Phase 1 ID RA CHASP Scope, and thus this section consists, in large part, of a roadmap with cross-references to those documents. (Note that the average concentrations described in this section for given time periods are block averages for that discrete time period, not running averages.)

5.1 Overview of Standards

Air Quality Performance Standard

The standards for total PCB concentrations in ambient air are 24-hour average concentrations of 0.11 micrograms per cubic meter (µg/m3) in residential areas and 0.26 µg/m3 in commercial/industrial areas, with "Concern Levels" at 80% of those values (0.08 µg/m3 in residential areas and 0.21 µg/m3 in commercial/industrial areas) (QoLPS, pp. 6-8 and 6-18).

The air quality standard for opacity, based on New York State regulations (6 NYCRR 211.3), is that opacity during project operations must be less than 20% as a 6-minute average, except that there can be one 6-minute period per hour of not more than 57% (QoLPS, p. 6 to 16).

In addition, the Air Quality Performance Standard requires an assessment during design of the following pollutants for which EPA has promulgated National Ambient Air Quality Standards (NAAQS): nitrogen oxides, sulfur dioxide, carbon monoxide, particulate matter with a median diameter of 10 micrometers or less, particulate matter with a median diameter of 2.5 micrometers or less, and ozone (QoLPS, pp. 6-9 to 6-11).

The need for monitoring of these constituents will be determined during Final Design using specific design data. The RD Team will repeat the assessment in EPA's *White Paper – Air Quality Evaluation* analyses (EPA, 2002) using project specific design data. If this project specific information developed during design validates the assumption used in EPA's *White Paper – Air Quality Evaluation* analyses (EPA, 2002), this will be considered a determination of compliance with the QoLPS such that further demonstration by on-site or off-site sampling will not be required. If air quality compliance is not demonstrated as a result of these analyses for any NAAQS, GE will evaluate potential design changes that could result in achievement of the NAAQS and/or the need for monitoring for such pollutant(s), and will submit a proposal on this topic to EPA for review and approval.

Odor Performance Standard

The odor standard has two components: 1) a numerical standard for hydrogen sulfide (H2S), which is 0.01 ppm (14 $\mu g/m^3$) over 1 hour; and 2) a standard for odor complaints, which is that the complaints are investigated and mitigated (QoLPS, p. 6-19).

Noise Performance Standard

The noise standards are as follows (QoLPS, p. 6-25):

Short-term criteria – applicable to facility construction, dredging, and backfilling:

- Residential Control Level (maximum hourly average):
  - Daytime = 75 dBA (A-weighted decibels)
- Residential Standard (maximum hourly average):
  - Daytime = 80 dBA
  - Nighttime (10:00 pm – 7:00 am) = 65 dBA
- Commercial/Industrial Standard (maximum hourly average):
  - Daytime and nighttime = 80 dBA

Long-term criteria – applicable to the processing facility and transfer operations:

- Residential Standard (24-hour average):
  - Day-night average = 65 dBA (after addition of 10 dBA penalty to night levels from 10:00 p.m. to 7:00 a.m.)

- Commercial/Industrial Standard (maximum hourly average):
  - Daytime and nighttime = 72 dBA

Lighting Performance Standard

The numerical lighting standards for light emissions attributable to the project are as follows (QoLPS, p. 6-39):

- Rural and suburban residential areas = 0.2 footcandle;
- Urban residential areas = 0.5 footcandle; and
- Commercial/Industrial areas = 1 footcandle.

In addition to these numerical standards, the Lighting Performance Standard references certain statutory and regulatory requirements pertaining to lighting. These include the following (QoLPS, p. 6-42):

- 33 CFR 154.570, which requires adequate fixed lighting for bulk transfer facilities at nighttime and states that lighting will be located or shielded so as not to mislead or otherwise interfere with navigation; and
- 33 USC §§ 2020 through 2024 (specifying various lighting requirements for vessels).

The project will comply with these requirements, as well as 33 CFR §§ 84-88, Annex I and Annex V, and the other requirements specified in the Navigation Performance Standard governing lighting on vessels.

As noted in the QoLPS, the Lighting Performance Standard will not supersede worker safety lighting requirements established by the Occupational Safety and Health Administration (OSHA) (QoLPS, p. 6-40).

5.2 Design Analysis

Section 3.11.2 of the Phase 1 IDR documents the engineering bases and assumptions to date to demonstrate that the equipment and processes to be used in Phase 1 are expected to meet the above quantitative standards as required by the QoLPS. Final analyses will be provided in the Phase 1 FDR.

5.3 Routine Monitoring

The following monitoring will be conducted:

- Routine and baseline air quality monitoring for PCBs in accordance with the requirements set forth in Section 6.1 of the QoLPS and Sections 4.2.1, 4.3.1, and 4.4.1 of the Phase 1 ID RA Monitoring Scope;
- Opacity monitoring in accordance with the requirements set forth in Section 6.1 of the QoLPS and Sections 4.2.3, 4.3.3, and 4.4.3 of the Phase 1 ID RA Monitoring Scope;
- Odor monitoring in accordance with the requirements set forth in Section 6.2 of the QoLPS and Sections 4.2.4, 4.3.4, and 4.4.4 of the Phase 1 ID RA Monitoring Scope;
- A 2-week noise study at the beginning of Phase 1 dredging operations, as described in Section 5.3 of the Phase 1 ID RA Monitoring Scope;
- Routine noise monitoring in accordance with the requirements set forth in Table 6-8 and Section 6.3 of the QoLPS and Sections 5.3 and 5.4 of the Phase 1 ID RA Monitoring Scope; and
- Lighting monitoring in accordance with the requirements set forth in Section 6.4 of the QoLPS and Sections 6.2 and 6.3 of the Phase 1 ID RA Monitoring Scope.

5.4 Contingency Monitoring and Responses

Ambient Air Concentrations of PCBs

In the event that air quality monitoring for PCBs shows an exceedance of an applicable Concern Level (defined in Section 5.1 above) or of a PCB air quality standard, the required actions, specified in Table 6-2 of the QoLPS will be taken. GE will provide the notifications specified in Section 4.6.1 of the Phase 1 ID RA Monitoring Scope, conduct the contingency monitoring specified for such exceedances in Section 4.5.1 of the Phase 1 ID RA Monitoring Scope, and take the other response actions specified for such exceedances in Section 2.1 of the Phase 1 ID RA CHASP Scope.

Opacity

In the event that opacity monitoring shows an exceedance of the opacity standard, GE will: 1) notify EPA and the New York Department of Environmental Conservation (NYSDEC); 2) undertake the contingency actions, to

be specified for this situation in the RA CHASP; and 3) submit to EPA a report on the reasons for the exceedance and measures taken to prevent further exceedances.

Odor

The Odor Performance Standard defines the "Concern Level" as the presence of uncomfortable project-related odors identified by RA workers or an odor complaint from the public; and it defines the "Exceedance Level" as an exceedance of the H2S standard or "[f]requent, recurrent odor complaints related to project activities" (QoLPS, p. 6-24). If the Concern Level occurs and the odor is identified as potentially H2S, the required actions specified in Table 6-4 of the QoLPS will be taken. GE will provide the notification specified in Section 4.6.2 of the Phase 1 ID RA Monitoring Scope and conduct H2S monitoring as described in Sections 4.2.4 and 4.5.2 of the Phase 1 ID RA Monitoring Scope. If that monitoring shows an exceedance of the H2S standard, GE will continue monitoring on a regular basis until the standard is met, and will take the response actions specified in Section 2.2 of the Phase 1 ID RA CHASP Scope. In addition, if the Control or Exceedance Level is triggered by an odor complaint, GE will provide the notification specified in Section 4.6.2 of the Phase 1 ID RA Monitoring Scope and will respond to the complaint in accordance with the procedures set forth in Section 3 of the Phase 1 ID RA CHASP Scope, as noted in Section 5.5 below. The specified responses differ depending on whether the odor is identified as H2S.

Noise

The Noise Performance Standard defines the "Concern Level" as an exceedance of the residential control level, or an exceedance of an applicable noise standard that can be easily and immediately mitigated, or receipt of a project-related noise complaint (QoLPS, p. 6-38). It defines the "Exceedance Level" as an exceedance of an applicable noise standard that cannot be easily and immediately mitigated, or "[f]requent, recurrent noise complaints related to project activities" (QoLPS, p. 6-38). If there is an occurrence of the Concern Level or the Exceedance Level, the required actions specified in Table 6-9 of the QoLPS will be taken. GE will provide the notifications specified in Section 5.6 of the Phase 1 ID RA Monitoring Scope and will conduct the contingency monitoring specified in Sections 5.3 and 5.5 of that Scope. In addition, if noise levels are measured above the residential control level or an applicable noise standard, GE will conduct the response actions specified for such contingencies in Section 2.3 of Phase 1 ID RA CHASP Scope. The process for responding to complaints shall be as set forth in Section 3 of the Phase 1 ID RA CHASP Scope, as noted in Section 5.5 below.

Lighting

The Lighting Performance Standard defines the "Concern Level" as an exceedance of an applicable numerical standard that can be easily and immediately mitigated, or receipt of a project-related lighting complaint (QoLPS, p. 6-45). It defines the "Exceedance Level" as an exceedance of an applicable numerical lighting standard that cannot be easily and immediately mitigated, or "[f]requent, recurrent complaints related to project activities" (QoLPS, p. 6-45). If there is an occurrence of the Concern Level or the Exceedance Level, the required actions specified in Table 6-11 of the QoLPS will be taken. GE will provide the notifications specified in Section 6.5 of the Phase 1 ID RA Monitoring Scope and will conduct the contingency monitoring specified in Section 6.4 of that Scope. In addition, if lighting levels are measured above an applicable numerical standard, GE will conduct the response actions specified for the relevant level (Control or Exceedance) in Section 2.3 of the Phase 1 ID RA CHASP Scope. The process for responding to complaints shall be as set forth in Section 3 of the Phase 1 ID RA CHASP Scope, as noted in Section 5.5 below. Further, in the event of a deviation from a lighting requirement applicable to lighting on vessels, GE will follow the procedures for deviations from the navigation requirements, as specified in Section 2.5 of the Phase 1 ID RA CHASP Scope. These procedures for deviations from the standard include notifying the EPA and the New York State Canal Corporation (NYS Canal Corporation) promptly but no later than 24 hours after discovery of the deviation, identifying the cause of the deviation, implementing an action plan for mitigation measures and providing a corrective action report to the EPA in accordance with the RA CHASP.

During Phase 1, equipment modifications or additions that are not reasonably available from a schedule or cost standpoint will not be required, recognizing that substitutions for major equipment approved in the Phase 1 Final Design or being used in Phase 1 may be impractical. However, in the event reasonable changes can be made to address achievement of the performance standards during Phase 1, GE will propose such changes to equipment or operations for EPA review and approval. During Phase 1, EPA will consider any information that GE may submit regarding impacts to schedule and project costs when the Agency reviews GE's proposals, if any, for modification of the EPA-approved Phase 1 Final Design based on field conditions or experience.

5.5 Response to Complaints

The process to be followed for handling and responding to complaints from the public relating to quality-of-life issues will be as set forth in Section 3 of the Phase 1 ID RA CHASP Scope. If a complaint is received relating

to air quality, odor, noise, or lighting, GE will follow the procedure specified in that section for recording and responding to the complaint.

5.6 Notifications and Reporting

GE will conduct the recordkeeping, reporting, and notification activities specified in the following:

- For air quality, Section 6.1 of the QoLPS, Section 2.1 of the Phase 1 ID RA CHASP Scope and Section 4.6.1 of the Phase 1 ID RA Monitoring Scope;
- For odor, Section 6.2 of the QoLPS, Section 2.2 of the Phase 1 ID RA CHASP Scope and Section 4.6.2 of the Phase 1 ID RA Monitoring Scope;
- For noise, Section 6.3 of the QoLPS, Section 2.3 of the Phase 1 ID RA CHASP Scope and Section 5.6 of the Phase 1 ID RA Monitoring Scope; and
- For lighting, Section 6.4 of the QoLPS, Section 2.4 of the Phase 1 ID RA CHASP Scope and Section 6.5 of the Phase 1 ID RA Monitoring Scope.

In addition, reporting on the handling of complaints will be conducted as illustrated in Figure 6-1 of the QoLPS and as described in Section 3 of the Phase 1 ID RA CHASP Scope and in the Phase 1 RA CHASP.

6. Navigation Performance Standard

This section discusses the QoLPS for navigation during dredging operations. It sets forth the general requirements of the standard, describes the design analyses to be performed to assess achievement of the standard, and specifies the routine notice and monitoring requirements, contingency actions in the event of a deviation from the applicable requirements, requirements for responding to complaints, and notification and reporting requirements. Some of these requirements are specified in the Phase 1 ID RA CHASP Scope; these requirements are incorporated by reference in this section.

6.1 General Requirements

GE will comply with the following requirements of the Navigation Performance Standard:

- **Obstructions:** GE will, to the extent practical consistent with meeting the goals of the project and complying with the other performance standards, comply with 33 U.S.C. Ch. 9 § 409, which prohibits tying up or anchoring vessels or other craft in navigable channels in such a manner as to prevent or obstruct the passage of other vessels or craft.

- **Lighting on Vessels:** GE will comply with the following requirements relating to the type, size, location, color, and use of lighting on all ships:
  - 33 CFR §§ 84-88, Annex I – requirements for positioning and spacing of lights, location of direction-indicating lights for dredges, and screens, color, shape, and intensity of lights;
  - 33 CFR §§ 84-88, Annex V – additional requirements for lighting of moored barges and dredge pipelines; and
  - NYS Canal Corporation regulations at 21 NYCRR 151.11 – lighting requirements for moored floats.

- **Signals on Vessels:** GE will comply with the following requirements relating to the type, intensity, and use of lighting and sound for signaling on all ships:
  - 33 CFR § 86, Annex III – requirements for technical details of sound signals;
  - 33 CFR § 87, Annex IV – requirements for distress signals; and
  - NYS Canal Corporation regulations at 21 NYCRR 151.6 (draft marking on floats), 151.15 (buoys and lights displaced), 151.23 (warning signals approaching bends), and 151.26 (aids to navigation).

- **Piloting:** GE will comply with the following requirements regarding the piloting and movement of vessels:
  - 33 CFR § 88, Annex V – requirements for public safety activities, obtaining copies of rules, and law enforcement vessels; and
  - NYS Canal Corporation regulations at 21 NYCRR 151.7, 151.8, 151.9, 151.17. 151.18, 151.19, 151.20, 151.21, and 151.24 – piloting requirements.

As stated in the QoLPS (Section 7: Finalizing the Standards, p. 7-1): "If during design EPA determines that adjustments to the quality of life performance standards are warranted, EPA may adjust the standards and will involve the public in any such adjustment." The Navigation Performance Standard is modified herein to be consistent with the recent revisions to the navigational regulations of the NYS Canal Corporation (21 NYCRR Part 151), which were identified after release of the QoLPS.

In addition to the above, GE will comply with the following:

- **Restricting Access:** Access to work areas undergoing remediation will be restricted where necessary in coordination with the NYS Canal Corporation. Where access is restricted, necessary steps will be taken, to the extent practical, to provide an adequate buffer zone for safe passage of commercial and recreational vessels in the navigational channel. In any event, channel encroachment requirements will be established in consultation with the NYS Canal Corporation.
- **Scheduling Activities and Use of Locks:** Project-related river traffic will be controlled and scheduled so that interference with non-project-related vessels is not unnecessarily hindered, while at the same time allowing efficient performance of the project. Where locks are used, remedial operations will be coordinated with the NYS Canal Corporation and its lock operators. Project-related vessels will be considered commercial vessels for purposes of navigation.
- **Temporary Aids to Navigation:** Temporary aids to navigation (e.g., lighting, signs, buoys) in areas of active work may be necessary and will consist of items specified by the NYS Canal Corporation or United States Coast Guard (USCG).

The navigation performance standard includes two action levels – Concern and Exceedance Levels, as described below.

- The Concern Level occurs if there is a deviation from the requirements described above and the deviation can be easily mitigated, or if a project-related navigation complaint is received from the public.

- The Exceedance Level occurs if remedial activities unnecessarily hinder overall non-project related vessel movement and create project-related navigation interferences, or if there are frequent recurrent complaints from the public that project activities are unnecessarily hindering non-project vessel movement.

6.2 Design Analysis

Section 3.11.2.5 of the Phase 1 IDR documents the bases and assumptions for the design to demonstrate that the vessels and other equipment to be used in Phase 1 are expected to meet the Performance Standard for Navigation. Further details will be provided in the Phase 1 FDR. The NYS Canal Corporation will be consulted during RD on issues relating to navigation.

6.3 Routine Notices

In accordance with the Performance Standard for Navigation (Sections 6.5.6 and 6.5.7 of QoLPS), GE will provide routine notices during dredging, which will include the following:

- The NYS Canal Corporation will be notified when in-river project activities are anticipated. This will be done by both verbal and written notice. Information will be provided to allow the NYS Canal Corporation and/or USCG to issue Notices to Mariners.
- The public will be provided with a schedule of anticipated project activities. Methods for informing the public of anticipated actions may include the following, where appropriate:
  - Communications with lock operators during lock usage;
  - Broadcasting on appropriate marine frequencies during in-river activities to notify lock operators and other mariners of transient activities that may affect navigation;
  - Posting notices at marinas, public boat launches, and locks;
  - Providing interested commercial and recreational user groups with a summary of anticipated activities on an annual basis prior to initiating in-river activities; and
  - Posting information about in-river activities on a publicly accessible website.

Further details regarding the provision of notices to the public will be provided in the Phase 1 FDR.

6.4 Routine Monitoring

In accordance with the Performance Standard for Navigation (Section 6.5.6 of QoLPS), a routine monitoring program will be implemented to assess in-river activities associated with the project and non-project vessel traffic in the vicinity of the in-river activities. The routine monitoring will include the following:

- Periodic monitoring of in-river activities that may have an impact on navigation of the river by commercial and recreational watercraft; and
- Monitoring vessel traffic and compiling daily logs of river navigation activities in the vicinity of in-river project activities along with any resulting navigation issues.

Further details regarding the routine monitoring will be provided in the Phase 1 FDR.

6.5 Contingency Actions/Responses

In the event that the Concern or Exceedance Level occurs in the form of a deviation from the navigation requirements specified in Section 6.1, GE will take the required actions specified in Table 6-13 of the QoLPS. GE will conduct the contingency response actions specified for such level in Section 2.5 of the Phase 1 ID RA CHASP Scope.

During Phase 1, equipment modifications or additions that are not reasonably available from a schedule or cost standpoint will not be required, recognizing that substitutions for major equipment approved in the Phase 1 Final Design or being used in Phase 1 may be impractical. However, in the event reasonable changes can be made to address achievement of the performance standards during Phase 1, GE will propose such changes to equipment or operations for EPA review and approval. During Phase 1, EPA will consider any information that GE may submit regarding impacts to schedule and project costs when the Agency reviews GE's proposals, if any, for modification of the EPA-approved Phase 1 Final Design based on field conditions or experience.

6.6 Specific Requirements for Handling Complaints

If a navigation complaint is received from the public, GE shall follow the procedure specified in Sections 3.1 and 3.3 of the Phase 1 ID RA CHASP Scope, which shall describe the system for managing navigation complaints at and around the project site.

6.7 Notifications and Reporting

In accordance with the Performance Standard for Navigation (Sections 6.5.8 and 6.5.9 of the QoLPS), GE will make the following notifications and reports:

- A monthly navigation monitoring report summarizing monitoring activities for the previous month shall be submitted to EPA and NYS Canal Corporation. This report will include the daily record logs of river navigation activities and issues. The report will be in a tabular format and include a log of navigation complaints and follow-up actions taken to resolve the complaint.
- If there is a deviation from the navigation requirements specified in Section 6.1, GE will notify EPA and the NYS Canal Corporation verbally within 24 hours for deviations at the Concern Level and immediately upon knowledge of the deviation for deviations at the Exceedance Level.
- In the event of an occurrence of the Concern Level, GE will provide a follow-up report to EPA and the NYS Canal Corporation with a summary of the navigation issue and any mitigation conducted. In the event of an occurrence of the Exceedance Level, GE will submit daily navigation reports to the EPA and NYS Canal Corporation until compliance is achieved, and will submit a corrective action report within 10 days of discovery of the deviation, describing the cause of the problem and the mitigation measures implemented.

The required contents of these reports will be provided in the Phase 1 FDR. In addition, reporting on the handling of complaints will be conducted as described in Section 3 of the Phase 1 ID RA CHASP Scope, and in the Phase 1 RA CHASP.

7. WQC Requirements for In-River Releases of Constituents Not Subject to Performance Requirements

This section discusses the WQ requirements for in-river releases of constituents not subject to the EPS. It provides an overview of the substantive standards as set forth in the EPA's WQ requirements, and specifies the routine monitoring requirements, contingency monitoring and other responses in the event of an exceedance of an applicable standard or an observation of distressed or dying fish, and notification and reporting requirements. Where these requirements are specified in the Phase 1 ID RA Monitoring Scope and Phase 1 ID RA CHASP Scope, this section incorporates those requirements by reference.

7.1 Overview of Standard

The WQ requirements for in-river releases are divided into acute water quality standards to be met at near-field stations and health-based standards to be met at far-field stations.

Aquatic acute water quality standards at near-field stations

The WQ requirements issued by EPA in January 2005 (pp. 1 & 2) set forth the following standards for near-field stations:

- "Aquatic standards (some of which are hardness-dependent) apply to the dissolved form. Hardness varies along the length of the project area and will result in a range of calculated standards. For example, based on limited available data, average hardness values from Corinth and Waterford range from 18 ppm to 55 ppm respectively. The resulting ranges of water quality standards are as follows (where applicable , the formulas for calculating the standards are in brackets):
  - cadmium – Aquatic Acute A(A): 0.6 µg/L to 2.0 µg/L [(0.85) exp(1.128[ln (ppm hardness)] – 3.6867)].
  - lead – Aquatic Acute A(A): 14.4 µg/L to 50.4 µg/L [{1.46203 – [ln (hardness) (0.145712)]} exp (1.273 [ln (hardness)] – 1.052)].
  - chromium – Aquatic Acute A(A): 140 µg/L to 349 µg/L [(0.316) exp (0.819 ln (ppm hardness)) + 3.7256)].

- chromium (hexavalent) – Aquatic Acute A(A): 16 µg/L.
- mercury – Aquatic Acute A(A): 1.4 µg/L."

- "Water quality standards for pH and dissolved oxygen are specified in NYCRR Title 6, Chapter X, Part 703.3.
  - pH shall not be less than 6.5 or more than 8.5.
  - Dissolved oxygen for non-trout waters:
    - The minimum daily average shall not be less than 5.0 mg/L.
    - At no time shall the dissolved oxygen concentration be less than 4.0 mg/L."

Health (water source) standards at far-field stations

The WQ requirements (pp. 2 & 8) set forth the following standards for far-field stations:

- The following water quality standards, which apply to the total form and are not hardness dependent, should not be exceeded at any of the Schuylerville, Stillwater, or Waterford fixed far-field stations:
  - Cadmium (total): 5 µg/L;
  - Chromium (total): 50 µg/L;
  - Mercury (total): 0.7 µg/L; and
  - Lead (total): 15 µg/L (New York State Department of Health [NYSDOH] action level), with a "trigger level" of 10 µg/L at Stillwater and Waterford.

- Determination of an exceedance requires a "confirmed occurrence" prior to any changes in operation, though the potential changes will be formulated after one exceedance – i.e., four subsequent samples, each representing a 6-hour composite, as specified in the WQ requirements.

7.2 Routine Monitoring

GE will conduct the routine near-field and far-field monitoring for metals and water quality parameters (i.e., pH, DO, temperature, turbidity, suspended solids, hardness, and conductivity as described in the WQ requirements (pp. 2-7) as modified in Sections 2.2, 2.3, and 2.4.4 of the Phase 1 ID RA Monitoring Scope.

7.3 Contingency Monitoring

In the event that the routine monitoring shows an exceedance of an applicable standard (or the trigger level for total lead), GE will conduct the contingency monitoring specified for the relevant exceedance in the WQ requirements (pp. 2-7) as modified in Sections 2.2, 2.4.4, and 2.5 of the Phase 1 ID RA Monitoring Scope. As described in Section 7.2 above, lead and cadmium will be used initially as a surrogate for the metals RA monitoring program. Monitoring requirements may be modified to include the additional metals as identified in the WQ requirements and section 7.1 above.

7.4 Contingency Actions/Responses

If any of the above standards is exceeded at a near-field or far-field station, GE will promptly notify EPA and NYSDEC (and, for exceedances of the health standards at far-field stations, the NYSDOH and the public water suppliers), but no later than 3 hours after receipt of the laboratory data, evaluate the cause(s) of the exceedance, and propose an appropriate response to EPA for approval. GE will make these laboratory data available to EPA, NYSDEC, NYSDOH and the water suppliers.

The selection of investigative measures will depend on specific project circumstances and may include one or more the following different actions:

- Visual observations of operations;
- Discussions with project personnel;
- Review of operations records;
- Examination of the integrity of containment barriers (if in use);
- Examination of sediment transport pipeline (if in use);
- Examination of barge loading system and barge integrity;
- Examination of resuspension associated with tugs, barges, and other support vessels; and
- Additional monitoring and/or sampling.

GE will consider and evaluate potential responses and propose an appropriate response to EPA. Such responses may include additional studies, increased monitoring, and/or implementation of engineering controls. GE will consider potential engineering controls including:

- Initiate engineering evaluation and continual adjustments to dredging operations until concentrations are in compliance with the WQ requirements.
- Evaluate and identify any problems.
- Changes in resuspension controls, dredge operation, or dredge type.
- Implementing additional resuspension controls.
- Temporarily cease operations if required.

GE will prepare and submit an Engineering Evaluation Report, which contains the results of this engineering evaluation, the proposed engineering solution, and a proposed schedule for implementing that solution, except as follows: if the solution involves a refinement in operations or equipment that is consistent with, and would not require a modification of, the EPA-approved design or the RA Work Plan, then GE will implement the solution in consultation with the EPA field representative and will document the implementation of that solution in the Engineering Evaluation Report. In all other cases, GE will implement the engineering solution in accordance with the EPA-approved Engineering Evaluation Report. If the cause of the exceedance was not identified by the engineering evaluation, the Engineering Evaluation Report will include a course of action for continued monitoring and evaluation to determine the cause of the exceedance. GE will consult with EPA on a regular basis until the cause and solution are determined, or until EPA orders a temporary halt to the operation(s) that caused the exceedance or until EPA determines that further evaluation is not necessary. During Phase 1, equipment modifications or additions that are not reasonably available from a schedule or cost standpoint will not be required, recognizing that substitutions for major equipment approved in the Phase 1 Final Design or being used in Phase 1 may be impractical. However, in the event that reasonable changes can be made to address achievement of the performance standards during Phase 1, GE will propose such changes to equipment or operations for EPA review and approval. During Phase 1, EPA will consider any information that GE may submit regarding impacts to schedule and project costs when the Agency reviews GE's proposals, if any, for modification of the EPA-approved Phase 1 Final Design based on field conditions or experience.

In addition, if a trigger level of 10 µg/L total lead (~ 70% of the action level) is exceeded by a single water column sample at the Stillwater or Waterford Stations, GE will promptly notify EPA, NYSDEC, NYSDOH and the water suppliers, but no later than 3 hours after receipt of the laboratory results. If that exceedance is confirmed by the next 24-hour sample, GE will evaluate the cause of the exceedance and propose an appropriate response to EPA. Such response may include increased monitoring and/or implementation of engineering controls, as described in the preceding paragraph.

7.5 Responses to Observations of Distressed or Dying Fish

If, during in-water activities, distressed or dying fish are observed, GE will promptly notify EPA. GE will also assess the cause(s) of the situation; and if the cause can be determined and is project-related, GE will conduct increased monitoring for metals and additional water quality parameters, where appropriate, in accordance with the WQ requirements (p. 9) and the Phase 1 ID RA Monitoring Scope, and will propose an appropriate response to EPA, following the same requirements and subject to the same qualifications specified in Section 7.4 for an exceedance of water quality standards.

7.6 Notifications and Reporting

In addition to the notifications and reporting described above in this section, GE will conduct the notification and reporting activities specified in Section 2.7 of the Phase 1 ID RA Monitoring Scope.

8. Substantive WQC Requirements for Discharges to Hudson River and Champlain Canal (Land Cut above Lock 7)

This section addresses the substantive WQ requirements for discharges to Hudson River and Champlain Canal (land cut above Lock 7), as well as the associated monitoring requirements, response actions, and notification and reporting requirements.

8.1 Effluent Limitations

The following (Table C8-1) are effluent limits for the potential discharge from dredged sediment dewatering facilities to the Champlain Canal (land cut portion) above Lock 7 for the Hudson River PCB Site Remedial Action.

Table C8-1 – Effluent Limits for Potential Discharge from Dredged Sediment Dewatering Facilities to the Champlain Canal (Land Cut Portion) Above Lock 7

Parameter	Treatment Plant Discharge Flow Rate	Water Quality Based Effluent Limits
PCBs	Any Assumed Flow Rate	0.3 µg/l, goal of 0.065 µg/l (same as for discharge to Hudson River)
Mercury	Any Assumed Flow Rate	(same as for discharge to Hudson River)
Chromium	0.1 MGD	0.21 mg/l (0.175 lb/day)
	Discharge Flow rate greater than 0.1 MGD	18.9 lb/day (maximum mass flow rate)
Cadmium	0.1 MGD	0.04 mg/l (0.033 lb/day)
	Discharge Flow rate greater than 0.1 MGD	0.62 lb/day (maximum mass flow rate)
Lead	0.1 MGD	0.038 mg/l (0.03 lb/day)
	Discharge Flow rate greater than 0.1 MGD	0.31 lb/day (maximum mass flow rate)
Copper	0.1 MGD	0.136 mg/l (0.11 lb/day)
	Discharge Flow rate greater than 0.1 MGD	0.75 lb/day (maximum mass flow rate)

Note: The accompanying table lists concentrations and associated mass loading rates for Cadmium, Chromium, Lead and Copper for discharge flow rates between 0.1 and 15 MGD.

All other parameters and conditions included in the substantive requirements of a State Pollutant Elimination Discharge Elimination System permit for potential discharge to the Hudson River from dredged sediment dewatering facilities as listed below (Table C8-2) would also be applicable to discharges to the Champlain Canal.

Table C8-2: Other Parameters and Conditions Included In the Substantive Requirements of a State Pollutant Elimination Discharge Elimination System Permit

Flow, MGD	Cr	Load	Cd	Load	Pb	Load	Cu	Load
0.100	0.210	0.175	0.040	0.033	0.038	0.032	0.136	0.113
0.300	0.210	0.525	0.040	0.100	0.038	0.095	0.136	0.340
0.500	0.210	0.876	0.040	0.167	0.038	0.158	0.136	0.567
0.700	0.210	1.226	0.040	0.234	0.038	0.222	0.128	0.750
0.900	0.210	1.576	0.040	0.300	0.038	0.285	0.100	0.750
1.100	0.210	1.927	0.040	0.367	0.034	0.310	0.082	0.750
1.300	0.210	2.277	0.040	0.434	0.029	0.310	0.069	0.750
1.500	0.210	2.627	0.040	0.500	0.025	0.310	0.060	0.750
1.700	0.210	2.977	0.040	0.567	0.022	0.310	0.053	0.750
1.900	0.210	3.328	0.039	0.620	0.020	0.310	0.047	0.750
2.100	0.210	3.678	0.035	0.620	0.018	0.310	0.043	0.750
2.300	0.210	4.028	0.032	0.620	0.016	0.310	0.039	0.750
2.500	0.210	4.379	0.030	0.620	0.015	0.310	0.036	0.750
2.700	0.210	4.729	0.028	0.620	0.014	0.310	0.033	0.750
2.900	0.210	5.079	0.026	0.620	0.013	0.310	0.031	0.750
3.000	0.210	5.254	0.025	0.620	0.012	0.310	0.030	0.750
3.500	0.210	6.130	0.021	0.620	0.011	0.310	0.026	0.750
4.000	0.210	7.006	0.019	0.620	0.009	0.310	0.022	0.750
4.500	0.210	7.881	0.017	0.620	0.008	0.310	0.020	0.750
5.000	0.210	8.757	0.015	0.620	0.007	0.310	0.018	0.750
5.500	0.210	9.633	0.014	0.620	0.007	0.310	0.016	0.750
6.000	0.210	10.508	0.012	0.620	0.006	0.310	0.015	0.750
6.500	0.210	11.384	0.011	0.620	0.006	0.310	0.014	0.750
7.000	0.210	12.260	0.011	0.620	0.005	0.310	0.013	0.750
7.500	0.210	13.136	0.010	0.620	0.005	0.310	0.012	0.750
8.000	0.210	14.011	0.009	0.620	0.005	0.310	0.011	0.750
8.500	0.210	14.887	0.009	0.620	0.004	0.310	0.011	0.750
9.000	0.210	15.763	0.008	0.620	0.004	0.310	0.010	0.750
9.500	0.210	16.638	0.008	0.620	0.004	0.310	0.009	0.750
10.000	0.210	17.514	0.007	0.620	0.004	0.310	0.009	0.750
10.500	0.210	18.390	0.007	0.620	0.004	0.310	0.009	0.750
11.000	0.206	18.900	0.007	0.620	0.003	0.310	0.008	0.750
11.500	0.197	18.900	0.006	0.620	0.003	0.310	0.008	0.750
12.000	0.189	18.900	0.006	0.620	0.003	0.310	0.007	0.750
12.500	0.181	18.900	0.006	0.620	0.003	0.310	0.007	0.750
13.000	0.174	18.900	0.006	0.620	0.003	0.310	0.007	0.750
13.500	0.168	18.900	0.006	0.620	0.003	0.310	0.007	0.750
14.000	0.162	18.900	0.005	0.620	0.003	0.310	0.006	0.750

Flow, MGD	Cr	Load	Cd	Load	Pb	Load	Cu	Load
14.500	0.156	18.900	0.005	0.620	0.003	0.310	0.006	0.750
15.000	0.151	18.900	0.005	0.620	0.002	0.310	0.006	0.750

Note: Mass Loadings, in lb/day, and Concentrations, in mg/l, for Chromium (Cr), Cadmium (Cd), Lead (Pb), and Copper (Cu) for Various Discharge Flow Rates to the Champlain Canal

Calculations: The mass equivalent of the listed concentrations for Cadmium, Chromium, Lead, and Copper, respectively, may be discharged up to the maximum mass flow rate listed. For example, 0.21 mg/l of Chromium may be discharged at any discharge flow rate up to 10.8 MGD, which equates to 18.9 lb/day at 0.21 mg/l. At discharge flow rates greater than 10.8 MGD, no more than 18.9 lb/day of Chromium may be discharged (resulting in proportionally lower concentrations). The mass flow rate is determined using the calculation:

Load = [flow, MGD] x [concentration, mg/l] x [8.34]

Substantive Requirements of State Pollutant Discharge Elimination System Permit for Potential Discharge to the Hudson River

During the period beginning with the effective date of discharge (EDD) and lasting until the completion of the project, the discharges from the treatment facility to water index number H, Class B/C, Hudson River will be limited and monitored as specified in Table C8-3 below.

Table C8-3: Limits to Discharges from the Treatment Facility to Water Index Number H, Class B/C, Hudson River

Outfall Number and Parameter	Discharge Limitations		Units	Minimum Monitoring Requirements		Foot-note
	Daily Avg.	Daily Max		Measurement Frequency	Sample Type	
Outfall 001 - Treated Remediation Discharge for Hudson River PCB Site:						
Flow	Monitor	Monitor	GPD	Continuous	Meter	
pH (range)	6.0 to 9.0		SU	Monthly	Grab	
Solids, Total Suspended	Monitor	50	mg/l	Weekly	Grab	8
Total Organic Carbon	Monitor	Monitor	mg/l	Weekly	Grab	8
PCBs, Aroclor 1016	Monitor	0.3	µg/l	Weekly	Runtime composite	1,8

Outfall Number and Parameter	Discharge Limitations		Units	Minimum Monitoring Requirements		Foot-note
	Daily Avg.	Daily Max		Measurement Frequency	Sample Type	
Outfall 001 - Treated Remediation Discharge for Hudson River PCB Site:						
PCBs, Aroclor 1221	Monitor	0.3	µg/l	Weekly	Runtime composite	1,8
PCBs, Aroclor 1232	Monitor	0.3	µg/l	Weekly	Runtime composite	1,8
PCBs, Aroclor 1242	Monitor	0.3	µg/l	Weekly	Runtime composite	1,8
PCBs, Aroclor 1248	Monitor	0.3	µg/l	Weekly	Runtime composite	1,8
PCBs, Aroclor 1254	Monitor	0.3	µg/l	Weekly	Runtime composite	1,8
PCBs, Aroclor 1260	Monitor	0.3	µg/l	Weekly	Runtime composite	1,8
PCBs, Total	Monitor	Monitor	µg/l	Weekly	Runtime composite	1,8
Cadmium, Total	Monitor	0.04	mg/l	Weekly	Grab	2,8
Chromium, Total	Monitor	0.21	mg/l	Weekly	Grab	2,8
Copper, Total	Monitor	0.136	mg/l	Weekly	Grab	2,8
Lead, Total	Monitor	0.038	mg/l	Weekly	Grab	2,8
Mercury, Total	Monitor	0.0002	mg/l	Weekly	Grab	2,3,8
Dissolved Oxygen	Monitor	Monitor	mg/l	Weekly	Grab	8

Additional Conditions and Footnotes:

(1) PCBs:

a. GE must monitor this discharge for PCBs using EPA laboratory Method 608. The laboratory must make all reasonable attempts to achieve the Minimum Detection Levels (MDLs) of 0.065 µg/l for each of the subject Aroclors. Monitoring requirements may be modified in the future if the EPA approves a method different from Method 608

b. Non-detect at the MDL of 0.065 µg/l is the discharge goal. GE shall report all values above the MDL. If the level of any Aroclor is above its listed MDL, GE must evaluate the treatment system and identify the cause of the detectable level of PCBs in the discharge. Following three consecutive months that include

analytical results above any MDL, GE shall prepare an approvable report identifying the measures undertaken to eliminate the detections and propose additional steps to be taken to eliminate the recurrence of such detections. This report shall be submitted to the EPA within 28 days following receipt of sampling results from the third monitoring period.

c. If EPA determines that effluent monitoring results above the MDL of 0.065 µg/l can be prevented by implementation of additional measures as proposed by GE, GE shall implement such additional measures.

d. The treatment technology for this discharge shall be the maximum feasible treatment technology for treatment of PCBs. As treatment technology improvements become available, GE shall, at its own initiative or the EPA's request, review the available technology and submit for EPA approval, plans to improve the treatment technology and/or Best Management Practices employed to remove maximum feasible amount of PCBs from the wastewater discharge.

e. This limit is a phased Total Maximum Daily Loading limit, prepared in accordance with 6 NYCRR 702.16(b). Discharge is not authorized until such time as an engineering submission showing the method of treatment is approved by the EPA. The discharge rate may not exceed the effective or design treatment system capacity.

(2) Mass based effluent limits for these metals will be developed when the final effluent flow rate is determined.

(3) Mercury, Total shall be analyzed using EPA Method 1631.

(4) All monitoring data, engineering submissions and modification requests must be submitted to:

Doug Garbarini
Hudson River Team
EPA
290 Broadway, 19th Floor
New York, NY 10007
(212) 637-3952

With a copy sent to:

William Daigle, Hudson River Unit
Division of Environmental Remediation
NYSDEC, 625 Broadway, Albany, New York 12233-7010
(518) 402-9770

(5) Only site generated wastewater related to the Hudson River PCB Site Remedial Action is authorized for treatment and discharge.

(6) Both concentration (mg/l or µg/l) and mass loadings (lbs/day) must be reported for all parameters except flow and pH.

(7) Any use of corrosion/scale inhibitors or biocidal-type compounds used in the treatment process must be approved by EPA prior to use.

(8) In accordance with CERCLA Sections 121(d)(2) and 121(e), no permits are required for on-site CERCLA response actions.

With respect to Footnote 1, GE will not be required to make any modification to the PCB method or treatment technologies that is not being required at other facilities by NYSDEC. During Phase 1, equipment modifications or additions that are not reasonably available from a schedule or cost standpoint will not be required, recognizing that substitutions for major equipment approved in the Phase 1 Final Design or being used in Phase 1 may be impractical. However, in the event that reasonable changes can be made to address achievement of the performance standards during Phase 1, GE will propose such changes to equipment or operations for EPA review and approval. During Phase 1, EPA will consider any information that GE may submit regarding impacts to schedule and project costs when the Agency reviews GE's proposals, if any, for modification of the EPA-approved Phase 1 Final Design based on field conditions or experience.

8.2 Discharge Monitoring

GE will monitor the above discharges in accordance with the discharge monitoring requirements set forth in the WQ requirements and Section 8 of the Phase 1 ID RA Monitoring Scope. Further details will be specified in the Phase 1 RAM QAPP to be prepared as part of the RA Work Plans.

The monitoring will be consistent with the substantive requirements identified in EPA's letter to GE dated January 7, 2005.

8.3 Response Actions

In the event of an exceedance of the discharge limitations (which include a detection of Aroclors above the MDL), GE will perform an engineering evaluation and propose, for EPA approval, appropriate corrective action in an Engineering Evaluation Report to be submitted to EPA and NYSDEC. The corrective action may include additional testing to assess the problem, carbon (or other media) changeout, repairs to equipment, operational modifications (e.g., modifying additive dosages, more frequent backwashing, lead/lag changes of activated carbon, reducing flow rate), modifications to or replacement of treatment equipment, or, if necessary, temporary cessation of operations. In addition, if the level of any PCB Aroclor is above the MDL, GE will perform an

investigation into the cause of the detectable level of PCBs in the discharge and provide the results in a report to EPA. If 3 consecutive months include PCB results above the MDL, GE will prepare and submit to the EPA a report that identifies the corrective measures undertaken and proposes additional steps to eliminate the recurrence of such detections. GE will submit the report to the EPA within 28 days from GE's receipt of the sampling results from the third monitoring period. GE will implement any additional corrective measures in accordance with the EPA-approved report recommending such corrective measures.

8.4 Notifications and Reporting

GE will submit to the EPA and NYSDEC a monthly report that includes the routine monitoring results for discharges to the Hudson River and the Champlain Canal (Land Cut above Lock 7). Both concentration [mg/L or µg/L] and mass loadings [lbs/day] will be reported for all parameters except flow and pH. In the event of an exceedance of the discharge limitations or PCB detection, GE will prepare and submit to the EPA and NYSDEC a separate report, as described in Section 8.3 of this Phase 1 ID PSCP Scope. Monitoring data, engineering submissions and modification requests will be submitted to EPA with a copy sent to NYSDEC.