

## 4.2 Soil Sampling

As stipulated in GES's Work Plan and QAPP, once exposed, the soils beneath the metal beam stockpile areas will be sampled to verify PCBs do not exceed the 1.0 mg/Kg cleanup standard set forth by EPA for the site. Each of the three identified stockpile areas was divided into equal-sized grids, not to exceed 10 by 10 feet as specified in the approved work plan and QAAP. A surface soil sample was to be collected at each grid point and combined into composite samples in accordance with 40 CFR 761.283 (b)(3) and 40 CFR 761.289. Should testing show that any soil sample exceed the 1 mg/kg PCB cleanup standard, that area was to be excavated in 1" lifts and the confirmation sampling repeated until analysis verifies the remaining site soils do not exceed the 1.0 mg/kg PCB concentration.

Three steel beam stockpile areas had been identified at the site labeled as Area A, Area B and Area C as shown on the Soil Sampling Plan included as **Figure 3 in Appendix 1**.

Grid point surface samples consolidated into composite samples for laboratory submission and subsequent confirmation analysis were to be carefully documented in the site sampling log for tracking and clearance purposes. Composite samples submitted to the lab were distinguished by the assigned capital letter for the metal beam stockpile area and consecutive numeric numbers. Therefore, the first composite sample submitted from a former metal beam stockpile area A would have the distinct composite sample identification as "A1."

To minimize the need for sample equipment decontamination, soil samples were collected and combined with dedicated, disposable sampling equipment whenever possible. On the square-based grid system overlaid at each former metal stockpile area a surface soil sample was taken at each grid point and combined into composite samples for laboratory submission.

Each former steel beam stockpile area was divided into equal-sized grids (shown on **Figures 4a, 4b, and 4c of Appendix 1**) not exceeding 10 feet by 10 feet grids in accordance with the procedure for compositing samples collected at grid points in accordance with 40 CFR 761.283 (b)(3) which allows for consolidation of a maximum nine individual samples with the maximum dimensions of the area enclosing a nine grid point composite being two grid intervals bounded by three collinear grid points. Flags were used to mark the grid points and a wooden stake was used to mark and distinguish the grid area of each of the composite samples. All samples in the composite were surface samples taken at the same depth (~ one inch). The composite samples were prepared using equal volumes of each grid point sample, mixed thoroughly and of sufficient weight and portion for the chemical analyst to measure the concentration of PCBs and still have sufficient analytical detection sensitivity to reproducibly measure PCBs.

Surface soil samples were collected from each grid point and combined into composite samples as follows:

- A dedicated disposable 10 cm x 10 cm template was placed at each grid point (flag area) to mark the area to be sampled;
- The surface was scraped to an approximate depth of one inch with a dedicated spoon;
- Soil collected from each grid point was placed into a dedicated mixing container (pan);
- Once all grid point samples (maximum of nine grid points) that form a composite sample (based on the established grids), are placed in the mixing container, the samples were thoroughly homogenized to create a representative composite sample;

- The representative composite sample was paced into a laboratory supplied 4 oz. glass container with a lined lid (PTFE cap); and
- The sample container was then labeled with sample identification and sampling time, affixed with a yellow TSCA PCB label and the sampling log filled.

A total of 33 composite soil samples (excluding duplicates) were collected from the three former stockpile areas.

Sample jars were then wiped clean and placed into a sealable bubble bag and placed into a cooler with ice (to keep sample at about 4° C. Once sampling was completed, the chain of custody filled out, and the samples prepared/stored for shipping.

To minimize the need for sample equipment decontamination, samples were collected with dedicated, disposable sampling equipment. The used templates, sampling spoons, mixing pans, and the sampling gloves were discarded into plastic bags used for disposal of PCB contaminated material. A new template, sampling spoon, mixing pan, and gloves were used at each composite sampling location.

**4.2.1 Soil/Solids Sampling Event (August 11, 2009)** – On August 11, 2009, 21<sup>st</sup> Century Resources, Inc. collected samples of soil/solids generated during site remedial activities for disposal purposes.

In addition, four background soil samples depicted on **Figure 3 of Appendix 1**, were also collected from the site utilizing the same techniques discussed earlier in this section. Photographs of the background soil samples with the sampling log are provided in **Appendix 2 (Photographs 61 – 68)** of this report. Samples included the following:

- **Roll off Composite** - Five samples were collected from the roll off box containing solids (mainly soils) generated during site remedial activities. Four of the samples were collected; one each from each corner of the box and the fifth sample was collected from the middle of the box. All samples were placed into a mixing pan and a composite sample, designated as "Roll off Composite" was collected for PCB analysis for disposal purposes.
- **Paint Chip** - Paint chips that had pealed-off the metal beams were collected into 2 drums. One composite paint chip sample was collected from the two drums for PCB analysis for disposal purposes.
- **Background South** – Collected to the south of the former location of Stockpile C
- **Background West 1** – Collected between the location of former Stockpile C and the western property boundary.
- **Background West 2** – Collected between former Stockpiles A & B locations and the western property boundary.
- **Background North** – Collected at the northern portion of the property, west of the storage area.

A background sample was not collected from the east due to SIM's site activities which may not be representative of background conditions. See sampling log below:

**SOIL/SOLID SAMPLE LOG - August 11, 2009  
PCB SAMPLING FOR DICO INC.  
SIM – OTTUMWA PCB SITE**

*Photo No.	Sample No.	Sample Designation	Sample Description	Time Sampled
61 & 62	1	Background South	Background soil sample collected to the south of former Stockpile "C"	9:00
63 & 64	2	Background West 1	Background soil sample collected to the west between former Stockpile "C" location and the western property boundary	9:10
65 & 66	3	Background West 2	Background soil sample collected to the west of former Stockpiles "A & B" location and the western property boundary	9:20
67 & 68	4	Background North	Background soil sample collected within the northern portion of property west of the storage area	9:30
NA	5	Roll off Composite	A composite of five soil samples collected from the roll of box for characterization	9:52
NA	6	Paint Chip	A paint chip composite sample collected from two drums containing paint chip from the beams	9:58

\* Photographs are provided in Appendix 2

Sunny, hot and muggy (approx. 86°F)

Samples were properly preserved & packaged for shipment and dispatched to the appropriate laboratory for analysis, with a separate signed custody record enclosed in the cooler. The shipping container was secured with strapping tape and signed custody seals (attached to the front right and back left of the cooler) for shipment to the laboratory. The custody seals are covered with clear plastic tape. The cooler was strapped shut with strapping tape in at least two locations.

A chain-of-custody record identifying the contents of each sample container accompanied the sample shipment. The original record accompanied the shipment. Copies were retained at the site for inclusion in the site record.

Samples were shipped on August 11, 2009, overnight, via Federal Express (Air Bill Tracking Number: 8683-9561-6550) to Fibertec Environmental Services laboratory in Holt, Michigan for PCB analyses. Commercial carriers are not required to sign-off on the custody form as long as the custody forms are sealed inside the sample cooler and the custody seals remain intact.

**4.2.2 Soil Sampling (August 12, 2009)** – 21<sup>st</sup> CR mobilized to the site to perform soil sampling from grid points established for the three former stockpile areas (A, B, & C) with EPA. Sampling activities were conducted using the techniques discussed above.

As indicated earlier, each former steel beam stockpile area was divided into equal-sized grids not exceeding 10 feet by 10 feet grids (shown on the **Figures 3, 4a, 4b, and 4c of Appendix 1**) using flags to mark the grid points and a wooden stake to mark and distinguish the grid area of each of the composite samples.

During this sampling event, we were accompanied by Mr. DeAndre' Singletary of EPA. Photographs of this event along with the sampling logs are provided in **Appendix 2 (Photographs 93 – 125)** of this report.

A surface soil sample (from the surface to 1-inch depth) was collected at each grid point utilizing an individual disposable sampling tool at each grid point. The individual grab soil samples were combined into composite samples using a maximum of nine grab samples per composite sample. Thirty-three composite soil samples (excluding field duplicates) were collected from the three areas as identified in the log below:

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**GRID SOIL SAMPLE LOG – August 12, 2009**  
**PCB SAMPLING FOR DICO INC.**  
**SIM – OTTUMWA PCB SITE**

(Grid approved by USEPA Personnel)

*Photo No.	Sample No.	Sample Designation	Sample Description	Time Sampled
93	1	C1	Composite soil sample located on the southeastern corner of area C. It comprises of 9 sampling points (~1" deep) around composite stake C1.	8:00
94	2	C2	Composite soil sample west of C1 comprising of 8 sampling points (~1" deep). It excludes southwest sampling point which falls outside area C boundary.	8:18
95	3	C3	Composite soil sample west of C2 comprising of 5 sampling points (~1" deep). It excludes southern row and middle west sampling point which falls outside area C boundary.	8:45
96	4	C4	Composite soil sample north of C1 comprising of 9 sampling points (~1" deep) around composite stake C4.	8:57
97	5	C5	Composite soil sample north of C2 and west of C4 comprising of 9 sampling points (~1" deep) around composite stake C5.	9:15
98	6	C6	Composite soil sample north of C3 and west of C5 comprising of 9 sampling points (~1" deep) around composite stake C6.	9:27
99	7	C7	Composite soil sample north of C4 comprising of 9 sampling points (~1" deep) around composite stake C7.	9:40
100	8	C8	Composite soil sample north of C5 and west of C7 comprising of 9 sampling points (~1" deep) around composite stake C8.	9:57
101	9	C9	Composite soil sample north of C6 and west of C8 comprising of 9 sampling points (~1" deep) around composite stake C9.	10:11
102	10	C10	Composite soil sample north of C7 comprising of 9 sampling points (~1" deep) around composite stake C10.	10:24
102	11	C10 Duplicate	Duplicate of Composite sample C10 (C10 duplicate was also provided to EPA)	10:24
103	12	C11	Composite soil sample north of C8 and west of C10 comprising of 9 sampling points (~1" deep) around composite stake C11.	11:07
104	13	C12	Composite soil sample north of C9 and west of C11 comprising of 9 sampling points (~1" deep) around composite stake C12.	11:23
105	14	C13	Composite soil sample north of C10 comprising of 9 sampling points (~1" deep) around composite stake C13.	11:39
106	15	C14	Composite soil sample north of C11 and west of C13 comprising of 9 sampling points (~1" deep) around composite stake C14.	12:04
107	16	C15	Composite soil sample north of C12 and west of C14 comprising of 9 sampling points (~1" deep) around composite stake C15.	12:23
108	17	C16	Composite soil sample north of C13 comprising of 9 sampling points (~1" deep) around composite stake C16.	12:39
109	18	C17	Composite soil sample north of C14 and west of C16 comprising of 9 sampling points (~1" deep) around composite stake C17.	13:00
110	19	C18	Composite soil sample north of C15 and west of C17 comprising of 8 sampling points (~1" deep) around composite stake C18. It excludes northwest sampling point which falls outside area C boundary.	13:11
111	20	C19	Composite soil sample north of C16 (slightly offset to west) comprising of 6 sampling points (~1" deep). It excludes the northern row sampling points which falls outside area C northern boundary.	13:34
112	21	C20	Composite soil sample north of C17 (slightly offset to west) and west of C19 comprising of 5 sampling points (~1" deep). It excludes the northern row and one western sampling point which falls outside area C northern and western boundary.	13:50
112	22	C20 Duplicate	Duplicate of Composite sample C20 (C20 duplicate was also provided to EPA)	13:50
113	23	C21	Composite soil sample west of C6 comprising of 5 sampling points (~1" deep). It excludes western row and one south sampling point which falls outside area C western and southern boundary.	14:04

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**GRID SOIL SAMPLE LOG– August 12, 2009, Continued**  
**GRID SOIL SAMPLE LOG**  
**PCB SAMPLING FOR DICO INC.**  
**SIM – OTTUMWA PCB SITE**

(Grid approved by USEPA Personnel)

*Photo No.	Sample No.	Sample Designation	Sample Description	Time Sampled
114	24	B1	Composite soil sample located on the southeastern corner of area B. It comprises of 9 sampling points (~1" deep) around composite stake B1.	16:09
115	25	B2	Composite soil sample west of B1 comprising of 6 sampling points (~1" deep). It excludes the western row sampling points which falls outside area B western boundary.	16:21
116	26	B3	Composite soil sample north of B1 comprising of 9 sampling points (~1" deep) around composite stake B3.	16:48
116	27	B3 Duplicate	Duplicate of Composite sample B1 (B1 duplicate was also provided to EPA)	16:48
117	28	B4	Composite soil sample west of B3 comprising of 6 sampling points (~1" deep). It excludes the western row sampling points which falls outside area B western boundary.	17:00
118	29	B5	Composite soil sample north of B4 comprising of 3 sampling points (~1" deep) along the northern boundary of area B.	17:09
119	30	A1	Composite soil sample located on the northeastern corner of area A. It comprises of 4 sampling points (~1" deep). It excludes the northern, eastern, and western rows sampling points which falls outside area A.	17:47
119	31	A1 Duplicate	Duplicate of Composite sample A1 (A1 duplicate was also provided to EPA)	17:47
120	32	A2	Composite soil sample south of A1 comprising of 6 sampling points (~1" deep). It excludes the eastern row sampling points which falls outside area A eastern boundary.	18:02
121	33	A3	Composite soil sample west of A2 comprising of 6 sampling points (~1" deep). It excludes the western row sampling points which falls outside area A western boundary.	18:15
122	34	A4	Composite soil sample south of A2 comprising of 6 sampling points (~1" deep). It excludes the eastern row sampling points which falls outside area A eastern boundary.	18:28
123	35	A5	Composite soil sample south of A3 and west of A4 comprising of 6 sampling points (~1" deep). It excludes the western row sampling points which falls outside area A western boundary.	18:40
124	36	A6	Composite soil sample south A4 comprising of 4 sampling points (~1" deep). It excludes the southern and eastern rows sampling points which falls outside area A boundary.	18:50
125	37	A7	Composite soil sample south of A5 and west of A4 comprising of 6 sampling points (~1" deep). It excludes the southern row sampling points which falls outside area A southern boundary.	19:03

\* Photographs are provided in Appendix 2

Sunny, hot and muggy (approx. 85°F)

The soil sample locations are depicted on the Sample Grid Plans included as **Figures 4a, 4b and 4c in Appendix 1**.

At the conclusion of this sampling event, seven composite soil samples (A1 – A7) were collected from Stockpile Area A (plus one field duplicate), five composite soil samples (B1 – B5) were collected from Stockpile Area B (plus one field duplicate), and 21 composite soil samples (C1 – C21) were collected from former Stockpile Area C (plus two field duplicates).

Field duplicates were collected at a frequency of one duplicate for every ten analytical samples per the approved QAPP. A total of four field duplicates were collected during this event. Field duplicates were collected, identified and analyzed as a separate analytical sample. Field duplicates are collected using the same methods as the analytical samples.

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Each composite soil sample was placed into an individually labeled jar with a PTFE lined lid. The jar is then wiped clean and placed into a sealable bubble bag and placed into a cooler with ice (to keep sample at about 4° C).

Samples were properly preserved & packaged in a cooler (shipping cooler) with ice with a separate custody record enclosed in the cooler. A trip blank prepared by the laboratory was also placed in the shipping cooler per the approved QAPP.

On August 13, 2009, the container was inspected by the sampler and more ice was placed inside the cooler in preparation for delivery to the analytical laboratory.

A chain-of-custody record identifying the contents of the sample container accompanied the sample shipment.

On August 13, 2009, the samples were hand delivered by the sampler to Fibertec Environmental Services field office in Brighton, Michigan.

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