## Results

### Soil Analyses

In total eighteen eroding bank sediment cores, and eighteen channel deposit sample were obtained for analysis and were assessed to determine their TP content and bulk density. All confidence intervals for soil analyses are reported in terms of standard error. According to an ANOVA test, both sets of samples did show significant variation in TP content by stream order. For erosional samples, first order samples had the lowest mean TP content (245 ± 20 mg/kg), and fourth order samples had the highest concentration (587 ± 66 mg/kg). In general eroding bank TP content increased from first to fourth order, then decreased from fourth to six. Both fifth and sixth order cores had TP that was less than third order, but greater than second order. Depositional samples generally decreased in TP content from first (505 ± 72 mg/kg) to sixth order (235 ± 40) channels. There was no significant difference in TP content between erosional and depositional samples, but depositional samples had higher TP content in first and second order samples, and lower TP content in all other orders.

There was a however a significant difference in bulk density between erosional and depositional samples. On average, erosional samples were 3.5 times denser. While this is a large difference, this is not unsurprising since the erosional samples are made of Holocene alluvial and glacial materials that have undergone a high degree of compaction, and the deposition samples represent relatively young, freshly eroded sediments that have not experienced any significant compaction since their deposition. Variations in bulk density by stream order were also significant for both sample types. For erosional samples, the highest average was bulk density was in first and sixth orders (1.29 ± 0.3 and 1.30 ± 0.4 g/cm3 respectively), and the lowest average bulk density was found in the fourth order (1.15 ± 0.3 g/cm3). The in peak TP content and a low point in bulk density average within the fourth order erosion samples is an interesting result of this data that bears further analysis. The depositional samples displayed a steady increase in average bulk density with increasing stream order from first (0.26 ± 0.02 g/cm3) to fifth (0.40 ± 0.1) order, but slightly decreased from fifth to sixth order.

The large difference in average bulk density between erosional and deposition is an important component of the Nishnabotna river system that greatly diminishes the magnitude of depositional values when total loads are discussed in terms of weight instead of volume.