IV. WATER QUALITY IN THE ILLINOIS RIVER WATERSHED

28. The IRW in Oklahoma hosts an intricate network of tributaries to the Illinois River, including Sager Creek, Flint Creek, Peacheater Creek, Tyner Creek, Tahlequah Creek and the Baron Fork of the Illinois River. The State of Oklahoma defines impaired waters as those in which "…the water quality standard is not attained. The water body is impaired or threatened for one or more designated uses by a pollutant(s)…" (State of Oklahoma, 2006b). Indicator bacteria levels in each of these tributaries routinely exceed Oklahoma water quality standards, therefore these water bodies have been placed on the State's 303(d) list of impaired waters. This Oklahoma Scenic River is considered to be too polluted by fecal bacteria to support its designated use of primary body contact recreation. Dr. Teaf's Expert Report for this case describes the extent of impairment in the IRW; in summary over 75% of the Illinois River and its major tributaries are listed as impaired by high bacterial levels (Teaf, 2008).

29. The data collected by the State of Oklahoma for water quality assessment includes (but is not limited to) fecal coliform concentrations. Fecal coliforms are used by the State of Oklahoma to evaluate recreational water quality, but are not recommended by the U.S. EPA due to their lack of correlation with human illness in some locations (U.S. Environmental Protection Agency, 1986). However, *E. coli* is recommended for recreational water quality monitoring by the U.S. EPA. A comparison of *E. coli* and fecal coliform concentrations in water samples collected throughout the IRW shows that almost all of the fecal coliforms in these samples are *E. coli* (Figure 1). This relationship confirms the public health significance of elevated fecal coliform concentrations in IRW waters, i.e. they are nearly synonymous with *E. coli* concentrations, which are correlated with the risk of gastroenteritis for recreational water users.

30. Enterococci are responsible for many of the water quality exceedances throughout the IRW (Teaf, 2008). This group of fecal indicator bacteria is recognized as measure of recreational water quality by the U.S. EPA and the State of Oklahoma, and its levels are correlated with the risk of gastroenteritis in recreational water users in fresh and salt water (Teaf, 2008).

31. The State of Oklahoma recognizes the potential impact of poultry operations and other agriculture on water quality. Under the Oklahoma Registered Poultry Feeding Operation Act, it is required that "…there shall be no discharge to waters of the state." (Title 2; Registered Poultry Feeding Operation Act) Management of poultry litter/manure in the IRW is by land application, which is considered a passive waste management approach that can impact