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February 1, 2007

Mr. Joseph T. Martella II
Senior Engineer
State of Rhode Island
Office of Waste Management
Department of Environmental Management
235 Promenade Street
Providence, RI 02908-5767

RE: Response to Comments
Supplemental Site Investigation Report
Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, Rhode Island

Dear Mr. Martella:

Textron Inc. (Textron) is submitting the attached responses to comments on the Supplemental Site Investigation Report (SSIR) for the Former Gorham Manufacturing Site located at 333 Adelaide Avenue, Providence, Rhode Island. The SSIR was submitted to the Rhode Island Department of Environmental Management (RIDEM) on July 31, 2006, in accordance with the March 2006 Consent Order and the April 2006 amended Letter of Responsibility. RIDEM provided comments on the SIR to Textron on December 1, 2006.

You will note that in addressing certain comments we have proposed to undertake additional investigations. We will be working with RIDEM to draft a work plan for these additional investigation activities. The SSIR revisions presented within this response to comments and the results of the additional investigation will be presented in an amended SSIR.

While the attached responses to comments are specific to the requirements of the March 2006 Consent Order and April 2006 amended Letter of Responsibility (requiring commercial/industrial use of the park parcel), Textron will continue working with the stakeholders to address their interests and concerns regarding the former Gorham site. Based on our collaboration with the stakeholders and RIDEM, we believe the common goal of bringing the site to beneficial reuse and regulatory closure can be achieved.

In order to facilitate your review of our comments we are available to meet with RIDEM at your convenience. In the meantime, please let me know if you have any questions (401) 457-2635.

Sincerely,

TEXTRON Inc.

Gregory L. Simpson
Project Manager

Enclosures: Response to Comments: Supplemental Site Investigation Report – Three bound hard copies and one electronic copy on compact disk

cc: Senator Juan M. Pichardo, District 2 (One Hard Copy)
Representative Thomas Slater (One Hard Copy)
Repository – Knight Memorial Library (One Hard Copy)
Thomas Deller, City of Providence (One Hard Copy)
Peter Grivers, EA Engineering, Science and Technology, Inc. (One Electronic Copy)
David McCabe, Textron, Inc. (Electronic Submittal)
David Heislein, Mactec (Electronic Submittal)

MACTEC

RESPONSE TO COMMENTS

Supplemental Site Investigation Report
Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, Rhode Island
July 2006

Comments Provided By: **Rhode Island Department of Environmental Protection**
Case No. 2005-059 (Associated with Case No. 97-030)
Dated December 1, 2006

Comment 1) It should be noted that there are paging and spacing differences between the original hard copy SSIR report submitted to the Department, and the subsequent electronic PDF file submitted and posted on the Department's web site. The following references to sections, pages, paragraphs and quotes are all referenced to the original hard copy SSIR report.

Response: *No action required.*

Comment 2) In our March 14, 2006 comment letter on Mactec's November 2005 draft Supplemental Site Investigation Work Plan to Support Human Health and Ecological Risk Assessment Activities – Park Parcel/Mashapaug Cove (SSIWP), the Department requested a site figure depicting measured fill depths throughout the Park Parcel (Comment 3). As this SIR is intended to address all of the Department's comments on the SSIWP, please include the requested figure in the response to this comment letter.

Response: *A figure has been prepared that summarizes the available measured fill thickness information for the Park Parcel. The figure is presented in Attachment A. The figure is based on all available field data sheets, boring logs, test pit logs, and monitoring well installation logs.*

Comment 3) Regarding SSIR Section 2.1 (Property and Site History), page 2-1, paragraph 1, the Order of Approval for Parcel B (Providence Public School) was issued on June 9, 2006, and the Order of Approval for Parcel C (YMCA) was issued on April 24, 2006. The text of the referenced paragraph incorrectly indicates that both Orders were issued on October 11 2001, which is the date of the original Order of Approval for Parcel A (former Stop & Shop).

Response: *The text will be revised to read as follows:*

The Remedial Action Work Plan (RAWP) for the entire 333 Adelaide Avenue site (Parcels A, B, C, and D) was approved by RIDEM in the Order of Approval dated on October 11, 2001. The former manufacturing facility has been razed, partly remediated and is in the process of redevelopment. A retail development has been completed on the southeastern portion (Parcel A). A public high school is currently under construction on a second parcel (Parcel B). The high school construction is subject to the requirements of the RAWP that was approved by RIDEM on June 9, 2006 in the Order of Approval,

specific to Parcel B. The Greater Providence YMCA will soon be constructing a facility that will include offices, recreational, and after-school daycare facilities and athletic fields on Parcel C under a RAWP which was approved by RIDEM on April 24, 2006 in the Order of Approval, specific to Parcel C.

Comment 4) SSIR Section 3.1 (Soil Sampling), page 3-3, paragraph 1, states, "Samples collected from the upland area of the debris pile and from the adjacent sampling grid generally appeared to be fill soils which contained varying amounts of construction debris. Hand excavations indicated that a thin layer of fill (generally one to two feet) likely overlies the original native sandy soil in this area of the Site. "Did the hand excavations conclusively determine the depth of fill (i.e., always reach native soils), and does the fill cover the entire upland area?

Response: *The hand excavations did not conclusively determine the thickness of fill. However, previous investigations did provide information concerning the depths at which native soils were encountered. See Figure 1 for fill thickness information.*

Comment 5) SSIR Section 3.4 (Magnetic Survey), page 3-5, paragraph 2, references "known intake pipes of cove water for process operations...located along the western and southern shores of the Inner Cove." Please add these items to Figure 3.4 (Magnetic Survey Results, Mashapaug Pond) or identify which of the 16 distinct magnetic anomalies correspond to the intake pipes. Please provide a copy of the map (or if already submitted, reference the location in the specific document) used to determine that the subject pipes were historic water intake pipes as opposed to discharge pipes.

Response: *Figure 3.4 has been revised and is attached to show the historical pipes that withdrew water from the Cove for fire protection or discharged into the Cove. Figure 3.4 already included a listing of the anomalies encountered at the 16 locations of interest during the magnetometer survey.*

Comment 6) SSIR Section 3.4.5 (Collection of Sediment Samples), page 3-8, paragraph 1, indicates, "The deeper samples were analyzed for the principal Site-related COPCs (VOCs, PPMs, and PAHs)." It should be noted that total petroleum hydrocarbons (TPH) was detected in 24 of 28 soil samples and 19 of 29 sediment samples, and dioxins/furans were detected in all 33 soil and all 28 sediment samples, indicating that they are also principal Site-related constituents of potential concern (COPC).

Response: *The term "principal" is intended here to mean that the chemical has been identified as having frequency of detection and range of concentrations (relative to applicable standards) that indicates that it is among a subset of chemicals or chemical groups that is more likely than others to*

pose risk that might require remedial action. "Site-related" in this context means that previous investigations have identified the chemical as being related to a release at the facility.

TPH is site-related in soil, but in terms of surface soil, especially along the perimeter of the pond, concentrations are almost completely below the applicable (defined by the March 2006 Consent Order) industrial/commercial direct exposure criterion of 2,500 mg/kg and the GB leachability criteria which is also 2,500 mg/kg. The source area petroleum product and impacted soil in the former manufacturing area (which has already been remediated) does not appear to be linked physically to the pond sediments.

Dioxin TEQ concentrations are not indicative of a principal chemical of potential concern. For soil, only, 5 of the 33 samples have concentrations above the applicable (defined by the March 2006 Consent Order) industrial/ commercial direct exposure criterion of 0.000038 mg/kg. Most of the detections show a congener distribution that is consistent with ubiquitous "combustion sources" that often deposit dioxins and furans on the ground via atmospheric deposition.

Note: samples with concentrations above the 38 ppt criterion include SS-1003, SS-SI005, SS-SI007, SS-SI008, and SS-SI024. Except for SS-SI-024, the samples are located in the same general area along the southern shore of Mashapaug Cove.

Comment 7) Regarding SSIR Section 4.1.3 (Inorganics and Metals), page 42, during conversations and meetings (including the meeting on October 4, 2006), representatives of Textron have consistently expressed the belief that the lead contamination in the fill surrounding the slag pile area (i.e., fill at the outer limits of the slag pile excavation area that does not contain visible pieces of slag), is consistent with lead contamination in fill throughout the site. Review of the SSIR results and Figure 4.7 (Concentrations of Lead in Soil) do not support Textron's interpretation of the data. When compared to the majority of the lead sample results from Parcel D, the compliance samples collected from the slag pile walls and base of the slag pile excavation exhibit elevated levels of lead contamination indicative of a concentrated "hot spot," rather than uniform or random lead distribution in fill.

Response: This issue was discussed at the January 10, 2007 Textron/RIDEM meeting and is addressed in the January 16, 2007 *Former Slag* Pile Area Supplemental Removal Action Work Plan.

Comment 8) Regarding SSIR Section 4.2.6 (Dioxins), page 4-7, your report should note that according to Table 4.6, the calculated dioxin toxic equivalents (TEQs) for all three surface water samples were greater than the surface water screening value standards.

Response: *Please note, the risk-based screening values are not standards – these screening values are very conservative values (drinking water risk-based concentrations) that would greatly overestimate risks for a non-drinking water exposure scenario such as the Mashapaug Cove scenario that is evaluated here. On page 4-7, the analytical findings are being presented for all of the analytical parameter groups. For none of the other analytical parameter groups discussed on this page or in this section of the SSIR are there any discussion about the comparisons that are made in Table 4.6. There is, however, detailed discussion of those comparisons in the risk assessment text in Appendix G, with respect to selection of chemicals of potential concern.*

Comment 9) Regarding Section 4.3.1 (Physical Characterization of Sediments in Mashapaug Cove), page 4-8) paragraph 2, this sentence suggests that several sediment samples (referring to SD-29 to SD-32) "included slag in [the] upper part of the cores" and that "the slag was subsequently removed from the shallow portion of the cove immediately to the north of the slag pile." Since these sample locations were spread out, has it been conclusively determined that all slag potentially above the upper concentration limit (UCL) was removed from the cove or will this need to be addressed at some later date?

Response: *Field records indicate slag was observed in only 3 sediment cores. Field records indicate one piece of slag was observed in each of the following three cores: SD-30, SD-31, SD-32. Slag was not observed in any of the other cores. These three core locations are the three locations closest to the former slag pile (all within 20 feet of the former slag pile) and are located in a very small area immediately adjacent to the former slag pile. These locations likely represented the northern extent of the slag material from the slag pile (slag pieces were not observed at sample locations further to the north, east, and west). The excavator was used to remove the slag material that was present in the submerged sediment immediately adjacent to the slag pile. This removal was conducted by feel (the bucket contacting the dense slag material versus the soft sediment was obvious to the operator). Once slag was no longer felt by the operator, submerged sediment was brought to the surface and visually confirmed to not contain slag.*

Any remaining slag pieces (if there are any) will be addressed as part of the sediment remedial activities.

Comment 10) SSIR Section 4.3.2 (Chemical Characterization of Sediments in Mashapaug Cove), page 4-9, paragraph 2, indicated "Four samples collected by RIDEM in 2005 are included in the discussion of current results." Please clarify whether "four" is a typographical error and all five samples collected by RIDEM were included. If not, please indicate which four were used and why.

Response: *The text will be revised to indicate that all five RIDEM sediment samples (SD-1001 to SD-1005) are in Table 4.7, Compounds Detected in Sediment, and that all five of the samples were used in the risk assessment.*

Comment 11) Regarding SSIR Section 4.3.3 (VOCs), additional investigation of sediment sampling location SD-19 should be performed, since several volatile organic compounds (VOCs) as well as arsenic were reported to be increasing with depth. This investigation should be included in the additional sediment investigation activities described in Section 4.4.5.

Response: *Additional evaluation of sediment quality at location SD-19 will be conducted. The evaluation will be conducted to clarify the nature and extent of contamination and to enhance the conceptual site model.*

Comment 12) SSIR Section 4.3.4 (SVOCs), page 4-10, states that sampling location SD-20 reported the highest semi-volatile organic compound (SVOC) concentrations, and indicates "Stormwater from the new shopping center discharges near this location and this result may be indicative of an influence from the large pavement areas that drain the new development." SSIR Section 5.2 (Ecological Risk Assessment for Mashapaug Cove), page 5-3, also states, "The source of PAHs appears to be the storm drain which discharges near SD-20." In order to determine if this hypothesis is correct, the runoff route and the complete upgradient pathway should be sampled appropriately, including the storm water detention/infiltration basin located behind the former Stop & Shop building. Consideration must also be given to the likelihood that storm water runoff may be a contributing source of polycyclic aromatic hydrocarbons (PAHs), but not be the only source.

a) Is it known whether the subject storm drain is old or new?

b) If old, what was it connected to (i.e., what did it drain) prior to the current development configuration?

c) Has the storm drain been inspected (videoed) for gaps, cracks and loose joints that could be allowing groundwater to enter the drain?

Response: *It is acknowledged that the stormwater discharge is not the only contributor of PAHs to Cove sediments, given that the "waste fill" that is located immediately to the south of Mashapaug Cove, and which is itself subject to stormwater flow and erosion, also contains PAH compounds. The discussion was intended to point out that the location with the highest sediment PAH concentrations is potentially impacted by the discharge from the stormwater retention pond as well as from overland flow from the remainder of the site.*

Comment 13) Regarding SSIR Section 4.3.8 (Organic Carbon), page 4-12, paragraph 2, the citation for the table of Organic Carbon Content of Sediments in Mashapaug Cove, should be Table 4.10, not Table 4.9.

Response: *The revision to the text will be made as suggested.*

Comment 14) Regarding SSIR Section 4.3.9 (Dioxins and Furans), page 4-12, paragraph 3, the citation for the figure of Concentrations of Dioxin TEQ in Surficial Cove Sediment (0-1 or 0-2 ft), should be Figure 4.31, not Figure 4.30.

Response: *The revision to the text will be made as suggested.*

Comment 15) Regarding SSIR Section 4.4.5 (Groundwater Quality and Potential Chemical Transport), page 4- 16, paragraph 3, a conclusion has been drawn, that "Analytical data for deep wells between the plume and Mashapaug Cove indicate the deep plume does not extend to the cove." This conclusion is based upon 11 year-old data (1995) and probably is not accurate today based upon current estimates of groundwater direction ("across the site towards the pond" [Sec. 4.4.41) and predicted rate of flow. ("groundwater could traverse the entire, property within a range of approximately one to 18 years" [Sec. 4.4.4]). These groundwater flow characteristics indicate that the plume may well extend to the Cove today and, at a minimum, represents a substantial future threat to the Cove. Also, SSIR Section 4.4.6 (Potential Groundwater/Sediment Interaction), states that "the June 2006 sediment sampling and analysis program in Mashapaug Cove did indicate that sediments at several sampling locations within the cove did contain a similar suite of VOCs as has been reported in groundwater. These data are suggestive of a link between groundwater discharge and sediment quality in Mashapaug Cove." And concludes that "If the VOC concentrations reported in sediments are associated with discharging groundwater, further study appears to be needed to fully understand the accumulation or retardation mechanisms that would explain the sediment concentrations. Other explanations for the VOC concentrations reported in sediments may also need to be investigated."

Therefore, since *"The vertical hydraulic gradient along the southern shore of Mashapaug Cove is upward, indicating that groundwater discharges into Mashapaug Pond"* [Sec.4.4.4], the Department requires properly investigating groundwater migrating toward the cove. In addition to further study of the cove sediments, a representative number of new groundwater monitoring wells (shallow and deep) should be installed at appropriate locations within Parcel D, to properly assess and gauge (or conversely to definitively rule out) any ongoing impacts to cove sediments from the chlorinated solvent groundwater plume originating on Parcel A, and/or to determine if there are any other previously unidentified groundwater contamination sources.

Response: *A work plan to investigate the source of VOCs in sediments will be prepared and submitted to RIDEM. The work plan will include the following components: 1.) review VOC data for soil, groundwater, sediment and surface water (including spatial distribution); 2.) installation of monitoring well pairs (shallow and deep) immediately south of Mashapaug Cove to determine vertical gradients, groundwater quality, and to confirm the previous characterization of the deep and shallow VOC plume adjacent to the Cove; 3.) installation of piezometers (screened at various depths) within Mashapaug Cove to determine water quality and to evaluate VOC migration mechanisms.*

Comment 16) Regarding SSIR Section 4.5.2 (Migration Pathways and Receiving Media), page 4-22, paragraph 2, a conclusion has been drawn that "There have not been highly leachable material identified in soils within the Site that might migrate to groundwater via leaching or infiltration." This statement is contradicted by the statements made earlier in the same section (page 4-21, paragraph 2); "Potentially, release of metals from the former slag pile might have occurred via infiltration of precipitation and subsequent leaching of metals. The leachate may have infiltrated into groundwater and subsequently flowed to surface water or it may have flowed directly into the cove from the slag pile." Furthermore, analytical data from the slag pile has indicated that at least one metal (lead) has been demonstrated to have the potential to leach.

Response: *No "readily leachable" materials have been identified. Slag material was leachable under an acidic test procedure (TCLP) and not in the natural environment. Between 1994 and 2006 three groundwater samples were collected from GZA-5 and analyzed for total lead. GZA-5 was located in the middle of the former slag pile and the top of screen extends from the bottom of this slag pile down 15 feet into the groundwater table. The lead concentrations from the three sampling periods ranged in concentration from 4 to 13.9 µg/L (ppb), below the GA drinking water standards for lead of 15 ppb. This site is located in a GB zone for which no lead standard exists. This historical data for GZA -5 was submitted by Textron to RIDEM in October 2006.*

In addition to the groundwater data from immediately beneath the former slag pile, surface water data from three sampling points (SW-24 through SW-26) near the former slag pile exhibited non-detectable concentrations (less than 5 µg/L) of lead. These surface water samples were collected prior to the removal of 1,300 cubic yards of slag material. This surface water data is included in the July 2006 SSIR. These groundwater and surface water data confirm that the former slag was not readily leachable under natural site conditions.

On page 4-21 of the SSIR, this discussion of a conceptual site model does not contradict the other language. It simply presents the possibility of leaching and migration into the cove – the surface water and groundwater data were reviewed and evaluated to determine if the "possibility" was a "reality". The actual data indicate that leaching of lead from slag into groundwater and/or surface water was not occurring while the slag pile was in place. This slag pile was removed from the site immediately following this sampling activity on June 6, 2006.

Comment 17) SSIR Section 5.1.2 (Sediment and Surface Water), page 5-3, paragraph 2 should clearly state that RME stands for Reasonable Maximum Exposure and CT stands for Central Tendency.

Response: *The text will be revised as suggested.*

Comment 18) SSIR Section 5.1.3 (Industrial/Commercial Worker), page 5-3, paragraph 4, makes an assumption that "Only those sediments at locations with two feet or less of standing water have been considered accessible to human receptors. This assumption is consistent with USEPA Region 1 risk assessment practice." Please provide a copy of the reference indicating USEPA Region 1's approval of this assumption, as well as documentation clearly indicating which data points have been excluded from consideration based upon the use of this assumption. Also, please explain whether and to what extent reasonably foreseeable (i.e., seasonal) changes in the water level in the pond and cove over time were considered when excluding data?

Response: *Appendix G Section 4.3 (Identification of Exposure Points and Exposure Routes) identifies which sediment samples were used to calculate risks and which samples were excluded.*

No sediment samples were eliminated from the human health risk assessment because standing water was more than two feet deep. Only samples with standing water greater than 6 feet were excluded – and this is based on common sense and professional judgment – there is almost no potential for sediment exposure when the depth of the water is greater than 6 feet.

Within the Inner Cove, it was conservatively (in a health-protective manner) assumed that due to seasonal fluctuations in water levels and the shallow nature of the Inner Cove, that all sediment sampling locations could have less than two feet of standing water and therefore could be accessible. All 2005 and 2006 RIDEM and Textron sediment samples collected from within the Inner Cove were utilized in the risk assessment as indicated in the text of Appendix G. Text will be added to section 4.3 to clarify this.

The only sediment samples that were not used in the human health risk assessment because the sediments were not accessible were samples collected from SED11, SED14, and SED15 located in the Mashapaug Outer Cove. The measured water depths at those locations were greater than 6 feet at the time of sampling. It is virtually impossible for humans who are swimming to be exposed to sediments that are beneath more than six feet of water and people who are wading would not be in water more than six feet deep.

Obviously, in the environmental risk assessment, all surficial sediment samples were considered accessible for environmental receptors and therefore, all surficial sediment samples were considered in the assessment.

Although there is no written policy, USEPA Region I has directed the Army and MACTEC to consider submerged sediments to be generally inaccessible. In a comment letter to a technical memorandum for the Natick Buildings 22 & 36 Sites, the following USEPA comment and Army response address this issue.

RESPONSE TO USEPA COMMENTS ON BUILDINGS 22 & 36 RISK TECHNICAL MEMO DATED JUNE 2002

Comment (Part 1): Potential sediments exposure pathways:

Because there is no data on exposed sediments (clearly above the water level of the lake) as the tech memo suggests, USEPA suggests that this pathway not be quantitatively evaluated for human health risk as proposed. The reason being is that despite what may be a plausible transport mechanism, the nature of exposure to submerged sediments is apt to be so fleeting that it would only warrant a qualitative evaluation. If however, transport of site related contaminants to exposed sediments is plausible and if there is data on exposed sediments, then incidental ingestion and dermal contact with exposed shoreline sediments would likely represent two complete exposure pathways for which a quantitative risk evaluation may be warranted.

Response: *The Army concurs that there is unlikely to be a complete exposure pathway to submerged sediment. The sediments associated with the release at the site do not become unsubmerged. Therefore, the sediments do not require quantitative evaluation in the risk assessment.*

No revisions to the risk assessment calculations are needed with respect to this comment.

Comment 19) SSIR Section 5.1.4 (Trespasser) page 5-4, paragraph 1:

a) The 2nd sentence of the 1st paragraph is not entirely consistent with field observations. During two site visits, trespassers (homeless?) were observed camping on the shore of Parcel D. According to Mr. Robert Dorr, the site has a long history of trespassers entering and living along the cove shoreline. In addition to catching fish, Mr. Dorr has observed trespassers wading and bathing in the inner cove as well as cooking with water from the inner cove. Please respond.

Response: *The second sentence of the 1st paragraph states, "Trespassers could potentially circumvent the fence and enter the Site for various activities." That sentence is accurate.*

More effective enforcement of the Consent order-required Barrier to access to the Park Parcel is required. The Consent Order for Parcels B and C requires that the City install and maintain a "Barrier to prevent access to the Park Parcel". The Order requires that signs be posted on the fence indicating "Warning – Keep Out – Environmental Clean-up In Progress". Further, the Order requires that "The

City shall continue to maintain and keep in place the Barrier until such time as the Park Parcel has been remediated to a level that is sufficient to safely permit limited public recreational activities". Additional actions are being taken by the City to prevent frequent trespassers during the Environmental Clean-up Process and to provide housing or shelter for frequent trespassers or campers.

b) The final two sentences in this paragraph state that "In the summer months which is when swimming and wading are likely to occur, the Inner Cove becomes covered with aquatic vegetation making it a less desirable place for wading or swimming compared to the Outer Cove. Also the water in the Inner Cove is relatively shallow (generally less than 3 feet during the summer) which would make swimming difficult." However, shallower water in the summer also makes wading easier and more inviting, particularly near areas that are typically clear of mass vegetation such as outfall pipes and overland storm water discharge channels, which also appear to be locations where elevated levels of contamination have been detected at this site.

Response: *The Inner Cove is not an inviting place for wading. Most of the surficial sediments within the Inner Cove are highly organic, soft muck, which makes wading difficult, uncomfortable, and unsafe (someone could get stuck in the muck, lose his/her balance, and fall into the water) due to the physical nature of the sediment material in the Inner Cove.*

Comment 20) Regarding SSIR Section 6 (Remedial Alternative Evaluation), the Department acknowledges that construction of an engineered cap over areas of contaminated soil, along with long term maintenance and monitoring of the cap, and recording an Environmental Land Usage Restriction (ELUR) on the Site, is typically an acceptable remedial alternative. In this case however, due to the proximity of the proposed capped area to Mashapaug Cove, and the significant impact that installation of any type of cap would have on the established wetlands, the Department cannot conceptually concur with either of the two capping remedial alternative as currently proposed. The Department's Freshwater Wetlands Program (Wetlands) has jurisdiction over the 50-foot perimeter of Mashapaug Cove, and any disturbance in that jurisdictional area must receive prior Wetlands review and approval. The limited description of the proposed activities is insufficient to evaluate either capping remedial alternative. At a minimum, the following questions must be addressed:

a) Please clarify whether and to what extent installation of either proposed cap involves any of the following activities and include comprehensive explanations or descriptions as applicable:

i) Cutting or removal of any vegetation (trees, shrubs, bushes, plants, etc.);

Response: *The construction of the proposed cap will require a graded surface to place geotextile fabric upon or to place clean fill above the native soils (see the response to comment 20(i) for more clarification on the cap materials and thickness). Vegetation including shrubs to trees will need to be cleared and stumps removed. Viable woody plants under the cap will compromise the cap's effectiveness. These details will be provided within the Remedial Action Work Plan (RAWP) and will be coordinated with RIDEM under both the Remediation and Wetland Regulations.*

ii) Modification of the existing wetlands terrain by excavation, removal of material, filling, consolidation, regrading or other disturbance;

Response: *By RIDEM definition a fresh water wetland is located within 50 feet of a surface water body (Mashapaug Cove). MACTEC and Textron understand the importance of preserving wetlands and will develop a RAWP that addresses this habitat. As stated above the capping alternative will require the removal of material, grading and restoration of this wetland area. The RAWP will include the details of this remediation alternative and the restoration of the fresh water wetlands.*

iii) Modification of the existing shoreline boundary and dimensions or grades by addition or subtraction of fill, or the use of bulkheads, riprap or other engineered structures.

Response: *The shoreline boundary along Mashapaug Cove will be restored to approximately its original location and grade. The grading of the site away from the shoreline will be performed using native soils whenever possible. Grading will be performed in areas where it would be difficult to impossible to otherwise construct the cap.*

In certain cases, clean fill will be required to support slope stabilization. This thickness of clean fill will not be counted toward the cap thickness. Further details of the cap construction will be developed and detailed within the RAWP.

b) Since it is understood that placement of an engineered cap thick enough to provide a protective cover over contaminated site soil would also result in the death of existing trees, shrubs and plants, please clarify how the proposed capping will be implemented.

Response: *These matters will be addressed in the Remedial Action Work Plan.*

c) Please clarify how placement of the geofabric mentioned in the second proposed remedial alternative, will be implemented (i.e., removal of all existing vegetation followed by placement of the geofabric, or excavation and placement around existing vegetation, etc.).

Response: *These matters will be addressed in the Remedial Action Work Plan.*

d) How will the engineered cap be constructed and maintained on the steep slopes of the site?

Response: *These matters will be addressed in the Remedial Action Work Plan.*

e) Note that the fence installed by the City around Parcel D pursuant to the March 29, 2006 Consent Order (Parcels B and C) was intended as a temporary barrier to facilitate the development of residential uses on Parcels B and C while the investigation and remediation of Parcel D was completed. Please explain whether the City was consulted on or has agreed to this proposal and discuss how this proposal is consistent with the limited public recreational uses that have been proposed for Parcel D.

Response: *The SIR proposal to meet industrial/commercial soil standards with a cap is consistent with the March 2006 Consent Order (Park Parcel). The Consent Order states,* ***"The goal of the proposed final remedy shall be to bring the Park Parcel into compliance with applicable RIDEM-established industrial/commercial standards."*** *It should be noted that RIDEM and the City are parties to the Consent Order.*

The City has been briefed on the proposed remedy.

f) Who (Textron or the City) will assume long term monitoring and maintenance of the engineered cap, including but not limited to periodic inspections, tending of any restored vegetation, repair of damaged or eroded areas, and annual certification requirements under the ELUR?

Response: *These matters will be addressed in the Remedial Action Work Plan.*

In addition, please be advised of the following related issues:

g) The Department recognizes that limited disturbance of the existing wetlands for the purpose of removing the slag pile and/or UCL exceedances is unavoidable. As noted by Wetlands personnel during correspondence regarding the slag pile area remedial activities, any disturbance of jurisdictional wetlands requires appropriate restoration and replanting of the disturbed area to its prior forested condition. As such, the proposal to simply loam and seed the cap would not meet Wetlands minimum requirements.

Response: *These matters will be addressed in the Remedial Action Work Plan. See response to Comment 20(a).*

h) As currently proposed, the remedial work in the 50-foot perimeter of Mashapaug Cove would not fall under the Site Remediation exemption listed in Rule 6.01 (General Conditions for Exempt Activities) and Rule 6.08 (Site Remediation) of the Department's Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act (Wetlands Regulations), but would require a formal Wetlands application and permit (typically averaging eight to ten months).

Response: *The remedial alternatives in the SSIR will be revised such that the alternatives would qualify for the Site Remediation exemption from Wetlands Permitting through the remediation and restoration of the fresh water wetlands.*

i) The Department requires that any engineered cap provide a minimum degree of protection equivalent to two feet (24 inches) of clean fill over regulated soil. As currently proposed, neither of the two capping remedial alternatives (15 inches and 21 inches) meets that minimum requirement.

Response: *According to RIDEM Remediation Regulations Section 12.03(B) and again within RIDEM January 29, 2002 Policy for Marginal Risk Sites the equivalents of two feet of clean fill are:*

6 inches clean soil cap with 4 inches of asphalt pavement or concrete;

OR

1 foot of clean soil over a Geofabric material.

The 15-inch cap alternative included in the SSIR exceeds the two-foot equivalent as it provides a Geofabric barrier and 15 inches, rather than only 12 inches of clean soil over Geofabric.

The 2001 RAWP approved by RIDEM included 12 inches of clean soil or a hard cap (e.g., pavement) for Industrial/Commercial Direct Exposure Criteria exceedances and 18 inches of clean soil with a geotextile fabric for Residential Direct Exposure Criteria in undeveloped portions of the Site.

j) An acceptable alternative to capping contaminated soil in a jurisdictional wetland is to remove the contaminated soil and restore the disturbed area to its prior forested condition.

Response: *Comment noted and will be considered in the reassessment of the remedial alternatives.*

k) When submitting the revised remedial alternatives, please include one additional hard copy for submittal to Wetlands. This requirement also applies to submittal of the draft Remedial Action Work Plan (RAWP).

Response: *An additional hardcopy of the revised remedial alternatives (and of the RAWP) will be provided to RIDEM for submittal to Wetlands.*

l) A site specific, post construction Soil Management Plan (SMP), detailing plans for long term monitoring and maintenance of the engineered cap, must be developed and submitted for Department review and approval during the RAWP phase of the project, and shall be required to be recorded with the final Department approved ELUR for the property.

Response: *Comment noted. This will be included with the RAWP.*

Comment 21) Section 6.1 should include a statement that dioxins/furans were also found at concentrations that exceeded the calculated Method 2 Industrial/Commercial Direct Exposure Criteria (I/CDEC).

Response: *The text will be revised to indicate that concentrations of dioxin TEQ in soil were higher than the calculated Method 2 Industrial/Commercial Direct Exposure Criteria (I/CDEC) at five sampling locations.*

Comment 22) Regarding SSIR Section 6.2 (UCL Exceedance), page 6-2, paragraph 1, please be reminded of the following:

a) All confirmatory compliance samples shall be grab samples collected from the excavation floor and walls, in order to adequately demonstrate that removal actions have been completed and the remedial objective goal achieved. Samples collected from the excavated, material may not be used as confirmatory compliance samples.

Response: *A letter report has been prepared to summarize the removal of UCL exceedances in the Park Parcel soils by Textron in 2006. The letter report is included as Attachment B.*

b) When submitting any samples to the laboratory for analysis (whether for investigation or remedial compliance purposes), please confirm that all of the laboratory detection limits are below the Department's criteria, as a number of samples from previous sampling events reported method detection limits higher than the applicable Department criteria. Contaminants noted to have detection limit exceedances on the laboratory analytical data reports in this SSIR included benzo(a)pyrene, benzo(a)anthracene, benzo(g,h,i)perylene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, indeno(l,2,3-cd)pyrene, chrysene, antimony and thallium.

Response: *Soil: For soil, the laboratory detection limits for all soil samples presented in this SSIR were below the Remediation Regulations Industrial/Commercial Direct Exposure Criteria consistent with the March 2006 Consent Order for all analytical parameters except benzo(a)pyrene and dibenzo(a,h)anthracene. For those compounds, the detection limit was higher than* the *Remediation Regulations Industrial/Commercial Direct Exposure Criteria in only 4 of 77 and 9 of 77 samples respectively. All four of the benzo(a)pyrene detection limits higher than the Industrial/Commercial Direct Exposure Criteria were associated with samples analyzed in either 1994 or 2001 (none from the recent 2005 or 2006 sampling events). For dibenzo(a,h)anthracene, only two samples from 2006 had non-detectable results with detection limits higher than the Industrial/Commercial Direct Exposure Criteria. Detection limits for antimony and thallium were below Industrial/Commercial Direct Exposure Criteria for soil in all soil samples.*

When coordinating with analytical laboratories, we request methods that are standard methods and generally meet risk-based needs. However, on a sample-specific basis, we may have some elevated

reporting limits, which are typically considered as an uncertainty and are discussed as such within the SSIR.

Comment 23) Regarding SSIR Section 7.1.3 (Fate and Transport), page 7-5, paragraph 3, the statement that "Groundwater containing low levels of chlorinated VOCs is currently being remediated on Parcel A." is misleading, as (a) the groundwater on Parcel A contains very high levels of chlorinated VOC contamination, and (b) remedial efforts to date have been unsuccessful.

Response: *The text will be revised to read as follows:*

Groundwater source area remediation and groundwater monitoring activities are ongoing on Parcel A.

Comment 24) SSIR Section 7.1.4 (Risk Characterization and Remedial Requirements), page 7-6, paragraph 4, states that "Specific to the Outer Cove, only arsenic in sediment is associated with cancer risk greater than one in one million, even though the cumulative cancer risk is less than one in one hundred thousand. It is not clear, however, that the arsenic sediment concentration used to evaluate the Outer Cove represents a Site-related impact or if it is typical of the variability within Mashapaug Pond sediments." It should be noted that the determination of the source of the arsenic (or any other contaminant detected at the Site), does not change the potential risk associated with exposure to the contaminant.

Response: *The statement, "It is not clear, however, that the arsenic sediment concentration used to evaluate the Outer Cove represents a Site-related impact or if it is typical of the variability within Mashapaug Pond sediments" is intended to provide RIDEM and the public important context for the summary risk statement cited above Figure 4.25 of the SSIR which presents the spatial distribution of arsenic concentrations in surficial sediments. The distribution of arsenic concentrations for the Inner Cove and Outer Cove is very different from the distributions of copper (Figure 4.26), chromium (Figure 4.27), lead (Figure 4.28), nickel (Figure 4.29), and silver (Figure 4.30). As can be observed in these figures, the concentrations of copper, chromium, lead, nickel, and silver in surficial sediments within the Inner Cove are substantially higher than the corresponding concentrations in surficial sediments in the Outer Cove. However, for arsenic (Figure 4.25), there is no substantial difference in concentrations between the Inner Cove and Outer Cove, and in fact, the highest arsenic concentration in surficial sediments was detected in the Outer Cove at location SED-14 (47.6 mg/kg). The arithmetic mean arsenic concentrations in surficial sediment for the Inner Cove and Outer Cove are 17.9 mg/kg and 13.0 mg/kg respectively.*

The arsenic sediment concentration used as the exposure point concentration for the Outer Cove was the highest concentration among those Outer Cove samples that were considered potentially accessible (in this case, with less than 6 feet of standing water above them). The concentration of 11.5 mg/kg was identified for sampling location SED-13.

The conceptual site model suggests that metals associated with waste fill along the North Bank area (southern shore of Mashapaug Cove) may have been transported into the Cove via stormwater flow and erosion processes that carry waste fill soil. In such a situation, typically, there is a greater impact on receiving media at locations closer to the source than at locations distant from the source. In some cases there is a clear concentration gradient, with decreasing concentrations in receiving media as distance from the source increases. In other cases, there may be a highly impacted zone or area immediately adjacent to the source and then areas or zones at some distance from the source where impacts are not so obvious or even non-existent. Also, typically, at some distance from the source, concentrations appear to be stable (no longer decreasing), which is indicative of background conditions and an absence of source-related impacts. The distribution of concentrations in receiving media may not perfectly fit this simplistic model, since there may be physical factors that affect the transport and deposition of eroded materials. For example, deeper depositional areas may accumulate greater amounts of eroded material than other areas. In some cases, contaminants may bind to a greater extent to sediments with higher organic carbon content than to sediments with lower organic carbon content. In addition, a channel (deeper bottom) may extend the area of impact by transporting eroded material a greater distance.

At the Gorham site, it does appear that the metals impacts are primarily observed in Inner Cove sediments, but there does appear to be a channel through the middle of the Outer Cove (oriented roughly through SED-14 (water depth 9.4 feet) and SED-11 9 (water depth 11 feet) where a limited impact appears to be present.

The distributions of copper, chromium, lead, nickel, and silver in the Inner Cove and Outer Cove surficial sediments appear to be consistent with the waste fill/stormwater runoff/erosion conceptual site model and they show greater impacts in the Inner Cove (closer to the waste fill source) than in the Outer Cove (further from the source). The arsenic concentration distribution in surficial sediments does not appear to fit the waste fill/stormwater runoff/erosion conceptual site model, and that is not surprising, since arsenic concentrations in soil at the site were not highest in the waste fill material in the North Bank area (Figure 4.6), but rather in soils outside and to the northeast of the Inner Cove. Arsenic is not characteristic of the waste fill material. The highest concentration of arsenic in surficial sediment is at SED-14 in the Outer Cove, which is not immediately adjacent to the waste fill area, but rather approximately 300 feet from the southern shore of the Inner Cove that is adjacent to the North Bank area. This is not consistent with the transport and deposition mechanisms and the distributions of metals that are characteristic of the waste fill along the North Bank area.

It is acknowledged that the source of a contaminant does not affect the magnitude of risk associated with a given concentration. However, a consideration of sources of contaminants is very important in the cleanup process. At a given site, the concentration of a chemical in sediment could be reflective of a natural condition, an urban background condition, a point "source-release", or a combination of these conditions.

Decisions about the need for remediation under the Remediation Regulations should be made using professional judgment and should consider the true risk reduction that might be achieved by a remedial action. The Remediation Regulations were not intended to require cleanup of all environmental contamination regardless of source. In urban areas, atmospheric deposition of materials released into the air by industrial facilities, power plants, and municipal waste combustors and non-point source storm water runoff contribute chemicals to surface soils and sediments in and around surface water bodies. Those contributions are added to the natural occurring concentrations of many substances. The Remediation Regulations were not developed to cleanup those types of contamination. These regulations were developed to cleanup specific point-source releases of chemicals to the environment.

When very specific site-related impacts are evaluated and determined to require cleanup based on the risk-based requirements of the Remediation Regulations, risk reduction measures are clearly appropriate. However, when a typical urban condition (typical sediment quality in an urban pond) is found to be associated with a borderline risk (a single chemical has cancer risk estimate slightly above one in one million, but the cumulative risk (multiple chemicals) is below the cumulative risk limit), it would appear that remedial activity could result in minimal risk reduction, the risk reduction could be short-lived (if the mechanisms of contributing to typical urban conditions continue and re-contaminate the remediated area), and the funding for the remediation might mean that some type of site improvement might not be possible.

The following language is taken from the USEPA Guidance, Contaminated Sediment Remediation Guidance for Hazardous Waste Sites, EPA-540-R-05-012 Office of Solid Waste and Emergency Response OSWER 9355.0-85 December 2005:

> Where site contaminants may also have natural or anthropogenic (man-made) non-site-related sources, it may be important to establish background or reference data for a site. When doing so, project managers should consult USEPA's *Role of Background in the CERCLA Cleanup Program* (U.S. EPA 2002b), the *EPA ECO Update - The Role of Screening-Level Risk Assessments and Refining Contaminants of Concern in Baseline Ecological Risk Assessments* (U.S. EPA 2001f), and *Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites* (U.S. EPA 2002c). Although the latter is written specifically for soil, many of the concepts may be applicable to contaminant data for sediment and biota. It should be noted that a comprehensive investigation of all background substances found in the environment usually will not be necessary at CERCLA sites. For example, radon background samples would not be normally collected at a chemically contaminated site unless radon, or its precursor was part of the CERCLA release.
>
> Where applicable, project managers should consider continuing atmospheric and other background contributions to sites to adequately understand contaminant sources and establish realistic risk reduction goals (U.S. EPA 2002b). For baseline risk assessments, USEPA recommends an approach that generally includes the evaluation of the contaminants that exceed protective risk-based screening concentrations, including contaminants that may have natural or anthropogenic sources on and around the Superfund site under evaluation. When site-specific information demonstrates that a substance with elevated concentrations above screening levels originated solely from natural causes (i.e., is a naturally occurring substance and not release-related), these contaminant normally does not need to be carried through the quantitative analysis. However, these contaminants should be generally discussed in the risk characterization summary so that the public is aware of its existence.

The presence of naturally occurring substances above screening levels may indicate a potential environmental or health risk, and that information should be discussed at least qualitatively in the document. If data are available, the contribution of background to site conditions should be distinguished (U.S. EPA 2002b). This approach is designed to ensure a thorough characterization of risks associated with hazardous substances, pollutants, and contaminants at sites (U.S. EPA 2002b).

For risk management purposes, understanding whether background concentrations are high relative to the concentrations of released hazardous substances, pollutants, and contaminants may help risk managers make decisions concerning appropriate remedial actions (U.S. EPA 2002b). Generally, under CERCLA, cleanup levels are not set at concentrations below natural or anthropogenic background levels (U.S. EPA 1996a, 1997c, 2000c). If a risk-based remediation goal is below background concentrations, the cleanup level for that chemical may be established based on background concentrations.

Comment 25) SSIR Section 7.2 (Conclusions of the Supplemental Site Investigation Report), page 7-9, paragraph 3, states, "Removal of the slag material along the southern shore of Mashapaug Cove was completed on July 17, 2006." This statement is not accurate. It should be noted that there are outstanding issues that need to be resolved before the Department considers the slag removal to be complete. These issues will continue be addressed in correspondence separate from this SSIR.

Response: *The text will be revised as follows: "Approximately 1,300 cubic yards of slag was removed from the site between May 26, 2006 and July 18, 2006. Slag removal activities ceased at the visual limit of slag material. The follow-up confirmatory sampling, site restoration, and coordination with the soils remedy for the Park Parcel are on-going with RIDEM." A meeting with RIDEM to discuss this issue was held on January 10, 2007 and a supplemental slag removal work plan was submitted to RIDEM on January 16, 2007.*

Comment 26) SSIR Section 7.2, page 7-10, paragraph 1, states, "Additional sampling and analysis is necessary to delineate the extent of sediment contamination by metals and dioxins and furans and to distinguish Site-related impacts from the current sediment conditions in Mashapaug Pond." Is Textron proposing to complete a comprehensive assessment of the surface water and sediments of Mashapaug Pond in order to characterize "current sediment conditions in Mashapaug Pond?" It would be necessary to fully assess Mashapaug Pond in order to accurately distinguish between Pond related and Site related impacts, and to determine if cove related contamination was extending into the pond or vice versa.

Response: *Please see response to comment 24 above. The intent is to conduct additional investigation in the area of sediment sampling location SED-11 to determine the horizontal extent of sediment impact. The results will be used in a "concentration gradient" approach to characterize horizontal extent.*

When concentration gradients "flatten out" (no additional decreasing trend is observed), that is an indication that the impact of the source is no longer substantial or even discernible. The sediment data collected to date do show generally decreasing trends as the distance from the southern shore of Mashapaug Cove increases (moving into the open water area of the pond). Based on the data results obtained to date, an assessment of Mashapaug Pond is not necessary to delineate metals, dioxin and furan contamination in the sediment.

Comment 27) SSIR Section 7.2, page 7-11, paragraph 3, states, "It is not clear that the arsenic concentrations in the Outer Cove sediment are typical of the variability within Mashapaug Pond or are Site-related so additional site investigation is warranted prior to determining the need for remediation of the Outer Cove sediments." It should be noted that the need for remediation is typically based upon the measured and calculated risks from exposure to contamination, not upon the source of the contamination. It should be further noted that the Cove is part of the Site for which Textron is a responsible party.

Response: *Please see response to comment 24 above.*

Comment 28) Table 4-1 of the Health and Safety Plan (HASP) in Appendix A should also list dioxins and furans. The 4th paragraph of HASP Section 4.1 should state that certain sediment and soil locations are known to contain dioxins, furans and PCBs. The Department also requests that Textron strike the following language from the 4th paragraph of HASP Section 4.1 "...that are not thought to have originated at the Site..." because it is unsupported and speculative.

Response: *Comment has been noted and the revisions will be made to the HASP for future site activities. The HASP will be revised to include the contaminants within Table 4-1 and that they are present in Mashapaug Pond.*

Comment 29) Area of Proposed Cap, Figure 6.1. A soil sample at location SS-210 is shown to have exceeded a Method 1 I/CDEC. Will additional testing be conducted to define the boundaries of contamination? How will it be determined that all contaminated soil above the Method 1 I/CDEC has been identified and placed under the soil cap as proposed in the "Notes" section on Figure 6.1?

Response: *Additional soil sampling will be proposed as part of the soil cap design to further define the horizontal extent of the cap and to consolidate outliers under the cap. Soil from SS-210 will be removed and consolidated under the cap. This information is included in the note section on Figure 6.1. Confirmatory soil samples will be collected at SS-210 to ensure that the soils exceeding*

Industrial/Commercial Criteria have been removed. This will be discussed in greater detail within the RAWP.

Comment 30) Regarding SSIR Appendix G (Human Health Risk Assessment), the Department has the following comments:

a) In accordance with Rule 8.03 (Method 3 Remedial Objectives) of the Remediation Regulations, "Site-specific human health risk assessments shall be conducted only after review and approval of a Human Health Risk Assessment Work plan by the Department.

The methodology proposed in the Human Health Risk Assessment Work plan must be consistent with scientifically acceptable risk assessment practices and the fundamentals of risk assessment under USEPA's Risk Assessment Guidance for Superfund. The Human Health Risk Assessment Report, when completed according to the approved work plan, shall propose remedial objectives for all impacted environmental media, as appropriate."

According to the SSIWP previously referenced in comment 2, (SSIWP page 1-2, paragraph 2), "A proposed Work Plan for the expanded risk assessment for the Park Parcel and Mashapaug Pond will be submitted to RIDEM following a review of this, supplemental site investigation of the Cove." No such Work Plan was ever submitted to the Department by Textron.

The Department expected the submittal of a Human Health Risk Assessment Work Plan prior to submittal of the Human Health Risk Assessment. Many of the Department's Risk Assessment related comments and concerns would have been addressed during the work plan review.

Response: *The text of the previous SSIWP envisioned a step-wise process in which the supplemental site investigation data would be reviewed prior to scoping an expanded risk assessment and writing a Work Plan. The schedule for the submittal of the SSIR (including human health and ecological risk assessments) imposed by the "March 2006 Consent Order (Park Parcel) precluded the step-wise process that had been planned. The Consent Order required the submittal of the SSIR Report (including risk assessments and proposed remedial alternatives) by July 31, 2006. Dialog with RIDEM concerning the scope of the site investigation activities (sampling and analysis) continued into June 2006. Field investigation activities began the first week of June 2006. Laboratory data were not all received until the middle of July. There was no time in the Consent Order-mandated schedule for a Work Plan submittal, RIDEM review, dialog, and revisions to the Work Plan. The Consent Order did not require a*

risk assessment Work Plan. All future work to complete the Cove Investigation and SSIR will be coordinated with RIDEM and will include a work plan submittal to RIDEM before conducting these activities.

Response: *See response to comment above.*

b) It should be noted that the reported human health risks, associated with potential exposure to cove contaminants (excluding dermal contact with PAHs and dioxins), exceed Department cancer risk benchmarks (Appendix G, Table 14). When dermal exposures to PAH's and dioxin were added into the cumulative risk calculations for the inner cove trespasser scenario (Appendix G, Table E14), the total cancer risk for the receptor is given as 3E-04, which is an order of magnitude above the Department regulatory standard.

Response: *The risks associated with potential dermal exposure to PAHs and dioxin/furans in surface water are highly uncertain and likely greatly overestimate the actual risks. The standard approach for evaluating skin exposure to contaminants in surface water does not fit well with compounds that are sparingly soluble in water.*

USEPA's standard approach for evaluating absorption from water through the skin assumes that the contaminants are dissolved in water and are then transferred through the skin. The dioxin/furan compounds and PAHs reported in surface water are most likely tightly bound to suspended sediment particles in the water. These tightly bound compounds are not likely dissolved in the water and are not available for absorption through the skin during water/skin contact. This issue was discussed at length in the human health risk assessment for the Centredale Manor Superfund Site in North Providence, and, because of the high level of uncertainty associated with the surface water/dermal absorption pathway, the exposure assessment and risk assessment for that pathway was not included in the risk calculations that were used in the remedial decision-making. The approach presented in this Former Gorham Site risk assessment is consistent with the USEPA approach presented in the Centredale Manor Superfund Site risk assessment.

c) In the Department's 2002 report "Mashapaug Pond Data Report and Analysis," fish tissue (Carp) was found to be "high for certain dioxins and furans...and some values were at or around [the USEPA fish

consumption limit of 1.2 ng/kg." Also, the concentrations of PCBs in "some of the Carp tissue samples appear[ed] high, but the limit for PCBs [was] 94 µg/kg and the highest recorded [value] was 54.93 µg/kg". Given those findings and considering Department observations in the field and those of Mr. Robert Dorr concerning homeless people living in the park parcel and eating fish, cumulative risk calculations should include the fish ingestion pathway for both homeless trespassers who live along the inner cove and community members (adolescent/adult trespassers and family members, e.g., children) who consume fish from the pond. This is an important pathway to consider as long-term risk management options will need to incorporate more effective measures than currently exist (i.e., fencing and signage) for preventing exposure to COPCs in fish tissue. Section 6 of Appendix G concludes that PAHs and dioxins in sediment have the potential to bioaccumulate in fish and that the consumption of fish "could potentially result in exposure." Questions to be addressed include the range of COPCs that may need to be tested for in fish tissue (for example, it does not appear that earlier testing included PAHs or lipophilic VOCs of concern) and the number of samples to be taken. Also, the conceptual site model (fate and transport) should be modified to show that a complete exposure pathway from site sources to biota (including fish) exists, while risks from ingesting contaminated fish would need to be added to the adolescent and adult trespasser cumulative risk calculations as acknowledged on page 10 of the risk assessment report (App. G).

Response: *The Department's 2002 "Mashapaug Pond Data Report and Analysis" provided a summary of analytical results for two composite fish samples (one each of carp and bass). The limited data set was apparently used as the basis of a fish consumption advisory issued jointly by RIDEM and RIDOH. That advisory apparently utilized a published "advisory level" of 1.2 ppt TEQ. The use of the word "high" to describe levels of certain dioxins and furans does not appear to be appropriate. The dioxin and furan toxic equivalence (TEQ_{DF}) for the carp and bass tissue samples were only 1.33 ppt and 0.46 ppt respectively. These values represent all of the dioxins and furans detected in those samples. To place those concentrations in perspective, the 2004 Draft Dioxin Reassessment Document submitted to the National Academy of Sciences for review identifies background levels of dioxin and furan TEQ concentrations for freshwater fish and shellfish. That document (page 3-60) states, " ...the average background TEQ_{DF}-WHO_{98} concentration in freshwater fish and shellfish was estimated to be 1.0 ppt, assuming non-detects are equal to one-half the detection limit.* ***The average TEQ_{DF} for the Mashapaug pond samples is (1.33 ppt + 0.46 ppt)/2 = 0.895 ppt. This suggests the 2002 dioxin and furan data for fish tissue from Mashapaug Pond are consistent with average background concentrations in freshwater fish and shellfish as reported by USEPA in 2004.***

The 2002 fish data are summarized in the table below, as is the calculation of the Toxic Equivalence (TEQ). When the TEQ term is written as TEQ_{DF}, this indicates the TEQ is based on dioxin and furan compounds. When the term TEQ_P is presented, this indicates the TEQ is based on dioxin-like PCB compounds only.

Some language putting the fish tissue concentrations into perspective might be a useful addition to an update of the RIDEM/RIDOH fish consumption advisory.

See response to comment 19 regarding people who had been trespassing and temporarily living at the Park Parcel. Textron and its consultants do not have verifiable documentation of people catching and consuming fish from Mashapaug Cove, in violation of the fish consumption advisory that was previously issued by RIDEM and RIDOH. Textron continues to urge the City of Providence to minimize access to the Park Parcel during the remedial activities.

The dioxin and furan data collected for two fish samples from Mashapaug Pond in 2002 do not indicate a site-related impact. PCBs and dioxins and furans are virtually ubiquitous in fish in urban areas. In fact, typical background concentrations may be higher than published fish consumption advisory levels. In the tables below, the fish tissue data (carp and bass) from Mashapaug Pond are compared to the fish tissue data for the background area (Greystone Mill Pond) and the reference area (Assapumpsett Pond) for the Centredale Manor Restoration Project Superfund Site. The 2002 Mashapaug Pond fish tissue data appear to be consistent with the unimpacted areas investigated for the Centredale Manor Superfund Site.

Summary of Analytical Data for Dioxins and Furans in Two Fish Samples Collected from Mashapaug Pond (2002)

Congener	TEF	CARP (ng/kg)	BASS (ng/kg)	CARP TEQ (ng/kg)	BASS TEQ (ng/kg)
2,3,7,8-TCDD	1	0.15	0.05	0.15	0.05
1,2,3,7,8-PeCDD	1	0.47	0.19	0.47	0.19
1,2,3,4,7,8-HxCDD	0.1	0.23	0.05	0.023	0.005
1,2,3,6,7,8-HxCDD	0.1	0.05	0.05	0.005	0.005
1,2,3,7,8,9-HxCDD	0.1	0.05	0.05	0.005	0.005
1,2,3,4,6,7,8-HpCDD	0.01	1.23	0.12	0.0123	0.0012
OCDD	0.0001	1.47	0.06	0.000147	0.000006
2,3,7,8-TCDF	0.1	1.07	1.48	0.107	0.148
1,2,3,7,8-PeCDF	0.05	0.05	0.2	0.0025	0.01
2,3,4,7,8-PeCDF	0.5	1.05	0.05	0.525	0.025
1,2,3,4,7,8-HxCDF	0.1	0.13	0.05	0.013	0.005
1,2,3,6,7,8-HxCDF	0.1	0.05	0.05	0.005	0.005
1,2,3,7,8,9-HxCDF	0.1	0.05	0.05	0.005	0.005
2,3,4,6,7,8-HxCDF	0.1	0.05	0.05	0.005	0.005
1,2,3,4,6,7,8-HpCDF	0.01	0.23	0.05	0.0023	0.0005
1,2,3,4,7,8,9-HpCDF	0.01	0.05	0.05	0.0005	0.0005
OCDF	0.0001	0.25	0.12	0.000025	0.000012
			TOTAL TEQ:	**1.330772**	**0.460218**
			ng/kg		

congener was not detected; highlighted value shown is 1/2 detection limit
TEF = Toxic Equivalency Factor
TEQ = Toxic Equivalence
ng/kg = nanograms per kilogram

1 ng/kg = 1 part per trillion (ppt)

The concentrations of dioxin TEQ in the Mashapaug Pond fish samples (shown in the table above) are consistent with concentrations of dioxin TEQ in fish tissue samples collected from the "unimpacted" background area (Greystone Mill Pond) and reference location (Assapumpset Pond) for the Centredale Manor Superfund Site in North Providence.

Location and Sample Type	Individual Sample TEQ_{DF} (ppt)										Minimum Result	Maximum Result	Mean Result
Greystone Mill Pond - Background Area White Sucker Whole Body	2.4	2.2	2.2	0.72	1.5	2.1	2.0	3.0	1.1	3.9	0.72	3.9	2.112
Greystone Mill Pond - Background Area Largemouth Bass Fillet	0.23	0.20	0.19	0.15	0.16	0.21	0.18	0.31	0.20	0.25	0.15	0.31	0.208
Assapumpset Pond - Reference Area Largemouth Bass Fillet	1.1	2.2	1.2	2.8							1.1	2.8	1.825
Assapumpset Pond - Reference Area Brown Bullhead Whole Body	1.9	2.6	2.0								1.9	2.6	2.167

d) Appendix G, Sec 4.4. Current USEPA guidance indicates that the 95 percent upper confidence limit (UCL) should be used in both reasonable maximum exposure and central tendency estimates. Therefore, central tendency estimates should include the 95 percent UCL concentration term.

Response: *The comment will be incorporated into the revised document.*

e) Appendix G, Table B2. Why is 2004 given as the access date for USEPA's Integrated Risk Information System (IRIS) Oral Reference Dose (RfD) values? All toxicity values tabulated and used in risk calculations should be current. The same is true for Tables F1 through F4.

Response: *The citations for the dose-response values used in the risk assessment will be updated to reflect the 2006 data search in IRIS. This revision will be made for Table B-2 and Tables F-1 through F-4.*

f) Appendix G, Tables 2 & 7. Antimony was shown to be detected in 2 out of 28 samples at concentrations of 2.7 and 1.6 ppm. The Region IX screening Preliminary Remediation Goal (PRG) for antimony is 3.1 mg/kg. Table 2 shows that most sediment sample detection limits for antimony are elevated above the 3.1 mg/kg screening level, this is reflected in the arithmetic mean of 6.0 mg/kg when 1/2 the detection limit was used. Since most detection limits are above the screening level, it cannot be determined whether actual sediment values were above or below the screening level. Antimony should, therefore, be evaluated for its potential contribution (attributable incremental increase) to the overall hazard index.

Response: *The results of the site investigation to date indicate that antimony is not a "site contaminant". Antimony was detected in only 4 of 65 soil samples, and in only 2 of 28 surficial sediment samples. Further, when the basis of the sediment screening values that are used in the risk assessment is considered, it is more obvious that antimony in sediment need not be evaluated further because it is unlikely to be a significant contributor to site human health risks.*

The Region IX residential soil PRG (31.0 mg/kg) divided by 10 (3.1 mg/kg) was used for risk-based screening to identify chemicals that would be carried through the risk assessment for exposure to sediments. The division of the PRG by 10 results in the screening value having a Hazard Quotient of only 0.1 (for a residential soil exposure scenario). This approach to deriving risk-based screening values is consistent with USEPA Region I procedures for soil (and sediment by extension). However,

this is a conservative approach in the absence of any human health risk-based screening values for sediment. Using a residential soil exposure scenario to screen cove sediments greatly overestimates potential risks. The USEPA Region IX residential soil PRGs assume that a resident is exposed to soils 350 days per year for 30 years, which is clearly a substantial overestimate of frequency of exposure to sediments of Mashapaug Cove for a trespasser, visitor, or industrial/commercial worker.

An estimate of a sediment antimony concentration that would be associated with a hazard index of 1 might be the residential soil PRG (31 mg/kg) multiplied by approximately four (assuming the exposure frequency is approximately 25% of the assumed 350 day per year residential soil exposure frequency) which yields a sediment antimony concentration of approximately 124 mg/kg. (A more detailed evaluation of the exposure scenario would likely yield a sediment antimony concentration at hazard index equal to 1 that is greater than 124 mg/kg.) The Remediation Regulations (Rule 8.01) state that "the remedial objective for each non-carcinogenic substance does not exceed a hazard index of 1 and the cumulative hazard index posed by the contaminated-site does not exceed 1 for any target organ." As noted in the comment above, the arithmetic mean concentration of antimony in the sediment samples was 6.0 mg/kg. The average concentration of antimony would be associated with a hazard index of only 6/124 or 0.05, which is 20 times lower than the risk management criterion. Further, the highest reported concentration of antimony in sediment was 2.7 mg/kg, which would be associated with a hazard index of only 0.02 (fifty times lower than the risk management criterion). These hazard index values clearly indicate that antimony is not likely to be a significant contributor to human health risk. Any revisions to the risk assessment to the document would not change this conclusion.

g) Dioxins and Furans. The "Unimpacted Soil Sample SS-SI208" which is the subject of the chart on SSIR Figure 4.12, is not identified on Site Figure 4.10. Please clarify where this sample was taken.

Response: *The figure incorrectly shows location SS-208 instead of SS-SI208. The figure will be revised.*

h) Appendix G, Tables 8 & 10: Commercial/Industrial Worker. The ingestion rate for water is given as 5 ml/h. This should be changed to 50 ml/hr and calculations revised accordingly.

Response: *Tables 8 and 10 will be revised to make them consistent with the text of the document and with the risk calculation spreadsheets. The use of the 50 ml/hour surface water ingestion rate for industrial/commercial workers who might wade in the shallow water of Mashapaug Cove greatly overestimates likely exposure, since the likely surface water ingestion rate for adults wading is obviously much lower than likely water ingestion rates for trespassers who might wade and swim in the water. This revision of tables 8 and 10 does not change the risk calculations presented in the report.*

i) Typically, the default values used in RME calculations are equal to or greater than those for central tendency estimates.

i) Appendix G, Tables 8 & 10: Surface Water. Why are skin surface areas used in the central tendency, dermal exposure trespasser calculations higher than for RME scenarios? Also, why are the exposure times (ET) for ingestion and dermal intake calculations higher for CT (1.5 hr/event) than RME (1.0 hr/event) scenarios?

Response: *In the risk assessment, the RME exposures for dermal contact with surface water are greater than the CT exposures. The footnotes to the tables provide the information summarized below. The skin surface areas shown in these tables are the average skin surface area exposed to surface water on those days when people are contacting the surface water. The surface water exposure is not just a function of the average surface area contacted on days exposed, but rather the product of the average surface area contacted on days exposed and the frequency of exposure (surface area per day x days per year = surface area per year). For the CT scenario, wading occurs 17 days and swimming occurs 17 days per year. Surface area for swimming is 19,400 cm^2 per day exposed for the adult and for wading is 4860 cm^2 per day for the adult. This gives a weighted surface area of 12,130 cm^2 per day exposed for a frequency of 34 days per year. The RME scenario includes 17 days of swimming and 34 days of wading. The RME wading and swimming surface areas are the same as the CT values. However, the weighted average surface area <u>on days exposed</u> for the RME is 9,707cm^2 per day exposed (lower because the proportion of swimming days is lower than for the CT scenario) and the RME frequency of exposure is 51 days per year (higher than for the CT scenario). The CT scenario surface area exposed per year is lower than the corresponding RME scenario as shown below.*

CT: EF X SA = 412,420 cm^2 per year
RME: EF X SA =495,057 cm^2 per year

The exposure time for the CT scenario will be revised to 1 hr per day exposed.

ii) Appendix G, Tables 9 & 11, Sediment. Why is the fraction ingested (FI) for the CT Commercial/Industrial Worker equal to 1.0 whereas it is listed a 0.5 for the same receptor in the RME scenario?

Response: *Table 9 will be revised to correctly identify the fraction ingested value of 1.0 for the RME Industrial/Commercial Worker. The value of 1.0 was used in all of the risk calculations for that receptor.*

j) Appendix G, Tables 8 & 10, Surface Water. The permeability coefficient (PC) event table cited in the "Intake Equation/Model Name" column of Tables 8 & 10 appears to be missing.

Response: *The PC event table will be added to the report.*

k) Construction worker receptor, pages 9 & 10. This receptor is described as having a potentially complete exposure pathway (Appendix G, pg. 10). The scenario for this receptor, however, has not been developed and risks were not evaluated; also, the receptor is not listed in Figure 4.41 Conceptual Site Model (site soil). Please explain.

Response: *The human health risks for soils and the remedial objectives for soils were identified using the Remediation Regulations Method 1 Industrial/Commercial Direct Exposure Criteria and GB Leachability Criteria as directed by the March 2006 Consent Order (Park Parcel). The Consent Order requires that Method 1 RIDEM-established criteria be utilized in the development of remedial objectives for soil. The construction worker was identified in the text as a potential human receptor for the sake of completeness of the discussion of potential receptors. When Method 1 Industrial/Commercial Direct Exposure Criteria are used, it is not necessary to develop an exposure profile or to calculate risks for a construction worker or any other potential receptor group. In the application of Method 1 Industrial/Commercial Direct Exposure criteria, the construction worker is considered to be protected by the Industrial/Commercial Direct Exposure Criteria.*

l) Appendix G, Tables 16 & 17: Calculation of Blood Lead Concentrations. The variables used in the adult lead model (excel spreadsheets) for soil ingestion (IRs) and baseline PbBo should be consistent with the RME tabulated values for sediment (Table 9); i.e., IRs should equal 0.1 g/dy for the trespasser scenario. Also, the baseline blood lead level used in the calculation should more nearly reflect the ethnic makeup of the surrounding community using the most recent National Health and Nutrition Examination Survey (NHANES) and Rhode Island Department of Health (RIDOH) data.

Response: *The comments will be incorporated into the tables.*

m) Please double check dermal cancer risk calculations in Table Dl (RME Trespasser 7-18) of Appendix G as they appear to be low by a factor of ~3.

Response: *Calculations have been doubled checked and no calculation errors were identified.*

n) Planned development for Parcels B and C respectively include a school and a YMCA. The proposed remedial alternative for the terrestrial portion of Parcel D involves placing an engineered cap over any soil with contamination that exceeds the Department's Method 1 I/CDEC or the calculated Method 2 I/CDEC. As proposed, remaining terrestrial areas of Parcel D will be uncapped. Please conduct a separate assessment of the remaining uncapped areas of the terrestrial portion of Parcel D, utilizing the trespasser scenario (adult and adolescent combined).

Response: *The SIR proposal to meet industrial/commercial soil standards with a cap is consistent with the March 2006 Consent Order (Park Parcel). The SSIR and associated proposed remedial alternatives were developed specifically to meet the requirements of the Consent Order. Further, the Consent Order states,* ***"The goal of the proposed final remedy shall be to bring the Park Parcel into compliance with applicable RIDEM-established industrial/commercial standards."***

More effective enforcement of the Consent Order required barrier preventing access to the Park Parcel is required. The Consent Order for Parcels B and C requires that the City install and maintain a "Barrier to prevent access to the Park Parcel". The Order requires that signs be posted on the fence indicating "Warning - Keep Out – Environmental Clean-up In Progress". Further, the Order requires that "The City shall continue to maintain and keep in place the Barrier until such time as the Park Parcel has been remediated to a level that is sufficient to safely permit limited public recreational activities". Additional actions have already been initiated by the City to prevent frequent trespassers

during the Environmental Clean-up Process and to provide housing or shelter for frequent trespassers or campers.

An assessment of a trespasser scenario, assuming the proposed "industrial/commercial" cap is in place, will be conducted in order to evaluate conditions that would exist upon completion of that proposed "industrial/commercial" cap. For this evaluation, it will be assumed the site fencing remains in place.

Comment 31) Regarding SSIR Appendix H (Screening Level Ecological Risk Assessment, the Department has the following comments:

a) Regarding Section 2.3 (Exposure Pathways), page 7, this section of the report discusses all of the potential sources of contamination at the site. As the site is complex, and as this is a public document it is recommended that these sources, along with other sources not noted, such as historic storm drains, historic discharge pipes from the plant, historic storage areas, etc., be included on a figure(s). Depending upon the scale of the figure(s) it may also be possible to include information concerning general contaminant distribution in the soil and groundwater. These figures would provide the reader with a link to onsite sources and the sampling stations for sediment and surface water (which would also be included in the figure).

Response: *A figure will be prepared that illustrates information requested.*

b) Regarding Section 2.4 (Historical Investigations and Data Used in the SLERA), page 10, paragraph 2, the report notes that historical information from three previous studies was not included in the Screening Level Ecological Risk Assessment (SLERA) as they may not represent current conditions. Certain contaminants, such as metals and SVOCs are not expected to degrade or are expected to degrade relatively slowly. In addition, this data may provide supplemental information concerning contaminant distribution. Finally, this is a SLERA and questions concerning the data from these reports may be addressed in an uncertainty analysis. Therefore, please include the data from the previous studies in the SLERA.

Response: *Although some chemicals may not degrade quickly over a 20 year period, degradation, in combination with mixing or burial by continual deposition could change conditions over time. Twenty-year old data also do not incorporate background contributions which have occurred over the twenty year period. Also, historical data which were not evaluated in the SLERA were excluded because they lacked documentation of sampling information (ex. depth, methods, decontamination procedures), data validation, and laboratory quality assurance/quality control. One of the purposes of conducting SLERA*

is to help focus future ecological risk investigations (Eco-Update: The Role of Screening Level Risk Assessments and Refining Contaminants of Concern in Baseline Ecological Risk Assessments, USEPA, 2001). Inclusion of historical data with high uncertainty would be not serve to focus the risk assessment.

c) Regarding Section 3.1 (Surface Water Screening Values), page 12, this section of the report proposes eliminating inorganics from the screening process as levels were detected below benchmark values. Locations, which were found to contain high levels of metals in the sediments, were, in some cases, not sampled for surface water. This needs be evaluated in this section of the report prior to eliminating all metals from the screening process. As part of this evaluation please provide overlays of surface water sampling stations on to the figures depicting elevated sediment sampling locations.

Response: *There is no requirement in the RIDEM Remediation Regulations or the ecological risk assessment guidances to co-locate surface water and sediment samples. In a comprehensive, representative sampling round including fifteen surface water samples, no metals (or inorganics) were detected in any of the filtered surface water samples. All surface water samples were collected from within one foot of the sediment/surface water interface. That sampling round is sufficient to conclude that, with respect to metals and inorganics, potential sediment impacts on surface water quality and potential aquatic receptors are not significant and do not require further evaluation. The fact that no metals or inorganics were detected in any of the fifteen surface water samples indicate that further evaluation of these parameters is not necessary. Dissolved metals in water would disperse throughout the matrix and not remain in a single location as the comment would suggest.*

d) Regarding Section 4.0 (Screening Level Exposure and Risk Calculation), page 14, the report notes that contaminants detected at frequencies less than five percent were eliminated from further screening. Elimination based upon frequency is typically coupled with an evaluation of the data including, but not limited to, adequacy of the investigation for the locations where elevated levels were observed, whether the observed contamination represents a hot spot, a discharge point, etc. Please include this evaluation in the screening process.

Response: *The application of the "less than 5% frequency of detection" criterion in eliminating chemicals from further ecological screening and assessment has had virtually no impact on the results and conclusions of the Screening Level Ecological Risk Assessment (SLERA). This criterion resulted in no detected chemicals being eliminated from further evaluation for surface water (both the Cove Study*

Area and the Property Line Study Area) and for sediments in the Property Line Study Area. Only for sediments in the Cove Study Area did this criterion result in the elimination of any detected chemicals from further evaluation. For sediments in the Cove Study Area, the following chemicals, each detected only once in 25 samples, were eliminated from further evaluation based on low frequency of detection: isopropyl benzene (0.0514 mg/kg); toluene (1.92 mg/kg); DDE (0.0109 mg/kg); DDT (0.0635 mg/kg); endrin ketone (0.0431 mg/kg); and Aroclor-1260 (0.605 mg/kg). These single detections are not indicative of hot spots. The application of the "less than 5% frequency of detection" criterion is consistent with accepted risk assessment practice and its application in the SLERA is appropriate.

e) Section 4.0 (Screening Level Exposure and Risk Calculation), page 14, states "The SLERA divided the cove into two exposure area in order to facilitate risk calculations." Please include a discussion indicating the criteria that were used to develop the two areas, why it was necessary to develop two areas, etc.

Response: *The division was based on differences in habitat. The Inner Cove study area is shallow, densely vegetated, and sediment has a high component of detritus. The Outer Cove is deeper, the water column is not densely vegetated, the water surface is generally open, and substrate has less detritus. The Inner Cove study area was also divided based upon chemical distributions, and was divided to highlight broad patterns within the cove.*

f) Regarding Section 4.2.114.2.2, page 17, the report has proposed eliminating certain VOCs, SVOCs and other organics from the surface water screening process based upon detected concentrations. Similar to the inorganic analysis please include an evaluation of the adequacy of the surface water/sediment sampling overlap and provide the appropriate figures. In addition, please include a discussion of sample depth, that is were the samples collected at the top, midpoint or bottom of the water column. Finally, in addition to spatial considerations the report should evaluate seasonal affects as the samples were collected in the summer when ambient water temperature is high.

Response: *The extent of surface water sampling is adequate; there are no requirements in the RIDEM Remediation Regulations or ecological risk assessment guidances to co-locate surface water and sediment samples. A review of the data did not identify any high detection limits in surface water. Surface water samples were collected within one foot of the sediment/ surface water interface. With regard to seasonal effects, summer is the most appropriate time to collect samples. Biological activity is*

highest in the summer, so there is greater temporal overlap between potential contaminants and potential receptors. Sampling in the winter would coincide with low biological activity and low metabolism. Many organisms (including macroinvertebrates, plants, and amphibians) would be hibernating or dormant, and thus would have minimal uptake and metabolism. Colder temperatures would also increase the amount of dissolved oxygen. Concentrations of chemicals themselves would not be expected to change.

g) Regarding Section 4.3.2 (Sum PAH Method), page 19, the Sum PAH Method evaluates PAH toxicity through a process involving equilibrium partitioning and sample-specific total organic carbon. While this model may be used in a qualitative sense to predict toxicity at a certain location, it has limitations and it should not be used as a substitute for either a sample specific toxicity assessment and/or diversity analysis. Further, it should not be used in a screening assessment to eliminate sediment stations with elevated levels of PAHs. The report should note this and state that additional analysis must be performed, including toxicity test and diversity analyses before quantitative statements and conclusions concerning the toxicity of a particular sampling station can be made.

Response: *TheΣPAH model does not predict toxicity, rather, it is used to eliminate locations where toxicity would not be likely to occur. By definition, ΣPAH analysis is a benchmark (the title of the document describing the procedure is called* Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: PAH Mixtures). *As a benchmark, it is appropriate for use in a SLERA to determine which locations do in fact have "elevated levels of PAHs" and to eliminate exposure areas for which PAH concentrations are below the benchmark without the need for toxicity testing or diversity analyses.*

h) Section 5.1.1 (Risk Characterization Cove Study Area), page 21, of the report states that three SVOCs were detected above ambient water quality criteria at sampling station SW-19. However, the Sum PAH model for SED-19 predicted that the elevated levels of PAHs found in the sediment sampling station would be tightly bound to the sediment and therefore not bioavailable in the water column. This appears to be a contradiction in that according to the model the PAHs should be tightly bound to the sediments and no leaching of PAHs should occur, yet exceedances of water quality criteria are evident at this location. Please explain what appears to be a contradiction.

Response: *Surface water samples were not filtered prior to PAH analysis. PAHs which were detected at SW-19 could have been bound to suspended particulate matter. The ΣPAH model addresses dissolved PAHs, which are most likely to have impacts on aquatic life.*

i) Section 5.1.1 (Risk Characterization Cove Study Area), page 22, of the report has stated that Arochlor 1254 was eliminated, as it was not a site-related compound. In support of this position the report should note whether any PCBs were detected on the site, whether the Arochlor 1254 is a degradation product, etc. Furthermore, it is inappropriate for a responsible party to remove any contaminant from an investigation simply because it is not believed to be site-related. As a former property owner, Textron is responsible for all contaminants found on its property.

Response: *Aroclors were detected in soils within the Park Parcel at low frequencies and total concentration of PCBs (all Aroclors combined) in all 41 soil samples was below both the Industrial/Commercial and Residential Direct Exposure Criteria. Aroclor-1242 was detected in only 2 of 41 soil samples, Aroclor-1254 was detected in only 7 of 41 soil samples, and Aroclor-1260 was detected in only 3 of 41 soil samples as shown in Table 4.1 of the SSIR. Since erosion of soil and transport to the cove would be the most likely migration mechanism for relatively insoluble compounds such as PCBs, the fact that no exceedances of either Industrial/Commercial or Residential Direct Exposure Criteria were observed for PCBs in soil suggests that migration of substantial amounts or concentrations of PCBs to Mashapaug Cove would not be expected. The sediment data, as discussed below, confirm this expectation that no substantial migration of PCBs to the cove has occurred.*

Aroclor-1242 was not detected in any of the 28 sediment samples. Aroclor-1254 was detected in only 2 of 28 sediment samples (at concentrations of only 0.207 mg/kg and 0.528 mg/kg), and Aroclor-1260 was detected in only 1 of 28 sediment samples (at only 0.605 mg/kg). The sediment data are shown in Table 4.7 of the SIR and summarized in the COPC screening tables (Tables 4.2 and 4.4 of Appendix H). As shown in Table 4.2 of Appendix H, for the Cove Study Area, only Aroclor-1254 (not Aroclor-1260) had a maximum concentration in sediment greater than the selected ecological screening benchmark (0.06 kg/kg), and therefore, Aroclor-1254 was identified as a COPC (to be carried forward into the ecological risk assessment).

As described in Section 3.2 of the USEPA ecological risk assessment guidance document (USEPA, 1997) the list of COPCs can be refined after the exposure level risk calculation has been completed. Refinement includes eliminating chemicals which are considered background or are not site related.

The SLERA, in this refinement step, concluded that the Aroclor-1254 detected at only 3 of 28 sediment sample locations was not site-related and would not be evaluated further.

Aroclors are not degradation products.

j) Regarding Section 5.2 (Uncertainties), page 26, TPH was not used in the screening process due to the lack of a suitable screening benchmark. This is a public document, therefore the report must include a discussion and a list of all of the benchmarks or TPH that were reviewed, the benchmark values and why they were considered unsuitable.

Response: *Sources consulted included but was not limited to published screening benchmarks used by USEPA Regions III, IV, V, and IX, various toxicity databases (ECOTOX, ERED, HSDB, ATSSDR, IRIS, and RAIS), as well as published studies and review articles in the scientific literature. A thorough search of these sources did not identify any benchmarks. In addition, chemical compositions vary considerably from site to site and study to study, and analytical methods and targeted analytes vary between laboratories (Irwin, 1997). Even if a benchmark were identified, comparison to concentrations detected at the former Gorham site would be impeded by unquantifiable uncertainty. However, the primary hazards from TPH typically relate to PAHs or BTEX (Irwin, 1997), thus any risk from PAHs or BTEX would have been evaluated against individual chemical benchmarks.*

k) Regarding Section 5.2 (Uncertainties), page 26, SVOCs and BTEX were used as substitutes to evaluated TPH. In support of this position please provide a figure depicting Total PAH concentrations, BTEX and TPH.

Response: *A figure will be prepared that illustrates total PAH, BTEX, and TPH concentrations.*

l) Section 5.3 (Conclusions), page 26, of the report proposes proceeding forwarded with the development of an ecological risk assessment. As indicated in the above comments there are a number of concerns associated with the SLERA. These concerns must be addressed prior to the development of an ecological risk assessment for the site.

Response: *According to the ecological risk assessment guidance document (USEPA, 1997), one of the purposes of the SLERA is to identify data gaps and uncertainties which are addressed as part of a BERA. Data gaps and uncertainties need not be resolved in a SLERA.*

REFERENCES

Irwin, R.J. Environmental Contaminants Encyclopedia: Total Petroleum Hydrocarbons. National Park Service, Water-Resources Division, Fort Collins, CO. July 1, 1997.

USEPA. 2001. ECO Update: The Role of Screening-Level Risk Assessments and Refining Contaminants of Concern in Baseline Ecological Risk Assessments. USEPA Office of Solid Waste and Emergency Response. EPA-540/F-01/014. June, 2001.

USEPA. 1997. Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments. EPA 540-R-97-006. June 1997.

Comment 32) Textron, as a Responsible Party, must notify all abutting property owners, tenants, and interested parties that additional investigation is about to occur prior to the implementation of any investigation field activities in accordance with the Industrial Property Remediation and Reuse Act (Rhode Island General Law 23-19.14-5) and the Remediation Regulations. The notice should be printed in English and Spanish and should briefly indicate the purpose of the investigation, the work to be performed, the approximate scheduled date of activities, and the names and telephone numbers of contacts from Textron, MACTEC and the Department. Failure to comply with any of the aforementioned laws and regulations may result in enforcement actions as specified in Rhode Island General Law 23-19.1-1 7 and 23-19.1-18.

Response: *Comment is noted. Textron will coordinate with the City of Providence concerning notifications.*

ATTACHMENT A

Figures

Mashapaug Pond

Mashapaug Cove

SS-SI002
SS-SI021
TP-037 (89) 0.5
TP-033 (89) 4
SS-SI015 1.5
SS-SI014 0.4
SS-SI202
SS-SI020 0.5
TP-032 (89)
SS-SI013 0.6
SS-SI016 1
TP-039 (89) 6
SS-SI019 0.6
SS-SI017 0.5
TP-034 (89) 0.5
SS-SI012
SS-SI018 0.5
TP-036 (89) 4
SS-SI101
SS-SI022 0.5
TP-035 (89)
JTP-1 3.4
SS-SI023
TP-030 (89)
JTP-2
SS-SI024 0.5
JTP-4
JTP-3
SS-SI207
SS-SI206
SS-SI205
SS-SI003
SS-SI004
SS-SI006
MW-GZA5 7
SS-SI008
SS-SI007
TP-028 (89) 15
TP-025 (89) 7
EX-002 11
SS-SI208
MW-GZA3 22
TP-026 (89) 13.5
SS-SI005
SS-SI011 0.5
MW-110D 11
MW-109D 16
SS-SI010
TP-027 (89) 14
MW-FD/B6D 16
SS-SI001
TP-015 (89) 10
TP-008 (89) 2.5
SS-SI209
TP-004 (89) 7.5
SS-SIBK2
SS-SI210

Railroad Tracks

Parking Lot

Planned Development 2006

Adelaide Avenue

Legend

- Locations where fill has been identified
- Locations where fill has not been identified
- Approximate Park Parcel Boundary
- Elevation
- Waste Fill Area as shown in 1999 Site Investigation Report
- TP-028 (89) / 15 — Location name and thickness of fill in feet

N

0 75 150 Feet

Prepared/Date: BJR 01/03/07
Checked/Date: MJM 01/03/07

333 Adelaide Avenue
Providence, RI

MACTEC

Distribution and Thickness of Fill

Project 3650-05-0041 Figure 1

Document: P:\TEXTRON\GORHAM\GIS\MapDocuments\RTC_SIR_ParkParcel.mxd PDF: P:\TEXTRON\GORHAM\GIS\Figures\RTC_SIR\Depth_to_Fill.pdf 01/03/2007 2:11 PM bjroden

SED13
SED14
SED15
4" Tile
8" Metal Suction
4" Metal Suction
Mag-1
Mag-2
Mag-3
SD-1005
SED17
Mag-4
Mag-5
SED16
SED27
SED20
SD-1003
SD-1002
Mag-16
SED21
SED18
SD-1004
Mag-7
SED19
Mag-6
Mag-15
Mag-12
Mag-8
Mag-14
Mag-9
SED28
SED26
SED22
SED24
SED25
SD-1001
Mag-13
Mag-11
SED23
SED29
Mag-10
SED30
SED32
8" Cast Iron to Bldg H
6" Cast Iron to Bldg R
8" Cast Iron to Bldg O
6" Cast Iron
SED31
8" Pipe to Bldg V
Cast Iron Water Intake Pipe
Excavated Area
(approximate)

Name	Description
Mag-1	Fairly small single object
Mag-2	Exposed pipe seen in sonar records
Mag-3	Single object or possible cluster of small objects off of point
Mag-4	Fairly small single object
Mag-5	Cluster of targets located on or very near the shoreline
Mag-6	Large target, initial attempts could not identify object creating signature
Mag-7	Fairly small single object
Mag-8	Fairly small single object
Mag-9	Probably a short section of pipe, seen in sonar records
Mag-10	Shoreline debris. Could be seen during the survey and in the sonar records
Mag-11	Probably a short section of pipe
Mag-12	Fairly small single object
Mag-13	Fairly small single object
Mag-14	Probably section of pipe
Mag-15	Cluster of targets located on or very near the shoreline
Mag-16	Single object or possible cluster of small objects

Legend

- Sediment Location
- Surface Water and Sediment Location
- Elevation
- Approximate Site Boundary
- Pipes

Note: Approximate location of pipes from historical documents.

N

0 26.5 53 Feet

Prepared/Date: BJR 01/05/07
Checked/Date: DEH 01/06/07

Supplemental Site Investigation Report
333 Adelaide Avenue
Providence, RI

MACTEC

Magnetic Survey Results
Mashapaug Cove
Project 3650-05-0041 Figure 3.4

Document: P:\TEXTRON\GORHAM\GIS\MapDocuments\RiskAssessmentCove2006-Magnetic.mxd PDF: P:\TEXTRON\GORHAM\GIS\Figures\RTC_SIR\Mag_Pipes.pdf 01/05/2007 12:52 PM bjroden

ATTACHMENT B

Summary of UCL Removal: SS-SI008

January 23, 2007

Mr. Joseph T. Martella, II
Senior Engineer
Department of Environmental Management
Office of Waste Management
Rhode Island Department of Environmental Management
235 Promenade Street
Providence, Rhode Island 02908-5767

Subject: Summary of UCL Removal: SS-SI008
Parcel D
Former Gorham Site
333 Adelaide Avenue
Providence, Rhode Island
MACTEC Project No. 3650-05-0041

Dear Mr. Martella:

MACTEC Engineering and Consulting, Inc. (MACTEC) has prepared this letter on behalf of Textron, Inc. (Textron) to summarize the excavation of soils exhibiting concentrations of copper exceeding the Upper Concentration Level (UCL) as described in Rule 8.07 of the Remediation Regulations (DEM-DSR-01-93). A total of approximately 3.5 cubic yards (cy) of impacted soil surrounding surface soil sample SS-SI008 was transported under hazardous waste manifest to a permitted hazardous waste landfill. Confirmatory soil samples collected from the excavation sidewalls and bottom were submitted for laboratory analysis. The analytical results indicate that no remaining soil samples exhibited copper concentrations above the UCL.

Background of SS-SI008

On June 6, 2006, MACTEC collected soil sample SS-SI008 from Parcel D of the Site. This surface sampling was performed as part of a supplemental site investigation that was summarized in the July 31, 2006 MACTEC Supplemental Site Investigation Report (SIR). The sample was collected from surface soils from 0 to 6" below ground surface (bgs) and submitted for laboratory analysis of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, thirteen priority pollutant (PP-13) metals, and dioxin. The copper concentration at SS-SI008 exceeded the Remediation Regulation UCL of 10,000 milligrams per kilogram (mg/kg). Please refer to Table 1 for analytical results from soil sample SS-SI008 and Figure 1 for the location of SS-SI008.

Excavation of Copper-Impacted Soils

On August 2, 2006, MACTEC directed the excavation of soils surrounding SS-SI008. The excavation was centered on SS-SI008 and approximately 5 feet in length and width. The excavation was located approximately 40 feet south of the shore of Mashapaug Cove and within a gently sloping area of topography. As such, the excavation encountered groundwater at approximately two feet bgs. The excavation was advanced to a depth of approximately four inches below the water table.

Confirmatory soil samples were collected from the sidewalls and bottom of the excavation. A field duplicate sample was collected from the bottom of the excavation for quality control and quality assurance (QA/QC) purposes. The confirmatory soil samples were submitted to a state-certified laboratory for copper analysis with standard five-day turnaround time (TAT). Analytical results indicated that the northern and eastern sidewalls (soil samples SS-SI65N and SS-SI68E) exceeded the copper UCL. The bottom, field duplicate, and two other sidewall soil samples (SS-SI64B1, SS-SI64B1DUP, SS-SI66S, and SS-SI67W) exhibited copper concentrations below the UCL. A total of approximately 2 cy of material was excavated and loaded into an on-site roll-off. This roll-off was covered with a heavy-duty waterproof plastic cover and secured within construction fencing at the Site. Please refer to Table 1 for confirmatory soil analytical results and Figure 2 for the soil sample locations.

On August 14, 2006, MACTEC directed the expansion of the excavation to the north and east. An X-ray fluorescence meter (XRF) was used as a field-screening tool to determine concentration of copper along the northern and eastern sidewalls. Approximately 1 cy of soil was removed from SS-SI008 and added to the roll-off and secured (Figure 2). Confirmatory soil sampling was performed on the north and east sidewall and submitted for rapid 24-hour TAT. The samples were identified as SS-SI69E and SS-SI70N. Please refer to Table 1 for analytical results and Figure 2 for soil sample locations.

On August 16, 2006, MACTEC directed the expansion of the excavation to the north as soil sample SS-SI70N exhibited copper concentration exceeding the UCL. Approximately 0.5 cy was excavated and confirmatory soil sample SS-SI78N was submitted for copper analysis (Figure 2). The excavated soils were loaded into the roll-off and secured. Analytical results indicated that

The excavated soils were loaded into the roll-off and secured. Analytical results indicated that copper concentrations were below the UCL. Please refer to Table 1 for soil sample analytical results and Figure 2 for soil sample locations.

Offsite Transport and Disposal

The approximately 3.5 cy of copper-impacted soils were loaded into a roll-off for hazardous waste disposal. The roll-off was transported under Hazardous Waste Manifest to the Clean Harbors landfill in Braintree, Massachusetts on September 29, 2006.

We anticipate that this summary letter will satisfy the reporting requirements for the soil excavation activities of the former copper UCL exceedance at SS-SI008. Please note that the laboratory analytical data reports for the soil sampling described in this letter was submitted to your office on September 7, 2006 and are reproduced in Appendix A. Please contact either of the undersigned at (781) 245-6606 with questions about the contents of this letter.

Sincerely,
MACTEC Engineering and Consulting, Inc.

Daron G. Kurkjian
Staff Engineer

David E. Heislein
Project Manager

Attachments: Table 1: Summary of Copper UCL Confirmatory Sampling
Figure 1: Site Plan
Figure 2: Soil Sample Locations
Appendix A: Laboratory Analytical Data

cc: D. McCabe, Textron Inc.
G. Simpson, Textron Inc.
MACTEC Project Files [P:\TEXTRON\GORHAM\Slag Removal Action\Copper UCL Excavation SS-SI008\SS-SI008 Excavation Summary Final.doc]

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TABLES

Table 1. Summary of Copper UCL Confirmatory Sampling
Former Gorham Manufacturing Site
Providence, Rhode Island

Parameter	Frequency of Detection	Average of Samples	Residential	Industrial / Commercial	SS-SI008* 6/6/2006 0-0.5ft	SS-SI008 DUP* 6/6/2006 0-0.5ft	SS-SI 64 B1 8/2/2006 1.5-2ft	SS-SI 64 B1 DUP 8/2/2006 1.5 2ft	SS-SI 65 N* 8/2/2006 0-1ft	SS-SI 66 S 8/2/2006 0-1ft	SS-SI 67 W 8/2/2006 0-1ft	SS-SI 68 E* 8/2/2006 0-1ft	SS-SI69 E 8/14/2006 0-0.5ft	SS-SI70 N 8/14/2006 0-1ft*	SS-SI78 N 8/16/2006 0-1ft
Volatile Organics (mg/kg)															
1,1,1,2-Tetrachloroethane	0 / 2	0.0032	2.2	220	<0.0065	<0.0064									
1,1,1-Trichloroethane	2 / 2	0.18	540	10000	0.145	0.222									
1,1,2,2-Tetrachloroethane	0 / 2	0.0032	1.3	29	<0.0065	<0.0064									
1,1,2-Trichloroethane	0 / 2	0.0032	3.6	100	<0.0065	<0.0064									
1,1-Dichloroethane	2 / 2	0.0091	920	10000	0.0068	0.0114									
1,1-Dichloroethene	0 / 2	0.0032	0.2	9.5	<0.0065	<0.0064									
1,1-Dichloropropene	0 / 2	0.0032			<0.0065	<0.0064									
1,2,3-Trichlorobenzene	0 / 2	0.0032			<0.0065	<0.0064									
1,2,3-Trichloropropane	0 / 2	0.0032			<0.0065	<0.0064									
1,2,4-Trichlorobenzene	0 / 2	0.0032	96	10000	<0.0065	<0.0064									
1,2,4-Trimethylbenzene	0 / 2	0.0032			<0.0065	<0.0064									
1,2-Dibromo-3-chloropropane	0 / 2	0.0032	0.5	4.1	<0.0065	<0.0064									
1,2-Dibromoethane	0 / 2	0.0032	0.01	0.07	<0.0065	<0.0064									
1,2-Dichlorobenzene	0 / 2	0.0032	510	10000	<0.0065	<0.0064									
1,2-Dichloroethane	0 / 2	0.0032	0.9	63	<0.0065	<0.0064									
1,2-Dichloropropane	0 / 2	0.0032	1.9	84	<0.0065	<0.0064									
1,3,5-Trimethylbenzene	0 / 2	0.0032			<0.0065	<0.0064									
1,3-Dichlorobenzene	0 / 2	0.0032	430	10000	<0.0065	<0.0064									
1,3-Dichloropropane	0 / 2	0.0032			<0.0065	<0.0064									
1,4-Dichlorobenzene	0 / 2	0.0032	27	240	<0.0065	<0.0064									
1,4-Dioxane	0 / 2	0.16			<0.326	<0.32									
1-Chlorohexane	0 / 2	0.0032			<0.0065	<0.0064									
2,2-Dichloropropane	0 / 2	0.0032			<0.0065	<0.0064									
2-Butanone	0 / 2	0.032	10000	10000	<0.0652	<0.064									
2-Chlorotoluene	0 / 2	0.0032			<0.0065	<0.0064									
2-Hexanone	0 / 2	0.032			<0.0652	<0.064									
4-Chlorotoluene	0 / 2	0.0032			<0.0065	<0.0064									
4-Methyl-2-pentanone	0 / 2	0.032	1200	10000	<0.0652	<0.064									
Acetone	0 / 2	0.032	7800	10000	<0.0652	<0.064									
Benzene	0 / 2	0.0032	2.5	200	<0.0065	<0.0064									
Bromobenzene	0 / 2	0.0032			<0.0065	<0.0064									
Bromochloromethane	0 / 2	0.0032			<0.0065	<0.0064									
Bromodichloromethane	0 / 2	0.0032	10	92	<0.0065	<0.0064									
Bromoform	0 / 2	0.0032	81	720	<0.0065	<0.0064									
Bromomethane	0 / 2	0.0065	0.8	2900	<0.013	<0.0128									
Carbon disulfide	0 / 2	0.0032			<0.0065	<0.0064									
Carbon tetrachloride	0 / 2	0.0032	1.5	44	<0.0065	<0.0064									
Chlorobenzene	0 / 2	0.0032	210	10000	<0.0065	<0.0064									
Chloroethane	0 / 2	0.0065			<0.013	<0.0128									
Chloroform	0 / 2	0.0032	1.2	940	<0.0065	<0.0064									
Chloromethane	0 / 2	0.0065			<0.013	<0.0128									
cis-1,2-Dichloroethene	0 / 2	0.0032	630	10000	<0.0065	<0.0064									
cis-1,3-Dichloropropene	0 / 2	0.0032			<0.0065	<0.0064									
Dibromochloromethane	0 / 2	0.0032	7.6	68	<0.0065	<0.0064									

Table 1. Summary of Copper UCL Confirmatory Sampling
Former Gorham Manufacturing Site
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Parameter	Frequency of Detection	Average of Samples	Residential	Industrial / Commercial	SS-SI008* 6/6/2006 0-0.5ft	SS-SI008 DUP* 6/6/2006 0-0.5ft	SS-SI 64 B1 8/2/2006 1.5-2ft	SS-SI 64 B1 DUP 8/2/2006 1.5 2ft	SS-SI 65 N* 8/2/2006 0-1ft	SS-SI 66 S 8/2/2006 0-1ft	SS-SI 67 W 8/2/2006 0-1ft	SS-SI 68 E* 8/2/2006 0-1ft	SS-SI69 E 8/14/2006 0-0.5ft	SS-SI70 N 8/14/2006 0-1ft*	SS-SI78 N 8/16/2006 0-1ft
Dibromomethane	0 / 2	0.0032			<0.0065	<0.0064									
Dichlorodifluoromethane	0 / 2	0.0065			<0.013	<0.0128									
Diethyl ether	0 / 2	0.0032			<0.0065	<0.0064									
Diisopropyl ether	0 / 2	0.0032			<0.0065	<0.0064									
Ethyl tertiary-butyl ether	0 / 2	0.0032			<0.0065	<0.0064									
Ethylbenzene	0 / 2	0.0032	71	10000	<0.0065	<0.0064									
Hexachlorobutadiene	0 / 2	0.0032	8.2	73	<0.0065	<0.0064									
Isopropyl Benzene	0 / 2	0.0032	27	10000	<0.0065	<0.0064									
m,p-Xylene	0 / 2	0.0065			<0.013	<0.0128									
Methylene Chloride	0 / 2	0.016	45	760	<0.0326	<0.032									
Methyl-t-butyl ether	0 / 2	0.0032	390	10000	<0.0065	<0.0064									
Naphthalene	0 / 2	0.0032	54	10000	<0.0065	<0.0064									
n-Butylbenzene	0 / 2	0.0032			<0.0065	<0.0064									
n-Propyl Benzene	0 / 2	0.0032			<0.0065	<0.0064									
o-Xylene	0 / 2	0.0032			<0.0065	<0.0064									
p-Isopropyl Toluene	0 / 2	0.0032			<0.0065	<0.0064									
s-Butylbenzene	0 / 2	0.0032			<0.0065	<0.0064									
Styrene	0 / 2	0.0032	13	190	<0.0065	<0.0064									
t-Butylbenzene	0 / 2	0.0032			<0.0065	<0.0064									
Tertiary-amyl methyl ether	0 / 2	0.0032			<0.0065	<0.0064									
Tetrachloroethene	0 / 2	0.0032	12	110	<0.0065	<0.0064									
Tetrahydrofuran	0 / 2	0.0032			<0.0065	<0.0064									
Toluene	0 / 2	0.0032	190	10000	<0.0065	<0.0064									
trans-1,2-Dichloroethene	0 / 2	0.0032	1100	10000	<0.0065	<0.0064									
trans-1,3-Dichloropropene	0 / 2	0.0032			<0.0065	<0.0064									
Trichloroethene	2 / 2	0.074	13	520	0.0628	0.0855									
Trichlorofluoromethane	0 / 2	0.0032			<0.0065	<0.0064									
Vinyl Chloride	0 / 2	0.0065	0.02	3	<0.013	<0.0128									
Xylenes, Total	0 / 2	0.0097	110	10000	<0.0195	<0.0192									
Semivolatile Organics (mg/kg)															
1-Methylnaphthalene	0 / 2	1.2	123	10000	<0.777	<3.99									
2-Methylnaphthalene	0 / 2	1.2	123	10000	<0.777	<3.99									
Acenaphthene	0 / 2	1.2	43	10000	<0.777	<3.99									
Acenaphthylene	0 / 2	1.2	23	10000	<0.777	<3.99									
Anthracene	0 / 2	1.2	35	10000	<0.777	<3.99									
Benzo(a)anthracene	1 / 2	1.7	0.9	7.8	1.48	<3.99									
Benzo(a)pyrene	2 / 2	2.9	0.4	0.8	**1.69**	**4.14**									
Benzo(b)fluoranthene	2 / 2	4.0	0.9	7.8	2.26	5.81									
Benzo(g,h,i)perylene	1 / 2	1.5	0.8	10000	0.953	<3.99									
Benzo(k)fluoranthene	1 / 2	1.8	0.9	78	1.61	<3.99									
Chrysene	2 / 2	3.1	0.4	780	1.77	4.44									
Dibenzo(a,h)anthracene	0 / 2	1.2	0.4	0.8	<0.777	<3.99									
Fluoranthene	2 / 2	6.3	20	10000	2.24	10.3									

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Fluorene	0 / 2	1.2	28	10000	<0.777	<3.99									
Indeno(1,2,3-cd)pyrene	1 / 2	1.4	0.9	7.8	0.898	<3.99									
Naphthalene	0 / 2	1.2	54	10000	<0.777	<3.99									
Phenanthrene	2 / 2	5.2	40	10000	2.42	7.88									
Pyrene	2 / 2	6.4	13	10000	4.36	8.41									
Pesticides/PCBs (mg/kg)															
4,4'-DDD	0 / 2	0.0039	2.7	24	<0.00762	<0.00794									
4,4'-DDE	1 / 2	0.20	1.9	17	<0.00762	0.402									
4,4'-DDT	2 / 2	1.0	1.9	17	0.95	1.05									
Aldrin	0 / 2	0.0039			<0.00762	<0.00794									
alpha-BHC	0 / 2	0.0039	0.1	0.9	<0.00762	<0.00794									
alpha-Chlordane	0 / 2	0.0039	1.8	16	<0.00762	<0.00794									
beta-BHC	0 / 2	0.0039	0.4	3.2	<0.00762	<0.00794									
Chlordane	0 / 2	0.039	0.5	4.4	<0.0762	<0.0794									
delta-BHC	0 / 2	0.0039	0.5	4.4	<0.00762	<0.00794									
Dieldrin	0 / 2	0.0039	0.04	0.4	<0.00762	<0.00794									
Endosulfan I	0 / 2	0.0039			<0.00762	<0.00794									
Endosulfan II	0 / 2	0.0039	470	12000	<0.00762	<0.00794									
Endosulfan sulfate	0 / 2	0.0039	470	12000	<0.00762	<0.00794									
Endrin	0 / 2	0.0039			<0.00762	<0.00794									
Endrin aldehyde	0 / 2	0.0039			<0.00762	<0.00794									
Endrin ketone	0 / 2	0.0039	23	610	<0.00762	<0.00794									
gamma-BHC (Lindane)	0 / 2	0.0039			<0.00762	<0.00794									
gamma-Chlordane	0 / 2	0.0039	1.8	16	<0.00762	<0.00794									
Heptachlor	0 / 2	0.0039	0.1	1.3	<0.00762	<0.00794									
Heptachlor epoxide	2 / 2	0.47	0.07	0.6	0.297	**0.651**									
Hexachlorobenzene	1 / 2	0.0065	0.4	3.6	<0.00762	0.00919									
Methoxychlor	0 / 2	0.0039	390	10000	<0.00762	<0.00794									
Toxaphene	0 / 2	0.19			<0.381	<0.397									
Aroclor-1016	0 / 2	0.21	10	10	<0.761	<0.0793									
Aroclor-1221	0 / 2	0.039	10	10	<0.0761	<0.0793									
Aroclor-1232	0 / 2	0.039	10	10	<0.0761	<0.0793									
Aroclor-1242	0 / 2	0.039	10	10	<0.0761	<0.0793									
Aroclor-1248	0 / 2	0.039	10	10	<0.0761	<0.0793									
Aroclor-1254	2 / 2	6.6	10	10	6.02	7.15									
Aroclor-1260	2 / 2	1.7	10	10	1.34	2.02									
Aroclor-1262	0 / 2	0.039	10	10	<0.0761	<0.0793									
Aroclor-1268	0 / 2	0.039	10	10	<0.0761	<0.0793									

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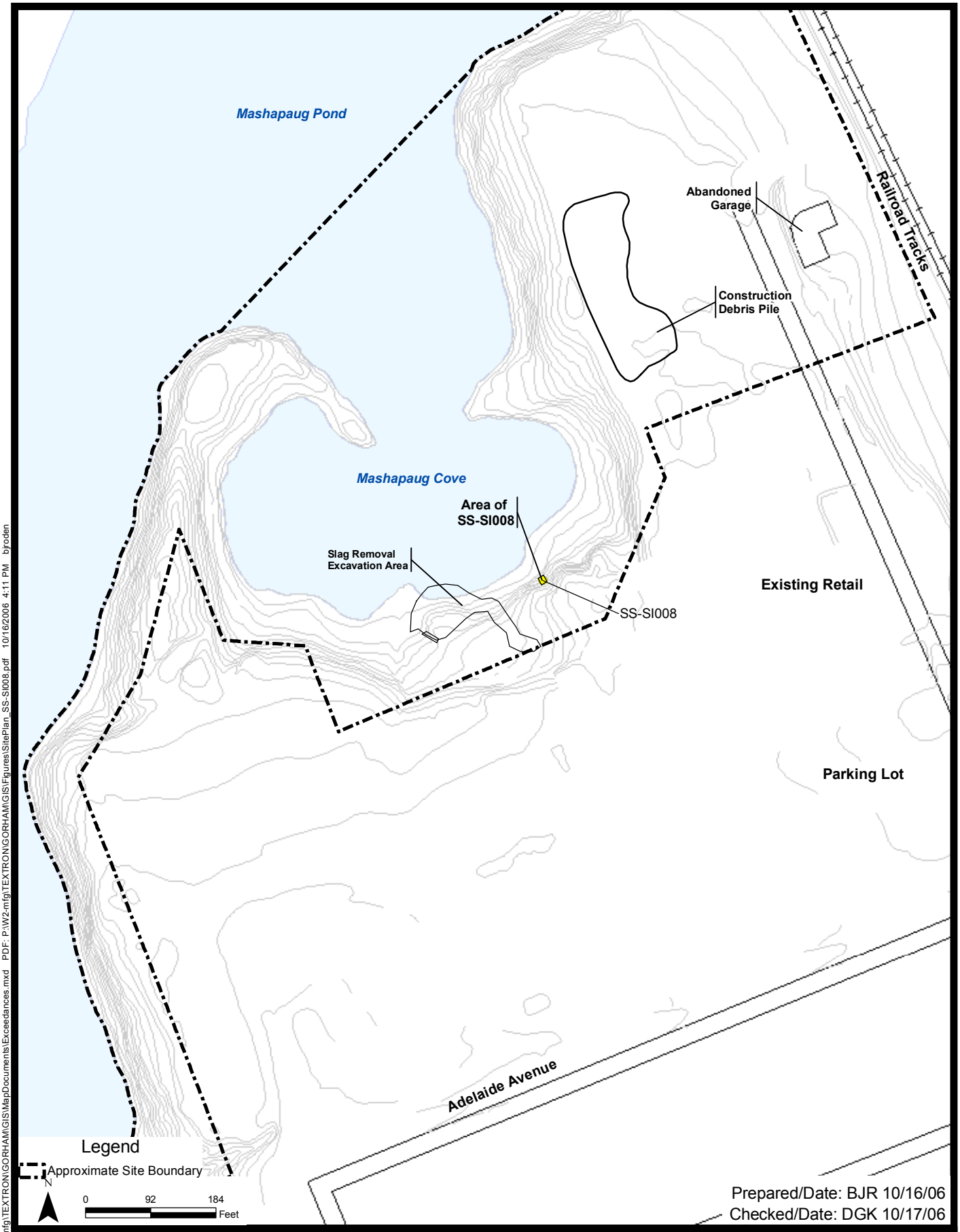
Inorganics (mg/kg)															
Antimony	2 / 2	32	10	820	32.1	32									
Arsenic	2 / 2	17	7	7	**17.6**	**17.3**									
Barium	2 / 2	88	5500	10000	93.3	83.1									
Beryllium	2 / 2	0.78	0.4	1.3	0.77	0.79									
Cadmium	2 / 2	24	39	1000	21.7	25.3									
Chromium	2 / 2	843	390	10000	746	940									
Copper	11 / 11	8474	3100	10000	**14100**	**15000**	5440	9830	**16900**	3970	2110	**10700**	2590	**10800**	1770
Lead	2 / 2	3505	150	500	**3350**	**3660**									
Mercury	2 / 2	2.2	23	610	2.89	1.43									
Nickel	2 / 2	71	1000	10000	76.6	65.9									
Selenium	0 / 2	4.4	390	10000	<8.6	<8.9									
Silver	2 / 2	412	200	10000	379	445									
Thallium	0 / 2	1.1			<2.2	<2.2									
Zinc	2 / 2	1450	6000	10000	1470	1430									
Dioxins/Furans (mg/kg)															
1,2,3,4,6,7,8-HpCDD	2 / 2	0.0019			0.0016	0.0022									
1,2,3,4,6,7,8-HpCDF	2 / 2	0.0010			0.00099	0.00099									
1,2,3,4,7,8,9-HpCDF	2 / 2	0.00012			0.00013	0.00011									
1,2,3,4,7,8-HxCDD	2 / 2	0.000063			0.000062	0.000064									
1,2,3,4,7,8-HxCDF	2 / 2	0.00026			0.00029	0.00023									
1,2,3,6,7,8-HxCDD	2 / 2	0.00016			0.00015	0.00016									
1,2,3,6,7,8-HxCDF	2 / 2	0.00021			0.00023	0.00018									
1,2,3,7,8,9-HxCDD	2 / 2	0.00012			0.00011	0.00012									
1,2,3,7,8,9-HxCDF	2 / 2	0.000072			0.0001	0.000044									
1,2,3,7,8-PeCDD	2 / 2	0.000034			0.000042	0.000025									
1,2,3,7,8-PeCDF	1 / 2	0.000065			<0.000001	0.00013									
2,3,4,6,7,8-HxCDF	2 / 2	0.00025			0.00026	0.00023									
2,3,4,7,8-PeCDF	2 / 2	0.00038			0.00049	0.00027									
2,3,7,8-TCDD	2 / 2	0.000006			0.0000062	0.0000065									
2,3,7,8-TCDF	2 / 2	0.00015			0.00014	0.00015									
OCDD	2 / 2	0.012			0.0095	0.015									
OCDF	2 / 2	0.0011			0.00097	0.0012									
Total HpCDD	2 / 2	0.0033			0.0028	0.0037									
Total HpCDF	2 / 2	0.0022			0.0022	0.0022									
Total HxCDD	2 / 2	0.0016			0.0015	0.0017									
Total HxCDF	2 / 2	0.0034			0.0035	0.0032									
Total PeCDD	2 / 2	0.00065			0.00066	0.00063									
Total PeCDF	2 / 2	0.0038			0.0038	0.0038									
Total TCDD	2 / 2	0.00041			0.0004	0.00042									
Total TCDF	2 / 2	0.0021			0.0019	0.0022									

Shading indicates an exceedance of the
Industrial / Commercial RIDEM Direct Exposure Criteria.
ft - feet
mg/kg - milligrams per kilogram
* indicates sample location was excavated
Blank spaces indicated sample not analyzed for analyte

FIGURES



Prepared/Date: BJR 10/16/06
Checked/Date: DGK 10/17/06

Former Gorham Site
333 Adelaide Avenue
Providence, Rhode Island

MACTEC

Site Plan

Figure 1

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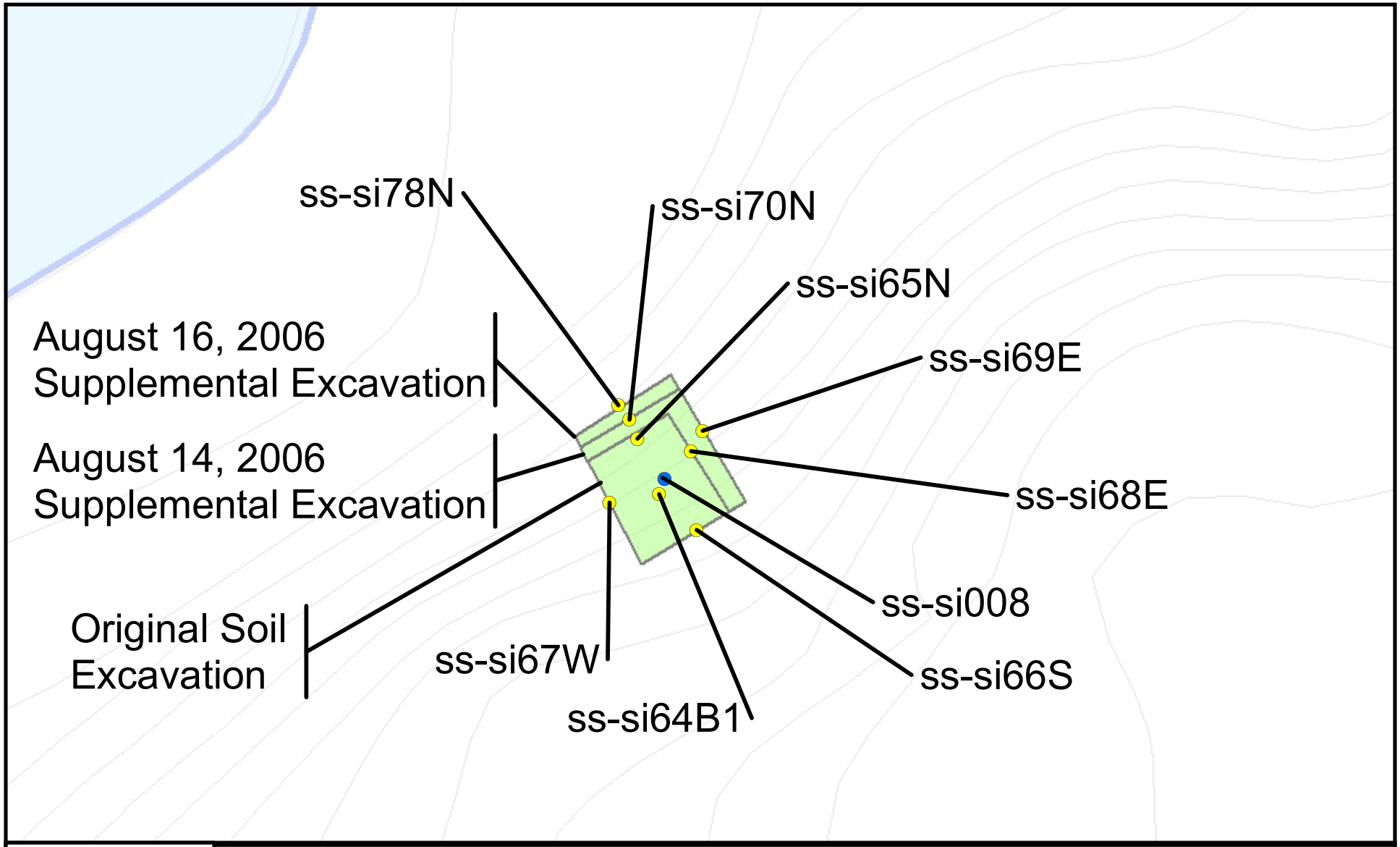

MACTEC

Legend

- Copper UCL Confimatory Sample
- SS-SI008
- Excavated Area
- Mashapaug Cove

N

0 5 10 Feet

Prepared by BJR | Checked by DGK

Note: Depth of excavation approximately 2 feet bgs

Figure 2
UCL Soil Excavation and
Confirmtory Sample Locations

Former Gorham Site
333 Adelaide Avenue
Providence, Rhode Island

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APPENDIX A

Laboratory Analytical Data

(Provided on data CD attached to hardcopy)