

**IOWA DEPARTMENT OF
NATURAL RESOURCES**

**AGREEMENT 2006-7158-01
WITH
DES MOINES WATER WORKS**

**Report on 1st Quarter Data for the
Raccoon and Des Moines Rivers**



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I. Overview

The Des Moines and Raccoon Rivers, and shallow groundwater wells influenced by the Raccoon River, are the water sources for the Des Moines Water Works. Nitrate and bacteria are monitored regularly in samples obtained from each of the source water intakes. The Raccoon Intake is located in Water Works Park near Fleur Drive; the Des Moines intake is located near the intersection of ML King and Hickman Ave. This report is a summary of first quarter 2006 data.

II. *E. coli* bacteria

E. coli levels in both rivers during the first quarter were pleasantly low and well below the long term averages of 216 colonies/100 ml (Raccoon) and 50 colonies/100 ml (Des Moines). Figures 1 and 2 below shows first quarter *E. coli* values for each river. The Raccoon exceeded the safe contact threshold of 200 colonies/100ml on only three days while the Des Moines River never exceeded that number. Quarterly averages for 2006 were 35 for the Raccoon and 12 for the Des Moines.

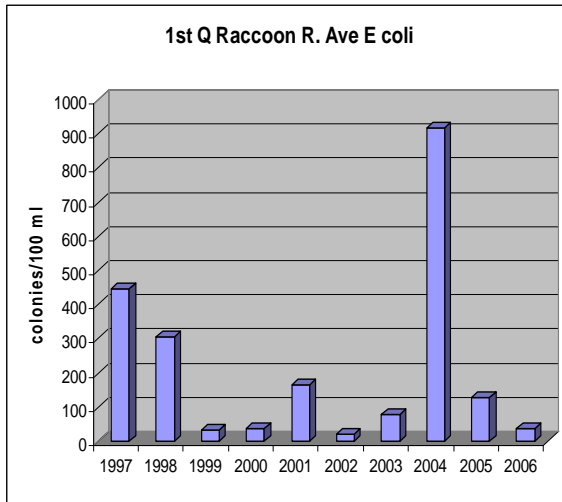


Figure 1

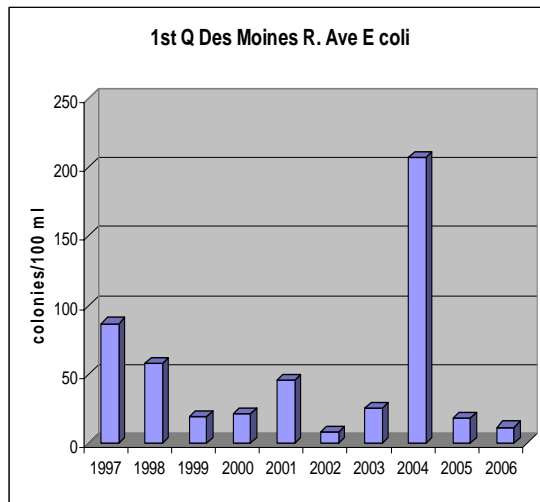


Figure 2

III. Nitrate

The real story of the first quarter has been the enormously high nitrate concentration and load in the Des Moines River, perhaps the highest ever seen in that stream for the first quarter. The average nitrate concentration and load were both nearly double the historical average, and no other first quarter in the last decade comes close to matching the load values. The nitrogen load in the Des Moines River was nearly 8 times

that seen in the Raccoon for the first quarter; prior to 2006, Des Moines River first quarter loads averaged only about 18% higher than those seen in the Raccoon. Nitrate levels exceeded 10 mg/L on 44 days, with the peak concentration of 14.2 observed on February 16. This was one of the highest February nitrate levels ever observed by the Des Moines Water Works, and because ice conditions prevented use of the Raccoon River, it resulted in the first-ever February operation of the nitrate removal facility. Figures 3 and 4 below depict first quarter nitrate concentrations and loads in the Des Moines River since 1996.

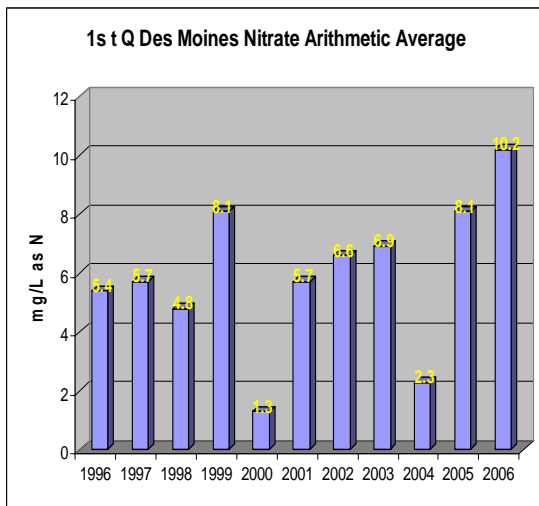


Figure 3

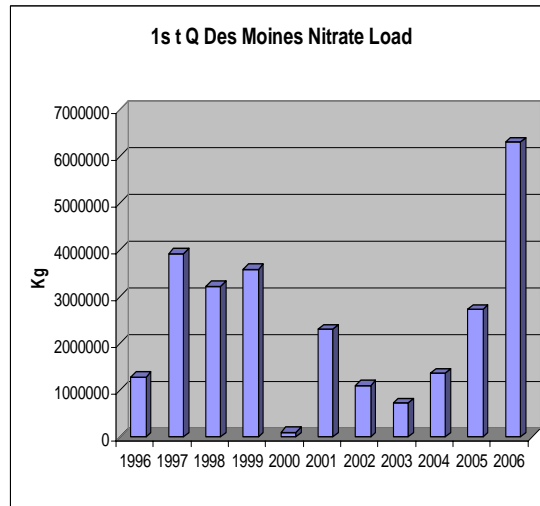


Figure 4

First Quarter Raccoon River nitrate concentrations ran about 20% higher than historical averages, although the loads were only about 1/2 of 1996-2005 average, and as mentioned earlier, only 1/8 of that seen in the Des Moines River. This load disparity between the two rivers likely reflected flow conditions in both—below normal in the Raccoon and near-to-well-above-normal in the Des Moines. The Raccoon River exceeded 10 mg/L on six days, peaking at 10.3 on March 21 and 22. Figures 5 and 6 on the next page depict first quarter nitrate levels in the Raccoon River compared to those seen during the first quarter from 1996-2005.

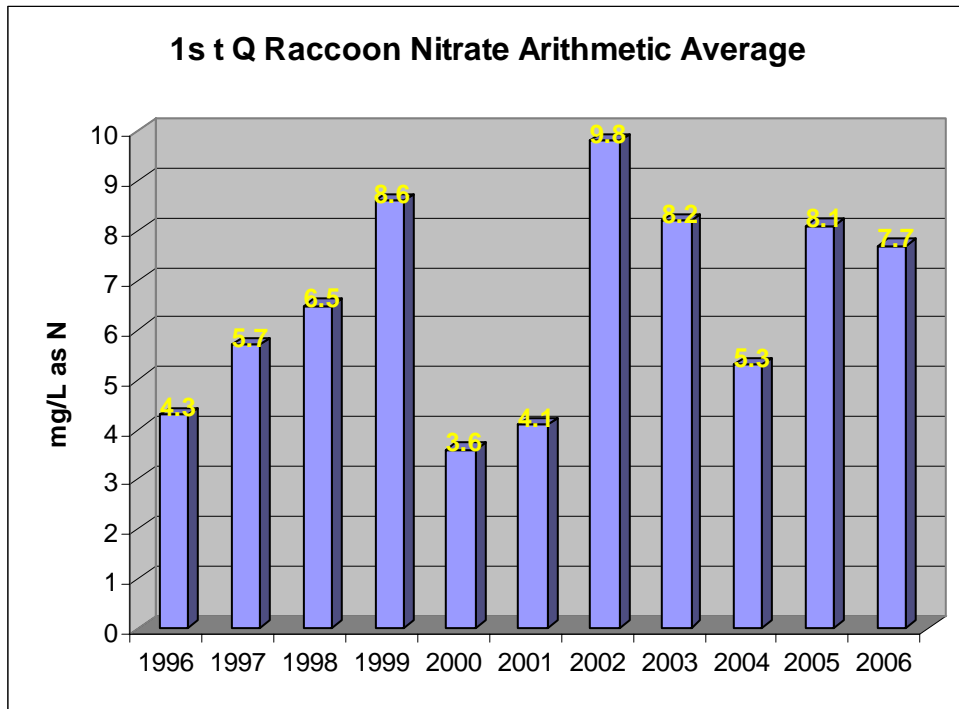


Figure 5

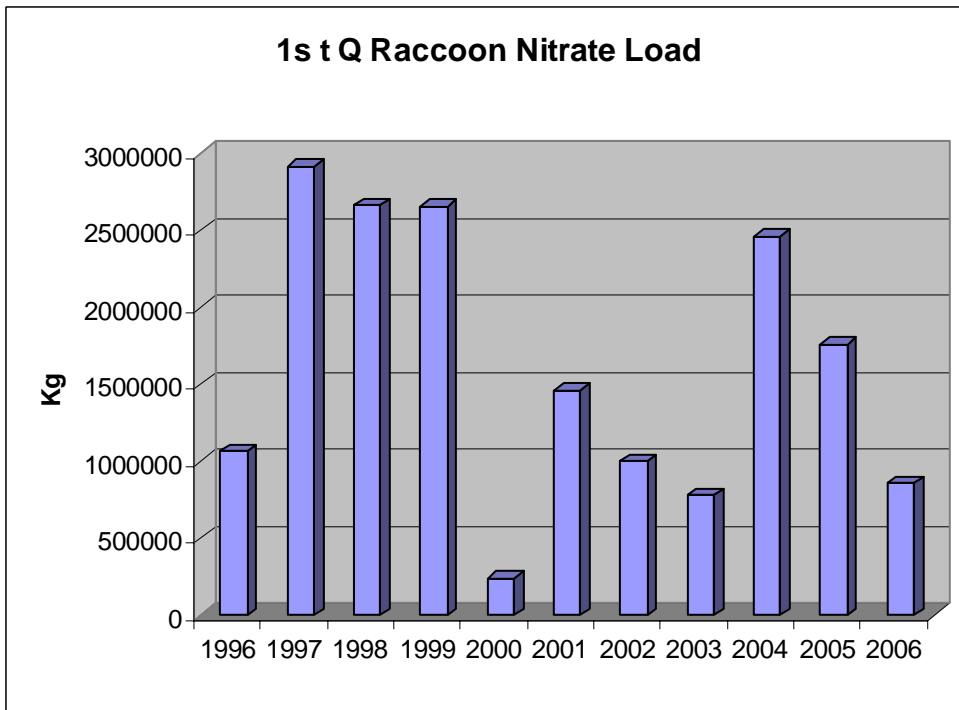


Figure 6