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December 27, 2013

Mr. John Maddox  
Georgia DNR - Environmental Protection Division  
2 Martin Luther King, Jr. Drive, S.E.  
Suite 1462 East  
Atlanta, Georgia 30334

RE: Response to EPD's June 12, 2013 Comments  
Davidson-Kennedy Company  
1195 Victory Drive  
Atlanta, Fulton County, Georgia  
HSI Site No. 10866

Mr. Maddox:

The comments below were generated during EPD's review of the proposed area averaging exercise used for the Davidson-Kennedy site. Peachtree has provided the following responses to EPD's comments sent via email following the June 12, 2013 meeting.

**Comment #1:** The data set used for the Kriging process is a subset of all site data consisting of approximately 130 data points. **A)** Please provide justification for the use of this subset. A discussion of how representativeness was ensured or verified must be included. **B)** For comparison purposes, please provide a table (excel format) of *all* surface soil concentration data points remaining at the site showing the arithmetic mean and the standard deviation. In addition, please provide a figure showing the concentration of lead for all remaining surface-sample locations with the Kriging blocks and designated concentration range of that block (color coded) shown as well.

**Responses:**

**A)** A general rule of thumb in Kriging analysis is that a minimum of 30 data points is required for analysis. In this case a total of 130 data points, sufficient for analysis, was used for Kriging. The 130 data points represents the surface lead concentrations detected during several investigations, as documented in the initial report on the Kriging analysis. The population was vetted and data points which were subsequently removed during the excavations were replaced by lead concentrations determined to be in the fill material.

In Kriging analysis the estimation process is governed by the spatial correlation between the data points being analyzed. The correlation of the data is determined through computation of a sample variogram which forms the basis for modeling the data and for predicting and mapping the data across the site using the process of point or block Kriging.

In determining the sample variogram all pairs of measurement values in a data set are compared to each other in order to provide a consistent measure of their degree of spatial correlation. As part of the variogram the correlation distance of the data points, referred to as the range is also calculated. Data points within the range are correlated and those outside are uncorrelated. The calculated range informs the analyst as to how close the data point must be located to ensure accuracy in the Kriging estimation. In order to minimize uncertainty in the mapped surface the Kriging estimation was performed within the calculated range of the data points. The accuracy of the Kriging process is measured by the Kriging standard deviation and the corresponding correlation distance referred to as the range.

**B) Table 1** provides a summary of all data points with the arithmetic mean and the standard deviation. **Figure 1** depicts the concentration of lead for all remaining surface sample locations with the color-coded Kriging blocks.

**Comment #2: A)** Additional justification for the selection of the 5 exposure domain should be provided. The geometry and area of the individual exposure domains should be addressed. **B)** For comparison purposes, please provide an example of the selected data subset Kriged using the entire site as a single exposure domain.

## **Responses**

**A)** The site was divided into 5 exposure domains each approximately 2 acres in size. The size of the domain was selected based on existing land use patterns in the area. The area is dominated by industrial properties with the smallest property, within a 2 mile radius, being approximately 2 acres in size with an average size of approximately 10 acres. The geometry and orientation of the 2 acre industrial lots/domains were determined by taking into account potential access point and existing topographic features on the site that will affect the development of these industrial lots.

**B)** If the site is considered as a single domain, the existing 95UCL of lead on the site would be 1109 mg/kg. In order to reduce the 95UCL to below the 400 mg/kg industrial standard a total of nine (9) 30'x30' blocks will have to be excavated as shown in the figure below. This would reduce the 95UCL for the site to 360 mg/kg. Considering the site as a single domain would reduce the amount of contaminated soil required to be removed by about half.



**Comment #3:** **A)** Additional justification should be given for the selection of the 30'x30' block size. Please provide the justification for this size selection, and **B)** provide examples of how manipulation of the block size changes the outcome of the Kriging model and more specifically the remedial footprint.

**Responses:**

**A)** The block sizes used for Kriging are dependent on the specific application. Based on our experience in applying Kriging analysis for developing excavation plans for contaminated soils a 30'X30' block has provided optimal results for capturing the spatial extent of contamination. The size of the Kriging block determines which data points influence the block estimate and the accuracy of the results. Too large a block results in greater influence that samples further away from the location being estimated have. Too small a block results in fewer data points used in the analysis. Both of these can lead to poor estimations and have resulted in both the over and under estimation of areas requiring excavation.

**B)** Peachtree hopes that the above response will provide adequate justification for the Kriging block size utilized in the model. If necessary, a meeting to observe the model manipulation and resulting outcomes can be scheduled at EPD's convenience.

**Comment #4:** **A)** Please verify that 18mg/Kg is the actual concentration for the fill material used to backfill previous remedial excavations as used in the Kriging process. A minimum of 10 lead concentration data points should be collected using XRF to verify this value. **B)** In lieu of collecting this data, the model may be re-run using the Type 1 RRS (75 mg/Kg) as the fill concentration.

**Responses:**

**A)** Peachtree collected 10 additional XRF lead concentration data points on October 30, 2013. Utilizing the 10 lead concentrations collected across the backfill areas, a background average of 36 mg/kg was calculated and input into the Kriging model. **Table 2** provides a summary of the XRF soil sample results. The resulting model indicates that an additional 80 cubic yards will need to be removed from the site, in addition to the previously calculated 1,100 cubic yards, for a total of 1,180 cubic yards.

**B)** Not applicable.

**Comment #5:** TCLP values should be provided for material planned to be left on-site based on the current remedial footprint to determine if impacted material may qualify as hazardous waste if ever excavated.

**Responses:**

Comment noted. Davidson-Kennedy will implement deed restrictions stating that if excavation within the footprint of the impacted soils left onsite is conducted, soil samples for lead TCLP analysis will be required.

**Comment #6:** Davidson-Kennedy should demonstrate that impacted soil remaining on-site will not migrate via erosion or other means of transportation into the on-site waterway such that in-stream water quality standards and sediment concentrations are exceeded.

**Responses:**

Comment noted. Davidson-Kennedy will develop appropriate plans and place appropriate maintenance suggestions in an Environmental Covenant. For example: "Perform annual inspections to insure stream banks are maintained/vegetated, and if necessary, install engineering controls to mitigate stream/sediment impacts. As the stream is intermittent, these inspections should occur during or after rain events."

**Comment #7:** EPD would like to know if a sensitivity analysis was conducted as part of this exercise. If so, please describe which input parameters have the greatest effect on the output or results. Describe what actions have been taken to ensure that the sensitive input parameters used for this exercise are appropriate.

**Responses:**

A sensitivity analysis was not performed as part of this exercise.

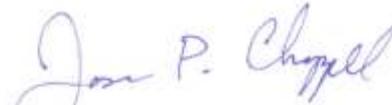
Peachtree hopes the responses to your comments are both responsive and useful. Please feel free to contact either of the undersigned if you have any questions or require additional information.

Sincerely,

**Peachtree Environmental**



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HSI #10866

TABLE 1  
SOIL ANALYTICAL RESULTS FOR SURFICIAL SOIL SAMPLE LOCATIONS REMAINING ON-SITE  
TOTAL LEAD

Sample Designation	Sample Date	Depth (ft.)	Lead
			Analytical Results (mg/kg)
TMW-1A	7/25/2005	0.5	39
TMW-10	8/23/2005	0.5	28.4
HA-3A	7/26/2005	0.5	202
HA-4A	7/27/2005	0.5	180
HA-5A	7/26/2005	0.5	50.8
HA-6A	7/27/2005	0.5	106
HA-14A	7/27/2005	0.5	161
HA-15A	7/27/2005	0-5	50.4
BH-2	8/24/2005	0-5	219
BH-4	8/23/2005	0-5	163
BH-5	8/24/2005	0.5	18.5
BH-6	8/24/2005	0-5	50.3
BH-7	8/24/2005	0.5	87.3
BH-8	8/24/2005	0-5	151
BH-9	8/24/2005	0.5	<b>303</b>
BH-10	8/24/2005	0-5	<b>350</b>
GP-1	8/24/2005	0.5	<b>307</b>
GP-3	8/24/2005	0.5	<b>342</b>
GP-4	8/24/2005	0.5	<b>278</b>
GP-8	8/24/2005	0.5	74.9
GP-9	8/25/2005	0.5	126
GP-17	8/25/2005	0.5	140
GP-18	8/25/2005	0.5	<b>325</b>
GP-20	8/25/2005	0.5	166
GP-22	8/25/2005	0.5	<b>305</b>
GP-27	8/25/2005	0.5	19.4
GP-29	8/25/2005	0.5	<b>254</b>
GP-30A	8/25/2005	0-5	70.7
GP-36	8/25/2005	0.5	<b>309</b>
GP-42B	8/25/2005	0.5	100
GP-56A	8/25/2005	0.5	222
GP-60	8/25/2005	0.5	208
GP-61A	8/25/2005	0.5	189
GP-62	8/25/2005	0.5	<b>356</b>
GP-63	8/25/2005	0.5	<b>292</b>
GP-69	8/25/2005	0.5	187
GP-70	8/25/2005	0.5	84.3
GP-72A	8/25/2005	0.5	20.6
GP-73A	8/25/2005	0.5	36
GP-76	8/26/2005	0.5	189
GP-77	8/26/2005	0.5	102
GP-82A	8/26/2005	0.5	129
GP-83	8/26/2005	0.5	<4.63
GP-87	8/26/2005	0.5	<b>360</b>
DK-15	11/22/2011	0.5	124
DK-16	11/22/2011	0.5	<b>364</b>
DK-17	11/22/2011	0.5	166
DK-18	11/22/2011	0.5	16.2
DK-19	11/22/2011	0.5	<b>514</b>
DK-20	11/22/2011	0.5	48.5
DK-21	11/22/2011	0.5	<b>479</b>
DK-22	11/22/2011	0.5	17.7
DK-23	11/22/2011	0.5	<b>243</b>
DK-24	11/22/2011	0.5	<b>28,600</b>
DK-25	11/22/2011	0.5	<b>3,170</b>
DK-26	11/21/2011	0.5	32.8
DK-27	11/21/2011	0.5	<b>1,430</b>
DK-28	11/21/2011	0.5	<b>564</b>
DK-29	11/21/2011	0.5	<b>292</b>
DK-30	11/21/2011	0.5	29.1
DK-31	11/21/2011	0.5	26.1
DK-32	11/21/2011	0.5	35.8
DK-33	11/21/2011	0.5	207
DK-34	11/21/2011	0.5	130
DK-35	11/21/2011	0.5	<b>292</b>
DK-36	11/21/2011	0.5	98.0
DK-37	11/21/2011	0.5	95.9
DK-38	11/21/2011	0.5	126
DK-39	11/21/2011	0.5	130
DK-40	11/21/2011	0.5	214
DK-41	11/21/2011	0.5	163
DK-42	11/21/2011	0.5	41.2
DK-43	11/22/2011	0.5	<b>1,420</b>
DK-44	11/22/2011	0.5	68.8
DK-45	11/22/2011	0.5	78.7
DK-46	11/22/2011	0.5	<b>240</b>
DK-47	11/22/2011	0.5	<b>551</b>
DK-48	11/22/2011	0.5	80.9
DK-49	11/22/2011	0.5	<b>260</b>
<b>Arithmetic Mean</b>			611.5
<b>Standard Deviation</b>			3195.9

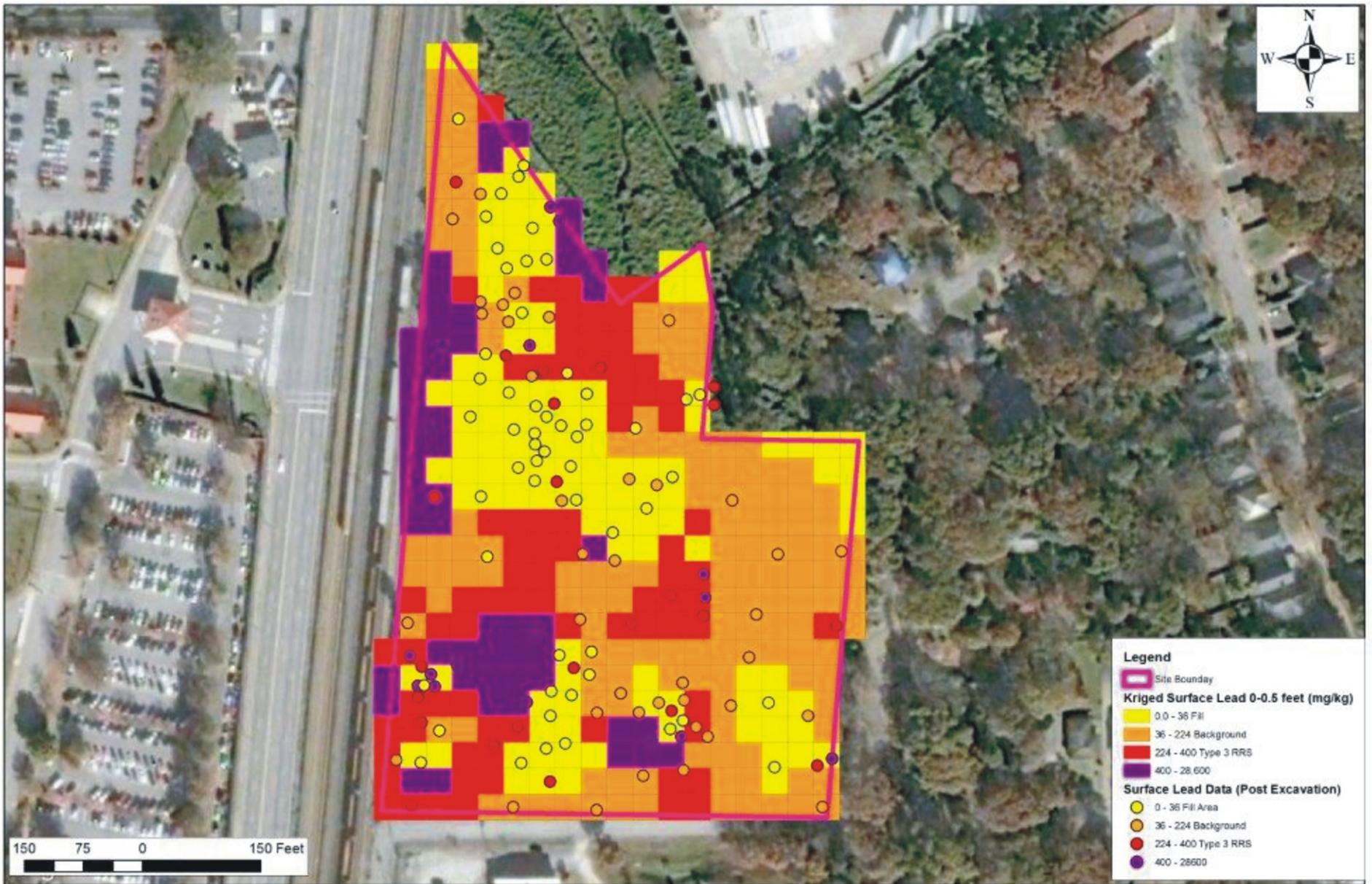
**NOTES:**

Soil samples summarized above represent 2005 and 2011 samples remaining outside of excavation areas.  
Concentrations in **BOLD** exceed the calculated anthropogenic background concentration of 224 mg/kg.

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**TABLE 2**  
**OCTOBER 2013 XRF BACKFILL LEAD RESULTS AND COORDINATES**

Sample Designation	Date	XRF LEAD RESULT (ppm)	Latitude	Longitude
DK-AREA G	10/30/2013	36	33.707028	-84.426667
DK-AREA H	10/30/2013	46	33.707125	-84.426698
DK AREA M	10/30/2013	37	33.707024	-84.425732
DK-AREA A3	10/30/2013	28	33.707881	-84.426419
DK-AREA A1	10/30/2013	34	33.708057	-84.42698
DK-AREA A2	10/30/2013	43	33.708053	-84.426573
DK-AREA K	10/30/2013	45	33.708944	-84.426842
DK-AREA J	10/30/2013	20	33.708768	-84.426937
DK-AREA E	10/30/2013	34	33.707206	-84.427306
DK-AREA F	10/30/2013	34	33.706971	-84.427333
<b>AVERAGE XRF LEAD RESULT IN BACKFILLED AREAS</b>				36



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**FIGURE 1-  
 SURFACE SOIL LEAD IMPACTS WITH KRIGING BLOCK OVERLAY**

VOLUNTARY REMEDIATION PROGRAM - DECEMBER 2013



MAP  
 LOCATION

