



(300.340c.083)



(300.340c.083)



(300.340c.083)



(300.340c.083)



(300.340c.083)



(300.340c.083)



(300.340c.083)

Summary of Deposits in Bank Exposures

TABLE B-1-2

SUMMARY OF DEPOSITS IN BANK EXPOSURES

Seismic Hazards Report for the EGC ESP Site

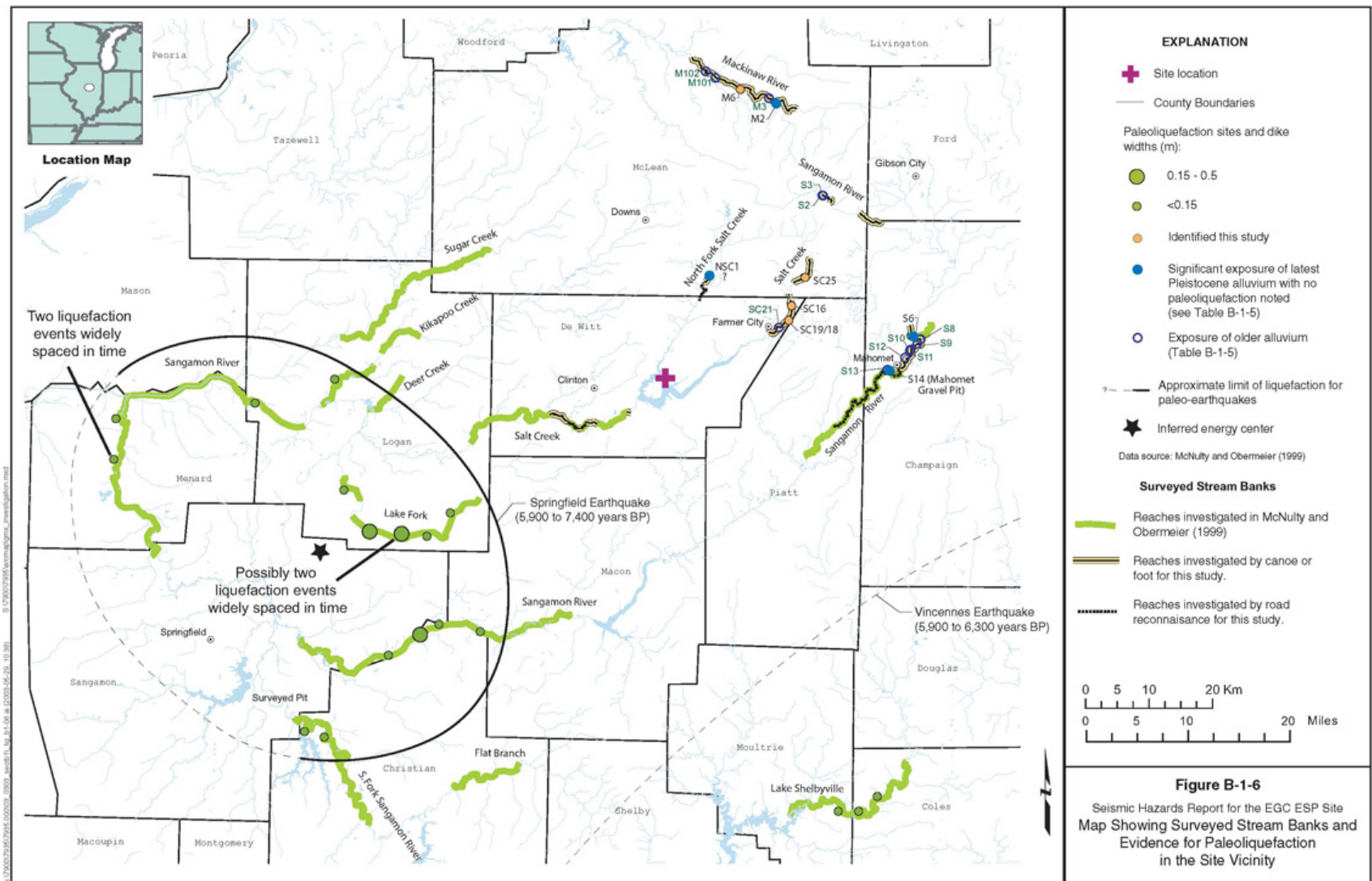
River	Salt Creek	Sangamon	Mackinaw
Total distance observed	11.7 miles	12.3 miles	17.5 miles
Estimated total length of till observed	150 feet	4,950 feet	8,200 feet
Estimated total length of liquefiable latest Pleistocene alluvium observed (glaciofluvial outwash)	360 feet	135 feet	440 feet
Estimated total length of pre-hypsithermic (early Holocene) alluvium observed	1,200 feet	2,000 feet	5,850 feet

Notes:

1. Limited reconnaissance (approximately 1 mile walked) on the North Fork of Salt Creek revealed ~ 20-foot exposure of latest Pleistocene alluvium.
2. Sections of riverbank not accounted for in this table generally consist of younger Holocene terrace deposits. Approximately 70 to 80 percent of the riverbanks observed were covered.
3. The estimated total lengths of liquefiable latest Pleistocene alluvium shown in this table do not include the exposures at Locality S 14 (the Mahomet gravel pit).

Clastic Dike Localities Identified During This Study

- Salt Creek
 - SC 25
 - SC 16, SC 18/19
- Mackinaw River
 - M 6



Clastic dike-SC 25



A



B

Dike approaches
within 20 inches of
ground surface



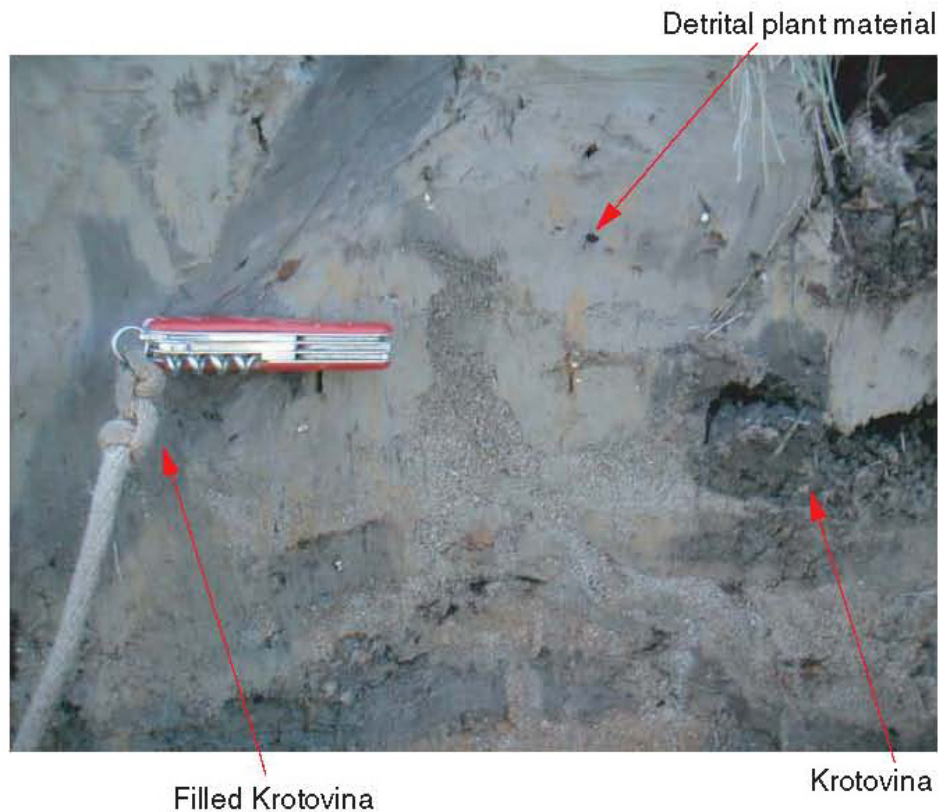
Dike intrudes
~8 feet of loess

Location of
photograph A

Bank rises approximately 12 feet above water level

Note that:

1. Dike widens downward.
2. Gravelly sand fill fines upward.
3. Dike walls are sharp and irregular.
4. Dike is roughly tabular.
5. Dike occurs in clear association with source material.
6. Weathering within dike suggests it is relatively old.



Note that:

1. Dike widens downward.
2. Sand in filling fines upwards.
3. Contacts are sharp and irregular.
4. Dike occurs in clear association with source material.
5. Dike includes clasts of silty clay, apparently ripped from its walls.
6. Maximum dike width is 1.5 in.

Seismic Hazards Report for the EGC ESP Site
Photograph of Dike 2 at Locality SC 19

Figure
B-1-14

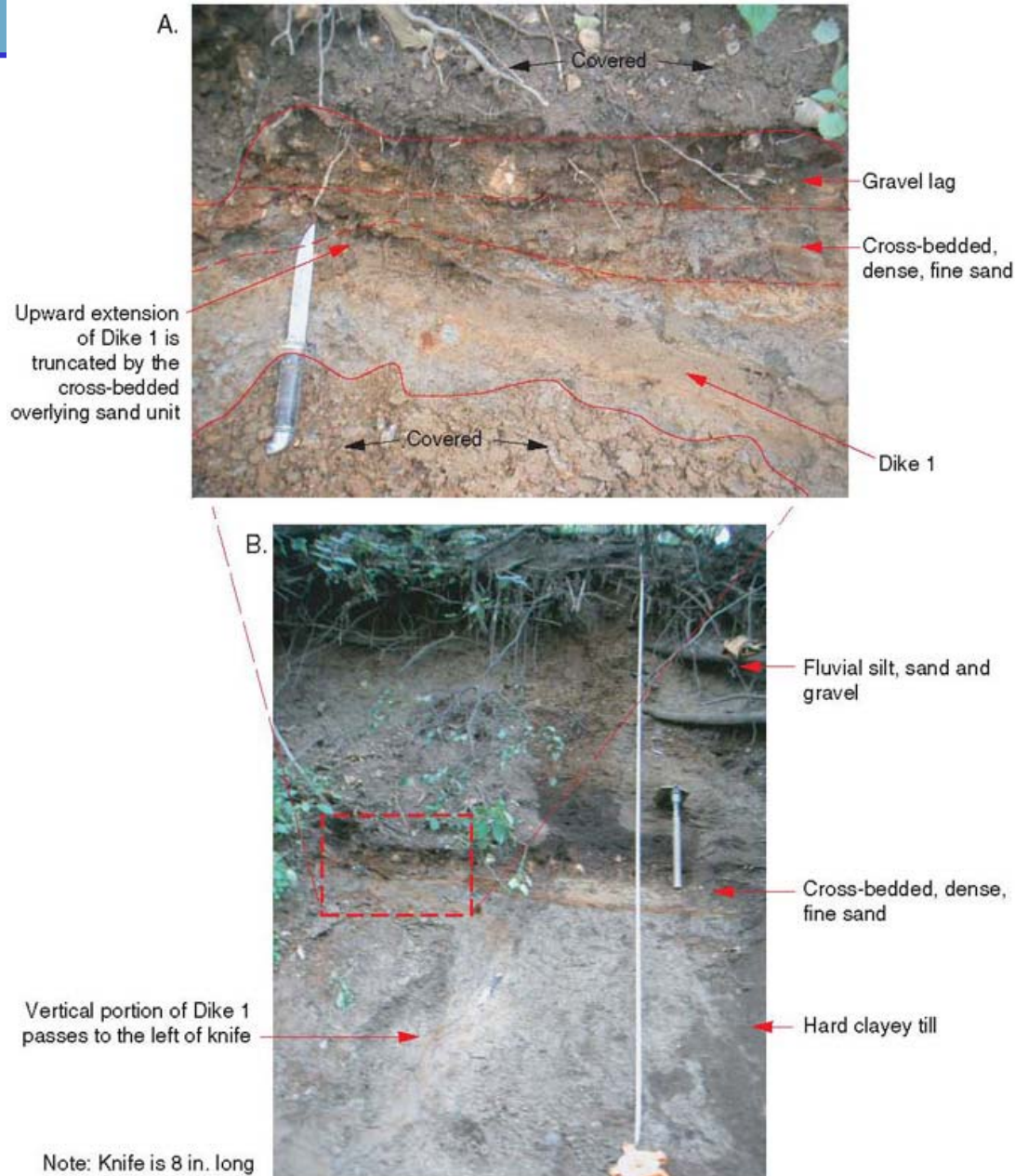
Clastic dike-SC-18

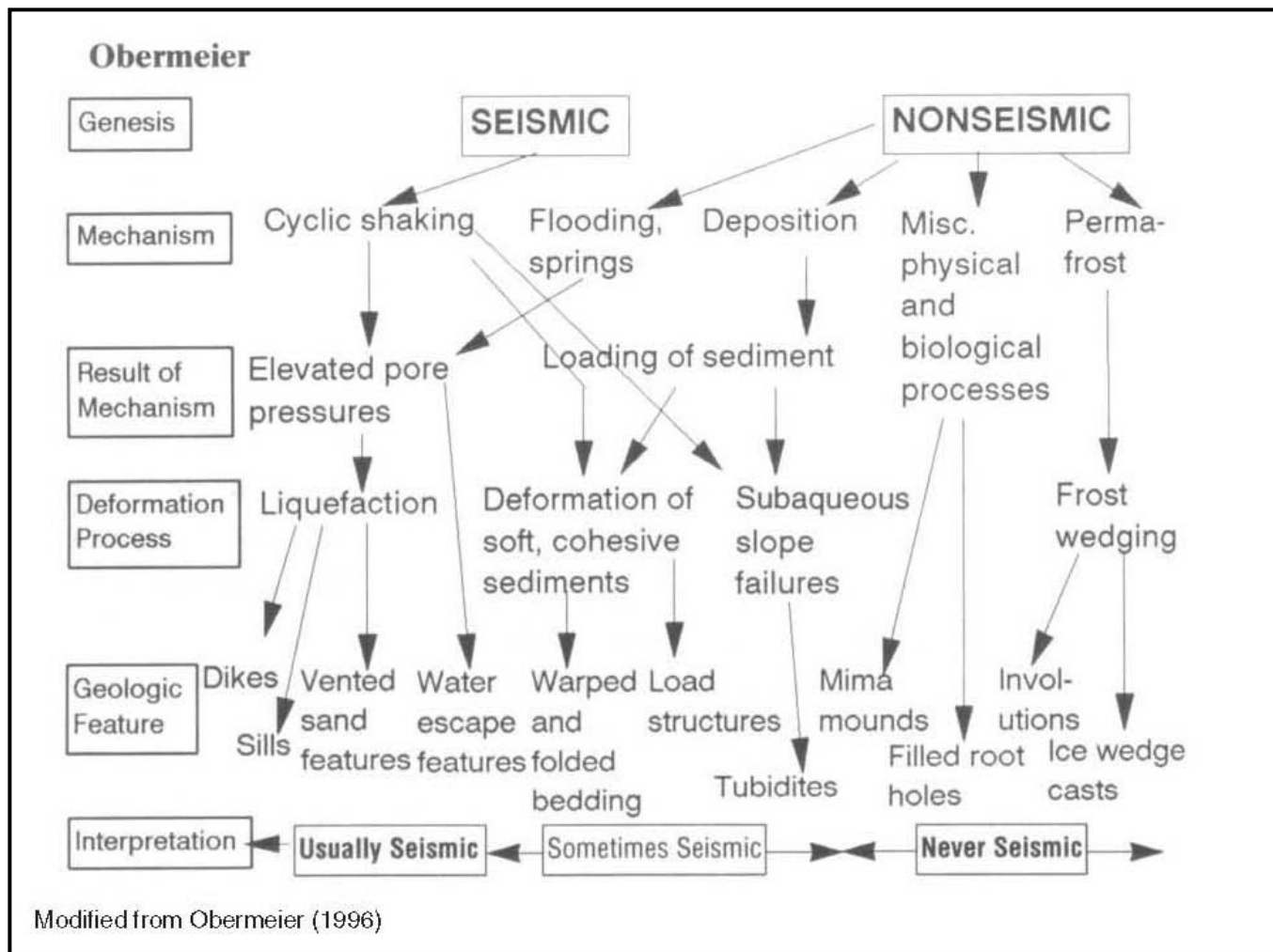


(300.340c.083)

Clastic dike-SC-16







Seismic Hazards Report for the EGC ESP Site
Flow Chart Showing Seismic and Nonseismic Mechanisms
That Create Deformation Features in Sediment

Figure
B-1-12

Frost wedges



Glaciotectonic- Soft sediment deformation



(300.340c.083)

Criteria for Differentiating Origins of Liquefaction Features (Table B-1-3)

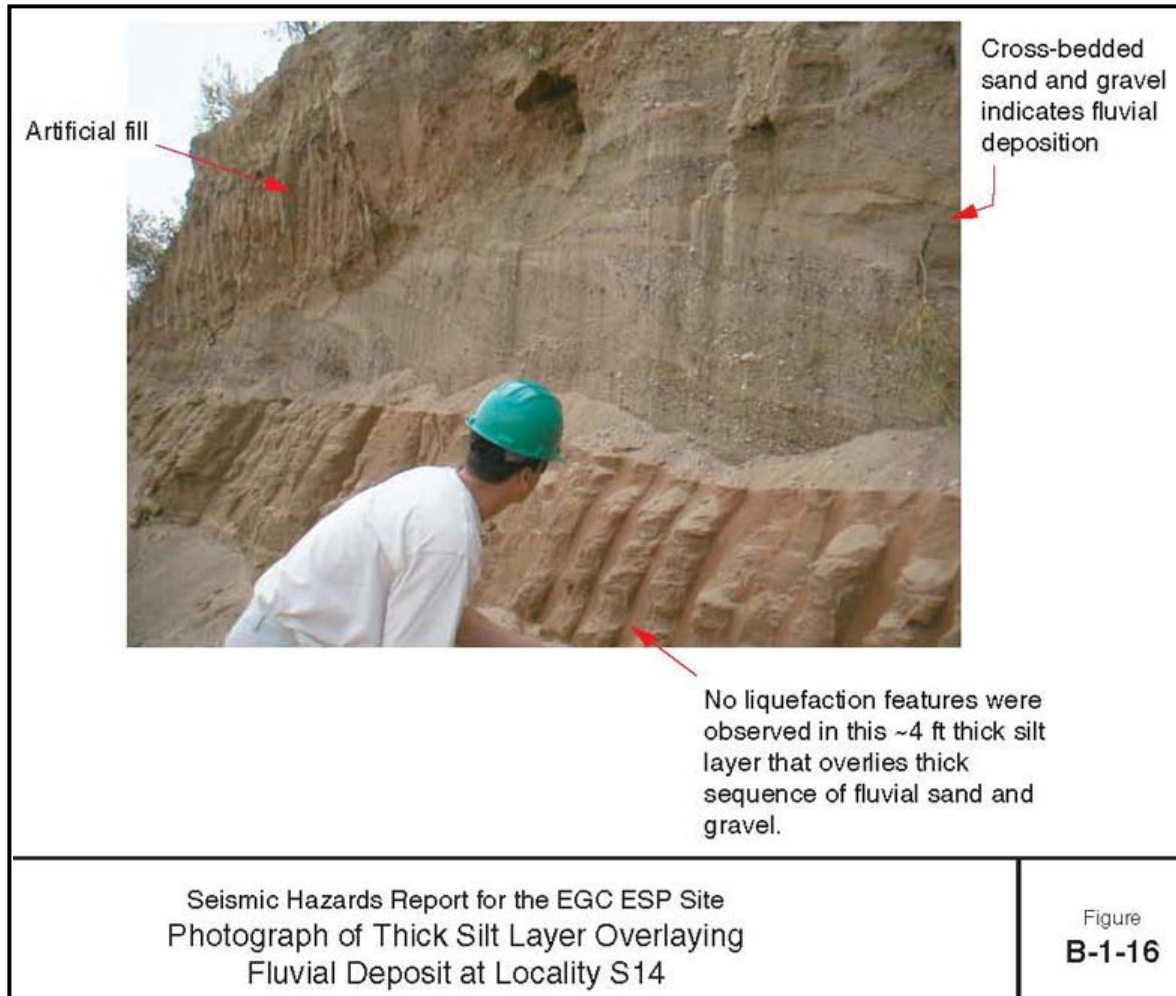
	SC 25	SC 16	SC 18	SC 19	M 6
Seismic					
Dike widens at depth or remains constant in width (injected from below)	Yes	Yes	No	Yes	Yes?
Dike fill includes silty sand, clean sand, or gravelly sand (liquefiable material)	Yes	Yes	Yes	Yes	Yes
Dike fill fines upward or remains constant in grain size (injected from below)	Yes	No	N/A	Yes	Yes
Dike is tabular in plan view	Yes	Yes	No	Yes?	Yes
Dike wall contacts are sharp and planar or irregular (injected suddenly)	Yes	Yes	Yes	Yes	Yes
Dike is observed in clear association with source material	Yes	No	No	Yes	No
Source material is observed to be loose	Yes	N/a	N/A	Yes	N/A
Source material is located at or below the water table	Yes	Yes?	Yes?	Yes	Yes?
Nonliquefiable cap present	Yes	Yes	Yes	Yes	No
Evidence of recurrent events is found nearby	Yes	Yes	Yes	Yes	No
Dike fits a regional pattern based on dike width and abundance	No ⁱ	No ⁱⁱ	No ⁱⁱ	No ⁱⁱ	No ⁱ
Glaciotectionic					
Evidence of basal drag, ice push, meltwater expulsion, and hydraulic fracturing is found					
Temporal association with glaciers	No	No	No	No	Yes
Spatial association with glaciers	No	No	No	No	Yes
Associated or nearby evidence for subglacial deformation of soft-sediments	No	No	No	No	Yes
Terminates at base of overlying till	No	No	No	No	Yes
Other Nonseismic Mechanisms					
Artesian conditions are recorded historically in the vicinity	No	No	No	No	No
Dike is located in a setting prone to artesian conditions (e.g., at the base of a hill or near an artificial levee)	No	No	No	No	No
Dike is associated with features that may indicate nonseismic landsliding	No	Yes	No	No	No

Characteristics and Estimated Ages Potential Liquefaction Features (Table B-1-43)

Locality	Coordinates	No. of dikes	Maximum Width		Material Intruded	Interpretation	Estimated Age
			in.	cm			
Salt Creek SC 25	365962 E 4460489 N	6	4	10	Silt cap (loess)	Preferred origin for dikes is seismic liquefaction.	Latest Pleistocene/early Holocene based on weathering of dike material, soil profile development, and estimation of paleo- water table levels.
Salt Creek SC 16	363816E 4459593N	2	1.5	4	Clayey silt (fluvial)	Dikes likely caused by seismic liquefaction.	Mid- to late Holocene based on soil profile development.
Salt Creek SC 19/ SC 18	363376E 4457299N	2	1.5	4	Clayey silt (fluvial)	Preferred origin for dikes is seismic liquefaction. Sill may indicate seismic liquefaction or soft sediment deformation.	Mid- to late Holocene based on soil development.
Mackinaw River M 6	355764E 4493685N	2	4	10	Lodgement till	Origin for dikes is uncertain; may be seismic or glaciotectionic fluidized injection.	Latest Pleistocene (17.7 ± 1 ka) capped by glacially compacted fluvial deposits.

Note: Coordinate system is UTM (meters) zone 16, NAD 83.

Evidence for Absence of Paleoliquefaction Mahomet Gravel Pit



Conclusions

- No evidence for post-mid-Holocene (past ~ 6-7 ka) earthquake comparable to the Springfield event
- No repeated post-~15-20 ka moderate- to large-magnitude events in vicinity of site
- Isolated features may be due to seismically induced liquefaction
 - **Salt Creek**
 - (post-~9559 yr BP) 11.5 to 13 mi from site
 - (<17 to 10 ka) ~ 17 mi from site
 - **Mackinaw River**
 - (17.7 ± 1 ka) (possible glaciotectionic) 29 mi

Implications to Seismic Source Characterization

- Possible Holocene/latest Pleistocene seismically-induced paleoliquefaction features in the site region
- Range of M_{\max} assigned to random background earthquake in PSHA should include events comparable to that estimated for the Springfield earthquake (**M** 6.2 to 6.8)