APPENDIX B

Soil Balance Evaluation Letter

Golder Associates Inc.

10 Canal Street, Suite 217
Bristol, PA 19007
Telephone (215) 826-1560
Fax (215) 826-9458

January 15, 2009

073-86322
Via Federal Express

Ms. Rebecca Zayatz
Market Area Engineering Manager
CWM Chemical Services, LLC
1550 Balmer Road
Model City, New York 14107

RE: SOIL BALANCE EVALUATION
MILL SEAT LANDFILL
BERGEN, NEW YORK

Dear Ms. Zayatz:

Per your request, Golder Associates Inc. (Golder) has evaluated the soil quantity requirements provided in the original permit documents for the site and the latest estimate of soil requirements prepared for the currently permitted landfill operations.

BACKGROUND

The required earthworks quantities for landfill construction and operation are presented in the Part 360 Engineering Report prepared by Clark Engineers & Associates (Clark). For Mill Seat, Table 2-1 entitled "Earthwork Quantity Summary" presents the estimated soil requirements for the entire facility in the original permit application. Additional information related to the site operational soils is provided in the table entitled "Solid Waste Volume Summary" provided on page 36 of the Engineering Report by Clark.

Golder was requested by Waste Management of New York, LLC to update the soils balance for the site considering the current disposal area construction and current topography.

SOILS BALANCE EVALUATION

Golder has developed Table 1 entitled "Earthwork Quantity Summary, Mill Seat Landfill" (attached) to provide a comparison between the original estimates for the required soil quantities for the entire facility and the new projected required quantities for the site as of July 12, 2007. The upper portion of the table presents the quantity estimates from Table 2-1 (Clark Engineers). The table represents a total net available soil volume (after excavation) of 552,581 cubic yards (cy).

Golder's soils balance evaluation indicates that there is a current soil deficit of 1,143,898 cy for the remaining construction and capping at the facility, which represents a variance from the Clark Engineers estimate of 552,581 cy soil excess. This variance is attributable to the following major soil categories:

- Subgrade Fill: Additional 196,000 cy required;
- Excavation: 481,831 cy less than estimated by Clark Engineers;
- Soil Liner: 216,703 cy less than estimated by Clark Engineers;
- Daily Cover: Additional 735,917 cy required; and,
- Intermediate/Final Cover and Top Soil: Additional 499,434 cy required.

The keys to the soil variances are explained below:

- For the Daily Cover category, the original Clark estimate appears to account for only approximately 5% of the total airspace for daily cover volume. Golder estimates the volume of daily cover soils from site excavation as 10% of the total airspace, which is more representative of the amount of soil used for this purpose at the site. This 10% soil volume accounted for as daily cover in our volume estimates does not include the beneficial use determination (BUD) materials that are also used for this function.

- Clark's estimate of the volume of Intermediate/Final Cover soils obtained from the on-site borrow area (160,865 cy from Table 2-1 in the Clark Engineering Report) is significantly less than the currently projected amount of 660,300 cy by Golder. However, Clark's estimate for the Final Cover quantity of 643,462 cy provided in the table entitled "Solid Waste Summary" (from page 36 of the Engineering Report) is close to the Intermediate/Final Cover volume estimated by Golder to be 660,300 cy. It is not clear as to why the discrepancy exists between the two (2) tables in the Clark Report, considering that on page 19, it indicates that approximately 475,000 cy of the sand lenses from the on-site borrow area could be utilized in the final cover system. If this available soil volume was properly applied to Table 2-1, the soil volumes presented in the Engineering Report would be more consistent with the current estimates. Minor soil volume variations could be attributed to the changes to the final cover system configuration made by Earth Tech[1] in 2002 to be consistent with current practice.

Table 2-1 and additional narrative sections from the Clark Engineering Report are provided in Attachment 1.

Should you have any questions regarding this letter, please do not hesitate to call.

Very truly yours,

GOLDER ASSOCIATES INC.

Frank A. Sopcak
Senior Landfill Designer

Paul A. Whitty, P.E.
Senior Consultant

Attachments

cc: Mr. Francis T. Adams, P.E., Golder Associates Inc.

[1] "Engineering Design Report, Final Cover Design Modifications, Mill Seat Landfill, Riga, New York", dated October, 2002, prepared by Earth Tech, Inc.

Table 1
Earthwork Quantity Summary
Mill Seat Landfill

Information from Table 2-1 entitled " Earthwork Quantity Summary From Engineering Report (Revised August, 1990) prepared by Clark Engineers & Associates								
Stage No.	Stage Size (Acres)	Subgrade Fill [2] (CY)	Excavation [2] (CY)	Soil Liner [2] (CY)	Net Soils Balance [2] (CY)	Daily Cover [2] (CY)	Intermediate, Final, Top Soil [2] (CY)	Net Quantity [2] (CY)
I	20.17	260,933	0	116,073	377,006	86,657	25,007	488,670
II	31.42	0	(913,126)	180,035	(733,091)	182,278	25,071	(525,742)
III	23.57	0	(1,174,409)	133,092	(1,041,317)	437,865	43,028	(560,424)
IV	19.86	0	(317,462)	114,651	(202,811)	179,966	67,760	44,915
Total	95.02	260,933	(2,404,997)	543,851	(1,600,213)	886,766	160,866	(552,581)
Material Requirements and Available Soil Borrow Estimate prepared by Golder Associates Inc.								
Projected Required Soil [1]		456,933	(1,923,166)	327,148[5]	(1,139,085)	1,622,683	660,300	1,143,898
Difference in Required Soil [1][4]		-196,000	-481,831	216,703[5]	-461,128	-735,917	-499,434	-1,696,479

Notes:

1) Golder Associates calculated required soil volumes for Stages III and IV based on the April 27, 2002 aerial topography. These values were then combined with the Clark Engineers Stage I and II estimates to represent the projected required soil estimates for the entire site.
2) Quantities represent fill required, numbers in parenthesis represent cut volumes or surplus fill volumes from excavation as represented in Clark Engineers Table 2-1.
3) Golder has computed Daily Cover volume as approximately 10 percent of the total airspace for the entire site.
4) Values represent difference between totals from Clark Engineers and Golder Associates volumes.
5) The site is currently importing material for the secondary soil liner construction and only the primary soil liner is constructed from on-site borrows.

ATTACHMENT 1
TABLE 2-1 "EARTHWORK QUANTITY SUMMARY"
FOR MILL SEAT LANDFILL AND ADDITIONAL NARRATIVE SECTIONS
FROM ENGINEERING REPORT, REVISED AUGUST, 1990 BY CLARK ENGINEERS & ASSOCIATES

During construction of the fourth and final 19.86 acre stage, approximately 317,000 additional cubic yards of earth will be excavated of which 115,000 cubic yards of this material will be reused as stage IV soil liner material. Approximately 481,000 additional cubic yards of earth will be required for daily intermediate and final cover in stage III. Stage IV work also includes construction of the final 3,450 foot segment of the perimeter access road. Finally, daily, intermediate and final cover for this stage will require an additional 248,000 cubic yards of soil material, leaving an apparent earth excavation surplus of 550,000 cubic yards of earth.

An indeterminate amount of this material will be rejected as road and liner material because of the occurrence of sand lenses found within the drumlin.

Material from these sand lenses would be suitable for use as the protective soil layer of the final cover system and possibly as the protective soil over the primary composite liner, thereby reducing the amount of material to be imported to the site. Up to 475,000 cubic yards of this protective soil material could be utilized to offset the project's surplus excavation. The remainder of this surplus material will be used for general fill associated with the construction of the equipment maintenance facility and the Brew Road realignment, thereby further reducing imported material volumes. No excavated material will be disposed of off-site.

A 7.5 acre area south of the landfill footprint, as shown on Figure 1-3, has been designated for temporary stockpiling of excavated material. Excavated topsoil will be stockpiled separate from other earth material, so that the topsoil can be used in the final cover component and not be wasted as daily or intermediate cover.

Surface drainage, erosion, and sedimentation control measures will be included in the operation of the temporary spoil area, such as diversion swales, hay bales, silt fences, and reseeding after closure.

Presented on Table 2-1 is a summary of the theoretical earthwork quantities for the landfill project. It should be noted that the daily cover operation will be an ongoing process during the operational stage of a landfill stage, so the net quantities cannot be used to estimate spoil pile size. Future stage excavation, road construction and daily/intermediate covering will take place simultaneously, so the spoil pile size will only be a fraction of these net quantities. Additionally, up to 50% of the daily cover will be stripped from the edge of the final grade slope in order to minimize the potential for side slope leachate breakouts. This procedure will result in the reutilization of some 175,000 cubic yards of material.

Presented on sheet #9 of the landfill permit application plans is the detailed excavation plan for the Mill Seat Landfill. This plan shows the high point of the bottom of the liner system at elevation 705 at the far southwestern portion of the site. The low point of this excavation plan is near elevation 653 on the northeastern portion of the landfill footprint.

TABLE 2-1

EARTHWORK QUANTITY SUMMARY (CUBIC YARDS)

STAGE NO.	STAGE SIZE (ACRES)	SUBGRADE FILL	SOIL LINER	NET EXCAVATION	DAILY COVER	TOPSOIL/ FINAL COVER	NET QUANTITY
I	20.17	260,933	116,073	377,006	86,657	25,007	488,670
II	31.42	(913,126)	180,035	(733,091)	182,278	25,071	(525,742)
III	23.57	(1,174,409)	133,092	(1,041,317)	437,865	43,028	(560,424)
IV	19.86	(317,462)	114,651	(202,811)	179,966	67,760	44,915
TOTALS	95.02	(2,144,064)	543,851	(1,600,213)	886,766	160,865	(552,582)

() Indicates Cut

2.3 SUBGRADE PREPARATION

The existing till (generally $5x10^{-6}$ cm/sec. or less permeability) will be rough graded using earth movers. Graders will be used to establish the ridge and valley grades, and the surface will be rolled with a smooth drummed roller to seal it. As previously mentioned, filling the subgrade will occur in the relatively low lying western portion of the landfill site. Excavated material from the drumlin (mainly lodgement till) will be utilized as the fill source for this area. This material will be spread and compacted to insure a maximum in place permeability of 5×10^{-6} cm/sec.

As shown on Figure 2-2, the flanks of the drumlin have lenses of coarse-grained deposits at the landfill subgrade. Before the final grading is complete, these deposits will be excavated until the glacial till is reached. This granular material will be stockpiled possibly for use as part of the protective soil layer which is placed on top of the primary leachate collection material or as part of the protective soil layer of the final cover.

Upon over-excavation of the coarser-grained material and backfilling with the glacial till, the liner subgrade will be graded in accordance with the excavation plan grades. Any previous borings, piezometer, or monitoring wells located beneath the subgrade elevation will be excavated and properly abandoned. This will consist of overboring to remove the casing and sand pack to five feet below

storage tanks until laboratory analyses indicate that such runoff flows may be discharged to the stormwater detention basin.

2.6 GRADING AND OPERATIONAL PLAN

As previously indicated on Figure 2-1, the Mill Seat Landfill will be constructed and operated in four stages. Permit application Sheets #13 through #15 show the grading plans for Stages I, II, and III. The final grading plan encompassing all four stages is presented on Sheet #12. A summary of the volume of each operational stage is presented on the following page.

It should be noted that the above figures indicate that nearly half of the landfill will come to final grade during the fourth operational stage. The initial capacity of the first two stages is limited due to the fact that filling of these stages requires 3:1 (h:v) side slopes toward the outside of the landfill and 2:1 side slopes toward the interior. Hence, the estimated site life of the first stage is roughly one year. By contrast, the third stage, while only 17% larger in area, results in an estimated site life of seven to eight years because a large portion of solid waste filling occurs over the 2:1 intermediate slopes of the two adjacent cells. The fourth and smallest stage has a projected site life of three to four years because of the same kind of overlapped filling. The site life of the entire landfill is 13.6 years, with no volume reduction with an average in-place density of 1100 lbs per cubic yard and an average of 510,000 tons per year waste received.

The overall grades for this fill plan encompass 3:1 final side slopes. The total gross volume will be 12.8 million cubic yards and a total solid waste filling area will be 95 acres. The maximum fill height with this grading plan is approximately 210 feet.

Presented in Appendix C are pertinent operation plan elevations based on a 100-feet by 100-feet grid pattern as graphically depicted on Figure 2-9 and permit application Sheet 42. In addition to the final grade elevations of the landfill, this appendix shows the top of bedrock elevation, the seasonal high groundwater level for the bedrock "B" wells, existing grades, and the proposed liner subgrade elevations.

SOLID WASTE VOLUME SUMMARY

STAGE NO.	STAGE SIZE (AC.)	GROSS VOL. (CU.YDS.)	FINAL COVER (AC.)	FINAL COVER FLAT EQUIV.	FIN. COV. VOLUME	DAILY COV. VOLUME	ADDTL VOL. FM STRIPPING	NET SOLID WASTE VOL.	TOTAL SOL. WASTE AFTER SETTLEMENT
I	20.17	1,207,109	14.70	15.50	100,027	86,657	17,675	1,110,100	1,229,910
II	31.42	2,597,245	14.74	15.54	100,285	102,270	35,525	2,350,207	2,585,228
III	23.57	6,170,261	25.35	26.67	172,110	437,865	84,350	5,644,636	6,209,099
IV	19.86	2,736,322	40.23	42.00	271,040	179,966	37,450	2,322,766	2,555,043
TOTALS	95.02	12,790,937	95.02	99.71	643,462	806,746	175,000	11,435,709	12,579,280