MEMORANDUM

TO: Ronald Murawski
FROM: David J. Hagen
RE: Tremont City Barrel Fill Site, Interim Report Regarding Waste Characterization Activities
DATE: November 20, 2003
Revised: December 2, 2003

The Waste Cell Characterization and Waste Characterization activities described in Section 4.05 and 4.06 of the Support Sampling Plan for the BFOU are ongoing. This memorandum will serve as an interim report regarding the same.

The primary objective of these RI activities was to confirm operational records provided in historic documents related to the BFOU. A significant task intended to satisfy this objective was excavation of test pits that are specifically intended to:

- confirm that waste cell locations and boundaries as identified in historic records and subsequent geophysical surveys are accurate (SSP: Sections 2.06 A 6, 2.06 B 3, 4.05 A, FSP: Section 2.03 A, and QAPP: Section 4.01 A);
- confirm that operational records regarding placement of drums in the cells are accurate (SSP: Section 2.06 B 3 and FSP: Section 2.04);
- observe and evaluate the current condition of the drums in the cells (SSP: Section 4.06 B);
- confirm the operational records of drum contents by sampling selected drums (SSP: Sections 2.06 B 3 and 4.06, FSP: Section 2.04, and QAPP: Section 4.01 B);
- observe and document subsurface conditions, including the potential presence of wastes in cell water and soil and the potential presence of uncontainerized wastes (SSP: Section 2.06 B 3 and FSP: Section 2.03 A);
- verify operational records on the construction of cells, including depth and volumes of wastes and number of drums in waste cells (SSP: Sections 4.05 A, 4.05B and FSP: Sections 2.03 A and 2.03 B); and
- determine chemical and physical quality of soils beneath waste cells including horizontal and vertical extent of soil impact (SSP: Section 4.05 B and FSP: Section 2.03 B).

Based on the test pit excavation activities conducted to date, it is clear that the objectives of the test pit program outlined in the SSP already have been met. The details of our field investigation findings with respect to the above objectives are provided below. Attached are Figures 1, 2 and 3, Table 1 and a photographic log of the excavation activities.
Confirm that waste cell locations and boundaries as identified in historic records and subsequent geophysical surveys are accurate.

Waste cell locations as identified in the SSP were field located by the project surveying contractor prior to the start of test pit activities. These locations were identified using the Administrative Record, operational records prepared by Danis Corporation during the operation of the BFOU, and three geophysical surveys completed at the BFOU. Waste cells and drums were encountered through test pit excavation activities at locations C-3, D-3, D-7 and B-7, coincident to where the surveying contractor field located these cells, thereby verifying the operational records. In addition, a geophysical surveying contractor performed an electromagnetic survey of the Barrel Fill in October and November of this year. Results of this survey (Figure 1) again indicate that documented waste cell locations and boundaries coincide with the field locations, derived from the operational records. These data confirm that waste cell locations and boundaries, as identified in historic records and subsequent geophysical surveys, are accurate. Based on these data, we have clearly met the decision rule for the waste delineation investigation as outlined in Section 4.01 A of the QAPP.

Confirm that operational records regarding placement of drums in the cells are accurate.

Test pits at waste cell location C-3 uncovered more than 20 drums present in the shallow-most layer of drums (Figure 2). The majority of exposed drums appeared to be intact and appeared to be arranged in an orderly fashion consistent with operational records (Photographic Log, Photograph 8).

After drum sampling was completed, a deeper excavation was advanced along the eastern side of waste cell C-3 to collect sidewall and pit bottom soil samples for analysis and to visually observe the conditions of the drums in the waste cell. The samples are being analyzed per the SSP. Upon completion of the deeper test pit, additional excavation was completed to remove soils from around the drums in C-3 to allow for more direct visual inspection of the drum conditions. During this operation, soil present between cells C-3 and D-3 collapsed and exposed drums in cell D-3. Continued excavation of the test pit to depth indicated that drums disposed in C-3 appeared to be intact throughout the waste cell and that these drums were placed in the cell in an orderly fashion (See Photographic Log, Photograph 12). These excavation activities also indicated that six layers of drums were present, consistent with information provided in the operational records. Inspection of drums uncovered in waste cell D-3 indicated the drum conditions and drum placement were similar as in C-3.

Test pits at waste cell location B-7 uncovered more than 25 drums in the uppermost layer of drums within this cell. Similar to cell C-3, drums appeared intact and arranged in an orderly fashion, although drums were stacked in a vertical position in this cell.

Observations and data collected during the excavation of test pits at cells B-7 and C-3 and opportunistic data collected by visual inspection of a portion of cell D-3 confirm that operational records regarding drum placement are accurate.
Observe and evaluate the current condition of the drums in the cells.

See discussion above. Most drums observed at waste cell locations C-3, D-3 and B-7 appear to be intact with some drums punctured or badly deteriorated. In general, drums were submerged except for the top of the shallow-most layer of drums in waste cell C-3. Dewatering was completed in order to access these drums for inspection and sampling. Note that a preliminary review of the potential effects of test-pit dewatering on the buried drums has been completed. Based on this review, it appears that dewatering of the test pits increases soil pressure (e.g. weight) on the effected drums by approximately 23 percent, due to the resultant loss of buoyancy. This obviously increases the potential for drum failure and drum-content release during these operations, and likely adversely affects the long-term condition of the drums due to these test-pitting operations.

Confirm the operational records of drum contents by sampling selected drums.

Samples collected from 10 drums uncovered in each of waste cells C-3 and B-7 were submitted to the laboratory for analyses, as outlined in the SSP. Results of laboratory analyses are pending, and will be evaluated as outlined in Section 4.06 of the SSP. Each of the drum samples was located in the shallow-most layer of drums in the waste cells C-3 and B-7. Inspection of drums present in deeper layers of waste cells C-3 and D-3 indicated that collection of samples from these deeper drums was not logistically possible because their removal would jeopardize the stability of the excavation. This action would also likely damage the drum removed and the adjacent drums.

Markings were observed on many of the drums within excavated cells C-3, D-3 and B-7, although most were illegible. Markings were legible on five drums within cell B-7, four of which were sampled. Markings on several of the drums in waste cell C-3 were legible and appeared to be consistent with the disposal records for this cell, including information on the types of wastes disposed and the waste generators, (See Photographs 15 through 19). For example:

- Markings on a drum from cell C-3 identified it as potentially coming from a Delco facility, which at the time of the operation of this facility was a fully owned subsidiary of General Motors Corporation (GMC). Waste records indicated that approximately 575 drums from GMC are present in the cell.

- Markings on a drum from cell B-7 identified it as most likely originating from “PPG Industries”, which is consistent with waste records that indicate approximately 86 of 137 drums from PPG Industries are located in the top layer of drums in this cell. In addition, a sample of the contents of this drum (See photograph 16) appeared to be a type of resin, which coincides with expected drum contents as determined through review of the operational records.

- Markings on a drum from cell B-7 indicated that this drum contained “VULCACURE”, a rubber vulcanization resin manufactured by Monsanto. Waste records indicate that nine drums of resin generated by Monsanto were present in this cell. Further, records indicated that at least eight of the nine drums containing resin are located in the first layer of drums in this cell, consistent with these findings.
In addition, and as discussed above, markings identified on drums from waste cells C-3 and B-7 appear to be consistent with the disposal records for these cells including information on the types of wastes and the sources of the wastes. Observations and data collected during drum sampling and drum inspection activities confirm that operational records regarding drum contents are accurate. Therefore, we believe that, pending results of the laboratory analyses of drum samples and successful correlation to the operational records, we have met the decision criteria for waste characterization as included in Section 4.01 B of the QAPP.

Observe and document the potential presence of wastes in cell water and soil.

Stained soil, water and a film of free product on the water surface (LNAPL) were observed during test pit activities at waste cell locations F-7, B-7, D-3 and C-3 (See photographic log). Samples of LNAPL, groundwater, visibly impacted soils and obvious wastes were collected from cells B-7 and C-3, where present, and submitted to the laboratory for analysis, consistent with the SSP. It is apparent from visual observations made at these locations that wastes are present in cell water and fill material at the BFOU.

Verify operational records on the construction of cells.

Operational records indicated that a cap of approximately 2 feet of low permeability soils was placed on the cells when they were closed. Additional cover material was added in the mid 1980s, although specific records of the amount of additional material and locations where it was added have not been found. Test pit activities at cell locations B-7, D-3 and C-3 have indicated that cell depths now are approximately 10 to 14 feet below ground surface. This depth has also been verified through the electromagnetic survey completed at the Site in October and November this year (Figure 1). Further, field evaluation of this information by the geophysical surveyor indicated that cells located on the west side of the site likely contain drums at a greater depth with more soil cover than those located on the east side of the site, mirroring site topography (west side has a greater elevation). These data confirm that drums are buried 10 to 14 feet below ground surface on the eastern side of the BFOU and are located shallower, approximately 7 to 8 feet below ground surface, on the western side of the BFOU.

In addition to the above, waste cells depicted in Figure 1 were measured and areas of the most discreet and identifiable cells were calculated. Using information obtained by review of the operational records, the number of drums in the uppermost layer of each of these specific cells was determined. Then, using the cross sectional area of a drum (plus ten percent to reflect stacking inefficiency), the number of drums in each of these cells was calculated, as outlined in Table 1. The reported number was then compared to the calculated number of drums for each selected cell. The average correlation between the reported number of drums (obtained form the operational records) and the estimated number of drums (calculated using data obtained in the field) was 98%, with a 7% standard deviation. This correlation further verifies the operational records on the construction of waste cells within the barrel fill.
Determine Chemical and Physical Quality of Soils beneath Waste Cells

Soil sampling from beneath the waste cells was included in the SSP, at the request of the OEPA and USEPA. Though numerous USEPA guidance documents indicate that collection of soils from beneath the groundwater surface is not advisable nor appropriate (e.g. “USEPA Soil Screening Guidance: Users Guide”, July 1996, 2nd edition and “USEPA Guidance Conducting Remedial Investigations and Feasibility Studies under CERCLA”, 1988), the USEPA and the OEPA insisted that the SSP include the collection of samples from deep test pits at two cell locations even if the samples were located below the water table. Soil samples have been collected from the sidewall and bottom of a deep excavation advanced along waste cell C-3. These samples were submitted to the laboratory for appropriate analyses, as specified in the SSP. Though these samples were collected and submitted to the laboratory for analysis, USEPA’s own guidance indicates the results will be unusable in determination of the presence or extent of soil contamination, as the samples were collected from beneath the groundwater surface, making comparison to PRGs or calculated site-specific risk values inappropriate.

Conclusions

1. Test pit activities have verified that operational records on waste boundaries, including the vertical and lateral dimensions of cells are accurate. Therefore the number of drums (i.e. waste volume) is accurately estimable which satisfies the SSP requirements of determining the cell boundaries and volume of waste (QAPP Section 4.01 A).

2. Test pit activities have clearly demonstrated that records on drum placement are accurate, which adds significant certainty to the validity of operational records. Additional evidence associated with this conclusion is the witness accounts referenced in the Dykema Gossett letter dated 24 November 2003.

3. Test pit activities to date have uncovered drums at three cell locations. In all cases, drums were consistently observed to be mostly intact. Sampled cells were of differing age, including cell C-3 which is one of the older cells at the BFOU and cell B-7, one of the newer cells.

4. Sampling and inspection activities of drums indicate materials sampled are consistent with waste cell records. Markings observed on several drums have identified types of wastes and waste generators that are consistent with the waste records. Observations made of samples collected from drums are consistent with the types of wastes identified in waste records. This conclusion will be verified with the pending laboratory analytical results (QAPP Section 4.01 B).

5. Test pit activities consistently encountered uncontainerized waste in the form of free product at cells C-3, D-3, B-7, D-7 and F-7. These observations verify that uncontainerized waste is located at the BFOU fulfilling the SSP objective documenting the presence of uncontainerized wastes in waste cells.

Based on the above, it is clear that all of the objectives for waste characterization and waste cell characterization specified in the SSP have been met.
Proposed Additional Activities

Despite the above, we understand that the USEPA and OEPA remain concerned about the certainty of the above conclusions. Although we believe that additional waste characterization activities are unnecessary, we have provided the following proposed work scope modification to continue waste characterization activities at the Site.

- Two lateral boundaries of one additional cell (D-7) will be field verified by field excavation activities.
- One additional test pit to depth will be attempted, using methods outlined in the FSP. This excavation will be advanced adjacent to waste cell D-7 and will terminate at the bottom of this cell. Along with samples for physical characteristic analyses, we also propose to collect samples of obviously impacted soil above the water table, groundwater, NAPL and obvious waste materials from this pit, to provide additional data to satisfy agency requests for this information. In addition, information on the depth of waste, condition of drums, presence of uncontainerized waste and other such information will be obtained to further verify the operational records.
- No additional drum sampling will be completed unless evaluation of the 20 drum samples previously collected from waste cells C-3 and B-7 indicate that additional samples would be needed, as per the decision rules as outlined in Section 4.01 B, of the QAPP.

cc: D. Embil
    J. Lapachin
Table 1
Comparison of Observational Record versus Calculated Value
Drums Present in Top Layer of Waste Cell

<table>
<thead>
<tr>
<th>Cell</th>
<th>Cell Area (sf)</th>
<th>Number of Drums Reported in Top Level</th>
<th>Number of Drums Calculated in Top Level</th>
<th>Correlation Between Operational Record and Calculations</th>
</tr>
</thead>
<tbody>
<tr>
<td>D-1</td>
<td>480</td>
<td>75</td>
<td>84</td>
<td>89%</td>
</tr>
<tr>
<td>F-2</td>
<td>575</td>
<td>96</td>
<td>101</td>
<td>95%</td>
</tr>
<tr>
<td>G-2</td>
<td>792</td>
<td>240</td>
<td>261</td>
<td>92%</td>
</tr>
<tr>
<td>H-2</td>
<td>648</td>
<td>102</td>
<td>113</td>
<td>90%</td>
</tr>
<tr>
<td>G-3</td>
<td>576</td>
<td>102</td>
<td>101</td>
<td>101%</td>
</tr>
<tr>
<td>F-4</td>
<td>600</td>
<td>105</td>
<td>105</td>
<td>100%</td>
</tr>
<tr>
<td>F-6</td>
<td>1440</td>
<td>504</td>
<td>475</td>
<td>106%</td>
</tr>
<tr>
<td>F-7</td>
<td>2112</td>
<td>744</td>
<td>696</td>
<td>107%</td>
</tr>
</tbody>
</table>

Average Correlation Percent: 98%
Std Deviation: 7%

(1) - From Report of Geophysical Survey - Figure 1, assuming 10% stacking inefficiency
(2) - Determined from operational records
(3) - Note that cell selected were most discreet in historical and current records, had best EM reflection, and were most easily measured in Figure 1.
EM In-Phase Response (metal-sensitive) Contour Diagram - 2,010 Hz

EM In-Phase Response (metal-sensitive) Color Contour Scale (ppm)

15000
12000
9500
9000
6500
5000
3500
2000
800
50
10

Scale (1"=100')

Survey grid origin

Notes
GSSI GEM-300 EM Terrain Conductivity Profiling System, 3 Freqs 2010, 9810 & 15030 Hz Line/station spacing 5-ft/2-ft Survey date October 27 & November 3, 2003 Locations of site and interpreted features are approximate

Grumman Exploration, Inc.
2309 Dorset Road, Columbus, Ohio 43221

Report of Geophysical Survey

Tremont City Landfill, Tremont City Ohio

Client/Owner

Haley & Aldrich

By Dlg Date 10/27/03

Project No 01-23085 Checked Scale 1"=100'
Eventually opened this area further for deep test pit access.

Approximate location of waste cell D-3.

Apparent corner of drums.

Approximate limits of deep test pit.

Top of excavation.

Bedrock grade.

Deep test pit.

Drum pit.

Bench.

Bench.

Bench.

Spoil.

Ramp down.

Sump.

Figure 2

Plan view

Cell C-3 excavation

As of 11/16/03

Scale: NTS

Haley & Aldrich

TREMONT BARRELL FILL OU

NOVEMBER 2003

G:\28703\AutoCad\CELL_C_3.dwg
Photograph 1 – Initial test pits completed at the Barrel Fill were completed in the area of Waste Cell A-8. Approximately 70 linear feet of trenches were excavated in an attempt to locate drums buried in this location. These excavations were advanced to depths of approximately 10 to 11-1/2 feet below grade in certain areas. No drums were encountered.

Photograph 2 – The decision was made to relocate test pit excavation operations to the location of Waste Cell B-7. Again, test pits were excavated to depths of approximately 10 feet below grade and no drums were encountered.
Photograph 3 – Excavation operations were then relocated to waste cell F-7. During excavation of this waste cell, copious amounts of water were encountered at depths of approximately 8 feet below grade. An estimated 1,500 gallons of liquids were removed from this test pit in an attempt to continue excavation. Water, however, kept flowing into the pit, so this excavation was abandoned and excavation activities focused on waste cell C-3.

Photograph 4 – Excavation of Waste Cell C-3 began utilizing a small track hoe. This piece of equipment was utilized throughout the first several days of the field effort, due to the anticipated shallow drum burial depth and the potential for damaging shallow drums if a larger piece of equipment were used.
Photograph 5: After no drums were found in the upper several feet of soil, a larger track-hoe was mobilized to the site to make benching of excavations easier and more rapid.

Photograph 6: Excavation in Waste Cell C-3, looking to the southeast. This photograph depicts the 60' x 65' excavation made within Waste Cell C-3, in order to access and sample drums buried in this area. Note that drums were encountered at depths of greater than 10 feet below grade, although drum burial depths of four feet were anticipated.
Photograph 7 - Drums were encountered at a depth of approximately 10 to 11 feet below grade in waste cell C-3. The drums appeared to be placed into the waste cell in an orderly fashion, consistent with the permit, site operational records and other information. Drums encountered appeared to be intact. Note in the bottom right hand corner of the photograph that water was present in the pit at a depth of about 1 to 1-1/2 feet below the tops of the drums.

Photograph 8 - This photograph shows another view of the drums present in waste cell C-3. Notice that a degraded fiber drum (green) is present in the foreground. Inspection of the drum lids indicated that some of the drums had originated at the Delco Air Conditioning plant in Moraine, Ohio.
Photograph 9 - Waste Cell C-3 - After ten of the drums in the shallow-most layer were sampled, excavation of a deep pit to the bottom of the waste cell began. Excavation into native soil was completed and sidewall and bottom samples were collected. Attempts were then made to remove soils directly adjacent to the drums to get a better visual inspection of the end of the cell. During this phase of work, the soil separating waste cell C-3 and waste cell D-3 collapsed and water from cell D-3 began flowing into the excavation. The side wall of cell D-3 is shown here.

Photograph 10 - The excavation between C-3 and D-3 filled with a two-phase liquid. A red LNAPL and discolored water were present in the pit. Approximately 13,000 gallons of this liquid was removed and placed into a frac tank, in order to continue advancement of the excavation.
Photograph 11 – Continuous pumping was needed to de-water the test pit, allowing excavation to continue. Note the pump and discharge line on the right-central portion of the photograph.

Photograph 12 – Excavation of the deep test pit along the side of waste cell C-3 uncovered the presence of what appears to be six layers of drums, generally consistent with site operational records. Drums were neatly arranged within the waste cell, consistent with the operational record.
Photograph 13 - After work at waste cell C-3 was completed; waste cell B-7 was excavated. Drums were encountered at depths of approximately 13 to 14 feet below grade. Approximately 20 drums were uncovered and the drums were stacked on ends, unlike the drums present in waste cell C-3, which were stacked on their sides.
Photograph 14 – Waste Cell B-7 showing drums that were sampled.
Photograph 15 - Markings on Drum #11. This drum was carefully cleaned off by hand so the markings could be inspected. The markings are interpreted above.

Photograph 16 - Markings on Drum #15. This drum was carefully cleaned off by hand so the markings could be inspected. The markings are interpreted above.
Photograph 17 – Sampling of Drum #15.

Photograph 18 – Markings on Drum #14. This drum was carefully cleaned off by hand so the markings could be inspected. The markings were still mostly illegible.
Photograph 19 – Markings on Drum #20. This drum was carefully cleaned off by hand so the markings could be inspected. The markings are interpreted above.