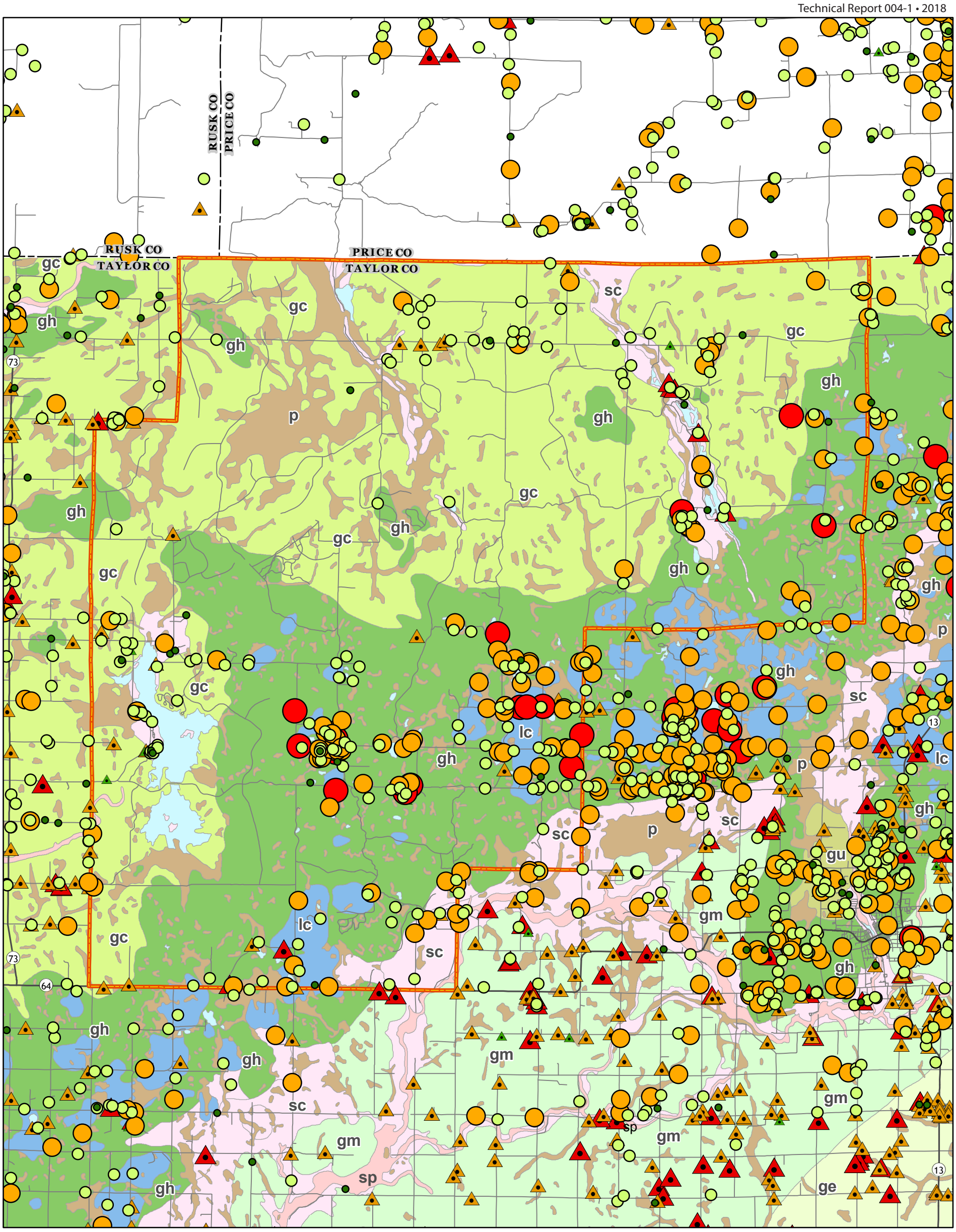
Groundwater Data Summary for the
Medford Unit, Chequamegon-Nicolet National Forest
Taylor County, Wisconsin

Plate 1
Transmissivity

Wisconsin Geological and Natural History Survey
Technical Report 004-1 • 2018



Bedrock T, log ft²/day

- <1
- 1–2
- >2

Medford Unit

Glacial T, log ft²/day

- <2.5
- 2.5–3.5
- 3.5–4.5
- >4.5

Pleistocene geology

p	lc	gh	water
sp	gc	gm	
sc	gu	ge	

Refer to table 1 for unit descriptions.

0 4 Miles

N

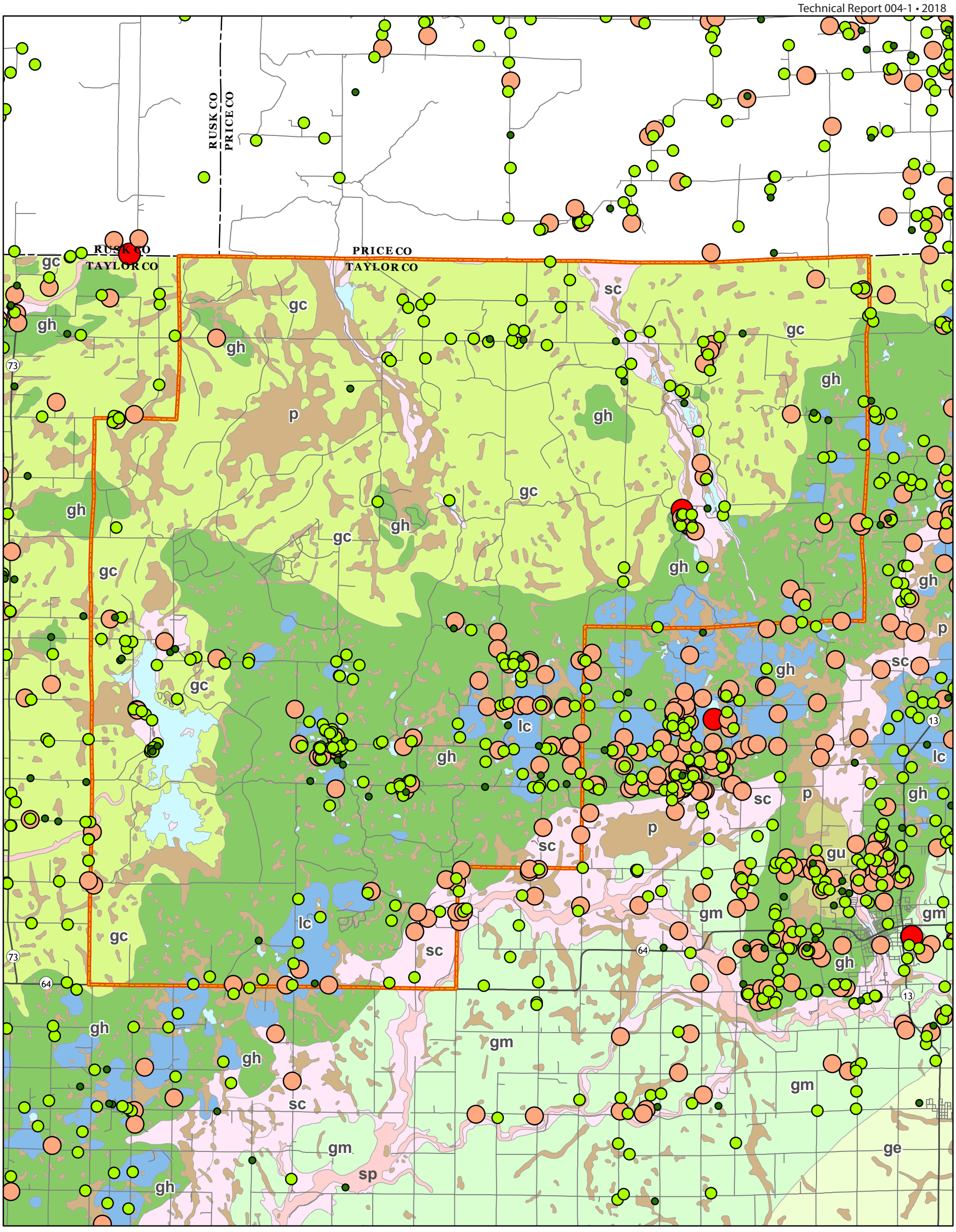
UW Extension
University of Wisconsin-Extension

Pleistocene geology map modified from Attig, 1993. Political boundaries from Wisconsin DNR, 2011. National Forest boundaries from the USDA Forest Service, 2011. Roads from U.S. Census Bureau, 2015.

Groundwater Data Summary for the
Medford Unit, Chequamegon-Nicolet National Forest
Taylor County, Wisconsin

Plate 2
Hydraulic Conductivity of Unlithified Materials

Wisconsin Geological and Natural History Survey
Technical Report 004-1 • 2018



Glacial hydraulic conductivity, log ft/day

- ≤1
- >1–2
- >2–3
- >3

Medford Unit

Pleistocene geology

p, lc, gh, water
sp, gc, gm
sc, gu, ge

Refer to table 1 for unit descriptions.

0 4 Miles

N

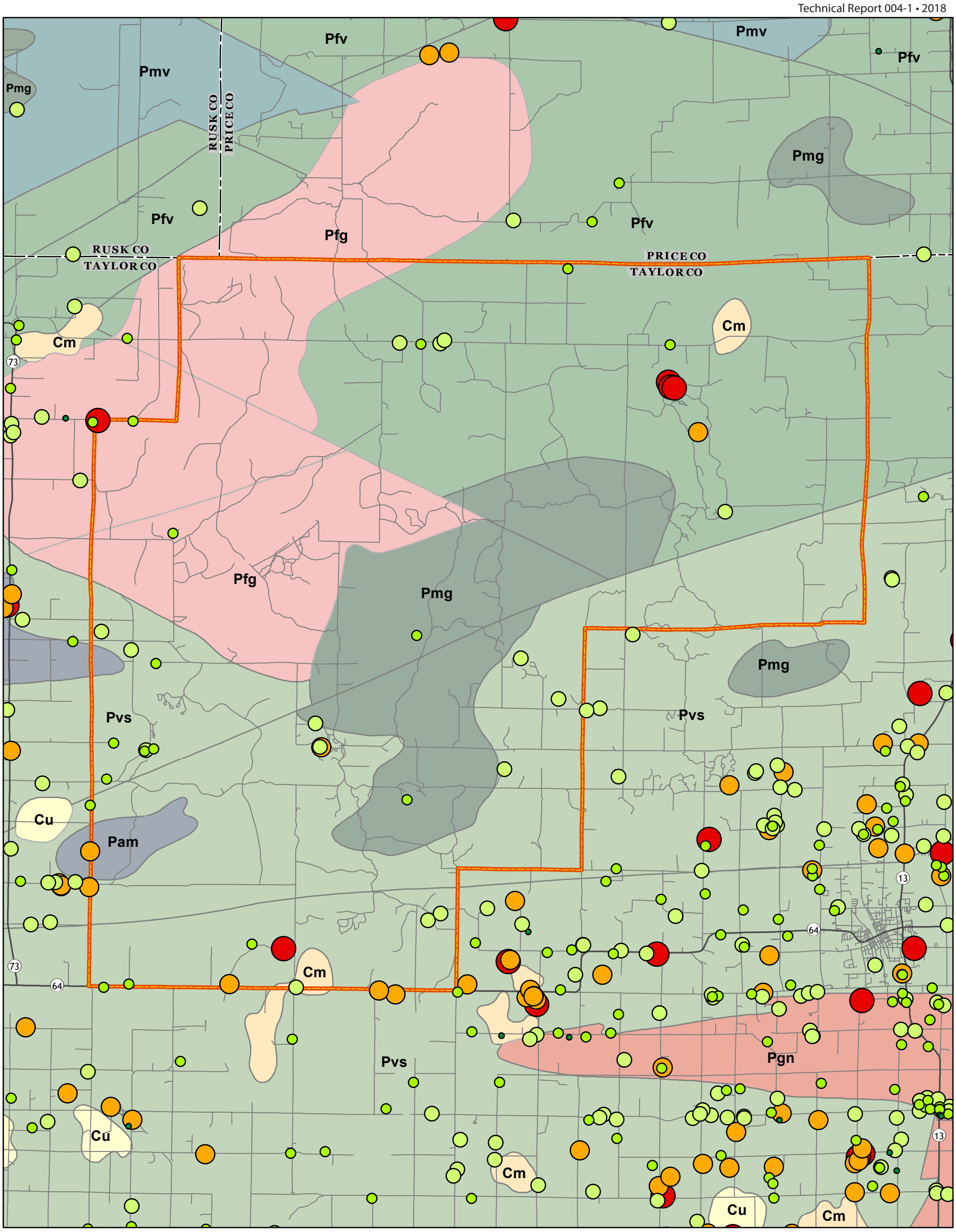
Pleistocene geology map modified from Attig, 1993. Political boundaries from Wisconsin DNR, 2011. National Forest boundaries from the USDA Forest Service, 2011. Roads from U.S. Census Bureau, 2015.

UW Extension
University of Wisconsin-Extension

Groundwater Data Summary for the
Medford Unit, Chequamegon-Nicolet National Forest
Taylor County, Wisconsin

Plate 3
Hydraulic conductivity of bedrock

Wisconsin Geological and Natural History Survey
Technical Report 004-1 • 2018



Bedrock hydraulic conductivity, log ft/day

- <–1
- >–1 to 0
- >0 to 1
- >1 to 2
- >2
- Medford Unit

Bedrock geology

Cu, Cm, Pfg, Pmg, Pfv, Pvs, Pmv, Pam, Pgn

Refer to Table 2 for unit descriptions.

0 4 Miles

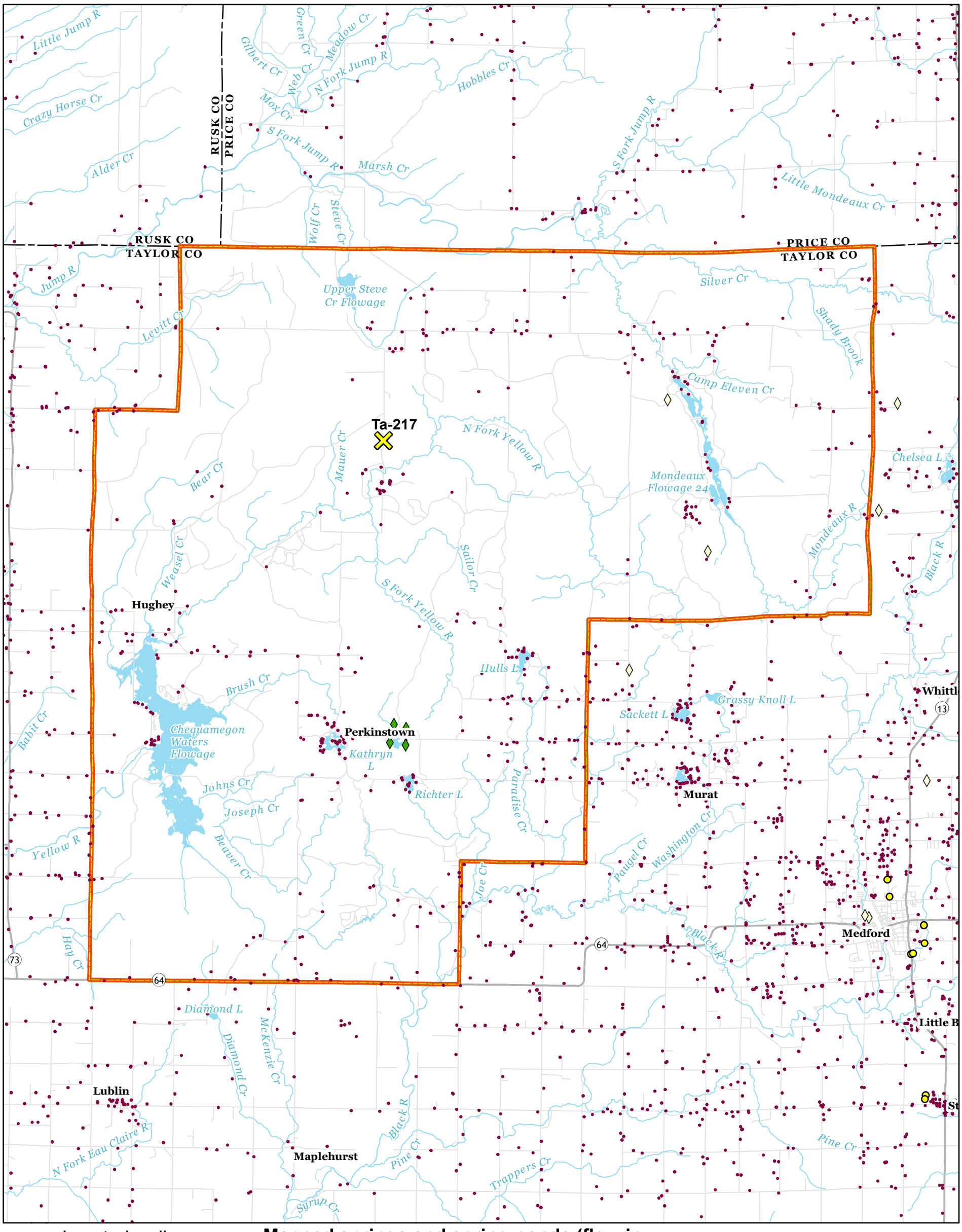
N

UW Extension
University of Wisconsin-Extension

Bedrock map from Mudrey and others, 1987. Political boundaries from Wisconsin DNR, 2011.
National Forest boundaries from the USDA Forest Service, 2011. Roads from U.S. Census Bureau, 2015.

Groundwater Data Summary for the
Medford Unit, Chequamegon-Nicolet National Forest
Taylor County, Wisconsin

Plate 4
Data points, springs, and spring discharge



Located wells

High-capacity wells

Monitoring well TA-217

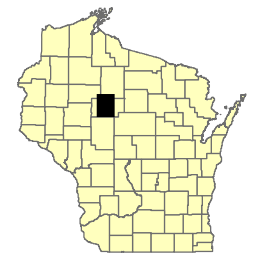
Medford Unit

Mapped springs and spring ponds (flow in cubic feet per second)

No measurement

<0.1

0 4 Miles

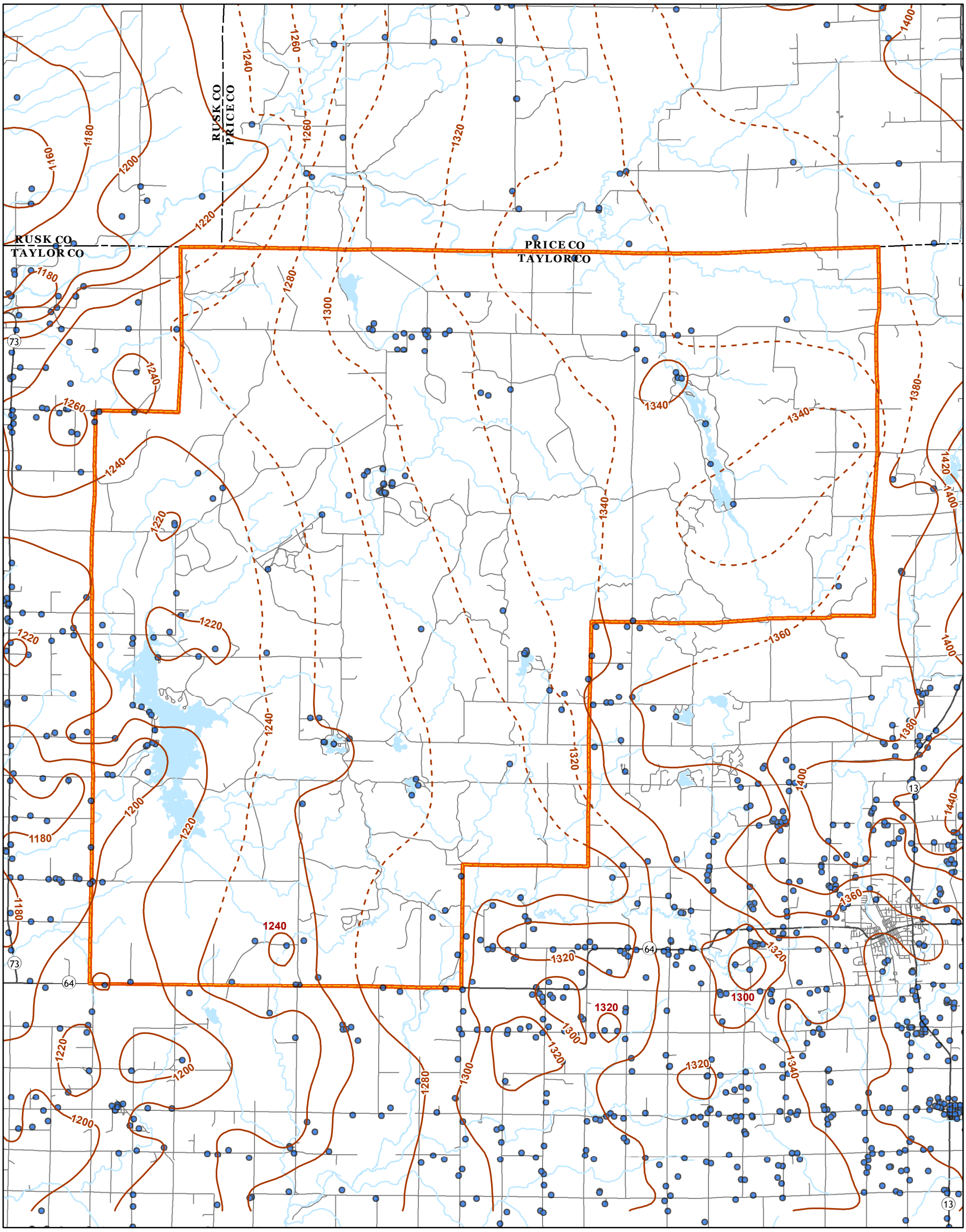


National Forest boundaries from the USDA Forest Service. Roads from CENSUS, 2015. Hydrography from National Hydrography Dataset, 2012. Boundaries from multiple sources, 2015. Terrain data from Wisconsin Department of Natural Resources and US Geological Survey. Springs and spring ponds from Macholl (2007).

Groundwater Data Summary for the
Medford Unit, Chequamegon-Nicolet National Forest
Taylor County, Wisconsin

Plate 5
Elevation of bedrock surface

Wisconsin Geological and Natural History Survey
Technical Report 004-1 • 2018



Bedrock elevation, 20 ft contour interval

Bedrock elevation, inferred from sparse data

Well reaching bedrock

Medford Unit

0 4 Miles

N

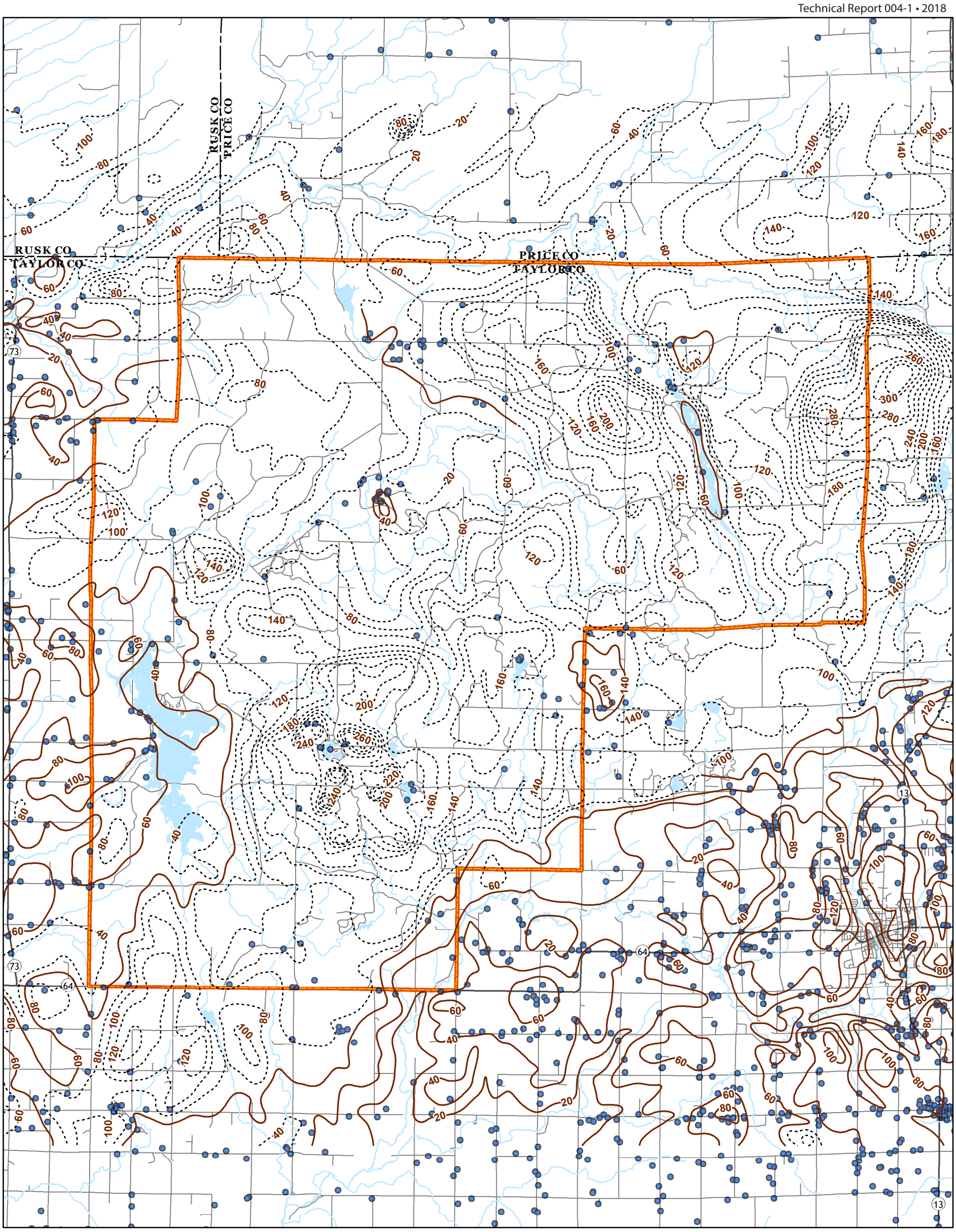
UW Extension
University of Wisconsin-Extension

Political boundaries from Wisconsin DNR, 2011. National Forest boundaries from the USDA Forest Service, 2011. Roads from U.S. Census Bureau, 2015. Hydrography from National Hydrography Dataset, 2012.

Groundwater Data Summary for the
Medford Unit, Chequamegon-Nicolet National Forest
Taylor County, Wisconsin

Plate 6
Depth to bedrock

Wisconsin Geological and Natural History Survey
Technical Report 004-1 • 2018



Depth to bedrock, 20 ft contour interval

Depth to bedrock, inferred

Well reaching bedrock

Medford Unit

0 4 Miles

N

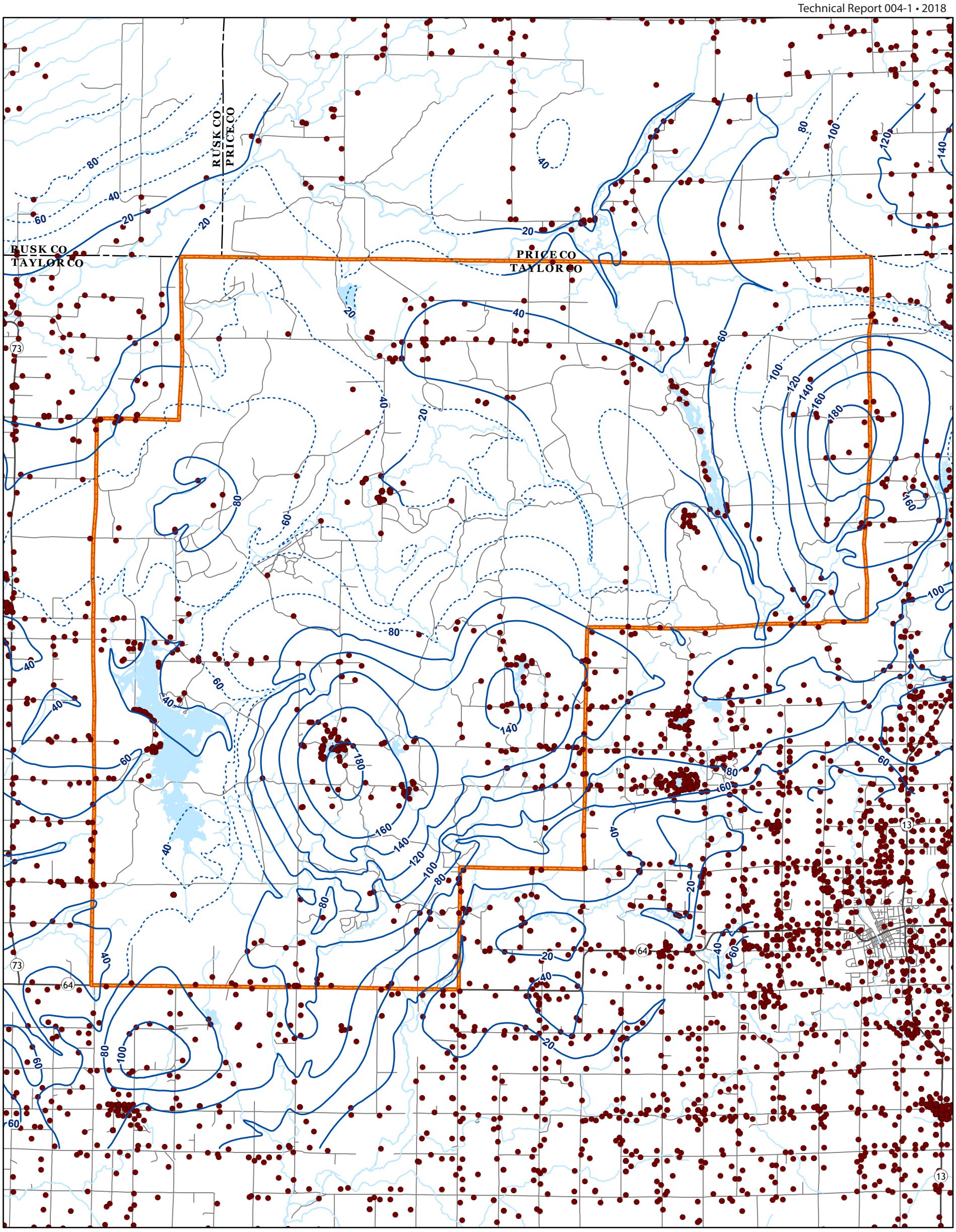
University of Wisconsin-Extension

Political boundaries from Wisconsin DNR, 2011. National Forest boundaries from the USDA Forest Service, 2011. Roads from U.S. Census Bureau, 2015. Hydrography from National Hydrography Dataset, 2012.

Groundwater Data Summary for the
Medford Unit, Chequamegon-Nicolet National Forest
Taylor County, Wisconsin

Plate 7
Saturated thickness of unlithified materials

Wisconsin Geological and Natural History Survey
Technical Report 004-1 • 2018

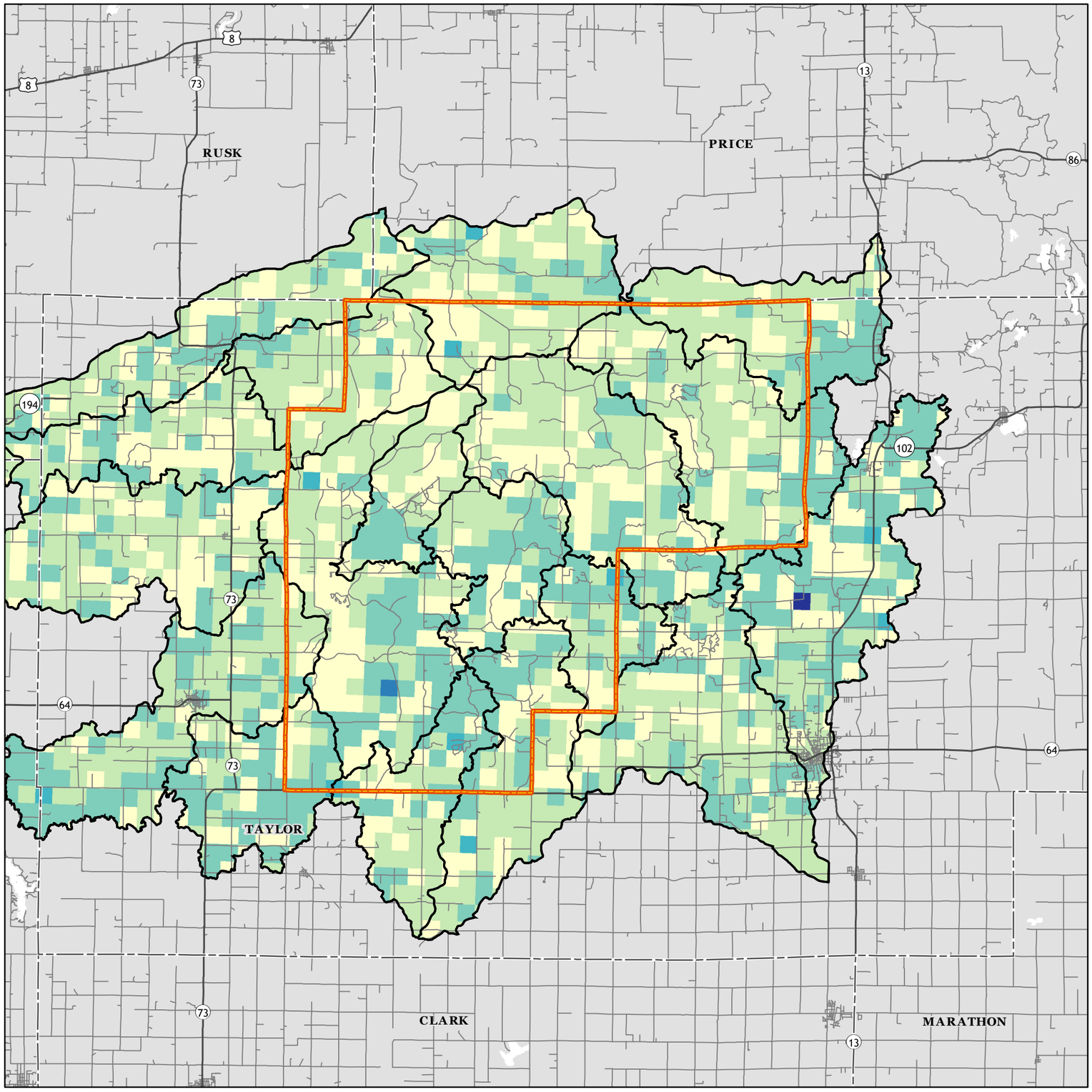


University of Wisconsin-Extension

Political boundaries from Wisconsin DNR, 2011. National Forest boundaries from the USDA Forest Service, 2011. Roads from U.S. Census Bureau, 2015. Hydrography from National Hydrography Dataset, 2012.

Plate 8
Average annual groundwater recharge (2000–2010)

Watersheds of the Medford Unit of the Chequamegon-Nicolet National Forest
Wisconsin



1:250,000

Medford Unit

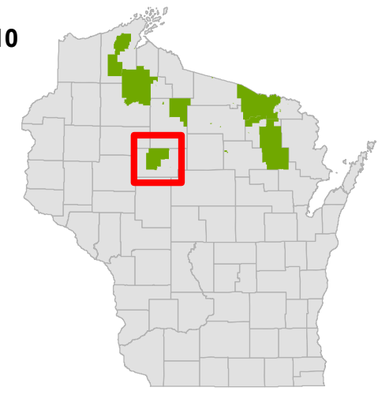
Watershed

0 5 10 Miles

Mean annual recharge, 2000–2010

Inches

- <3
- 3–6
- >6–9
- >9–12
- >12–15
- >15



Groundwater recharge was estimated through application of a soil-water balance (SWB) model and calibrated in a separate groundwater flow model. A brief description is provided here; see accompanying report for model setup, results, and data availability.

The SWB model estimates the distribution of deep drainage, approximately equal to groundwater recharge, through time using a modified Thornthwaite-Mather method to track soil moisture storage and flux on a spatially referenced grid at daily time increments. Inputs to the SWB model include map data layers for land surface topography and soil and land cover characteristics, as well as daily climate records. Model outputs included datasets of annual recharge from 2000 to 2010 and tabular summaries of daily and annual water balance calculations.

The 2000–2010 SWB annual recharge output was then used as initial input for a groundwater flow model. During flow model calibration, recharge was adjusted by using a multiplier to calibrate to groundwater conditions by adjusting the magnitude of recharge while maintaining the spatial distribution of SWB results. The SWB results were also downsampled for use in the flow model, resulting in a grid that is more generalized than the original SWB output. The results of this recharge calibration are shown here.

Political boundaries from Wisconsin DNR, 2011. National Forest boundaries from the USDA Forest Service, 2011. Roads from U.S. Census Bureau, 2015. Watershed boundaries and hydrography from National Hydrography Dataset, 2011–12.

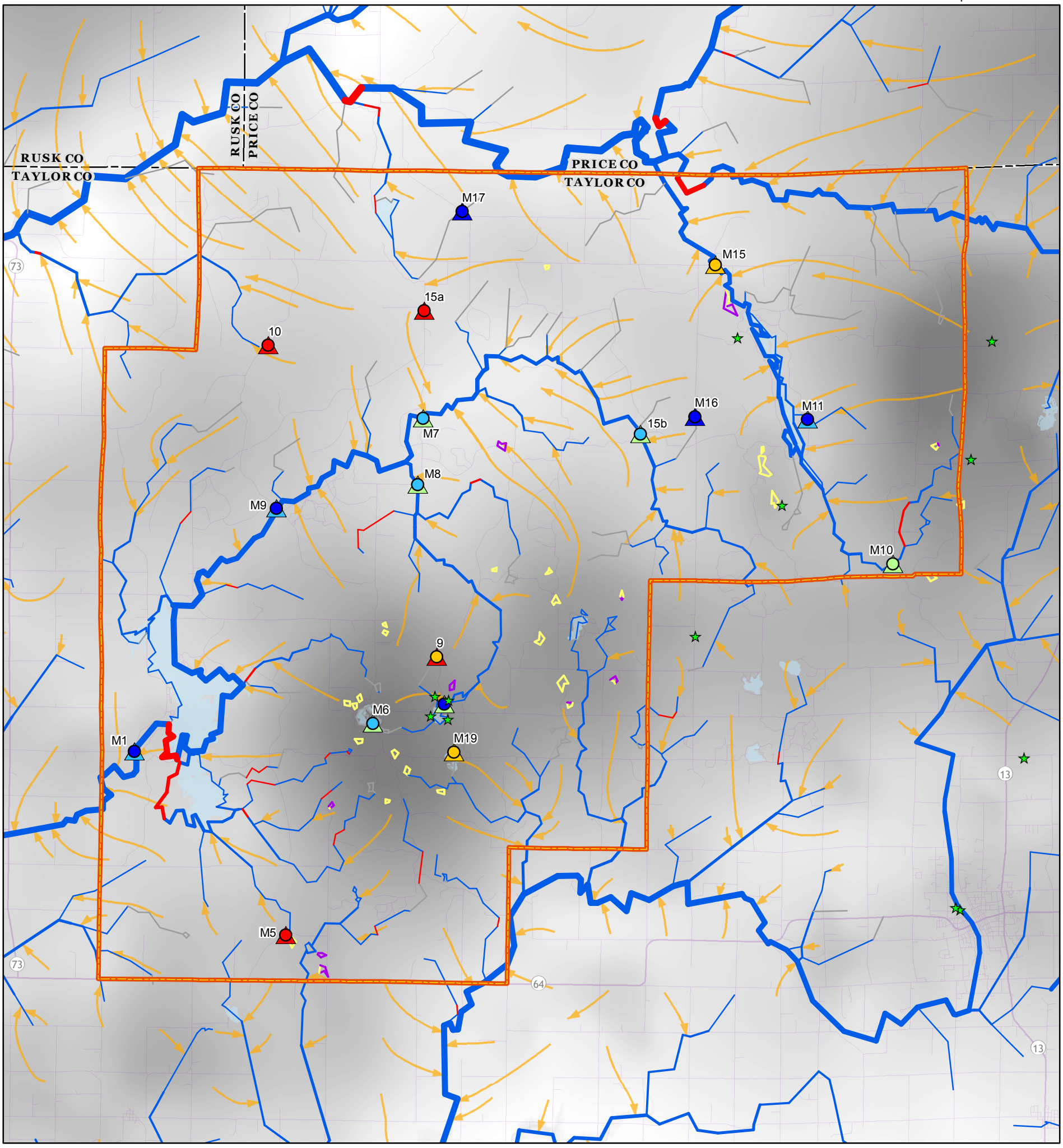
Wisconsin Geological and Natural History Survey
Technical Report 004-1 • 2018

UW Extension
University of Wisconsin-Extension

Groundwater Data Summary for the
Medford Unit, Chequamegon-Nicolet National Forest
Taylor County, Wisconsin

Plate 9
Surface water chemistry and simulated baseflow

Wisconsin Geological and Natural History Survey
Technical Report 004-1 • 2018



Stream, wetland, and lake samples[1]

Conductivity, µs/cm	Alkalinity, mg/L
≤50	≤30
>50–100	>30–60
>100–150	>60–100
>150–200	>100–130
>200	>130

[1]Label indicates site number. See report for further explanation.

Simulated stream baseflow, by color and line weight[2]

Aquifer interaction	Baseflow, cfs
Dry	<1
Gaining from groundwater	1–3
Losing to groundwater	>3–6
	>6–10
	>10–15
	>15–20
	>20–30
	>30–60
	>60–100
	>100

[2]Color indicates interaction with aquifer; lineweight proportional to baseflow volume. Gray lines indicate streams that are represented in the flow model but have zero simulated baseflow. Farfield streams not shown.

Simulated lake discharge

- Losing to groundwater
- Gaining from groundwater
- Medford Unit
- Springs and spring ponds
- Simulated groundwater flow path

Saturated aquifer thickness
200 ft
0 ft

Springs and spring ponds from Macholl, 2007. Political boundaries from Wisconsin DNR, 2011. National Forest boundaries from the USDA Forest Service, 2011. Roads from U.S. Census Bureau, 2015. Hydrography from National Hydrography Dataset, 2012.

UW Extension
University of Wisconsin-Extension

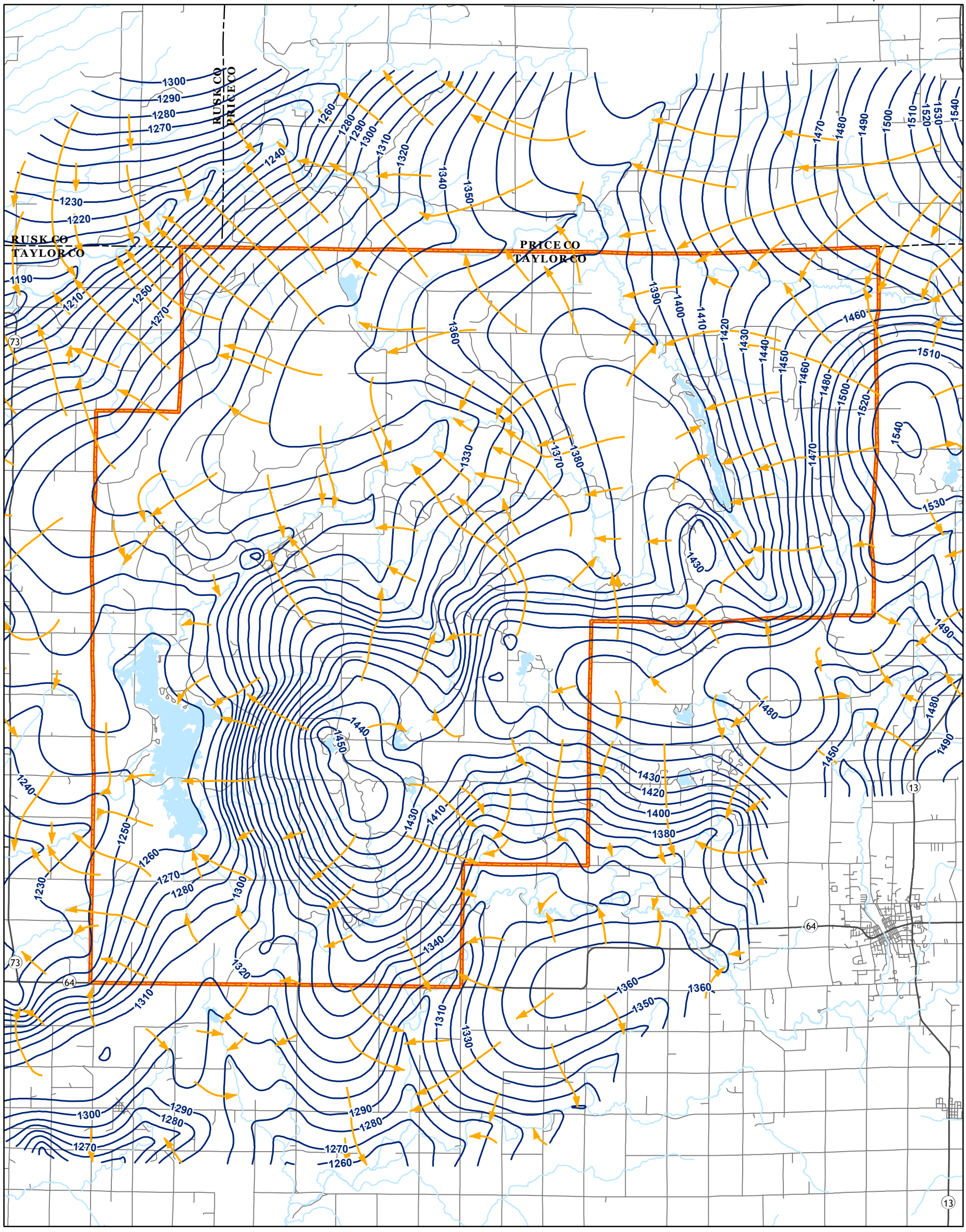
0 4 Miles

N

Groundwater Data Summary for the
Medford Unit, Chequamegon-Nicolet National Forest
Taylor County, Wisconsin

Plate 10
Groundwater flow model simulated water table

Wisconsin Geological and Natural History Survey
Technical Report 004-1 • 2018



Simulated water-table elevation, 10 ft contour interval

Simulated flow paths

Medford Unit

0 4 Miles

N

University of Wisconsin-Extension

Water-table elevations and flow paths generated from regional groundwater flow model (see report for details). Political boundaries from Wisconsin DNR, 2011. National Forest boundaries from the USDA Forest Service, 2011. Roads from U.S. Census Bureau, 2015. Hydrography from National Hydrography Dataset, 2012.