ATTACHMENT 7

REGULATORY CORRESPONDENCE

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Site Remediation Program
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KIM GUADAGNO
Lt. Governor

BOB MARTIN
Commissioner

W. Michael McCabe
Site Administrator
Jersey City PPG Chromium Sites

12/12/12

APPROVAL

Re: Spectra Energy Excavation Management Plan and Addendum
Hudson County Chromium Sites 63 (PI #G000008691) and 65 (PI #G000008693)
One Burma Road
Jersey City, New Jersey

Dear Mr. McCabe:

The New Jersey Department of Environmental Protection (Department) has reviewed the Spectra Energy Excavation Management Plan (the Plan) distributed on November 6, 2012 and the Plan Addendum dated November 26, 2012 for the Spectra pipeline installation at 1 Burma Road (Hudson County Chromium Sites 63/65) in Jersey City, New Jersey. The Department hereby approves the Plan and Plan Addendum, effective the date of this letter.

The Department will consider the remediation of chromate chemical production waste (CCPW) complete, within the limits of the pipeline excavation corridor proposed in the Plan at the subject property, if implemented in accordance with the Plan. All relevant information to document the remediation of CCPW as outlined in the Plan, including a final survey to document the extent of the pipeline excavation corridor, shall be incorporated in the Remedial Action Report (RAR) for Sites 63/65 to be submitted at a future date. Should additional information become available subsequent to the date of this letter that indicates the presence of CCPW beyond the presumed limits outlined in the Plan, the CCPW must be addressed accordingly.

Please note that the Department's approval is based solely on the Plan's adequacy in addressing the CCPW and related constituents within the pipeline trench corridor, and does not consider the potential presence of any other non-CCPW contamination on Sites 63/65. Furthermore, the Department did not assess any of the protective measures for the installed pipeline or indemnification for potential impacts to the pipeline.

If you have any questions regarding this matter, contact me at (609) 984-2905.

Sincerely,

Thomas J. Cozzi, Assistant Director
Site Remediation DEP

C: Brian McPeak, Project Manager
Dave Doyle, DEP

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Texas Eastern Transmission, LP
Algonquin Gas Transmission, LLC

EXCAVATION MANAGEMENT PLAN ADDENDUM

NJ-NY EXPANSION PROJECT
1 BURMA ROAD, JERSEY CITY

NOVEMBER 26, 2012

INTRODUCTION

Spectra Energy has received a certificate from the Federal Energy Regulatory Commission to construct a natural gas pipeline, in order to expand its service in the New Jersey – New York Metropolitan Area. A segment of the pipeline is aligned through Jersey City, parallel to the New Jersey Turnpike Extension.

The alignment runs through the property at 1 Burma Road. This property is one of a group of sites under investigation due to the historic use of chromite ore processing residue (COPR) as fill at these properties. The property at 1 Burma Road is referred to by the New Jersey Department of Environmental Protection (NJDEP) as Chromium Sites 63 and 65. PPG is working under a Judicial Consent Order (JCO) issued by the Superior Court of New Jersey to investigate and remediate chromium and a suite of other metals determined to be associated with COPR, at this property and others.

PPG has sampled soil and groundwater at the property as part of its Remedial Investigation (RI) and plans to conduct additional investigative activities in Fall 2012. PPG has indicated it plans to prepare a Remedial Action Workplan (RAW) for submittal to the NJDEP in early 2013, and implement remedial activities as early as Spring 2013.

A meeting was held on October 22, 2012 between the NJDEP, representatives of the Superior Court, PPG, and Spectra. On November 6, 2012, Spectra distributed an excavation management plan with a cross section describing the steps Spectra will take to remove all fill material that could contain COPR and chromium at concentrations above applicable standards. At a subsequent meeting on November 16, 2012, the NJDEP (by phone) and PPG requested clarification of certain aspects of Spectra's proposed excavation and pipeline installation plan.

PURPOSE

Spectra plans to begin construction of the pipeline through the 1 Burma Road property in November or December 2012. This Excavation Plan Addendum addresses the remaining issues raised by the NJDEP and PPG.

PROCEDURES

The proposed alignment of the pipeline through the 1 Burma Road property is shown on the alignment sheets in Attachment A. Attachment B shows the area that will be occupied by the proposed valve station and accompanying structure.

Excavation Depth

The NJDEP and PPG indicated that they are satisfied that Spectra's proposed depth of remediation will remove all detected chromium exceedances and any potential COPR along the alignment, and that for most of the alignment on the property, will remove all historic fill down to the native geologic material. In the northern part of the property, the excavation will not extend down to the bottom of the historic fill. The NJDEP requested that Spectra inspect the trench bottom in this portion for the presence of COPR and remove it if encountered. (PPG's investigations to date indicate that the presence of COPR at these depths is highly unlikely.) PPG indicated they would probably want to have a representative present during trench excavation, which is acceptable to Spectra. The NJDEP and PPG understand that Spectra will install the pipe immediately after trench excavation, and that there will be no provisions for surveying by third parties, post-excavation sampling or subsequent over-excavation based on sampling results.

Excavation Width

Spectra proposes to excavate a trench 11 feet wide, remove all excavated material for off-site disposal, and fill the trench with soil that meets the criteria defining certified clean fill in the NJDEP's Alternate and Clean Fill Guidance. Spectra has determined that PPG can safely conduct future remedial activities within 5.5 feet of the center line, and 3 feet from the edge, of the installed pipe. These activities can include excavation and sheet pile driving. Spectra's transmission division will provide oversight and guidance during PPG's anticipated remedial activities in proximity to the pipeline. Spectra will hold separate discussions with PPG regarding indemnification for potential impacts to the pipeline.

Spectra has informed PPG that equipment can be staged over the pipeline for future remedial work. Spectra has specific requirements for driving heavy equipment over its pipelines, including the use of mats and other weight-spreading techniques. Spectra's transmission division will provide oversight and guidance during any such activities.

Valve Station

The dimensions of the footprint of the proposed valve station are approximately 30 by 50 feet and are depicted in Attachment B. The footprint of the valve station will be excavated to a depth of 6.5 feet and all historic fill within this footprint will be removed. The excavation area will be backfilled with certified clean fill. PPG can safely excavate or drive sheeting to the edges of this valve station footprint.

Response to NJDEP Comments Dated March 2, 2012
March 2012 Remedial Investigation Report
Site 63/65; Jersey City, New Jersey

Tetra Tech, on behalf of PPG Industries, Inc. (PPG) and Shaw have prepared the following responses to the NJDEP comments for the Site 63 and 65 Remedial Investigation Report. A response to each of the comments has been provided below each comment in bold text.

The RI report did not include any discussion of the presence of CCPW (including chromate ore processing residue [COPR]) other than identification of COPR in the boring logs provided in Appendix B. This issue of not identifying CCPW/COPR within the body of RI reports has been brought to the attention of PPG in the past on other sites (e.g., Site 114 off-site borings, Site 16 RIR). The presence and/or absence of CCPW (including COPR) needs to be identified, pursuant to Judicial Consent Order (JCO), in the text, tables, and figures in this, and subsequent reports, for all sites.

Response: The presence of CCPW/COPR has been added to the text, figures, and appendix of the RIR.

GENERAL COMMENTS

1. As per N.J.A.C. 7:26E-1.5 and 7:26E-4.8, all RIR submittals must be accompanied by a Remedial Investigation Report Form, and must be certified by PPG. The Department has commented numerous times on the need for PPG submittals to be accompanied by the appropriate certifications. Henceforward, reports submitted without the applicable certification and form will be considered not having been submitted to the Department, and will no longer be reviewed.

   Response: The Remedial Investigation Report Form will be included in the final submission of the RIR.

2. Delineation has not been completed for PPG-related contamination present at either Site 63 or at Site 65 (the Sites) in either soils or groundwater. Additional investigation is required to complete the delineation. In addition, chromate chemical processing waste (CCPW) was detected in several borings without there being "clean" (non-CCPW-containing) borings between the boring location and the site perimeter. The extent of all CCPW must be fully identified.

   Response: Based on the technical memorandum, conference calls, and discussions with NJDEP further delineation was conducted in December 2012 and January 2013. Delineation was performed according to the Technical Memorandum sent to NJDEP on July 16, 2012 with minor revisions as discussed with NJDEP. The delineation included the collection of soil samples from additional soil borings, installation and sampling of monitoring wells (deep and shallow), and the collection of soil samples for SPLP analysis. The results of the delineation are incorporated into the revised RIR in a separate section.

3. In the discussion of historic activities undertaken at the Sites, mention is made of historic sampling performed which indicated the presence of hexavalent chromium at concentrations greater than the current remedial standard, as well as the presence of CCPW. Those discussions suggest that some or all of these soils and/or CCPW remain on-site. Historic data associated with soils remaining on-site must be presented in the RIR in tables and figures as per N.J.A.C. 7:26E-4.8(c).

   Response: Available historical data from sampling events after the Interim Remedial Action has been incorporated in Figures 6, 7a, 7b and 7c of the RIR. Text has been updated to incorporate historical data. An Appendix will present the available historical data as well as historical figures.

4. PPG may wish to develop site-specific impact-to-groundwater soil remedial standards (IGWSRS), consistent with one of the Department-approved methods identified at http://www.nj.gov/dep/srp/guidance/rs/. In addition, the discussions of IGWSRS exceedances should include evaluation of the groundwater elevation, as IGWSRS only apply to soils in the vadose zone.

   Response: Site Specific IGWs were calculated with data obtained from the delineation data collected in December 2012. Text regarding this site specific IGW will be found in Section 4 as well in an Appendix. The figures, tables, and text will evaluate the soil samples in the vadose zone in relation to the IGWSRS.

5. The RIR must discuss data quality issues, including how those issues impact the findings of the Remedial Investigation. The RIR should discuss how the outcome of the validation reports presented in Appendix F impact the findings, and what impact samples having detection limits that were greater than remedial standards have on the conclusions presented in the RIR.

   Response: The investigation was conducted in accordance with the approved RIWP that required the use of Method 6010. The laboratory reported the results to the Reporting Limit initially and after discussions with NJDEP and the laboratory the results of the laboratory analysis were reported to the Method Detection Limit. Additional text has been added to Section 2. The delineation sampling conducted in December 2012 and January 2013 will utilize Method 6020 that has a lower quantitation level for the metals of concern. The text in Section 2 and 4 has been revised based on the change to how the laboratory reported the data.

6. An updated receptor evaluation is required to accompany the final RIR.

   Response: An updated receptor evaluation has been added to the RIR based on the NJDEP Receptor Evaluation Forms submitted during this remedial investigation.

7. As per an email dated 21 February 2011 from Environmental Remediation and Financial Services, LLC (ERFS, consultant to Jersey City), the City has no comments on the RIR at this time.

Response: Comment noted.

SECTION-SPECIFIC COMMENTS

1. Title page: Date should be January 2012, not January 2011. Please revise.

   Response: The change has been made.

2. List of Tables, page iii: Table 13 is not listed. Please add.

   Response: Table 13 is has been listed.

3. Executive Summary, page ES-1, third and fifth paragraphs: Note that the remedial criteria for CCPW-related metals are remedial standards for these Sites (and all sites governed by the 2009 Judicial Consent Order), not screening criteria. Please revise the text here and throughout the RIR to use the correct terminology.

   Response: Text has been revised in the RIR to reflect the reference to CCPW-related metals remedial standards.

4. Section 1.2.1, page 2, last paragraph: The RIR should provide figures which show the nature and extent, including location and depth, of all Interim Remedial Measures performed to date at the Sites.

   Response: See the response to General Comment 3

5. Section 2.1, page 4, first bullet: The text states that "Disposable, dedicated plastic trowels and paper bowls were used for soil sampling and homogenization." However, throughout the report reference is made to the usage of stainless steel trowels and stainless steel bowls for sample collection and homogenization activities. Please clarify the method which was used for sample collection and homogenization during this investigation.

   Response: The text in Section 2.0 has been revised to disposable, dedicated plastic trowels and paper bowls for sample collection and homogenization activities.

6. Section 2.1, page 4, second bullet: Please note that henceforward, the method of sealing the borings should be consistent with the requirements of N.J.A.C. 7:9D-3.4.

   Response: Comment noted.

7. Section 2.1, page 4, last bullet: Please confirm that all borings which were moved as described in this bullet have their positions accurately depicted on all applicable figures provided in the RIR.

   Response: The locations/positions of the borings are accurately depicted on the figures.

8. Section 2.2.1, page 6, last paragraph: Please provide detail on how the high-density polyethylene (HDPE) liner was repaired.

   Response: Text was added in Section 2.0 to describe how the liner was repaired.

9. Section 2.3.1, page 6, second paragraph, first sentence: Please provide the rationale for determining the placement of the wells screens in relation to the water table.

   Response: The rationale for placement of the well screen was in accordance with the RIWP - 5 feet of well screen placed immediately below the water table or within visually impacted soils where appropriate. The text in Section 2.0 has been revised to include the rationale from the RIWP.

10. Section 2.3.1, page 7: Monitoring Well Certification Forms A and B should be provided in the RIR.

    Response: Appendix C will be updated with the Monitoring Well Certification Forms provided by the driller.

11. Section 2.3.3, page 7, first paragraph: Figure 4 is identified incorrectly as "contour map". Figure 4 is "Cross-Section B-B'" and Figure 5 is the correct "Contour Map" figure. Please correct.

    Response: The text was corrected according to the comment.

12. Section 2.3.4, page 7, first paragraph: Please provide the rationale for not sampling all the wells during a single sampling event. For future sampling events, please sample all wells during the same time event.

    Response: Text has been added to Section 2.0 to address the two sampling dates at the site. For the delineation sampling event the groundwater was sampled in a single sampling event in January 2013.

13. Section 2.5, page 8: Please include the investigation-derived waste (IDW) disposal documentation (e.g., manifests) in Appendix E, as is indicated by the text.

    Response: Appendix E has been updated.

14. Section 2.6.2, page 9, second paragraph: Sentence states that "Trip blanks were not retained during this sampling event since volatile organic compounds were analyzed." Since volatile organic compounds were not analyzed, this statement is assumed to be a typographical error. Please clarify and/or correct this sentence to reflect rationale for not collecting trip blanks during this sampling event.

    Response: Trip blanks were collected daily according to the RIWP. The text has been changed accordingly.

15. Section 2.6.2, page 9, third paragraph: The 3-step decontamination procedure identified is not consistent with the 3-step decontamination procedure established for PPG sites under the Quality Assurance Project Plan (AECOM, June 2010), which the March 2011 Remedial Investigation Work Plan for the Sites indicated would be used during implementation of the Remedial Investigation. Please discuss the results of the field blank samples for all environmental media as they relate to the adequacy of the revised decontamination procedure.

    Response: Text has been added to the report in Section 2.0 to address the comment.

16. Section 2.6.3, page 9, third sentence: Please elaborate on which "quality control criteria" failed, and how this affects the dataset.

    Response: Laboratory quality control requirements for the analysis of hexavalent chromium failed and the laboratory reanalyzed for hexavalent chromium as required by the laboratory method. Text has been added to Section 2.0 to address the comment.

17. Section 3.4.1, page 11, second paragraph, eighth sentence: The text states that "One industrial groundwater well was identified." Please disclose the details and any findings surrounding this industrial well in both the RIR and in the updated Receptor Evaluation.

    Response: Text in Section 3.0 has been revised based on the information in the Receptor Evaluation Form.

18. Section 3.5.2, page 11: This report section should be renumbered to Section 3.4.2.

    Response: This change has been made to the text.

19. Section 4 and subsequent subsections: The RIR should present information on the limits and extent of CCPW observed during installation of the Remedial Investigation sampling program. See General Comment 2.

    Response: See response to General Comment 2. References to locations where COPR/CCPW was located will be incorporated throughout the document (mainly in Section 4.0) and figures.

20. Section 4.0, page 12, second paragraph: See General Comment 4 and Section-Specific Comment 3.

    Response: See response to General Comment 4 and Section-Specific Comment 3.

21. Sections 4.1.1, page 12: It is noted that antimony contamination has not been fully delineated either vertically (e.g., 063_C009a) or horizontally (e.g., 063_B012, 063_B015, 063_D010, 065_A007065_A009). See General Comment 2. See also General Comments 4 and 5.

    Response: See the response to General Comments 2 and 4.

22. Section 4.1.3, page 13: It is noted that hexavalent chromium contamination has not been fully delineated horizontally (063_B013). See General Comment 2.

    Response: See the response to General Comment 2.

23. Section 4.1.4, page 13: It is noted that nickel contamination has not been fully delineated horizontally (063_B003a, 063_B013, 063_B014, 063_C011, 063_C012, 063_D009, 063_D010, 063_E003, 065_A005, 065_A006, 065_A007, 065_A008, 065_A0 9, 065_A 11, 065_A 12, 065_A 13, 065_A 14, 065_A 15). See General Comment 2. See also General Comments 4 and 5.

    Response: See the response to General Comments 2, 4 and 5.

24. Section 4.1.5, page 13, second paragraph: An evaluation of the data set indicates that approximately 18 percent of the thallium samples had detection levels higher than the applicable remedial standards. Please describe how this impacts the findings of the Remedial Investigation. See General Comment 5.

    Response: See response to General Comment 5. There are few concerns related to the impact of quantitation levels for thallium.

25. Section 4.1.6, page 13: It is noted that vanadium contamination has not been fully delineated either vertically (e.g., 063_C009a, 063_D006) or horizontally (e.g., 063_B003a, 063_B009a, 063_B013, 063_B014, 063_C003, 063_C011, 063_D009, 065_A005, 065_A006, 065_A008, 065_A009, 065_A011, 065_A013). See General Comment 2.

    Response: See the response to General Comment 2.

26. Section 4.2.1, page 14: Please discuss the implications of four of the seven groundwater samples having non-detectable antimony results where the laboratory reporting limit is greater than the groundwater quality standards. See General Comment 5.

    Response: See response to General Comment 5.

27. Section 4.2.3, page 14: It is stated that "Seven…samples contained hexavalent chromium", while Table 10 illustrates that there are three samples with hexavalent chromium detections. Further, it is reported that the hexavalent chromium samples collected on August 4, 2011 were analyzed beyond the acceptable holding time, and these samples were re-collected for subsequent analysis. Please discuss whether the analytical results of the hexavalent chromium groundwater samples collected on August 4, 2011 are valid and useable results and correct/modify the text as appropriate. Please include in this discussion the implications of the reanalyzed sample having a detection limit in excess of the groundwater quality standard for total chromium. See General Comment 5. In addition, the last sentence is incongruous and should be removed, as the allergic contact dermatitis endpoint is for soils, not groundwater.

Response: See response General Comment 5. Text has been added to Section 4.0 to address the non-compliance of the holding time for the hexavalent chromium samples. The last sentence of Section 4.2.3 has been removed.

28. Section 4.2.4, page 14: The text states that "Three samples had concentrations of nickel that exceeded…screening criteria…" while Tables 9 and 10 illustrate that there are two samples which have nickel exceedances. Please correct text to reflect data. Also please correct the typographical error in the last sentence.

    Response: The text in Section 4.2.4 and Tables 9 and 10 have been corrected. Typographical error in the last sentence has been corrected.

29. Section 4.3, page 15, first paragraph: It is not appropriate to compare surface water results to groundwater quality criteria, nor is it appropriate to compare surface water results collected from a fresh water-containing feature to marine surface water quality standards. Therefore, use of the most stringent of the fresh surface water, marine surface water, and groundwater criterion for each contaminant results in an overly conservative assessment of surface water quality at the Sites. Please reevaluate the data based on comparison of the analytical results to the fresh surface water criteria, and revise this section of the RIR accordingly.

    Response Section 4.3 will be revised according to the correct criteria.

30. Section 4.4, page 15: It is not appropriate to compare sediment samples to soil remediation standards. See Section-Specific Comment 46. Please reevaluate data against sediment screening levels and revise this section of the RIR accordingly.

    Response: See response to Site-Specific Comment 46. Sediment samples will be compared to the NJDEP Ecological Screening Criteria that is presented in Table 4.

31. Section 4.4, page 16: The text states that "Antimony and vanadium were not detected…where sediment was obtained." Please correct this sentence, as vanadium detections were discussed in preceding paragraph.

    Response: Text in Section 4.4 has been modified.

32. Section 5.0, page 17: The title of section is "Receptor Evaluation and Baseline Ecological Evaluation". There does not appear to be a portion of this section related to "receptor evaluations" and only focuses on environmentally sensitive natural resources (ESNRs). Section 3.4.1 of the RIR mentions the presence of an industrial well in proximity to the Sites. This well should be treated as a potential receptor and must be evaluated as such.

    Response: This section of the RIR will be revised to include appropriate receptor evaluations. Based on the Receptor Evaluation Form no wells are located within ½ mile of the site.

33. Section 5.1.1, page 17, second paragraph: The reference to Appendix J-1 should be updated. Also, the referenced Figure 4 does not distinguish land used for recreational purposes, per the legend. Please revise as necessary.

    Response: This section will be revised based on the comment.

34. Section 5.2, page 18, second paragraph: The statement "the majority of the Site is covered with a liner, which is topped with gravel" is not consistent with the information provided in the cross sections presented as Figures 3 and 4. Please revise text for accuracy.

    Response: The text will be revised to indicate approximately half of the site is covered with a liner.

35. Section 5.2, page 18, third paragraph: The statement "no surface water impacts are expected" must be removed unless the completed groundwater delineation supports it. Note that the groundwater delineation must include an evaluation of the subsurface infrastructure which may act as a preferential pathway for site-related contamination (as had been indicated would be done in Section 3.7.4.1 of the March 2011 Remedial Investigation Work Plan).

    Response: With the completion of the delineation investigation, the subsurface infrastructure (mainly within Burma Road) will be evaluated along with the groundwater delineation. The RIR text will be revised with these results.

36. Section 5.3, pages 18-19: Since the surface water and sediment samples that were collected from a catch basin and storm sewer contained site-related contaminants, the location(s) of the outfall(s) to which the sewer and catch basin are tied need(s) to be included in the receptor evaluation.

    Response:

37. Section 6.0, pages 20-21: The second sentence states that remedial actions were previously performed in 1988 and 1989; however, the RIR does not present any level of detail regarding the extent of those remedial actions, nor does it include post-remedial data collected during implementation of those interim remedial actions. The extent of, and residual contaminants associated with, the earlier remedial actions should be included in throughout the RIR and also be summarized in the conclusions section of the report.

    Additionally, the "Conclusions" section of the RIR should describe the completeness of the delineation of all contaminants detected in each media at the Sites in concentrations in excess of remedial criteria, as well as a summary of concerns arising from the data quality assessment. See General Comments 2 and 5.

    Response: See response to General Comments 2, 3, and 5. Section 6.0 has been modified to reflect the findings through the field investigation during the delineation activities in December 2012 and January 2013. Text has been added to Section 6.0 to address data quality assessments.

38. Section 6.0, page 20, Soil, fourth and sixth bullets: See General Comment 4.

Response: See response to General Comment 4.

39. Section 6.0, page 20, Groundwater, third bullet: The sentence states that "One sample had an estimated concentration of 16.8 ug/L that the screening criteria." This sentence is unclear, please modify.

Response. Sentence has been revised to be clear.

40. Section 6.0, page 21, Groundwater, first bullet: The text states "Five groundwater samples detected nickel." This is in conflict with data presented in Tables 9 and 10 of this report. Please verify correct number of samples with detectable concentrations of nickel, and modify the text and tables as appropriate.

Response: Text in Section 6.0, and Tables 9 and 10 have been revised.

41. Section 6.0, page 21, Groundwater, third bullet: The highest hexavalent chromium concentration is listed as "21.8 ug/L" for this sampling event. However, this sample was out of the hold time and cannot be validated at this concentration. In addition, the re-run sample result was 100 ug/L (U – non-detect). While there is no hexavalent chromium criterion for these Sites, please assign an asterisk (*) with this sample to denote that the sample result was out of lab compliance hold-time. See Section-Specific Comment 27.

Response: Text in Section 6.0 has been revised. See response to Section-Specific Comment 27.

42. Section 6.0, page 21, Sediment and Surface Water bullets: See Section-Specific Comment 29 and Section-Specific Comment 30.

Response: See response to Site-Specific Comments 29, 30 and 46. Text in Section 6.0 has been modified.

43. Tables, General: Please apply a constant number of significant figures throughout the values reported within all tables. There are currently inconsistencies with the number of significant figures reported, which could be the difference between an exceedance of a screening criteria/standard or not.

Response: Tables have been revised to be consistent with two significant digits.

44. Table 1: Please provide northing, easting, and elevation data for all soil borings (e.g., 063_C012, 063_D011).

Response: Table 1 has been modified accordingly to provide the northing, easting and elevation for all soil borings.

45. Table 3: Please include date the groundwater elevations were obtained. It is unclear if these measurements were from the August or September sampling event.

    Response: Table 3 has been modified accordingly to show the date of the sampling event.

46. Table 4: Table 4 shows soil remediation standards as sediment screening levels. Sediment screening levels should be obtained from the NJDEP Ecological Screening Criteria table (http://www.nj.gov/dep/srp/guidance/ecoscreening/esc_table.pdf). Also, please provide a definition for "SWFWAC" and remove the term "SWFWHH," which is not used in the table, from the notes. Also please explain why the groundwater quality standards were used as a "screening level" for surface water when a surface water quality criterion for (trivalent) chromium exists (and can be found at N.J.A.C. 7:9B-1.14(f)), and why a marine surface water criterion was selected for nickel when the drainage swales contain only fresh water.

    Response: Table 4 has been revised to include the acronyms and definitions. Table 4 has been revised to include the Sediment Screening Criteria. Text has been added to Section 4.0 to address the reasoning behind choosing the screening criteria.

47. Tables 5 and 9: It is noted that there are samples which are non-detect (U) with detection limits that exceed the applicable standard. Please flag these outliers within Table 5 and Table 9. Also, see General Comment 5.

    Response: Tables 5 and 9 have been revised based on the comment.

48. Table 10: Please add a note to indicate that the hexavalent chromium samples listed in the table were out of holding-time and are non-compliant with laboratory quality standards. Also, see General Comment 5.

    Response: A note has been added to Table 10 to indicate which samples were non-compliant based on the holding-time requirements.

49. Table 11: See Section Specific Comment 46.

    Response: Table 11 has been revised accordingly. See Response to Section Specific Comment 46

50. Figures 2 and 5: Please correct the road name to the south of the Sites on these figures.

    Response: Figures have been updated.

51. Figures 10, 11, 12 and 13: The isoconcentration maps included with this report illustrate the undefined boundary of groundwater contamination at the Sites. The current groundwater plume is not bound by any data in the southeastern direction, which is also the direction off-site toward the nearest body of water (Upper New York Bay). Please take these isoconcentration maps into consideration during further groundwater plume delineation activities.

Response: Comment noted.

52. Appendix B: There are borings shown on the figures for which there are no boring logs (e.g., 063_B003a, 063_D011). Additionally, the information in the "Field notes and sample summary" does not always accurately reflect the information presented in the "Burmeister System Soil Description" (e.g., 065_A004, 063_B010, 063_B013, 063_004a, 063_C011, 063_E005). Please revise the RIR to ensure all field data is accurately reflected in the figures, tables, text, and appendices.

Response: Appendix B has been fixed to include all boring logs.

53. Appendix G: See General Comment 5 regarding detection limits being sufficient to determine compliance with remedial standards. Please revise data presentation as necessary.

Response: See the response to General Comment 5. Data will be presented with the new detection limits.

54. Appendix H: It is noted that the "screening criteria" identified are promulgated remedial standards. See General Comment 5 regarding detection limits being sufficient to determine compliance with remedial standards. Please revise data presentation as necessary.

Response: See the response to General Comment 5.

55. Appendix I: See Section-Specific Comment 29. Also see General Comment 5 regarding detection limits being sufficient to determine compliance with remedial standards, and revise data presentation as necessary.

Response: See response Section Specific Comment 29 and General Comment 5.

56. Appendix J: See Section-Specific Comment 30.

Response: Appendix J has been modified according to comment. See response to Site-Specific Comment 30.

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
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CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

BOB MARTIN
Commissioner

W. Michael McCabe 4/11/13
Site Administrator
Jersey City PPG Chromium Sites

Re: Remedial Investigation Report
Non-Residential Chromate Chemical Production Waste Sites – Sites 063 and 065;
PI# G000008791 and PI# G000008693
Burma Road, Jersey City, New Jersey

Dear Mr. McCabe:

The New Jersey Department of Environmental Protection (Department) has completed review of the *Remedial Investigation Report, Sites 063 and 065; Jersey City, New Jersey* (RIR) prepared by Tetra Tech for PPG Industries dated March 2013.

The Department has determined that the RIR is administratively complete and approvable provided the following conditions are met. Note that each of the below-listed conditions must be addressed as identified in the specific bullet:

- PPG will finalize and resubmit the RIR to include the below listed corrections and submit the final RIR to the Department consistent with the timeframes established in the Master Schedule. Items to be addressed in the final RIR include:
    - Submittal of an updated and appropriately signed RIR Form consistent with the delineation limitations identified below. Please utilize the most current version (3/25/13) of the RIR Form, available on the Department's website. In addition, the form should be corrected to reflect the current site use (vacant), Section M (formerly Section K) should be corrected to reflect that a groundwater investigation was triggered pursuant to N.J.A.C. 7:26E-3.7 and 4.4(a), and responses for all questions within Section N (Ecological Receptors) should be provided;
    - Submittal of an updated and appropriately signed Receptor Evaluation form for soils at the sites pursuant to N.J.A.C. 7:26E-4.9(a)2. Please utilize the most current version (5/7/12) of the Receptor Evaluation Form, available on the Department's website. In addition, please update the reference in the first paragraph of Section 5.0, since the receptor evaluations are provided in Appendix G;
    - Submittal of full data deliverable packages and electronic data deliverables pursuant to N.J.A.C. 7:26E-1.6(a)5.

- PPG indicated during a February 19, 2013 meeting that the remedial action for the sites would be comprised of full excavation, as depicted on Figure 20 of the RIR. Therefore, the Department will allow the remedial limits to be finalized as follows during the pre-design phase of the remedy. The approach for the pre-design investigation (PDI) must be incorporated into the Remedial Action Work Plan (RAWP) and PDI results submitted to the Department consistent with the timeframes established in the Master Schedule.

    - **Soil:** Finalize via pre-excavation or pre-design sampling the remedial limits to the north/northwest of boring 063_E005 (visible CCPW), to the north/northwest of borings 063_B013 and 063_C014 (vanadium, hexavalent chromium, and visible CCPW) and to the east of 063_B003 (vanadium and visible CCPW); and,

    - **Impact to Groundwater (IGW):** If PPG intends to use the evaluation of historic fill as part of their Impact to Groundwater Soil Remediation Standard (IGWSRS) determination; multiple lines of evidence should be supplied. Otherwise, the remediation of IGWSRS exceedances must be incorporated into the RAWP/remedial design.

- Since groundwater contamination has been confirmed, additional groundwater remedial investigation is required. The findings may be reported in a groundwater RIR addendum. The groundwater delineation may be completed following implementation of the soil remedy. During the investigation of groundwater, PPG must determine the locations and invert depths of all utilities in the vicinity of impacted groundwater and compare those data to the horizontal and vertical limits of the impacted plume to determine if there is a potential for contaminant migration along utility bedding and/or infiltration into utilities. An updated Receptor Evaluation and Ecological Evaluation, based on groundwater delineation results, must be also completed and submitted with the groundwater RIR addendum.

If you have any questions regarding this matter, contact me at (609) 984-2905.

Sincerely,

Thomas J. Cozzi, Assistant Director
Site Remediation DEP

C: Brian McPeak, Project Manager
Dave Doyle, DEP

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Site Remediation Program
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CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

BOB MARTIN
Commissioner

M. Michael McCabe
Site Administrator
Jersey City PPG Chromium Sites

7/10/13

CONDITIONAL APPROVAL

Re: Remedial Action Work Plan
Non-Residential Chromate Chemical Production Waste Sites
Hudson County Chromate Sites 63 and 65
1 Burma Road
Jersey City, New Jersey
SRP - PI #G00000891 and #G000008693

Dear Mr. McCabe:

The New Jersey Department of Environmental Protection (Department) has completed review of the *Remedial Action Work Plan; Non-Residential Chromate Chemical Production Waste Sites; Hudson County Chromate Sites 63 and 65, 1 Burma Road, Jersey City, New Jersey* (RAWP) prepared by CB&I for PPG Industries dated April 2013 and the Response to Comments memorandum, submitted electronically on 26 June 2013.

The Department hereby approves the RAWP, conditional upon: 1) the submittal of the Final RAWP, 2) the submittal of a complete and appropriately signed RAWP Form, and 3) the submittal (consistent with the timeframes established in the Master Schedule dated June 14, 2013) of specific design deliverables requested by the Department including but not limited to the proposed excavation cut lines, the Air Monitoring Plan (AMP) and traffic safety/control plan.

If you have any questions regarding this matter, contact me at (609) 984-2905.

Sincerely,

Thomas J. Cozzi, Assistant Director
Site Remediation DEP

C: Brian McPeak, Project Manager
Dave Doyle, DEP

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MEMORANDUM

To:	**Tom Gibbons, PMP**
From:	**William Moran** **Marshall King, PE**
Subject:	**Response to Comments regarding Draft Cutlines and Tables from Weston Solutions dated November 14 and December 19, 2013**
Project:	**PPG, Site 63/65, 1 Burma Road, Jersey City, NJ**
Report Date:	**January 9, 2014**

We have reviewed Weston Solution's (Weston's) comments and conditional acceptance of the cutlines and tables for Sites 063 and 065. As indicated in the comments from Weston and as specified in our cutline tables, additional post excavation samples will be required for both depths and sidewall confirmation of remediation. This will be performed in the Remedial Action phase of the project.

The cut line cross-sections will be revised as noted in Weston's comments such that the final version issued for bid as part of the final bid documents will accurately depict the excavation limits.

We would like to address the following comments specifically, using the topic headings presented by Weston:

Weston Comments:

General:

· For ease of use by the excavation contractor, it is recommended that the cut lines be revised to reflect elevations rather than depths.

CB&I: Cutline figures reflecting elevations have been provided to contractors in the bid specification package.

· Comments on the site-specific impact-to-groundwater soil remediation standard for nickel will be provided in a separate email responding directly to that submittal.

Boring/Sample Locations Missing from Table 2 (related to CCPW elevations):

The following boring locations are shown on Figure 5, but not on Table 2. The review of the extent of excavation cannot be completed without knowing the proposed excavation depths at these locations. Please provide backup information to support the proposed excavation depths at these specific locations:

CB&I: Generally, proposed excavation depths are based on observations/sampling conducted at the boring locations as well as on a Kreiging algorithm that takes into account information from surrounding sample locations.

· 065_A010SS

CB&I: Proposed Excavation Depth= 0 ft bgs - Surficial sediment and surface water sample location with depth of 0 to 0.5 ft only. No CCPW observed at this location.

· 063_C013A

CB&I: Proposed Excavation Depth= 0 ft bgs - No CCPW observed at this location. As CCPW was not identified at this location, the nickel hit reported for this location is being attributed to other fill materials utilized by NJTP during the construction of the roadway and is not related to CCPW, therefore PPG is not responsible for its remediation.

· 063_C014A

CB&I: Proposed Excavation Depth= 0 ft bgs - No CCPW observed at this location. As CCPW was not identified at this location, the nickel hit reported for this location is being attributed to other fill materials utilized by NJTP during the construction of the roadway and is not related to CCPW, therefore PPG is not responsible for its remediation.

· 063_E005CB

CB&I: Proposed Excavation Depth= 0 ft bgs - Surficial sediment and surface water sample location with depth of 0 to 0.5 ft only.

· 063_F005

CB&I: Proposed Excavation Depth= 2.5 ft bgs - CCPW observed from 0 to 2.5 ft bgs during installation of MW-9 in this location.

· 063_E008 or 063_F008 (unclear on Figure 5)

CB&I: Locations is 063_E008 and it appears that it was never actually drilled or sampled. No data is available from previous submittals by others.

· 063_F009

CB&I: Location is also named 063_MW-12 on plans. No data is available from previous submittals by others. Data from CB&I installation of MW-12 = Proposed Excavation Depth= 0 ft bgs - No CCPW observed at this location and no CCPW-related metals reported in laboratory analytical samples.

· 063_F010A

CB&I: Proposed Excavation Depth= 0 ft bgs - No CCPW observed at this location and no CCPW-related metals reported in laboratory analytical samples.

(Backup information was not provided, as requested; therefore, Weston remains unable to determine whether the excavation depths proposed in these areas is adequate.)

CB&I: Backup information provided above.

It is noted that no samples were collected in the area along cross-section E-E' between stations 3+00 and 4+00. Based on information presented on Table 1, at 063_ED09 [ED009], chromate chemical process waste (CCPW) is present between 0 and 2.5 feet below ground surface (ft bgs) and contamination through 4 ft bgs. Likewise, at 063_ED10 [ED010], CCPW is present between 1 and 4 ft bgs. Therefore, these sampling locations cannot serve as sidewall samples documenting the completeness of remedial action, and the portion of the site between them should be assessed for the presence of CCPW/CCPW-related contamination, and included in the Areas Requiring Remediation, as appropriate.

CB&I: The extents of Areas Requiring Remediation have been modified to account for the observed CCPW. See also Figure 20 of approved RI report.

Excavation Depths Not Presented on Cutlines: Please provide elevation (depth) values on Figure 5 for the following areas:

· Areas centered on 063_C006 and 063_C007

· Areas centered on CD014 and 063_B010a

· Line connecting BD006 to CD017 (excavation depths not identified on revised drawings)

· Line connecting 063-B011 to near CD018

· Area DD007 to 063_C010 and northwest to the excavation boundary

CB&I: Figure 5 has been updated to provide values on the contours centered around the above locations.

It is noted that elevation lines are not shown on Figure 5 in the area along cross-sections C-C' and D-D' between stations 3+00 and 4+00. Figure 5 indicates that this is not included in the area requiring remediation; however, the C-C' and D-D' cross-sections and data collected from the margins of this area suggest differently. See Boring/Sample Locations Missing from Table 2 (related to CCPW elevations) specific to cross-section E-E' between stations 3+00 and 4+00.
CB&I: The extents of Areas Requiring Remediation have been modified to account for the observed CCPW.

Contamination Beyond Proposed Excavation Limits: The following boring locations have identified CPPW and/or site-related contaminant(s) present at concentration(s) greater than remediation standards which are not captured by the proposed limits of the excavation. The remedial limits must be expanded to achieve remedial goals for the site.

· The cross sections must be revised to address those locations which require excavation which are not indicated as such:

o Southwestern corner of Site 63

§ AD001: The thickness of CCPW at the identified "edge" of the excavation suggests that the remedial excavation may need to be extended to the south and west in this area. . Table 1 shows top of clean at 6.5 ft bgs; bottom of CCPW at 4.5 ft bgs; and no recovery noted on the boring log from 5-6.5 ft bgs.
CB&I: The extents of Areas Requiring Remediation have been modified to account for the observed CCPW.

A cross section needs to be developed for the area to the northeast of the Spectra easement at the northeast corner of Site 63 (i.e., associated with sample locations 063_C013, BD009, BD010, 063_B014, AD011, 063_C014). This could be shown as an extension of cross-section B-B', or could be a "stand-alone" cross section.
CB&I: Cross section F-F' added to cut sheet figures.

· AD002: Since no clean sample was observed beyond 7.0 ft bgs (hexavalent chromium [Cr+6], antimony [Sb], thallium [Tl], and vanadium [V] all exceed their respective remedial criteria at 7.0 ft bgs), PPG may need to extend the vertical extent of the remedial excavation beyond the proposed depth of approximately 7.5 ft bgs. Documentation of the adequacy of the remedial extent must be provided for this location by collection of clean confirmation samples.
CB&I: Acknowledged, a base post-excavation sample will be needed at this location.

· 065_A006: PPG must identify how the exceedance of the thallium default impact to groundwater soil remediation standard (IGWSRS) will be addressed in this area. Table 2 shows bottom of CCPW at 1.5 ft bgs and top of clean at 3.8 ft bgs, with a proposed excavation depth of approximately 5.5 ft bgs on Figure 3 cross-section. However, Table 5A in the March 2013 Remedial Investigation Report (RIR), notes Tl at 5.6U [above IGW] at 8.2 ft bgs.
CB&I: As demonstrated in the attached package, the analysis of this Thallium issue through compliance averaging shows that this location is not a concern. This sample result is a non-detect. Thallium was not detected in 318 out of 328 RIR samples and not detected in any of 272 Remedial Design Boring samples. The maximum detectable concentration of Thallium was 1 ppm. Since the average for Thallium across the site is well below the Impact to Groundwater Soil Screening Level (IGWSSL), we believe that the depth of excavation in the area should 3.8 ft bgs as per the top of clean sample result for this location.

· AD003: PPG must extend the vertical extent of the remedial excavation, with documentation of the adequacy of the remedial extent by clean confirmation samples. The excavation in this location is proposed

to a depth of approximately 8.5 ft bgs, however, Cr+6, Sb, and Tl exceed criteria at 8.5 ft bgs, and no deeper clean sample is present at this location.
CB&I: Acknowledged, a base post-excavation sample will be needed at this location.

· BD008: PPG must extend the vertical extent of the remedial excavation at this location (adjacent to the pipeline) with documentation of the adequacy of the remedial extent by clean confirmation samples. The proposed excavation depth approximately 4.5 ft bgs; however, Sb and Tl exceed criteria at 6.5 ft bgs and there is no clean sample deeper than 6.5 ft bgs.
CB&I: Acknowledged, a base post-excavation sample will be needed at this location.

· 063_C004a: The proposed excavation depth at this location is approximately 5.5 ft bgs per the cross section E-E' at station 1+25. PPG must extend the vertical extent of remedial excavation at this location to 6.7 ft bgs (Table 2 lists top of clean at 6.7 ft bgs).
CB&I: The cut sheet and profiles have been revised to reflect an excavation depth of 6.7 ft bgs.

· DD009: The proposed excavation depth at this location is approximately 2.5 ft bgs per the cross section D-D' at station 4+97. PPG must extend the vertical extent of remedial excavation at this location to 5.5 ft bgs (Table 2 lists top of clean at 5.5 ft bgs).
CB&I: The cut sheet and profiles have been revised to reflect an excavation depth of 5.5 ft bgs.

· ED011: The cross-section shows only about 5.0 ft to be excavated; however, no clean sample was detected deeper than beyond 5.0 ft bgs (Sb, Tl, and V all exceed criteria at 5.0 ft bgs). PPG must document clean condition at the final terminal depth at this location through the use of confirmation sample(s). Note, this location is close to 063_C009a, which requires excavation to 15.5 ft bgs at a minimum (see next bullet).
CB&I: Acknowledged, a base post-excavation sample will be needed at this location.

· 063_C009a: PPG must document clean condition at the terminal depth at this location. The proposed terminal depth at this location is approximately 15.5 ft bgs, V exceeds residential criteria at 15.0 ft bgs, but no clean sample was obtained deeper than 15.0 ft bgs. Also the elevation on Figure 5 is unreadable.
CB&I: As demonstrated in the attached package, the analysis of this Vanadium hit through compliance averaging shows that this location is not a concern. Furthermore, given the large clean interval between CCPW in this area and this sample, it appears that this hit is unrelated to the CCPW located above it. This hit should not define the excavation depth at this location. This excavation should extend only to a depth of 6.9 ft bgs where a base post-excavation sample should be collected.

This same rationale also applies to the vanadium hit observed at a depth of 15-15.5-ft in 063_D006 where no excavation should occur as no CCPW was observed and no metals exceedences were reported in shallower samples.

· 063_C013: PPG must extend the excavation to this area, and the cut lines must be revised, to address the Ni exceedance of site-specific IGW at the surface (<0.5 ft bgs).
CB&I: Acknowledged, a base post-excavation sample will be needed at this location. Cross section F-F' added to cut sheet figures.

<u>Miscellaneous Questions about the Cross-Sections (Figures 3 & 4):</u>
· Please revise cross section B-B' between stations 0+00 and 0+75 and to the northeast of the Spectra easement to reflect changes based on the response to Contamination Beyond Proposed Excavation Limits, above.
CB&I: Cross section B-B' revised and cross section F-F' created.

Required Post-Excavation Sampling: Sidewall and bottom samples are required, consistent with the requirements of the Department's Technical Guidance for Site Investigation of Soil, Remedial Investigation of Soil, and Remedial Action Verification Sampling for Soil (August 2012). Areas where confirmation sampling requirements have not been met include, but are not necessarily limited to:

· Southwestern corner of site (north and east of 063_D003) – sidewall samples.

· Southeastern corner of the site (near 063_B004) – sidewall samples. (While sidewall samples were proposed along the sidewall parallel to Burma Road, Sidewall samples are also required in the portion of the excavation sidewall that is perpendicular to Burma Road)

· The "cutout" within the area between grid points D7, D9, B9, and B7 – sidewall samples.

· Excavation centered on 063_F005 – sidewall samples, and if a clean sample has not yet been obtained from the 2.5-3 ft bgs interval, a bottom sample will also be required. (A bottom sample is required and was not identified on Drawing C-8)

· Excavation shown on the NJTA Berm beyond the northern limit of Site 63- sidewall and bottom samples.

· Note sidewall samples are also required for the small excavation centered around 063_C013, which was added to the revised drawings.

CB&I: Acknowledged. Additional post-excavation sampling will be required during the completion of remedial activities.

The following boring locations have their deepest soil sample showing site-related contaminant(s) present at concentration(s) greater than the respective most stringent soil remediation standard without a deeper clean sample present or planned sufficiently close. Confirmation samples are required at the proposed terminal depth of excavation consistent with the sample locations identified below. Note that Figure 5 and the cross-sections on Figures 3 & 4 may need to be edited based on the responses to these locations:

· AD002: at or deeper than 7.5 ft bgs; see Contamination Beyond Proposed Excavation Limits, above

· 065_A006: deeper than 8.2 ft bgs; see Contamination Beyond Proposed Excavation Limits, above

· AD003: deeper than 8.5 ft bgs; see Contamination Beyond Proposed Excavation Limits, above

· BD008: deeper than 6.5 ft bgs; see Contamination Beyond Proposed Excavation Limits, above

· ED011: deeper than 5.0 ft bgs (see Contamination Beyond Proposed Excavation Limits, above).

· 063_C009a: deeper than 15 ft bgs; see Contamination Beyond Proposed Excavation Limits, above.

• 063_C013: deeper than 0.5 ft bgs; see Contamination Beyond Proposed Excavation Limits, above.

CB&I: The need for additional post-excavation sampling is acknowledged and most of these locations were noted in Table 1 by identifying the top of clean for these locations as ND.

Small excavation areas: The following comments apply to excavation areas on the northwest side of the Spectra pipeline easement:

· The excavation area in the southwestern portion of the site near 063_F005 and 063_MW09 [0-2.5' deep volume 9.3 cu. yd.] is not shown on Figure 2. See Required Post-Excavation Sampling, above.

CB&I: Acknowledged. Figure 2 has been revised. Additional post-excavation sampling will be required during the completion of remedial activities.

· NJTA Berm at North End of Site 63 [Location 063_C013A analytical results report Ni up to 321 mg/kg @ surface] is not shown on Figure 2. See Required Post-Excavation Sampling, above. It may be to PPG's advantage to implement more sampling in this area to better define the anticipated limits of the remedy before revising the excavation design. However, PPG must comply with the schedule identified in Exhibit 2 of the June 14, 2013 Court submittal.

CB&I: As CCPW was not identified at this location, the nickel hit reported for this location is being attributed to other fill materials utilized by NJTP during the construction of the roadway and is not related to CCPW, therefore PPG is not responsible for its remediation.

· The soils in the vicinity of boring locations 063_C013, BD009, BD010, 063_B014, AD011, 063_C014 must be identified as an excavation area to address exceedances observed in samples collected from these borings. Requirements (see Contamination Beyond Proposed Excavation Limits, above). A cross section or sections should be developed for this area, or existing cross sections should be revised to document anticipated excavation limits. If this area has not already been fully delineated, confirmation sampling will be required for this area consistent with the Department's Technical Guidance for Site Investigation of Soil, Remedial Investigation of Soil, and Remedial Action Verification Sampling for Soil (August 2012). (063_C014 was not included in the remedial excavation identified in this area. This excavation should also be extended to include the site-specific IGWSRS for nickel in 063_B013.)

CB&I: Acknowledged. An additional area of remediation has been added to the cut sheet figures and cross section F-F' was created. Additional post-excavation sampling will be required during the completion of remedial activities.

ATTACHMENT A

Compliance Averaging Analysis

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MEMORANDUM

To: **Tom Gibbons, PMP**
From: **Dan Duh**
Project: **PPG, Site 63/65, 1 Burma Road, Jersey City, NJ**
Subject: **Compliance Averaging Analysis**
Report Date: **January 9, 2014**

Concentrations of antimony, thallium, and vanadium in pre-post excavation soil samples at Site 63-65 that serve as the post-excavation samples used to document the effectiveness and completeness of the soil remediation were collected at a post-excavation frequency and were evaluated for compliance with applicable soil remediation standards. For this evaluation, compliance averaging at the 95 percent upper confidence limit of the mean (UCL) was conducted using ProUCL Version 5.0.

Prior to performing statistical analyses, the applicable datasets were evaluated for duplicate sample results. The average concentration of duplicate results was used as the concentration for that sample. If both duplicate results were non-detect, the evaluated concentration was considered non-detect. If both duplicate results were detected concentrations, the evaluated concentration was considered detected. If one of the duplicate results was a detected concentration and the other was non-detect, the evaluated concentration was considered detected.

As the site is used for commercial or non-residential uses and as the size of the site is between 2 and 3 acres, the functional area used for the compliance averaging analysis encompasses the entire site. As average depth to groundwater in onsite borings was 2 ft bgs, impact to groundwater criteria were only applied against samples within the 0 to 2 ft interval.

Antimony

For analysis of Antimony the functional-area depth consisted of surficial soil 0 to 2 ft below ground surface (bgs). The following table summarizes the results of the compliance averaging for antimony from the surficial functional area for 0 to 2 ft bgs as defined by pre-delineation samples. Only samples characterizing the uppermost soil to be left undisturbed during remediation were used. ProUCL program output tables documenting this compliance averaging analysis are attached.

Site	Parameter	Soil Remediation Standard	ProUCL Recommended 95% UCL	
Site 63-65				
	Antimony	IGW – 6 mg/kg	3.459	95% KM (Percentile Bootstrap) UCL

Thallium and Vanadium

For analysis of thallium and vanadium, the functional-area depth consisted of the subsurface 2 ft bgs and deeper. The following table summarizes the results of the compliance averaging for thallium and vanadium in the subsurface functional area from 2 ft bgs and deeper as defined by pre-delineation samples. ProUCL program output tables documenting this compliance averaging analysis are attached.

Site	Parameter	Soil Remediation Standard	ProUCL Recommended 95% UCL	
Site 63-65				
	Thallium	RDC – 5 mg/kg	0.605	95% KM (t) UCL
	Vanadium	RDC – 78 mg/kg	53.63	95% Chebyshev UCL

Conclusions

The ProUCL recommended 95% UCLs for antimony, thallium, and vanadium were all below the applicable soil remediation standards for Site 63-65.

ATTACHMENT

ProUCL Program Output Tabless

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	1/9/2014 6:37:16 PM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Antimony

General Statistics

Total Number of Observations	12	Number of Distinct Observations	11
Number of Detects	3	Number of Non-Detects	9
Number of Distinct Detects	3	Number of Distinct Non-Detects	8
Minimum Detect	1.6	Minimum Non-Detect	0.36
Maximum Detect	10.6	Maximum Non-Detect	2.5
Variance Detects	22.01	Percent Non-Detects	75%
Mean Detects	5.333	SD Detects	4.692
Median Detects	3.8	CV Detects	0.88
Skewness Detects	1.314	Kurtosis Detects	N/A
Mean of Logged Detects	1.389	SD of Logged Detects	0.947

Warning: Data set has only 3 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.92	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.295	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.512	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	1.629	Standard Error of Mean	1.019
SD	2.876	95% KM (BCA) UCL	N/A
95% KM (t) UCL	3.459	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	3.305	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	4.686	95% KM Chebyshev UCL	6.071
97.5% KM Chebyshev UCL	7.994	99% KM Chebyshev UCL	11.77

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	1.902	k star (bias corrected MLE)	N/A
Theta hat (MLE)	2.804	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	11.41	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A

	A	B	C	D	E	F	G	H	I	J	K	L
52	**Gamma Kaplan-Meier (KM) Statistics**											
53					k hat (KM)	0.321				nu hat (KM)		7.699
54										Adjusted Level of Significance (β)		0.029
55					Approximate Chi Square Value (7.70, α)	2.562				Adjusted Chi Square Value (7.70, β)		2.133
56					95% Gamma Approximate KM-UCL (use when n>=50)	4.896				95% Gamma Adjusted KM-UCL (use when n<50)		5.881
57												
58	**Lognormal GOF Test on Detected Observations Only**											
59					Shapiro Wilk Test Statistic	0.998	**Shapiro Wilk GOF Test**					
60					5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level					
61					Lilliefors Test Statistic	0.189	**Lilliefors GOF Test**					
62					5% Lilliefors Critical Value	0.512	Detected Data appear Lognormal at 5% Significance Level					
63	**Detected Data appear Lognormal at 5% Significance Level**											
64												
65	**Lognormal ROS Statistics Using Imputed Non-Detects**											
66					Mean in Original Scale	1.435				Mean in Log Scale		-1.23
67					SD in Original Scale	3.088				SD in Log Scale		1.672
68					95% t UCL (assumes normality of ROS data)	3.036				95% Percentile Bootstrap UCL		2.919
69					95% BCA Bootstrap UCL	4.06				95% Bootstrap t UCL		9.92
70					95% H-UCL (Log ROS)	10.11						
71												
72	**UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed**											
73					KM Mean (logged)	-0.388				95% H-UCL (KM -Log)		3.629
74					KM SD (logged)	1.116				95% Critical H Value (KM-Log)		3.13
75					KM Standard Error of Mean (logged)	0.403						
76												
77	**DL/2 Statistics**											
78					**DL/2 Normal**					**DL/2 Log-Transformed**		
79					Mean in Original Scale	1.795				Mean in Log Scale		-0.145
80					SD in Original Scale	2.943				SD in Log Scale		1.143
81					95% t UCL (Assumes normality)	3.32				95% H-Stat UCL		4.97
82	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
83												
84	**Nonparametric Distribution Free UCL Statistics**											
85	**Detected Data appear Normal Distributed at 5% Significance Level**											
86												
87	**Suggested UCL to Use**											
88					95% KM (t) UCL	3.459				95% KM (Percentile Bootstrap) UCL		N/A
89	**Warning: One or more Recommended UCL(s) not available!**											
90												
91	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
92	Recommendations are based upon data size, data distribution, and skewness.											
93	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
94	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
95												

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	1/9/2014 6:43:04 PM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Thallium

General Statistics

Total Number of Observations	94	Number of Distinct Observations	16
Number of Detects	3	Number of Non-Detects	91
Number of Distinct Detects	3	Number of Distinct Non-Detects	14
Minimum Detect	1	Minimum Non-Detect	0.32
Maximum Detect	5.6	Maximum Non-Detect	9.9
Variance Detects	5.431	Percent Non-Detects	96.81%
Mean Detects	3.517	SD Detects	2.33
Median Detects	3.95	CV Detects	0.663
Skewness Detects	-0.808	Kurtosis Detects	N/A
Mean of Logged Detects	1.032	SD of Logged Detects	0.911

Warning: Data set has only 3 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.974	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.24	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.512	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.451	Standard Error of Mean	0.093
SD	0.673	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.605	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.603	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.729	95% KM Chebyshev UCL	0.856
97.5% KM Chebyshev UCL	1.031	99% KM Chebyshev UCL	1.376

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	2.372	k star (bias corrected MLE)	N/A
Theta hat (MLE)	1.483	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	14.23	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A

51												
52	**Gamma Kaplan-Meier (KM) Statistics**											
53					k hat (KM)	0.448			nu hat (KM)	84.17		
54									Adjusted Level of Significance (β)	0.0474		
55					Approximate Chi Square Value (84.17, α)	64.02			Adjusted Chi Square Value (84.17, β)	63.75		
56					95% Gamma Approximate KM-UCL (use when n>=50)	0.592			95% Gamma Adjusted KM-UCL (use when n<50)	0.595		
57												
58	**Lognormal GOF Test on Detected Observations Only**											
59					Shapiro Wilk Test Statistic	0.895			**Shapiro Wilk GOF Test**			
60					5% Shapiro Wilk Critical Value	0.767			Detected Data appear Lognormal at 5% Significance Level			
61					Lilliefors Test Statistic	0.313			**Lilliefors GOF Test**			
62					5% Lilliefors Critical Value	0.512			Detected Data appear Lognormal at 5% Significance Level			
63	**Detected Data appear Lognormal at 5% Significance Level**											
64												
65	**Lognormal ROS Statistics Using Imputed Non-Detects**											
66					Mean in Original Scale	0.217			Mean in Log Scale	-3.205		
67					SD in Original Scale	0.718			SD in Log Scale	1.758		
68					95% t UCL (assumes normality of ROS data)	0.34			95% Percentile Bootstrap UCL	0.355		
69					95% BCA Bootstrap UCL	0.431			95% Bootstrap t UCL	0.594		
70					95% H-UCL (Log ROS)	0.334						
71												
72	**UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed**											
73					KM Mean (logged)	-1.025			95% H-UCL (KM -Log)	0.434		
74					KM SD (logged)	0.457			95% Critical H Value (KM-Log)	1.825		
75					KM Standard Error of Mean (logged)	0.0828						
76												
77	**DL/2 Statistics**											
78					**DL/2 Normal**				**DL/2 Log-Transformed**			
79					Mean in Original Scale	0.766			Mean in Log Scale	-0.469		
80					SD in Original Scale	0.834			SD in Log Scale	0.504		
81					95% t UCL (Assumes normality)	0.908			95% H-Stat UCL	0.783		
82	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
83												
84	**Nonparametric Distribution Free UCL Statistics**											
85	**Detected Data appear Normal Distributed at 5% Significance Level**											
86												
87	**Suggested UCL to Use**											
88					95% KM (t) UCL	0.605			95% KM (Percentile Bootstrap) UCL	N/A		
89	**Warning: One or more Recommended UCL(s) not available!**											
90												
91	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
92	Recommendations are based upon data size, data distribution, and skewness.											
93	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
94	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
95												
96												

97	**Vanadium**										
98											
99	**General Statistics**										
100	Total Number of Observations				94	Number of Distinct Observations					83
101						Number of Missing Observations					0
102	Minimum				8.4	Mean					34.03
103	Maximum				422	Median					25.25
104	SD				43.61	Std. Error of Mean					4.498
105	Coefficient of Variation				1.282	Skewness					7.825
106											
107	**Normal GOF Test**										
108	Shapiro Wilk Test Statistic				0.351	**Shapiro Wilk GOF Test**					
109	5% Shapiro Wilk P Value				0	Data Not Normal at 5% Significance Level					
110	Lilliefors Test Statistic				0.314	**Lilliefors GOF Test**					
111	5% Lilliefors Critical Value				0.0914	Data Not Normal at 5% Significance Level					
112	**Data Not Normal at 5% Significance Level**										
113											
114	**Assuming Normal Distribution**										
115	**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**					
116	95% Student's-t UCL				41.5	95% Adjusted-CLT UCL (Chen-1995)					45.3
117						95% Modified-t UCL (Johnson-1978)					42.11
118											
119	**Gamma GOF Test**										
120	A-D Test Statistic				6.73	**Anderson-Darling Gamma GOF Test**					
121	5% A-D Critical Value				0.761	Data Not Gamma Distributed at 5% Significance Level					
122	K-S Test Statistic				0.199	**Kolmogrov-Smirnoff Gamma GOF Test**					
123	5% K-S Critical Value				0.0932	Data Not Gamma Distributed at 5% Significance Level					
124	**Data Not Gamma Distributed at 5% Significance Level**										
125											
126	**Gamma Statistics**										
127	k hat (MLE)				2.592	k star (bias corrected MLE)					2.516
128	Theta hat (MLE)				13.13	Theta star (bias corrected MLE)					13.52
129	nu hat (MLE)				487.2	nu star (bias corrected)					473
130	MLE Mean (bias corrected)				34.03	MLE Sd (bias corrected)					21.45
131						Approximate Chi Square Value (0.05)					423.6
132	Adjusted Level of Significance				0.0474	Adjusted Chi Square Value					422.9
133											
134	**Assuming Gamma Distribution**										
135	95% Approximate Gamma UCL (use when n>=50))				38	95% Adjusted Gamma UCL (use when n<50)					38.06
136											
137	**Lognormal GOF Test**										
138	Shapiro Wilk Test Statistic				0.882	**Shapiro Wilk Lognormal GOF Test**					
139	5% Shapiro Wilk P Value				2.867E-10	Data Not Lognormal at 5% Significance Level					
140	Lilliefors Test Statistic				0.149	**Lilliefors Lognormal GOF Test**					
141	5% Lilliefors Critical Value				0.0914	Data Not Lognormal at 5% Significance Level					
142	**Data Not Lognormal at 5% Significance Level**										
143											
144	**Lognormal Statistics**										
145	Minimum of Logged Data				2.128	Mean of logged Data					3.322
146	Maximum of Logged Data				6.045	SD of logged Data					0.513

147											
148	**Assuming Lognormal Distribution**										
149	95% H-UCL	34.91	90% Chebyshev (MVUE) UCL	36.88							
150	95% Chebyshev (MVUE) UCL	39.28	97.5% Chebyshev (MVUE) UCL	42.62							
151	99% Chebyshev (MVUE) UCL	49.17									
152											
153	**Nonparametric Distribution Free UCL Statistics**										
154	**Data do not follow a Discernible Distribution (0.05)**										
155											
156	**Nonparametric Distribution Free UCLs**										
157	95% CLT UCL	41.43	95% Jackknife UCL	41.5							
158	95% Standard Bootstrap UCL	41.35	95% Bootstrap-t UCL	52.96							
159	95% Hall's Bootstrap UCL	69.23	95% Percentile Bootstrap UCL	42.32							
160	95% BCA Bootstrap UCL	47.83									
161	90% Chebyshev(Mean, Sd) UCL	47.52	95% Chebyshev(Mean, Sd) UCL	53.63							
162	97.5% Chebyshev(Mean, Sd) UCL	62.12	99% Chebyshev(Mean, Sd) UCL	78.78							
163											
164	**Suggested UCL to Use**										
165	95% Chebyshev (Mean, Sd) UCL	53.63									
166											
167	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.										
168	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)										
169	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.										
170	For additional insight the user may want to consult a statistician.										
171											

From: Amend-Babcock, Laura [mailto:Laura.Amend-Babcock@WestonSolutions.com]
Sent: Wednesday, January 29, 2014 2:46 PM
To: 'bmcpeak@planningprogress.com'
Cc: Amin, Prabal; Mark Terril; Prins, Keith; Gibbons, Thomas; Michael McCabe (jcsiteadministrator@earthlink.net); Tom Cozzi; David Doyle; David Spader; Moran, William
Subject: Sites 16 and Sites 63/65 - adequacy assessment of response to cut line comments

Brian,

Weston has completed our review of the revised cut lines and responses to comments on the draft cut lines for Linden Avenue East (Site 16) and Baldwin Oil/Burma Road (Sites 63/65), both sets of which were submitted via email link on 1/10/14. Note that our assessment of the adequacy of the responses-to-comment have been discussed with the New Jersey Department of Environmental Protection (Department), who concurs with them. Please distribute this information to the appropriate parties.

In general, responses were acceptable, with the caveats specified in the documents attached to this email. However, it is noted that the cut lines may require additional revision based on the assessments. For clarity sake, the original comment, CB&I's response, and Weston's assessment of adequacy of that response have been included in the attached memoranda.

Laura

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From: Moran, William [mailto:William.Moran@cbi.com]
Sent: Friday, January 10, 2014 3:58 PM
To: Amin, Prabal; Amend-Babcock, Laura
Cc: bmcpeak@planningprogress.com; Terril, Mark; Prins, Keith; Gibbons, Thomas
Subject: more downloads to sharepoint

Prabal and Laura:
There are more Data Validation Reports loaded to the sharepoint link below. Also, we have loaded our response to comments to the cutline sheets for both Site 016 and 063.

Please call with any questions.
Thanks,
Bill

https://shawxnet.shawgrp.com/sites/PPGJersey/Site%20174%20%20Dennis%20Collins%20Park/Forms/AllItems.aspx

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29 January 2014

Assessment of Adequacy of CB&I 1/10/14 Response to Comments regarding Draft Cutlines and Tables for Sites 63 and 65; Jersey City, Hudson County, New Jersey

Chicago Bridge and Iron (CB&I) responses, dated 1/10/14, to Weston 11/14/13 and 12/19/13 comments on the Site 16 cutlines are adequate, except as discussed below. For clarity and ease of use, the original comment, CB&I's response, and the assessment of the adequacy of that response is provided. ***Weston's assessment of the adequacy of the response is provided in bold italic text.***

Following the assessment of adequacy of the response-to-comments is Weston's evaluation of the compliance averaging submittal provided by CB&I as an attachment to the cutline response-to-comment document.

Assessment of Adequacy of Previously-Submitted Comments

General Comment: For ease of use by the excavation contractor, it is recommended that the cut lines be revised to reflect elevations rather than depths.

Response: Cutline figures reflecting elevations have been provided to contractors in the bid specification package.

Adequacy of Response: Response is adequate.

General Comment Comments on the site-specific impact-to-groundwater soil remediation standard for nickel will be provided in a separate email responding directly to that submittal.

Response: No response provided.

Adequacy of Response: No response was necessary.

Boring/Sample Locations Missing from Table 2 (related to CCPW elevations): The following boring locations are shown on Figure 5, but not on Table 2. The review of the extent of excavation cannot be completed without knowing the proposed excavation depths at these locations. Please provide backup information to support the proposed excavation depths at these specific locations.

Response: Generally, proposed excavation depths are based on observations/sampling conducted at the boring locations as well as on a Kreiging algorithm that takes into account information from surrounding sample locations.

Adequacy of Response: Response is adequate.

- 065_A010SS

  Response: Proposed Excavation Depth= 0 ft bgs Surficial sediment and surface water sample location with depth of 0 to 0.5 ft only. No CCPW observed at this location.

  Adequacy of Response: Response is adequate.

- 063_C013A

  Response: Proposed Excavation Depth= 0 ft bgs - No CCPW observed at this location. As CCPW was not identified at this location, the nickel hit reported for this location is being attributed to other fill materials utilized by NJTP during

the construction of the roadway and is not related to CCPW, therefore PPG is not responsible for its remediation.

Adequacy of Response: ***Response is adequate for this location on NJ Turnpike property.***

- 063_C014A

  Response: Proposed Excavation Depth= 0 ft bgs - No CCPW observed at this location. As CCPW was not identified at this location, the nickel hit reported for this location is being attributed to other fill materials utilized by NJTP during the construction of the roadway and is not related to CCPW, therefore PPG is not responsible for its remediation.

  Adequacy of Response: ***Response is adequate.***

- 063_E005CB

  Response: Proposed Excavation Depth= 0 ft bgs - Surficial sediment and surface water sample location with depth of 0 to 0.5 ft only.

  Adequacy of Response: ***Response is adequate.***

- 063_F005

  Response: Proposed Excavation Depth= 2.5 ft bgs - CCPW observed from 0 to 2.5 ft bgs during installation of MW-9 in this location.

  Adequacy of Response: ***Response is adequate; however, post-excavation sampling will be required from beneath the CCPW.***

- 063_E008 or 063_F008 (unclear on Figure 5)

  Response: Locations is 063_E008 and it appears that it was never actually drilled or sampled. No data is available from previous submittals by others.

  Adequacy of Response: ***Response is adequate.***

- 063_F009

  Response: Location is also named 063_MW-12 on plans. No data is available from previous submittals by others. Data from CB&I installation of MW-12 = Proposed Excavation Depth= 0 ft bgs - No CCPW observed at this location and no CCPW-related metals reported in laboratory analytical samples.

  Adequacy of Response: ***Response is adequate. Please provide soil sampling results associated with samples collected from 063_MW12.***

- 063_F010A

  Response: Proposed Excavation Depth= 0 ft bgs - No CCPW observed at this location and no CCPW-related metals reported in laboratory analytical samples.

  Adequacy of Response: ***Response is adequate. Please provide soil sampling results associated with samples collected from 063_F010A.***

(Backup information was not provided, as requested; therefore, Weston remains unable to determine whether the excavation depths proposed in these areas is adequate.).

Response: Backup Information provided above.

Adequacy of Response: ***Response is adequate.***

It is noted that no samples were collected in the area along cross-section E-E' between stations 3+00 and 4+00. Based on information presented on Table 1, at 063_ED09 [ED009], chromate chemical process waste (CCPW) is present between 0 and 2.5 feet below ground surface (ft bgs) and contamination through 4 ft bgs. Likewise, at 063_ED10 [ED010], CCPW is present between 1 and 4 ft bgs. Therefore, these sampling locations cannot serve as sidewall samples

documenting the completeness of remedial action, and the portion of the site between them should be assessed for the presence of CCPW/CCPW-related contamination, and included in the Areas Requiring Remediation, as appropriate.

Response: The extents of Areas Requiring Remediation have been modified to account for the observed CCPW. See also Figure 20 of approved RI report.

Adequacy of Response: Response is adequate.

Excavation Depths not Presented on Cutlines: Please provide elevation (depth) values on Figure 5 for the following areas.

- Areas centered on 063_C006 and 063_C007
- Areas centered on CD014 and 063_B010a
- Line connecting BD006 to CD017 (excavation depths not identified on revised drawings)
- Line connecting 063-B011 to near CD018
- Area DD007 to 063_C010 and northwest to the excavation boundary

Response: Figure 5 has been updated to provide values on the contours centered around the above locations.

Adequacy of Response: Response is adequate.

It is noted that elevation lines are not shown on Figure 5 in the area along cross-sections C-C' and D-D' between stations 3+00 and 4+00. Figure 5 indicates that this is not included in the area requiring remediation; however, the C-C' and D-D' cross-sections and data collected from the margins of this area suggest differently. See Boring/Sample Locations Missing from Table 2 (related to CCPW elevations) specific to cross-section E-E' between stations 3+00 and 4+00.

Response: The extents of Areas Requiring Remediation have been modified to account for the observed CCPW.

Adequacy of Response: Response is adequate.

Contamination Beyond Proposed Excavation Limits: The following boring locations have identified CPPW and/or site-related contaminant(s) present at concentration(s) greater than remediation standards which are not captured by the proposed limits of the excavation. The remedial limits must be expanded to achieve remedial goals for the site. The cross sections must be revised to address those locations which require excavation which are not indicated as such:

- Southwestern corner of Site 63
  - AD001: The thickness of CCPW at the identified "edge" of the excavation suggests that the remedial excavation may need to be extended to the south and west in this area. . Table 1 shows top of clean at 6.5 ft bgs; bottom of CCPW at 4.5 ft bgs; and no recovery noted on the boring log from 5-6.5 ft bgs.

    Response: The extents of Areas Requiring Remediation have been modified to account for the observed CCPW.

    Adequacy of Response: Modifications were not observed on the cut line figures provided to Weston.
  - A cross section needs to be developed for the area to the northeast of the Spectra easement at the northeast corner of Site 63 (i.e., associated with sample locations 063_C013, BD009, BD010, 063_B014, AD011, 063_C014). This could be shown as an extension of cross-section B-B', or could be a "stand-alone" cross section).

    Response: Cross-section F-F' added to cut sheet figures.

    Adequacy of Response: Response is adequate.

- AD002: Since no clean sample was observed beyond 7.0 ft bgs (hexavalent chromium [Cr^{+6}], antimony [Sb], thallium [Tl], and vanadium [V] all exceed their respective remedial criteria at 7.0 ft bgs), PPG may need to extend the vertical extent of the remedial excavation beyond the proposed depth of approximately 7.5 ft bgs. Documentation of the adequacy of the remedial extent must be provided for this location by collection of clean confirmation samples.

  Response: Acknowledged, a base post-excavation sample will be needed at this location.

  ***Adequacy of Response*: Please ensure post-excavation sampling is performed consistent with the Department's Technical Guidance for Site Investigation of Soil, Remedial Investigation of Soil, and Remedial Action Verification Sampling for Soil**.
- 065_A006: PPG must identify how the exceedance of the thallium default impact to groundwater soil remediation standard (IGWSRS) will be addressed in this area. Table 2 shows bottom of CCPW at 1.5 ft bgs and top of clean at 3.8 ft bgs, with a proposed excavation depth of approximately 5.5 ft bgs on Figure 3 cross-section. However, Table 5A in the March 2013 Remedial Investigation Report (RIR), notes Tl at 5.6U [above IGW] at 8.2 ft bgs.

  Response: As demonstrated in the attached package, the analysis of this Thallium issue through compliance averaging shows that this location is not a concern. This sample result is a non-detect. Thallium was not detected in 318 out of 328 RIR samples and not detected in any of 272 Remedial Design Boring samples. The maximum detectable concentration of Thallium was 1 ppm. Since the average for Thallium across the site is well below the Impact to Groundwater Soil Screening Level (IGWSSL), we believe that the depth of excavation in the area should 3.8 ft bgs as per the top of clean sample result for this location. Also note that since the concrete drainage structure on Site 065 Was installed as an IRM to temporarily cap known CCPW, it is expected that all the CCPW beneath that structure will be removed as part of the remedial action described in the cut lines.

  ***Adequacy of Response*: Please see comments on compliance averaging, below.**
- AD003: PPG must extend the vertical extent of the remedial excavation, with documentation of the adequacy of the remedial extent by clean confirmation samples. The excavation in this location is proposed to a depth of approximately 8.5 ft bgs, however, Cr^{+6}, Sb, and Tl exceed criteria at 8.5 ft bgs, and no deeper clean sample is present at this location.

  Response: Acknowledged, a base post-excavation sample will be needed at this location.

  ***Adequacy of Response*: Please ensure post-excavation sampling is performed consistent with the Department's Technical Guidance for Site Investigation of Soil, Remedial Investigation of Soil, and Remedial Action Verification Sampling for Soil.**
- BD008: PPG must extend the vertical extent of the remedial excavation at this location (adjacent to the pipeline) with documentation of the adequacy of the remedial extent by clean confirmation samples. The proposed excavation depth approximately 4.5 ft bgs;

however, Sb and Tl exceed criteria at 6.5 ft bgs and there is no clean sample deeper than 6.5 ft bgs.

Response: Acknowledged, a base post-excavation sample will be needed at this location.

***Adequacy of Response*: Please ensure post-excavation sampling is performed consistent with the Department's Technical Guidance for Site Investigation of Soil, Remedial Investigation of Soil, and Remedial Action Verification Sampling for Soil.**

- 063_C004a: The proposed excavation depth at this location is approximately 5.5 ft bgs per the cross section E-E' at station 1+25. PPG must extend the vertical extent of remedial excavation at this location to 6.7 ft bgs (Table 2 lists top of clean at 6.7 ft bgs.

  Response: The cut sheet and profiles have been revised to reflect an excavation depth of 6.7 ft bgs.

  ***Adequacy of Response*: Modifications were not observed on cut line Figure C-7 provided to Weston.**
- DD009: The proposed excavation depth at this location is approximately 2.5 ft bgs per the cross section D-D' at station 4+97. PPG must extend the vertical extent of remedial excavation at this location to 5.5 ft bgs (Table 2 lists top of clean at 5.5 ft bgs).

  Response: The cut sheet and profiles have been revised to reflect an excavation depth of 5.5 ft bgs.

  ***Adequacy of Response*: Modifications were not observed on cut line Figure C-7 provided to Weston.**
- ED011: The cross-section shows only about 5.0 ft to be excavated; however, no clean sample was detected deeper than beyond 5.0 ft bgs (Sb, Tl, and V all exceed criteria at 5.0 ft bgs). PPG must document clean condition at the final terminal depth at this location through the use of confirmation sample(s). Note, this location is close to 063_C009a, which requires excavation to 15.5 ft bgs at a minimum (see next bullet).

  Response: Acknowledged, a base post-excavation sample will be needed at this location.

  ***Adequacy of Response*: Please ensure post-excavation sampling is performed consistent with the Department's Technical Guidance for Site Investigation of Soil, Remedial Investigation of Soil, and Remedial Action Verification Sampling for Soil.**
- 063_C009a: PPG must document clean condition at the terminal depth at this location. The proposed terminal depth at this location is approximately 15.5 ft bgs, V exceeds residential criteria at 15.0 ft bgs, but no clean sample was obtained deeper than 15.0 ft bgs. Also the elevation on Figure 5 is unreadable.

  Response: As demonstrated in the attached package, the analysis of this Vanadium hit through compliance averaging shows that this location is not a concern. Furthermore, given the large clean interval between CCPW in this area and this sample, it appears that this hit is unrelated to the CCPW located above it. This hit should not define the excavation depth at this location. This excavation should extend only to a depth of 6.9 ft bgs where a base post-excavation sample should be collected.

This same rationale also applies to the vanadium hit observed at a depth of 15-15.5-ft in 063_D006 where no excavation should occur as no CCPW was observed and no metals exceedences were reported in shallower samples.

***Adequacy of Response*: Please see comments on compliance averaging, below.**

- 063_C013: PPG must extend the excavation to this area, and the cut lines must be revised, to address the Ni exceedance of site-specific IGW at the surface (<0.5 ft bgs).

Response: Acknowledged, a base post-excavation sample will be needed at this location. Cross section F-F' added to cut sheet figures.

***Adequacy of Response*: Please ensure post-excavation sampling is performed consistent with the Department's Technical Guidance for Site Investigation of Soil, Remedial Investigation of Soil, and Remedial Action Verification Sampling for Soil.**

Miscellaneous Questions about the Cross-Sections (Figures 3 & 4): Please revise cross section B-B' between stations 0+00 and 0+75 and to the northeast of the Spectra easement to reflect changes based on the response to Contamination Beyond Proposed Excavation Limits, above.

Response: Cross section B-B' revised and cross section F-F' created.

***Adequacy of Response*: Response is adequate.**

Required Post-Excavation Sampling: Sidewall and bottom samples are required, consistent with the requirements of the Department's Technical Guidance for Site Investigation of Soil, Remedial Investigation of Soil, and Remedial Action Verification Sampling for Soil (August 2012). Areas where confirmation sampling requirements have not been met include, but are not necessarily limited to:

- Southwestern corner of site (north and east of 063_D003) – sidewall samples.
- Southeastern corner of the site (near 063_B004) – sidewall samples. (While sidewall samples were proposed along the sidewall parallel to Burma Road, Sidewall samples are also required in the portion of the excavation sidewall that is perpendicular to Burma Road).
- The "cutout" within the area between grid points D7, D9, B9, and B7 – sidewall samples.
- Excavation centered on 063_F005 – sidewall samples, and if a clean sample has not yet been obtained from the 2.5 -3 ft bgs inter
  bottom sample is required and was not identified on Drawing C-8).
- Excavation shown on the NJTA Berm beyond the northern limit of Site 63- sidewall and bottom samples.
- Note sidewall samples are also required for the small excavation centered around 063_C013, which was added to the revised drawings.

Response: Acknowledged. Additional post-excavation sampling will be required during the completion of remedial activities.

***Adequacy of Response*: Response is adequate. Please ensure post-excavation sampling is performed consistent with the Department's Technical Guidance for Site Investigation of Soil, Remedial Investigation of Soil, and Remedial Action Verification Sampling for Soil. Note that the majority of the area north of the pipeline, near and to the west of 063_C013, is not fully shown to be excavated/scraped. Portions of the surface at north end of the site showed signs of visible blooms in 2013. The surface of the entire north end of the site (north of the pipeline easement up to the identified excavation on NJTA property)**

should be assessed, and should be scraped with post-excavation sampling conducted if observations suggest chromium impacts in this area.

The following boring locations have their deepest soil sample showing site-related contaminant(s) present at concentration(s) greater than the respective most stringent soil remediation standard without a deeper clean sample present or planned sufficiently close. Confirmation samples are required at the proposed terminal depth of excavation consistent with the sample locations identified below. Note that Figure 5 and the cross-sections on Figures 3 & 4 may need to be edited based on the responses to these locations:

- AD002: at or deeper than 7.5 ft bgs; see Contamination Beyond Proposed Excavation Limits, above
- 065_A006: deeper than 8.2 ft bgs; see Contamination Beyond Proposed Excavation Limits, above
- AD003: deeper than 8.5 ft bgs; see Contamination Beyond Proposed Excavation Limits, above
- BD008: deeper than 6.5 ft bgs; see Contamination Beyond Proposed Excavation Limits, above
- ED011: deeper than 5.0 ft bgs (see Contamination Beyond Proposed Excavation Limits, above).
- 063_C009a: deeper than 15 ft bgs; see Contamination Beyond Proposed Excavation Limits, above.
- 063_C013: deeper than 0.5 ft bgs; see Contamination Beyond Proposed Excavation Limits, above.

Response: The need for additional post-excavation sampling is acknowledged and most of these locations were noted in Table 1 by identifying the top of clean for these locations as ND.

Adequacy of Response: ***Please confirm that all locations on Table 1 which are identified as "ND: will have post-excavation bottom samples. Also, please identify those locations which are not currently identified in Table 1 as "ND" which require bottom samples. Finally, please ensure post-excavation sampling is performed consistent with the Department's*** **Technical Guidance for Site Investigation of Soil, Remedial Investigation of Soil, and Remedial Action Verification Sampling for Soil.**

Small excavation area: The following comments apply to excavation areas on the northwest side of the Spectra pipeline easement.

- The excavation area in the southwestern portion of the site near 063_F005 and 063_MW09 [0-2.5' deep volume 9.3 cu. yd.] is not shown on Figure 2. See Required Post-Excavation Sampling, above.

Response: Acknowledged. Figure 2 has been revised. Additional post-excavation sampling will be required during the completion of remedial activities.

Adequacy of Response: ***Please ensure post-excavation sampling is performed consistent with the Department's*** **Technical Guidance for Site Investigation of Soil, Remedial Investigation of Soil, and Remedial Action Verification Sampling for Soil.**

- The excavation area in the southwestern portion of the site near 063_F005 and 063_MW09 [0-2.5' deep volume 9.3 cu. yd.] is not shown on Figure 2. See Required Post-Excavation Sampling, above.

  Response: Acknowledged. Figure 2 has been revised. Additional post-excavation sampling will be required during the completion of remedial activities.

  ***Adequacy of Response*: Response is adequate. Please ensure post-excavation sampling is performed consistent with the Department's Technical Guidance for Site Investigation of Soil, Remedial Investigation of Soil, and Remedial Action Verification Sampling for Soil.**
- NJTA Berm at North End of Site 63 [Location 063_C013A analytical results report Ni up to 321 mg/kg @ surface] is not shown on Figure 2. See Required Post-Excavation Sampling, above. It may be to PPG's advantage to implement more sampling in this area to better define the anticipated limits of the remedy before revising the excavation design. However, PPG must comply with the schedule identified in Exhibit 2 of the June 14, 2013 Court submittal.

  Response: As CCPW was not identified at this location, the nickel hit reported for this location is being attributed to other fill materials utilized by NJTP during the construction of the roadway and is not related to CCPW, therefore PPG is not responsible for its remediation.

  ***Adequacy of Response*: Response is adequate for this location on NJ Turnpike property.**
- The soils in the vicinity of boring locations 063_C013, BD009, BD010, 063_B014, AD011, 063_C014 must be identified as an excavation area to address exceedances observed in samples collected from these borings. Requirements (see Contamination Beyond Proposed Excavation Limits, above). A cross section or sections should be developed for this area, or existing cross sections should be revised to document anticipated excavation limits. If this area has not already been fully delineated, confirmation sampling will be required for this area consistent with the Department's Technical Guidance for Site Investigation of Soil, Remedial Investigation of Soil, and Remedial Action Verification Sampling for Soil (August 2012). (063_C014 was not included in the remedial excavation identified in this area. This excavation should also be extended to include the site-specific IGWSRS for nickel in 063_B013).

  Response: Acknowledged. An additional area of remediation has been added to the cut sheet figures and cross section F-F' was created. Additional post-excavation sampling will be required during the completion of remedial activities.

  ***Adequacy of Response*: Response is adequate.**

Evaluation of Compliance Averaging Submittal:

The CB&I compliance averaging evaluation was not performed in accordance with the Department's *Technical Guidance for the Attainment of Remediation Standards and Site-Specific Criteria* (September 2012); and as such is unacceptable. The major deficiencies are identified below:

1. Delineation: CB&I does not provide a discussion/demonstration of the completeness of horizontal and vertical delineation for the site, or discuss whether or not contamination

has migrated off site. The NJDEP attainment guidance indicates delineation must be completed by single point compliance prior to conducting the compliance averaging for the direct contact and the impact to groundwater (IGW) pathways. Delineation has not yet been completed towards Burma Road (CCPW beneath the IRM installed on Site 65) nor has any chemical analysis been performed associated with the observations of surface CCPW identified for remediation on the NJ Turnpike Authority property to the north of Site 63.

2. Functional Areas: CB&I does not establish functional areas consistent with the guidance. For example, the functional depth for the direct contact pathway was defined as subsurface soils (2 ft bgs and deeper), whereas the guidance requires that the surficial zone (surface to 2 ft bgs) also be evaluated, and as a distinct depth interval.

3. Functional Area Evaluation: CB&I must assign and tabulate the data being used for each functional area, and ensure that data other than those needed for delineation are not included. CB&I must also ensure that the data set "shall not include excessive sampling of uncontaminated areas" as per guidance. It is also strongly recommended that the shape of the functional area be evaluated to determine compliance with guidance.

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MEMORANDUM

To:	**Tom Gibbons, PMP**
From:	**William Moran** **Marshall King, PE**
Subject:	**Response to Assessment of Adequacy Memorandum regarding Draft Cutlines and Tables from Weston Solutions**
Project:	**PPG, Site 63/65, 1 Burma Road, Jersey City, Hudson County, New Jersey**
Report Date:	**February 7, 2014**

CB&I's responses to Weston's Assessment of Adequacy dated 29 January 2014 on the Site 63/65 cutlines follow below. Adequately addressed issues have been removed so that only open issues are included. For clarity and ease of use, the original comment, CB&I's response, the assessment of the adequacy (AOA), and the response to the AOA are provided. ***CB&I's response to the assessment of the adequacy is provided in bold italic text.***

In addition, CB&I's revised compliance averaging submittal is an attachment.

Assessment of Adequacy of Previously-Submitted Comments

Boring/Sample Locations Missing from Table 2 (related to CCPW elevations): The following boring locations are shown on Figure 5, but not on Table 2. The review of the extent of excavation cannot be completed without knowing the proposed excavation depths at these locations. Please provide backup information to support the proposed excavation depths at these specific locations.

Response: Generally, proposed excavation depths are based on observations/sampling conducted at the boring locations as well as on a Kreiging algorithm that takes into account information from surrounding sample locations.

Adequacy of Response: Response is adequate.

- 063_F009

  Response: Location is also named 063_MW-12 on plans. No data is available from previous submittals by others. Data from CB&I installation of MW-12 = Proposed Excavation Depth= 0 ft bgs - No CCPW observed at this location and no CCPW-related metals reported in laboratory analytical samples.

  Adequacy of Response: Response is adequate. Please provide soil sampling results associated with samples collected from 063_MW12.

  Response to AOR: See sample results attached.

- 063_F010A

  Response: Proposed Excavation Depth= 0 ft bgs - No CCPW observed at this location and no CCPW-related metals reported in laboratory analytical samples.

  Adequacy of Response: Response is adequate. Please provide soil sampling results associated with samples collected from 063_F010A.

  Response to AOR: See sample results attached.

Contamination Beyond Proposed Excavation Limits: The following boring locations have identified CPPW and/or site-related contaminant(s) present at concentration(s) greater than

remediation standards which are not captured by the proposed limits of the excavation. The remedial limits must be expanded to achieve remedial goals for the site. The cross sections must be revised to address those locations which require excavation which are not indicated as such:

- Southwestern corner of Site 63
  - AD001: The thickness of CCPW at the identified "edge" of the excavation suggests that the remedial excavation may need to be extended to the south and west in this area. . Table 1 shows top of clean at 6.5 ft bgs; bottom of CCPW at 4.5 ft bgs; and no recovery noted on the boring log from 5-6.5 ft bgs.

    Response: The extents of Areas Requiring Remediation have been modified to account for the observed CCPW.

    Adequacy of Response: Modifications were not observed on the cut line figures provided to Weston.

    Response to AOR: To be addressed during meeting between the parties.

- 065_A006: PPG must identify how the exceedance of the thallium default impact to groundwater soil remediation standard (IGWSRS) will be addressed in this area. Table 2 shows bottom of CCPW at 1.5 ft bgs and top of clean at 3.8 ft bgs, with a proposed excavation depth of approximately 5.5 ft bgs on Figure 3 cross-section. However, Table 5A in the March 2013 Remedial Investigation Report (RIR), notes Tl at 5.6U [above IGW] at 8.2 ft bgs.

  Response: As demonstrated in the attached package, the analysis of this Thallium issue through compliance averaging shows that this location is not a concern. This sample result is a non-detect. Thallium was not detected in 318 out of 328 RIR samples and not detected in any of 272 Remedial Design Boring samples. The maximum detectable concentration of Thallium was 1 ppm. Since the average for Thallium across the site is well below the Impact to Groundwater Soil Screening Level (IGWSSL), we believe that the depth of excavation in the area should 3.8 ft bgs as per the top of clean sample result for this location.
  Also note that since the concrete drainage structure on Site 065 was installed as an IRM to temporarily cap known CCPW, it is expected that all the CCPW beneath that structure will be removed as part of the remedial action described in the cut lines.

  Adequacy of Response: Please see comments on compliance averaging, below.

  Response to AOR: See revised compliance averaging memorandum attached. In addition, note that as the sample collected at 8.2 ft bgs is below the water table (which is at ~2 ft bgs) the IGWSSL do not apply.

- 063_C004a: The proposed excavation depth at this location is approximately 5.5 ft bgs per the cross section E-E' at station 1+25. PPG must extend the vertical extent of remedial excavation at this location to 6.7 ft bgs (Table 2 lists top of clean at 6.7 ft bgs.

  Response: The cut sheet and profiles have been revised to reflect an excavation depth of 6.7 ft bgs.

  Adequacy of Response: Modifications were not observed on cut line Figure C-7 provided to Weston.

  Response to AOR: To be addressed during meeting between the parties. This boring location will be identified on a spot elevation table with all the other borings on the site in the contractor bid documents for the site. The

spot elevation table will include boring coordinates and final elevations for the excavation.

- DD009: The proposed excavation depth at this location is approximately 2.5 ft bgs per the cross section D-D' at station 4+97. PPG must extend the vertical extent of remedial excavation at this location to 5.5 ft bgs (Table 2 lists top of clean at 5.5 ft bgs).

  Response: The cut sheet and profiles have been revised to reflect an excavation depth of 5.5 ft bgs.

  <u>Adequacy of Response</u>: Modifications were not observed on cut line Figure C-7 provided to Weston.

  <u>Response to AOR</u>: To be addressed during meeting between the parties.
- 063_C009a: PPG must document clean condition at the terminal depth at this location. The proposed terminal depth at this location is approximately 15.5 ft bgs, V exceeds residential criteria at 15.0 ft bgs, but no clean sample was obtained deeper than 15.0 ft bgs. Also the elevation on Figure 5 is unreadable.

  Response: As demonstrated in the attached package, the analysis of this Vanadium hit through compliance averaging shows that this location is not a concern. Furthermore, given the large clean interval between CCPW in this area and this sample, it appears that this hit is unrelated to the CCPW located above it. This hit should not define the excavation depth at this location. This excavation should extend only to a depth of 6.9 ft bgs where a base post-excavation sample should be collected.

  This same rationale also applies to the vanadium hit observed at a depth of 15-15.5-ft in 063_D006 where no excavation should occur as no CCPW was observed and no metals exceedences were reported in shallower samples.

  <u>Adequacy of Response</u>: Please see comments on compliance averaging, below.

  <u>Response to AOR</u>: See revised compliance averaging memorandum attached.

The following boring locations have their deepest soil sample showing site-related contaminant(s) present at concentration(s) greater than the respective most stringent soil remediation standard without a deeper clean sample present or planned sufficiently close. Confirmation samples are required at the proposed terminal depth of excavation consistent with the sample locations identified below. Note that Figure 5 and the cross-sections on Figures 3 & 4 may need to be edited based on the responses to these locations:

- AD002: at or deeper than 7.5 ft bgs; see Contamination Beyond Proposed Excavation Limits, above
- 065_A006: deeper than 8.2 ft bgs; see Contamination Beyond Proposed Excavation Limits, above
- AD003: deeper than 8.5 ft bgs; see Contamination Beyond Proposed Excavation Limits, above
- BD008: deeper than 6.5 ft bgs; see Contamination Beyond Proposed Excavation Limits, above
- ED011: deeper than 5.0 ft bgs (see Contamination Beyond Proposed Excavation Limits, above).

- 063_C009a: deeper than 15 ft bgs; see Contamination Beyond Proposed Excavation Limits, above.
- 063_C013: deeper than 0.5 ft bgs; see Contamination Beyond Proposed Excavation Limits, above.

Response: The need for additional post-excavation sampling is acknowledged and most of these locations were noted in Table 1 by identifying the top of clean for these locations as ND.

<u>Adequacy of Response</u>: Please confirm that all locations on Table 1 which are identified as "ND" will have post-excavation bottom samples. Also, please identify those locations which are not currently identified in Table 1 as "ND" which require bottom samples. Finally, please ensure post-excavation sampling is performed consistent with the Department's Technical Guidance for Site Investigation of Soil, Remedial Investigation of Soil, and Remedial Action Verification Sampling for Soil.

<u>Response to AOR</u>: Please see attached summary table of locations requiring post-excavation bottom samples. As confirmation, all the locations from Table 1 that were identified as "ND" has been included. Regarding locations 065_A006 and 063_C009a, please see compliance averaging memorandum attached.

TABLES

TABLE

Summary of Post-Excavation Bottom Sample Locations

Soil Boring	EASTING	NORTHING	ELEVATION (feet msl)	top of CCPW (ft bgs)	bottom of CCPW (ft bgs)	Top of Clean (ft bgs)	top of CCPW (ft msl)	bottom of CCPW (ft msl)	Sample Elevation Interval (ft msl)
AD002	612263.7	680293.9	7.5	0	5	7	7.50	2.50	0 to 0.5*
AD003	612299.4	680342.5	7.5	0	4	8.5	7.50	3.50	-1 to -1.5*
BD008	612491.0	680647.5	7.4	0	4.5	4.5	7.40	2.90	2.5 to 2.9
BD010	612519.5	680702.2	8.3	0	4.5	6.5	8.30	3.80	1.3 to 1.8*
ED011	612308.2	680558.5	9	0	3	5	9.00	6.00	3.5 to 4*
063_C009A	680559.79	612312.58	9.14	0.00	0.00	6.9	9.14	9.14	1.7 to 2.2
063_C013	680662.77	612497.47	7.51	0.00	0.00	0.5	7.51	7.51	6.51 to 7.01
063_F005/MW-9	680662.77	612497.47		0.00	2.50	2.5	0.00	-2.50	-2.5 to -3

* Locations at which vertical delineation is not complete.

TABLE
SITE 063 - SOIL ANALYTICAL RESULTS

										Wet Chem Analysis		
Sample ID	Lab ID	Date	Time		Antimony (mg/kg)	Chromium (mg/kg)	Nickel (mg/kg)	Thallium (mg/kg)	Vanadium (mg/kg)	Chromium (VI) (mg/kg)	pH (su)	Oxidation Reduction Potential, Dissolved (millivolts)
F-010A 0.0-0.5	460-53059-1	3/25/2013	9:05	Soil	0.54 J	34.1	18.5	0.27	44.0	0.69 U	8.53 HF	380
F-010A 0.5-1	460-53059-2	3/25/2013	9:15	Soil	0.41 U	29.0	13.6	0.21 J	32.4	0.58 U	8.49 HF	385
F-010A 1.5-2	460-53059-3	3/25/2013	9:20	Soil	0.41 U	29.3	22.2	0.23	38.4	0.56 U	8.16 HF	396
F-010A 2.5-3	460-53059-4	3/25/2013	9:35	Soil	0.88	163	46.6	0.23 U	45.2	0.67 U	8.37 HF	514
F-010A 3.5-4	460-53059-5	3/25/2013	9:45	Soil	3.0	41.2	30.7	0.52	49.4	0.63 U	7.25 HF	322
MW-12 0.0-0.5	460-52992-14	3/25/2013	13:25	Soil	0.38 U	17.7	11.5	0.18 U	17.4	0.53 U	8.62 HF	508
MW-12 0.5-1.0	460-52992-15	3/25/2013	13:30	Soil	0.46 U	941	27.2	0.22 U	44.6	0.64 U	8.32 HF	489
MW-12 3.5-4.0	460-52992-16	3/25/2013	13:40	Soil	0.52 U	44.6	14.5	0.25 U	22.3	0.71 U	7.17 HF	317
MW-12 7.5-8.0	460-53059-13	3/26/2013	11:40	Soil	0.44 U	54.1	24.7	0.30	62.3	0.60 U	7.66 HF	457
NJ Residential SRS Soil Cleanup Criteria					31	NA	1,600	5	78	NA	NA	NA
NJ Non Residential SRS Soil Cleanup Criteria					450	NA	23,000	79	1,100	NA	NA	NA
NJ Impact to GW Soil Screening Level					6	NA	31	3	NA	NA	NA	NA

Highlighted Concentrations: Sample results do not meet NJ Impact to Groundwater Soil Remediation Standard.

J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

U : Indicates the analyte was analyzed for but not detected.

HF : Field parameter with a holding time of 15 minutes

ATTACHMENT A

Compliance Averaging Analysis

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MEMORANDUM

To: **Tom Gibbons, PMP**
From: **Dan Duh**
Marshall E. King, PE
Project: **PPG, Site 63/65, 1 Burma Road, Jersey City, NJ**
Subject: **Compliance Averaging Analysis**
Report Date: **January 9, 2014 – Revised February, 2014**

Concentrations of thallium and vanadium in pre-post excavation soil samples at Site 63-65 that serve as the post-excavation samples used to document the effectiveness and completeness of the soil remediation were collected at a post-excavation frequency of one boring per 900 square feet (sf) and were evaluated for compliance with applicable soil remediation standards. On average four samples were collected from each boring in order to define vertical delineation at the location. For this evaluation, compliance averaging at the 95 percent upper confidence limit of the mean (UCL) was conducted using ProUCL Version 5.0.

Delineation

The application of compliance averaging at this site does not dismiss that additional horizontal delineation of the site may be required, however it is prefaced on the fact that the vast majority of the aerial extent of the onsite historic fill has reasonably been horizontally and vertically delineated. As the design boring program was implemented to obtain pre-post-excavation samples to demonstrate vertical delineation of CCPW-impacted historical fill, CB&I believes that it is technically appropriate to utilize compliance averaging to these vertical delineation sample results that are located well within the delineated horizontal boundaries of the impacted area. PPG has collected quadruple the number of samples that would normally have been collected from an excavation bottom to provide a timely and thorough assessment of the proposed excavation bottom extent and support the vertical delineation findings. Given the aerial extents of proposed excavation and the number of samples utilized, we believe that the addition of fringe samples from along Burma Road or the NJ Turnpike Authority property where additional horizontal delineation is required would have a statistically insignificant effect on the findings of the compliance averaging exercise.

Functional Area

The functional area of this analysis is limited to the proposed remedial extents of the proposed excavation which cover less than 2-acres. According to NJDEP guidance non-residential sites may use functional areas of this size. This entire area is impacted by CCPW, therefore there is no bias to areas that are “clean.” See attached figure depicting the functional area extents. Please note that the site is basically rectangular with the site’s width (~150-ft) being more than one quarter of the site’s length(~540-ft). This ratio is in general accordance with NJDEP guidance.

Data from the shallowest 2 ft of soil were not included in the statistical analysis as this soil interval will be removed during site remediation activities. Only data from samples representative of soil that is to remain onsite were used (i.e. the top of clean samples located at depth below the CCPW-impacted fill layer). In addition, areas which have been delineated as being clean have not been included within the functional area. The data set utilized is limited to the samples in the attached tables.

Duplicates

Prior to performing statistical analyses, the applicable datasets were evaluated for duplicate sample results. The average concentration of duplicate results was used as the concentration for that sample. If both duplicate results were non-detect, the evaluated concentration was considered non-detect. If both duplicate results were detected concentrations, the evaluated concentration was considered detected. If one of the duplicate results was a detected concentration and the other was non-detect, the evaluated concentration was considered detected.

Thallium and Vanadium

For analysis of thallium and vanadium, the functional-area depth consisted of the subsurface 2 ft bgs and deeper. As groundwater at the site is at approximately 2-ft, this means that Impact to Groundwater Criteria do not apply and that Residential Direct Contact (RDC) standards do apply to these samples. The following table summarizes the results of the compliance averaging for thallium and vanadium in the subsurface functional area from 2 ft bgs and deeper as defined by pre-post-excavation samples. ProUCL program output tables documenting this compliance averaging analysis are attached.

Site	Parameter	Soil Remediation Standard	ProUCL Recommended 95% UCL	
Site 63-65				
	Thallium	RDC – 5 mg/kg	0.638	95% KM (t) UCL
	Vanadium	RDC – 78 mg/kg	31.6	95% Student's-t or Modified-t UCL

Conclusions

The ProUCL recommended 95% UCLs for thallium and vanadium were all below the applicable soil remediation standards for Site 63-65. These findings are pertinent to the following sample locations.

For Thallium, the minimum detection limits (MDLs) for two non-detect samples were reported to be above the NJDEP Residential Direct Contact Standard. These samples were:

- 065_A005, 5 to 5.5 ft bgs (<6.3 U mg/kg), and
- 065_A006, 8.2 to 8.7 ft bgs (<5.6 U mg/kg).

For the purposes of the analysis to demonstrate worst case scenario, the MDLs of these samples were taken to be the thallium concentration in the samples. As per the statistical analysis detailed above, these two samples are not statistically significant and therefore should not be used to define the vertical delineation extent of the proposed excavation at these two locations.

For Vanadium, three samples of note were reported to be above the NJDEP Residential Direct Contact Standard. These samples were:

- 063_C009a 6.4 to 6.9 ft bgs (83.9 mg/kg),
- 063_C009a 15 to 15.5 ft bgs (87.6 mg/kg), and
- 063_D006, 15 to 15.5 ft bgs (86.2 mg/kg).

As per the statistical analysis detailed above, these three samples are not statistically significant and therefore should be considered background and not be used to define the vertical delineation extent of the proposed excavation at these two locations.

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ATTACHMENT

Compliance Averaging Input Data

Table 5

Summary of Pre-Post-Excavation Samples Used for Compliance Averaging

Sites 63 and 65
Jersey City, New Jersey

Sample Location:	RDC	Non-RES	SCC (Cr)	IGW	AD001	AD004	AD005	AD006	AD007	AD008	AD009		BD001	BD002	BD003
Sample Depth (ft bgs):					6.5-7	5.5-6	2.5-3	2.5-3	5.5-6	5-5.5	5-5.5	5-5.5	7-7.5	6.5-7	4.5-5
Client Sample ID:					AD001 6.5-7	AD004 5.5-6	AD005 2.5-3	AD006 2.5-3	AD007 5.5-6	AD008 5-5.5	AD009 5-5.5	AD009 5-5.5	BD001 7-7.5	BD002 6.5-7	BD003 4.5-5
Lab Sample ID:					JB44205-1	JB46800-4	JB46800-6	JB46800-11	JB46883-20	JB46883-29	JB47183-5	JB47183-5R	JB44205-5	JB43880-49A	JB46883-6
Date Sampled:					8/5/2013	9/9/2013	9/9/2013	9/9/2013	9/10/2013	9/10/2013	9/12/2013	9/12/2013	8/5/2013	8/2/2013	9/10/2013
Matrix:					Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Chromium, Hexavalent (mg/kg)	N/A	N/A	20	N/A	1.3	<0.47	3	1	<0.50	<0.52	0.83	<0.47	0.95	<0.46	<0.47
Chromium (mg/kg)	N/A	N/A	120,000	N/A	34.7	189	160	56.7	55.2	18.5	80.1	----	181	65.7	61.6
Antimony (mg/kg)	31	450	N/A	6	<2.3	<2.3	<2.0	<2.3	4	2.5	<2.3	----	<2.2	<2.3	<2.3
Nickel (mg/kg)	1,600	23,000	N/A	205**	16.8	15.4	19	19	16.6	12.9	18.1	----	12.9	15.1	17.5
Thallium (mg/kg)	5	79	N/A	3	<1.1	<1.2	<1.0	<1.2	<1.3	<0.98	<1.1	----	<1.1	<1.2	<1.1
Vanadium (mg/kg)	78	1,100	N/A	N/A	32.9	33	41.6	8.4	24.7	14.1	19.1	----	22.7	24.5	36.6
Redox Potential Vs H2 (mV)	N/A	N/A	N/A	N/A	213	16.7	176	265	281	253	282	----	128	147	182
Solids, Percent (%)	N/A	N/A	N/A	N/A	86.1	85.3	77.6	85.6	80	77.2	85.2	----	90.5	87.1	85.8
pH	N/A	N/A	N/A	N/A	9.84	9.99	8.09	7.82	7.74	7.73	8.09	----	10.33	9.52	9.63

NOTE:
RDC = NJ Residential Direct Contact
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SCC (Cr) = Chromium Soil Cleanup Criteria
IGW = NJ Impact to Ground Water Default Screening Values
[a] Elevated detection limit due to dilution required for high interfering element.
* Sample did not pass 2nd QA & QC. See Table 2 for Rerun.
**Site-specific impact to groundwater criteria developedusing SPLP methodology for Nickel

Table 5

Summary of Pre-Post-Excavation Samples Used for Compliance Averaging

Sites 63 and 65
Jersey City, New Jersey

Sample Location:	RDC	Non-RES	SCC (Cr)	IGW	BD004		BD005		BD006	BD007		BD008	
Sample Depth (ft bgs):					5-5.5	5-5.5	5.5-6	5.5-6	6-6.5	5-5.5	5-5.5	4.5-5	4.5-5
Client Sample ID:					BD004 5-5.5	BD004 5-5.5	BD005 5.5-6	BD005 5.5-6	BD006 6-6.5	BD007 5-5.5	BD007 5-5.5	BD008 4.5-5	BD008 4.5-5
Lab Sample ID:					JB46800-37	JB46800-37R	JB46883-10	JB46883-10R	JB44447-13	JB46883-15	JB46883-15R	JB46883-24	JB46883-24R
Date Sampled:					9/9/2013	9/9/2013	9/10/2013	9/10/2013	8/8/2013	9/10/2013	9/10/2013	9/10/2013	9/10/2013
Matrix:					Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Chromium, Hexavalent (mg/kg)	N/A	N/A	20	N/A	<0.53	1.1	1.2	2.7	0.49	0.45	0.98	<0.46	<0.46
Chromium (mg/kg)	N/A	N/A	120,000	N/A	278	----	43.2	----	25	38.3	----	73.2	----
Antimony (mg/kg)	31	450	N/A	6	<2.0	----	<2.3	----	<2.3	<2.3	----	<2.2	----
Nickel (mg/kg)	1,600	23,000	N/A	205**	17	----	15.7	----	12.5	18.5	----	14.5	----
Thallium (mg/kg)	5	79	N/A	3	<1.0	----	<1.2	----	<1.2	<1.2	----	<1.1	----
Vanadium (mg/kg)	78	1,100	N/A	N/A	25.9	----	53.5	----	28.3	38.5	----	16.9	----
Redox Potential Vs H2 (mV)	N/A	N/A	N/A	N/A	318	----	276	----	255	269	----	273	----
Solids, Percent (%)	N/A	N/A	N/A	N/A	76	----	86	----	90.4	88.2	----	87.4	----
pH	N/A	N/A	N/A	N/A	6.12	----	7.83	----	8.14	7.97	----	7.68	----

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[a] Elevated detection limit due to dilution required for high interfering element.
* Sample did not pass 2nd QA & QC. See Table 2 for Rerun.
**Site-specific impact to groundwater criteria developedusing SPLP methodology for Nickel

Table 5

Summary of Pre-Post-Excavation Samples Used for Compliance Averaging

Sites 63 and 65
Jersey City, New Jersey

Sample Location:	RDC	Non-RES	SCC (Cr)	IGW	CD001	CD002	CD003	CD004	CD005	CD006	CD007	CD008	CD009	CD010	
Sample Depth (ft bgs):					**7-7.5**	**6-6.5**	**3.5-4**	**7-7.5**	**5-5.5**	**7-7.5**	**4.5-5**	**4-4.5**	**4-4.5**	**4.5-5**	**4.5-5**
Client Sample ID:					CD001 7-7.5	CD002 6-6.5	CD003 3.5-4	CD004 7-7.5	CD005 5-5.5	CD006 7-7.5	CD007 4.5-5	CD008 4-4.5	CD009 4-4.5	CD010 4.5-5	CD010 4.5-5
Lab Sample ID:					JB43880-35A	JB43880-4A	JB43880-28A	JB44205-25	JB44205-18	JB44205-33	JB43880-39A	JB43880-41A	JB43880-44A	JB46883-1	JB46883-1R
Date Sampled:					7/31/2013	7/30/2013	7/30/2013	8/5/2013	8/2/2013	8/5/2013	8/1/2013	8/2/2013	8/2/2013	9/10/2013	9/10/2013
Matrix:					Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Chromium, Hexavalent (mg/kg)	N/A	N/A	20	N/A	<0.52	0.69	1.8	1.2	1.2	<0.44	<0.45	<0.48	0.7	<0.47	<0.47
Chromium (mg/kg)	N/A	N/A	120,000	N/A	15.3	25.7	320	46.3	28.4	46.7	12.9	15.2	34.4	17	----
Antimony (mg/kg)	31	450	N/A	6	<2.0	<2.3	<2.3	<2.3	<2.3	<2.3	<2.2	<2.5	<2.3	<2.3	----
Nickel (mg/kg)	1,600	23,000	N/A	205**	13.1	17.5	20.7	11.9	14.9	12.2	9.7	12.6	11.1	12	----
Thallium (mg/kg)	5	79	N/A	3	<1.0	<1.2	<1.2	<1.1	<1.1	<1.1	<1.1	<1.2	<1.1	<1.1	----
Vanadium (mg/kg)	78	1,100	N/A	N/A	22.2	35.5	41.3	28.5	26.2	24.5	17.4	20.6	21.5	20.3	----
Redox Potential Vs H2 (mV)	N/A	N/A	N/A	N/A	197	241	194	290	126	224	162	194	210	258	----
Solids, Percent (%)	N/A	N/A	N/A	N/A	77.2	86.5	86.2	88.9	88	91	89.1	83.4	86.5	84.8	----
pH	N/A	N/A	N/A	N/A	6.98	6.88	7.86	6.95	9.53	9.31	9.7	9.04	8.69	8.84	----

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SCC (Cr) = Chromium Soil Cleanup Criteria
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[a] Elevated detection limit due to dilution required for high interfering element.
* Sample did not pass 2nd QA & QC. See Table 2 for Rerun.
**Site-specific impact to groundwater criteria developedusing SPLP methodology for Nickel

Table 5

Summary of Pre-Post-Excavation Samples Used for Compliance Averaging

Sites 63 and 65
Jersey City, New Jersey

Sample Location:	RDC	Non-RES	SCC (Cr)	IGW	CD011		CD012	CD013		CD014		CD015	
Sample Depth (ft bgs):					4.5-5	4.5-5	5-5.5	5-5.5	5-5.5	8-8.5	8-8.5	5.5-6	5.5-6
Client Sample ID:					CD011 4.5-5	CD011 4.5-5	CD012 5-5.5	CD013 5-5.5	CD013 5-5.5	CD014 8-8.5	CD014 8-8.5	CD015 5.5-6	CD015 5.5-6
Lab Sample ID:					JB46800-42	JB46800-42R	JB46800-17	JB46800-21	JB46800-21R	JB44447-33	JB44447-33R	JB44447-30	JB44447-30R
Date Sampled:					9/9/2013	9/9/2013	9/9/2013	9/9/2013	9/9/2013	8/8/2013	8/8/2013	8/8/2013	8/8/2013
Matrix:					Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Chromium, Hexavalent (mg/kg)	N/A	N/A	20	N/A	<0.48	<0.48	<0.47	<0.47	0.61	3.6	10.2	<0.47	<0.47
Chromium (mg/kg)	N/A	N/A	120,000	N/A	19.7	----	26	23.3	----	483	----	28.4	----
Antimony (mg/kg)	31	450	N/A	6	<2.4	----	<2.3	<2.3	----	<2.0	----	<2.3	----
Nickel (mg/kg)	1,600	23,000	N/A	205**	14.4	----	13.7	13.9	----	19.5	----	11.6	----
Thallium (mg/kg)	5	79	N/A	3	<1.2	----	<1.2	<1.2	----	<1.0	----	<1.2	----
Vanadium (mg/kg)	78	1,100	N/A	N/A	25.8	----	20.8	21.2	----	41.1	----	18.3	----
Redox Potential Vs H2 (mV)	N/A	N/A	N/A	N/A	178	----	154	201	----	159	----	155	----
Solids, Percent (%)	N/A	N/A	N/A	N/A	82.5	----	84.5	84.4	----	78.1	----	85	----
pH	N/A	N/A	N/A	N/A	8.65	----	8.32	7.53	----	8.7	----	7.91	----

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[a] Elevated detection limit due to dilution required for high interfering element.
* Sample did not pass 2nd QA & QC. See Table 2 for Rerun.
**Site-specific impact to groundwater criteria developedusing SPLP methodology for Nickel

Table 5

Summary of Pre-Post-Excavation Samples Used for Compliance Averaging

Sites 63 and 65
Jersey City, New Jersey

Sample Location:	RDC	Non-RES	SCC (Cr)	IGW	CD016	CD017	CD018		CD019		DD001	DD002	DD003	DD004	DD
Sample Depth (ft bgs):					5-5.5	6-6.5	4.5-5	4.5-5	4-4.5	4-4.5	7-7.5	6-6.5	4-4.5	5-5.5	4-4.5
Client Sample ID:					CD016 5-5.5	CD017 6-6.5	CD018 4.5-5	CD018 4.5-5	CD019 4-4.5	CD019 4-4.5	DD001 7-7.5	DD002 6-6.5	DD003 4-4.5	DD004 5-5.5	DD005 4-4.5
Lab Sample ID:					JB44447-17	JB44447-1	JB47185-2	JB47185-2R	JB47183-1	JB47183-1R	JB43880-8A	JB44205-29	JB44205-9	JB43880-20A	JB47183-10
Date Sampled:					8/8/2013	8/8/2013	9/12/2013	9/12/2013	9/12/2013	9/12/2013	7/31/2013	8/5/2013	8/5/2013	8/1/2013	9/12/2013
Matrix:					Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Chromium, Hexavalent (mg/kg)	N/A	N/A	20	N/A	<0.47	2.6	<0.44	0.49	<0.45	<0.45	<0.47	<0.46	1	<0.48	<0.48
Chromium (mg/kg)	N/A	N/A	120,000	N/A	25.6	168	69.0 [a]	----	216	----	20.1	24.1	48.2	49.3	34.3
Antimony (mg/kg)	31	450	N/A	6	<2.4	<2.3	<2.1	----	<2.3	----	<2.3	<2.2	<2.4	<2.4	<2.4
Nickel (mg/kg)	1,600	23,000	N/A	205**	14.6	19.2	12.7 [a]	----	11.3	----	14.3	14.4	16.5	17.9	14.5
Thallium (mg/kg)	5	79	N/A	3	<1.2	<1.1	<2.1 [a]	----	<1.1	----	<1.2	<1.1	<1.2	<1.2	<1.2
Vanadium (mg/kg)	78	1,100	N/A	N/A	23.5	44.5	28	----	24.1	----	28.2	27.7	27.2	35.1	27.8
Redox Potential Vs H2 (mV)	N/A	N/A	N/A	N/A	193	296	275	----	284	----	216	214	120	194	147
Solids, Percent (%)	N/A	N/A	N/A	N/A	84.6	89.7	90.2	----	89.6	----	85.4	86.4	83.8	83.2	84
pH	N/A	N/A	N/A	N/A	8.67	8.33	7.92	----	8.01	----	7.81	8.46	9.42	8.8	9.7

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[a] Elevated detection limit due to dilution required for high interfering element.
* Sample did not pass 2nd QA & QC. See Table 2 for Rerun.
**Site-specific impact to groundwater criteria developedusing SPLP methodology for Nickel

Table 5

Summary of Pre-Post-Excavation Samples Used for Compliance Averaging

Sites 63 and 65
Jersey City, New Jersey

Sample Location:	RDC	Non-RES	SCC (Cr)	IGW		DD006		DD007		DD008
Sample Depth (ft bgs):					4-4.5	4.5-5	4.5-5	5-5.5	5-5.5	5-5.5
Client Sample ID:					DD005 4-4.5	DD006 4.5-5	DD006 4.5-5	DD007 5-5.5	DD007 5-5.5	DD008 5-5.5
Lab Sample ID:					JB47183-10R	JB44447-65	JB44447-65R	JB44447-38	JB44447-38R	JB44447-9
Date Sampled:					9/12/2013	8/7/2013	8/7/2013	8/7/2013	8/7/2013	8/9/2013
Matrix:					Soil	Soil	Soil	Soil	Soil	Soil
Chromium, Hexavalent (mg/kg)	N/A	N/A	20	N/A	<0.48	1.7	<0.53	1.2	0.57	<0.47
Chromium (mg/kg)	N/A	N/A	120,000	N/A	----	71.7	----	18.8	----	19.9
Antimony (mg/kg)	31	450	N/A	6	----	<2.0	----	<2.3	----	<2.5
Nickel (mg/kg)	1,600	23,000	N/A	205**	----	15.6	----	10.4	----	16
Thallium (mg/kg)	5	79	N/A	3	----	<1.0	----	<1.1	----	<1.2
Vanadium (mg/kg)	78	1,100	N/A	N/A	----	28	----	19.3	----	20.4
Redox Potential Vs H2 (mV)	N/A	N/A	N/A	N/A	----	134	----	217	----	141
Solids, Percent (%)	N/A	N/A	N/A	N/A	----	75.8	----	88.9	----	85.4
pH	N/A	N/A	N/A	N/A	----	8.47	----	8.9	----	8.38

NOTE:

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SCC (Cr) = Chromium Soil Cleanup Criteria

IGW = NJ Impact to Ground Water Default Screening Values

[a] Elevated detection limit due to dilution required for high interfering element.

* Sample did not pass 2nd QA & QC. See Table 2 for Rerun.

**Site-specific impact to groundwater criteria developedusing SPLP methodology for Nickel

Table 5

Summary of Pre-Post-Excavation Samples Used for Compliance Averaging

Sites 63 and 65
Jersey City, New Jersey

Sample Location:	RDC	Non-RES	SCC (Cr)	IGW	DD009		ED001	ED002	ED003	ED004		ED005	ED006	
Sample Depth (ft bgs):					**5.5-6**	**5.5-6**	**5-5.5**	**4-4.5**	**4-4.5**	**4.5-5**	**4.5-5**	**4-4.5**	*** 4.5-5**	**4.5-5**
Client Sample ID:					DD009 5.5-6	DD009 5.5-6	ED001 5-5.5	ED002 4-4.5	ED003 4-4.5	ED004 4.5-5	ED004 4.5-5	ED005 4-4.5	* ED006 4.5-5	ED006 4.5-5
Lab Sample ID:					JB44447-21	JB44447-21R	JB43880-14A	JB43880-24A	JB43880-16A	JB44447-50	JB44447-50R	JB44205-45	* JB44447-62	JB44447-62R
Date Sampled:					8/8/2013	8/8/2013	7/31/2013	7/29/2013	8/1/2013	8/6/2013	8/6/2013	8/6/2013	8/7/2013	8/7/2013
Matrix:					Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Chromium, Hexavalent (mg/kg)	N/A	N/A	20	N/A	<0.48	<0.48	1.6	<0.47	<0.47	<0.46	0.72	<0.47	4.6	11.5
Chromium (mg/kg)	N/A	N/A	120,000	N/A	15.5	----	21.6	32.4	92.8	283	----	38.7	152	----
Antimony (mg/kg)	31	450	N/A	6	<2.4	----	<2.6	<2.3	<2.4	<2.4	----	<2.3	<2.2	----
Nickel (mg/kg)	1,600	23,000	N/A	205**	15.1	----	14.2	18.7	15.2	17.2	----	12.6	13.8	----
Thallium (mg/kg)	5	79	N/A	3	<1.2	----	<1.3	<1.2	<1.2	<1.2	----	<1.2	<1.1	----
Vanadium (mg/kg)	78	1,100	N/A	N/A	19.4	----	23.7	30.9	26.8	40.3	----	21.3	24.5	----
Redox Potential Vs H2 (mV)	N/A	N/A	N/A	N/A	238	----	276	224	246	53	----	84	131	----
Solids, Percent (%)	N/A	N/A	N/A	N/A	83.3	----	80.1	84.4	84.6	87.1	----	86	88.5	----
pH	N/A	N/A	N/A	N/A	7.89	----	7.07	8.32	8.78	10.28	----	10.07	9.57	----

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SCC (Cr) = Chromium Soil Cleanup Criteria
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[a] Elevated detection limit due to dilution required for high interfering element.
* Sample did not pass 2nd QA & QC. See Table 2 for Rerun.
**Site-specific impact to groundwater criteria developedusing SPLP methodology for Nickel

Table 5

Summary of Pre-Post-Excavation Samples Used for Compliance Averaging

Sites 63 and 65
Jersey City, New Jersey

Sample Location:	RDC	Non-RES	SCC (Cr)	IGW	ED007	ED008	ED009		ED010		ED012		ED013	FD001	ED
Sample Depth (ft bgs):					4-4.5	4.5-5	4-4.5	4-4.5	4-4.5	4-4.5	4.5-5	4.5-5	5.5-6	6-6.5	4.5-5
Client Sample ID:					ED007 4-4.5	ED008 4.5-5	ED009 4-4.5	ED009 4-4.5	ED010 4-4.5	ED010 4-4.5	ED012 4.5-5	ED012 4.5-5	ED013 5.5-6	FD001 6-6.5	FD002 4.5-5
Lab Sample ID:					JB44205-37	JB44205-21	JB44447-53	JB44447-53R	JB44447-69	JB44447-69R	JB44447-45	JB44447-45R	JB44447-5	JB44205-42	JB44447-58
Date Sampled:					8/6/2013	8/6/2013	8/6/2013	8/6/2013	8/7/2013	8/7/2013	8/7/2013	8/7/2013	8/9/2013	8/6/2013	8/6/2013
Matrix:					Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Chromium, Hexavalent (mg/kg)	N/A	N/A	20	N/A	<0.46	<0.47	<0.46	<0.46	4.7	0.54	0.69	<0.54	0.53	<0.46	7.4
Chromium (mg/kg)	N/A	N/A	120,000	N/A	16.5	16	18.6	----	143	----	46.3	----	647	18.6	214
Antimony (mg/kg)	31	450	N/A	6	<2.3	<2.4	<2.3	----	<2.3	----	<2.0	----	<2.0	<2.4	<2.2
Nickel (mg/kg)	1,600	23,000	N/A	205**	12.5	14.8	13.9	----	18.9	----	34.2	----	18.8	15.6	21.4
Thallium (mg/kg)	5	79	N/A	3	<1.1	<1.2	<1.2	----	<1.2	----	<1.0	----	<1.0	<1.2	<1.1
Vanadium (mg/kg)	78	1,100	N/A	N/A	21.3	21.6	23.5	----	27.7	----	37.8	----	35	23	47.8
Redox Potential Vs H2 (mV)	N/A	N/A	N/A	N/A	162	276	161	----	177	----	177	----	127	284	176
Solids, Percent (%)	N/A	N/A	N/A	N/A	87.7	84.4	87.2	----	84.1	----	74.5	----	75	86.2	88.1
pH	N/A	N/A	N/A	N/A	9.14	8.95	8.93	----	8.82	----	8.95	----	8.35	8.02	9.18

NOTE:

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SCC (Cr) = Chromium Soil Cleanup Criteria

IGW = NJ Impact to Ground Water Default Screening Values

[a] Elevated detection limit due to dilution required for high interfering element.

* Sample did not pass 2nd QA & QC. See Table 2 for Rerun.

**Site-specific impact to groundwater criteria developedusing SPLP methodology for Nickel

Table 5

Summary of Pre-Post-Excavation Samples Used for Compliance Averaging

Sites 63 and 65
Jersey City, New Jersey

Sample Location:						**FD004**	
Sample Depth (ft bgs):					**4.5-5**	**4.5-5**	**4.5-5**
Client Sample ID:	**RDC**	**Non-RES**	**SCC (Cr)**	**IGW**	FD002 4.5-5	FD004 4.5-5	FD004 4.5-5
Lab Sample ID:					JB44447-58R	JB44447-25	JB44447-25R
Date Sampled:					8/6/2013	8/8/2013	8/8/2013
Matrix:					Soil	Soil	Soil
Chromium, Hexavalent (mg/kg)	N/A	N/A	20	N/A	7.7	0.65	<0.50
Chromium (mg/kg)	N/A	N/A	120,000	N/A	----	58.8	----
Antimony (mg/kg)	31	450	N/A	6	----	<2.0	----
Nickel (mg/kg)	1,600	23,000	N/A	205**	----	13	----
Thallium (mg/kg)	5	79	N/A	3	----	<0.99	----
Vanadium (mg/kg)	78	1,100	N/A	N/A	----	23.9	----
Redox Potential Vs H2 (mV)	N/A	N/A	N/A	N/A	----	158	----
Solids, Percent (%)	N/A	N/A	N/A	N/A	----	79.9	----
pH	N/A	N/A	N/A	N/A	----	8.75	----

NOTE:

RDC = NJ Residential Direct Contact

Non-Res = NJ Non-residential Direct Contact

SCC (Cr) = Chromium Soil Cleanup Criteria

IGW = NJ Impact to Ground Water Default Screening Values

[a] Elevated detection limit due to dilution required for high interfering element.

* Sample did not pass 2nd QA & QC. See Table 2 for Rerun.

**Site-specific impact to groundwater criteria developedusing SPLP methodology for Nickel

Table 1

Summary of Pre-Post-Excavation Samples Used for Compliance Averaging

Sites 63 and 65
Jersey City, New Jersey

LOCATION	MINIMUM	STANDARD/	063_B005	063_B006	063_B007	063_B010	063_B011	063_B012	063_C004a
SAMPLE ID	STANDARD/	SCREENING	063_B005_3.3	063_B006_6.5	063_B007_5.0	063_B010_5.0	063_B011_5.0	063_B012_5.0	063_C004a_6.7
SAMPLE_DATE	SCREENING	CRITERIA	20110719	20110715	20110719	20110728	20110728	20110711	20110722
TOP OF SAMPLE	CRITERIA	SOURCE	3.3	6.5	5	5	5	5	6.7
Metals (MG/KG)									
ANTIMONY	6* / 31	IGW SSL* / RDC SRS	5.9 J	0.93 UJ	0.93 UJ	5.8 UJ	1 UJ	0.58 UJ	1.1 UJ
CHROMIUM	120000	CrSCC	2610	14.9 J	83	2950	74.1 J	14.7	9.8
NICKEL	31* / 1600	IGW SSL* / RDC SRS	14.7	11.2	14.5	22.5	14.1	13.1	9.8
THALLIUM	3* / 5	IGW SSL* / RDC SRS	2.7 U	1 U	1 U	1.3 U	1.1 U	0.32 U	1.2 U
VANADIUM	78	RDC SRS	35.5	18.5	28	32	27.6	23.2 J	15.3
Miscellaneous Parameters (MG/KG)									
HEXAVALENT CHROMIUM	20	CrSCC	0.56 UJ	1 J	0.56 UJ	3	0.57 U	0.55 UJ	0.61 U
Miscellaneous Parameters (MV)									
OXIDATION REDUCTION POTENTIAL	NC	NA	289	379	408	341	417	455	465
Miscellaneous Parameters (S.U.)									
PH	NC	NA	10.8	8.41	9.32	9.16	8.4	8.2	8.38

U = NON DETECT

J = ESTIMATED

IGW SSL = DEFAULT IMPACT TO GROUNDWATER SOIL SCREENING LEVEL

RDC SRS = RESIDENTIAL DIRECT CONTACT SOIL REMEDIATION STANDARD

CrSCC = NJDEP CHROMIUM SOIL CLEANUP CRITERIA (FEB 2007/SEPT 2008)

EXCEEDS MINIMUM STANDARD/SCREENING CRITERIA

NON-DETECTION EXCEEDS MINIMUM STANDARD/SCREENING CRITERIA

Table 1

Summary of Pre-Post-Excavation Samples Used for Compliance Averaging

Sites 63 and 65
Jersey City, New Jersey

LOCATION SAMPLE ID SAMPLE_DATE TOP OF SAMPLE	MINIMUM STANDARD/ SCREENING CRITERIA	STANDARD/ SCREENING CRITERIA SOURCE	063_C005 063_C005_7.5 20110713 7.5	063_C006 063_C006_6.5 20110713 6.5	063_C007 063_C007_8.0 20110713 8	063_C009 063_C009_5.0 20110720 5	063_C009a 063_C009a_6.4 20110727 6.4	063_C009a 063_C009a_10.0 20110727 10	063_C009a 063_C009a_15.0 20110727 15
Metals (MG/KG)									
ANTIMONY	6* / 31	IGW SSL* / RDC SRS	0.93 UJ	0.98 UJ	1.1 UJ	1 UJ	9.4 UJ	0.91 UJ	6.6 J
CHROMIUM	120000	CrSCC	479 J	39.9 J	12.9 J	70.1	3830	49.6	3570
NICKEL	31* / 1600	IGW SSL* / RDC SRS	12.9 J	15.1 J	13.4	9.6	13.1	10.7	15.8
THALLIUM	3* / 5	IGW SSL* / RDC SRS	1 U	1.1 U	1.2 U	1.1 U	1 U	1 U	1 U
VANADIUM	78	RDC SRS	19	21	16.5	18.5	**83.9**	23.7	**87.6**
Miscellaneous Parameters (MG/KG)									
HEXAVALENT CHROMIUM	20	CrSCC	1.4 J	0.58 U	0.61 U	0.59 U	4.2	1.1 J	8.1
Miscellaneous Parameters (MV)									
OXIDATION REDUCTION POTENTIAL	NC	NA	265	287	375	433	332	347	429
Miscellaneous Parameters (S.U.)									
PH	NC	NA	9.79	9.41	8.2	9.13	9.62	9.43	10.1

U = NON DETECT

J = ESTIMATED

IGW SSL = DEFAULT IMPACT TO GROUNDWATER SOIL SCREENING LEVEL

RDC SRS = RESIDENTIAL DIRECT CONTACT SOIL REMEDIATION STANDARD

CrSCC = NJDEP CHROMIUM SOIL CLEANUP CRITERIA (FEB 2007/SEPT 2008)

EXCEEDS MINIMUM STANDARD/SCREENING CRITERIA

NON-DETECTION EXCEEDS MINIMUM STANDARD/SCREENING CRITERIA

Table 1

Summary of Pre-Post-Excavation Samples Used for Compliance Averaging

Sites 63 and 65
Jersey City, New Jersey

LOCATION SAMPLE ID SAMPLE_DATE TOP OF SAMPLE	MINIMUM STANDARD/ SCREENING CRITERIA	STANDARD/ SCREENING CRITERIA SOURCE	063_C010 063_C010_6.4 20110727 6.4	063_D005 063_D005_1.8 20110714 1.8	063_D006 063_D006_15.0 20110712 15	065_A005 065_A005_5.0 20110801 5	065_A005 065_A005_5.0-D 20110801 5	065_A006 065_A006_3.8 20110801 3.8	065_A006 065_A006_8.2 20110801 8.2
Metals (MG/KG)									
ANTIMONY	6* / 31	IGW SSL* / RDC SRS	1 UJ	0.93 UJ	0.57 UJ	1.4 UJ	5.7 UJ	5.1 UJ	12.7 UJ
CHROMIUM	120000	CrSCC	14.4	104 J	46.5	7060	9090	7640	12400
NICKEL	31* / 1600	IGW SSL* / RDC SRS	13.7	14.5	13.8	14.4	18.5 J	21.1 J	22.7 J
THALLIUM	3* / 5	IGW SSL* / RDC SRS	1.1 U	1 U	1 J	1.6 U	**6.3**	2.8 U	**5.6**
VANADIUM	78	RDC SRS	17.8	34.6	**86.2**	40.2	52.4 J	28.9 J	52.8 J
Miscellaneous Parameters (MG/KG)									
HEXAVALENT CHROMIUM	20	CrSCC	0.59 U	0.54 U	0.55 U	0.66 U	0.75 J	12.9	4.2
Miscellaneous Parameters (MV)									
OXIDATION REDUCTION POTENTIAL	NC	NA	486	372	334	201	213	224	214
Miscellaneous Parameters (S.U.)									
PH	NC	NA	7.92	8.58	8.94	10.4	10.3	11.3	11.7

U = NON DETECT

J = ESTIMATED

IGW SSL = DEFAULT IMPACT TO GROUNDWATER SOIL SCREENING LEVEL

RDC SRS = RESIDENTIAL DIRECT CONTACT SOIL REMEDIATION STANDARD

CrSCC = NJDEP CHROMIUM SOIL CLEANUP CRITERIA (FEB 2007/SEPT 2008)

EXCEEDS MINIMUM STANDARD/SCREENING CRITERIA

NON-DETECTION EXCEEDS MINIMUM STANDARD/SCREENING CRITERIA

Table 1

Summary of Pre-Post-Excavation Samples Used for Compliance Averaging

Sites 63 and 65
Jersey City, New Jersey

LOCATION SAMPLE ID SAMPLE_DATE TOP OF SAMPLE	MINIMUM STANDARD/ SCREENING CRITERIA	STANDARD/ SCREENING CRITERIA SOURCE	065_A008 065_A008_5.0 20110801 5	065_A009 065_A009_2.5 20110801 2.5	065_A011 065_A011_5.0 20110728 5	065_A013 065_A013_5.0 20110728 5
Metals (MG/KG)						
ANTIMONY	6* / 31	IGW SSL* / RDC SRS	3.2 J	1 UJ	3.1 J	1.9 J
CHROMIUM	120000	CrSCC	1490 J	73.7	31.2	22.3
NICKEL	31* / 1600	IGW SSL* / RDC SRS	7.7 J	10.1	14.4	12.5
THALLIUM	3* / 5	IGW SSL* / RDC SRS	1.1 U	1.1 U	1.1 U	1.1 U
VANADIUM	78	RDC SRS	16.2	13.7	23.4	14.4
Miscellaneous Parameters (MG/KG)						
HEXAVALENT CHROMIUM	20	CrSCC	5.5	0.57 U	0.58 U	0.59 U
Miscellaneous Parameters (MV)						
OXIDATION REDUCTION POTENTIAL	NC	NA	376	467	430	479
Miscellaneous Parameters (S.U.)						
PH	NC	NA	10.3	8.2	8.26	8.3

U = NON DETECT

J = ESTIMATED

IGW SSL = DEFAULT IMPACT TO GROUNDWATER SOIL SCREENING LEVEL

RDC SRS = RESIDENTIAL DIRECT CONTACT SOIL REMEDIATION STANDARD

CrSCC = NJDEP CHROMIUM SOIL CLEANUP CRITERIA (FEB 2007/SEPT 2008)

EXCEEDS MINIMUM STANDARD/SCREENING CRITERIA

NON-DETECTION EXCEEDS MINIMUM STANDARD/SCREENING CRITERIA

ATTACHMENT

ProUCL Program Output Tables

UCL Statistics for Uncensored Full Data Sets

User Selected Options	
Date/Time of Computation	2/7/2014 2:28:11 PM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Vanadium

General Statistics

Total Number of Observations	82	Number of Distinct Observations	72
		Number of Missing Observations	0
Minimum	8.4	Mean	28.94
Maximum	87.6	Median	24.6
SD	14.35	Std. Error of Mean	1.584
Coefficient of Variation	0.496	Skewness	2.426

Normal GOF Test

Shapiro Wilk Test Statistic	0.765	**Shapiro Wilk GOF Test**
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.208	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0978	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	31.57	95% Adjusted-CLT UCL (Chen-1995)	32
		95% Modified-t UCL (Johnson-1978)	31.64

Gamma GOF Test

A-D Test Statistic	1.973	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.754	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.154	**Kolmogrov-Smirnoff Gamma GOF Test**
5% K-S Critical Value	0.0988	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	5.804	k star (bias corrected MLE)	5.6
Theta hat (MLE)	4.986	Theta star (bias corrected MLE)	5.167
nu hat (MLE)	951.9	nu star (bias corrected)	918.4
MLE Mean (bias corrected)	28.94	MLE Sd (bias corrected)	12.23
		Approximate Chi Square Value (0.05)	849
Adjusted Level of Significance	0.0471	Adjusted Chi Square Value	847.8

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	31.3	95% Adjusted Gamma UCL (use when n<50)	31.34

	A	B	C	D	E	F	G	H	I	J	K	L
51	**Lognormal GOF Test**											
52	Shapiro Wilk Test Statistic					0.958	**Shapiro Wilk Lognormal GOF Test**					
53	5% Shapiro Wilk P Value					0.0317	Data Not Lognormal at 5% Significance Level					
54	Lilliefors Test Statistic					0.123	**Lilliefors Lognormal GOF Test**					
55	5% Lilliefors Critical Value					0.0978	Data Not Lognormal at 5% Significance Level					
56	**Data Not Lognormal at 5% Significance Level**											
57												
58	**Lognormal Statistics**											
59	Minimum of Logged Data					2.128	Mean of logged Data					3.276
60	Maximum of Logged Data					4.473	SD of logged Data					0.403
61												
62	**Assuming Lognormal Distribution**											
63	95% H-UCL					31.12	90% Chebyshev (MVUE) UCL					32.67
64	95% Chebyshev (MVUE) UCL					34.46	97.5% Chebyshev (MVUE) UCL					36.96
65	99% Chebyshev (MVUE) UCL					41.86						
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data do not follow a Discernible Distribution (0.05)**											
69												
70	**Nonparametric Distribution Free UCLs**											
71	95% CLT UCL					31.54	95% Jackknife UCL					31.57
72	95% Standard Bootstrap UCL					31.56	95% Bootstrap-t UCL					32.24
73	95% Hall's Bootstrap UCL					32.32	95% Percentile Bootstrap UCL					31.66
74	95% BCA Bootstrap UCL					32.05						
75	90% Chebyshev(Mean, Sd) UCL					33.69	95% Chebyshev(Mean, Sd) UCL					35.84
76	97.5% Chebyshev(Mean, Sd) UCL					38.83	99% Chebyshev(Mean, Sd) UCL					44.7
77												
78	**Suggested UCL to Use**											
79	95% Student's-t UCL					31.57	or 95% Modified-t UCL					31.64
80												
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
82	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
83	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
84	For additional insight the user may want to consult a statistician.											
85												

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	2/7/2014 2:28:44 PM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Thallium

General Statistics

Total Number of Observations	82	Number of Distinct Observations	12
Number of Detects	3	Number of Non-Detects	79
Number of Distinct Detects	3	Number of Distinct Non-Detects	10
Minimum Detect	1	Minimum Non-Detect	0.32
Maximum Detect	5.6	Maximum Non-Detect	2.8
Variance Detects	5.431	Percent Non-Detects	96.34%
Mean Detects	3.517	SD Detects	2.33
Median Detects	3.95	CV Detects	0.663
Skewness Detects	-0.808	Kurtosis Detects	N/A
Mean of Logged Detects	1.032	SD of Logged Detects	0.911

Warning: Data set has only 3 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.974	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.24	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.512	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.466	Standard Error of Mean	0.104
SD	0.71	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.638	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.636	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.776	95% KM Chebyshev UCL	0.917
97.5% KM Chebyshev UCL	1.112	99% KM Chebyshev UCL	1.496

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	2.372	k star (bias corrected MLE)	N/A
Theta hat (MLE)	1.483	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	14.23	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A

51												
52	**Gamma Kaplan-Meier (KM) Statistics**											
53					k hat (KM)	0.429			nu hat (KM)			70.44
54									Adjusted Level of Significance (β)			0.0471
55					Approximate Chi Square Value (70.44, α)	52.11			Adjusted Chi Square Value (70.44, β)			51.83
56					95% Gamma Approximate KM-UCL (use when n>=50)	0.629			95% Gamma Adjusted KM-UCL (use when n<50)			0.633
57												
58	**Lognormal GOF Test on Detected Observations Only**											
59					Shapiro Wilk Test Statistic	0.895			**Shapiro Wilk GOF Test**			
60					5% Shapiro Wilk Critical Value	0.767			Detected Data appear Lognormal at 5% Significance Level			
61					Lilliefors Test Statistic	0.313			**Lilliefors GOF Test**			
62					5% Lilliefors Critical Value	0.512			Detected Data appear Lognormal at 5% Significance Level			
63	**Detected Data appear Lognormal at 5% Significance Level**											
64												
65	**Lognormal ROS Statistics Using Imputed Non-Detects**											
66					Mean in Original Scale	0.213			Mean in Log Scale			-3.657
67					SD in Original Scale	0.763			SD in Log Scale			2.025
68					95% t UCL (assumes normality of ROS data)	0.354			95% Percentile Bootstrap UCL			0.37
69					95% BCA Bootstrap UCL	0.43			95% Bootstrap t UCL			0.754
70					95% H-UCL (Log ROS)	0.43						
71												
72	**UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed**											
73					KM Mean (logged)	-1.012			95% H-UCL (KM -Log)			0.45
74					KM SD (logged)	0.481			95% Critical H Value (KM-Log)			1.831
75					KM Standard Error of Mean (logged)	0.0917						
76												
77	**DL/2 Statistics**											
78					**DL/2 Normal**				**DL/2 Log-Transformed**			
79					Mean in Original Scale	0.692			Mean in Log Scale			-0.504
80					SD in Original Scale	0.681			SD in Log Scale			0.401
81					95% t UCL (Assumes normality)	0.817			95% H-Stat UCL			0.709
82	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
83												
84	**Nonparametric Distribution Free UCL Statistics**											
85	**Detected Data appear Normal Distributed at 5% Significance Level**											
86												
87	**Suggested UCL to Use**											
88					95% KM (t) UCL	0.638			95% KM (Percentile Bootstrap) UCL			N/A
89	**Warning: One or more Recommended UCL(s) not available!**											
90												
91	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
92	Recommendations are based upon data size, data distribution, and skewness.											
93	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
94	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
95												

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MEMORANDUM

To:	**Tom Gibbons, PMP**
From:	**William Moran** **Marshall King, PE**
Subject:	**Meeting Minutes - Assessment of Adequacy Memorandum regarding Draft Cutlines and Tables from Weston Solutions**
Project:	**PPG, Site 63/65, 1 Burma Road, Jersey City, Hudson County, New Jersey**
Report Date:	**March 13, 2014**

On February 26, 2014, CB&I and Weston met to review outstanding issues noted in Weston's Assessment of Adequacy dated 29 January 2014 on the Site 63/65 cutlines. Previously addressed issues have been removed so that only open issues are included. For clarity and ease of use, the original comment, CB&I's response, the assessment of the adequacy (AOA), the response to the AOA are provided, along with the outcome of the meeting. ***The outcome of the meeting is provided in bold italic text.***

In addition, CB&I's revised compliance averaging submittal is an attachment.

Assessment of Adequacy of Previously-Submitted Comments

Contamination Beyond Proposed Excavation Limits: The following boring locations have identified CPPW and/or site-related contaminant(s) present at concentration(s) greater than remediation standards which are not captured by the proposed limits of the excavation. The remedial limits must be expanded to achieve remedial goals for the site. The cross sections must be revised to address those locations which require excavation which are not indicated as such:

- Southwestern corner of Site 63
  - AD001: The thickness of CCPW at the identified "edge" of the excavation suggests that the remedial excavation may need to be extended to the south and west in this area. . Table 1 shows top of clean at 6.5 ft bgs; bottom of CCPW at 4.5 ft bgs; and no recovery noted on the boring log from 5-6.5 ft bgs.

    Response: The extents of Areas Requiring Remediation have been modified to account for the observed CCPW.

    Adequacy of Response: Modifications were not observed on the cut line figures provided to Weston.

    Response to AOR: To be addressed during meeting between the parties.

    Meeting Outcome: Matter resolved during meeting. Weston accepted that the Areas Requiring Remediation extents had been modified to account for CCPW identified in AD001.

- 065_A006: PPG must identify how the exceedance of the thallium default impact to groundwater soil remediation standard (IGWSRS) will be addressed in this area. Table 2 shows bottom of CCPW at 1.5 ft bgs and top of clean at 3.8 ft bgs, with a proposed excavation depth of approximately 5.5 ft bgs on Figure 3 cross-section. However, Table 5A in the March 2013 Remedial Investigation Report (RIR), notes Tl at 5.6U [above IGW] at 8.2 ft bgs.

Response: As demonstrated in the attached package, the analysis of this Thallium issue through compliance averaging shows that this location is not a concern. This sample result is a non-detect. Thallium was not detected in 318 out of 328 RIR samples and not detected in any of 272 Remedial Design Boring samples. The maximum detectable concentration of Thallium was 1 ppm. Since the average for Thallium across the site is well below the Impact to Groundwater Soil Screening Level (IGWSSL), we believe that the depth of excavation in the area should 3.8 ft bgs as per the top of clean sample result for this location.
Also note that since the concrete drainage structure on Site 065 was installed as an IRM to temporarily cap known CCPW, it is expected that all the CCPW beneath that structure will be removed as part of the remedial action described in the cut lines.

Adequacy of Response: Please see comments on compliance averaging, below.

Response to AOR: See revised compliance averaging memorandum attached. In addition, note that as the sample collected at 8.2 ft bgs is below the water table (which is at ~2 ft bgs) the IGWSSL do not apply.

Meeting Outcome: Weston requested that the site be split into 0.5-acre functional areas for comparison with residential standards. See revised compliance averaging memorandum attached.

- 063_C004a: The proposed excavation depth at this location is approximately 5.5 ft bgs per the cross section E-E' at station 1+25. PPG must extend the vertical extent of remedial excavation at this location to 6.7 ft bgs (Table 2 lists top of clean at 6.7 ft bgs.

  Response: The cut sheet and profiles have been revised to reflect an excavation depth of 6.7 ft bgs.

  Adequacy of Response: Modifications were not observed on cut line Figure C-7 provided to Weston.

  Response to AOR: To be addressed during meeting between the parties. This boring location will be identified on a spot elevation table with all the other borings on the site in the contractor bid documents for the site. The spot elevation table will include boring coordinates and final elevations for the excavation.

  Meeting Outcome: Matter resolved during meeting. Weston accepted that the cutsheet and profiles had been modified to account for vertical extent of remedial excavation at this location.

- DD009: The proposed excavation depth at this location is approximately 2.5 ft bgs per the cross section D-D' at station 4+97. PPG must extend the vertical extent of remedial excavation at this location to 5.5 ft bgs (Table 2 lists top of clean at 5.5 ft bgs).

  Response: The cut sheet and profiles have been revised to reflect an excavation depth of 5.5 ft bgs.

  Adequacy of Response: Modifications were not observed on cut line Figure C-7 provided to Weston.

  Response to AOR: To be addressed during meeting between the parties.

<u>Meeting Outcome</u>: Matter resolved during meeting. Weston accepted that the cutsheet and profiles had been modified to account for vertical extent of remedial excavation at this location.

- 063_C009a: PPG must document clean condition at the terminal depth at this location. The proposed terminal depth at this location is approximately 15.5 ft bgs, V exceeds residential criteria at 15.0 ft bgs, but no clean sample was obtained deeper than 15.0 ft bgs. Also the elevation on Figure 5 is unreadable.

  Response: As demonstrated in the attached package, the analysis of this Vanadium hit through compliance averaging shows that this location is not a concern. Furthermore, given the large clean interval between CCPW in this area and this sample, it appears that this hit is unrelated to the CCPW located above it. This hit should not define the excavation depth at this location. This excavation should extend only to a depth of 6.9 ft bgs where a base post-excavation sample should be collected.

  This same rationale also applies to the vanadium hit observed at a depth of 15-15.5-ft in 063_D006 where no excavation should occur as no CCPW was observed and no metals exceedences were reported in shallower samples.

  <u>Adequacy of Response</u>: Please see comments on compliance averaging, below.

  <u>Response to AOR</u>: See revised compliance averaging memorandum attached.

  <u>Meeting Outcome</u>: Weston requested that the site be split into 0.5-acre functional areas for comparison with residential standards. See revised compliance averaging memorandum attached.

The following boring locations have their deepest soil sample showing site-related contaminant(s) present at concentration(s) greater than the respective most stringent soil remediation standard without a deeper clean sample present or planned sufficiently close. Confirmation samples are required at the proposed terminal depth of excavation consistent with the sample locations identified below. Note that Figure 5 and the cross-sections on Figures 3 & 4 may need to be edited based on the responses to these locations:

- AD002: at or deeper than 7.5 ft bgs; see Contamination Beyond Proposed Excavation Limits, above
- **065_A006: deeper than 8.2 ft bgs; see Contamination Beyond Proposed Excavation Limits, above**
- AD003: deeper than 8.5 ft bgs; see Contamination Beyond Proposed Excavation Limits, above
- BD008: deeper than 6.5 ft bgs; see Contamination Beyond Proposed Excavation Limits, above
- ED011: deeper than 5.0 ft bgs (see Contamination Beyond Proposed Excavation Limits, above).
- **063_C009a: deeper than 15 ft bgs; see Contamination Beyond Proposed Excavation Limits, above.**

- 063_C013: deeper than 0.5 ft bgs; see Contamination Beyond Proposed Excavation Limits, above.

Response: The need for additional post-excavation sampling is acknowledged and most of these locations were noted in Table 1 by identifying the top of clean for these locations as ND.

<u>Adequacy of Response</u>: Please confirm that all locations on Table 1 which are identified as "ND" will have post-excavation bottom samples. Also, please identify those locations which are not currently identified in Table 1 as "ND" which require bottom samples. Finally, please ensure post-excavation sampling is performed consistent with the Department's Technical Guidance for Site Investigation of Soil, Remedial Investigation of Soil, and Remedial Action Verification Sampling for Soil.

<u>Response to AOR</u>: Please see attached summary table of locations requiring post-excavation bottom samples. As confirmation, all the locations from Table 1 that were identified as "ND" has been included. Regarding locations 065_A006 and 063_C009a, please see compliance averaging memorandum attached.

<u>Meeting Outcome</u>: Weston requested that the site be split into 0.5-acre functional areas for comparison with residential standards. See revised compliance averaging memorandum attached.

TABLES

ATTACHMENT A

Compliance Averaging Analysis

From: Amend-Babcock, Laura [mailto:Laura.Amend-Babcock@WestonSolutions.com]
Sent: Friday, April 4, 2014 2:12 PM
To: 'bmcpeak@planningprogress.com' <bmcpeak@planningprogress.com>
Cc: Vale, Lou <Lou.Vale@cbi.com>; Michael McCabe (jcsiteadministrator@earthlink.net) <jcsiteadministrator@earthlink.net>; Mark Terril <terril@ppg.com>; Prins@ppg.com; Gibbons, Thomas <thomas.gibbons@cbi.com>; David Doyle <David.Doyle@dep.state.nj.us>; Amin, Prabal <Prabal.Amin@WestonSolutions.com>
Subject: RE: Site 063 - Revised Cutlines

The revised cut lines and responses for Sites 63/65 are acceptable, as is the revised compliance averaging submittal. If you have any questions, please notify me.

Laura

Laura J. Amend-Babcock, P.E.
Senior Technical Manager
Weston Solutions, Inc.
205 Campus Drive
Edison, New Jersey 08837
phone: (732) 417-5811
fax: (732) 417-5801
e-mail: Laura.Amend-Babcock@westonsolutions.com
www.WestonSolutions.com

From: Amin, Prabal
Sent: Sunday, March 16, 2014 12:54 PM
To: Amend-Babcock, Laura
Subject: FW: Site 063 - Revised Cutlines

Prabal N. Amin, P.E.
Weston Solutions, Inc.
205 Campus Drive
Edison, NJ 08837
prabal.amin@westonsolutions.com
Voice: 732-417-5857
Fax: 732-417-5801

From: Moran, William [mailto:William.Moran@cbi.com]
Sent: Saturday, March 15, 2014 9:44 AM
To: bmcpeak@planningprogress.com; 'Mike McCabe'; Terril, Mark; Prins, Keith; Gibbons, Thomas; Amin, Prabal; Doyle, David
Cc: King, Marshall E.
Subject: Site 063 - Revised Cutlines

The revised cutlines for Site 063 are posted at the link below

https://shawxnet.shawgrp.com/sites/PPGJersey/Site%206365%20%20RAWP/Forms/AllItems.aspx?RootFolder=%2fsites%2fPPGJersey%2fSite%206365%20%20RAWP%2fRevised%20Cutlines%20%2d%20March%202014&FolderCTID=&View=%7b26F6E0E5%2dF6EA%2d4826%2dB86E%2dC9C36C1655CD%7d

William M. Moran
Program Manager III
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From: Amin, Prabal [mailto:Prabal.Amin@WestonSolutions.com]
Sent: Monday, April 28, 2014 9:54 AM
To: bmcpeak@planningprogress.com; Cozzi, Tom; Doyle, David; Spader, David
Cc: McCabe, Michael (jcsiteadministrator@earthlink.net); Ciara O'Connell; Garrison, Alanna; Keith Prins; Terril, Mark; Dave Tomsey; Gibbons, Thomas
Subject: RE: Site 63/65 - Revised AMP

Based on the clarification provided in the revised air monitoring plan (AMP) for Site 63/65 per the e-mail correspondences below, and consultation with the NJDEP Bureau of Environmental Radiation on the radiological monitoring components of the AMP, the NJDEP has informed Weston that the revised AMP for Site 63/65 is considered acceptable.

Thank you.

Prabal

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205 Campus Drive
Edison, NJ 08837
prabal.amin@westonsolutions.com
Voice: 732-417-5857
Fax: 732-417-5801

From: bmcpeak@planningprogress.com [mailto:bmcpeak@planningprogress.com]
Sent: Sunday, April 27, 2014 12:21 PM
To: Cozzi, Tom; Doyle, David; Spader, David
Cc: McCabe, Michael (jcsiteadministrator@earthlink.net); Ciara O'Connell; Garrison, Alanna; Amin, Prabal; Keith Prins; Terril, Mark; Dave Tomsey
Subject: FW: Site 63/65 - Revised AMP

I am pleased to forward the attached revised air monitoring plan for Site 63/65. I know that Emilcott and CBI worked diligently over the last several days and that the effort was vetted with Weston at critical points. Hopefully that collaboration has resulted in a submittal that meets all applicable regulatory requirements.

PPG has mobilized to remediate this site and the approval of the air monitoring plan needs to be completed before that work can begin. With that in mind, I expect that we will have discussions early Monday to chart a course forward.

Brian McPeak
Planning Progress, LLC
Site Administrator | Project Manager
Chromium Cleanup Partnership
bmcpeak@planningprogress.com

From: Gibbons, Thomas [mailto:thomas.gibbons@cbi.com]
Sent: Saturday, April 26, 2014 10:21 PM
To: bmcpeak@planningprogress.com
Cc: Prins, Keith; Terril, Mark; Michael McCabe (jcsiteadministrator@earthlink.net); Dave Tomsey; Amin, Prabal; Cozzi, Tom; Stewart, John C
Subject: Site 63/65 - Revised AMP

Brian,

The revised AMP is attached for review and distribution. The revised plan includes updated action levels for total VOCs, a new section on radiological air monitoring, and six new appendices covering CB&I's radiological policies and procedures.

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