

KANSAS GEOLOGICAL SURVEY

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September 21, 2005

Tom Brown, P.E.
Westar Energy
818 S. Kansas Ave
P.O. Box 889.
Topeka, KS 66601-0889

Re: Westar Energy Landfill Expansion Project, Lawrence, KS

Dear Mr. Brown:

The Kansas Geological Survey (KGS) has received your notification in accordance with the requirements of the Kansas Department of Health and Environment (KDHE) for permit modifications to expand an existing industrial landfill (Section 10, Location Demonstrations of the KDHE *Permit Application for an Industrial Landfill*).

The Kansas Geological Survey received from you location maps and the proposed landfill location. Additionally, a geologic map and report exists for Douglas County (O'Connor, 1960, KGS Bulletin 148). This map indicates the surface geology of the site is glacial till and glacial-fluvial deposits. Dan Merriam (unpublished data) indicates that Douglas Group rocks are also exposed in the area. The Douglas Group consists of the Lawrence and Strange formations. Both formations contain sandstone, shale and siltstone with minor amounts of coal and limestone. The Lawrence Formation is known to have active and dormant landslides in other parts of Douglas County. The Stranger Formation has landslides in adjacent Leavenworth County (Ohlmacher, 2003, KGS Map M-109A, & McCauley, 1998, KGS Map M-53). The Lawrence Formation contains the Ireland Sandstone, and the Stranger Formation contains the Tonganoxie Sandstone, both of which are aquifers in Douglas County. Surrounding the landfill site are the alluvial deposits of the Kansas River. Alluvial deposits contain aquifers. Ground-water flow would be towards the Kansas River from the nearby uplands.

The landfill location is close to the Kansas River and residential areas in Lawrence, and is not far upstream from water supply wells for the City of Lawrence.

- Flyash contains a range of toxic and potentially toxic elements including arsenic, chromium, lead, and mercury, thus posing a potential environmental hazard from leaching into the immediate environment. Potential aquifers may exist below the landfill. Leachate that escapes from the landfill could potentially migrate to the Kansas River through the alluvial sediments.
- An existing flyash landfill exists west of the proposed site. Information on chemical analysis of ground water from monitoring wells around the existing landfills should be included and

evaluated as part of the proposed landfill application. The KGS recommends monitoring wells and chemical analysis for the proposed landfill.

- In addition, flyash poses a potential threat to the atmosphere in gaseous form and due to its fine particle fraction that is a potential threat to lung airways if inhaled.
- Landslides may be an issue in any areas with steep slopes especially the Kansas River bluffs near the Burlington Northern Santa Fe Railroad tracks north and east of the proposed landfill site.
- The Kansas Geological Survey recommends a thorough examination of the history and possible contamination associated with the former chemical plant on the proposed landfill site.
- In my opinion the possibility of encountering karst problems at this site is low. In general, the limestone beds in the Douglas Group are relatively thin; however, exploratory drilling to examine the limestones for potential karst issues is suggested.

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.

Marios Sophocleous and Margaret Townsend provided input on potential ground-water and airborne pollution issues. If you have any questions, feel free to contact me at (785) 864-2194 or ohlmac@kgs.ku.edu.

Sincerely,

A handwritten signature in black ink, appearing to read 'G. Ohlmacher', with a stylized flourish at the end.

Gregory C. Ohlmacher, P.G.
Associate Scientist



August 29, 2005

Mr. Greg Ohlmacher
Associate Scientist
Kansas geological Survey
1930 Constant Ave., Parker 102
Lawrence, Kansas 66047-3726

Re: Westar Energy Landfill Expansion Project, Lawrence, KS

Dear Mr. Ohlmacher:

To insure continued operation of the Lawrence Energy Center, it is necessary for Westar Energy to construct a new combustion byproduct industrial landfill. One of the requirements for securing a solid waste permit for the proposed landfill is to check with several agencies and determine if they have any comments about this project.

The proposed landfill will be a 59 acre monofill and will be located on a 262 acre parcel of company-owned land east of, and adjacent to, the Lawrence Energy Center. It will contain fly ash, bottom ash and dewatered scrubber slurry. The proposed landfill is legally described as being within the SW 1/4 of Section 13, Township 12 South, Range 19 West, Douglas County, Kansas. For your reference, a copy of the vicinity map, site location map and landfill configuration drawing are enclosed.

We are requesting that your agency review the attached documents and issue a response regarding the landfill expansion project. If possible, please submit comments to me by October 1, 2005. These comments will be included with the permit application that will be sent to the Kansas Department of Health and Environment. If you have any questions, comments or need further information, please contact me at 785-575-1548.

Sincerely,

Tom Brown, P.E.
Manager, Water and Waste Programs

Cc: M. Schreiber, R. Degenhardt, B. Eastman, C. Luce all of Westar Energy
LEC New Landfill File w/ enclosures

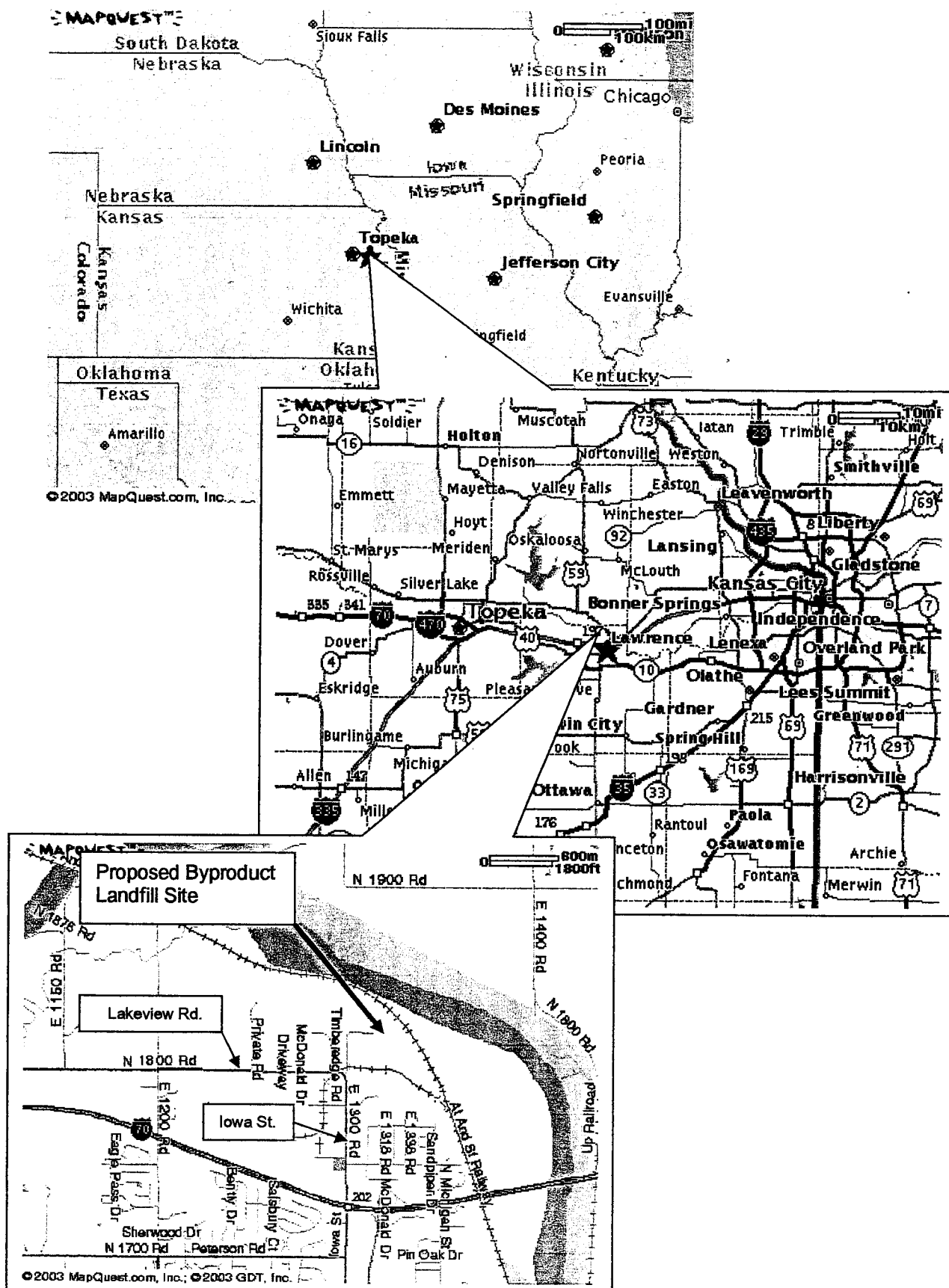


Figure 1-1
Proposed Byproduct Landfill Vicinity Map