

GIS Basics and Stormwater Mapping

2016 EPA Region 6 Stormwater Workshop
Monday, October 3, 2016
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General Permit OKR04

Phase II Small Municipal Separate Storm Sewer System
Discharges Within the State of Oklahoma

November 1, 2015

What are the mapping requirements?

We will use the City of Claremore as our example.

MS4 Jurisdiction

- II.B Contents of the Notice of Intent
- 2.b requires: “A description or map that defines the boundaries or extent of your MS4 jurisdiction.”
- The NOI itself says “Attach a map showing your MS4 boundaries.”
- I used current city limit shapefiles. These are often available from the municipality. INCOG keeps shapefiles of our members and updates them as the boundaries change.
- I prepared them in 11” x 17” format.

MS4 Jurisdiction

- 3. Illicit Discharge Detection and Elimination
 - a.(3) “Develop (if necessary), maintain and regularly update a storm sewer system map, showing the location of all outfalls and the names and location of all waters of the State that receive discharges from those outfalls.”

MS4 Audit Checklist

- Section 1, J.
- Have pollutants of concern (POC) been established? If yes, based on what?
- 303(d) list?
- TMDLs?
- Land uses of concern?
- Existing watershed planning efforts?

MS4 Audit Checklist

- Section 4, 6.
- “Is the map of MS4 system complete?”
 - A. “If yes, hard copy or electronic?”
- Section 5. MS4 Mapping
 - A. “Outfalls and receiving waters mapper?”
 - B. “Catch basins?”
 - C. “Pipes, ditches, other conduits?”
 - D. “Public stormwater facilities (BMPs)?”
 - E. “Private stormwater facilities (BMPs)?”

MS4 Audit Checklist

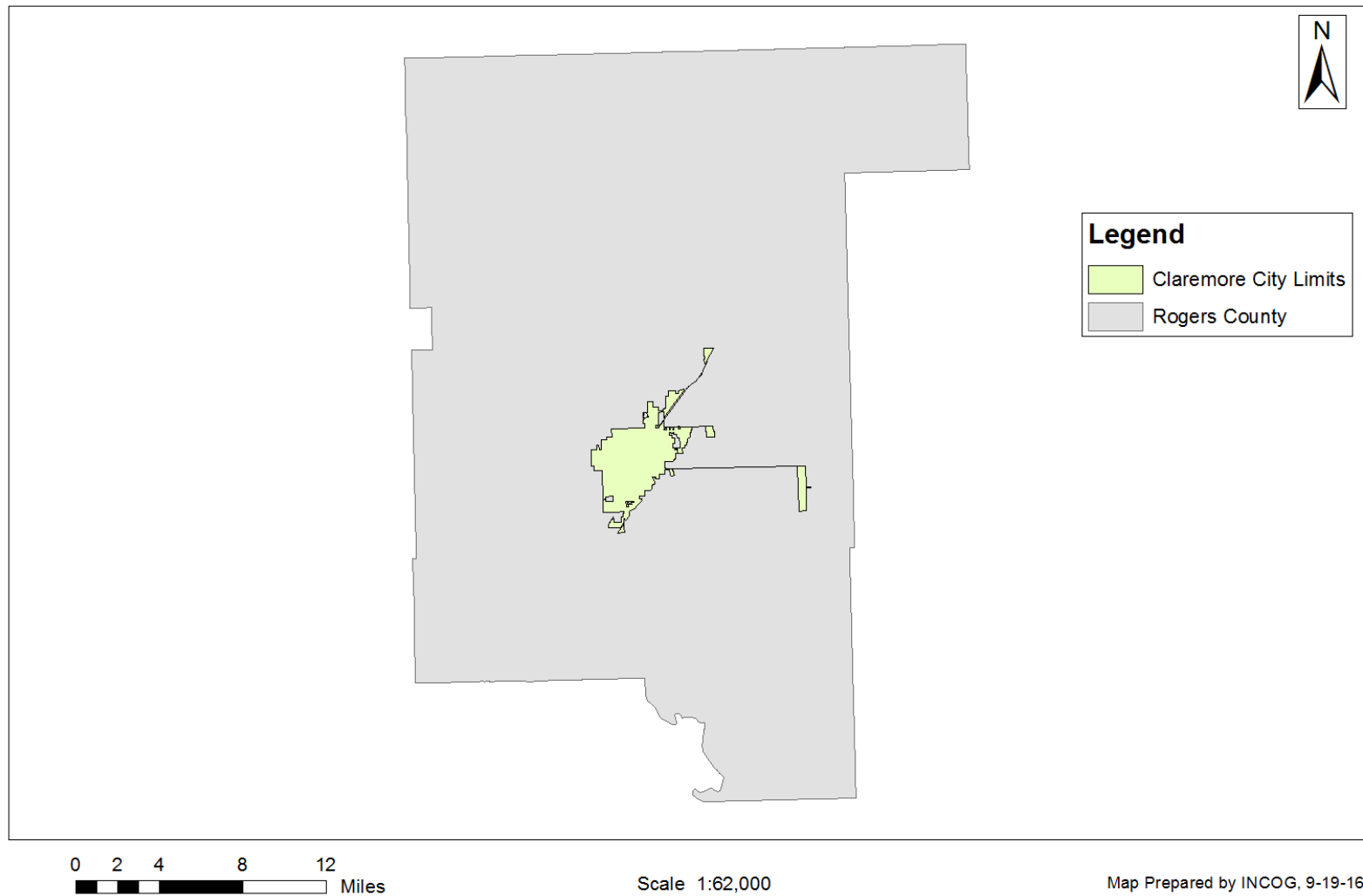
- Section 8, 3
- “Has a map or description of the geographical boundaries in which municipal construction activities can take place been developed?”
- There are numerous requests for site maps throughout the evaluation checklist.

Initial Steps

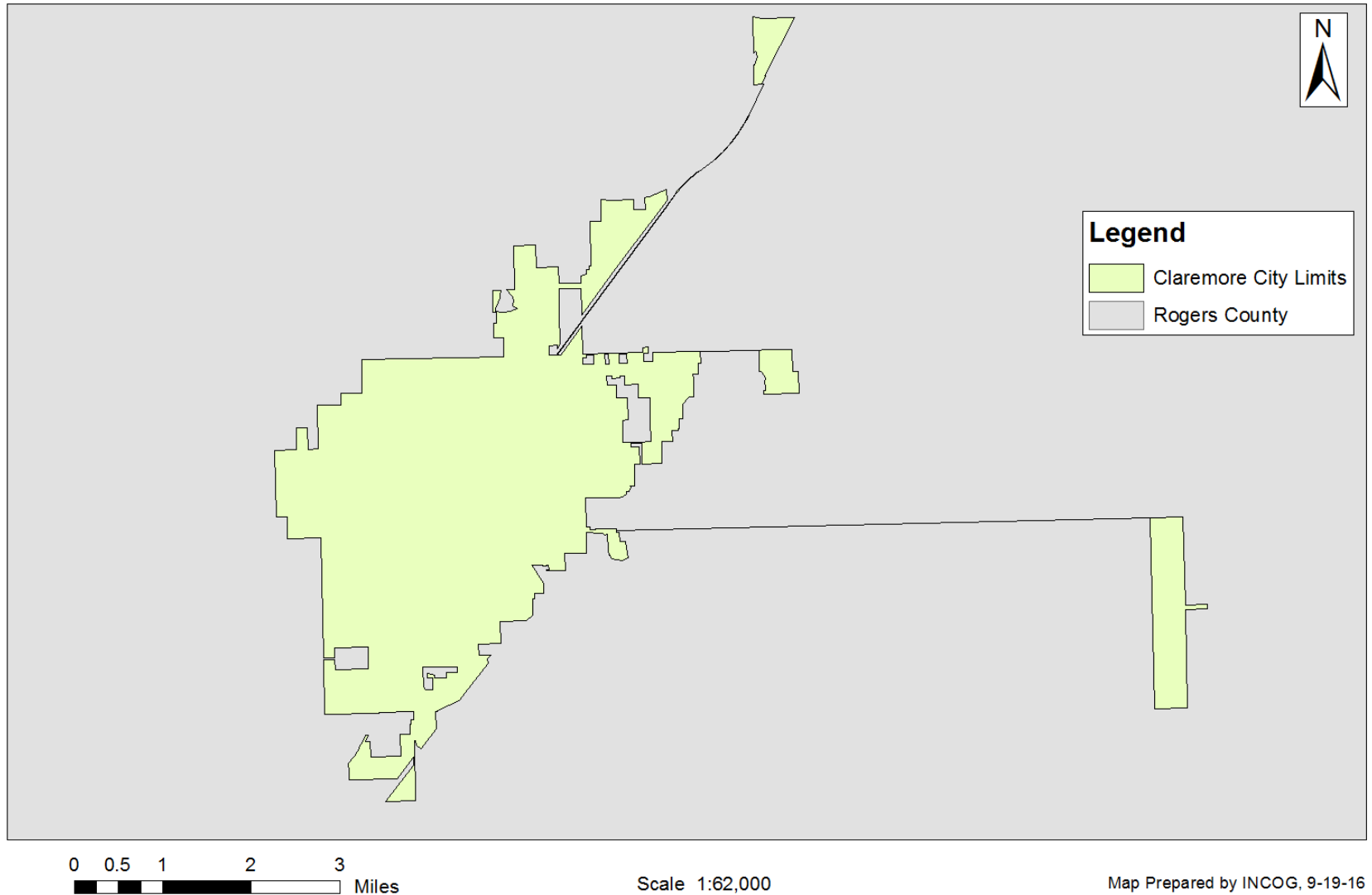
- First add the county
- Then add the city limits
- Add legend
- Add a north arrow
- Add a scale
- This is 1:62,000

Initial Steps

Claremore MS4 Stormwater Map

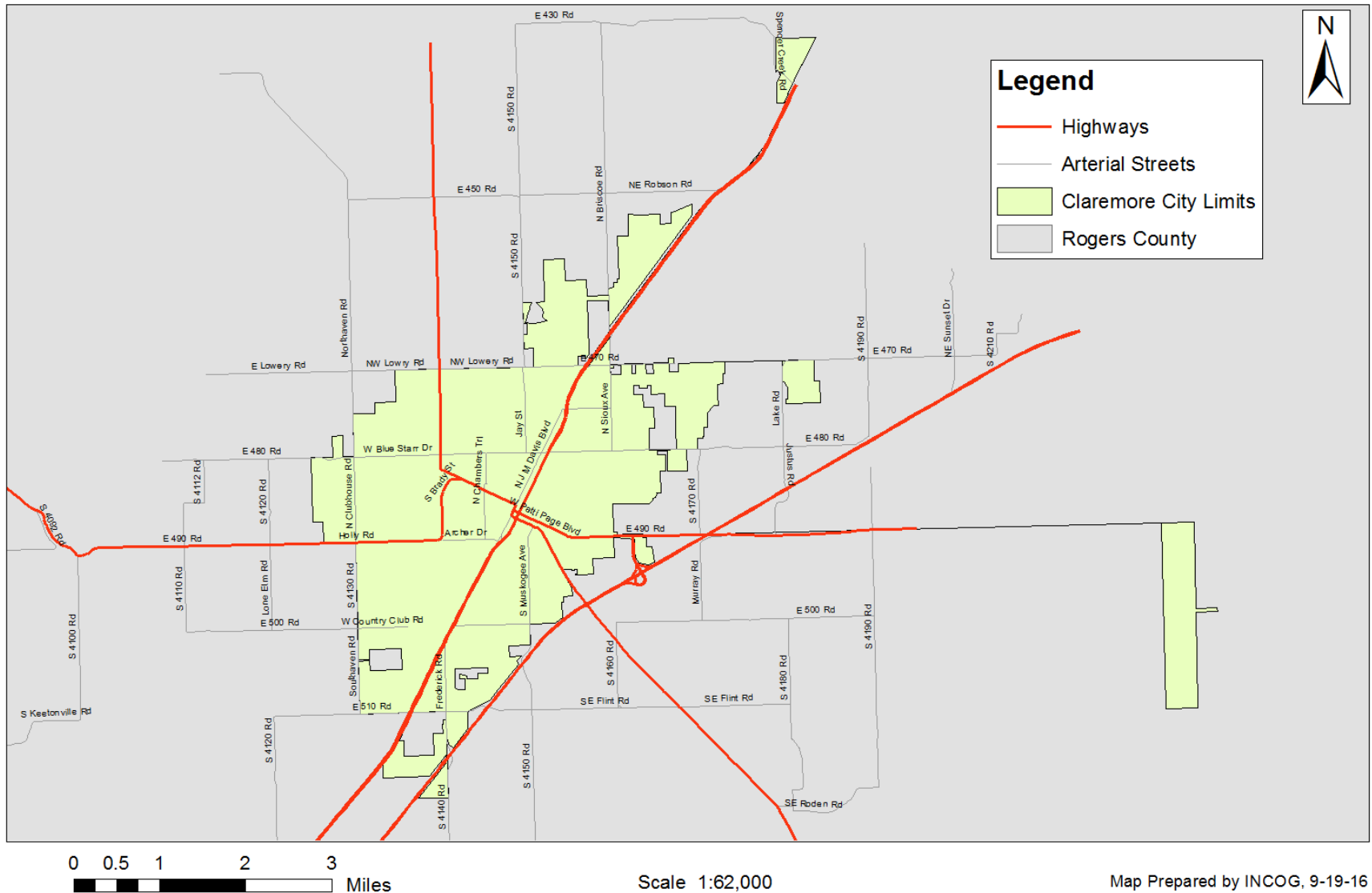


Claremore MS4 Stormwater Map



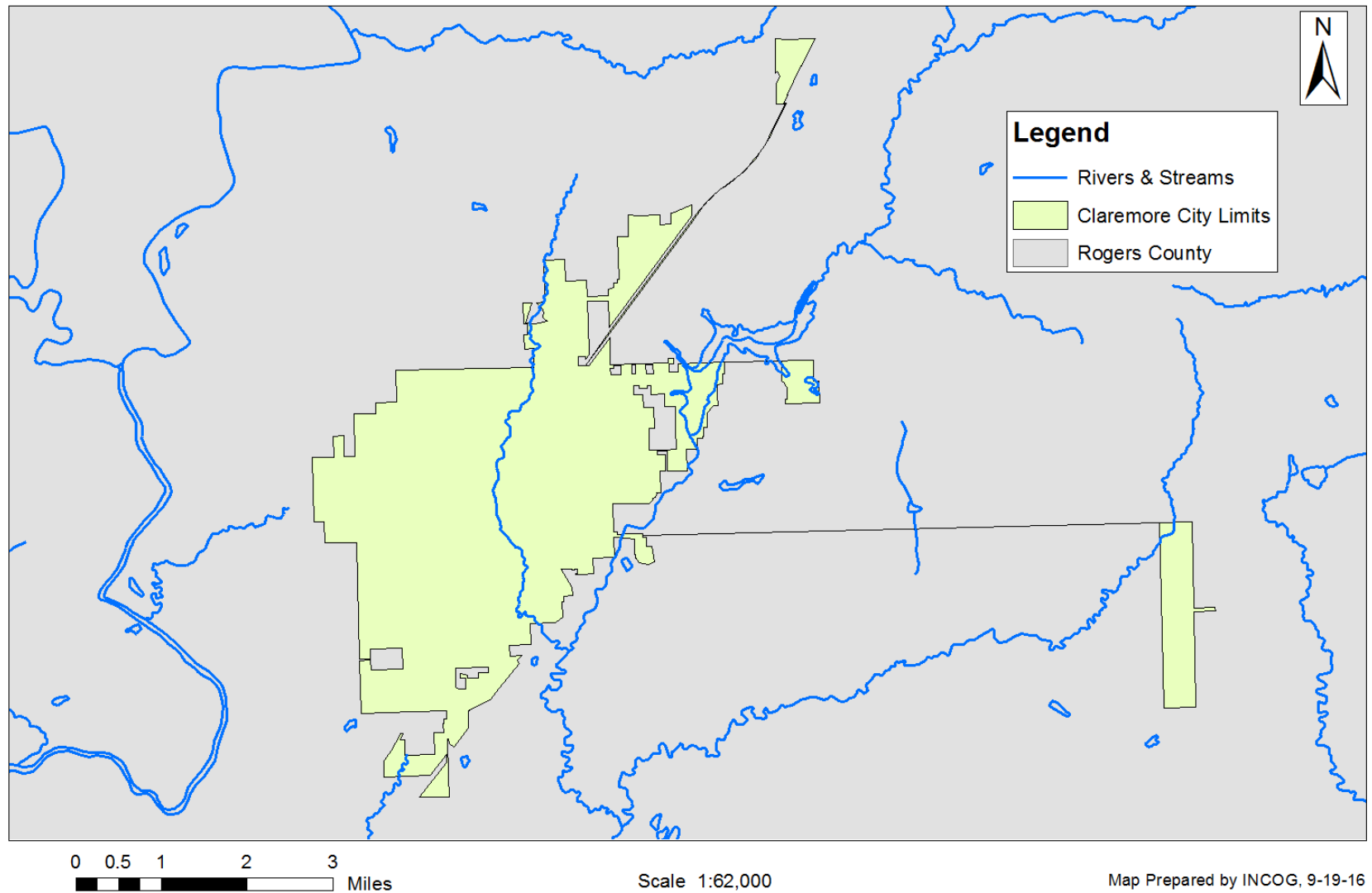
“Zoom to Layer” by right clicking the shapefile in the Table of Contents.

Claremore MS4 Stormwater Map



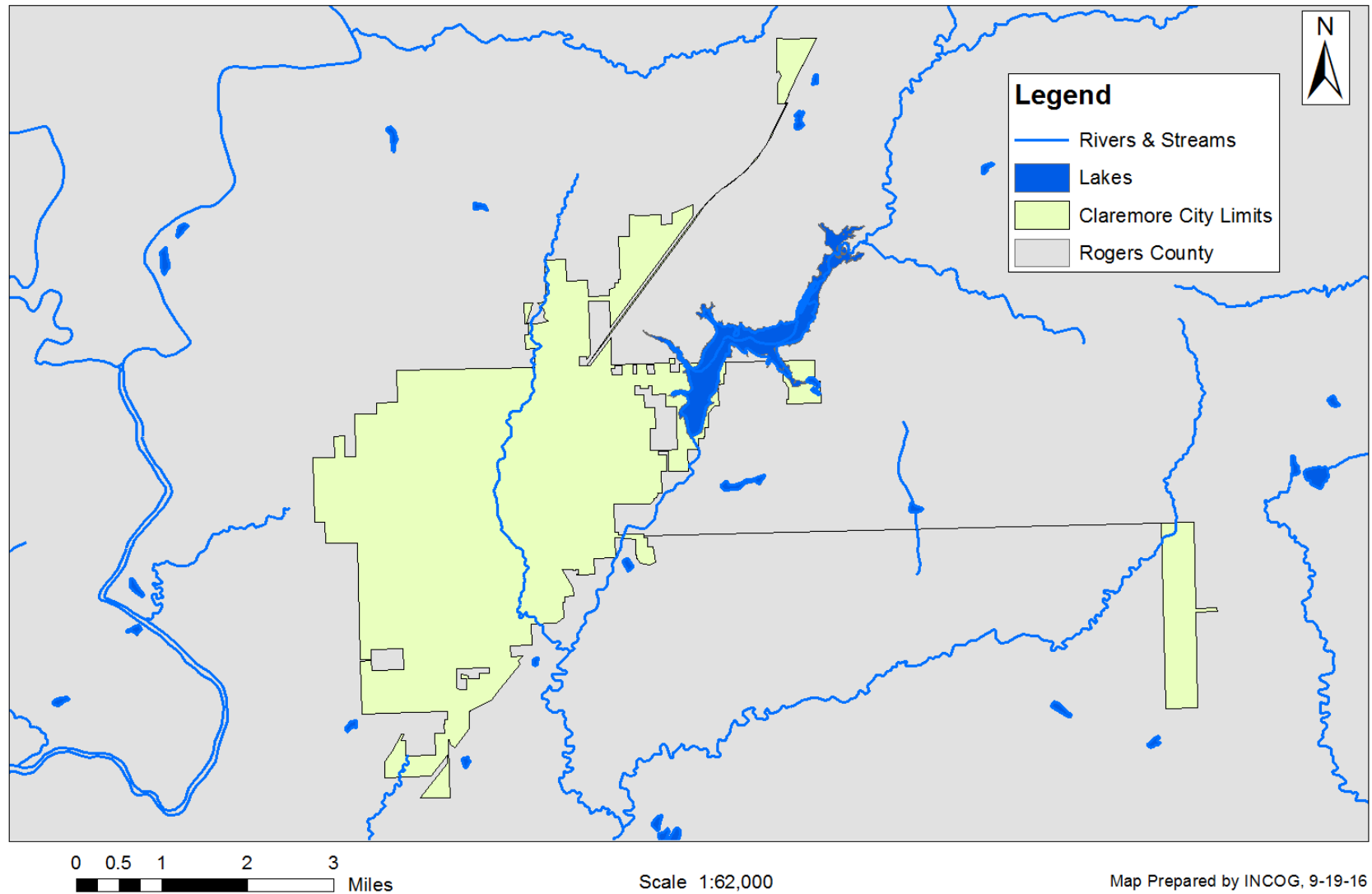
I have added highways and major arterials by importing two more shapefiles.

Claremore MS4 Stormwater Map



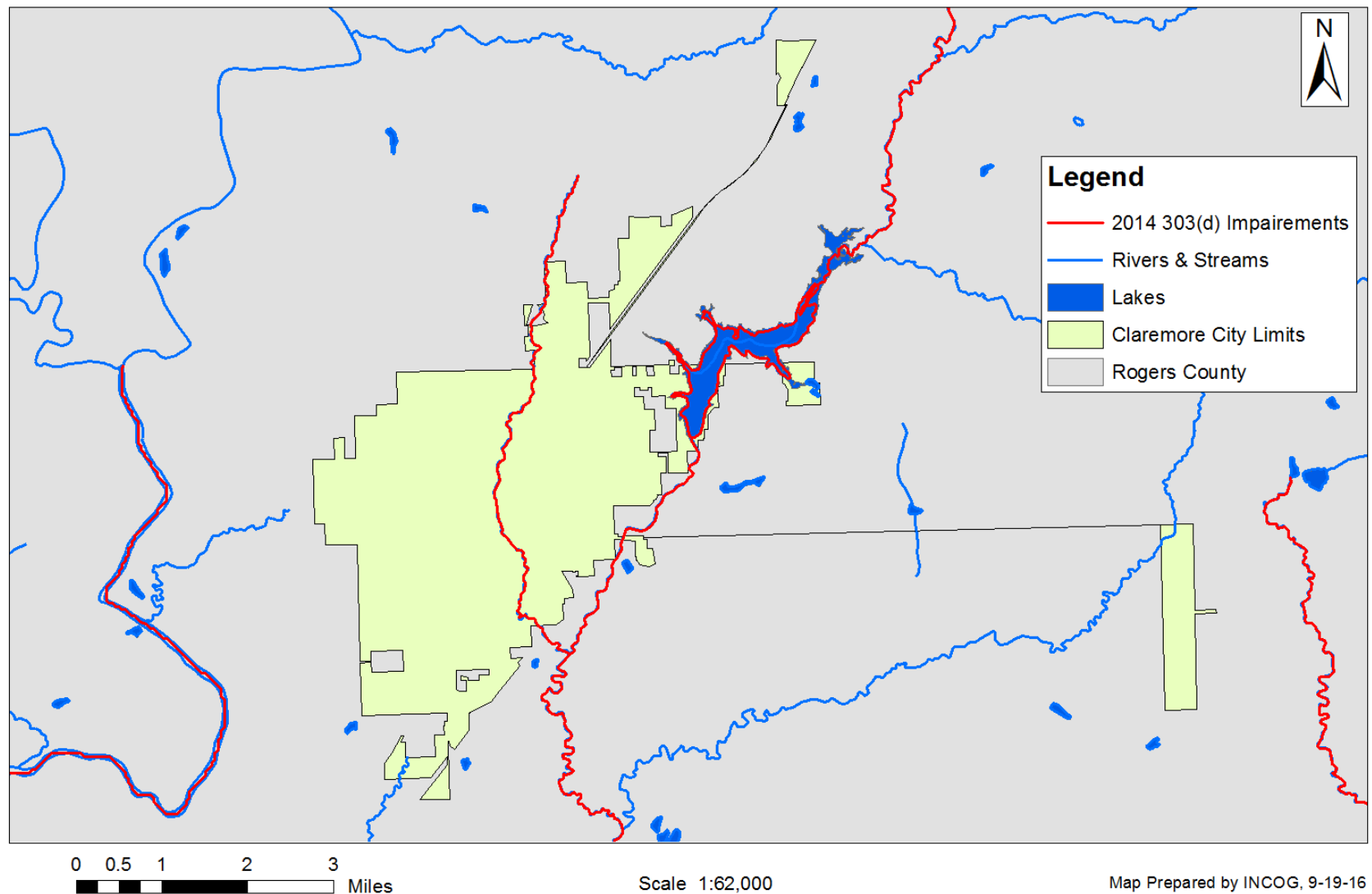
Now we focus on streams (add OWRB streams shapefile) and reduce clutter by removing roads.

Claremore MS4 Stormwater Map



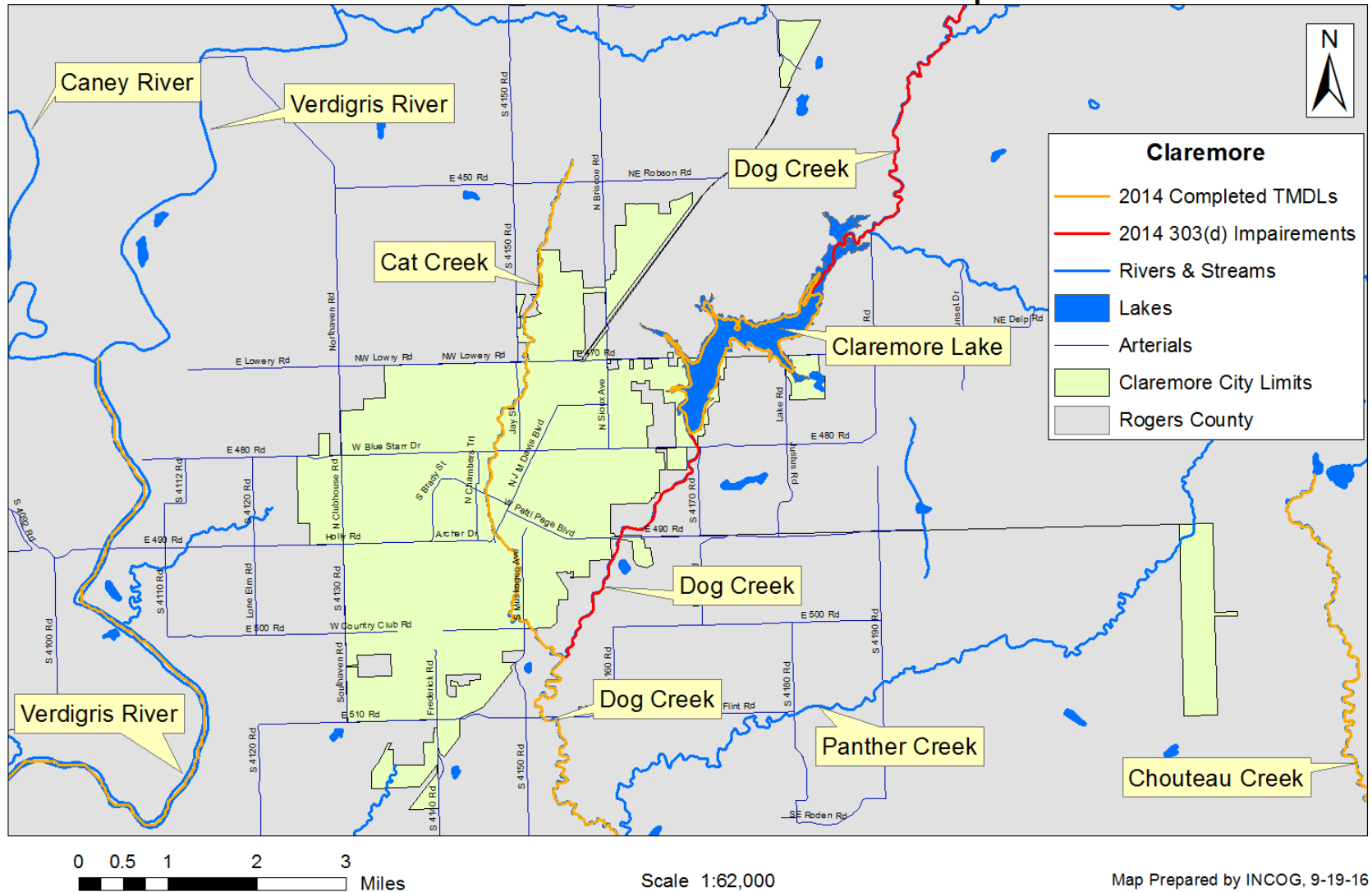
Now add an OWRB lake shapefile to complete the surface waters.

Claremore MS4 Stormwater Map



Now lets add our 303(d) impaired water shapefile from ODEQ.

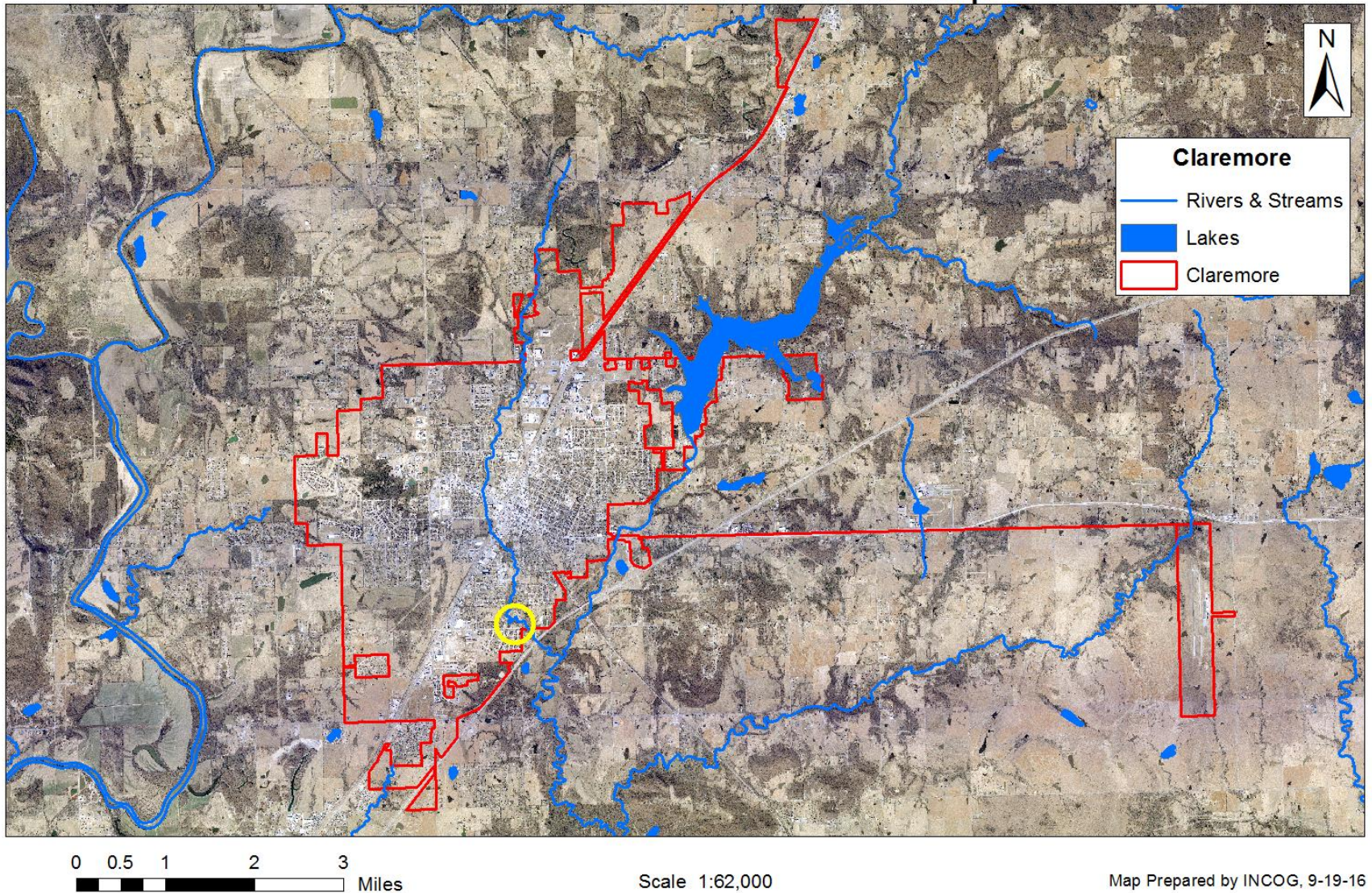
Claremore MS4 Stormwater Map



Now let's see which 303(d) impaired waters have a completed TMDL by adding the ODEQ TMDL shapefile.

What Else Can We Learn?

Claremore MS4 Stormwater Map



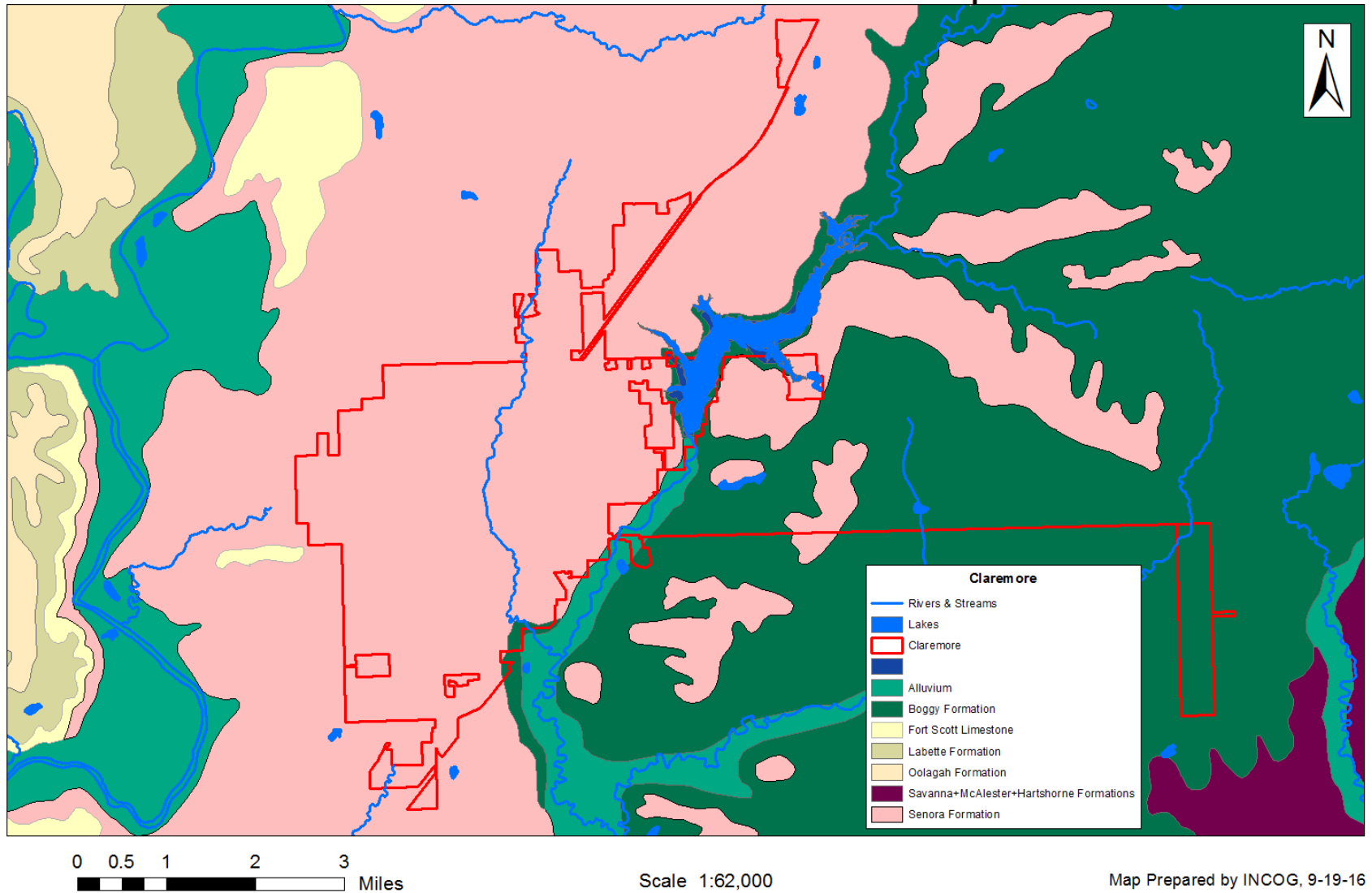
If we add an aerial and just show the city limits and surface waters we get the big picture, but we lack detail.

Claremore MS4 Stormwater Map



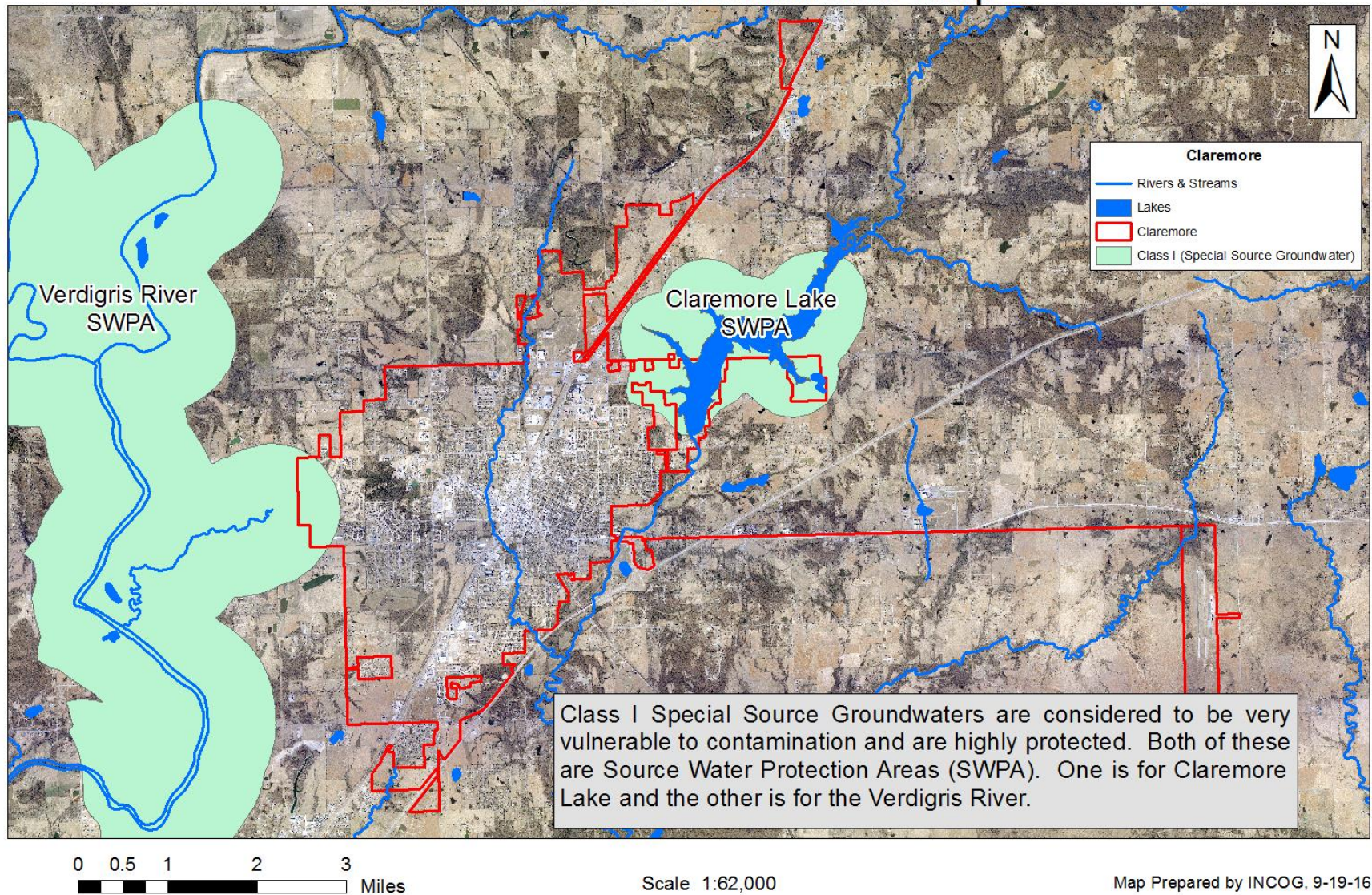
Now we see bridges, houses, ponds, roads and mapping irregularities.

Claremore MS4 Stormwater Map



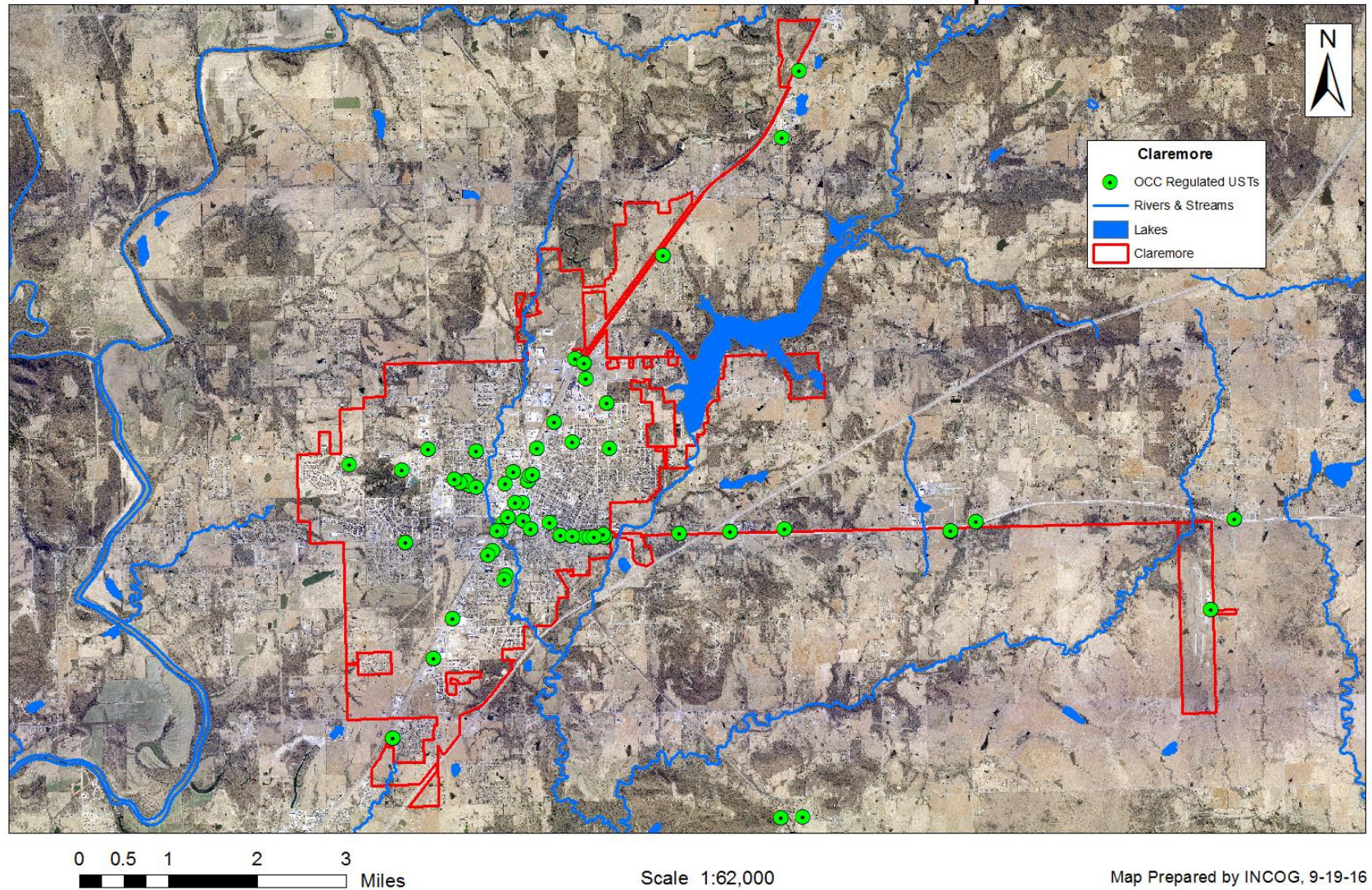
We can look at the geology and see what formations we are working with.

Claremore MS4 Stormwater Map



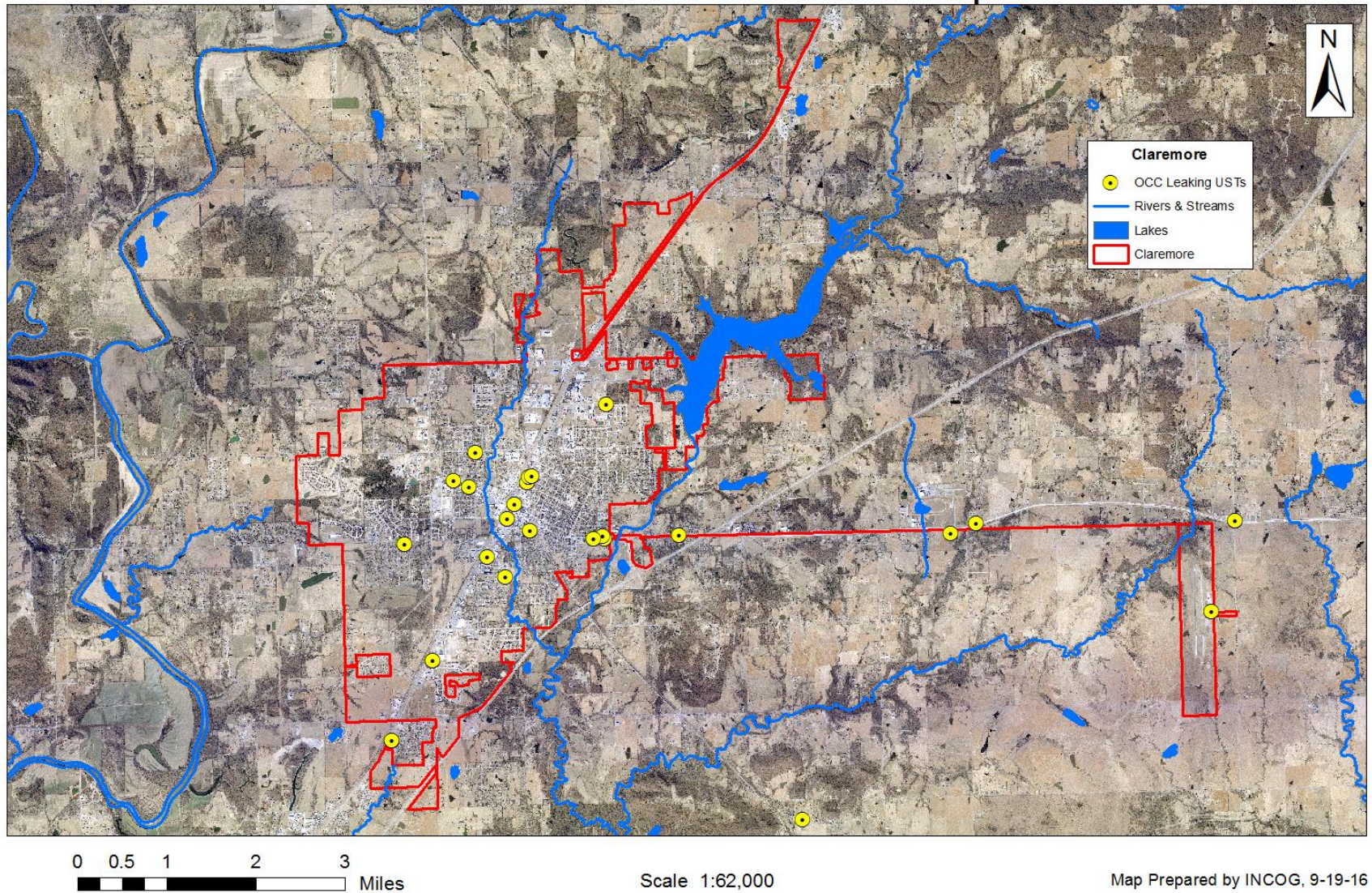
We can look at issues requiring special consideration.

Claremore MS4 Stormwater Map



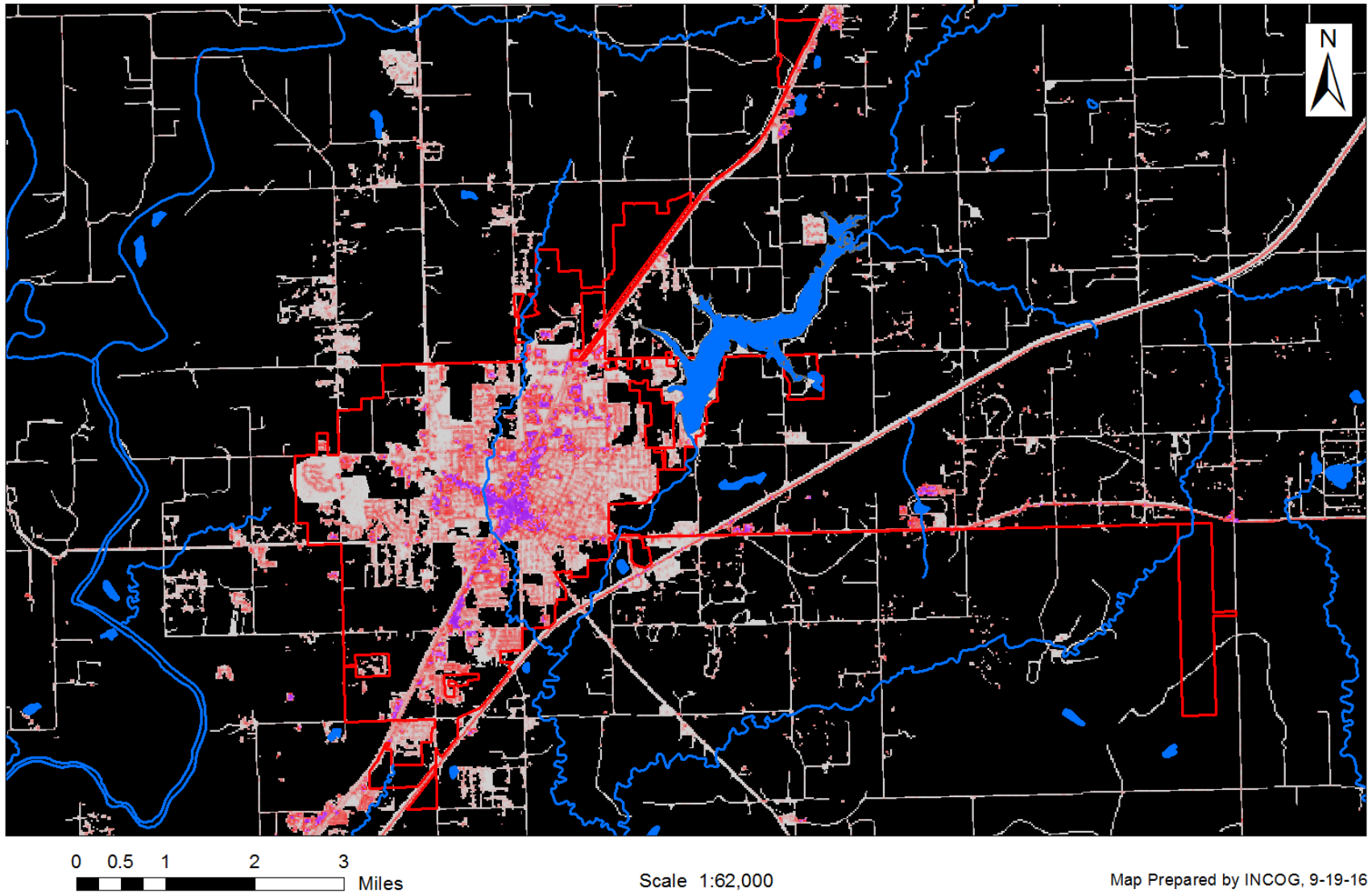
Location of regulated underground storage tanks.

Claremore MS4 Stormwater Map



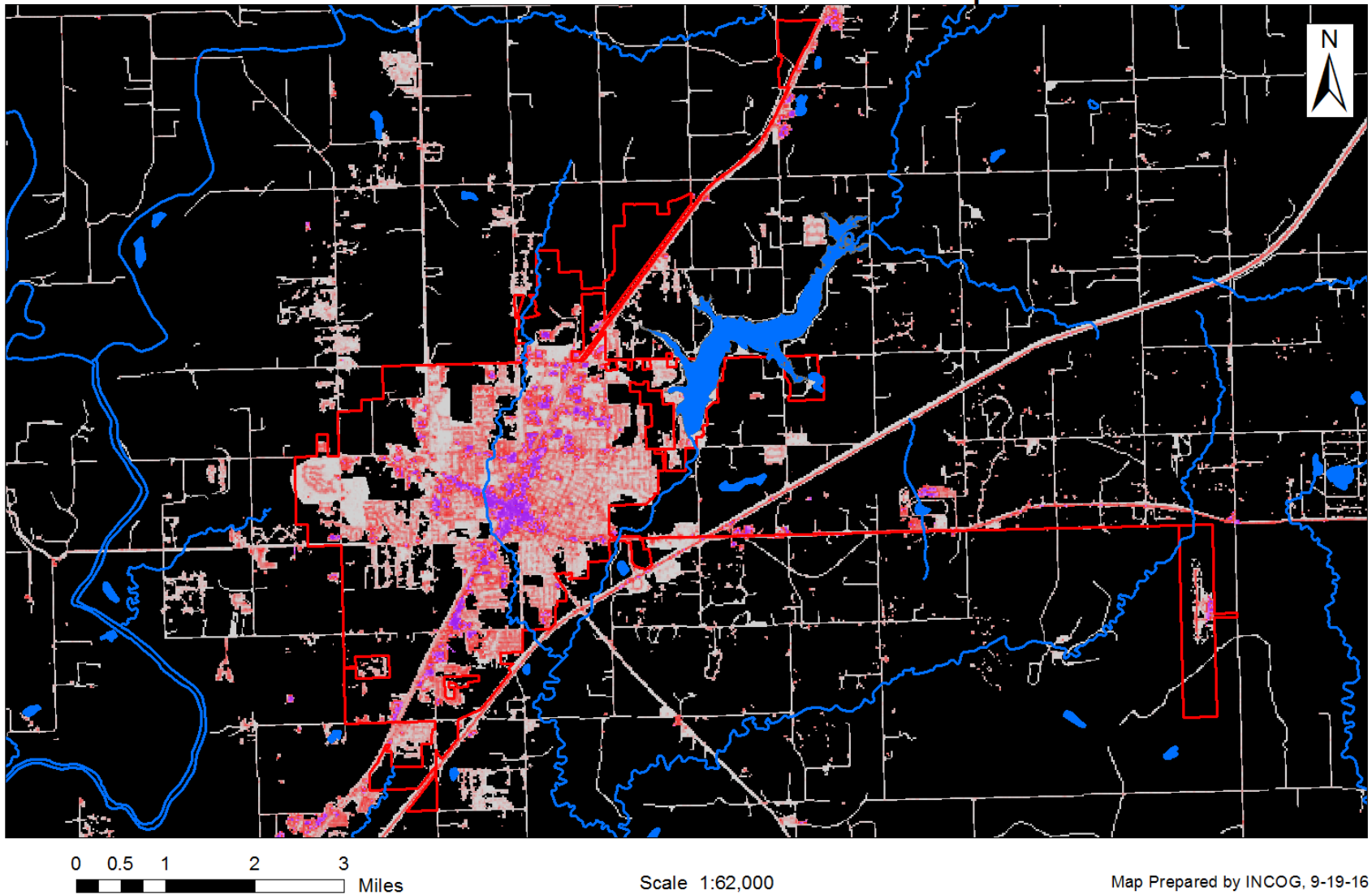
Location of underground storage tanks with documented leaks.

Claremore MS4 Stormwater Map



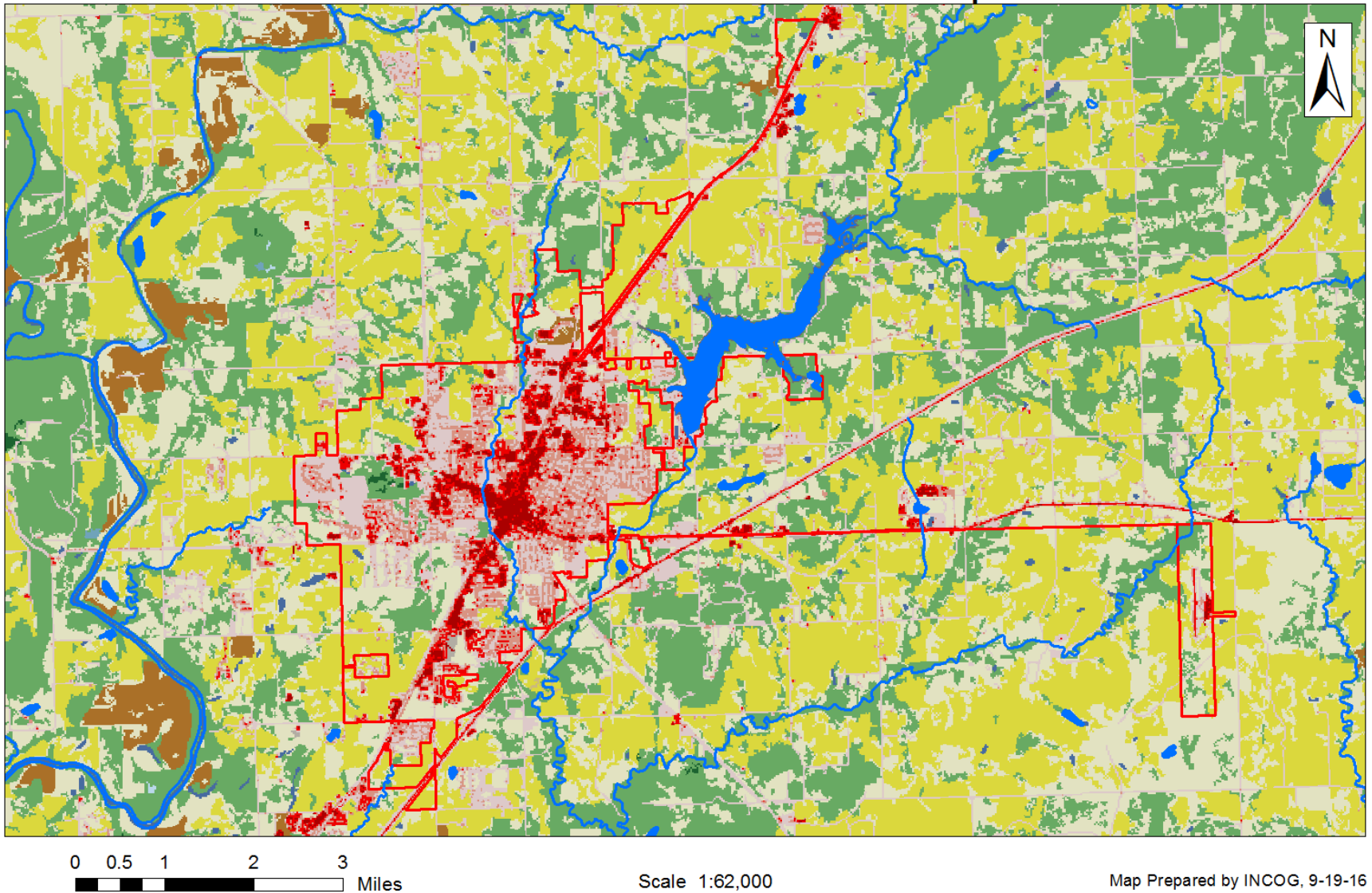
2006 Impervious Cover Map

Claremore MS4 Stormwater Map



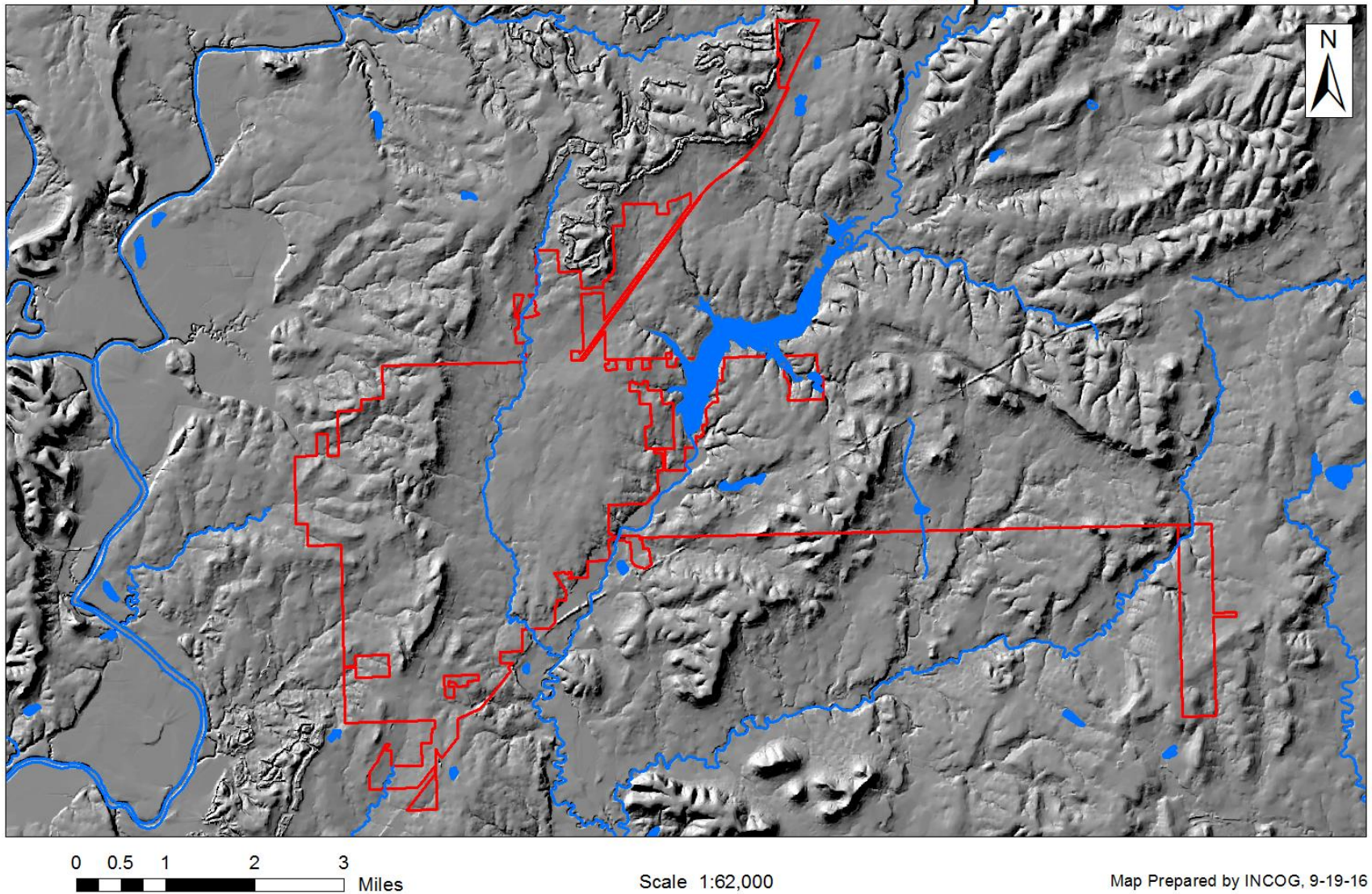
2011 Impervious Cover Map

Claremore MS4 Stormwater Map

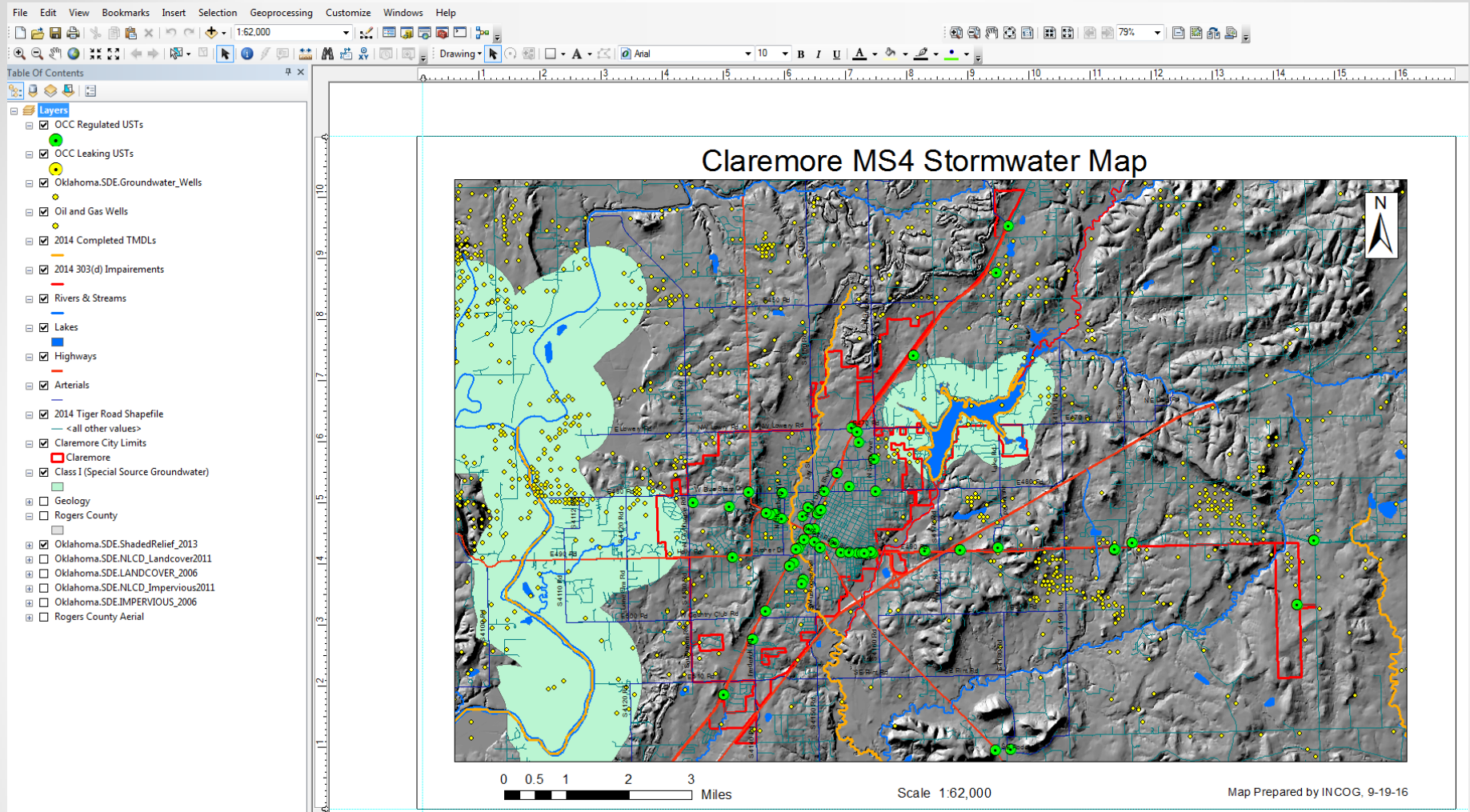


2011 Land Cover: Shows cultivated crops, forest types, pasture/hay, low, medium, high intensity, open space, etc.

Claremore MS4 Stormwater Map



Shaded Relief map shows topography.



Once we have the data layers it is just a matter of deciding how and what we want to display and then formatting the map so it is visually appealing.



Questions?

Claremore Lake, July 2012