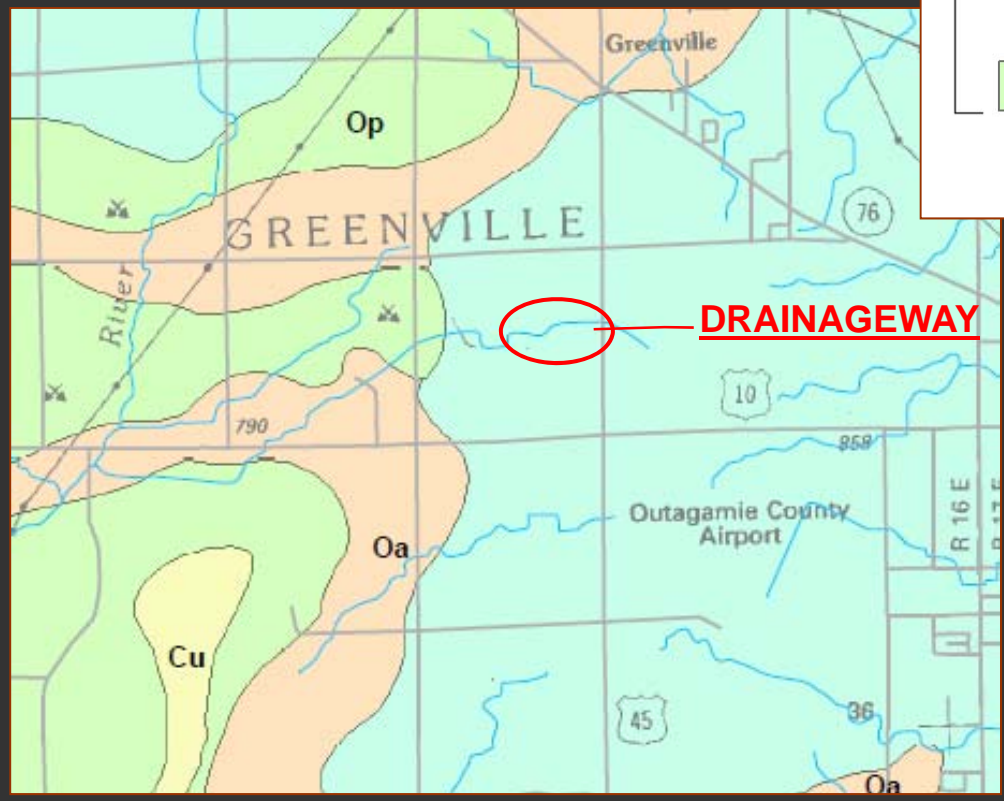


Geologic Evaluation of a Reported Karst



Prepared for
Town of Greenville
For narrated delivery on
September 11, 2017



| | | |
|------------|----|--|
| Ordovician | Om | Maquoketa Formation Shale and shaly carbonate rocks, known only in the subsurface of extreme southeastern Outagamie County. Maximum known thickness 200 ft. of blue calcareous shale and blue-green shaly dolomite. |
| | Os | Sinnipee Group Predominantly carbonate (dolostones) with minor shale and sandy dolostones. Consists of two formations, Platteville and the overlying Galena . The Platteville is pure tan to grey dolostones with minor bedded nodular chert, and becomes sandy near the base. The Galena Formation consists of grey to buff, pure to shaly dolostones; shale content increases to the northeast particularly in the lower beds. Not differentiated on preliminary map; total maximum thickness 200 to 220 ft.; eroded in all but extreme southeast where Maquoketa Fm. is present. |
| | Oa | Ancell Group Consists of Glenwood formation , locally present as 1 to 2 feet of greenish shale, overlying the St. Peter Formation , which consists of mature quartz sandstone variably cemented by carbonate or iron sulfide cement. The St. Peter overlies the Readstown Formation , which consists of red to purple shale. The St. Peter occurs in channels incised into the underlying Prairie du Chien Group and may vary from absent to 200+ ft. in thickness. Readstown is derived from reworking of the pre-St. Peter erosional surface and varies from absent to a maximum of 50+ feet in thickness. |
| | Op | Prairie du Chien Group The Prairie du Chien group consists of the upper Shakopee Formation and underlying Oneota Formation, both predominantly dolostones with interbedded sandstones and shales. The Prairie du Chien contains several internal unconformities, and was exposed to extensive erosion and karstification during the interval preceeding Anceall deposition. The total thickness of the Anceill-Prairie du Chien interval is 200+ ft. and can vary depending on presence and thickness of the overlying Anceall. Prairie du Chien (Shakopee) is directly overlain by Sinnipee Group in large areas where Anceall is absent. |

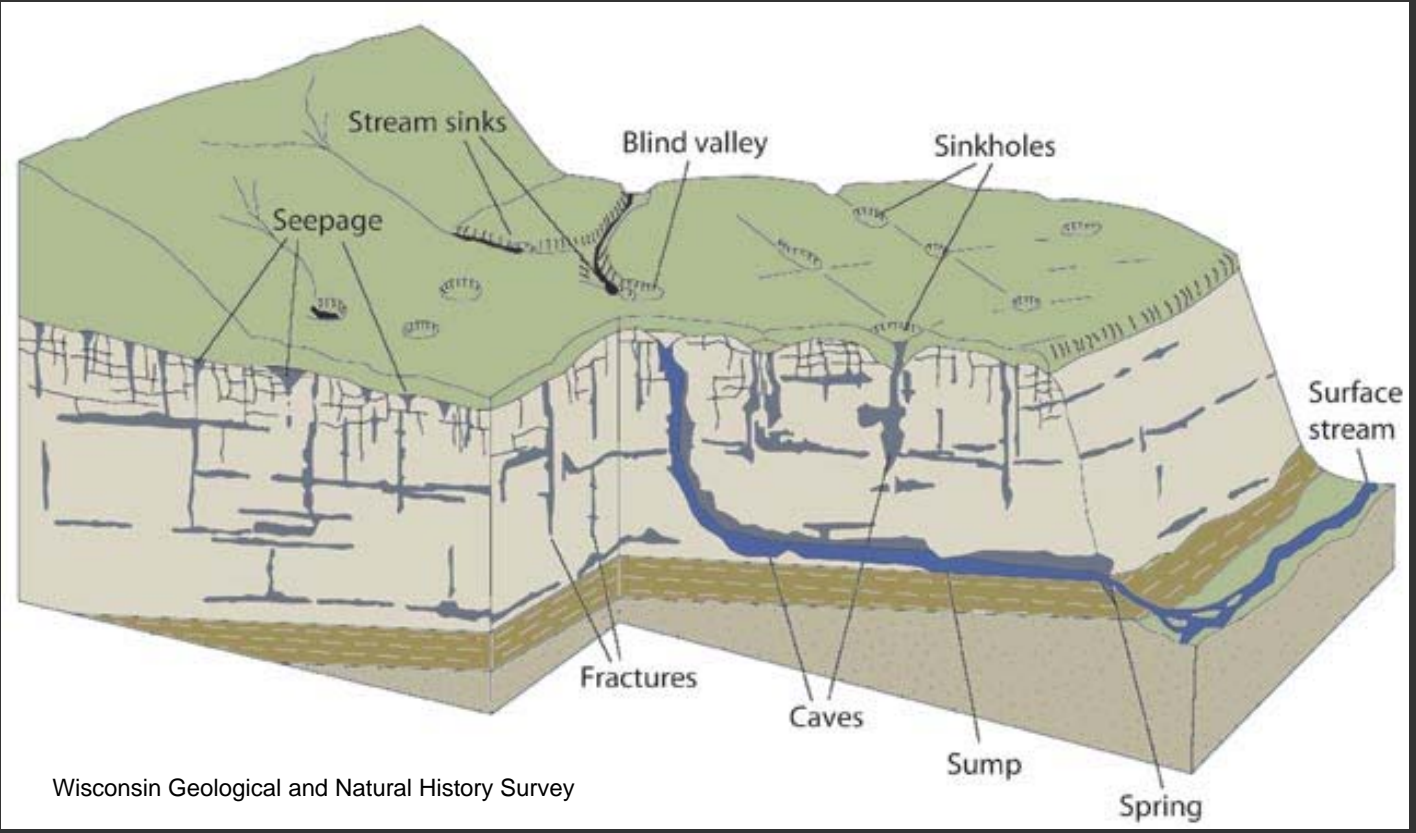
Sand Creek Consultants, Inc.
Environmental and Geological Scientists
and Engineers

What is karst?

- Karst is a type of landscape where water dissolves the underlying soluble bedrock

What is soluble bedrock?

- Dolomite
- Limestone



Wisconsin Geological and Natural History Survey

BEDROCK GEOLOGY OF WISCONSIN

UNIVERSITY OF WISCONSIN-EXTENSION

Geological and Natural History Survey

APRIL 1981
REVISED 2005

EXPLANATION

DEVONIAN

D dolomite and shale

SILURIAN

Sd dolomite

ORDOVICIAN

Om Maquoketa Formation—shale and dolomite

Os Sinipee Group—dolomite with some limestone and shale

Osp St. Peter Formation—sandstone with some limestone shale and conglomerate

Opc Prairie du Chien Group—dolomite with some sandstone and shale

CAMBRIAN

C sandstone with some dolomite and shale

MIDDLE PROTEROZOIC

ss Keweenaw rock—sandstone
v basaltic to rhyolitic lava flows
t gabbro, anorthositic and granitic rock

g Wolf River rock—
g rapakivi granite, granite, and syenite
a anorthosite and gabbro

LOWER PROTEROZOIC

q quartzite

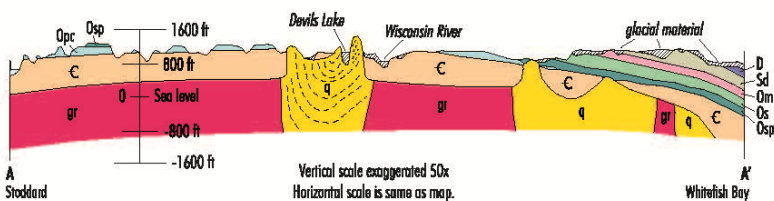
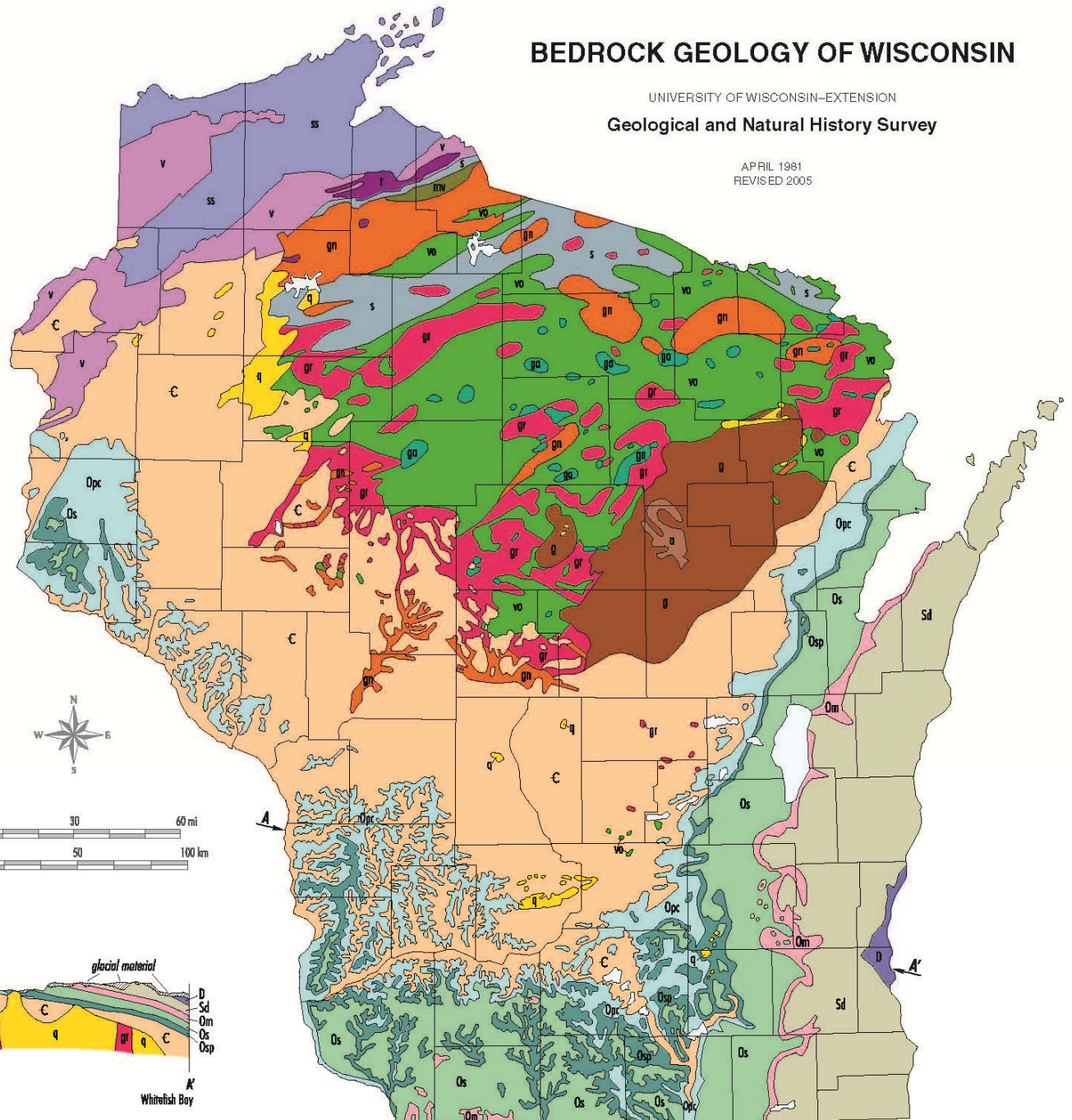
gr granite, diorite, and gneiss

s s, metasedimentary rock, argillite, siltstone, quartzite, greywacke, and iron formation
vo basaltic to rhyolitic metavolcanic rock with some metasedimentary rock
ga meta-gabbro and hornblende diorite

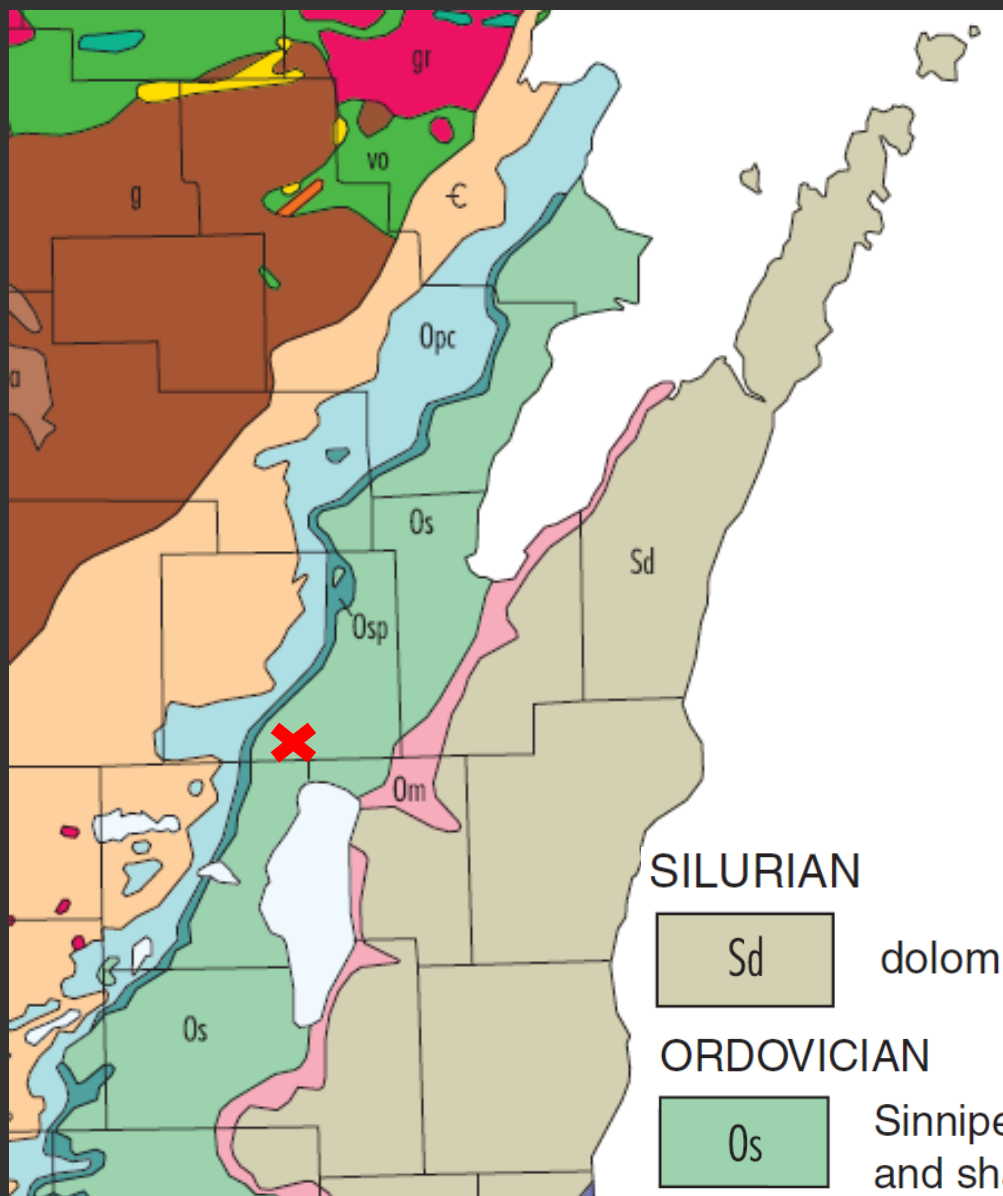
LOWER PROTEROZOIC OR UPPER ARCHEAN

mv metavolcanic rock

gn granite, gneiss, and amphibolite



Kewaunee vs. Outagamie Bedrock



- Kewaunee and Door Counties have Silurian-age sedimentary rock exposed and near surface, and exhibits dissolution effects (karst topography).
- Outagamie County has Ordovician-age sedimentary rock 30 to 60 million years older, scraped free by glaciers of overlying Silurian rock.

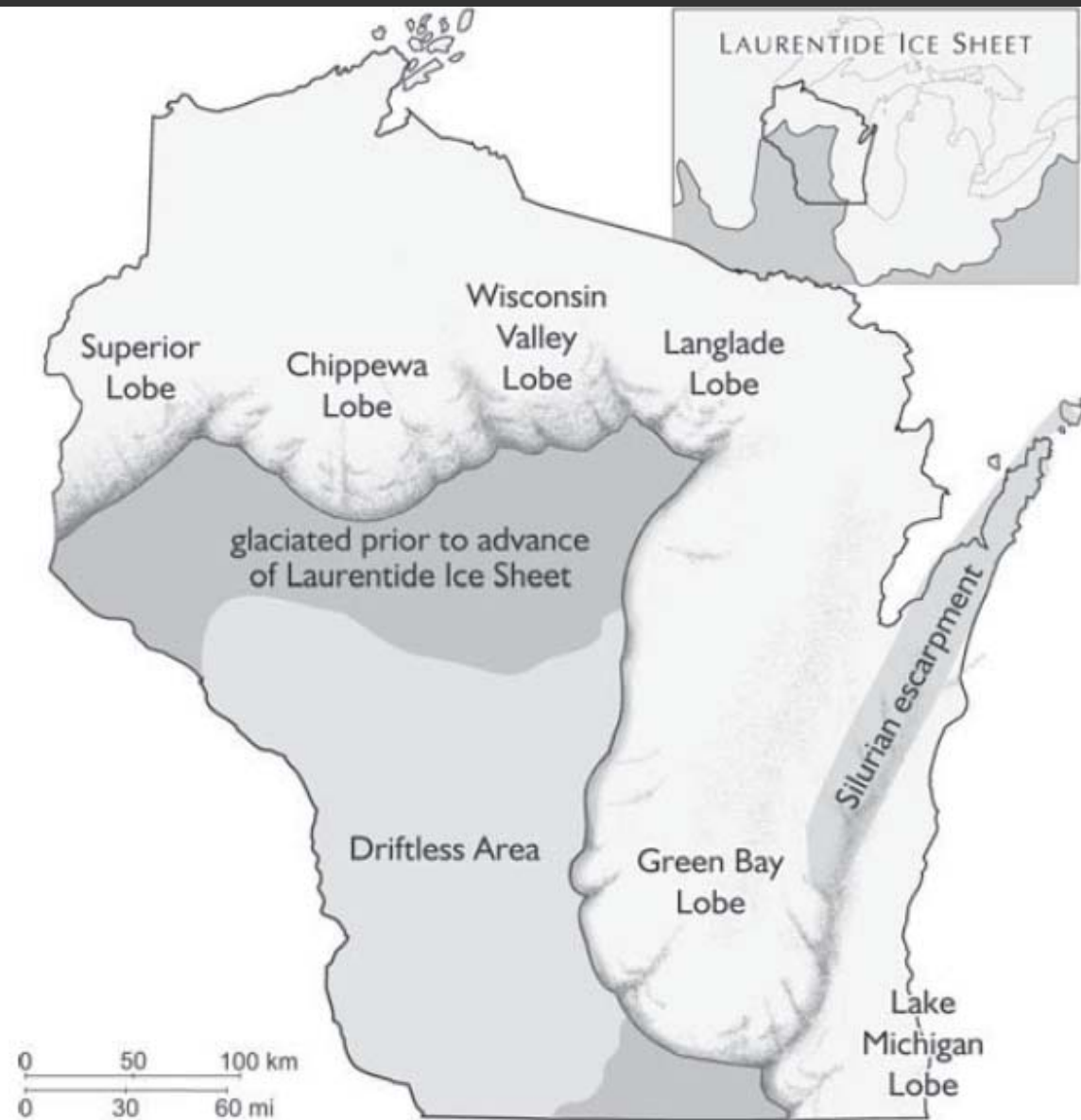
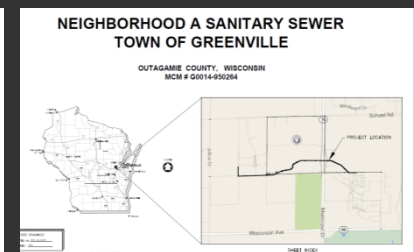
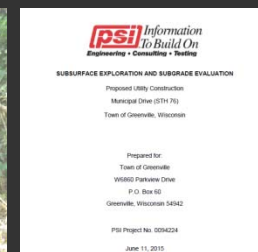
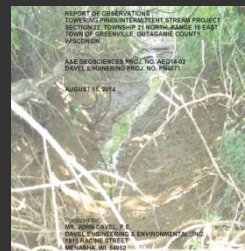
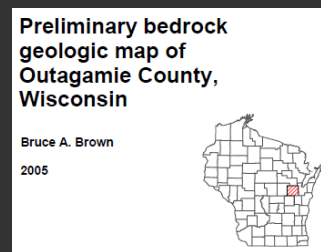
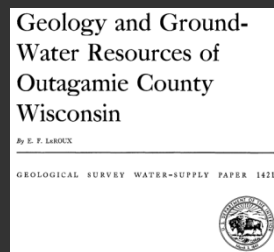
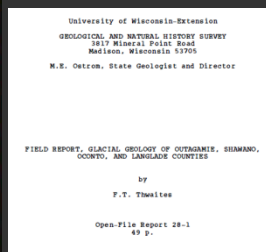


Figure 1. Major landscape regions and extent of glacialiation in Wisconsin. Note that the division of the Green Bay and Lake Michigan Lobes coincides with the Silurian escarpment.

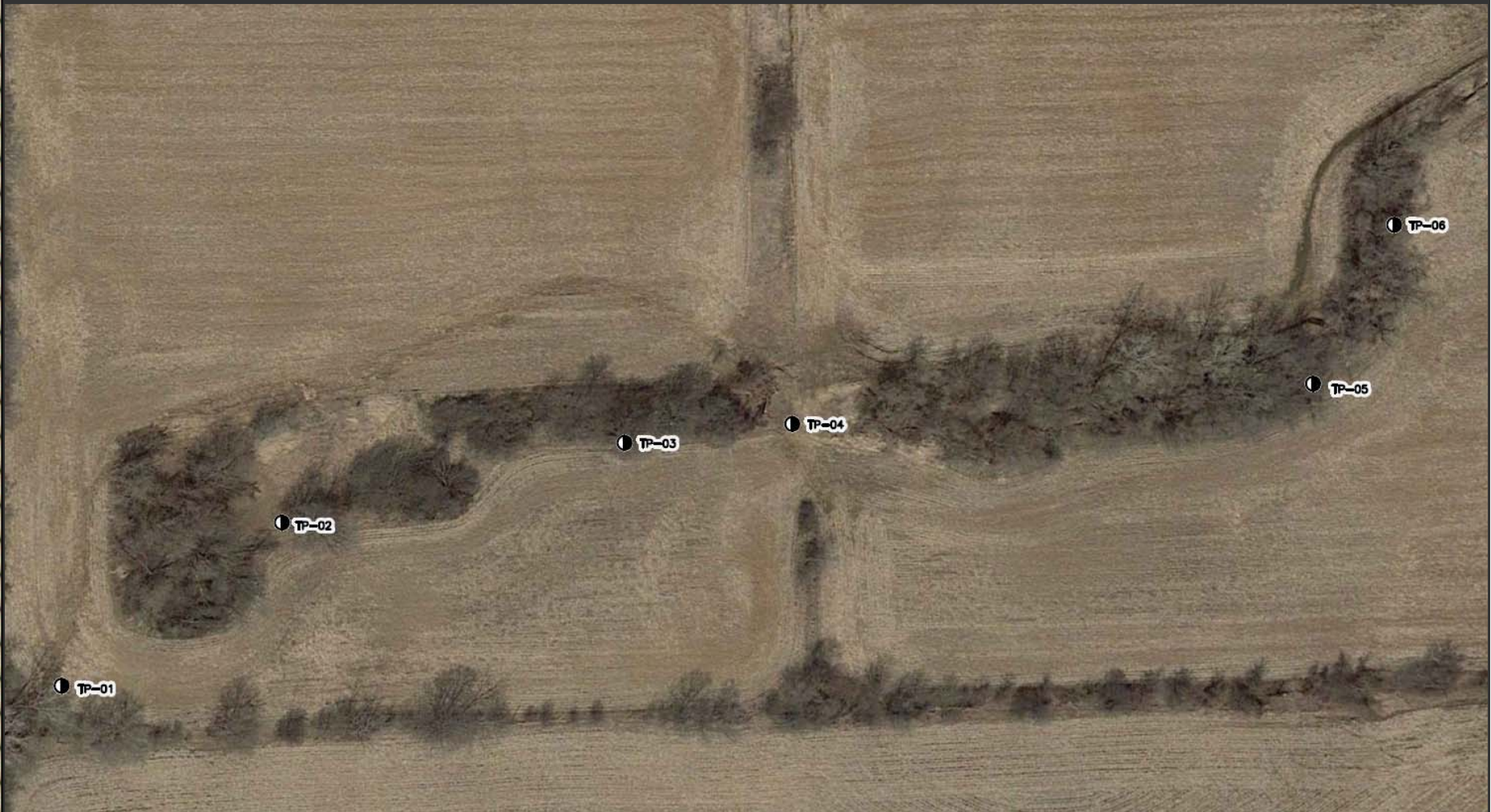
Background Information Compilation

- 1929, Thwaites, *Field Report, Glacial Geology of Outagamie, Shawano, and Langlade Counties*
- 1957, LeRoux, *Geology and Groundwater Resources of Outagamie County, Wisconsin*
- 2005, Brown, *Preliminary bedrock geologic map of Outagamie County, Wisconsin*
- 2014, A&E Geosciences, *Report of Observations Towering Pines/intermittent Stream Project*
- 2015, PSI, *Subsurface Exploration and Subgrade Evaluation*
- 2016, McMahan, *Neighborhood A Sanitary Sewer, Town of Greenville – As-Built*

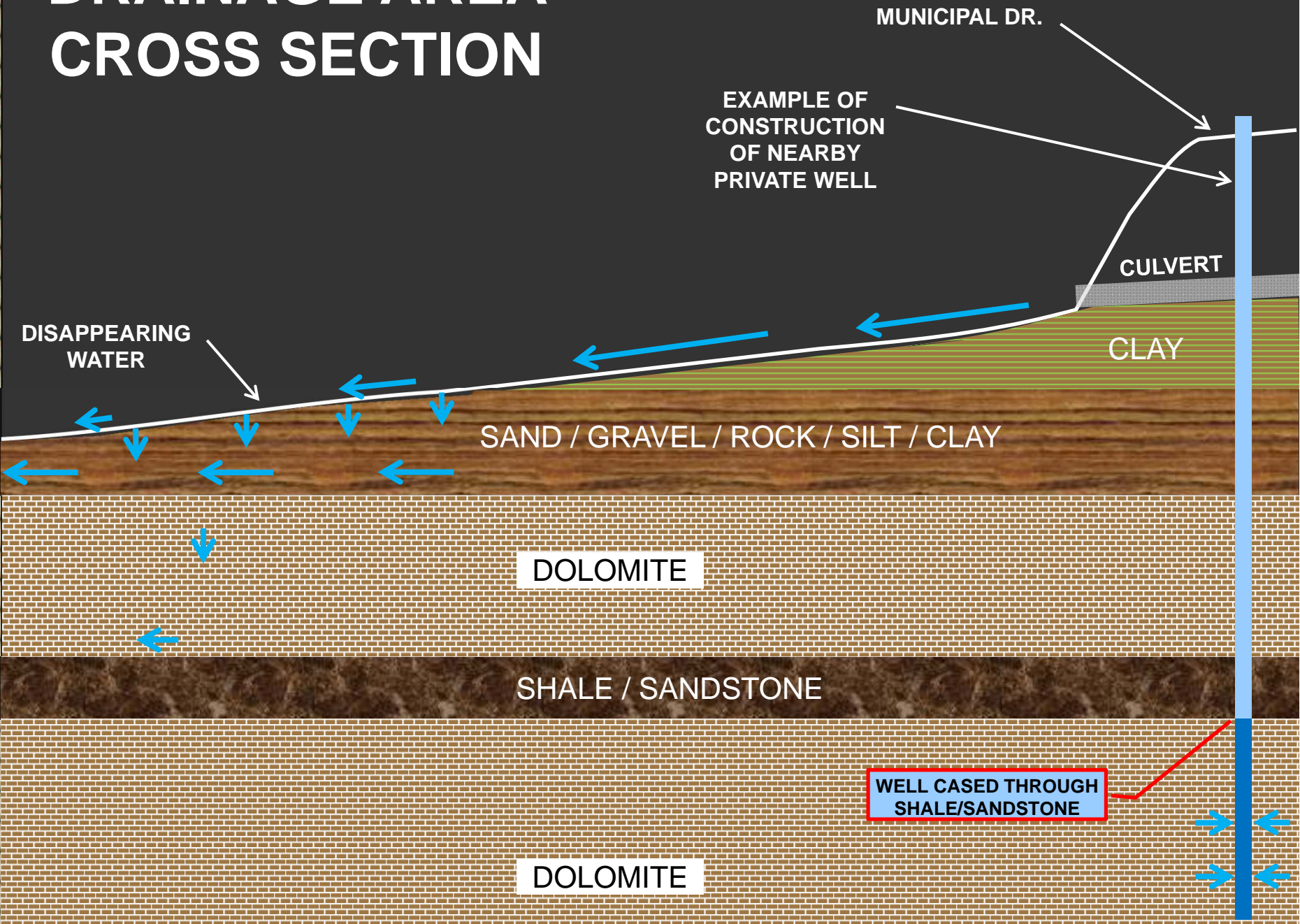


Physical Investigation Test Pit Locations

Placed at and near locations of reported “disappearing” water



DRAINAGE AREA CROSS SECTION



Here is what we found:



Test pit movie clip

Questions:

- **Were any karst features identified?
and**
- **Is groundwater quality at risk
associated with local drainage
features?**

Answers:

No and no.



