Beazer

BEAZER EAST, INC. C/O THREE RIVERS MANAGEMENT, INC.
ONE OXFORD CENTRE, SUITE 3000, PITTSBURGH, PA 15219-6401

February 20, 2009

Mr. Scott Miller
Remedial Project Manager
Superfund Division
Superfund Remedial Branch
Section C
U.S. EPA Region 4
61 Forsyth Street, SW
Atlanta, GA 30303

Re: Response to U.S. EPA Comments on Proposed Approach to Estimating Potential On-Site Human Health Risks Associated with Soils and Sediments
Koppers, Inc. Wood-Treating Facility
Gainesville, Florida

Dear Mr. Miller:

Last week, on behalf of Beazer East, Inc. ("Beazer"), AMEC submitted the "Evaluation of Potential On-Site Human Health Risks Associated with Soils and Sediments at the Koppers, Inc. Wood-Treating Facility in Gainesville, Florida" (the "HHRA") to U.S. EPA. Prior to preparing the HHRA, AMEC had submitted three documents presenting the approach to the HHRA. Those include: "PROPOSED APPROACH TO ESTIMATING POTENTIAL ON-SITE HUMAN HEALTH RISKS ASSOCIATED WITH SOILS AND SEDIMENTS AT THE KOPPERS INC. WOOD-TREATING FACILITY IN GAINESVILLE, FLORIDA" (dated June 23, 2008); "RELATIVE ABSORPTION FACTORS (RAFS) FOR ORAL AND DERMAL ABSORPTION OF COMPOUNDS IN SOIL: CABOT CARBON/KOPPERS SITE GAINESVILLE, FLORIDA" (dated July 23, 2008); and, "DESCRIPTION OF CABOT CARBON/KOPPERS GAINESVILLE, FLORIDA ON-SITE WORKER MICROEVENT EXPOSURE EVENT MODEL AND EXAMPLE OF MODEL CALCULATION" (dated July 23, 2008). On September 9, 2008 U.S. EPA provided comments on the first HHRA approach document, and on October 6, 2008, U.S. EPA provided comments on the second two HHRA approach documents. The U.S. EPA's comments were considered prior to finalizing the HHRA, and in many cases those comments resulted in modifications to the HHRA, as noted below. For the sake of clarity, Beazer is providing these direct responses to each of U.S. EPA's comments in this letter.

In addition, this letter provides responses to the comments that were submitted to you by the Florida Department of Environmental Protection ("FDEP") dated August 1, 2008 and which directly pertain to issues related to the proposed HHRA approach. Those comments were prepared by Drs. Steve Roberts and Leah Stuchal of the University of Florida for FDEP. Finally, we also respond to the two sets of comments dated August 8 and August 15, 2008 submitted by

the Alachua County Environmental Protection Department ("ACEPD") and which directly pertain to issues related to the proposed HHRA approach.

Response to U.S. EPA comments dated September 9, 2008.

1. *General Comment.* While the assessment of the Koppers worker may be accurate for the current site scenario, EPA is required to look at reasonable future use scenarios in the Human Health Risk Assessment (HHRA). Even if the Site remains industrial, it seems reasonable that the Site may change hands and that a future onsite worker may not observe all of the same personal protective practices/clothing. Therefore, the document should be updated to include a future scenario for a non-Koppers future industrial worker. In addition, Site-specific exposure factors assumed in the risk assessment will necessitate controls most likely in the form of institutional controls (deed restrictions, use restrictions) that must remain in place into perpetuity regardless of ownership unless risk reassessment takes place in advance of a change in Site use.

RESPONSE: After contacting the KI facility manager to acquire facility-specific information about current KI worker practices and characteristics at the facility, it became clear that current on-Site worker characteristics closely corresponded to the default assumptions U.S. EPA would typically use to characterize a generic industrial worker. For example, the exposure frequency used in the conservative deterministic risk assessment for exposure areas with active wood treating (250 days per year) is identical to the U.S.EPA default for industrial workers. Similarly, the exposure duration (23.9 years) is nearly identical to the U.S. EPA default of 25 years. Lastly, the conservative deterministic risk assessment assumes that hands, forearms and face are exposed in all exposure areas, except the Process Area where only forearms and face are assumed to be exposed. Daily exposure of hands, forearms and face is what might conservatively be expected of a non-KI future industrial worker. Given the similarity in exposure assumptions between U.S EPA default assumptions and the KI-worker-specific assumptions, a non-KI future industrial worker would be expected to have similar exposures to those estimated for the current KI workers and, thus, a discrete future scenario was not evaluated in the HHRA.

Beazer understands that institutional controls and deed restrictions may constitute part of the remedy at the Site.

2. *Section 1.1- Screening of COPCs.* For screening of chemicals of potential concern (COPCs), the noncarcinogenic screening values should be adjusted to a hazard quotient (HQ) of 0.1.

RESPONSE: The HHRA incorporates this requested change. See Section 2.3 and Table 1 of the HHRA.

3. *Section 1.1-Receptors to be assessed*. The deterministic risk assessment should assess all relevant receptors rather than proceeding under the assumption that the Koppers worker has the highest risk.

RESPONSE: The HHRA incorporates this requested change. See Section 3.2 and Table 7 of the HHRA. The deterministic risk assessment estimates conservative potential on-Site risks for KI workers, trespassers, utility workers and construction workers.

4. *Sections 1.1, 1.2, 4.0 – Use of distributions for toxicity values* - EPA Region 4 has not yet accepted use of toxicity factor distributions in a probabilistic risk assessment (except for chemicals with ranges on IRIS such as benzene). The Superfund probabilistic risk assessment guidance (RAGS, Volume III) does not recommend distributions for toxicity values, but we recognize that the current EPA Cancer guidelines allow such an approach. An especially pertinent factor for this HHRA is that dioxin is still being assessed by EPA, and EPA currently has no recommended cancer slope factor for TCDD. Therefore, EPA in consultation with FDEP will need to carefully evaluate any such distributions of toxicity values presented in the HHRA. For any cancer slope factor not currently recommended by EPA, it will be necessary for Beazer to submit solid scientific evidence supporting its choice of its preferred cancer slope factor. The fact that a specific governmental agency has accepted a cancer slope factor does not constitute scientific evidence necessary to meet this requirement. As it relates to alternative toxicity values, EPA Region 4 will consult with EPA HQ and the FDEP in determining if and what alternative toxicity values may be acceptable. Due to the precedent-setting nature of accepting alternative toxicity values in lieu of EPA current recommendations, an alternative toxicity determination may lead to more rigorous requirements which could extend the soil risk assessment approval process.

RESPONSE: The deterministic risk assessment uses U.S.EPA's recommended toxicity values. Specifically, the 1997 HEAST CSF for 2,3,7,8-TCDD of 150,000 (mg/kg-day)$^{-1}$ was used in the deterministic calculations. In addition, based upon a subsequent comment from U.S. EPA on the use of distributions of toxicity values in the MEE analysis (see October 6, 2008 MEE comment #2, reproduced below), the MEE analysis uses U.S.EPA's recommended toxicity values for all constituents except 2,3,7,8-TCDD –TEQ. A distribution of cancer slope factors is used for the latter constituent to account for the substantial new body of scientific data that has been developed about the potential carcinogenicity of 2,3,7,8-TCDD since the derivation of U.S. EPA's slope factor. By using U.S. EPA's current slope factor for dioxin in the conservative deterministic risk assessment, potential risks associated with potential exposures to dioxin are likely substantially overestimated. Similarly, by not using distributions of cancer slope factors for all constituents included in the MEE analysis, distributions of potential risk are overestimates of any actual risks. Thus, what is presented in the MEE analysis as a 50th percentile (or median) estimate of potential risk is actually greater than the 50th percentile because is based upon an 95% upper bound estimate of the cancer slope factor, not the estimated median cancer slope factor.

5. *Section 1.3, paragraph 1, sentences 2, 3.* EPA disagrees that deterministic risk assessments produce "unrealistic estimates of potential risks". EPA defines the Reasonable Maximum Exposure (RME) as the highest exposure that is reasonably expected to occur at a site (EPA 1989). And rather than "increase[ing] the realism of a risk assessment", probabilistic methods are really looking at a broader distribution of the exposed population.

RESPONSE: While it is not theoretically impossible for the conditions assumed by the conservative deterministic risk assessment to occur, it is highly improbable and cannot, in Beazer's view, be characterized as the highest "reasonable" exposure. The exposure assessment assumes that a worker is present for 250 day a year, for 25 years (so never gets sick nor takes vacation), and on every one of those days ingests soil with a concentration equal to the 95% UCL, and on everyone of those days has his or her entire exposed skin surface areas covered by soil a concentration equal to the 95% UCL, and that the bioavailability of constituents in the soil is equal to the 90th percentile of the distribution of relative absorption factors, among other factors. In addition, the deterministic risk characterization assumes that the on-Site worker is in the upper 95% percentile of sensitivity to every constituent that he or she is potentially exposed to. The assumption by the conservative deterministic risk assessment that all these conditions actually can occur, is in Beazer's view, better characterized as unrealistic than reasonable. However, in response to this comment, Beazer has eliminated use of the term "unrealistic" when referring to the conservative deterministic risk assessment contained in the HHRA.

6. *Section 3.1.1-Depth weighting of soil sample data.* Averaging of data across the top 24 inches could dilute contamination confined to the top few inches. EPA recommends averaging the data across no more than the top 12 inches of Site soil.

RESPONSE: In response to this comment, the HHRA uses the average concentration of constituents in the 0-6" soil interval to represent on-Site surface soils. See Section 3.4.1 of the HHRA.

7. *Section 3.3.1; Table 1.* The assumption that a worker only contacts the ditch sediments once per year seems very low. Either increase this assumption or provide specific Koppers Site-specific documentation that demonstrates that this assumption is accurate for the current facility worker. The incidental soil ingestion rate (IR) currently recommends for Superfund HHRA is 100 mg/day for the outside worker.

RESPONSE: AMEC contacted the plant manager of the KI facility who provided facility-specific information. That information indicated that on-Site workers have only contacted drainage ditch sediments once in the 20 years she has been plant manager and that an exposure frequency of once per year is conservative, particularly given that the conservative deterministic risk assessment assumes the exposure frequency applies for 23.9 years (so a worker has nearly 24 days of total exposure to drainage ditch sediments).

The deterministic risk assessment presented in the HHRA assumes an incidental soil ingestion rate of 50 mg/day. This assumption is consistent with current FDEP guidance,

"TECHNICAL REPORT: DEVELOPMENT OF CLEANUP TARGET LEVELS (CTLS) FOR CHAPTER 62-777, F.A.C." (FDEP 2005). Further, the assumption of 50 mg/day is consistent with available data and recommendations made by the researchers who derived the 100 mg/day ingestion rate referred to by U.S. EPA in the comment as presented in "LETTER FROM EDWARD CALABRESE TO K. HOLTZCLAW, RE: SOIL INGESTION RATES. JULY 23. EXHIBIT E.1 TO COMMENTS OF THE GENERAL ELECTRIC COMPANY ON THE U.S. ENVIRONMENTAL PROTECTION AGENCY'S HUMAN HEALTH RISK ASSESSMENT FOR THE HOUSATONIC RIVER SITE – REST OF RIVER. JULY 28." (Calabrese 2003). Additional justification for the assumption of 50 mg/day is provided in the HHRA.

8. *Section 3.3.2; Table 1 fraction ingested term for trespasser.* With a low exposure frequency (EF) for the trespasser (4-12 days/yr), the fraction ingested (FI) should be kept as 1.

RESPONSE: The KI facility plant manager indicated that trespassers are almost never seen on the facility and certainly not for an extended part of a day. Thus, the assumptions of an EF of 4-12 days/yr and an FI of 0.25 for the trespasser are very conservative and are used in the HHRA.

9. *Section 3.5.2.6; Tables 1, 3 – Soil ingestion rate.* 100 mg/day should be assumed as the soil ingestion rate for an outdoor worker for the deterministic HHRA, and as the upper bound value in the probabilistic assessment.

RESPONSE: As described in the response to comment #7, the conservative deterministic risk assessment uses an incidental soil ingestion rate of 50 mg/day. The upper bound of the soil ingestion rate distribution used in the MEE analysis is also 50 mg/day and is based upon the information and recommendations made by the researchers who derived the 100 mg/day ingestion rate referred to by U.S. EPA in the comment.

10. *Section 3.6.2, Table 1 – Use of 75 years in the averaging time term for carcinogens.* While it can be agreed upon that humans in the U.S. are living longer, a longer "lifetime" has not been applied to the averaging time (AT) in Superfund risk assessment equations. Using a larger value for the AT, and maintaining the other inputs as is, would effectively result in a slightly lower lifetime average dose (since the AT is in the denominator), and thus a lower estimated carcinogenic risk. Intuitively, this outcome does not make sense; the incidence of cancer is known to increase the longer a person lives. Therefore, the 70-year lifetime should be retained until such time as EPA guidance is revised to allow a longer lifetime.

RESPONSE: Though Beazer believes current demographic data support the use of 75 years as an average lifetime and believes use of such a lifetime is appropriate in risk assessments, in response to this comment, the HHRA uses 70 years as a default lifetime. See Section 3.5.10 and Table 7 of the HHRA.

11. *Section 4.0, Toxicity values.* If no value is in IRIS, the provisional value proposed for use in the HHRA should be approved by EPA. These provisional values (EPA-PROV) are subject to change, so a table of screening values should not be the source for such values.

RESPONSE: The deterministic risk assessment in the HHRA used a hierarchy of toxicity values. The first source was IRIS. When no IRIS value was used, HEAST values were incorporated to account for any potential toxicity.

12. *Table 3- Job Tenure/duration.* Since the rest of the exposure assessment is so specific to the current Koppers worker, Koppers Facility-specific input for job tenure is required to be used in lieu of the "Burmaster (2000)" values.

RESPONSE: The HHRA uses KI facility-specific job tenure information. See Section 3.5.3 and Table 7a of the HHRA.

13. EPA understands from recent discussions that AMEC is seeking Koppers Site-specific information on homeless trespassers, the extent to which the non-process area could be considered as one exposure unit based on worker practice, possible measured respirable particulate concentration measured from Koppers workforce, Koppers Site-specific worker exposure frequency, and exposure factors for construction workers. EPA expects that this Site-specific information will require an update to multiple areas of the soil risk assessment approach.

RESPONSE: U.S. EPA is correct; several aspects of the HHRA have been modified from that proposed in the approach documents, including division of the non-process area into six smaller exposure areas, and use of KI facility-specific exposure frequencies. See Section 3.1 of the HHRA.

14. The program used to perform the probabilistic risk assessment should be submitted to FDEP and EPA along with equations and distributions used for the on-site Koppers soil assessment. The information provided should allow replication of the output and assessment of the calculations and distribution sources used by the program.

RESPONSE: Beazer has provided U.S. EPA with a detailed description of AMEC's proprietary MEE model and the equations used therein. That description is also included in the HHRA. AMEC is also willing to provide a copy of the proprietary MEE model software to U.S. EPA enabling U.S. EPA to perform its own calculations, providing that U.S.EPA is willing to agree that U.S. EPA will only use the MEE model in connection with its evaluation of the HHRA for the KI facility in Gainesville.

15. EPA was initially under the impression that Beazer planned to utilize the 95% Upper Confidence Level (UCL) as the exposure point concentration (EPC) in the soil risk assessment. Recent discussions now lead EPA to believe that there is an alternative EPC being considered in lieu of the 95% UCL. Please specify which EPC Beazer will utilize in the soil risk assessment so that FDEP and EPA may evaluate the EPC.

RESPONSE: The conservative deterministic risk assessment uses the area weighted 95% UCL as stated in the approach document. The MEE analysis uses a distribution of area weighted EPCs. The derivation of the deterministic and MEE EPCs is described in the HHRA. See Section 3.4 of the HHRA.

16. While EPA understands that Beazer has selected the onsite Koppers worker as the most exposed individual for risk assessment purposes and is planning off-site soil sampling, exposure questions remain relative to off-site air transport of dust to nearby residents. It is unclear when this exposure pathway will be evaluated as it is necessary to do so to comply with Florida RBCA standards. Alachua County EPD has also requested that this exposure pathway be evaluated in a timely manner in order to address current concerns from nearby residents related to possible contaminated dust exposure from the Koppers Site. Please identify when and where this route of exposure will be addressed.

RESPONSE: The HHRA evaluates on-Site risks. Beazer will provide a separate submittal that evaluates potential off-Site air transport and potential exposure of nearby residents. In addition, Beazer is currently undertaking an off-Site soils investigation that will determine whether off-Site soils have potentially been impacted by dust migration from the Site.

Response to U.S. EPA comments dated October 6, 2008.

RELATIVE ABSORPTION FACTORS (RAFS) DOCUMENT COMMENTS

1. Overall, the approach regarding oral RAFs appears reasonable. It would be better if the soil types used in the cited studies could be matched up with the soil type(s) from the Koppers site. If we cannot match the soil type, there should be an upper bound of the range of values calculated in the deterministic risk assessment (as has been proposed). Also, it may be necessary to narrow somewhat the distribution used in the probabilistic risk assessment (PRA) to account for this uncertainty.

RESPONSE: As discussed with U.S. EPA, the soil type information referred to by the comment is not available. As a result, the conservative deterministic risk assessment uses the upper 90th percentile of the RAF distribution for the constituents that drive potential excess lifetime cancer risk (e.g., arsenic, 2,3,7,8-TCDD-TEQ, PAH and penta). For the non-cancer risk evaluation, AMEC RAFs are used if available, otherwise default RAFs are used. See Section 3.5.12 of the HHRA. The uncertainty section of the HHRA describes that the use of AMEC RAFs in the non-cancer risk evaluation does not affect the outcome of the HHRA. See Section 6.3 of the HHRA. Because Beazer believes all of the RAFs used to develop the RAF distributions are valid, the MEE analysis uses the full range of RAFs.

2. To assess the absorption from dermal exposure to soil, the methodology and quantitative values recommended in RAGS-E (EPA 2004) should be used. RAGS-E actually has

recommended dermal absorption (ABS) values for arsenic, PAHs, and TCDD which should be used for the deterministic human health risk assessment (HHRA). If other chemicals are selected as COPCs in the HHRA for which RAGS-E does not have recommended dermal ABS values, literature derived values can be proposed for EPA consideration. Then the GI absorption fraction from the toxicity studies should be used to determine if an adjustment to the toxicity value is needed for each chemical. The distribution of dermal ABS values can be used in the PRA.

RESPONSE: See response to October 6, 2008 RAF Comment 1.

MICROEXPOSURE EVENT MODEL PROPOSAL COMMENTS

1. As previously discussed, EPA will need to see this model "in action" to fully review the PRA portion of the HHRA.

RESPONSE: See response to September 9, 2008 Comment 14.

2. Use of distributions of toxicity values is discussed in this proposal. Any use of toxicity values not having undergone EPA's peer-review process will likely need to have substantial review from EPA Superfund Headquarters and/or EPA Office of Research and Development (ORD) scientists. For this reason, it is recommended to begin the HHRA by using only EPA-verified toxicity values in the PRA. Dioxin (TCDD-TEQ) is an exception since the current EPA Superfund recommendations (EPA 1998), rather than a toxicity value per se, is that specific concentrations of dioxin in soil are health protective. Thus, under the requirement from Florida regulations that a particular risk level be achieved, we should consider a range of potential toxicity values based on available regulatory recommendations from other states and based on the best currently available scientific information of the toxicity of dioxin.

RESPONSE: See response to September 9, 2008 Comment 4.

Response to FDEP comments dated August 1, 2008.

Responses to FDEP comments are presented in the order they occur in the FDEP comments. In some cases, a single paragraph in the FDEP comment letter is subdivided if it contained more than one comment.

As an overview, aspects of the proposal likely to be acceptable to FDEP include evaluation of risk at the 95th percentile.

RESPONSE: The approach document did not recommend a specific percentile of the potential excess lifetime cancer risk distribution upon which to base decisions about the acceptability of potential risk. Beazer does not believe that a specific percentile can be appropriately selected as a matter for default. As described in the HHRA, Beazer believes

the distribution of potential risk developed by the MEE analysis for the current on-Site KI worker meets FDEP's risk limits. See Section 5.2 of the HHRA.

Aspects not acceptable to FDEP include: 1) a cancer risk target higher than 1 x 10-6 FDEP has made this clear before.

RESPONSE: The HHRA discusses estimated potential excess lifetime cancer risks in the context of both U.S. EPA's acceptable risk range and FDEP's bright-line risk limits. See Sections 5.1.3 and 5.2 of the HHRA.

2) use of a cancer slope factor for dioxin other than the one from HEAST to calculate cancer risk.

RESPONSE: See response to U.S. EPA September 9, 2008 Comment 4.

3) adjustment of assumptions regarding relative bioavailability of contaminants from soil without supporting, site-specific in vivo data.

RESPONSE: See response to U.S. EPA October 6, 2008 RAF Comment 1.

4) use of extremely large exposure units, such as the one proposed for the non-process area.

RESPONSE: See response to U.S. EPA September 9, 2008 Comment 13.

More detailed technical comments are as follows:

1. The largest contingency with this risk assessment is that future use will remain identical to current use. Risks to workers from current uses are based on exposure factors specific to the Koppers operation in Gainesville, Florida, including number of days worked, maximum length of a workday, clothing worn in each area, size of the process and non-process areas, and lack of movement between areas for individual workers. These site-specific exposure factors would necessitate controls to maintain identical exposures in the future. Any changes to these site use conditions would require a reassessment of risk.

RESPONSE: See Response to U.S. EPA September 9, 2008 Comment_1. The assumptions used in the HHRA closely mirror default U.S. EPA assumptions for generic industrial workers.

2. The non-process area (approximately 70 acres) is defined as one exposure unit for on-site workers. An exposure unit represents an area over which exposure is assumed to be equal and random. We are concerned that this condition is not met in the non-process area, and that the exposure to at least some workers with non-random contact involving areas with higher soil concentrations could result in an underestimation of risk. This problem could be addressed by dividing the non-process area into smaller exposure units. Five-acre exposure units might be appropriate for areas with higher concentrations, while somewhat larger

exposure units (e.g., 10 acres) could be used for areas with lower concentrations, especially if the variability of concentrations within these areas is relatively small.

RESPONSE: See response to U.S. EPA September 9, 2008 Comment 13 and discussion in the HHRA regarding the basis for subdivision of the non-process area into six smaller exposure areas.

3. During the June 30 meeting, it was pointed out that homeless people camp near the border of the property and occasionally traverse the property using the ditch for concealment. The risk assessment should be expanded to include a scenario that addresses this situation.

RESPONSE: AMEC contacted the KI facility plant manager who indicated that trespassers are almost never seen on the facility and trespassers do not use the ditch to traverse the Site. Therefore, no basis exists to include this hypothetical scenario in the HHRA.

4. Pages 1-2 and 1-5 state that the probabilistic model may employ alternative toxicity factors if potential risks exceed allowable benchmarks under the initial set of toxicity values. A hierarchy of sources for toxicity factors and Florida Department of Environmental Protection (FDEP) approved toxicity values can be found in the Technical Report: Development of Cleanup Target Levels (CTLs) for Chapter 62-777, F.A.C. (2005). The sources are ranked based on the level of literature and peer review required to develop a toxicity value. For dioxins, the Department uses the cancer slope factor from the highest source in its hierarchy, which is the value in HEAST. This cancer slope factor has been used to develop soil cleanup criteria adopted by rule (Chapter 62-777, F.A.C.). Results using other cancer slope factors [as point values] can be presented for comparison in the uncertainty section of the risk assessment.

RESPONSE: See response to U.S. EPA September 9, 2008 Comment 4 and see U.S. EPA October 6, 2008 MEE Comment 2.

5. Slides 45-53 of the Koppers Inc. meeting with the FDEP express concern that the EPA IRIS/HEAST toxicity values for dioxin are considerably outdated. The presentation proposes using an alternate maximum toxicity value of 2.6E+04 mg/kg-d-1 for 2,3,7,8-TCDD. This value is stated to be a California EPA Office of Environmental Health Hazard Assessment (OEHHA) draft PGL. Documentation should be provided detailing the derivation of this value. The California EPA OEHHA reassessed its toxicity value for 2,3,7,8-TCDD in 1999. This reassessment underwent a peer review process and a public comment period. The resulting toxicity value (1.3E+05 mg/kg-d-1) is in agreement with the older HEAST value (1.5E+05 mg/kg-d-1) and is currently used by EPA Regions 3, 6, and 9 at Superfund Sites (Regional Screening Levels, May 20, 2008) and the State of California. In considering different cancer slope factors for dioxin, 2.6E+04 mg/kg-d-1was presented as the maximum value. Other potential choices, including the value in HEAST and the value in the EPA's dioxin reassessment, are higher and should be included if results from a range of values is presented in the uncertainty assessment.

RESPONSE: See response to U.S. EPA September 9, 2008 Comment 4 and see U.S. EPA October 6, 2008 MEE Comment 2. The HHRA provides detailed justification for the use of a distribution of cancer slope factors for dioxin.

6. Page 1-4 states that deterministic risk assessments "develop very conservative and unrealistic estimates of potential risks based on the combination of numerous conservative assumptions". Deterministic risk assessments combine upper percentile and median exposure estimates to calculate a reasonable maximum exposure. The resulting risk estimates are conservative in an attempt to represent a wide range of exposures in the absence of site-specific data. We disagree that deterministic risk assessments produce unrealistic estimates of potential risk.

RESPONSE: See response to U.S. EPA September 9, 2008 Comment 5.

7. Page 1-4 states a standard Monte Carlo analysis (MCA) does not produce a realistic representation of potential exposures because "a standard MCA may randomly draw a low body weight but then also select an unrealistically high skin surface area as part of the same iteration". Provisions for dealing with known correlated variables (such as body weight and skin surface area) should be part of any probabilistic risk assessment.

RESPONSE: Comment noted. The MEE analysis used in the HHRA does correlate body weight and skin surface area. See Sections 3.5.4 and 3.5.5 of the HHRA.

8. Page 2-1 COPC Screening states "any constituent detected in less than 5% of the samples for each media will not be considered further in the risk assessment. For constituents detected in more than 5% of the samples for soil and sediment, maximum concentrations will be compared to USEPA Region 6 Industrial Outdoor Worker Soil Human Health Medium-Specific Screening Levels."

a. COPCs may be eliminated based on detection frequency if detected in 5% or fewer of 20 or more samples (or one out of ten or more samples), detects are below default criteria, and the chemical is not believed to be associated with historical site activities (USEPA, 1989). We disagree that the detects need to be below “default criteria” by which we assume FDEP means CTLs. What is the point of a frequency of detection screen if the detects need to be below CTLs? May as well just have a CTL screen.

RESPONSE: A frequency of detection screening step was not employed in the HHRA to select COPCs. Any constituent detected at least once was compared to screening benchmarks.

b. Detected constituents in soil should be compared to FDEP soil CTLs found in Chapter 62-777, F.A.C. Detected constituents should initially be compared to the lowest SCTL for screening purposes.

RESPONSE: FDEP industrial direct contact soil CTLs, when available, were considered in the COPC screening. If the corresponding U.S. EPA industrial soil RSL was lower, it was used instead of the FDEP SCTL.

9. The document proposes use of only post-1995 data because earlier sampling data is not needed for adequate coverage. Many of the constituents present in the soil at Koppers Inc. degrade slowly and will remain in the soil at similar concentrations for many years. Concentrations detected pre-1995 are therefore relevant in estimating the current exposure point concentrations.

RESPONSE: Pre-1995 data is not representative of constituent concentrations on-Site. As discussed in the HHRA, all data collected from the Site between 1990 and 1995 were missing detection limits for constituents not detected. Using only the detected constituents from the 1990 to 1995 data would unnecessarily bias the dataset and result in EPCs that are biased high. Also, there are no surface soil samples, i.e., samples starting at a 0 depth, from the 1990 – 1995 dataset. Of the 59 soil samples collected between 1990 and 1995, 58 were collected from the 1 to 3 foot depth and one was collected from the 2 to 4 foot depth.

10. Page 3-1 states "a depth-weighted average concentration will be developed to represent the surface soil (0-2 ft bgs) EPC and subsurface soil (0-6 ft bgs) EPC for each COPC at each sampling location". Where metals or semivolatiles are known or suspected to be present, the soil sampling intervals are zero to six inches below ground surface, six inches to two feet, and two-foot intervals thereafter (Chapter 62-780, F.A.C.). For evaluation of risk from direct exposure, each of these soil intervals should be evaluated separately. Specifically, data from intervals within 0-2 ft bgs should not be averaged to obtain an exposure point concentration for surficial soil.

RESPONSE: See response to U.S. EPA September 9, 2008 Comment 6.

When evaluating the potential for leaching, a 0-6 ft bgs interval would be appropriate, but for direct contact with subsurface soil, the intervals should be 2-4 and 4-6 ft bgs (or deeper, depending upon depth to groundwater).

RESPONSE: The HHRA uses a 0-6' depth interval to evaluate the potential risks to a construction and utility worker because potential exposure of such workers would be to soil in the entire 0-6' interval when they are performing construction related activities or utility work. Exposure would not be to solely select depth intervals.

11. This document does not address leachability. In addition to direct contact CTLs, leachability criteria should be met throughout the vadose zone soil. FDEP default leachability-based CTLs can be used for this purpose. Alternatively site specific leachability CTLs can be developed using SPLP.

RESPONSE: The HHRA contains an evaluation of the potential risks associated with direct contact with on-Site soils. An evaluation of leachability of COPCs in on-Site soils will be included in the Feasibility Study.

12. Use of the 95% UCL as the exposure point concentration (EPC) necessitates apportionment per Chapter 62-780, F.A.C. For the purposes of additivity, constituents should be screened at 1/10th the default soil cleanup target level.

RESPONSE: The HHRA uses 1/10th of the lower of RSL and FL SCTL screening benchmarks.

13. Only nine samples are available for the 0-0.5 foot sediment interval. For human health risk assessment, Chapter 62-780, F.A.C. requires a minimum of ten samples for the calculation of a 95th percentile EPC. In the absence of ten samples, the maximum detected concentration should be used as the EPC.

RESPONSE: See response to U.S. EPA September 9, 2008 Comment 15.

14. The ditch needs to be evaluated both for human health risk and as a potential source of downstream contamination with ecological impacts. For potential sediment impacts, for example, comparison with TEC and PEC values would be appropriate.

RESPONSE: The HHRA contains an evaluation of potential human health risks associated with potential exposure to COPCs in ditch sediments. The HHRA does not contain an ecological evaluation. Moreover, Beazer does not believe such an evaluation is warranted. The on-Site concentrations of key wood treating-related constituents in sediments are within levels that Beazer has found to be without adverse effect to benthic macroinvertebrates at several other sites. This information has been summarized by AMEC in a 2006 white paper and memorandum submitted to U.S. EPA Region III and can be made available if requested. Thus, adverse effects to the benthic community related to wood treating constituents would not be expected in drainage ditch sediments.

15. The proposed respirable particulate concentration of 0.019 mg/m3 is an annual average for Gainesville, Florida under undisturbed conditions. The soil at Koppers Inc. is frequently disturbed by large vehicle traffic and generates high levels of dust. A higher particulate concentration more representative of site conditions should be used in the risk assessment.

RESPONSE: The basis for the respirable particulate concentration is described in the HHRA. See Section 3.5.11 of the HHRA. Site-specific respirable particulate matter (RPM) data were not available. In the absence of site-specific data, the distribution of RPM values (as PM10) measured at two air monitoring stations in Gainesville: Site_ID #23, located in the residential area at NW 53rd Avenue & NW 43rd Street; and, Site_ID #1003, located in the urban/commercial area at 721 NW Sixth Street were used, see:

http://www.epa.gov/aqspubl1/annual_summary.html .

16. Toxicity values used by the FDEP were developed based on a 70-year lifetime. The 75-year averaging time used in this assessment should be amended to reflect the same lifetime duration as the toxicity values. As discussed at the meeting, most SFs are based upon a lifetime of the test organism from which they were derived. Hence, if people are living to 75 years, that is the appropriate lifetime to use.

RESPONSE: See response to U.S. EPA September 9, 2008 Comment 10.

17. Comments concerning exposure factors for on-site workers:

a. The site-specific exposure frequency of 235 d/y seems low. Documentation is needed to support the on-site worker exposure frequency for Koppers Inc. at its Gainesville facility.

RESPONSE: The HHRA contains the requested documentation. See Section 3.5.2 of the HHRA.

b. The skin surface area available for contact for workers in the process area includes the approximate areas of the wrists and face. If chemical resistant gloves are not used at the site, the area of the hands should be included in the skin surface area. The area of the hands should also be included if the gloves are re-used without cleaning since this would allow soil and other contaminated particles into the glove and in contact with the skin surface.

RESPONSE: Based upon information provided by the KI facility manager, chemical resistant gloves are used by process area workers.

18. Comments concerning exposure factors for trespassers:

a. The assessment uses a 0.25 fraction of exposure from the site for trespassers. The fraction of exposure from the site is should be 1, especially given the infrequent contact assumed to take place. For the reasons discussed in the document and at the meeting, we believe the 0.25 is reasonable and consistent with common sense. If we confirm with KI that teenage trespassers are on the Site for a very short duration, we could decrease rather than increase the fraction exposed term.

RESPONSE: See response to U.S. EPA September 9, 2008 Comment 8.

b. We recommend using a soil to skin adherence factor for trespassers of 0.2 rnq/cm2, This is the mean for children playing in wet soil (US EPA, 2004).

RESPONSE: The HHRA uses an adherence factor of 0.145 mg/cm2. Because the trespassers are not children and the soil is not wet most of the time the adherence factor referred to in the comment is not appropriate.

19. Comments concerning the exposure factors for construction workers:

a. The construction worker scenario assumes only ten days of exposure to excavation and other soil related construction activities and calculates an ingestion rate of 118 mg/day. This seems low. We recommend using the US EPA default construction worker ingestion rate of 330 mg/day for the entire duration of the construction activities (US EPA, 2002).

RESPONSE: The HHRA uses the incidental soil ingestion rate presented in the approach document and describes the basis for the assumption. See Section 3.5.1 of the HHRA.

b. The soil to skin adherence factor of 0.14 mg/cm2 seems low. We recommend using the construction worker specific skin-soil adherence factor of 0.3 mg/cm2 (US EPA, 2002).

RESPONSE: The HHRA uses the adherence factor presented in the approach document and describes the basis for the assumption. See Section 3.5.6 of the HHRA.

20. The construction worker scenario only considers exposure to soil. The groundwater beneath the Koppers Inc. site is also contaminated and it is assumed that construction activities may bring the worker into contact with both soil and groundwater. These exposures should be combined when determining risk for the construction worker.

RESPONSE: Potential contact by construction workers with COPCs in groundwater is not expected during most times of the year given the nature of the Site, thus, this potential exposure pathway is not quantitatively evaluated in the HHRA.

21. Page 3-7 proposes the inclusion of alternative relative absorption factors (RAFs) in the probabilistic risk assessment. These RAFs will be derived from scientific literature on absorption and bioavailability for the routes of exposure and matrices used in the derivation of the toxicity values. It is unclear from this proposal what type of studies will be used in the derivation of alternative RAFs. The Department requires site-specific data from a suitable in vivo bioavailability study to modify the default RAF assumption of 1 (or, in the case of arsenic, the default assumption of 0.33). The only exception is for lead in soil, where in vitro bioaccessibility protocols as approved by the U.S. EPA can be used to determine a site-specific bioavailability.

RESPONSE: See response to U.S. EPA October 6, 2008 RAF Comment 1.

22. The program used to perform the probabilistic risk assessment should be submitted to the FDEP along with the equations and distributions used for the onsite Koppers Inc. soil assessment. The information provided should allow replication of the output and assessment of the calculations and distribution sources used by the program.

RESPONSE: See response to U.S. EPA September 9, 2008 Comment 14.

23. Comments concerning the proposed distributions for the probabilistic risk assessment:

a. Exposure point concentrations should be assessed over the vertical intervals defined in Chapter 62-780, F.A.C. (see Comment #9). The 0-0.5 foot and 0.5-2 foot intervals should be analyzed separately for direct contact to on-site receptors.

RESPONSE: See response to U.S. EPA September 9, 2008 Comment 6.

b. Site-specific Koppers Inc. data should be used for the job tenure distribution for workers. Use of the Burmaster (2000) data evaluates job tenures for different job classifications. However, it does not evaluate how long a person is employed at a specific site. It is common for workers to change jobs over the length of their tenure. Using the length of time spent on one job may underestimate the overall time spent under employment at the Koppers Inco site.

RESPONSE: See response to U.S. EPA September 9, 2008 Comment 1.

c. The maximum, minimum, and most likely values for exposure time should be based on site-specific data for the Koppers Inc Gainesville facility. Documentation should be provided that specifies the minimum and maximum length of shifts at the site.

RESPONSE: See response to U.S. EPA September 9, 2008 Comment 1.

d. A default exposure frequency of 235 d/y was chosen as the most likely exposure frequency because it has been used in previous risk assessments. Without site-specific information on exposure frequency, the default value of 250 d/y should be used as the most likely exposure frequency. This assumption would also change the minimum and maximum frequency values, which were based on professional judgment and represent two work weeks less and one work week more than the most likely exposure.

RESPONSE: See response to U.S. EPA September 9, 2008 Comment 14.

e. The upper 75th percentile soil ingestion rate from Stanek et al. (1997) of 50 mg/day is used as the maximum soil ingestion for the probabilistic risk assessment. This same study has a 9thth percentile of 331 mg/day. Co-author Edward Calabrese, in a letter written July 23, 2003, discusses the artificially high 95 th percentile from this study and suggests using the 75 th percentile as an upper end estimate for adult soil ingestion. The letter includes no explanation why the 75 th percentile would be an appropriate upper end estimate other than the artificial inflation of the 95 th percentile. The letter also does not discuss the extent to which the 95th percentile was inflated. Due to the uncertainties surrounding this study, we recommend using the current US EPA value of 100 mg/day as the upper end soil ingestion for outdoor workers (US EPA, 2002) and 50 mg/day as the most likely or median value (US EPA, 1997, Table 4-23).

RESPONSE: See response to U.S. EPA September 9, 2008 Comments 7 and 9.

f. It is unclear what reference was used to estimate the surface area of the face.

RESPONSE: This has been clarified in the HHRA. See Section 3.5.5 of the HHRA.

g. The average surface area of the head for workers ages 18-65 is 1287 cm2 (FDEP, 2005).

RESPONSE: As presented in USEPA 2004, "RISK ASSESSMENT GUIDANCE FOR SUPERFUND, VOLUME I: HUMAN HEALTH EVALUATION MANUAL (PART E, SUPPLEMENTAL GUIDANCE FOR DERMAN RISK ASSESSMENT", the face is assumed to be 1/3 of the head.

h. As stated in Comment #13, the respirable particulate matter value of 0.019 mg/m3 is not representative of conditions at the Koppers Inc. site. We recommend using a distribution that is representative of the higher levels of dust generated at the site.

RESPONSE: The basis for the respirable particulate concentration is described in the HHRA. See response to Comment #13 and see Section 3.5.11 of the HHRA.

i. It is unclear how the maximum inhalation rate of 2.0 m3/hr was derived. Table 5-23 of the US EPA Exposure Factors Handbook does not list a maximum or minimum inhalation rate. Table 5-8 of the Exposure Factors Handbook lists a 99 th percentile of 3.7 m3/hr for outdoor worker inhalation rates. We recommend using this value for the maximum inhalation rate in the distribution.

RESPONSE: The Exposure Factors Handbook maximum represents a short-term level of exertion, not an inhalation rate that would expected over the course of a full work-day. In conversations with the plant manager, many of the on-Site workers spend most of their time driving heavy equipment. Their exertion level is relatively low, therefore a more reasonable maximum of 2.46m3/hr was assumed.

24. In addition to the inhalation of respirable particulates, the inhalation of volatilized chemicals should be included in the average daily dose formulas for COPCs that may volatilize from soil.

RESPONSE: None of the COPCs are considered volatile chemicals, therefore this pathway is not complete.

25. Page 4-1 lists a hierarchy of sources for obtaining toxicity values for the probabilistic risk assessment. The hierarchy used by the FDEP is listed in the Technical Manual for Chapter 62-777, F.A.C. (FDEP, 2005, page 10). We recommend using FDEP preferred sources for the designation of toxicity values.

RESPONSE: See response to U.S. EPA September 9, 2008 Comment 4.

Editorial Comments:

26. On page 3-6, the body weights for utility workers and construction workers are transcription errors. The correct weights should be 71.5 kg.

RESPONSE: This has been corrected in the HHRA. See Section 3.5.4 of the HHRA.

27. In Table 3 the equation used to derive exposure time should be Risk Triangular.

RESPONSE: This has been corrected in the HHRA. See Section 3.5.8 of the HHRA.

28. Skin surface area percentile values are not shown in Table 2 and the distribution function for this exposure factor is missing from Table 3.

RESPONSE: This has been corrected in the HHRA. See Section 3.5.5 of the HHRA.

Response to ACEPD and City of Gainesville comments dated August 8, 2008.

1. **Migration to groundwater**
High concentration areas will need to be remediated to address both direct contact (surface soil) as well as deeper contamination of greater concern for ongoing migration to groundwater. It is expected that this will be addressed in the Feasibility Study and integrated with the decisions for surface soil.

RESPONSE: See response to FDEP Comment 11.

2a. **Migration to Adjacent Properties**
A high priority for the site is to reduce potential impacts to nearby residents. Contamination such as with dioxin at the western fence line is frequently more than ten times the Default FDEP clean-up criteria that are protective for residential properties, and because of the close proximity it is likely that elevated concentrations are present offsite.

RESPONSE: Virtually all on-Site concentrations of dioxin along the western fence line are below U.S. EPA's recommended residential clean up goal and, thus, are unlikely to represent unacceptable risk to residential receptors, even if such receptors were to occur on the Site. Nevertheless, Beazer is currently undertaking an off-Site soils investigation that will determine whether off-Site soils concentrations exceed background concentrations.

2b. **Migration to Adjacent Properties**
Remediating hot spots in the site interior to protect workers does not address ongoing releases (runoff and dust) for more sensitive receptors at the site perimeter, a primary concern of the community. More stringent criteria based on residential exposure assumptions should be developed for the more sensitive receptors to address potential ongoing releases.

RESPONSE: See response to U.S. EPA September 9, 2008 Comment 16.

3. **Surface Soil and Sediment Transport via Stormwater**

The proposed approach for onsite sediments in the drainage way is based on the assumption of very limited exposures for onsite workers or trespassers. That is not the primary concern for this exposure route. These contaminated sediments are a source of offsite contamination with concentrations (e.g. with dioxin, benzo-a-pyrene) orders of magnitude above relevant screening values (ecological and/or human health) at the point of discharge from this drainageway. Both the residual upstream contaminated sediments, as well as any ongoing releases from nearby soils, must be evaluated for this migration pathway and decisions regarding onsite remedial actions for sediment and soil must consider protection of offsite receptors from these ongoing releases.

RESPONSE: ACEPD's most recent sampling of the creeks downstream of the Site, "SCREENING OF SEDIMENT AND WATER QUALITY WITHIN SPRINGSTEAD CREEK AND DITCHED TRIBUTATIES NORTH OF CABOT-KOPPERS SUPERFUND SITE" (ACEPD, Dec. 2006) found that most locations have non-detectable concentrations of constituents and when detected, generally low concentrations were present. With regard to potential ecological effects, see response to FDEP Comment 14.

4a. **Other Onsite Receptors**

Homeless persons should be considered as potential on-site receptors since they are known to frequent the site, and their exposures would be much higher than the estimates used for trespassers.

Potential risks to ecological receptors should also be considered when selecting a final remedy for onsite soil and sediments where concentrations above ecological screening values are present in the more natural wooded areas that may attract wildlife.

RESPONSE: See response to FDEP Comment 3

4b. **Other Onsite Receptors**

Homeless persons should be considered as potential on-site receptors since they are known to frequent the site, and their exposures would be much higher than the estimates used for trespassers.

Potential risks to ecological receptors should also be considered when selecting a final remedy for onsite soil and sediments where concentrations above ecological screening values are present in the more natural wooded areas that may attract wildlife.

RESPONSE: See response to FDEP Comment 14.

5. **Need to Evaluate Soil in Northwestern Wooded Area**

No data have been collected in the Northwestern Wooded area. Based on site history, it is likely that soils in this area may be contaminated. This should be further evaluated for current and future risks.

RESPONSE: The absence of historic wood treating activity in this area suggests that elevated concentrations of constituents should not be present, that any potential risks would be lower than the allowable levels of potential risk estimated for exposure areas adjacent to the Northwestern wooded area and, therefore, potential risks associated with this area were not quantitatively evaluated in the HHRA.

6. **Consideration of Off-Site Sampling Results**

It is understood that some offsite sampling will be performed followed by submission of a sampling report in January of 2009; however, it appears that the Draft FS will be submitted in December of 2008, prior to the completion of the offsite sampling. The offsite sampling results may influence the estimates of the site as an ongoing source to offsite receptors. Therefore, the FS for onsite soil cannot be finalized until off-site soil data has been evaluated and this transport pathway has been fully evaluated.

RESPONSE: Not applicable to the HHRA.

7. **Need for Updated Conceptual Model**

Currently, the site is being evaluated as a series of isolated topics without consideration of how these would integrate in selecting the final remedy. Therefore, an updated conceptual site model should be developed, and the approach/schedule for the integrated onsite soil assessment be documented before alternatives are evaluated in the FS to support a final remedy for onsite surface soil and sediment.

RESPONSE: See response to U.S. EPA September 9, 2008 Comment 16.

<u>Response to ACEPD and City of Gainesville comments dated August 15, 2008.</u>

General Comments

1. The "Proposed Approach to Estimating Potential On-Site Human health Risks Associated with Soils and Sediments at the Koppers Inc. Wood-Treating Facility In Gainesville, Florida", hereinafter referred to as the "approach document", is intended to evaluate human health risks associated with onsite exposure to soils and sediment and appears to be the sole basis for developing cleanup criteria for onsite soils. As summarized in preliminary comments provided in our letter of August 8, 2008 to USEPA, this approach document does not address all exposure pathways or community concerns with surface soil contaminants, specifically offsite transport, elevated concentrations at the western property boundary near the residential neighborhoods, children playing in Springstead Creek, homeless persons living on or adjacent to the site, as well as any ecological receptors that inhabit or utilize the wooded areas or creek for foraging. Thus, estimating onsite-risks may not be adequate as a

basis for establishing final soil cleanup criteria based on a conceptual understanding of the site contamination conditions relative to the environmental setting. The approach document should include a conceptual site model (CSM) to justify the media, receptors, and exposure pathways evaluated for onsite soil.

RESPONSE: This comment summarizes points made in the County's and City's preliminary comments dated August 8, 2008. See Beazer's responses above to the points raised by the August 8, 2008 letter.

2a. Several critical key assumptions for chemicals of potential concern (COPCs) have not been specified in this approach document.

RESPONSE: All assumptions used to evaluate potential risks are presented in the HHRA. See, for example, Sections 3.5.12, 4.1, and 4.2 of the HHRA.

2b. Florida Department of Environmental Protection (FDEP) requirements for toxicity factors and relative absorption factors as specified in their comments must be followed for this assessment.

RESPONSE: See response to U.S. EPA September 9, 2008 Comments 4 and 11, and response to U.S. EPA October 6, 2008 RAF Comment 1.

3. The proposed probabilistic modeling approach will not be easily communicated to stakeholders, decreasing confidence in the protectiveness of the final remedy. Consistent with EPA guidance for probabilistic risk assessment (EPA, 2001), the proposed approach will provide a basis to state the Remedial Action Level (RAL) or maximum concentration remaining in the exposure unit, and also the post-remediation exposure point concentration (EPC) or target average concentration remaining in the exposure unit. The RAL and post-remediation EPC must be presented in the assessment.

RESPONSE: As described in the HHRA, and discussed at several meetings with U.S. EPA and other stakeholders, the risk assessment approach presented in the HHRA will demonstrate the protectiveness of a selected remedy (assuming a remedy is required) by demonstrating that after implementation of the remedy, potential risks associated with direct soil and sediment contact meet risk limits.

Specific Comments

1a. **Section 1.0 Introduction**
The text states that engineering controls will be used as the remedy to prevent direct contact exposures. However, this is a decision to be made based on the results of the feasibility study (FS) that considers other factors like reduction in toxicity, mobility and long term effectiveness, cost comparisons and other factors. A concern is that there may have been a pre-selection of remedy for the site without the completion and review of the FS alternatives. Clarification and explanation of this issue is needed.

RESPONSE: A remedy has not been preselected for the Site, and no pre-selected remedy is assumed or evaluated in the HHRA. The Approach Document was pointing out that the proposed approach can be used to evaluate the protectiveness of any of the potential controls that might be selected for the Site.

1b. **Section 1.0 Introduction**

This section states that "the endpoint of the risk assessment process will be a demonstration that postremediation soil and sediment risks to current and future on-Site human receptors are below applicable risk thresholds". This approach does not address future uses (or assumes they are the exactly the same as current). The use of the inferred future protection is not accurate as there are no guarantees that the exact same land use will continue into the unforeseen future.

RESPONSE: Use of the term future is correct. The HHRA assumes that future use of the Site remains the same as current use. If future use were to become different than current use, the HHRA discusses that the risk assessment approach presented therein can be used to evaluate the potential risks associated with an alternative future use. In addition, the future use of the Site is highly likely to remain industrial, and many of the assumptions used in the HHRA mirror U.S. EPA default assumptions for industrial workers.

1c. **Section 1.0 Introduction**

Following the deterministic analysis, the probabilistic modeling will refine the risk estimate for the most exposed receptor, the onsite KI worker. Assumptions for this receptor will provide the basis for evaluating risk reduction associated with hot spot removals in the interior of the site. It is assumed that if the remedial action is protective for this receptor, it would protect other receptors and pathways. First, additional pathways and receptors need to be evaluated. In addition, this approach may not adequately consider elevated concentrations near the site perimeter where greatest potential for transport offsite to residential neighborhoods may occur, or transport of sediments offsite. These factors should be evaluated.

RESPONSE: The HHRA describes the basis for assuming that all on-Site receptors will be protected by a remedy that is also protective of the on-Site workers, the most exposed receptor. See Section 5.2 of the HHRA.

With regard to the residential neighborhood to the west, see response to ACEPD August 8, 2008 Comment 2.

2. Section 2.1 COPC Screening, Page 2-1

This section proposes to remove chemicals as chemicals of potential concern (COPC) based on frequency of detection (FOD). However, FOD screening has the following qualifications:

- If the chemical is site-related and the detections are localized, suggesting a hotspot, FOD cannot be used as a basis for eliminating a chemical as a COPC;

- If any member of a chemical class has other members selected as COPCs, it should be retained
(e.g., detected carcinogenic polycyclic aromatic hydrocarbons) (EPA/RAGS 1989, p. 5-22);
- There must be at least 20 samples in order to screen based on a less than 5% FOD.

In addition, this section indicates that maximum site concentrations will be compared to USEPA Region 6 Industrial Outdoor Worker Soil Human Health Medium-Specific Screening Levels (MSSLS), however, this site is located in EPA Region 4 and the MSSLS do not apply. Further, as of June 12, 2008, Region 4 requires the use of the Regional Screening Levels for all risk assessment screening on Superfund projects. In June of 2008 EPA released the Regional Screening Table/Calculator which can be found at the following website: http://epa-prgs.ornl.gov/chemicals/index.shtml.
The Regional Screening Table has replaced the Region 3 Risk-Based concentration Table, the Region 6 MSSL table, and the Region 9 Preliminary Remediation Goal (PRG) table. This table/calculator was developed by Oak Ridge National Laboratory under an Interagency Agreement with EPA. The approach document should use the most current screening levels which are the Regional EPA screening levels as mentioned above.

RESPONSE: See response to FDEP Comment 8.

3a. Section 3.0 Exposure Assessment, Page 3-1
As indicated previously, this section does not include a screening of all potential exposure pathways and receptors based on a CSM for the site and does not provide a basis for demonstrating protection for sediments or high priority areas (near residential areas).

RESPONSE: See response to ACEPD August 8, 2008 Comment 3.

3b. Section 3.0 Exposure Assessment, Page 3-1

The previous data summary report (AMEC, 2007) did not summarize all data proposed to be used in the risk assessment. Please provide a complete data set in order that the data can be qualified for use in the risk assessment.

RESPONSE: The HHRA summarizes all of the data used to estimate potential risks. See response to FDEP comment #9.

4a. Section 3.1.1 EPCs For Soil, page 3-1
Depth Averaging. Because this risk assessment is for current workers, primary exposure will be to the upper soil layer. Depth weighted averages may be relevant for a future scenario where soil mixing may occur, or for maintenance or utility workers, but would significantly underestimate current exposures. Therefore, for current direct contact exposure, the shallowest surficial soil samples must be used and not averaged with less contaminated subsurface soils.

Spatially-weighted averages. Estimating average exposure concentrations in an exposure unit for a receptor is appropriate, and the Thiessen polygon approach is acceptable. However, further clarification of the derivation of the exposure point concentration (EPC) using the bootstrap method is necessary, or a specific reference or protocol provided. In addition, calculation of the UCL95 using all data points in the exposure unit using ProUCL (USEPA, 2007) should be presented for comparison and discussion in the uncertainty section.

RESPONSE: The HHRA explains the bootstrap calculation. See Section 3.4 of the HHRA.

4b. Section 3.1.1 EPCs For Soil, page 3-1

Spatially-weighted averages. Estimating average exposure concentrations in an exposure unit for a receptor is appropriate, and the Thiessen polygon approach is acceptable. However, further clarification of the derivation of the exposure point concentration (EPC) using the bootstrap method is necessary, or a specific reference or protocol provided. In addition, calculation of the UCL95 using all data points in the exposure unit using ProUCL (USEPA, 2007) should be presented for comparison and discussion in the uncertainty section.

RESPONSE: The bootstrap procedure is described in the HHRA. See Section 3.4 of the HHRA. Because ProUCL is unable to develop UCLs for area weighted averages, ProUCL results are not presented in the HHRA.

5. Section 3.1.2 Exposure Point Concentrations (EPCs) For Sediments, page 3-3
This section indicates that there are nine 0-0.5 foot samples and two 0.5 to 2 foot samples available for sediments, however, the risk assessment will only use the nine 0-0.5 feet samples "because receptors are not expected to contact sediments deeper than 6 inches." This is true if there is limited potential for erosion, or disturbance of these sediments by trespassers known to walk in the drainageway. Concentrations were higher in one of the two deeper samples. The risk assessment must document factors supporting the assumption that the sediments are stable and potential for exposure to higher concentrations in the future limited.

RESPONSE: The HHRA provides information supporting the assumptions used to estimate potential exposure to sediments in the drainageway. See Section 3.4.2 of the HHRA.

6a Section 3.2 Exposure Areas page 3-3
The approach document must consider smaller exposure units for the different worker operations in the 90-acre non-process area for estimating a reasonable maximum exposure (RME). The appropriateness of an exposure area to estimate current risks are highly dependent on worker activities and patterns. The non-process area is large and workers do not spend time equally/randomly across this entire area. Area use weighting should be considered together with the spatial data patterns to estimate exposure point concentrations for current

workers. Subdividing the non-process area is relevant for evaluating current uses as well as implications for future development.

RESPONSE: See response to U.S. EPA September 9, 2008 Comment 13.

6b Section 3.2 Exposure Areas page 3-3

As stated previously, the identification of the drainageway as a unique exposure unit is appropriate, but the pathways and assumptions are not the most relevant for evaluating risks associated with these sediments. There is greater potential trespasser exposures than assumed, and potential onsite ecological impacts and transport offsite must be evaluated.

RESPONSE: See responses to U.S. EPA September 9, 2008 Comment 7 and FDEP Comment 14.

7. Section 3.4.1 Relative Response Factors (RAF) page 3-6

Proposed values for RAFs and the basis for their selection must be documented. Consistent with FDEP requirements, site-specific data are necessary before modifying the default RAF.

RESPONSE: See response to U.S. EPA October 6, 2008 RAF Comment 1.

8. Section 3.5.2.2 Job Tenures, page 3-9

The Lumber and Wood Products Industrial Category includes a wide range of industry groups including logging, sawmills, millwork, and a range of activities that are likely not applicable for a local wood treating facility that has operated in this location for many years. Some basic inquiries on job tenures at the site are recommended to verify that the estimates for this wide industrial category are relevant. Specifically the job tenure information indicates 50 percent of male workers are employed for less than 2.4 years, and females less than 1.5 years. Given much lower job tenure assumptions for female workers, it should be verified that equal likelihood for female and male workers is valid.
Additional consideration of whether this worker remains the most exposed receptor should be demonstrated given potentially longer exposure durations for the homeless trespassers and nearby residents.

RESPONSE: See response to U.S. EPA September 9, 2008 Comment 1.

9. Section 3.5.2.6 Soil Ingestion Rates, page 3-10

The proposed approach will underestimate soil ingestion rates for workers at this site and must be modified. The referenced studies by Stanek et al. (1997) and recommendations by Dr. Calabrese are not relevant for this site. The Stanek et al. (1997) Massachusetts study was based on intakes by 10 adults during the months of September through November, with no indication of the work or activities of the volunteers. The workers at the Koppers Site are outdoors each workday at a site that has bare soil and dusty conditions, resulting in higher exposures than assumed for default outdoor workers doing

limited landscaping or digging. More appropriate upper bound soil ingestion exposures should be used, for example intakes consistent with assumptions for gardeners or construction workers.

RESPONSE: See response to U.S. EPA September 9, 2008 Comment 9.

10. Section 3.5.2.8 Respirable Particulate Matter, page 3-11

The assumptions for respirable particulate matter (RPM) are not adequate to reflect conditions at this site. The proposed RPM of 19 ug/m3 was selected based on data from a remote location (Newberry Water Tower), much less dusty than this site. The community has complained of high dust levels generated at the site, consistent with bare soil and site activities that increase dust generation. The RPM values for both the deterministic and probabilistic risk estimates must be revised using one of the following approaches:

- Concentration of 60 ug/m3 for total respiratory particulates equal to or less than 10 microns in diameter (PM-10) (MADEP, 2008) derived for sites with high dust generated from vehicles and equipment over bare soil.
- Calculation of a site-specific activity-based particulate emission factor (PEF) (EPA, 2002) reflecting dust generation by various activities including truck traffic on unpaved surfaces. Note also that the guidance states inhalation of these dusts should be evaluated for onsite workers and off-site residents.
- Data generated from an approved site specific study evaluating dust levels.

RESPONSE: See response to FDEP Comment 15.

11. Section 4.0 Toxicity Assessment, Page 4-1

This section does not follow the EPA (2003) or FDEP hierarchy for the selection of toxicity values to be used in deterministic risk assessments. We concur that FDEP preferred sources must be used for the designation of toxicity values.

RESPONSE: See response to U.S. EPA September 9, 2008 Comment 4.

12a Table 1 Exposure Assumptions, Page 6-7

In addition to previous comments regarding exposure assumptions, the following are specific examples where exposures are likely underestimated and the use of other factors recommended.

Soil ingestion rates. The EPA (2002) recommended ingestion rate for a construction type work is 330 mg/day yet the approach document assumes 118 mg/day which is nearly 3 times lower than the standard default value recommended for construction type work. Given the nature of this site and the work activities, increased intakes are likely also applicable for the process and non-process area workers.

RESPONSE: See response to FDEP Comment 19.

12b Table 1 Exposure Assumptions, Page 6-7

Trespasser The exposure frequency of only one time per month appears low for a trespasser. Due to the close proximity of residences on the western side of the site and warm climate, a more frequent trespassing is likely. For the events where trespassers are at the site, the fraction of exposure from the site should be assumed to be 1 because of the dusty site conditions. In addition, due to the presence of homeless people at or near the site, an adult trespasser should also be included in the risk assessment to address long-term and frequent exposures by the homeless.

RESPONSE: See response to U.S. EPA September 9, 2008 Comment 7.

If you would like to discuss these comments and Beazer's responses in more detail or require additional information, please call me or Paul Anderson at AMEC.

Sincerely,

Mitchell D. Brourman, P.G.
Environmental Manager

Enclosure

cc: Jack Spicuzza (KI)
Paul Anderson (AMEC)
Greg Council (HSI Geotrans)