1-3

Data Request:

Please provide information on the risk of subsidence potential per 20:10:22:14 (7).

Response:

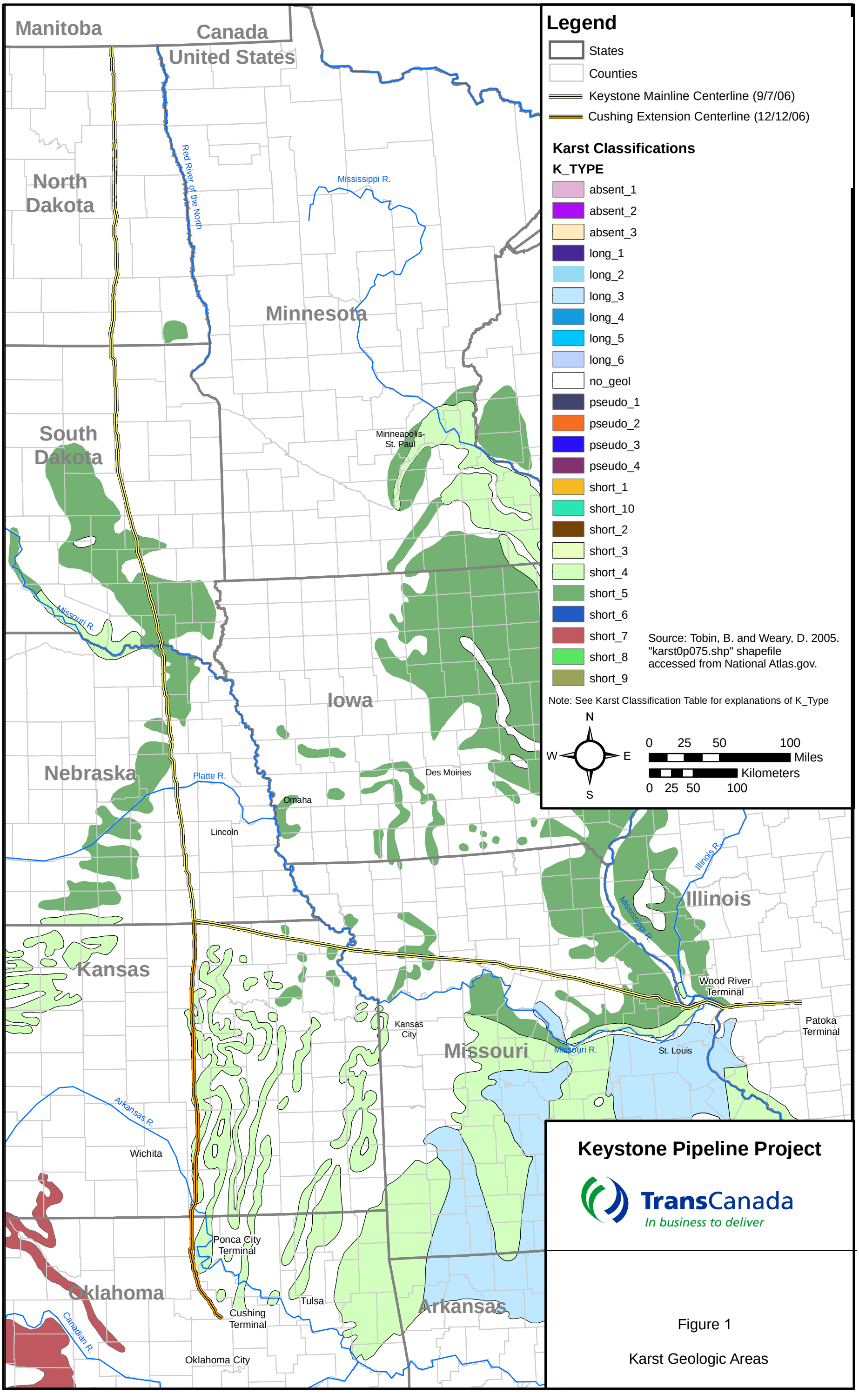
Subsidence risk can be related to earthquake and slope stability risks, which are discussed in subsection 5.3.6 of the Application. Subsidence can also be caused by bedrock dissolution in karst terrain (areas with underlying limestone bedrock near the surface). The national karst maps (Davies et al. 1984, Tobin and Weary 2005) were reviewed to determine areas of karst terrain. These areas can be visualized in the attached Karst Geological Areas Map (Figure 1), based on Tobin and Weary 2005.

The overall subsidence hazard risk from sinkholes that form in karst terrain is considered low. Deep (generally 50 feet or more) glacial drift deposits overlie karst terrain in South Dakota. This deep and interbedded glacial material matrix limits the potential for sinkholes to cause fractures and soil displacement at the surface.

Reference:

Tobin, B. and D. Weary. 2005. National Atlas.

Response prepared by: Michael James Koski


Manitoba
Canada
United States
North Dakota
Red River of the North
Mississippi R.
Minnesota
South Dakota
Minneapolis-
St. Paul
Missouri R.
Iowa
Nebraska
Platte R.
Omaha
Lincoln
Des Moines
Illinois R.
Illinois
Mississippi R.
Kansas
Wood River
Terminal
Patoka
Terminal
Kansas
City
Missouri
Missouri R.
St. Louis
Arkansas R.
Wichita
Ponca City
Terminal
Oklahoma
Tulsa
Cushing
Terminal
Canadian R.
Oklahoma City
Arkansas
Legend
States
Counties
Keystone Mainline Centerline (9/7/06)
Cushing Extension Centerline (12/12/06)
Karst Classifications
K_TYPE
absent_1
absent_2
absent_3
long_1
long_2
long_3
long_4
long_5
long_6
no_geol
pseudo_1
pseudo_2
pseudo_3
pseudo_4
short_1
short_10
short_2
short_3
short_4
short_5
short_6
short_7
short_8
short_9
Source: Tobin, B. and Weary, D. 2005.
"karst0p075.shp" shapefile
accessed from National Atlas.gov.
Note: See Karst Classification Table for explanations of K_Type
N
W
E
S
0 25 50 100
Miles
Kilometers
0 25 50 100
Keystone Pipeline Project
TransCanada
In business to deliver
Figure 1
Karst Geologic Areas