KANSAS GEOLOGICAL SURVEY

1930 Constant Ave., Campus West
The University of Kansas
Lawrence, Kansas 66047-3726
phone 785-864-3965
fax 785-864-5317

September 21, 2005

Susan McCart, P.E., P.G.
Aquaterra Environmental Solutions, Inc.
6980 West 153rd Street
Overland Park, Kansas 66223

**Re: Construction and Demolition Landfill Expansion, City of Coffeyville, Kansas**

Dear Ms. McCart,

I received your letter dated September 9, 2005, in response to my letter dated April 8, 2005, on the proposed expansion of the Construction & Demolition (C&D) Landfill for the City of Coffeyville. The proposed disposal area is located within the NW¼ of Section 25, T34S, R16E.

Since my letter, the Kansas Department of Health and Environment has clarified the role of the Kansas Geological Survey (KGS) in the C&D landfill permit process. The Kansas Geological Survey will no longer approve or exempt landfill sites. Instead, the KGS will disclose information about known or potential hazards at the proposed landfill location. The KGS comments are NOT a substitute for detailed site characterizations of proposed landfill sites.

I examined the information provided in your initial letter dated March 16, 2005, including site location and a flood impact analysis. In your letter dated September 9, 2005, you stated that you examined the KGS website for the geology of Montgomery County and the Geologic History of Kansas (Merriam, 1963, KGS Bulletin 162). Additionally, I examined the US Geological Survey Coffeyville East 7½-minute quadrangle, a geologic report on Montgomery County (O'Connor, 1974, KGS Ground Water Series 1) and a Geologic Map (Bennison, 1996, KGS Map M-44). No site specific data (field notes, outcrop measurements, drilling data, etc.) was examined as part of the KGS comments. It should be noted that the Water Well Completion dataset (WWC5) available on the KGS website contains 136 water well completion records in section 25 that Aquaterra might find useful. The site is located in the floodplain of the Verdigris River in Quaternary Alluvium. In general alluvial deposits contain aquifers. Bedrock below the site is Pennsylvanian age sediments of unknown lithology. The following is a list of geologic issues at this site that will need to be thoroughly addressed in the final application.

- The proposed landfill site is in alluvial deposits in the floodplain. The potential exists for contamination of ground and surface water from possible contaminants in the waste.
- I agree with your comment that the landfill site is on the inside of a meander and that erosion primarily occurs on the outside of a meander. In the short term, the migration of the meander may be away from the landfill; however, rivers are dynamic environments. A cutbank exists southwest of the proposed landfill site that could migrate between the landfill site and Coffeyville and possibly into the landfill area. Floods have been known to cause major shifts in the channel location.

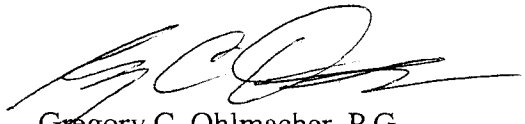
- Steep slopes composed of alluvial sediments can fail by landsliding. Landslides usually occur on the cutbank or outside of a meander; however, the topographic map and site plan indicate that the meanders of the Verdigris River may be entrenched at the proposed landfill site. Thus, steep slopes may exist on both sides of the river. This creates the possibility of landslides on the inside of the meander.
- The KGS has no knowledge of karst hazards at this site. However, some thick (several meters) dirty limestones of Pennsylvanian age with thin shale partings have caves and open joints in the subsurface and sinkholes at the ground surface in eastern Kansas. What is below the alluvial sediments at the proposed landfill site? Does it pose a potential karst hazard?

As I stated in my initial letter, the flood impact issue should be addressed by the U. S. Army Corps of Engineers and the Kansas Department of Agriculture, Division of Water Resources.

The above discussion represents the information that the Kansas Geological Survey has on this proposed landfill site. Other geologic conditions, not discussed here, might affect the stability or safe operation of this landfill. The information provided in this letter is from regional (countywide) studies and should NOT be used as a substitute for detailed site characterization by a licensed geologist or engineer. It is the responsibility of the applicant to produce the detailed site characterization.

If you have any questions about my comments, feel free to contact me at the above address, by phone at (785) 864-2194 or by e-mail at ohlmac@kgs.ku.edu.

Sincerely,



Gregory C. Ohlmacher, P.G.
Engineering Geologist

**AQUATERRA**
ENVIRONMENTAL SOLUTIONS, INC.

September 9, 2005

Mr. Gregory C. Ohlmacher, P.G.
Kansas Geological Survey
1930 Constant Avenue, Campus West
The University of Kansas
Lawrence, Kansas 66047-3726

Re: **City of Coffeyville**
**Construction and Demolition Landfill Location**
Aquaterra Project Number 1338.10

Dear Mr. Ohlmacher:

Aquaterra Environmental Solutions, Inc. (Aquaterra) has reviewed your letter dated April 8, 2005, indicating additional geologic assessment information is needed for the Kansas Geological Survey (KGS) to comment on the proposed expansion of the City of Coffeyville Construction and Demolition (C&D) landfill. The existing C&D landfill and the proposed expansion area are located inside a meander of the Verdigris River in the northwest quarter of Section 25, Township 34 South, Range 16 East, in Montgomery County, Kansas.

Based on our review of available information on the KGS website for the geology of Montgomery County and *The Geologic History of Kansas* (State Geological Survey of Kansas Bulletin 162, 1963), anticlines are present north and south of the site; however, no faults are present beneath the site. Therefore, Aquaterra believes the proposed C&D expansion area is not located in a geologic unstable area.

Your letter additionally expresses a concern related to rivers and stability because the site is located on the inside of a meander of the Verdigris River. Your concern is re-stated below in italics and our response follows.

*What will prevent this meander from eroding into the landfill at a future date?*

**Response:** The highest groundwater velocity will be found on the outside bank of a meander; therefore, the erosion, or cut, would occur on the outside bank. Sediment buildup and deposits will be found on the inside bank of a meander. Erosion due to stream flow will not occur on the inside bank.

Aquaterra appreciates your consideration of this project. If you have any additional questions or concerns, please do not hesitate to contact our office at (913) 681-0030.

Sincerely,
**Aquaterra Environmental Solutions, Inc.**

Susan McCart

Susan McCart, P.E., P.G.
Senior Project Manager

C: Mr. Scott Massman, City of Coffeyville Engineering Department
Mr. Charley Bowers, KDHE-BWM