



## **PRAIRIE PROVINCES WATER BOARD**

Report #179

### **Appendices E, Part 2 (SK-MB Boundary) Long-Term Trends in Water Quality Parameters At Twelve Transboundary River Reaches (From the beginning of the data record until the end of 2013)**

Prepared for the Prairie Provinces Water Board  
By the Committee on Water Quality

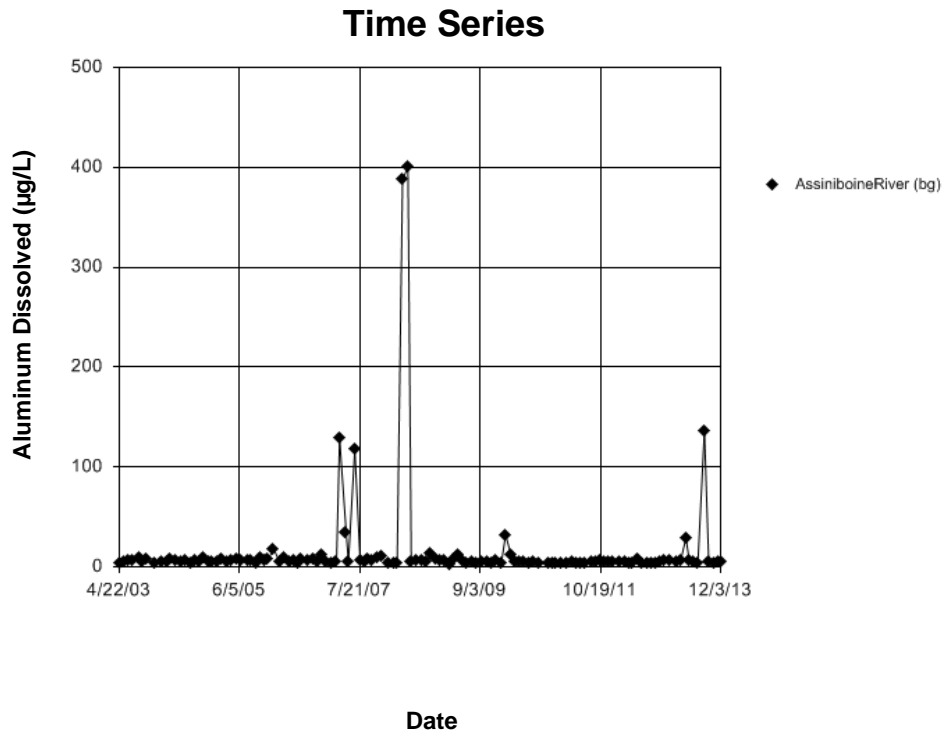
March 2018



**Appendix E: Metals Trending Graphs Part 2**  
**Saskatchewan/Manitoba Border**







**Figure E709 Assiniboine River: Aluminum Dissolved**



**Figure E710 Assiniboine River: Aluminum Dissolved**

## Sen's Slope Estimator

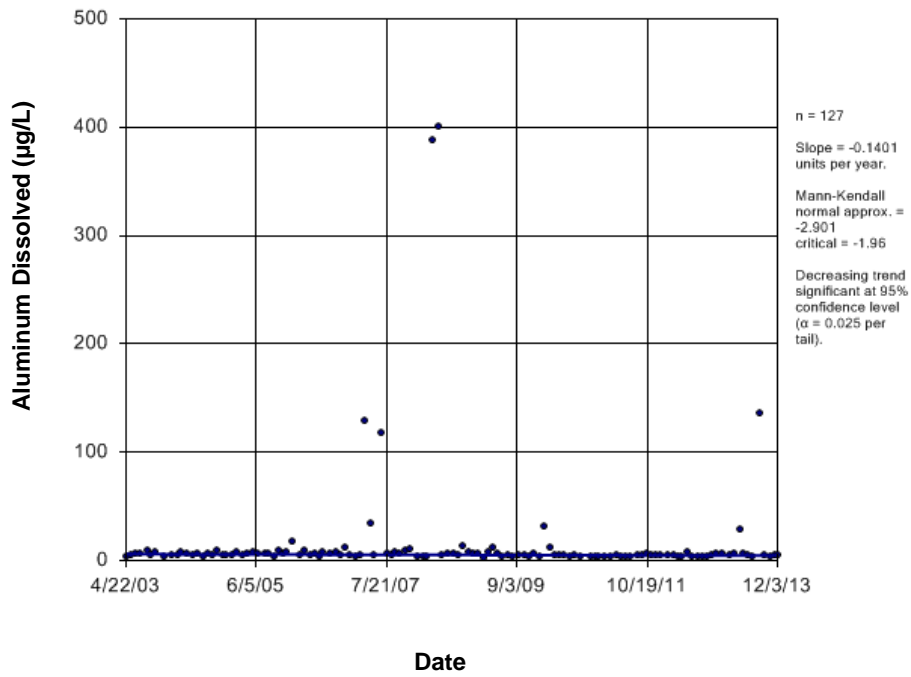


Figure E711 Assiniboine River: Aluminum Dissolved

## Time Series

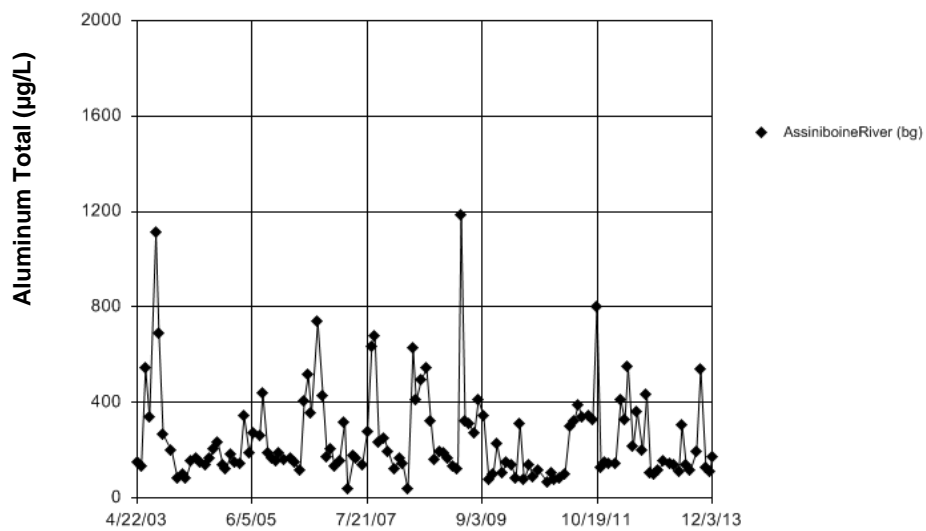
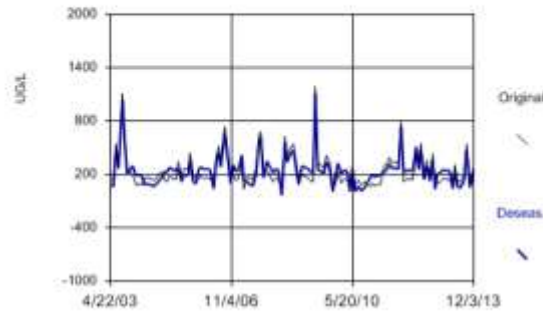


Figure E712 Assiniboine River: Aluminum Total

# Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 29.69  
 Calculated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

Aluminum Total (µg/L)

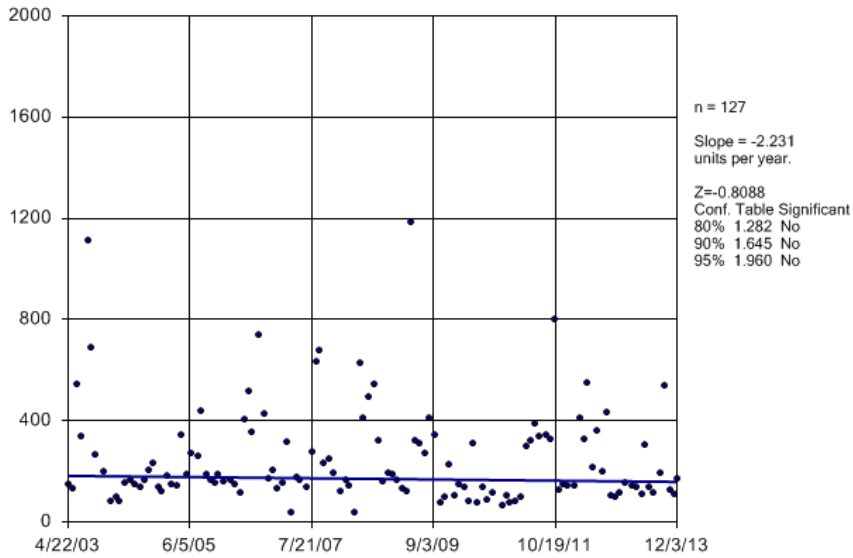


Date

Figure E713 Assiniboine River: Aluminum Total

# Seasonal Kendall

Aluminum Total (µg/L)



## Time Series

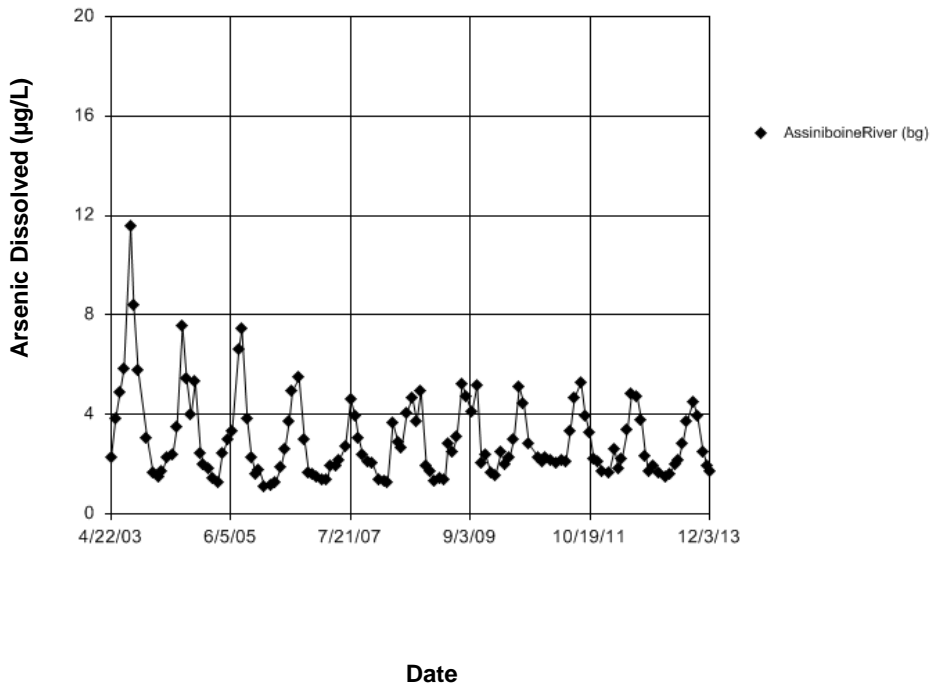


Figure E715 Assiniboine River: Arsenic Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 71.64. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal. Kruskal-Wallis statistic (H) = 71.64. Adjusted Kruskal-Wallis statistic (H') = 71.64.

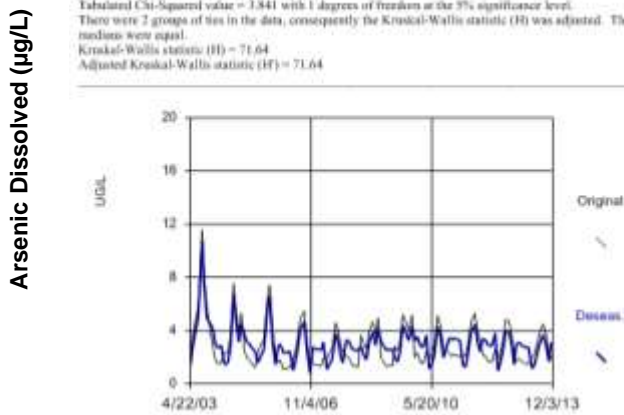


Figure E716 Assiniboine River: Arsenic Dissolved

### Seasonal Kendall

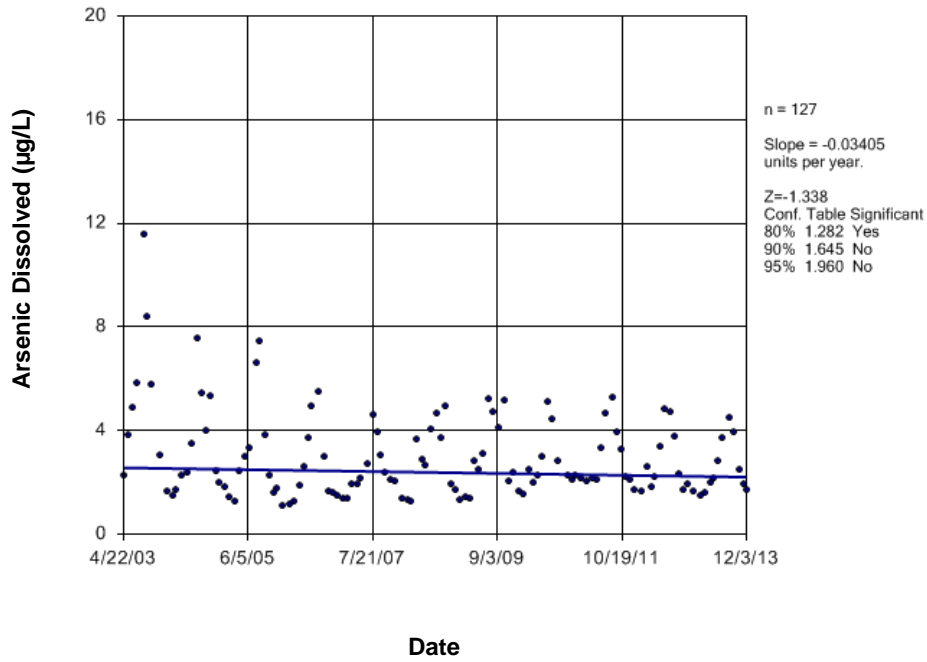


Figure E717 Assiniboine River: Arsenic Dissolved

### Time Series

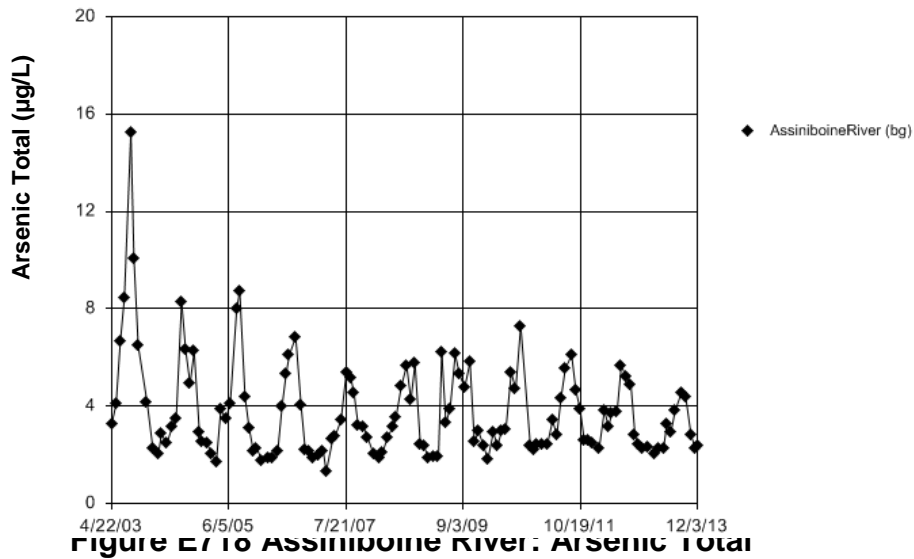
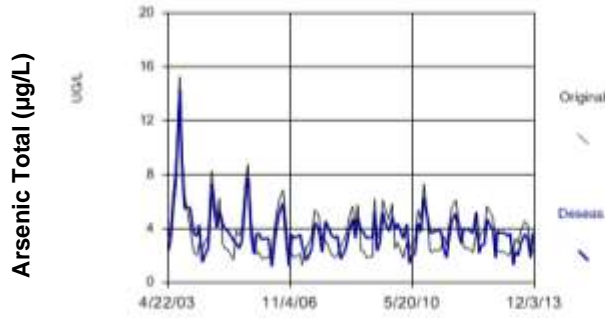


Figure E718 Assiniboine River: Arsenic Total

# Seasonality

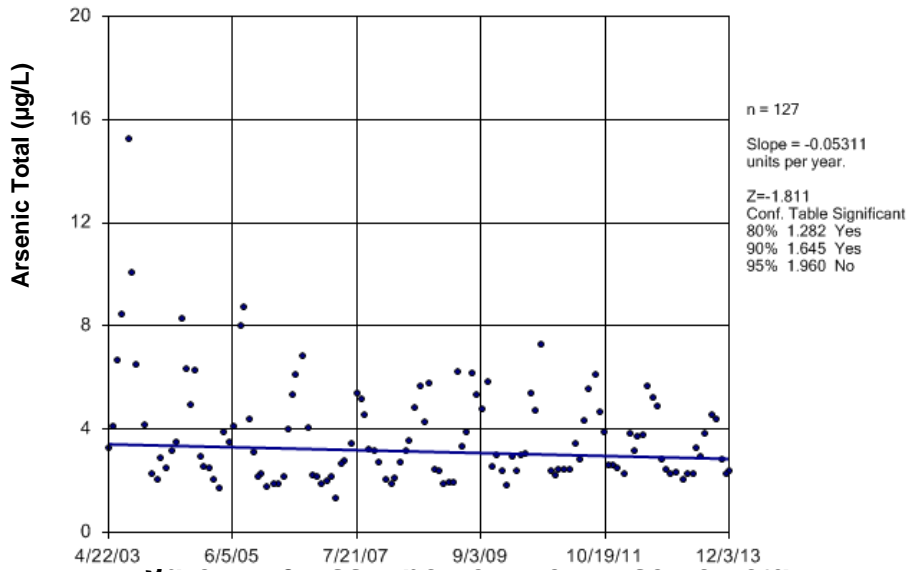
For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 71.97  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 71.97  
 Adjusted Kruskal-Wallis statistic (H') = 71.97



Date

Figure E719 Assiniboine River: Arsenic Total

# Seasonal Kendall



## Time Series

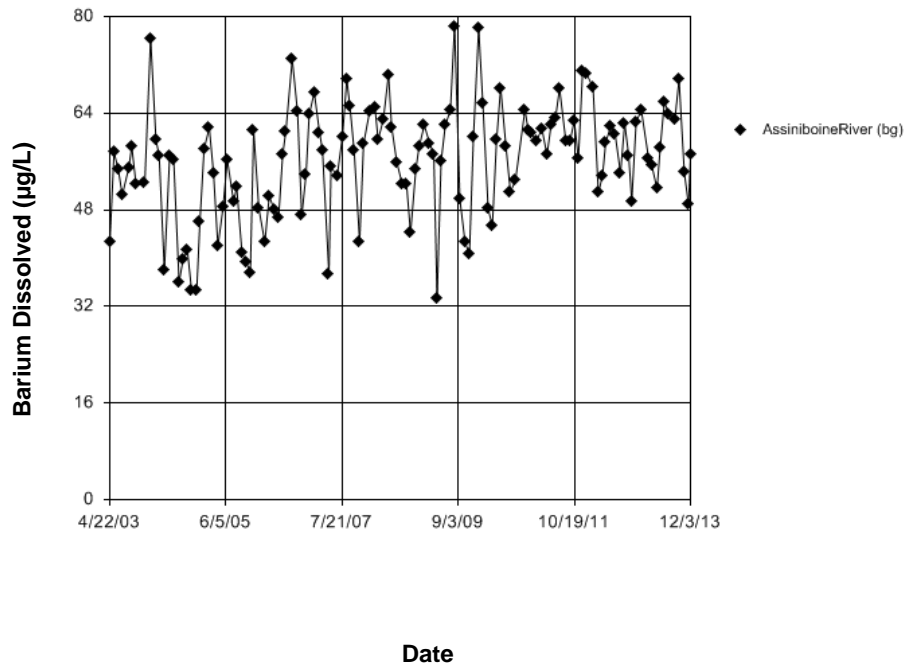


Figure E721 Assiniboine River: Barium Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 2.184. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H<sub>adj</sub>) was utilized to determine if the medians were equal. Kruskal-Wallis statistic (H) = 2.184. Adjusted Kruskal-Wallis statistic (H<sub>adj</sub>) = 2.184.

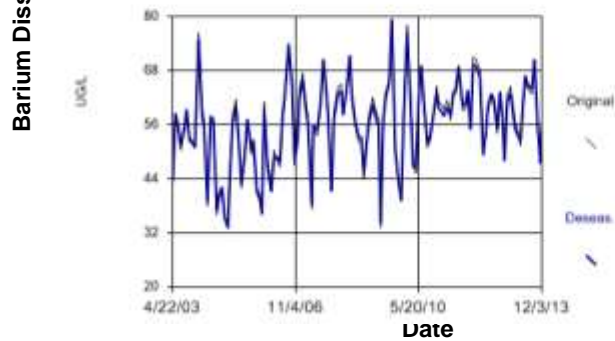


Figure E722 Assiniboine River: Barium Dissolved

## Sen's Slope Estimator

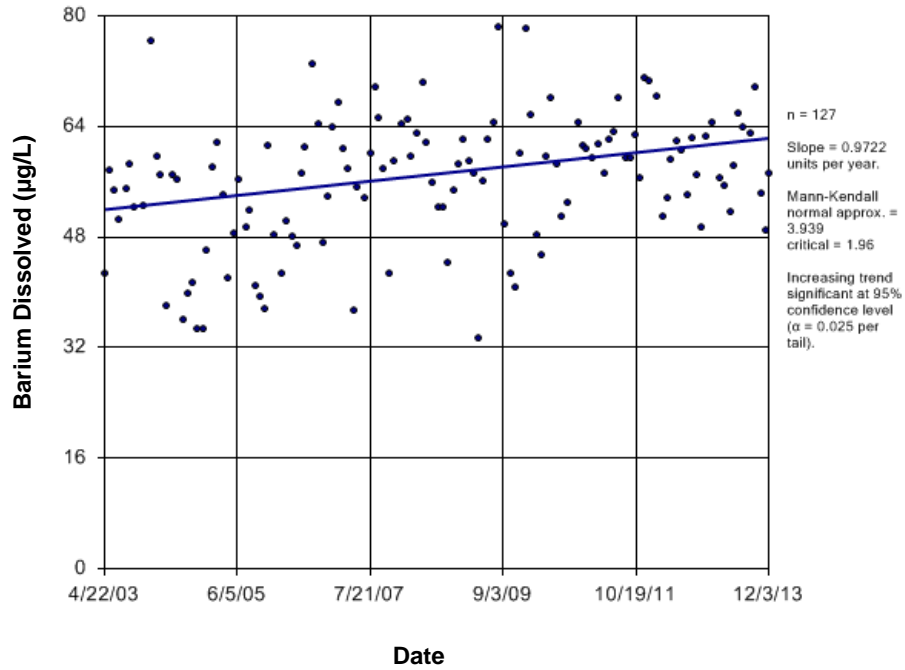


Figure E723 Assiniboine River: Barium Dissolved

## Time Series

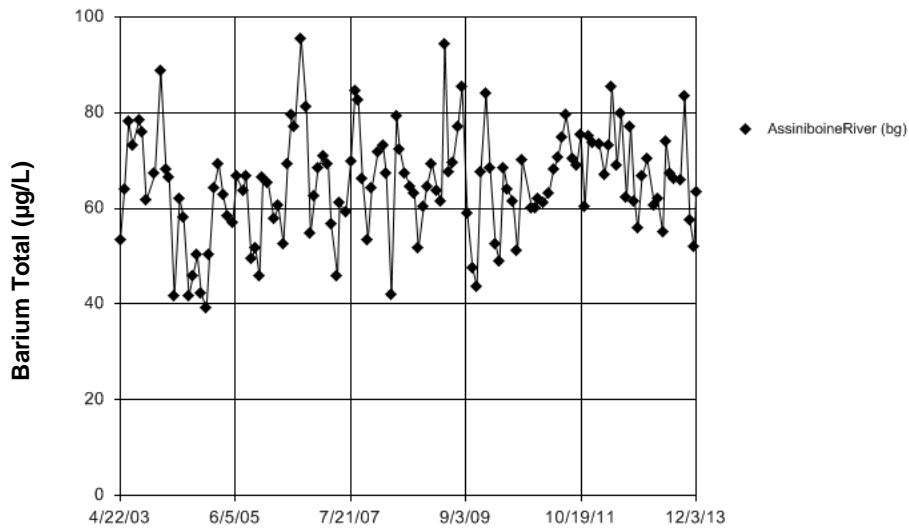


Figure E724 Assiniboine River: Barium Total



## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-Squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 1.393  
 Tabulated Chi-Squared value = 3.841 with 4 degrees of freedom at the 5% significance level.  
 There were 4 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 1.393  
 Adjusted Kruskal-Wallis statistic (H') = 1.393

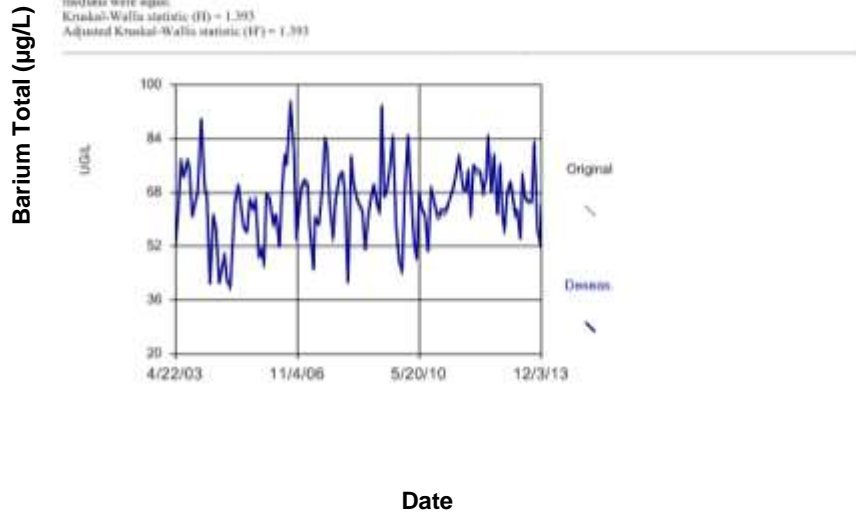


Figure E725 Assiniboine River: Barium Total

## Sen's Slope Estimator

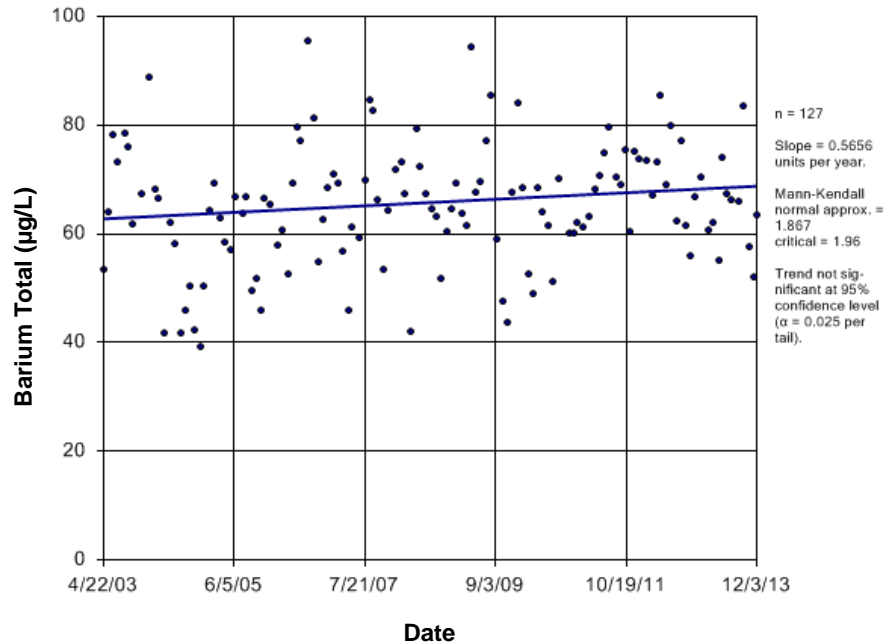


Figure E726 Assiniboine River: Barium Total

## Time Series

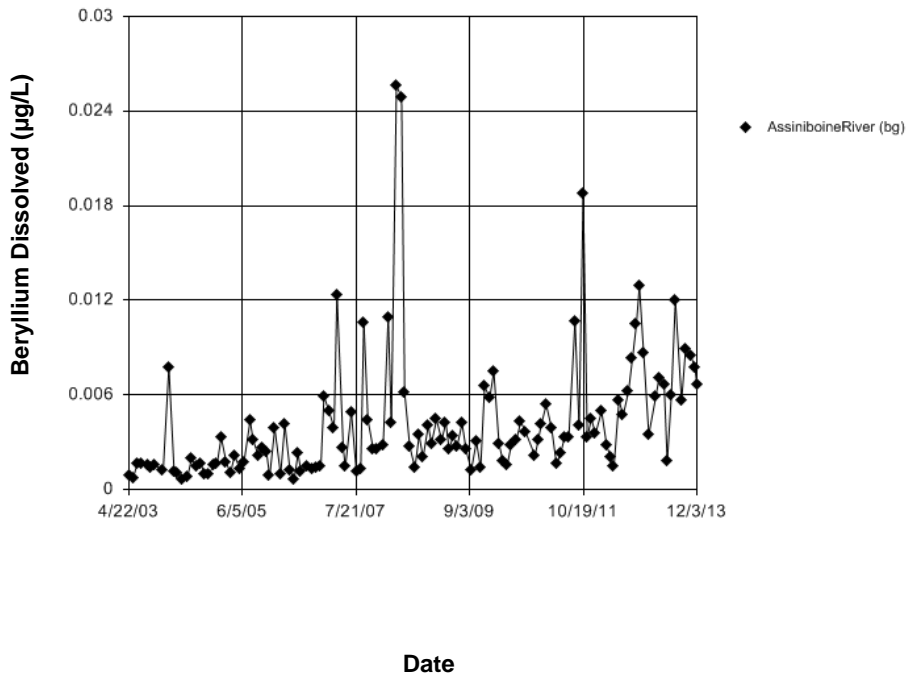


Figure E727 Assiniboine River: Beryllium Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 4.493  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H\*) was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 4.493  
 Adjusted Kruskal-Wallis statistic (H\*) = 4.493

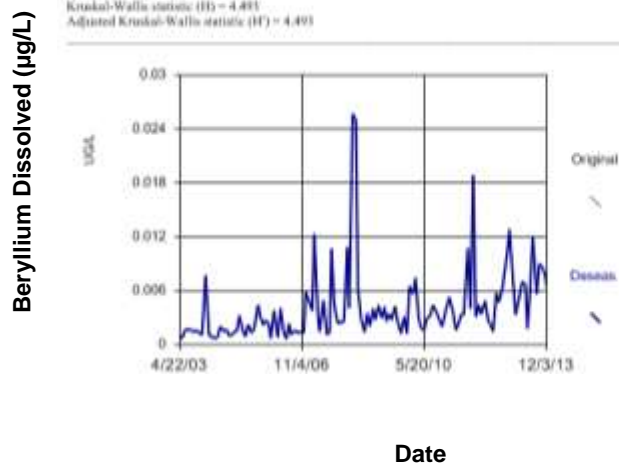


Figure E728 Assiniboine River: Beryllium Dissolved

## Seasonal Kendall

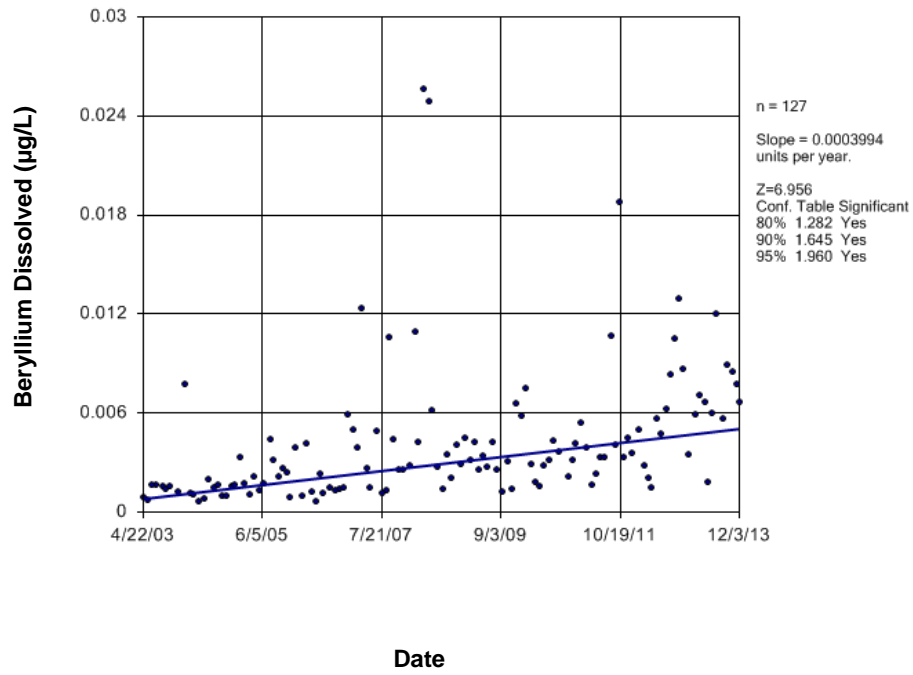


Figure E729 Assiniboine River: Beryllium Dissolved

## Time Series

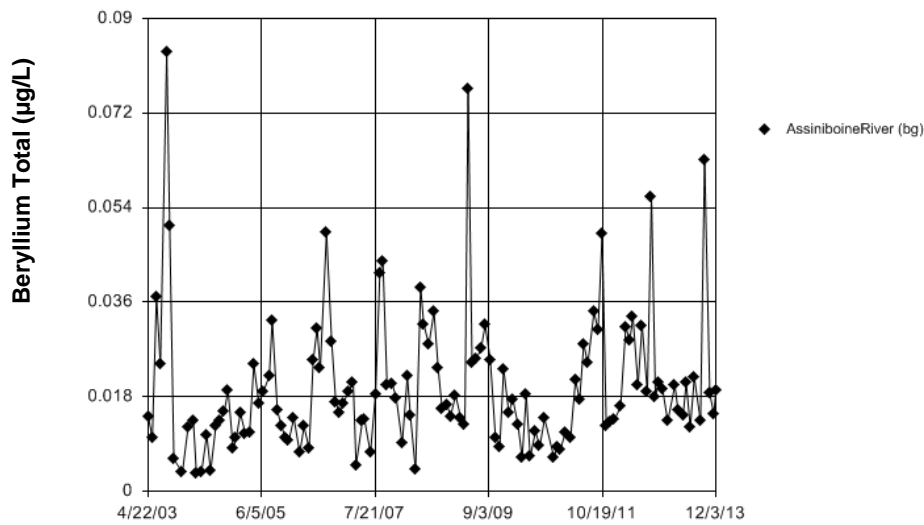


Figure E730 Assiniboine River: Beryllium Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 19.7  
 Tabulated Chi-squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 19.7  
 Adjusted Kruskal-Wallis statistic (H') = 19.7

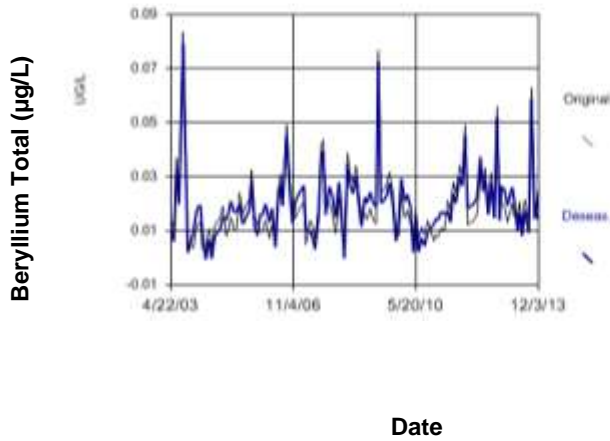


Figure E731 Assiniboine River: Beryllium Total

## Seasonal Kendall

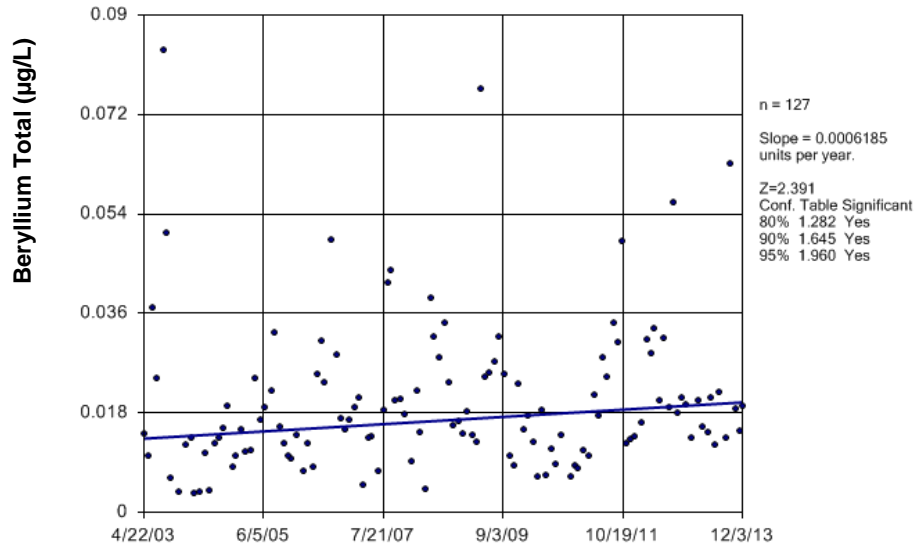
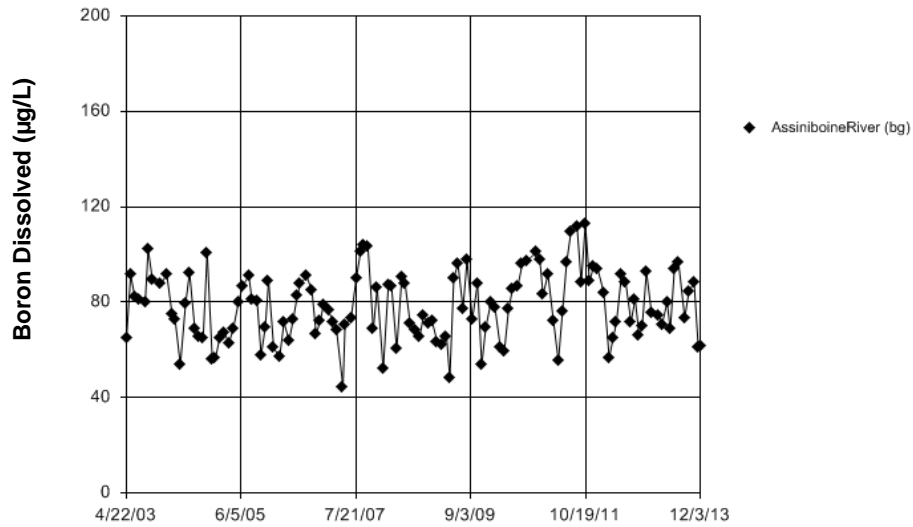


Figure E732 Assiniboine River: Beryllium Total

## Time Series

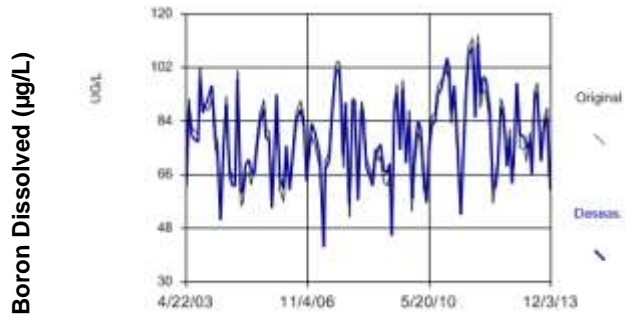


Date

**Figure E733 Assiniboine River: Boron Dissolved**

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 7.317  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H\*) was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 7.317  
 Adjusted Kruskal-Wallis statistic (H\*) = 7.317



Date

**Figure E734 Assiniboine River: Boron Dissolved**

### Seasonal Kendall

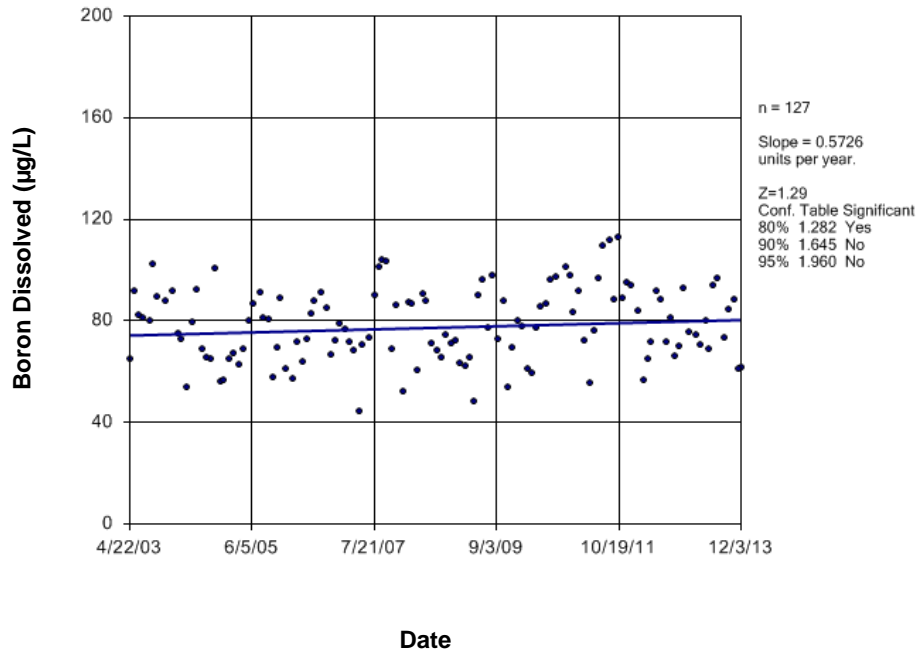


Figure E735 Assiniboine River: Boron Dissolved

### Time Series

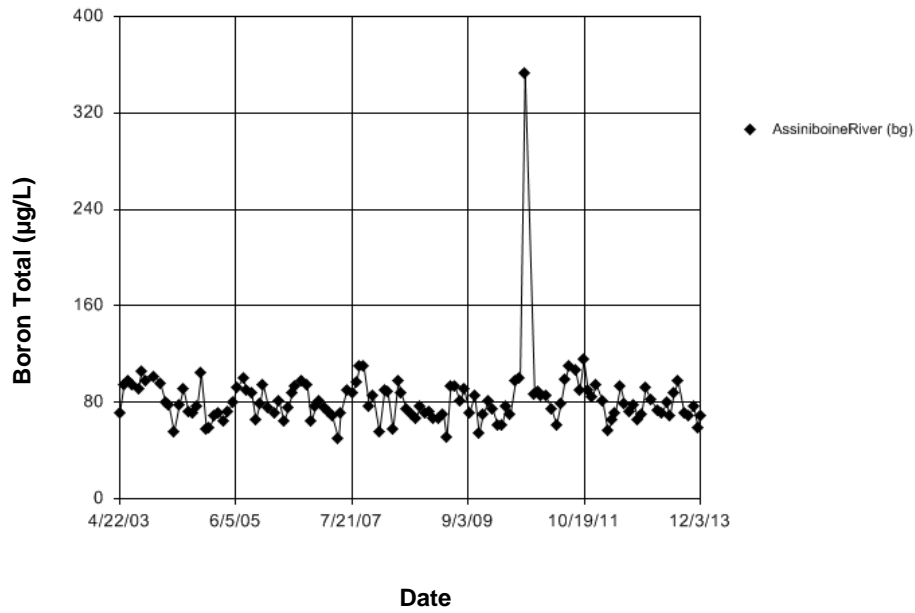


Figure E736 Assiniboine River: Boron Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 6.871  
Tabulated Chi-Squared value = 3.841 with 3 degrees of freedom at the 5% significance level.  
There were 4 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

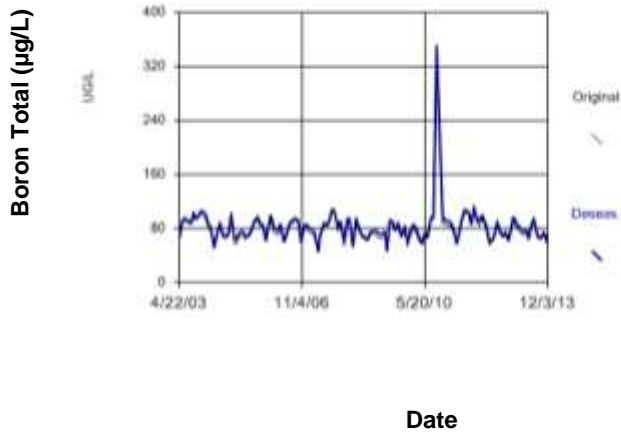


Figure E737 Assiniboine River: Boron Total

## Seasonal Kendall

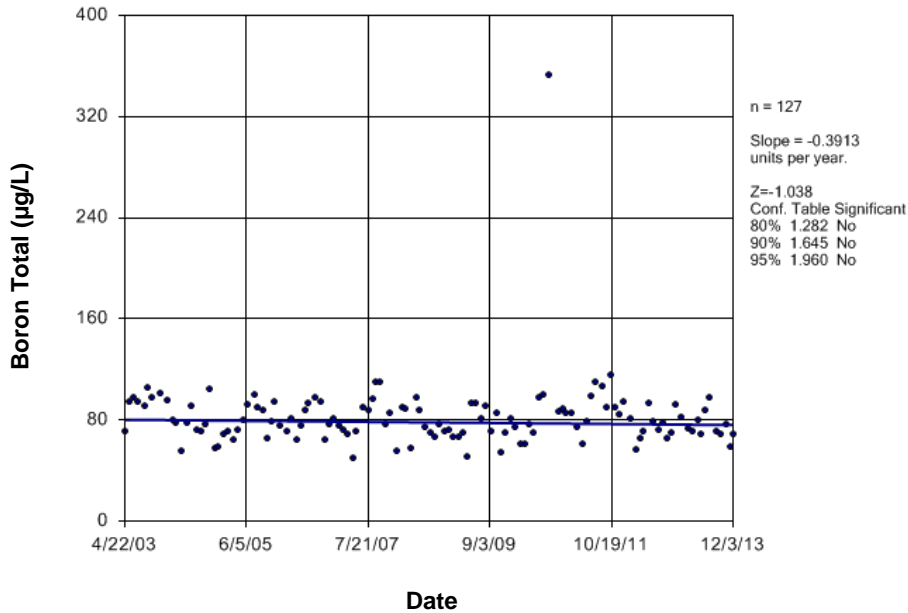


Figure E738 Assiniboine River: Boron Total

## Time Series

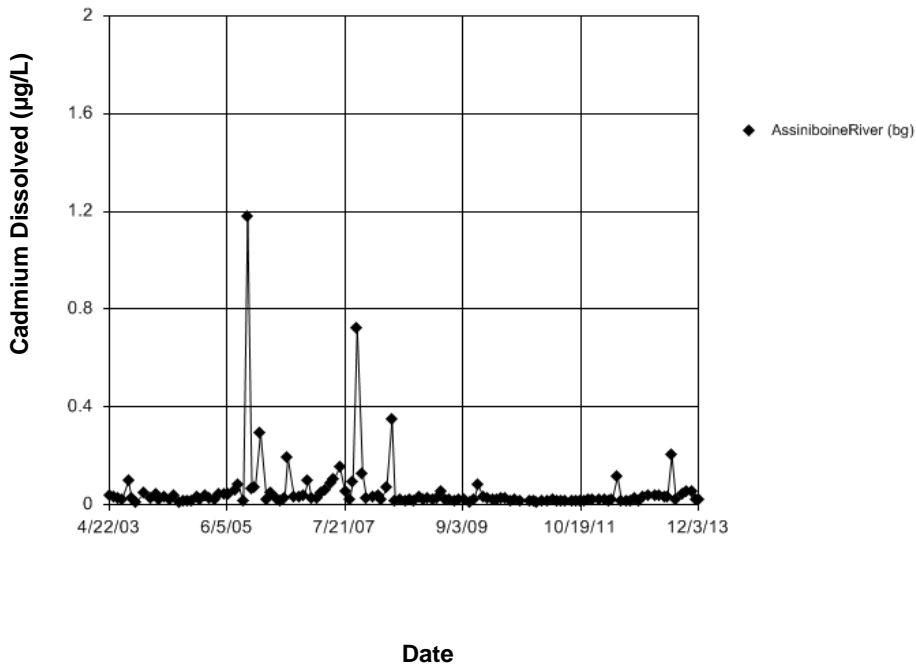


Figure E739 Assiniboine River: Cadmium Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.2667  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 5 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 0.2667  
 Adjusted Kruskal-Wallis statistic (H') = 0.2667

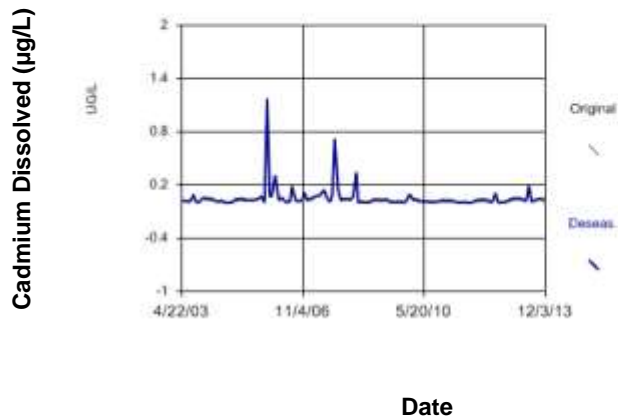


Figure E740 Assiniboine River: Cadmium Dissolved



### Sen's Slope Estimator

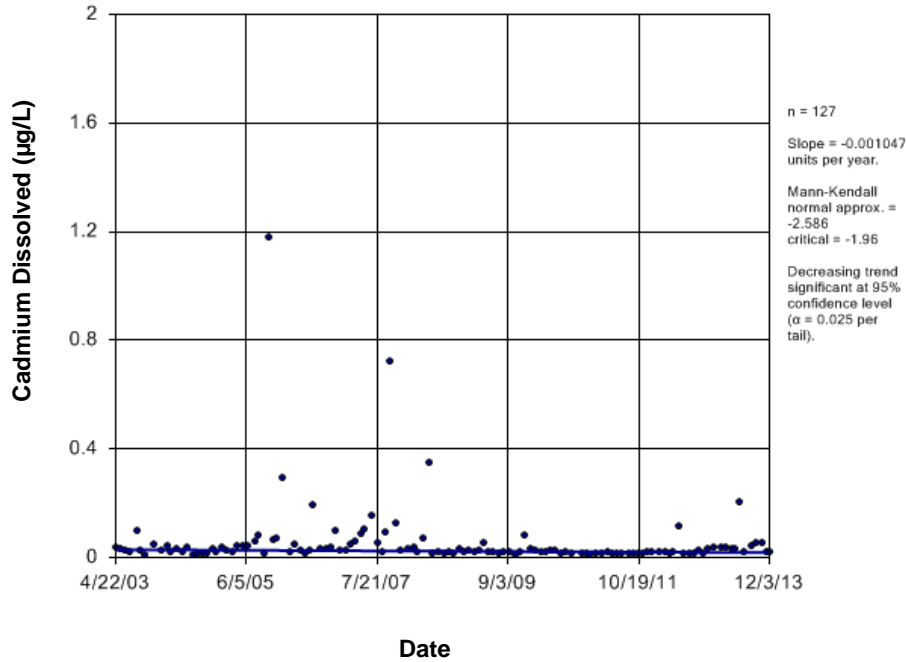


Figure E741 Assiniboine River: Cadmium Dissolved

### Time Series

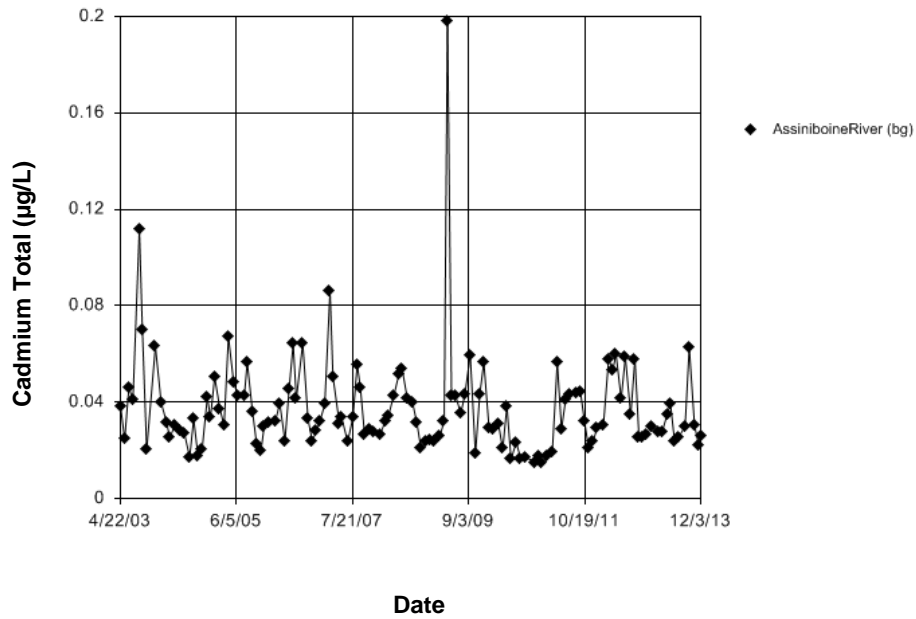


Figure E742 Assiniboine River: Cadmium Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates **SEASONALITY** at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 7.304. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 7 groups of data in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal. Kruskal-Wallis statistic (H) = 7.301. Adjusted Kruskal-Wallis statistic (H') = 7.304.

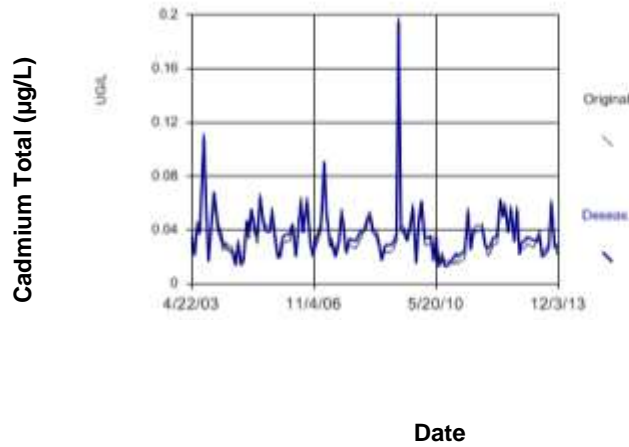


Figure E743 Assiniboine River: Cadmium Total

## Seasonal Kendall

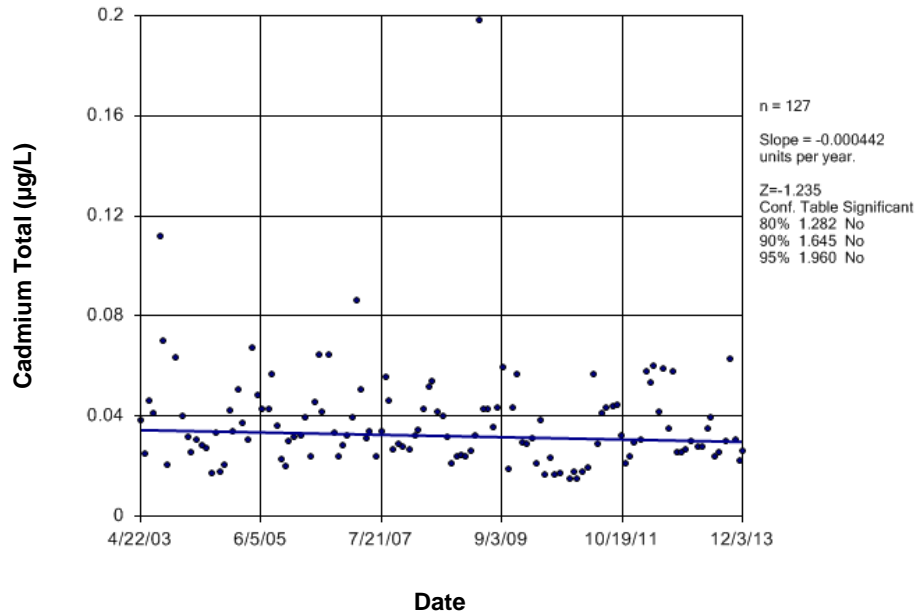
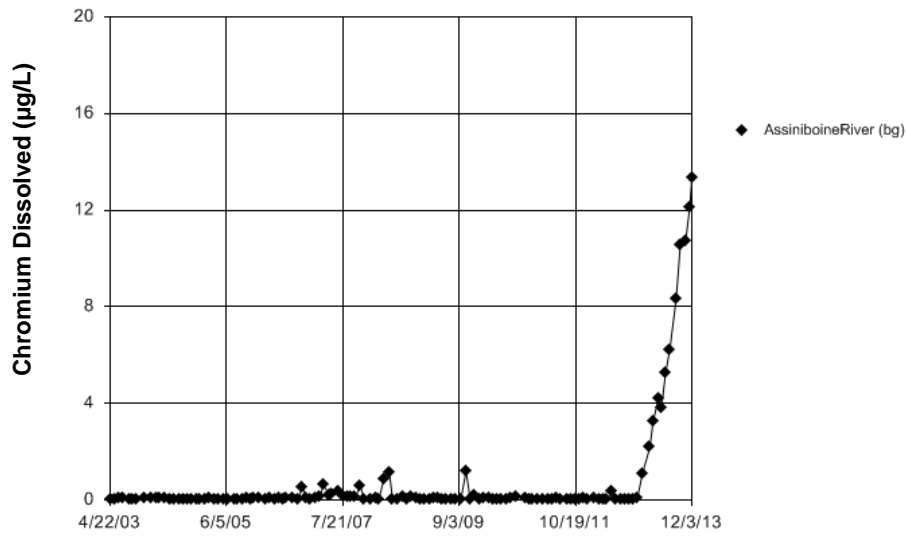


Figure E744 Assiniboine River: Cadmium Total

## Time Series

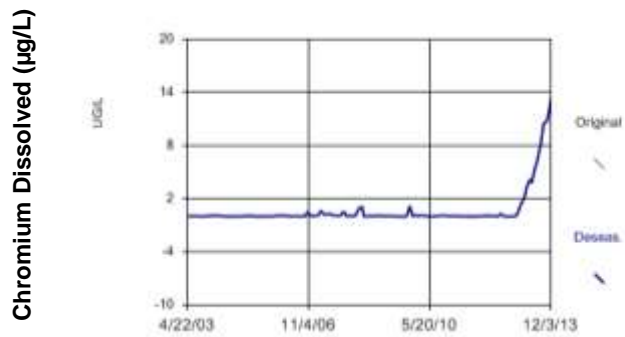


Date

Figure E745 Assiniboine River: Chromium Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.4609. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 3 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (0) was necessary.



Date

Figure E746 Assiniboine River: Chromium Dissolved

## Sen's Slope Estimator

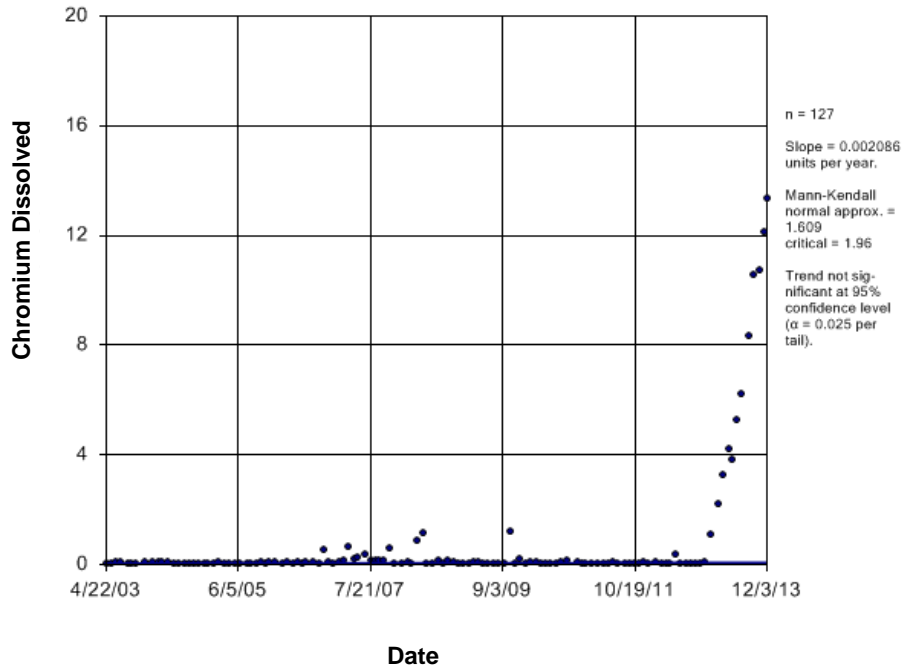


Figure E747 Assiniboine River: Chromium Dissolved

## Time Series

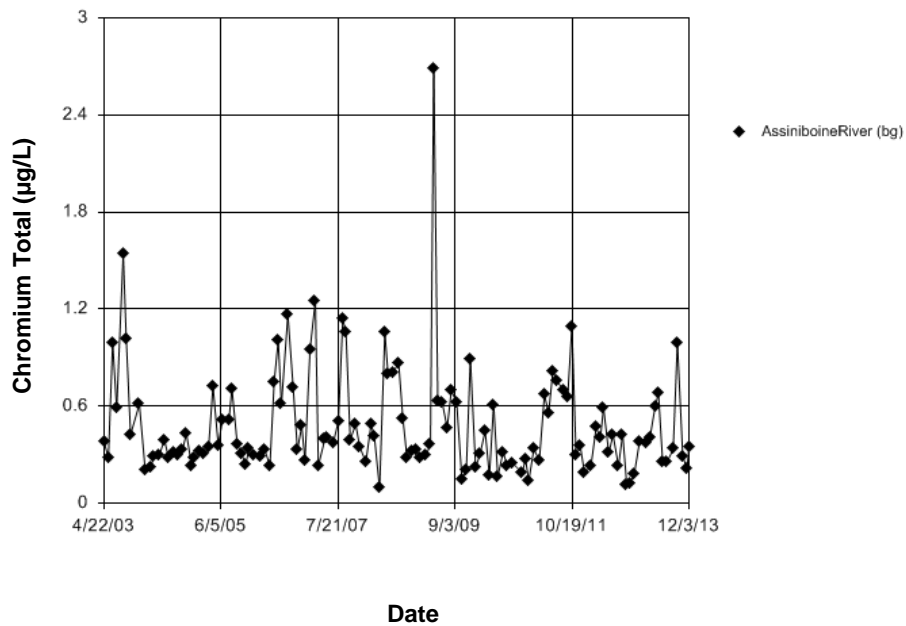


Figure E748 Assiniboine River: Chromium Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 18.27  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 9 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

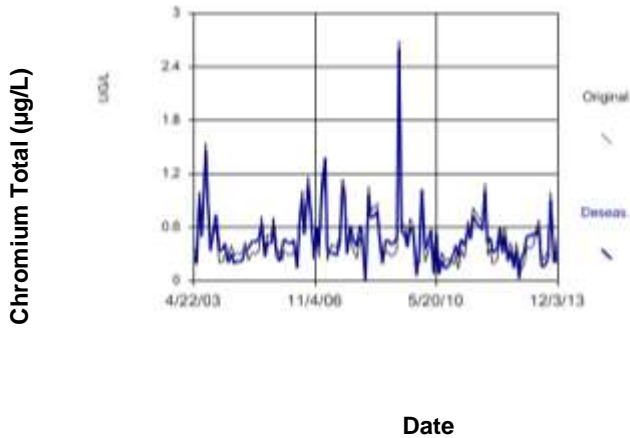


Figure E749 Assiniboine River: Chromium Total

## Seasonal Kendall

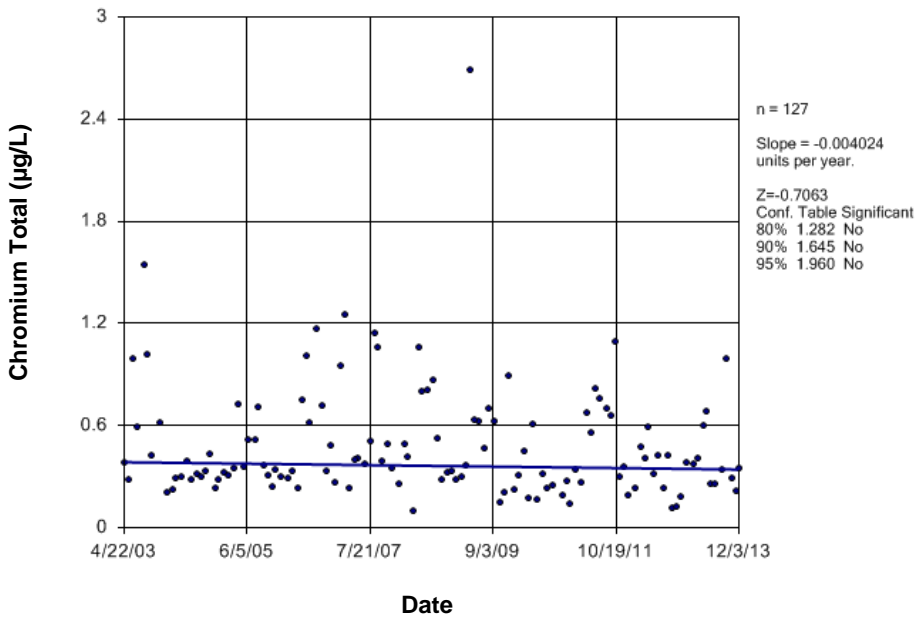


Figure E750 Assiniboine River: Chromium Total

## Time Series

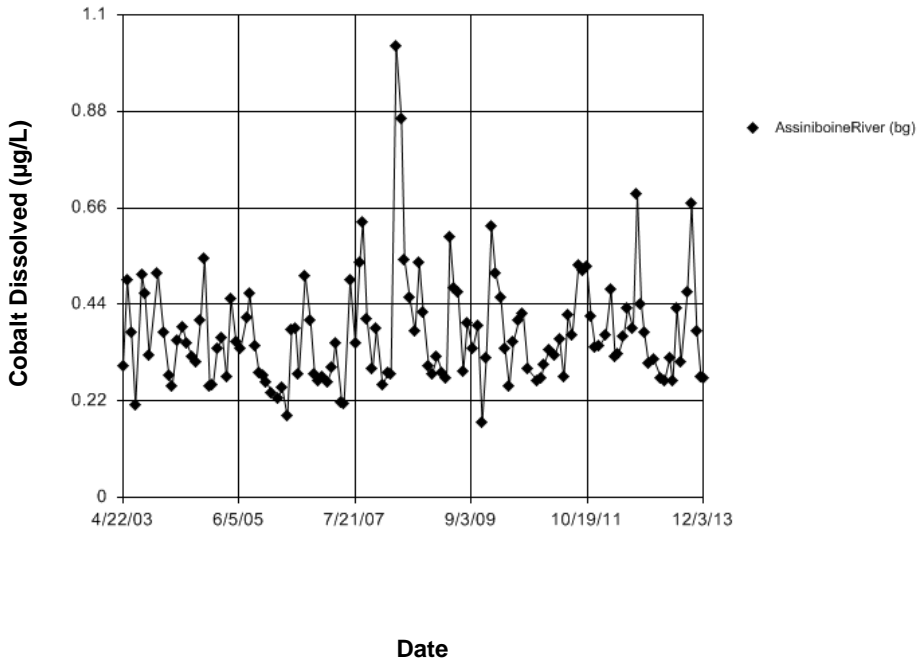


Figure E751 Assiniboine River: Cobalt Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.  
 Calculated Kruskal-Wallis statistic = 25.74  
 Tabulated Chi-squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 25.74  
 Adjusted Kruskal-Wallis statistic (H') = 25.74

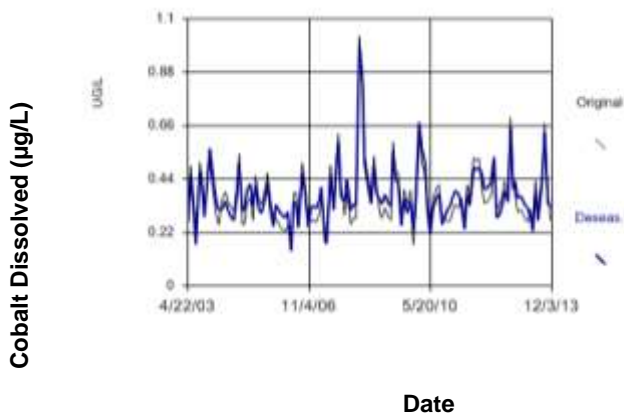


Figure E752 Assiniboine River: Cobalt Dissolved

### Seasonal Kendall

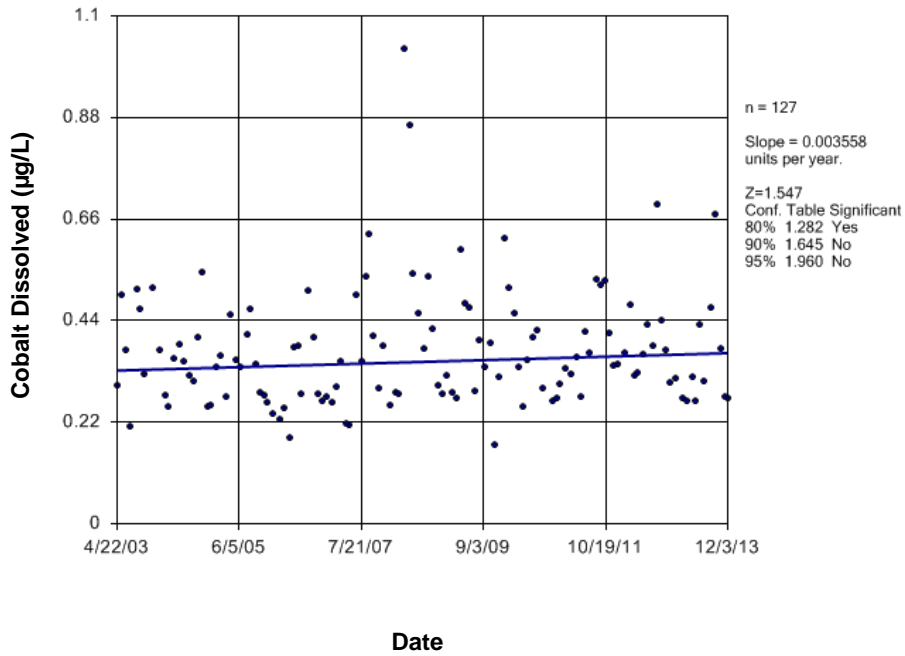


Figure E753 Assiniboine River: Cobalt Dissolved

### Time Series

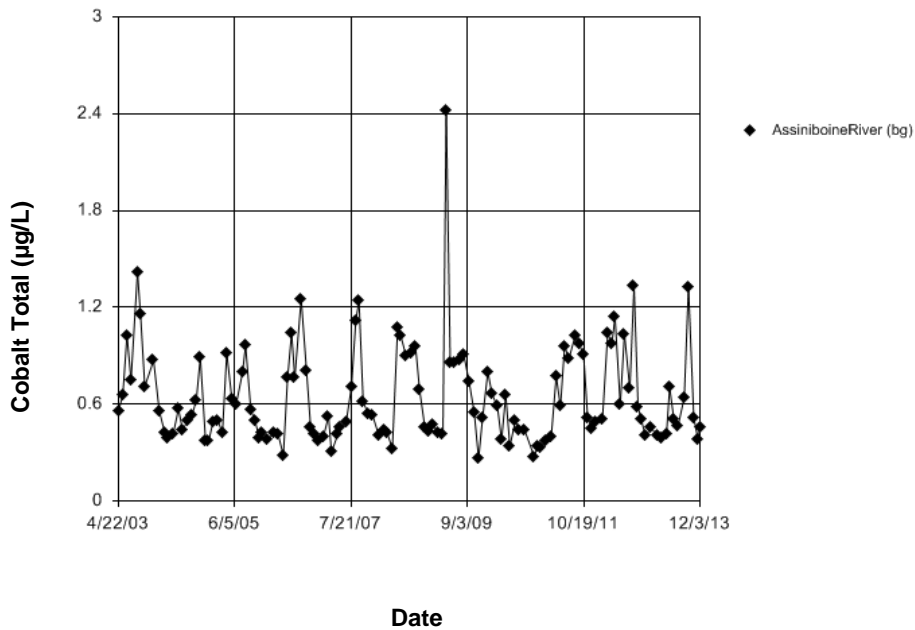


Figure E754 Assiniboine River: Cobalt Total

# Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 43.24  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 43.24  
 Adjusted Kruskal-Wallis statistic (H') = 43.24

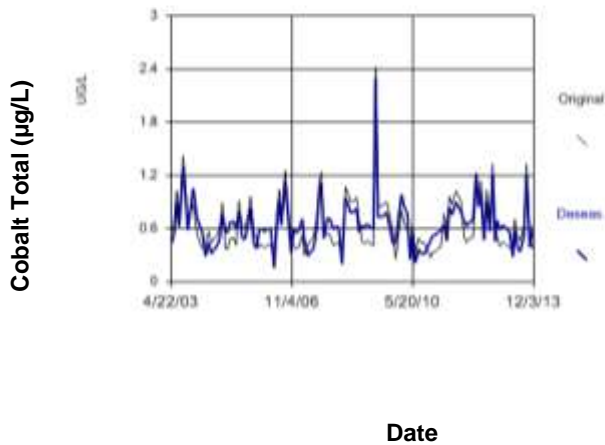


Figure E755 Assiniboine River: Cobalt Total

# Seasonal Kendall

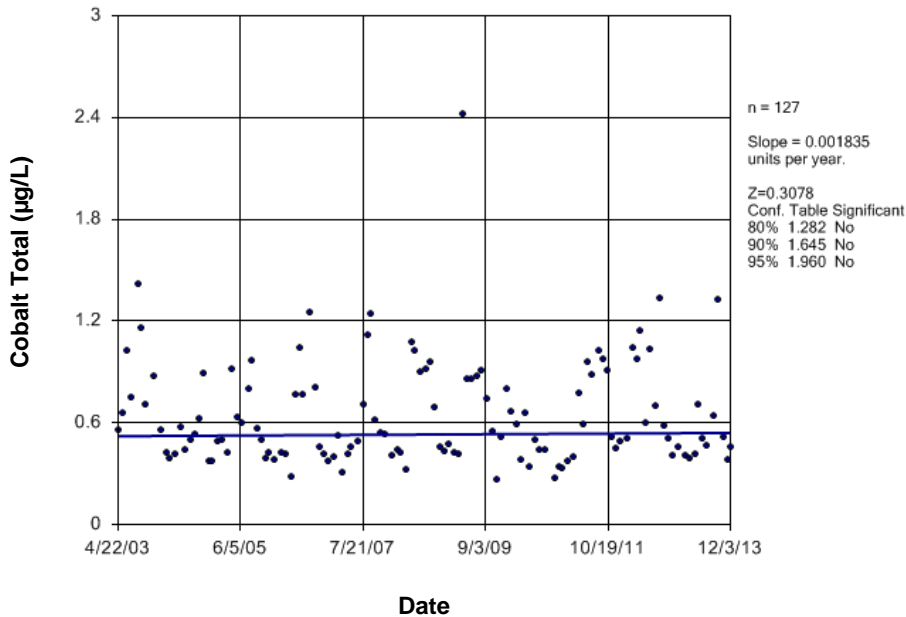


Figure E756 Assiniboine River: Cobalt Total



## Time Series

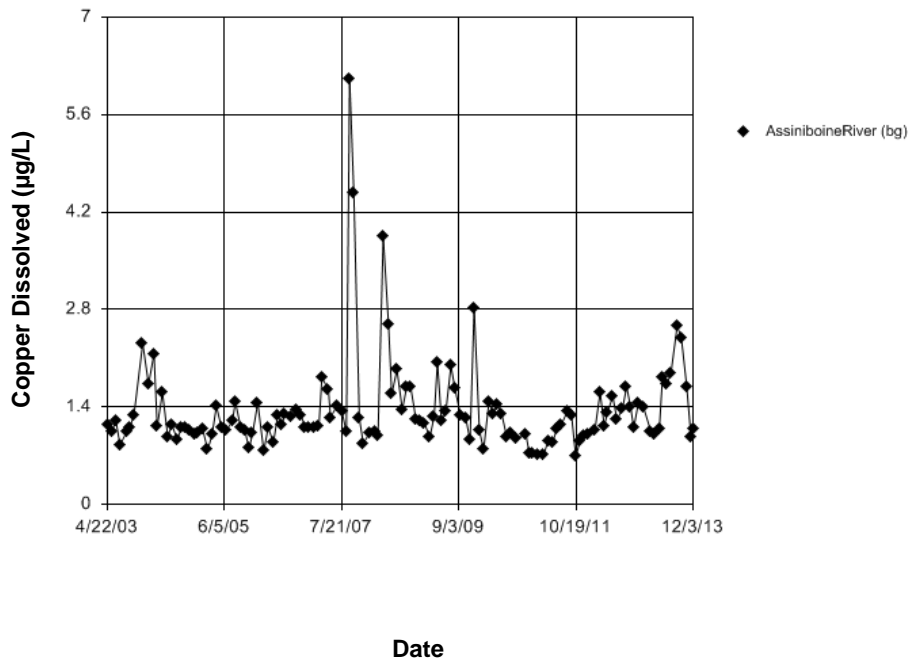


Figure E757 Assiniboine River: Copper Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 15.15  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
Kruskal-Wallis statistic (H) = 15.15  
Adjusted Kruskal-Wallis statistic (H') = 15.15

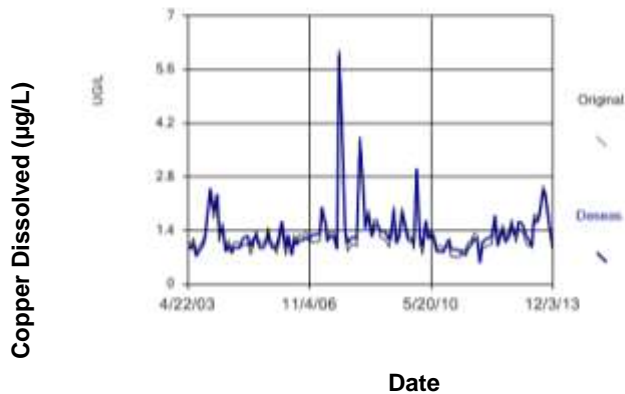


Figure E758 Assiniboine River: Copper Dissolved

### Seasonal Kendall

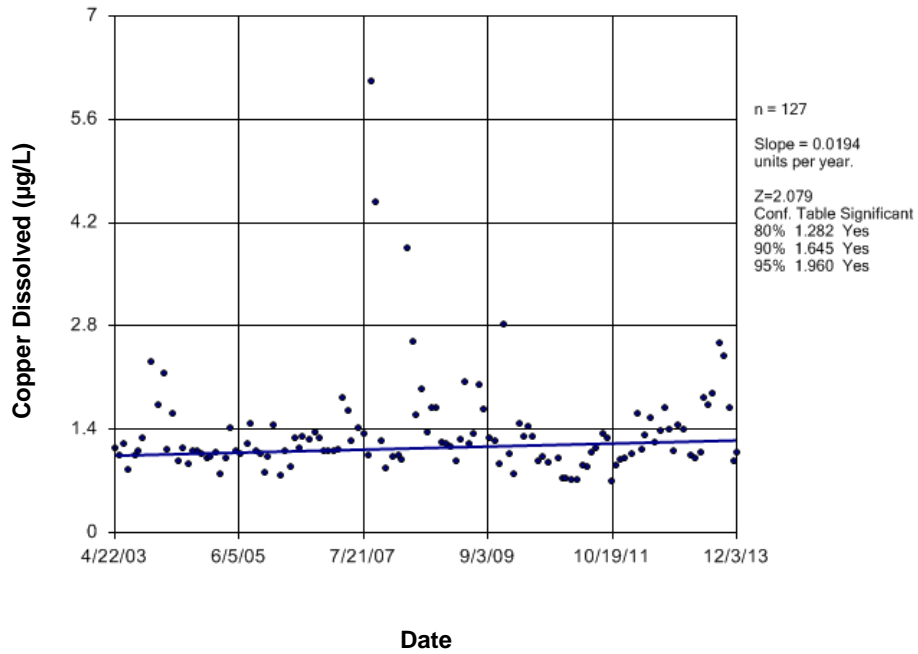


Figure E759 Assiniboine River: Copper Dissolved

### Time Series

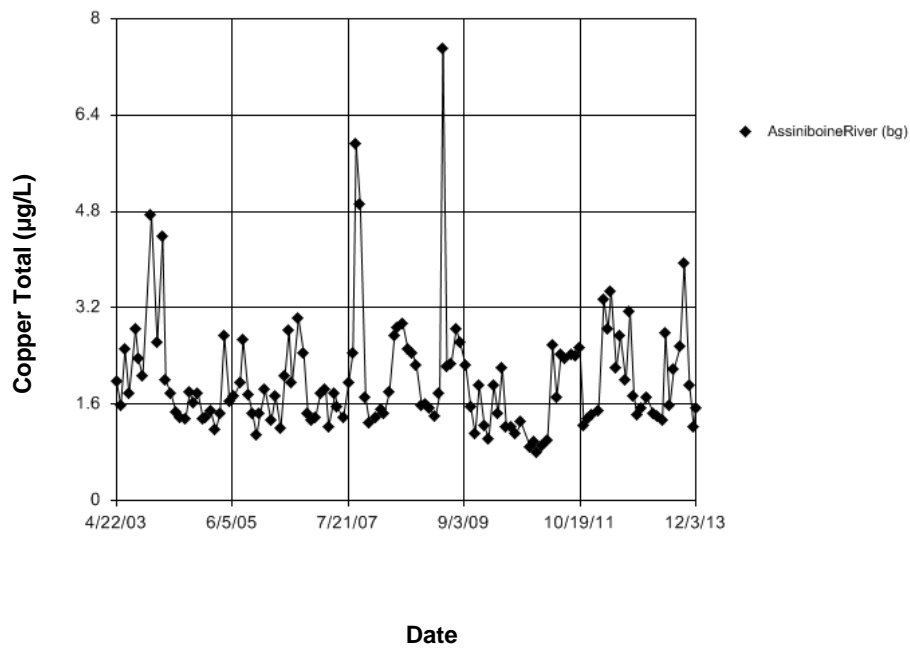


Figure E760 Assiniboine River: Copper Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 31.63  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
Kruskal-Wallis statistic (H) = 31.63  
Adjusted Kruskal-Wallis statistic (H') = 31.63

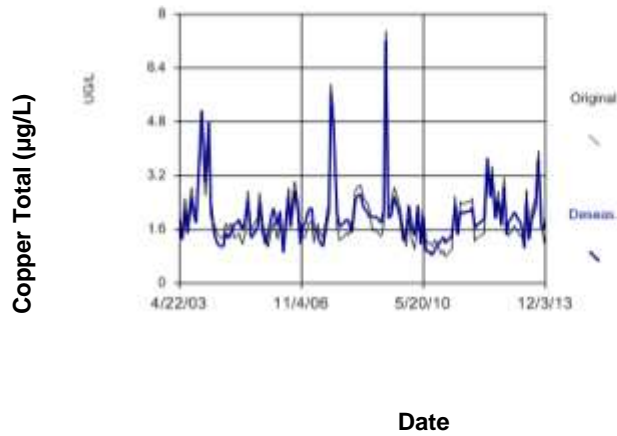


Figure E761 Assiniboine River: Copper Total

## Seasonal Kendall

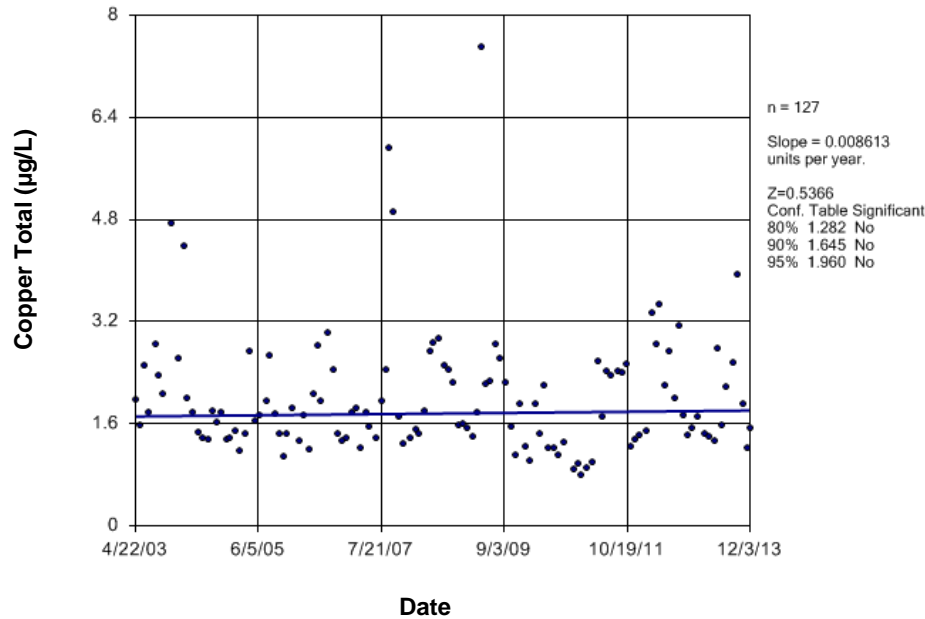


Figure E762 Assiniboine River: Copper Total

## Time Series

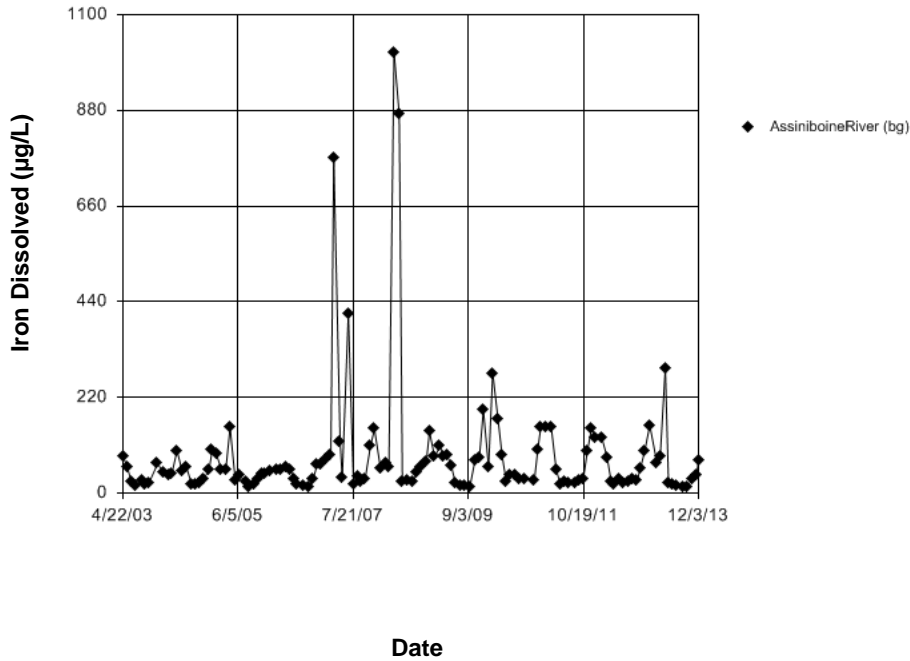


Figure E763 Assiniboine River: Iron Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates **SEASONALITY** at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 45.76  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H') = 45.76  
 Adjusted Kruskal-Wallis statistic (H') = 48.76

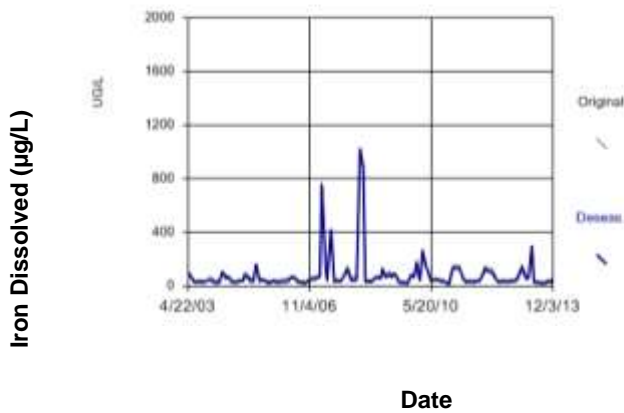


Figure E764 Assiniboine River: Iron Dissolved

### Seasonal Kendall

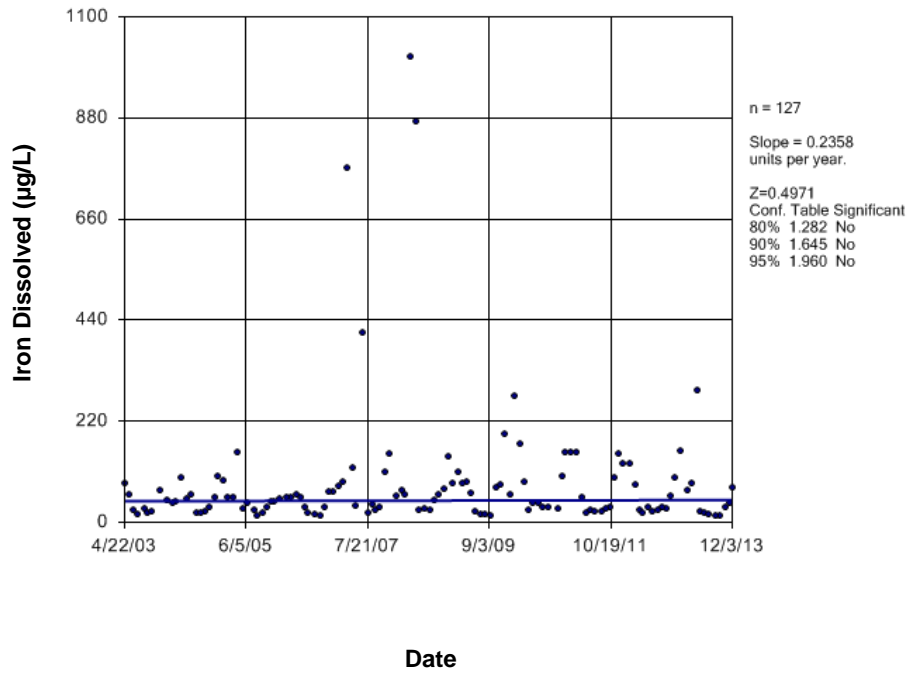


Figure E765 Assiniboine River: Iron Dissolved

### Time Series

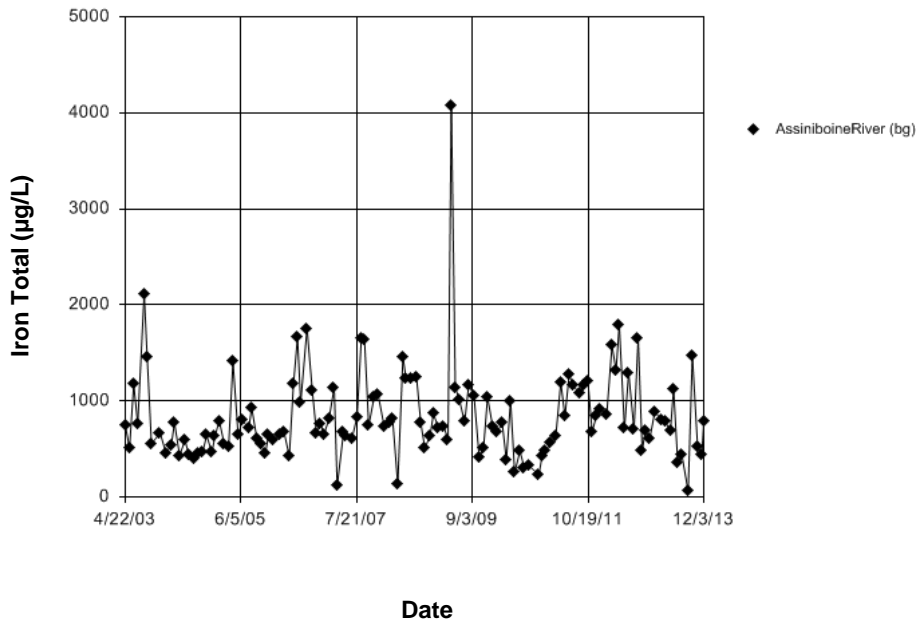
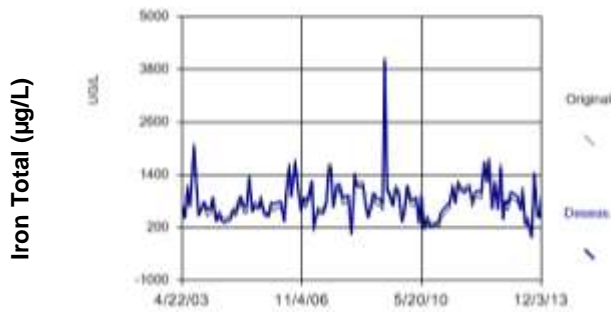


Figure E766 Assiniboine River: Iron Total

## Seasonality

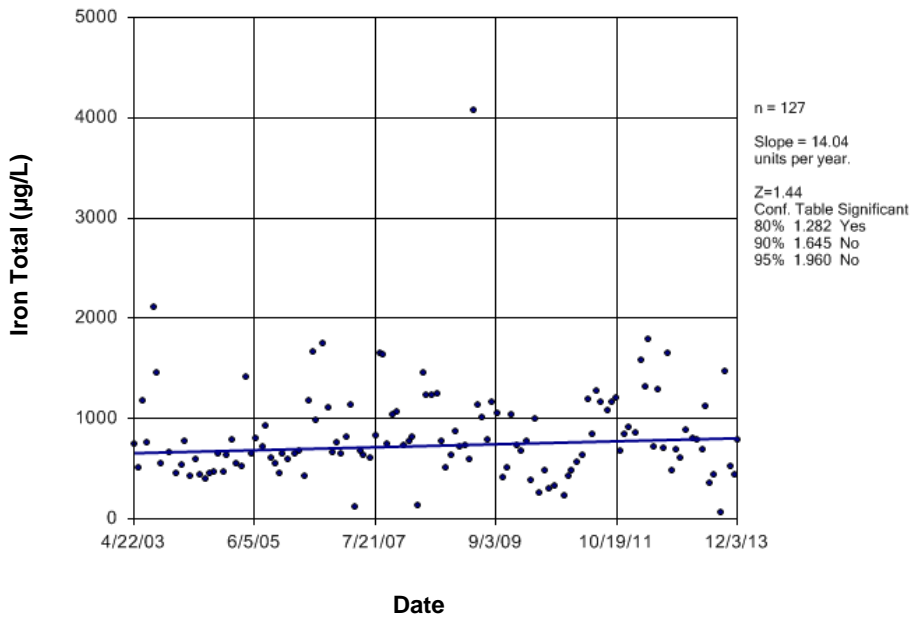
For the data shown, the Kruskal-Wallis test indicates **NO SEASONALITY** at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 3.736. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 0 groups of ties in the data, so an adjustment to the Kruskal-Wallis statistic (D) was necessary.



Date

Figure E767 Assiniboine River: Iron Total

## Seasonal Kendall



Date

Figure E768 Assiniboine River: Iron Total

## Time Series

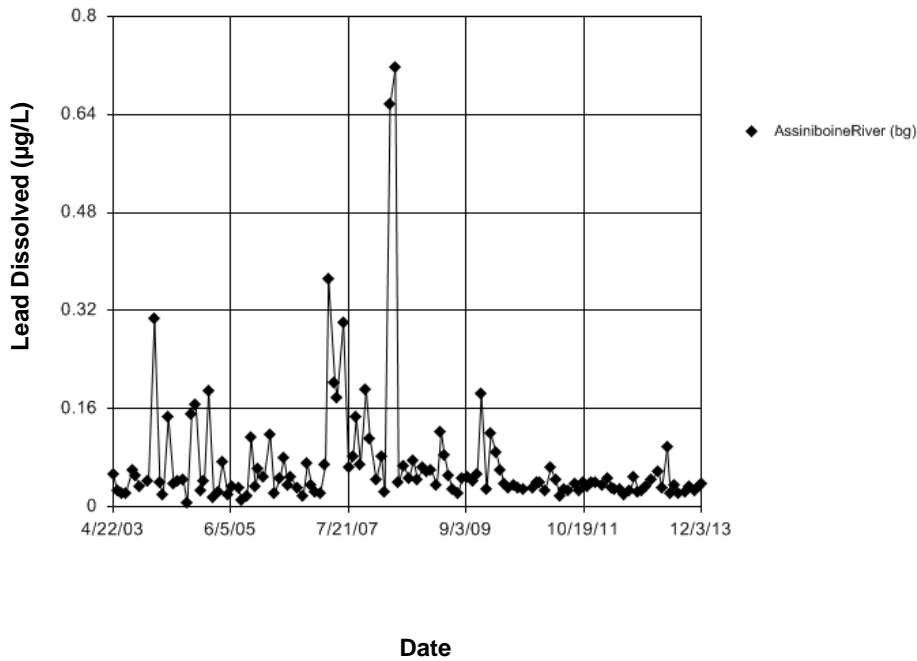


Figure E769 Assiniboine River: Lead Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates **NO SEASONALITY** at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.6192. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

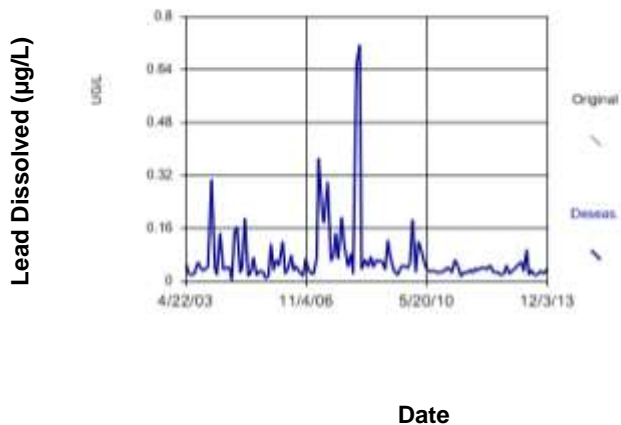


Figure E770 Assiniboine River: Lead Dissolved

### Sen's Slope Estimator

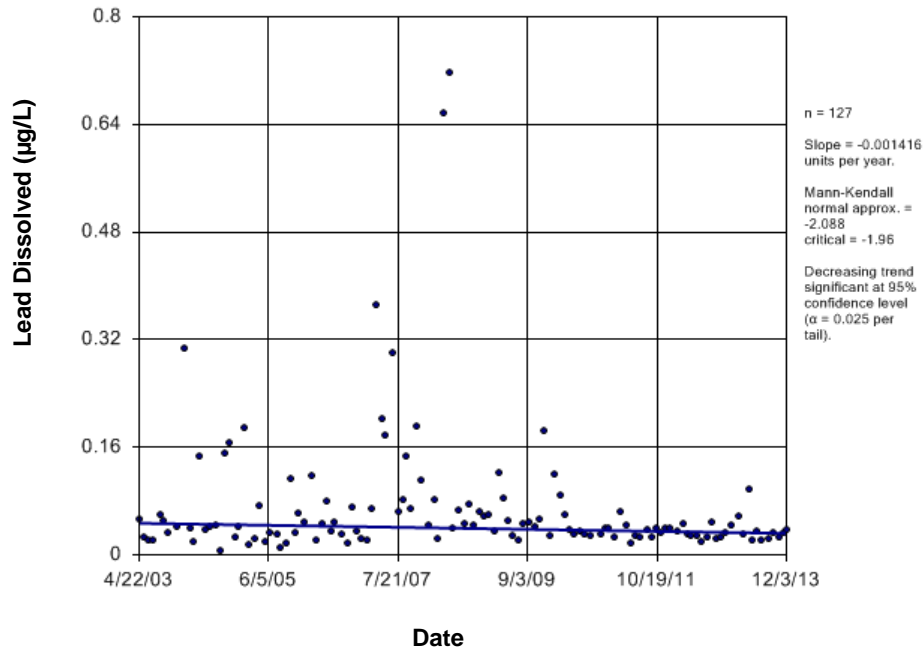


Figure E771 Assiniboine River: Lead Dissolved

### Time Series

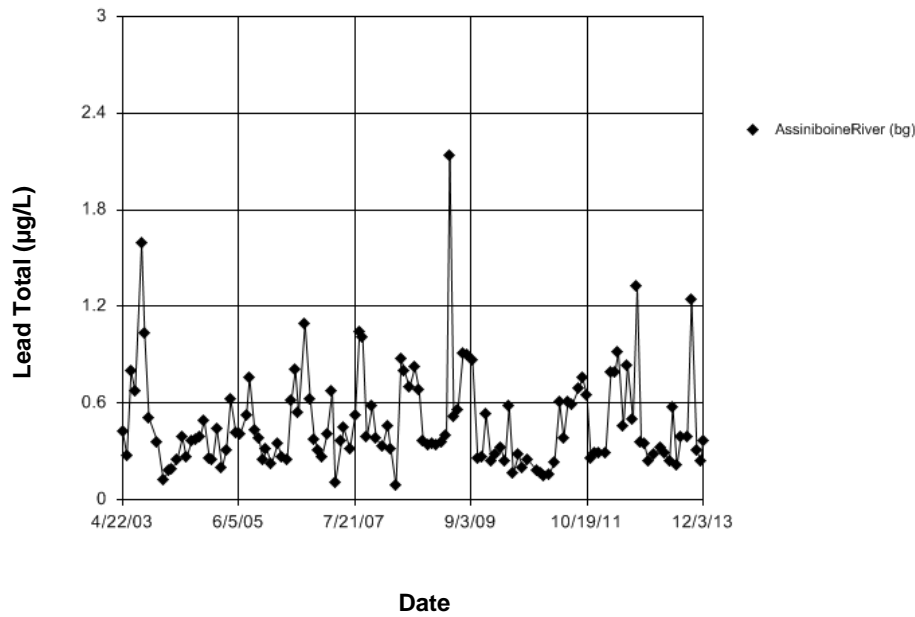


Figure E772 Assiniboine River: Lead Total



## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-Squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.  
 Calculated Kruskal-Wallis statistic = 34.74  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 34.74  
 Adjusted Kruskal-Wallis statistic (H') = 34.74

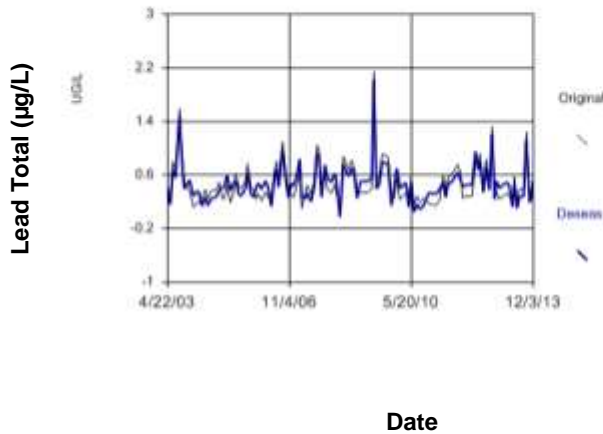


Figure E773 Assiniboine River: Lead Total

## Seasonal Kendall

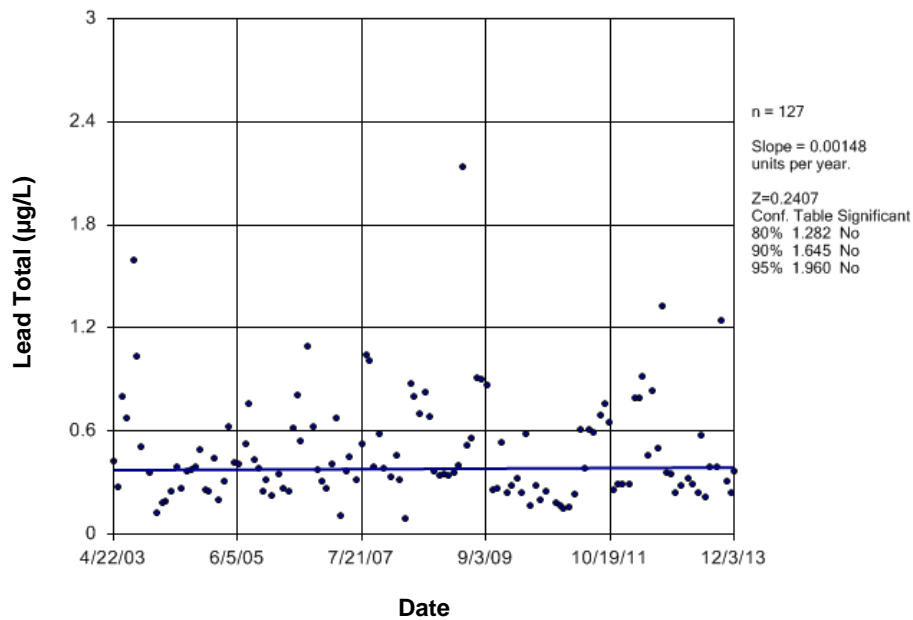
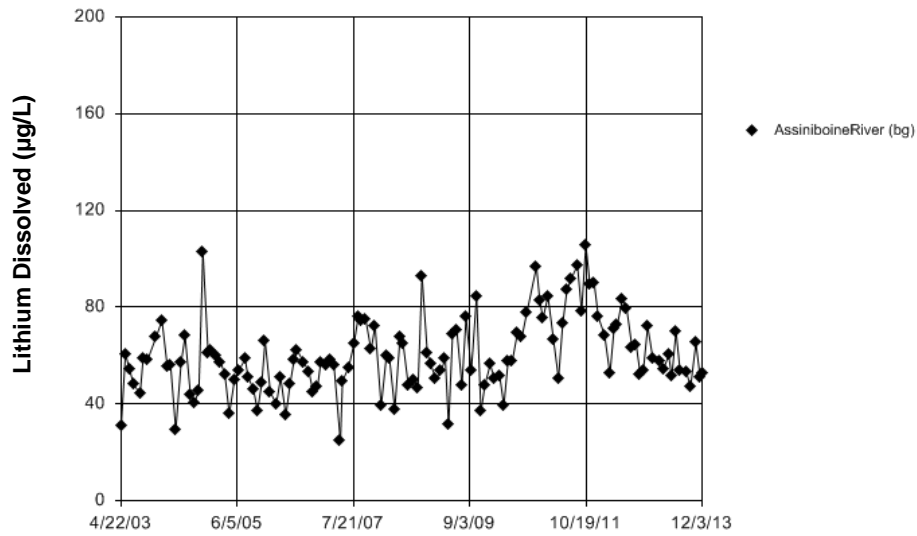


Figure E774 Assiniboine River: Lead Total

## Time Series

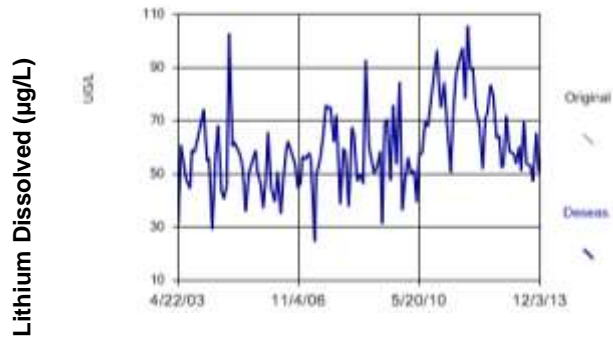


Date

Figure E775 Assiniboine River: Lithium Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates **NO SEASONALITY** at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.1727  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 0.1727  
 Adjusted Kruskal-Wallis statistic (H') = 0.1727



Date

Figure E776 Assiniboine River: Lithium Dissolved

## Sen's Slope Estimator

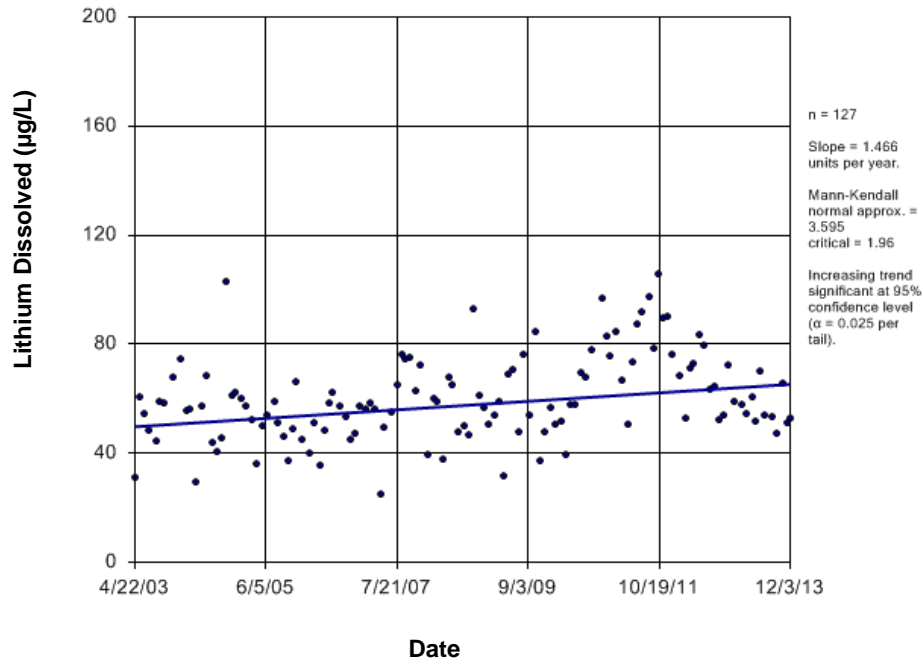


Figure E777 Assiniboine River: Lithium Dissolved

## Time Series

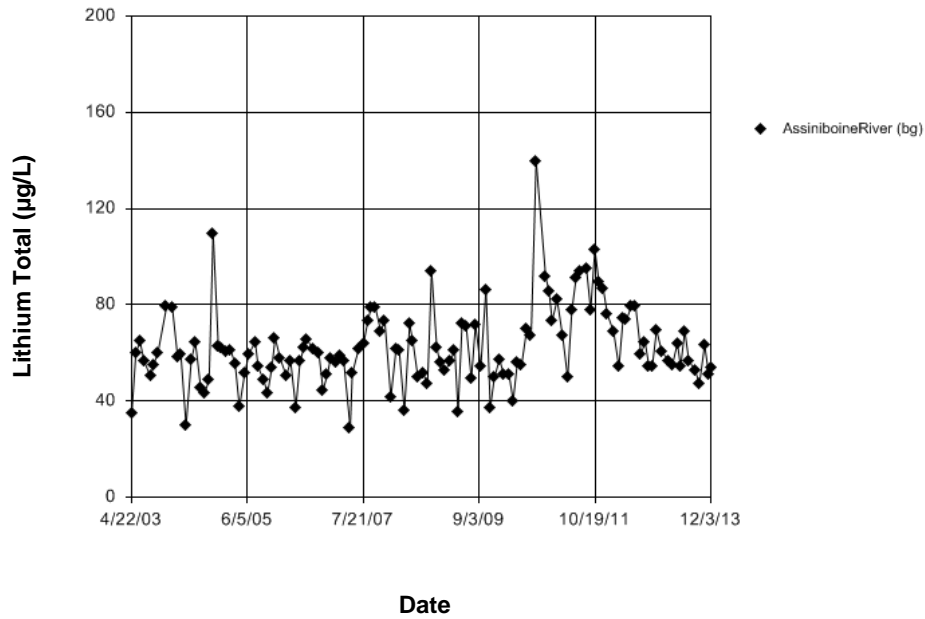


Figure E778 Assiniboine River: Lithium Total

# Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.1006  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
Kruskal-Wallis statistic (H) = 0.1006  
Adjusted Kruskal-Wallis statistic (H') = 0.1006

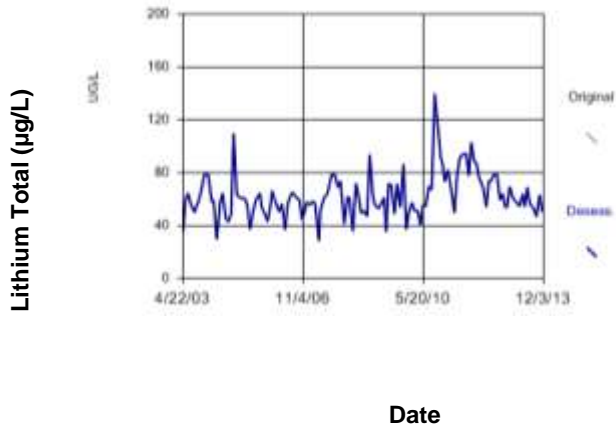


Figure E779 Assiniboine River: Lithium Total

# Sen's Slope Estimator

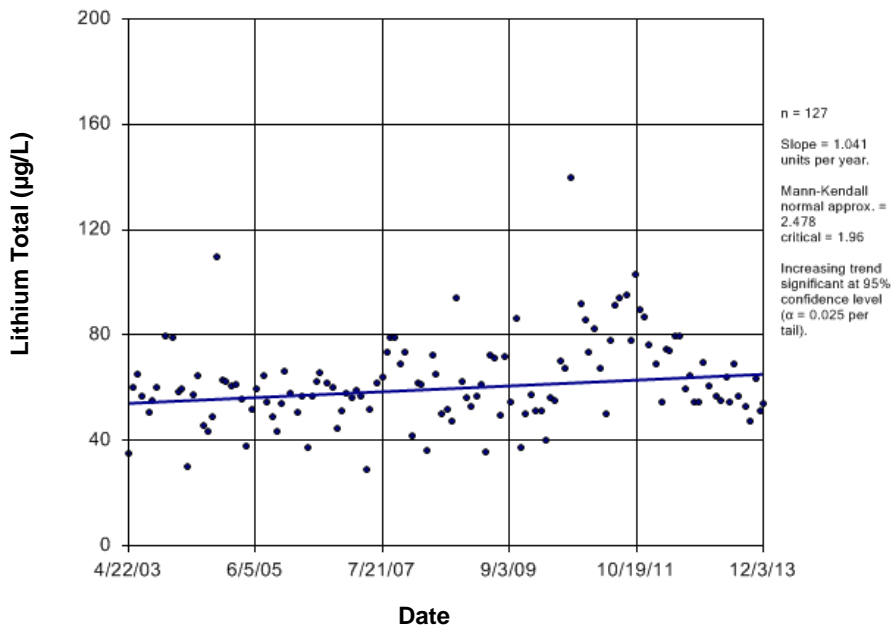


Figure E780 Assiniboine River: Lithium Total

## Time Series

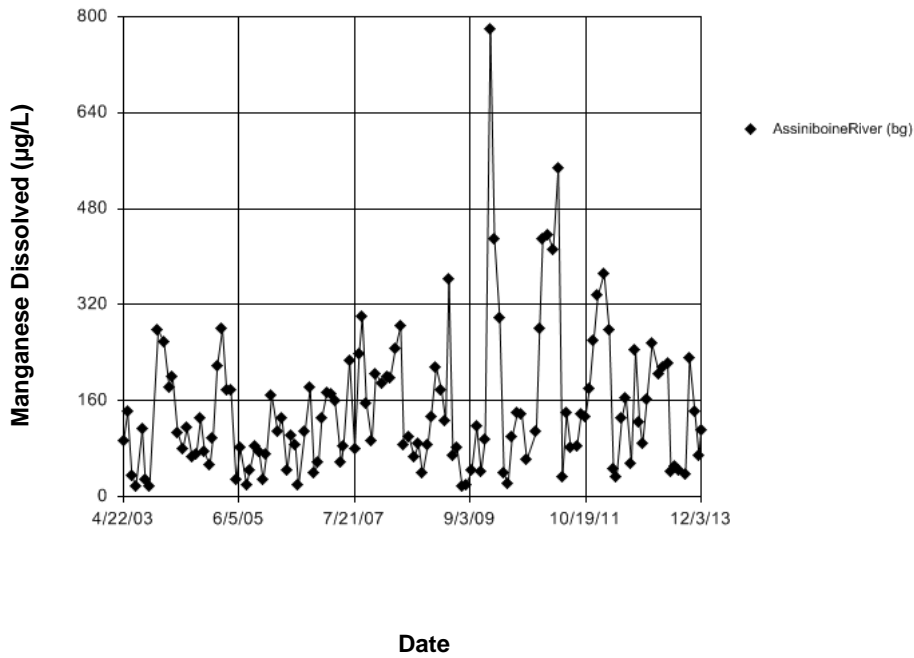


Figure E781 Assiniboine River: Manganese Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 26.31  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H<sub>adj</sub>) was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 26.31  
 Adjusted Kruskal-Wallis statistic (H<sub>adj</sub>) = 26.31

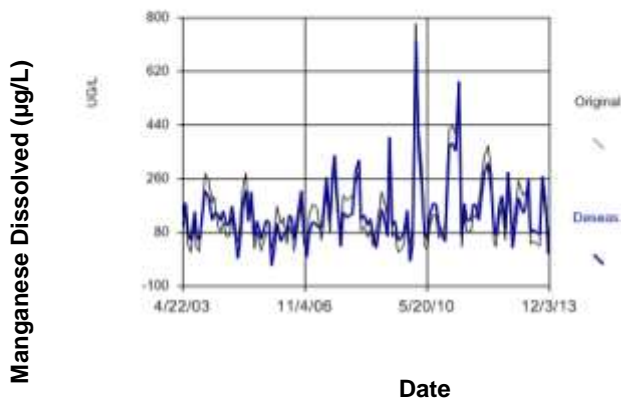


Figure E782 Assiniboine River: Manganese Dissolved

### Seasonal Kendall

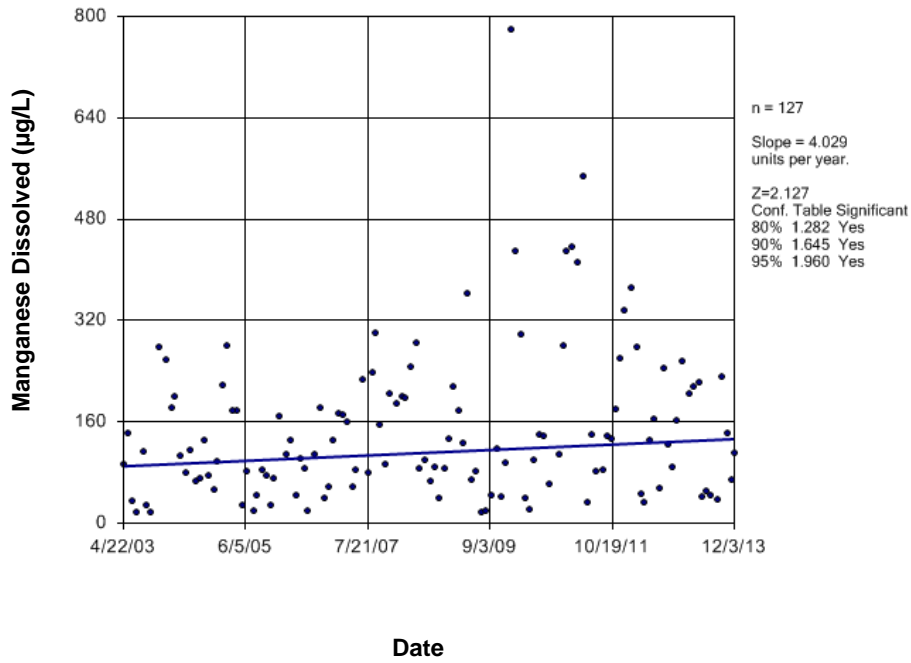


Figure E783 Assiniboine River: Manganese Dissolved

### Time Series

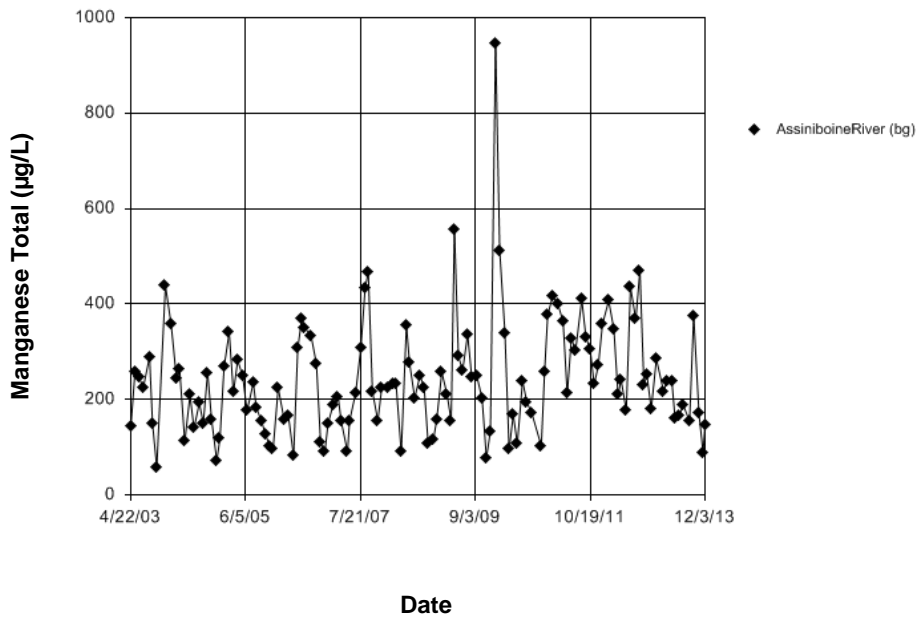
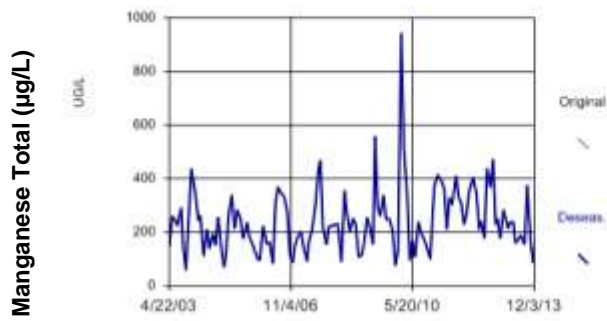


Figure E784 Assiniboine River: Manganese Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.151  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 0.151  
 Adjusted Kruskal-Wallis statistic (H') = 0.151



Date

Figure E785 Assiniboine River: Manganese Total

## Sen's Slope Estimator

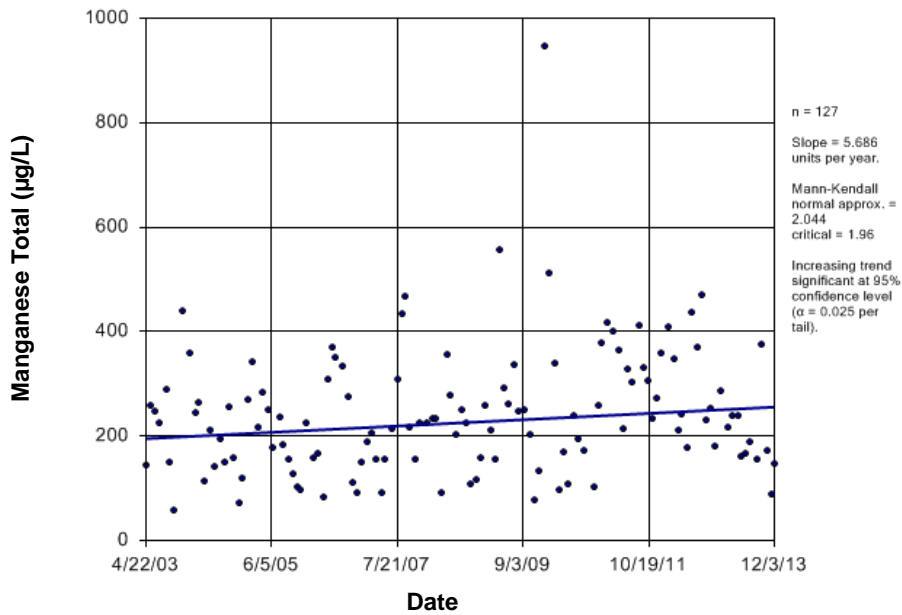


Figure E786 Assiniboine River: Manganese Total

## Time Series

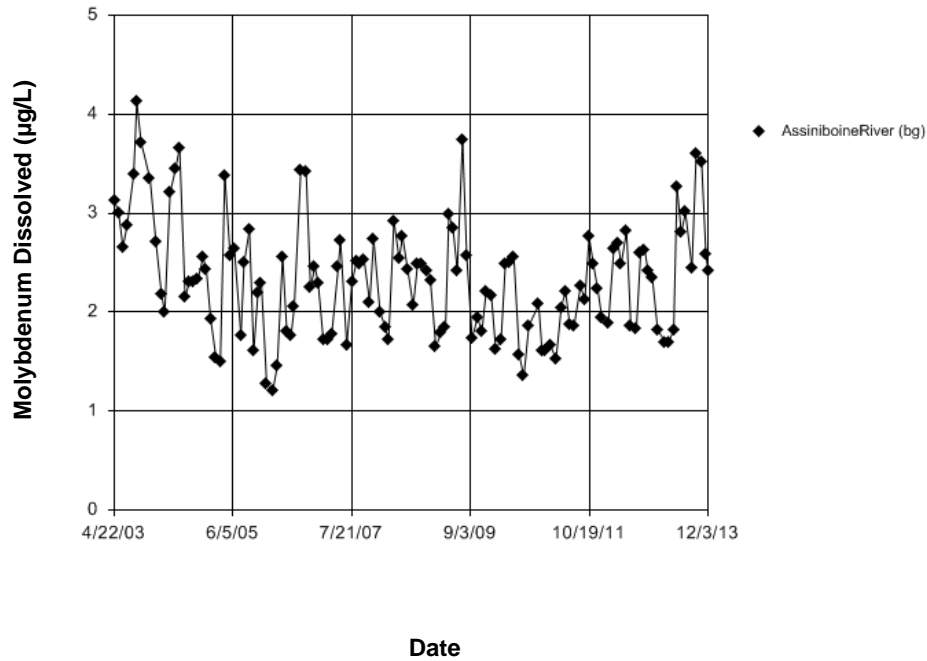


Figure E787 Assiniboine River: Molybdenum Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 27.18  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 4 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to decrease if the medians were equal.  
Kruskal-Wallis statistic (H) = 27.18  
Adjusted Kruskal-Wallis statistic (H') = 27.18

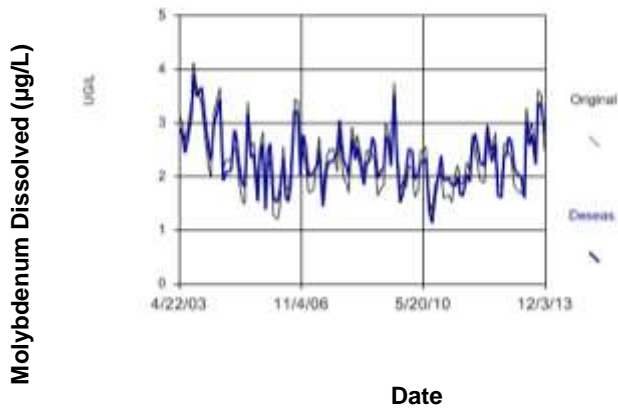


Figure E788 Assiniboine River: Molybdenum Dissolved



### Seasonal Kendall

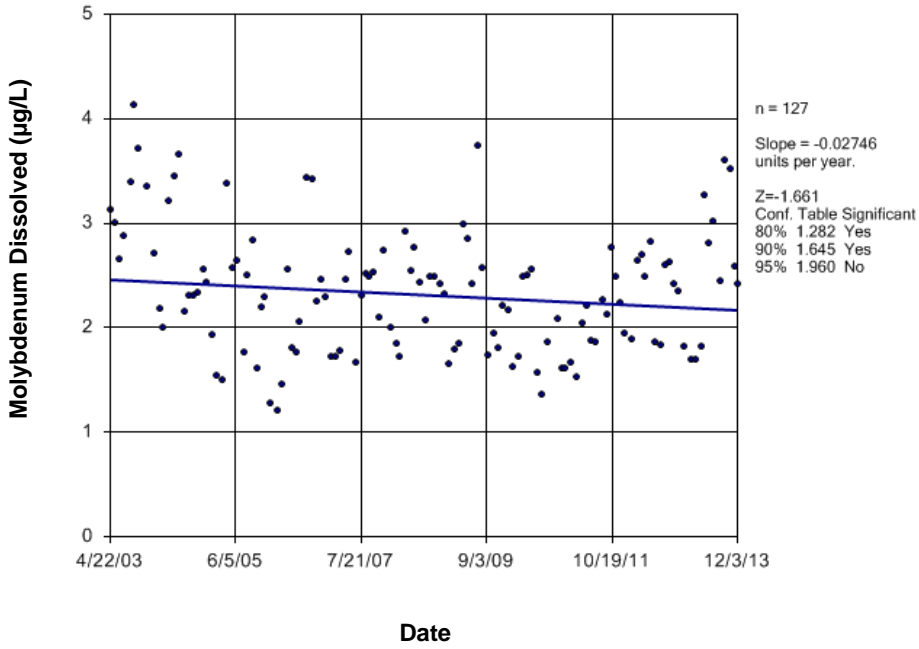


Figure E789 Assiniboine River: Molybdenum Dissolved

### Time Series

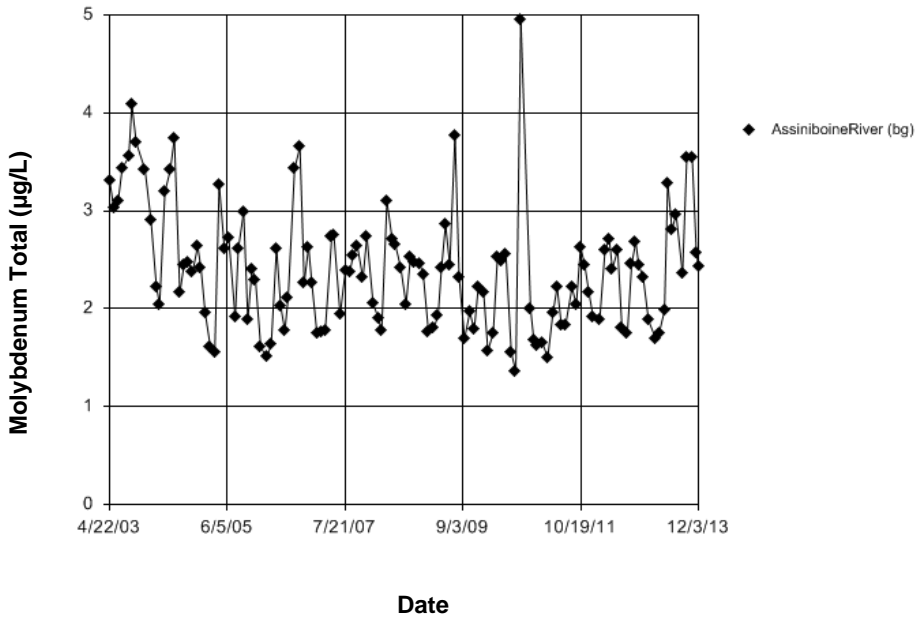
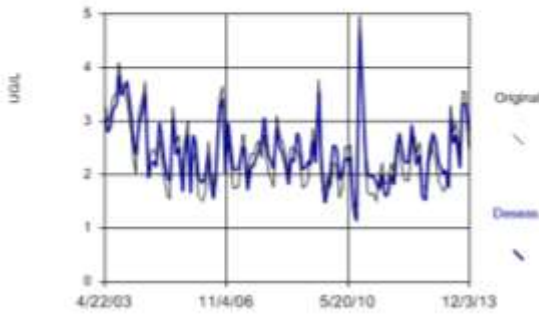


Figure E790 Assiniboine River: Molybdenum Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 1% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 27.49  
 Tabulated Chi-Squared value = 5.991 with 1 degree of freedom at the 1% significance level.  
 There were 4 groups of data in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 27.49  
 Adjusted Kruskal-Wallis statistic (H') = 21.49

Molybdenum Total (µg/L)



Date

Figure E791 Assiniboine River: Molybdenum Total

## Seasonal Kendall

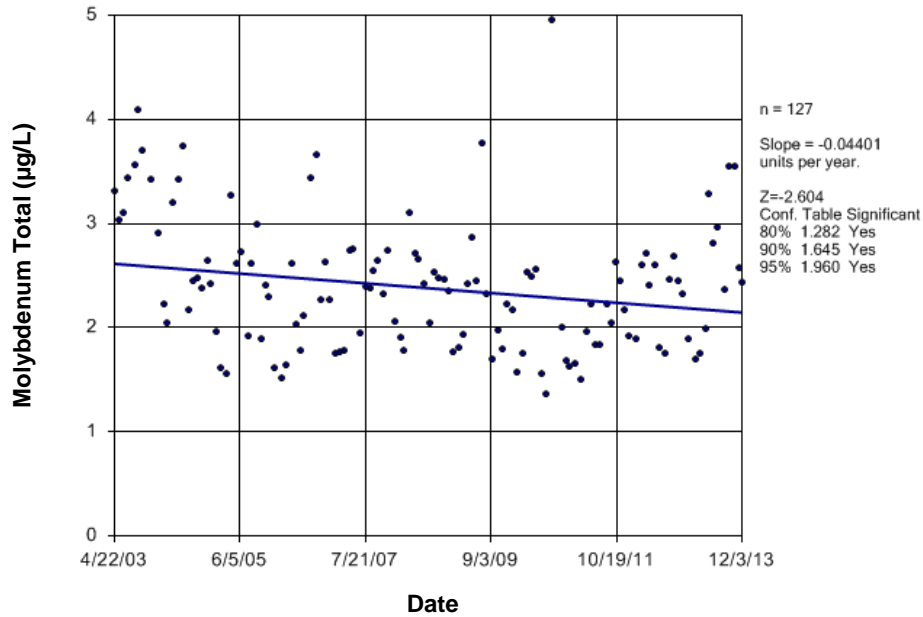


Figure E792 Assiniboine River: Molybdenum Total

## Time Series

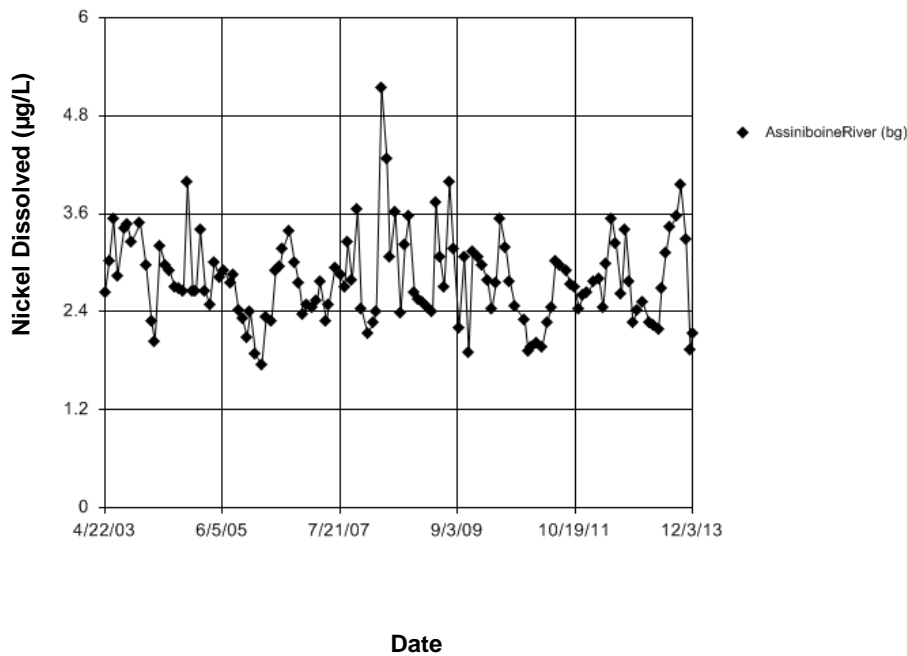


Figure E793 Assiniboine River: Nickel Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 34.86  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 34.86  
 Adjusted Kruskal-Wallis statistic (H') = 34.86

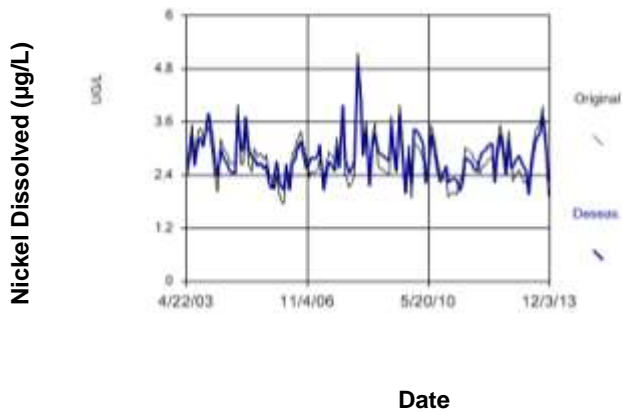


Figure E794 Assiniboine River: Nickel Dissolved

### Seasonal Kendall

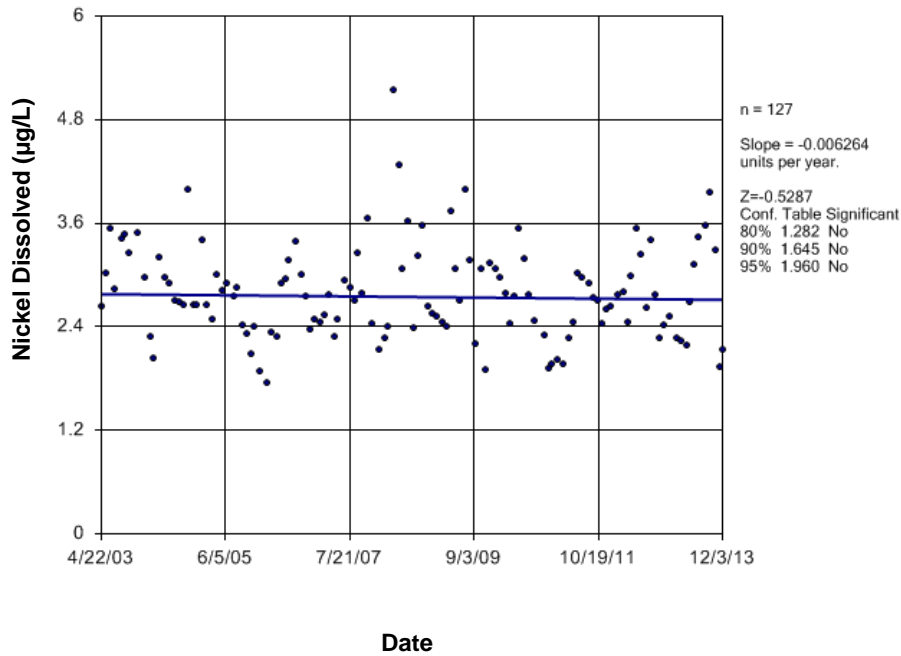


Figure E795 Assiniboine River: Nickel Dissolved

### Time Series

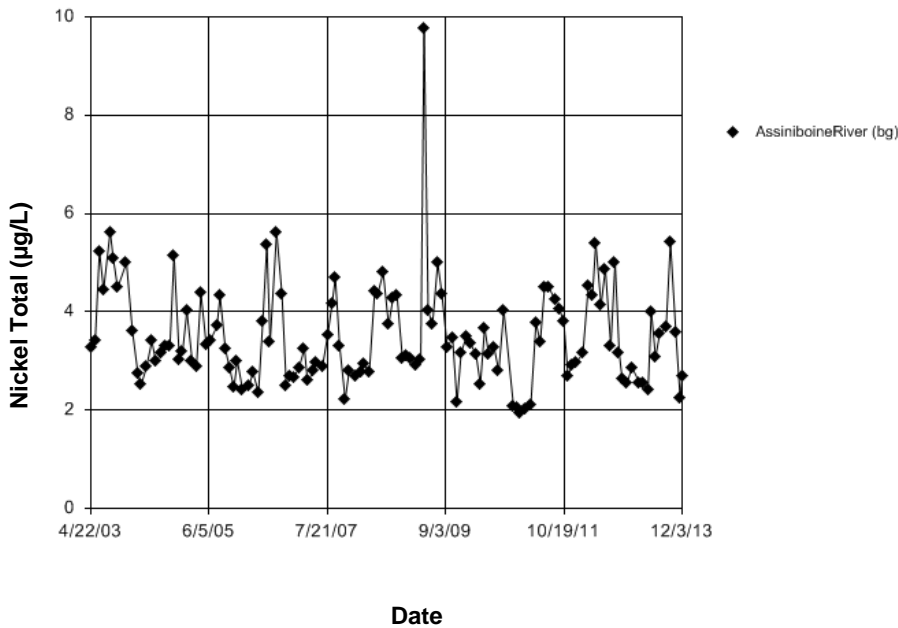


Figure E796 Assiniboine River: Nickel Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 46.06  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

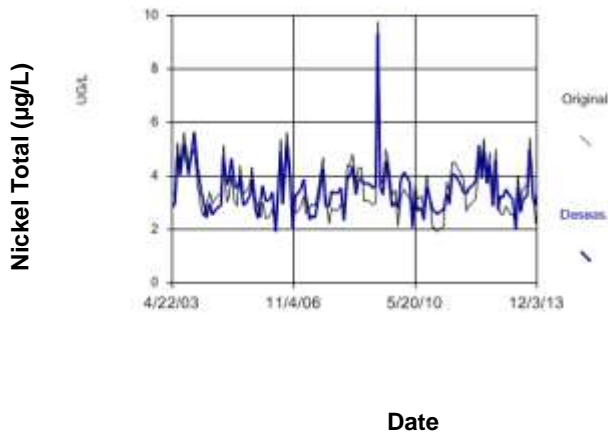


Figure E797 Assiniboine River: Nickel Total

## Seasonal Kendall

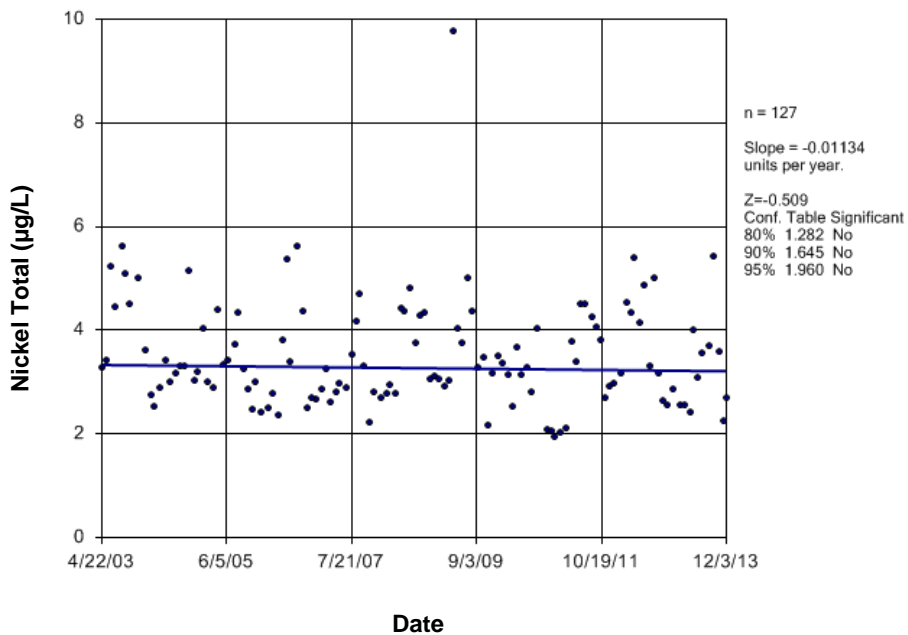


Figure E798 Assiniboine River: Nickel Total

## Time Series

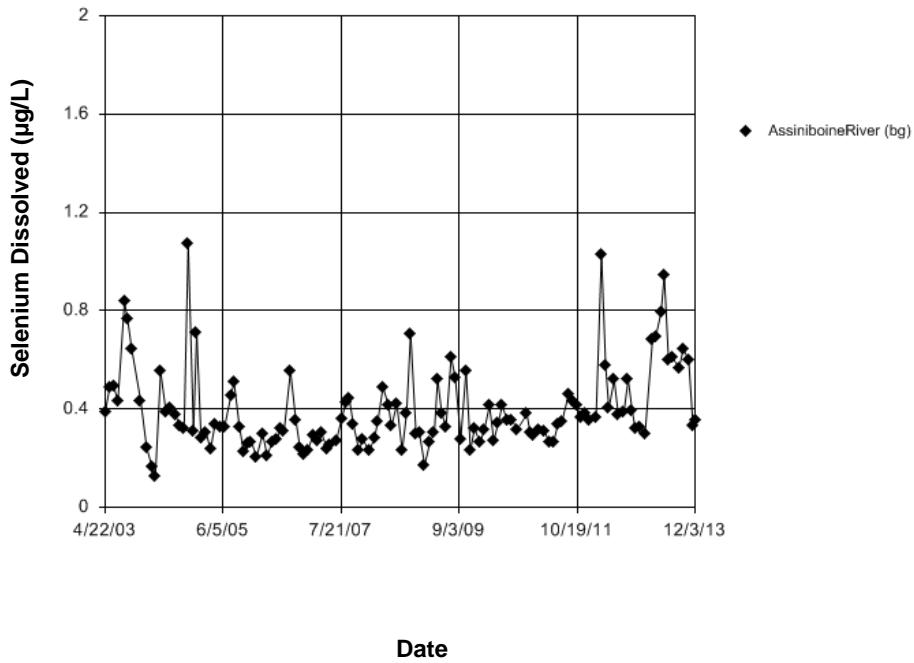


Figure E799 Assiniboine River: Selenium Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 25.54  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 25.54  
 Adjusted Kruskal-Wallis statistic (H') = 25.54

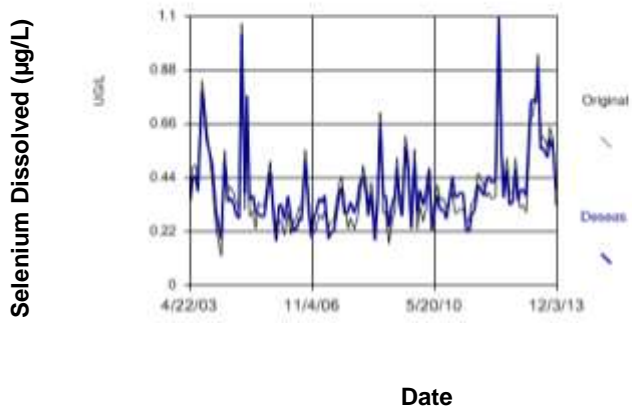


Figure E800 Assiniboine River: Selenium Dissolved

### Seasonal Kendall

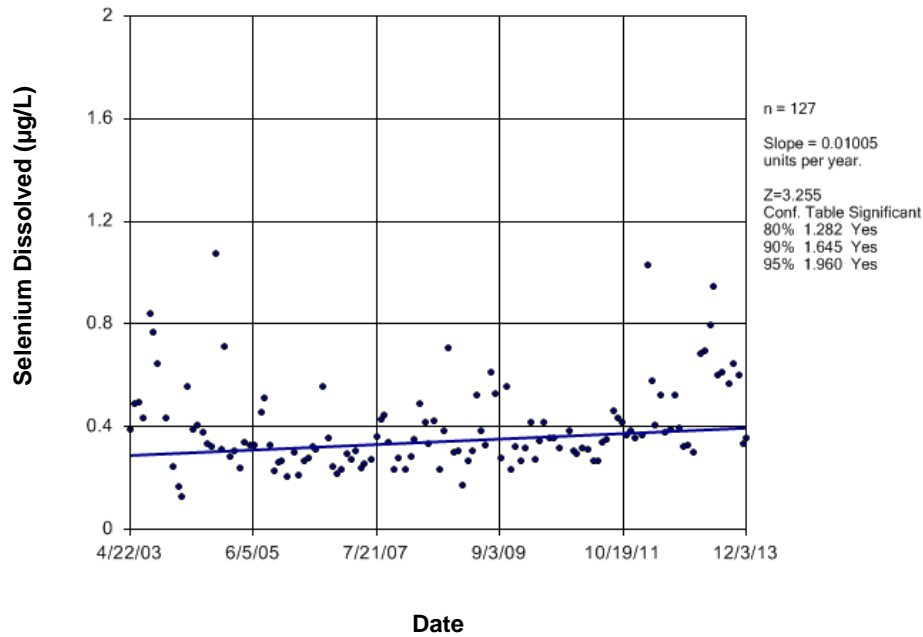


Figure E801 Assiniboine River: Selenium Dissolved

### Time Series

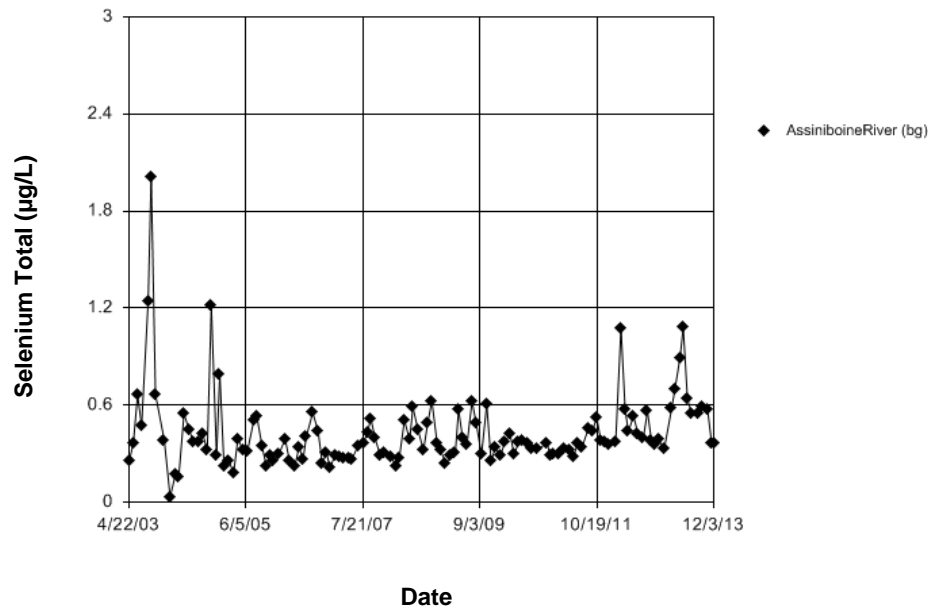


Figure E802 Assiniboine River: Selenium Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 26.72  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

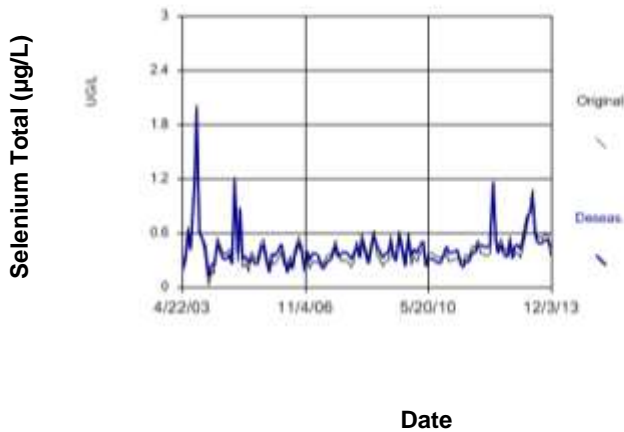


Figure E803 Assiniboine River: Selenium Total

## Seasonal Kendall

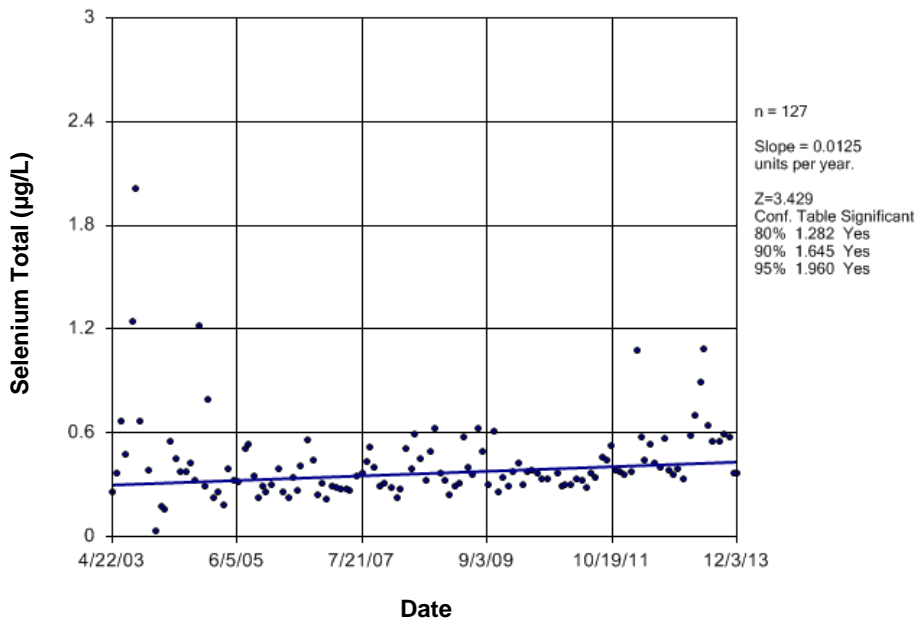


Figure E804 Assiniboine River: Selenium Total



## Time Series

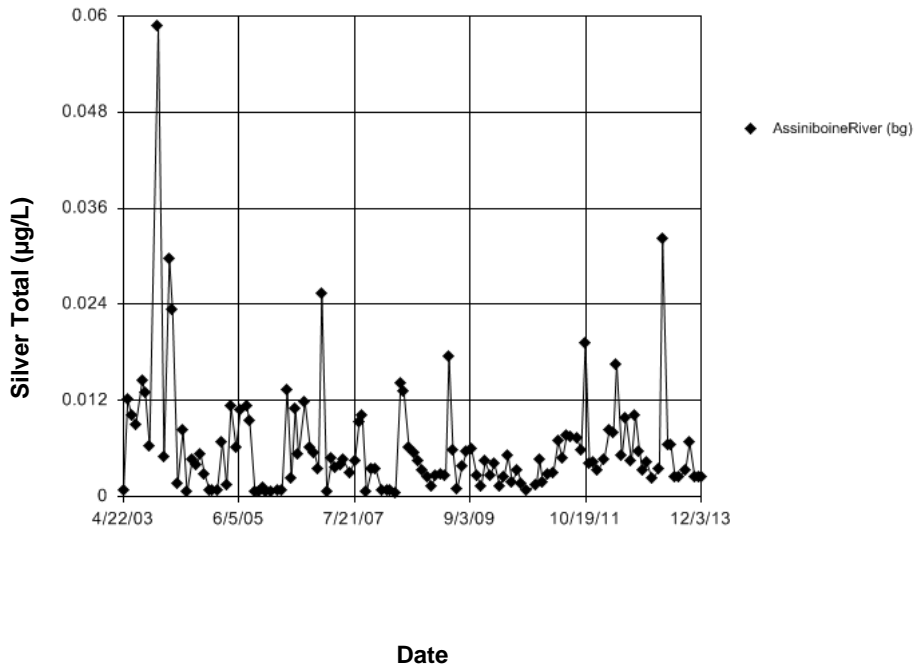


Figure E805 Assiniboine River: Silver Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.  
 Calculated Kruskal-Wallis statistic = 14.79  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 14.79  
 Adjusted Kruskal-Wallis statistic (H') = 14.79

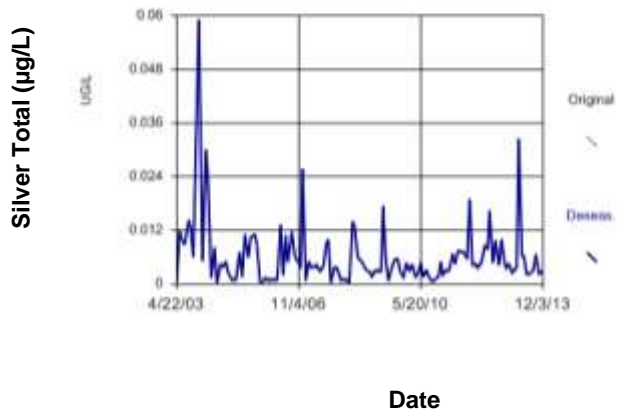


Figure E806 Assiniboine River: Silver Total

## Seasonal Kendall

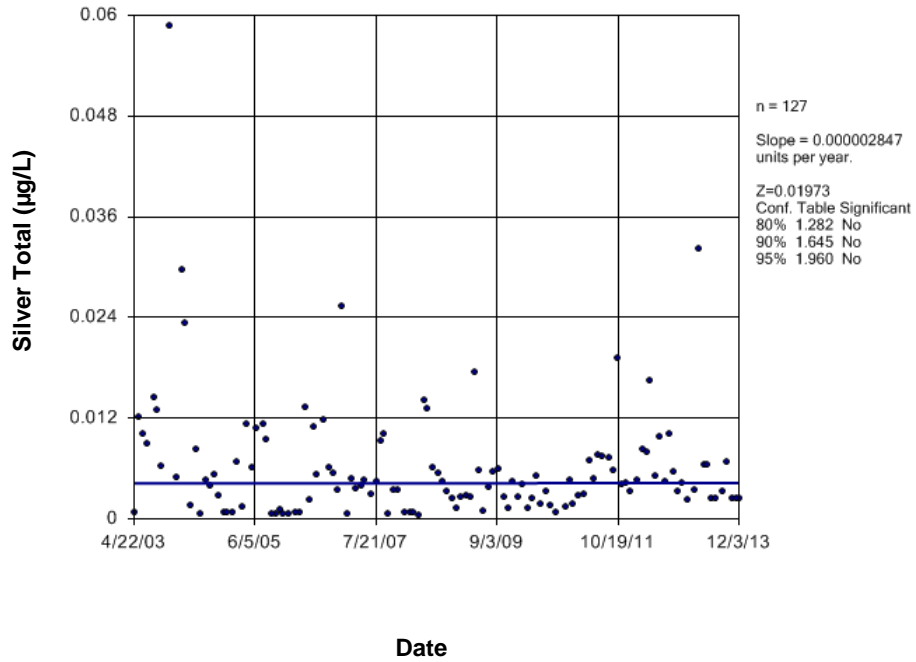


Figure E807 Assiniboine River: Silver Total

## Time Series

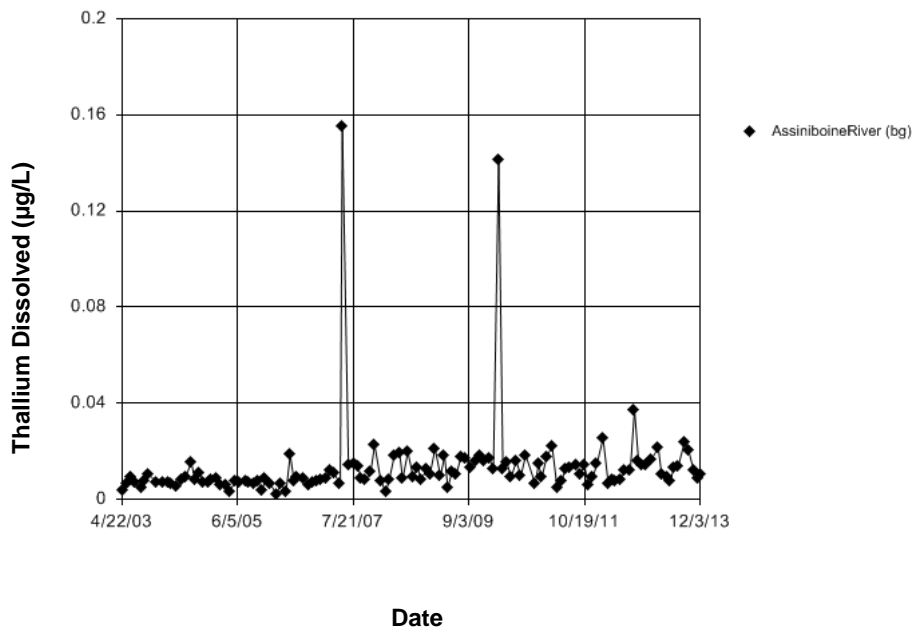


Figure E808 Assiniboine River: Thallium Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.02034  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 0.02034  
 Adjusted Kruskal-Wallis statistic (H') = 0.02034

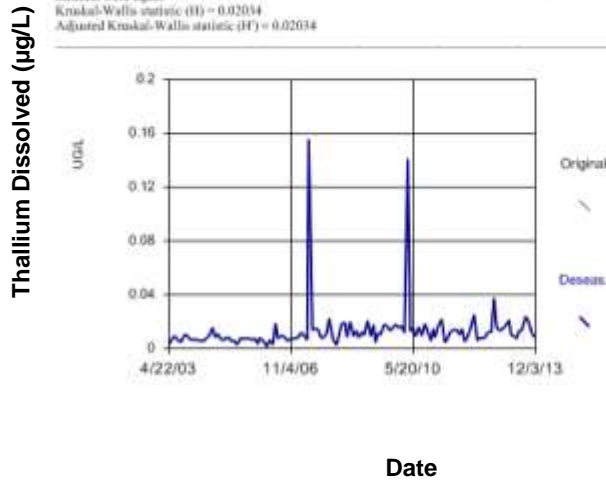


Figure E809 Assiniboine River: Thallium Dissolved

## Sen's Slope Estimator

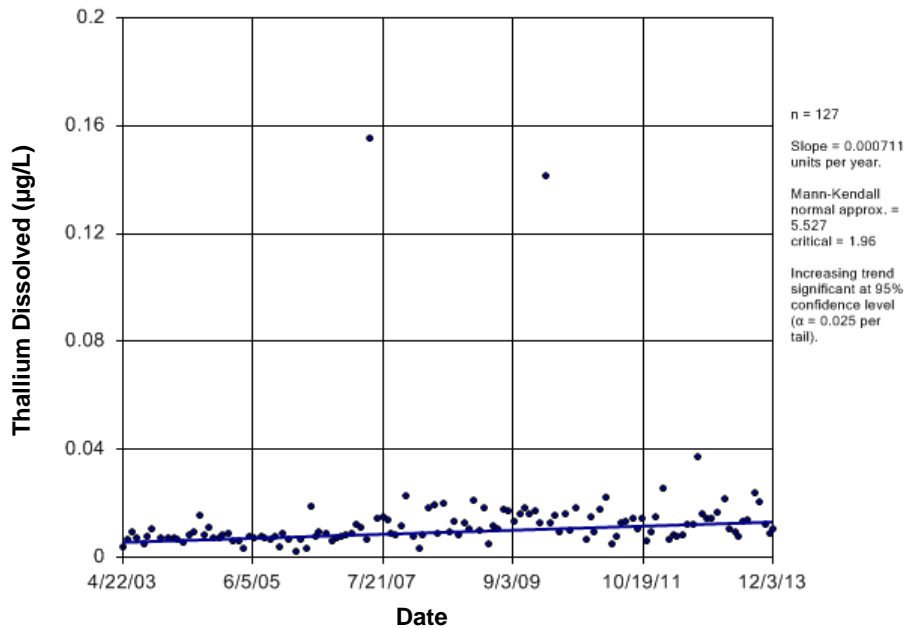


Figure E810 Assiniboine River: Thallium Dissolved

## Time Series

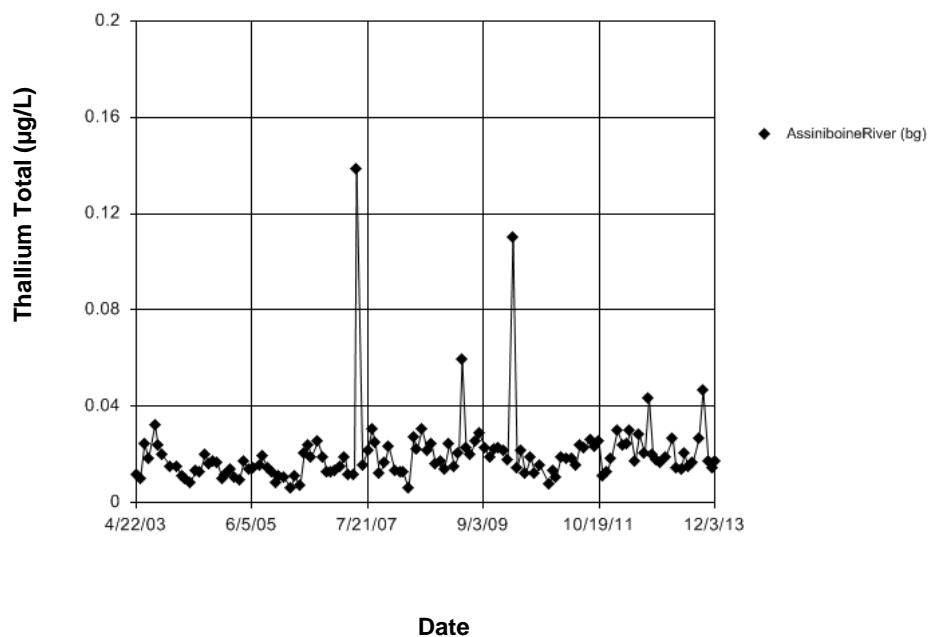


Figure E811 Assiniboine River: Thallium Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 14.45  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 14.45  
 Adjusted Kruskal-Wallis statistic (H') = 14.43

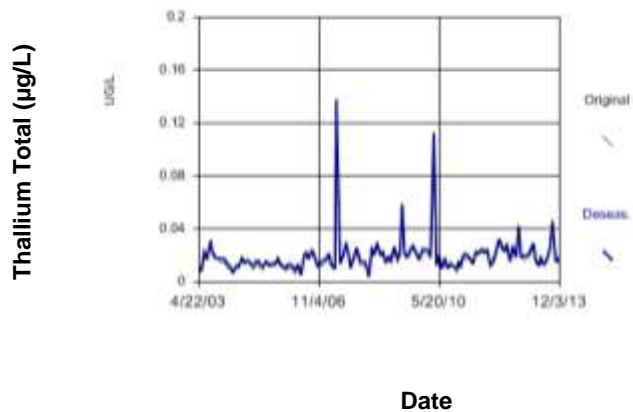


Figure E812 Assiniboine River: Thallium Total

### Seasonal Kendall

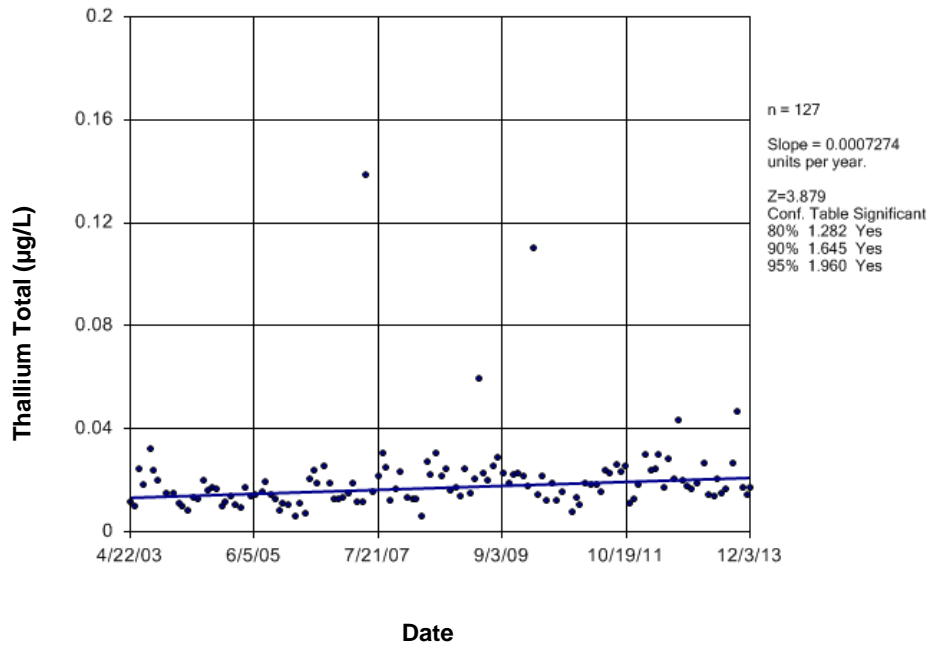


Figure E813 Assiniboine River: Thallium Total

### Time Series

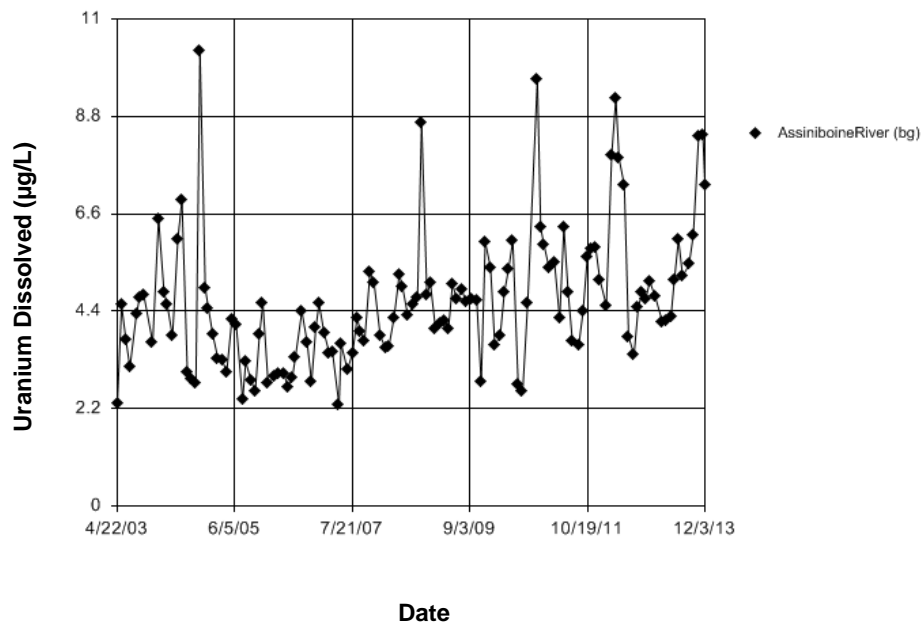
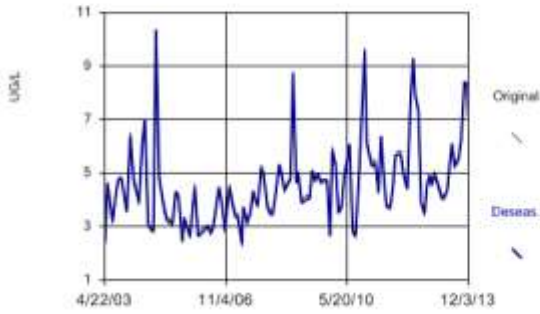


Figure E814 Assiniboine River: Uranium Dissolved

# Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 1.446.  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
Kruskal-Wallis statistic (H) = 1.446  
Adjusted Kruskal-Wallis statistic (H') = 1.446

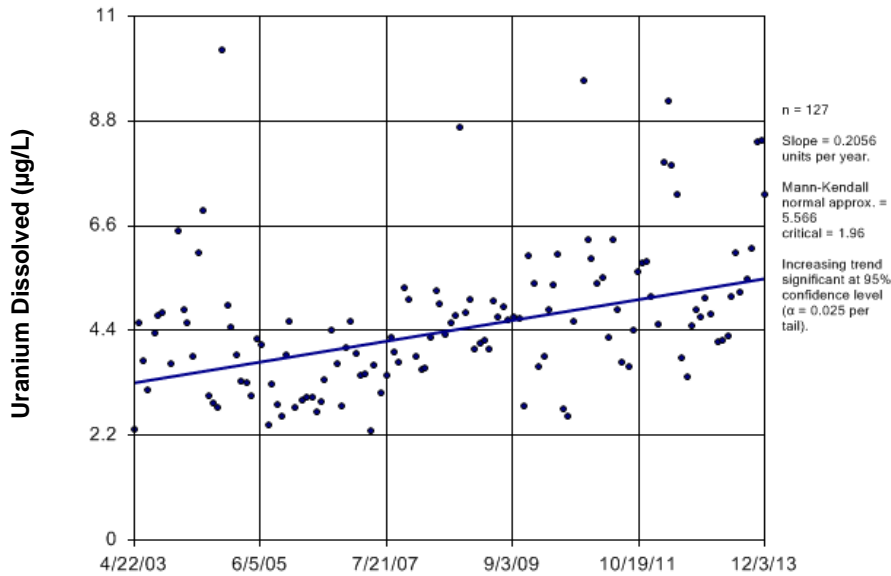
Uranium Dissolved (µg/L)



Date

Figure E815 Assiniboine River: Uranium Dissolved

# Sen's Slope Estimator



Date

Figure E816 Assiniboine River: Uranium Dissolved

## Time Series

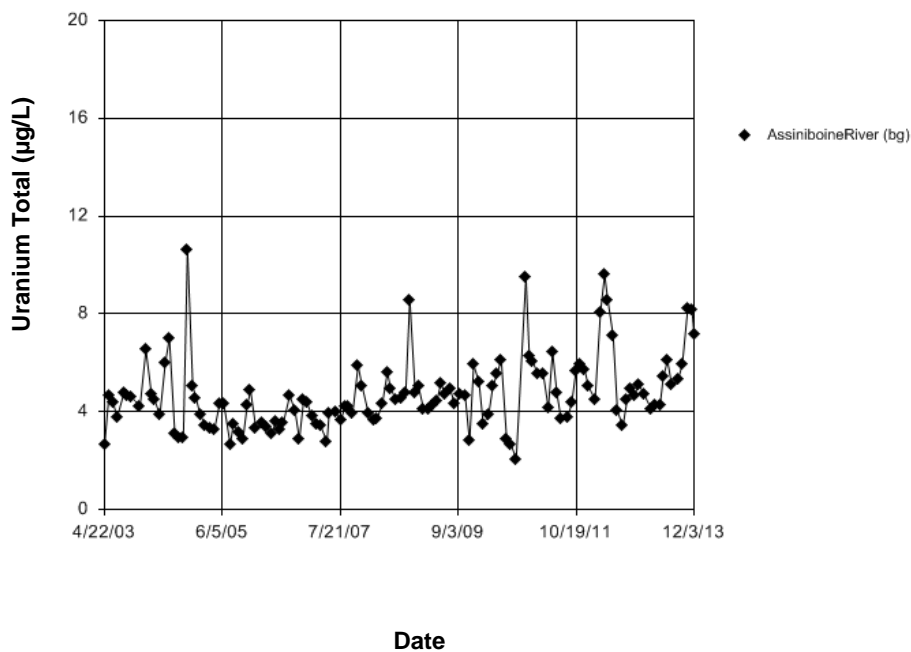


Figure E817 Assiniboine River: Uranium Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 1.118  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 4 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 1.118  
 Adjusted Kruskal-Wallis statistic (H') = 1.118

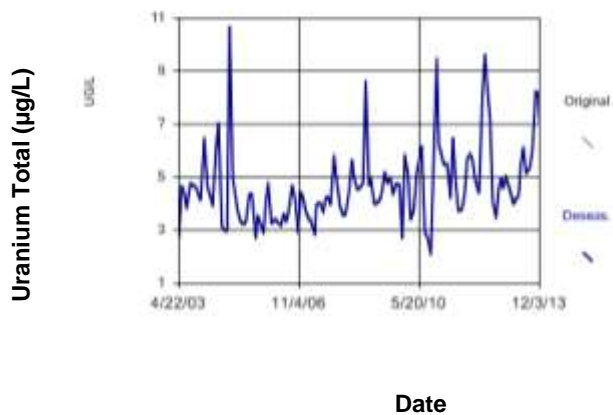


Figure E818 Assiniboine River: Uranium Total

## Sen's Slope Estimator

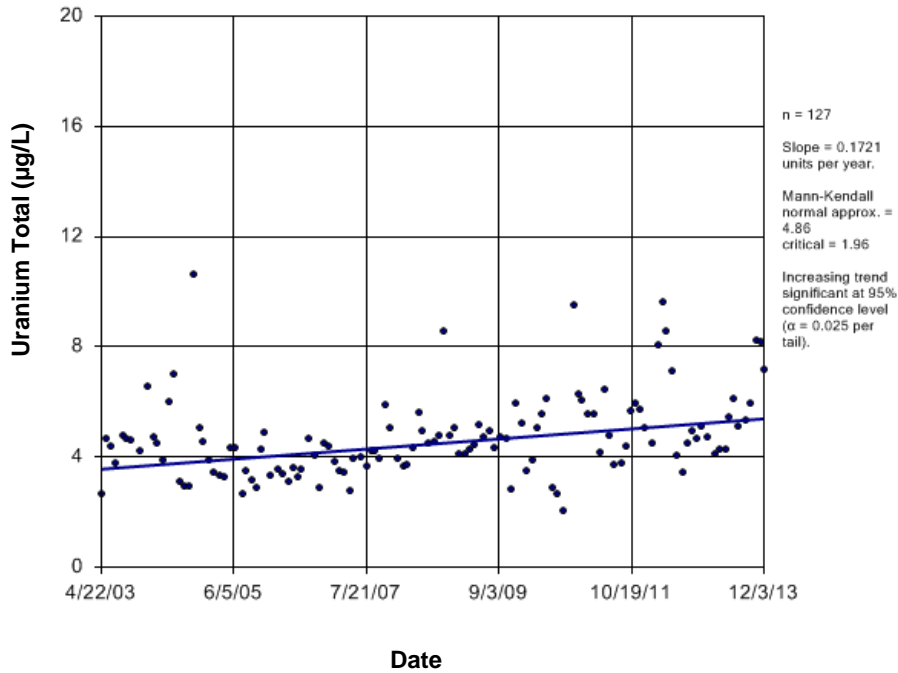


Figure E819 Assiniboine River: Uranium Total

## Time Series

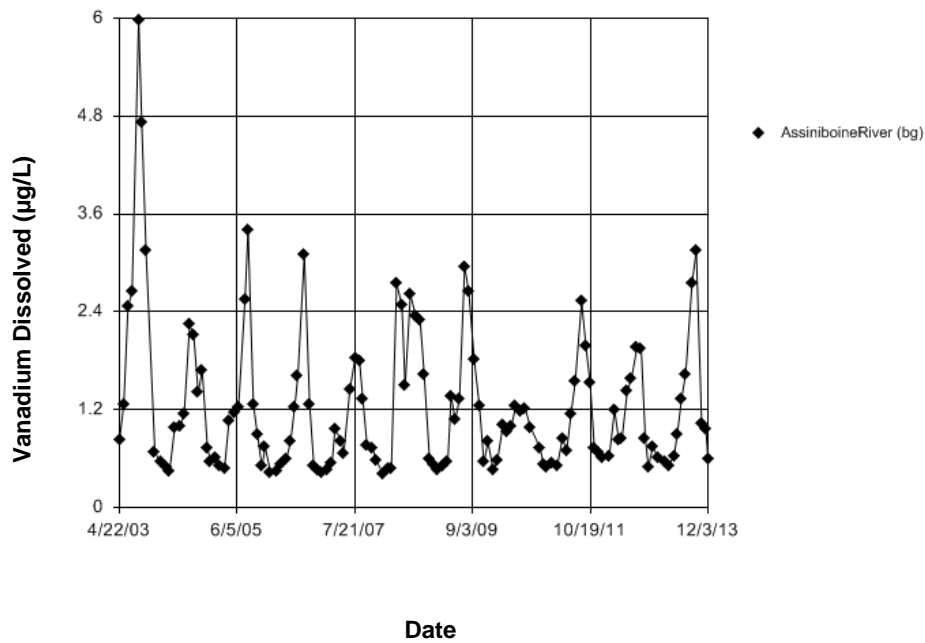


Figure E820 Assiniboine River: Vanadium Dissolved



## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 77.13  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 77.13  
 Adjusted Kruskal-Wallis statistic (H') = 77.13

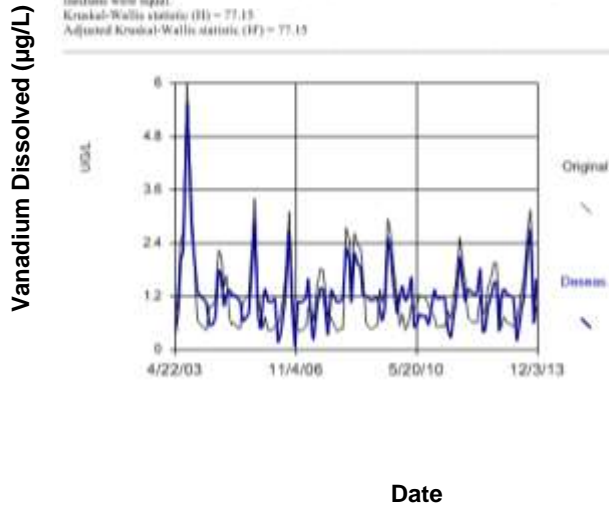


Figure E821 Assiniboine River: Vanadium Dissolved

## Seasonal Kendall

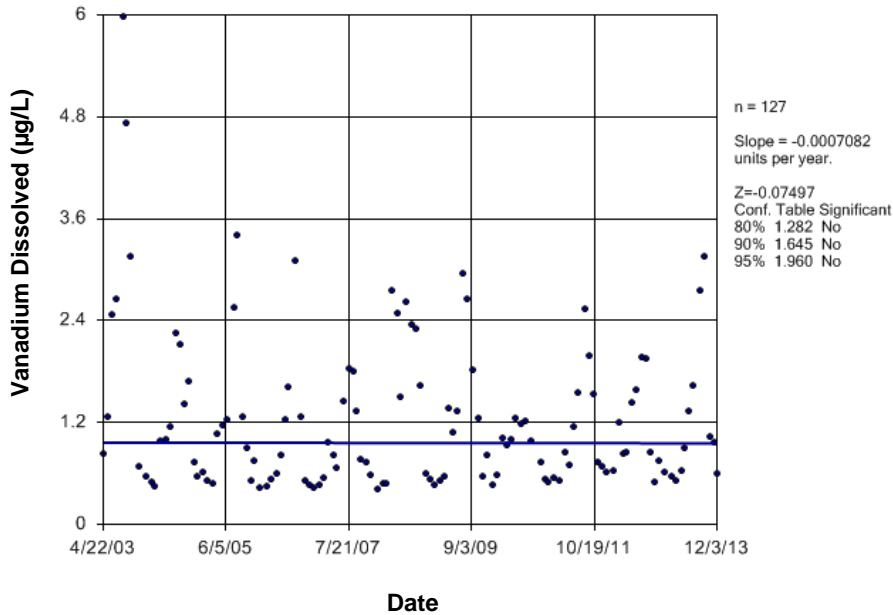


Figure E822 Assiniboine River: Vanadium Dissolved

## Time Series

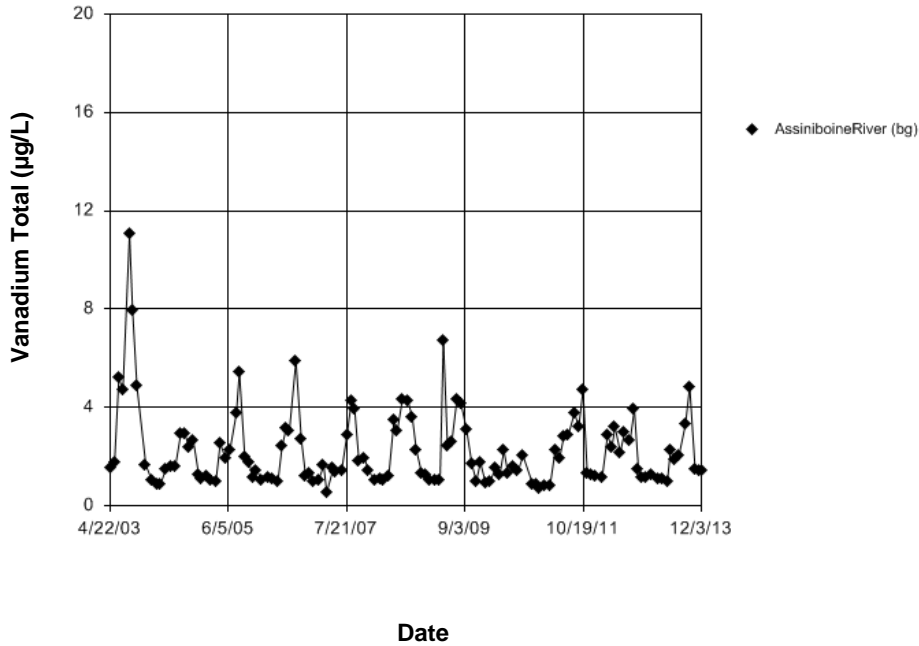


Figure E823 Assiniboine River: Vanadium Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates **SEASONALITY** at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.  
 Calculated Kruskal-Wallis statistic = 68.55  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 4 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 68.55  
 Adjusted Kruskal-Wallis statistic (H') = 68.55

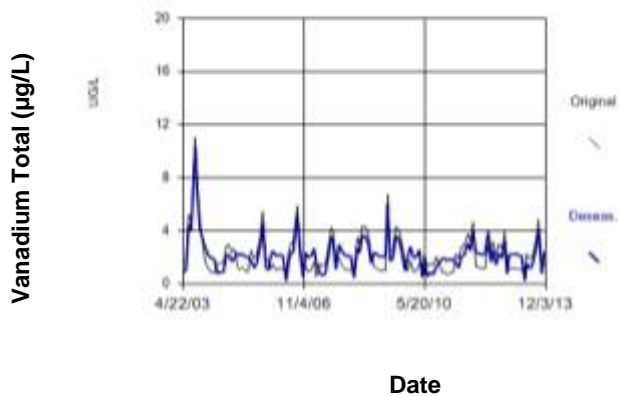


Figure E824 Assiniboine River: Vanadium Total

### Seasonal Kendall

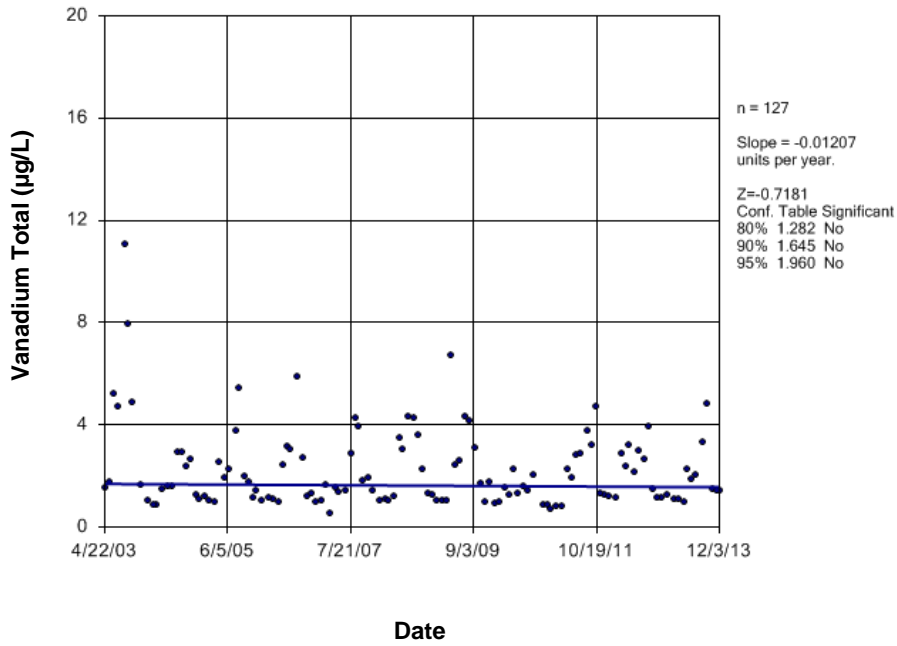


Figure E825 Assiniboine River: Vanadium Total

### Time Series

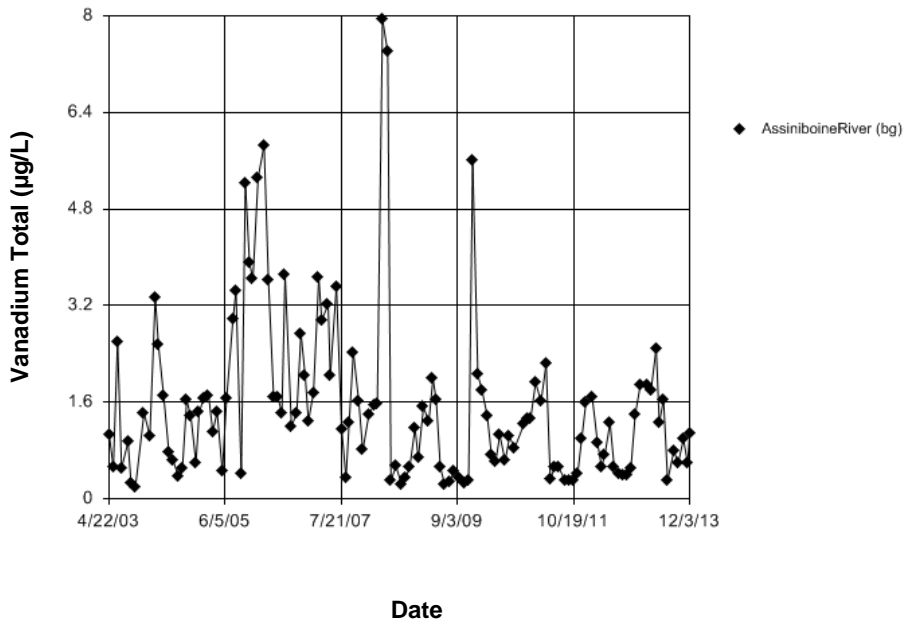


Figure E826 Assiniboine River: Zinc Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 16.18  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

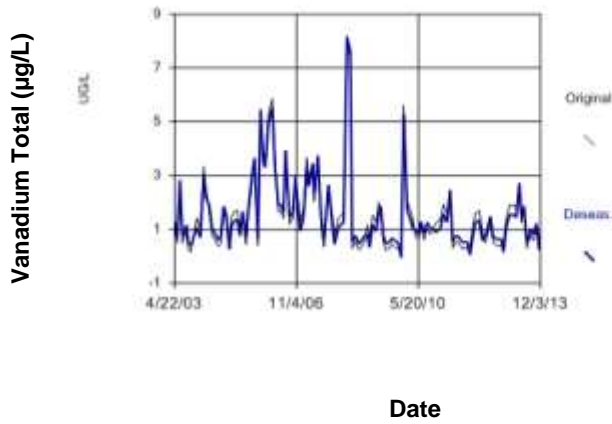


Figure E827 Assiniboine River: Zinc Dissolved

## Seasonal Kendall

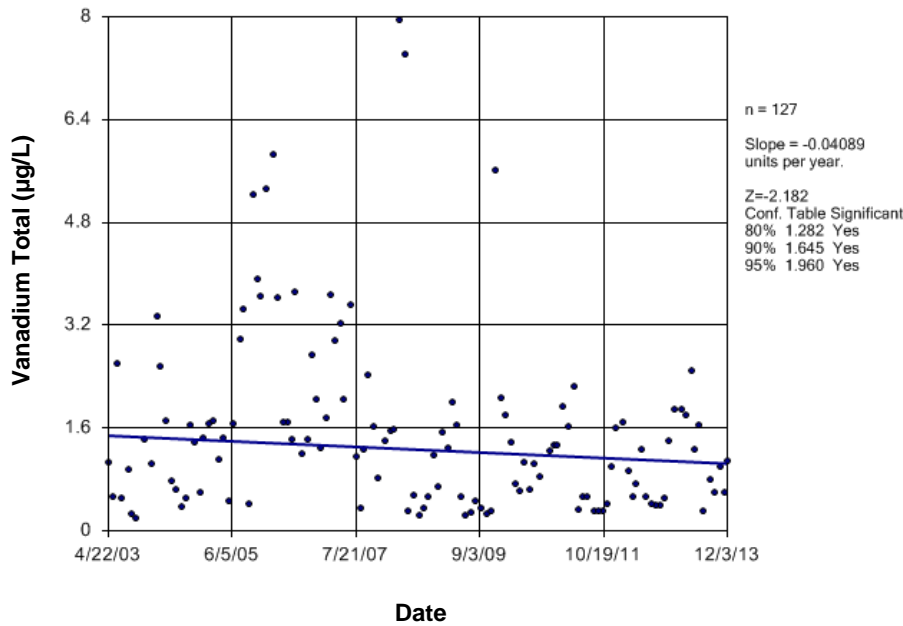
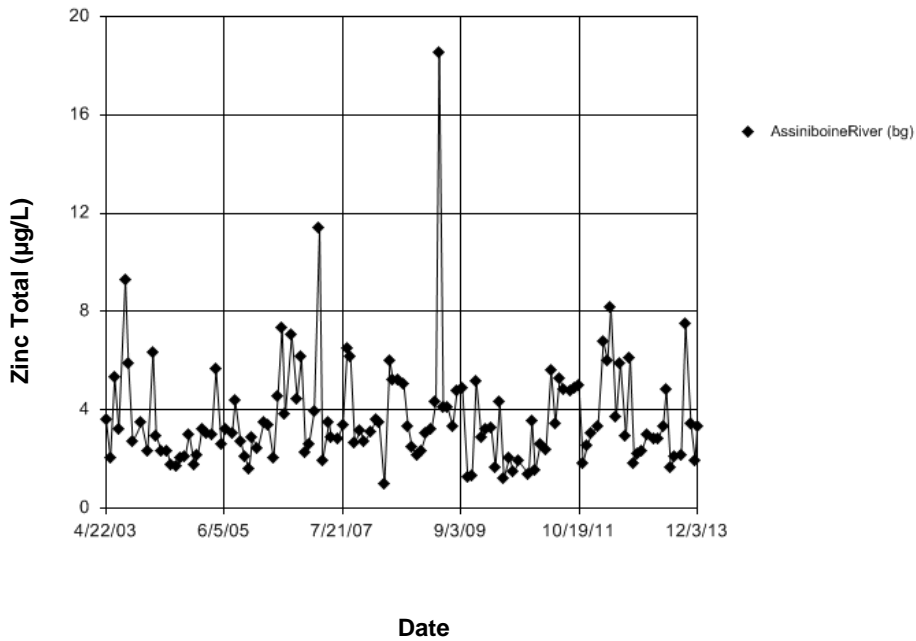


Figure E828 Assiniboine River: Zinc Dissolved

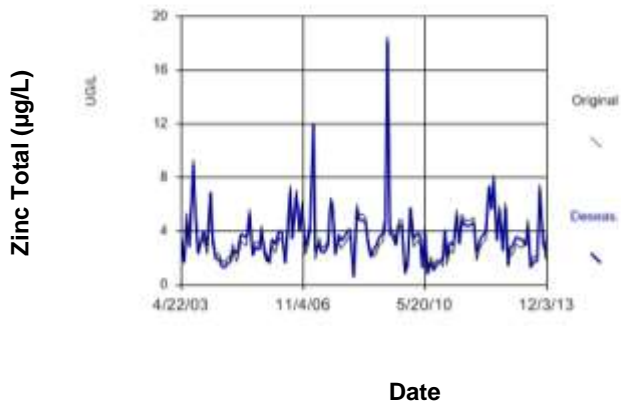
## Time Series



**Figure E829 Assiniboine River: Zinc Total**

## Seasonality

For the data shown, the Kruskal-Wallis test indicates **SEASONALITY** at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 6.54. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (B) was necessary.



**Figure E830 Assiniboine River: Zinc Total**

# Seasonal Kendall

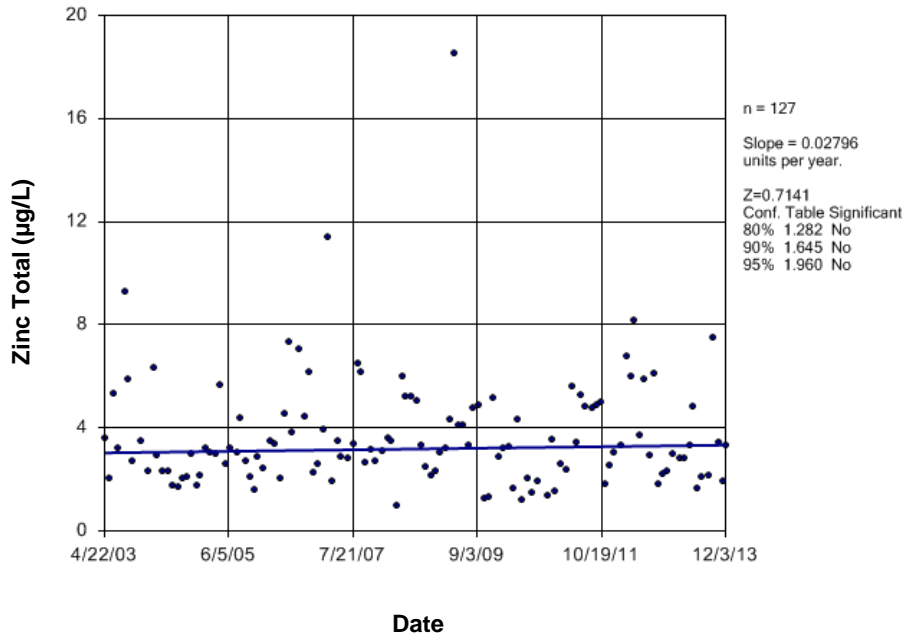


Figure E831 Assiniboine River: Zinc Total

## Time Series

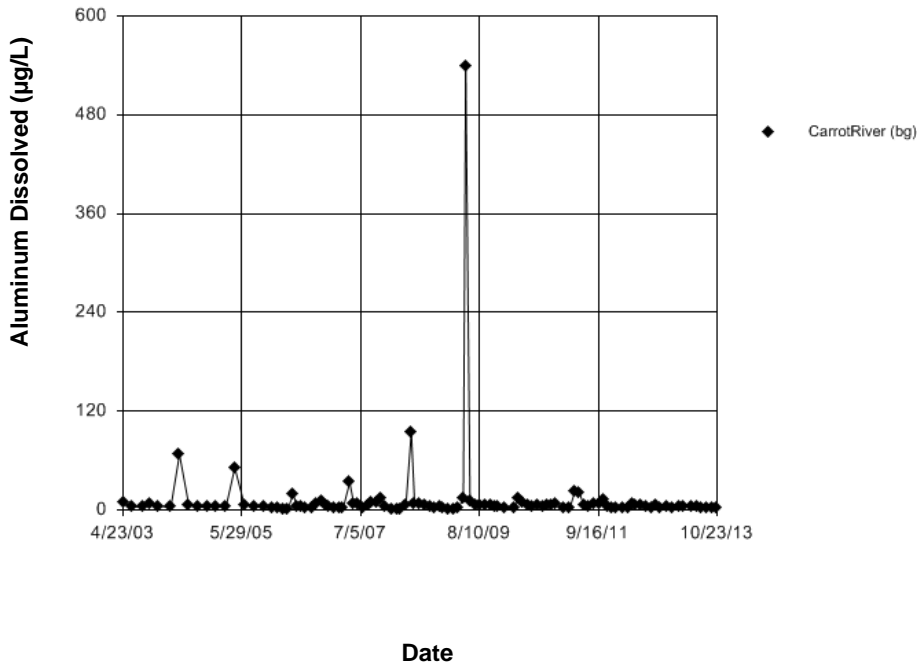


Figure E832 Carrot River: Aluminum Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 33.21. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

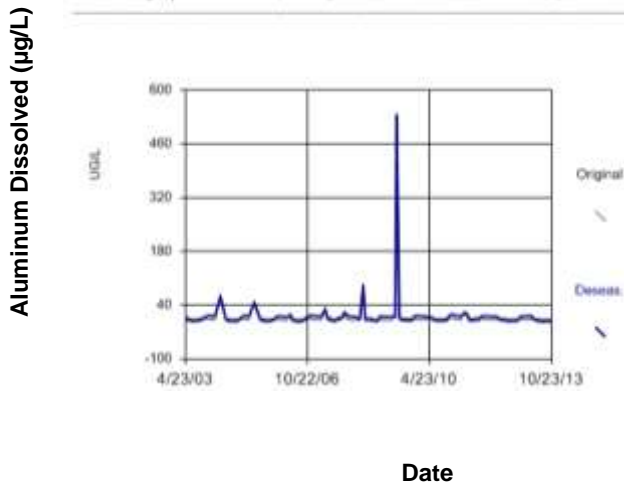


Figure E833 Carrot River: Aluminum Dissolved

### Seasonal Kendall

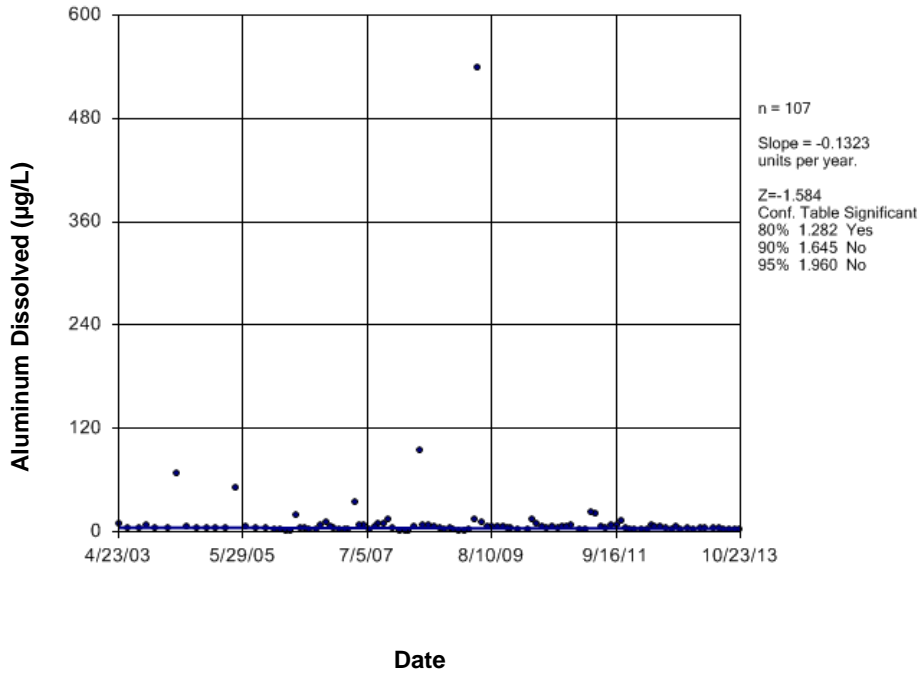


Figure E834 Carrot River: Aluminum Dissolved

### Time Series

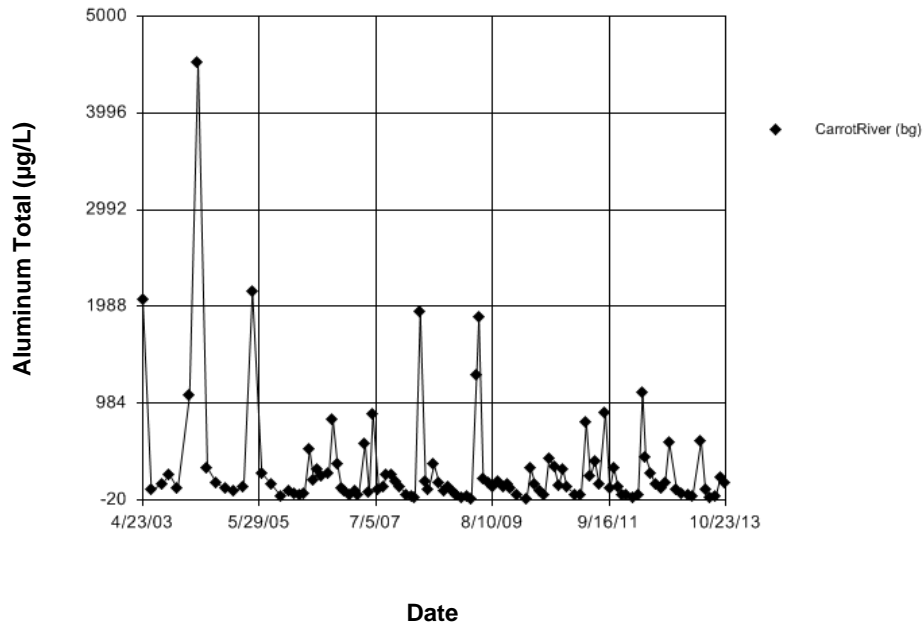


Figure E835 Carrot River: Aluminum Total



## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 1% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 40.55  
 Tabulated Chi-squared value = 3.841 with 1 degree of freedom at the 1% significance level.  
 There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 40.55  
 Adjusted Kruskal-Wallis statistic (H') = 40.55

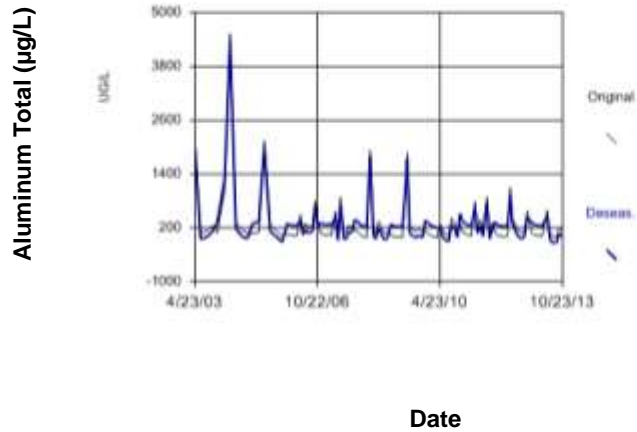


Figure E836 Carrot River: Aluminum Total

## Seasonal Kendall

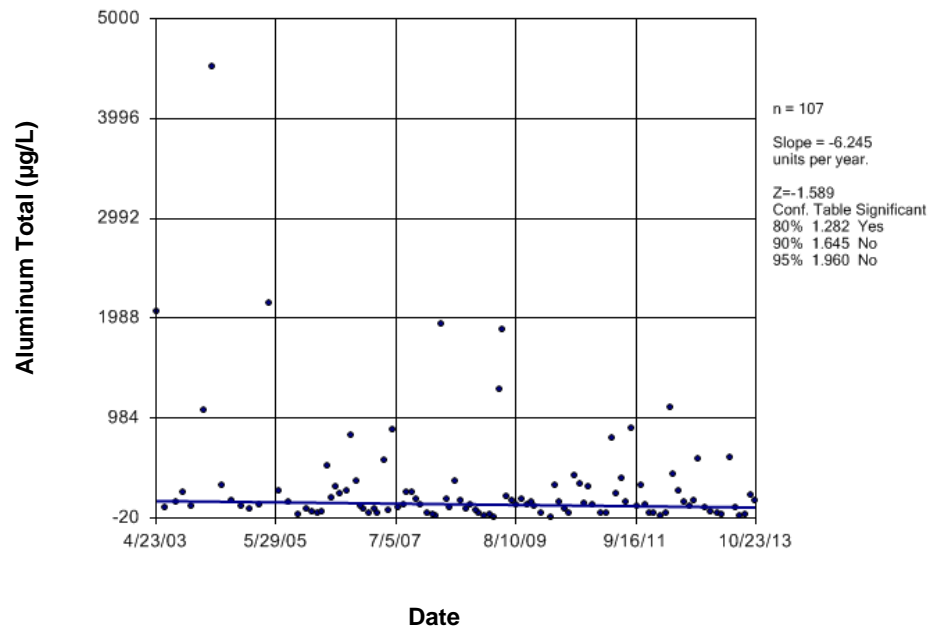
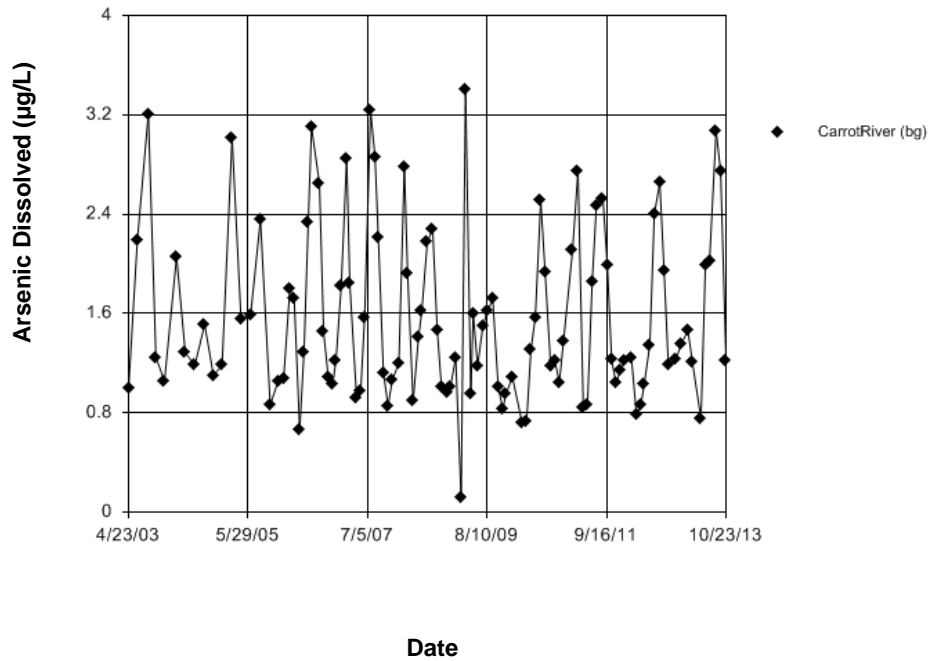


Figure E837 Carrot River: Aluminum Total

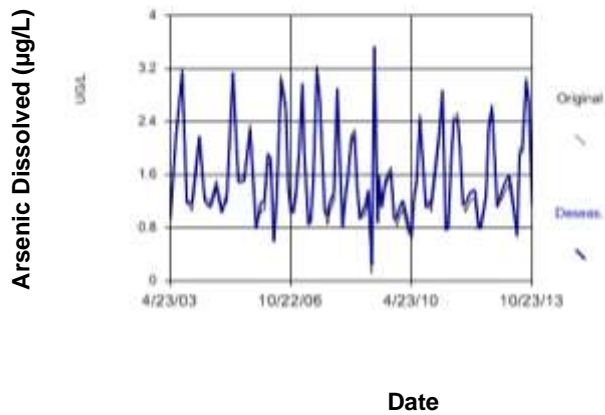
### Time Series



**Figure E838 Carrot River: Arsenic Dissolved**

### Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 2.633  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 2.633  
 Adjusted Kruskal-Wallis statistic (H') = 2.633



**Figure E839 Carrot River: Arsenic Dissolved**

## Sen's Slope Estimator

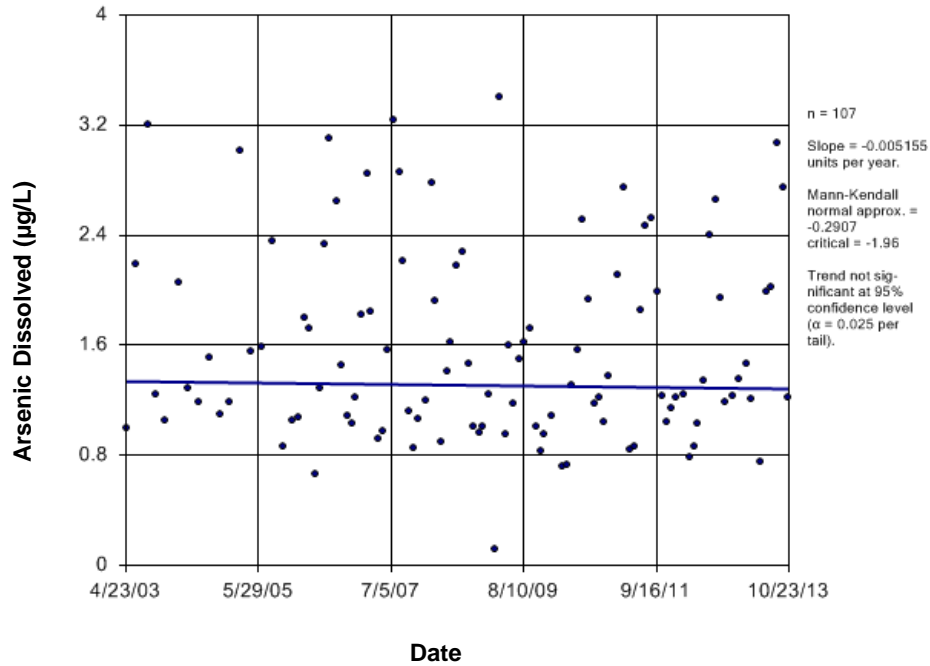


Figure E840 Carrot River: Arsenic Dissolved

## Time Series

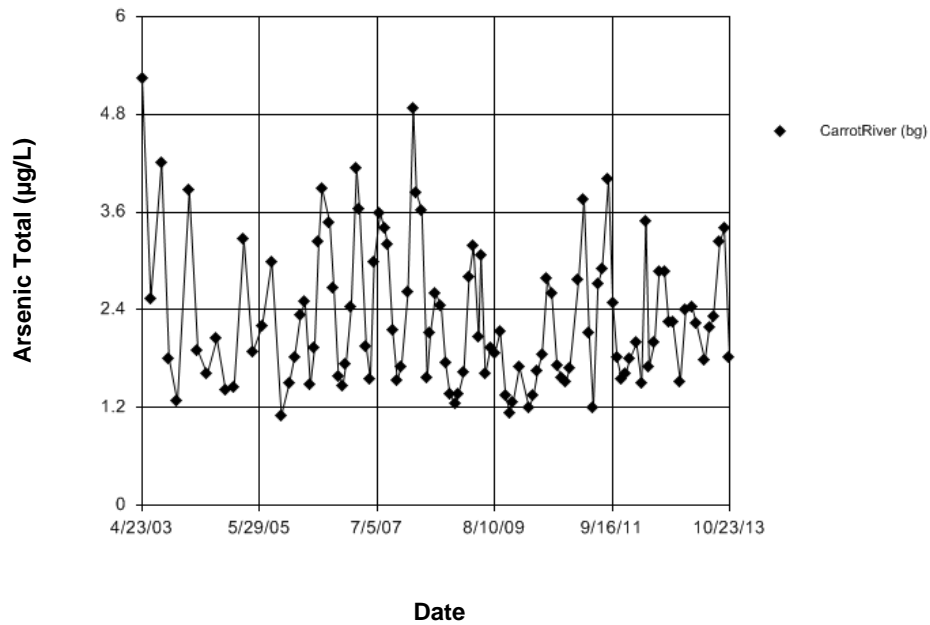
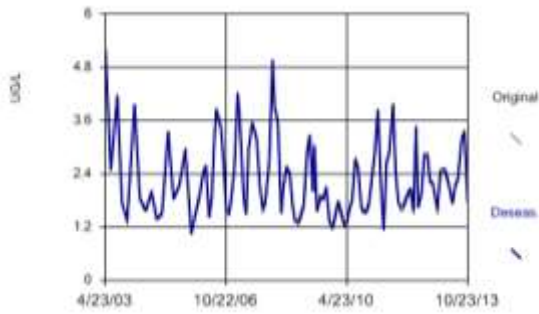


Figure E841 Carrot River: Arsenic Total

# Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-Squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 2.529  
 Tabulated Chi-Squared value = 3.841 with 3 degrees of freedom at the 5% significance level.  
 There were 3 groups of data in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 2.529  
 Adjusted Kruskal-Wallis statistic (H') = 2.529

Arsenic Total (µg/L)



Date

Figure E842 Carrot River: Arsenic Total

# Sen's Slope Estimator

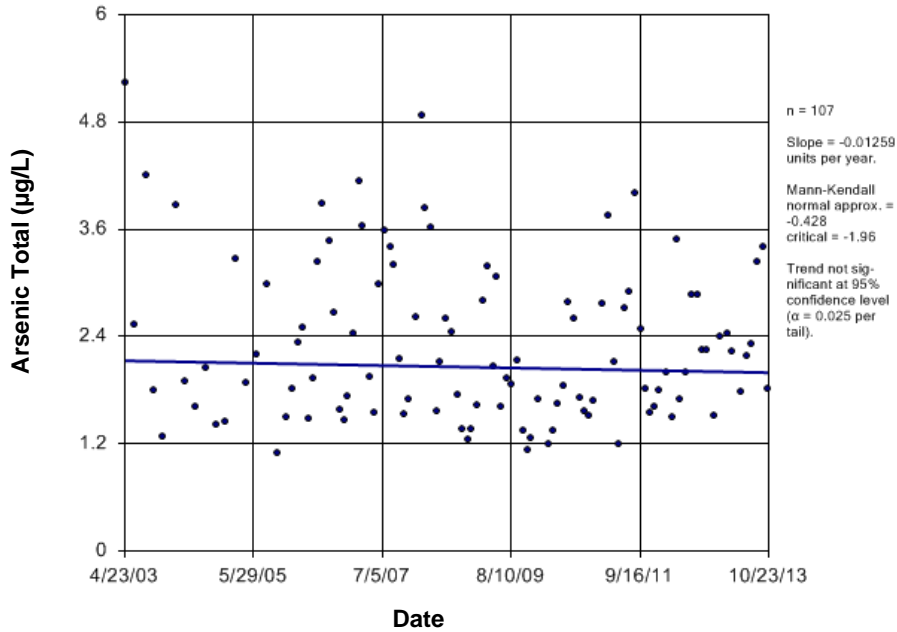


Figure E843 Carrot River: Arsenic Total

## Time Series

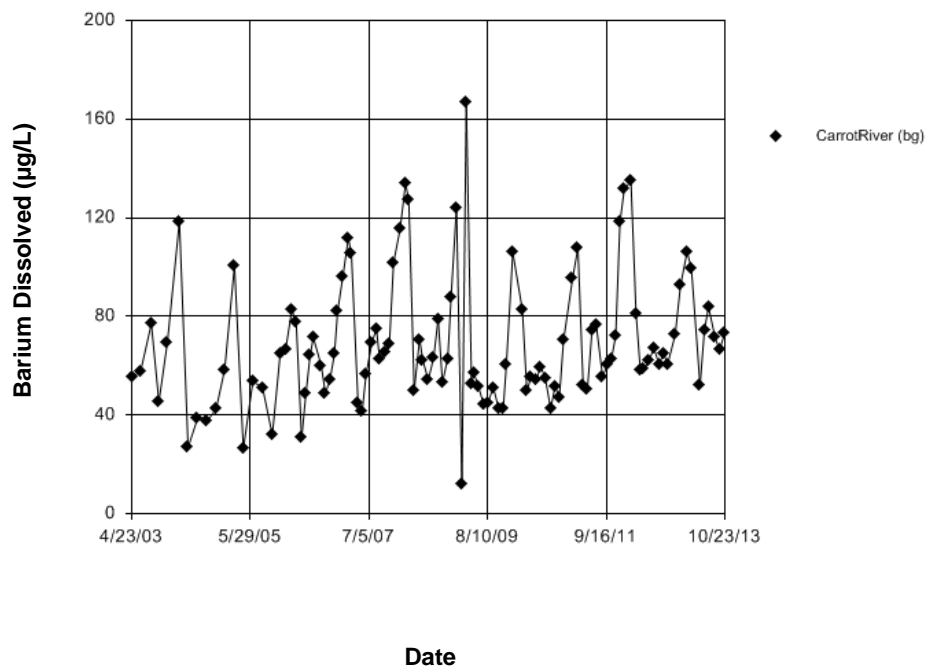


Figure E844 Carrot River: Barium Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 40.68  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 40.68  
 Adjusted Kruskal-Wallis statistic (H') = 40.68

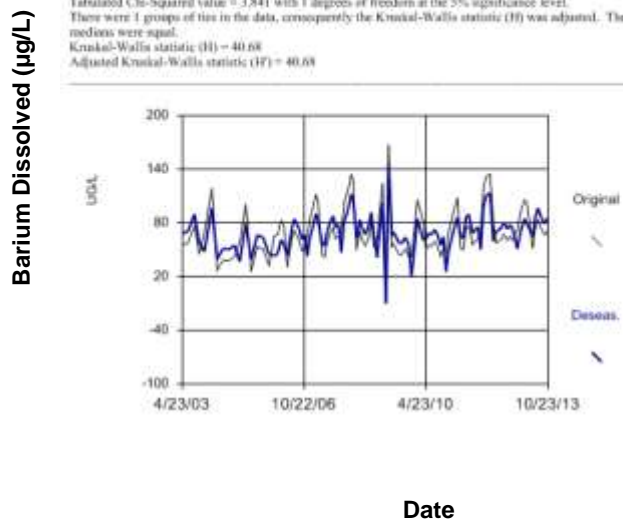


Figure E845 Carrot River: Barium Dissolved

### Seasonal Kendall

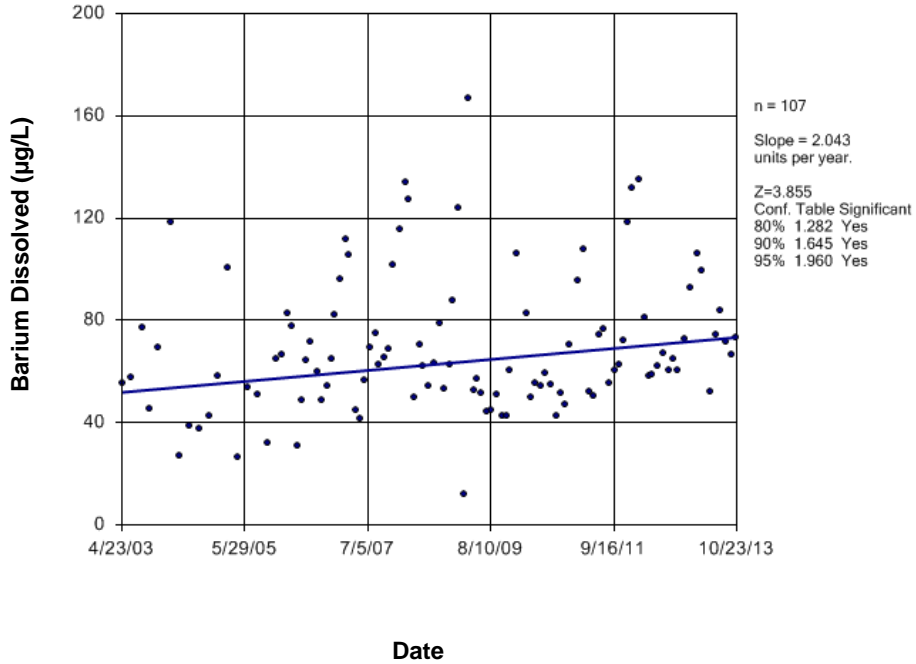


Figure E846 Carrot River: Barium Dissolved

### Time Series

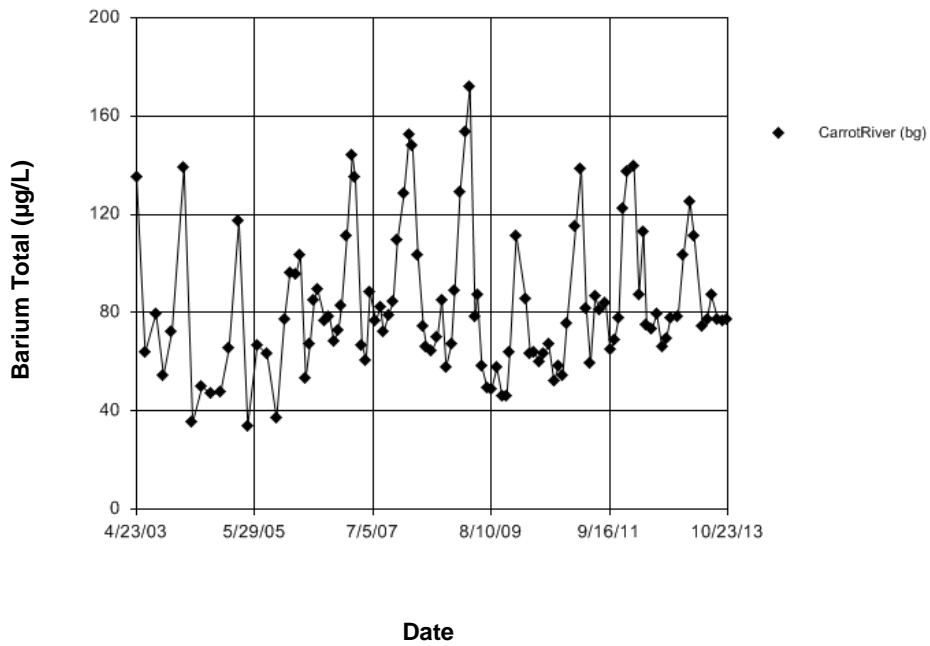
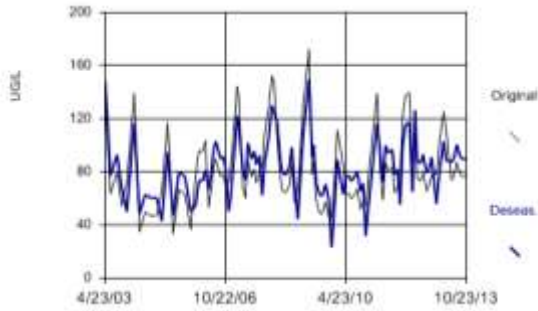


Figure E847 Carrot River: Barium Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 32.84. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal. Kruskal-Wallis statistic (H) = 32.84. Adjusted Kruskal-Wallis statistic (H') = 32.84.

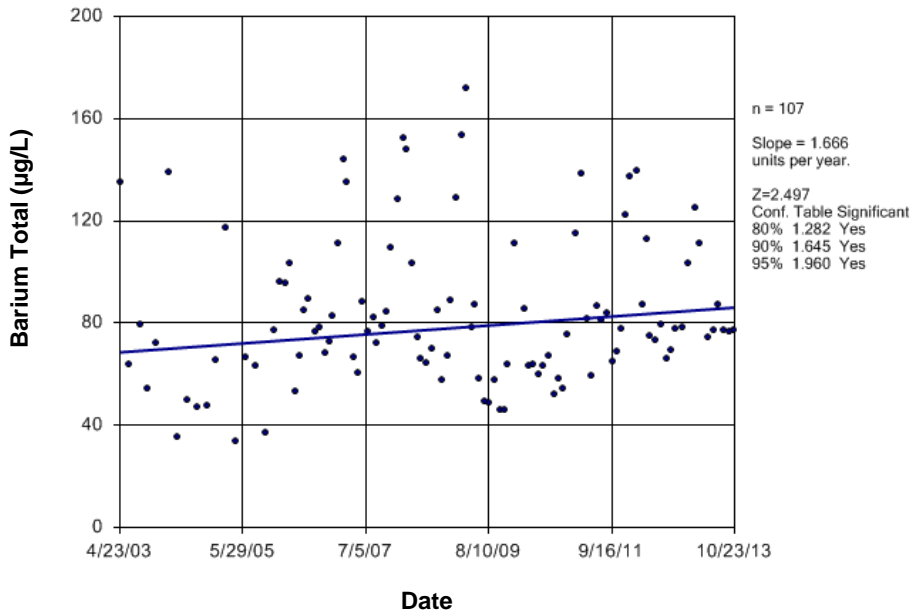
Barium Total (µg/L)



Date

Figure E848 Carrot River: Barium Total

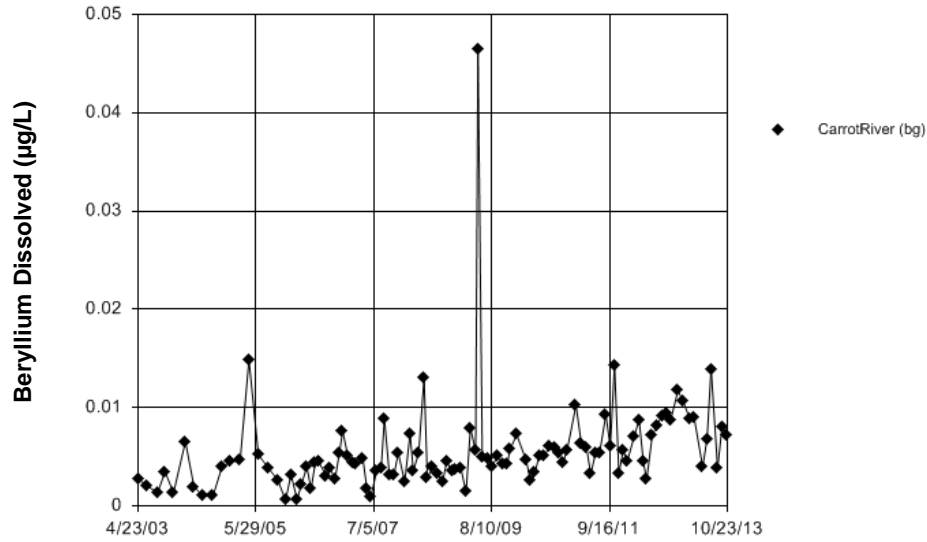
## Seasonal Kendall



Date

Figure E849 Carrot River: Barium Total

## Time Series

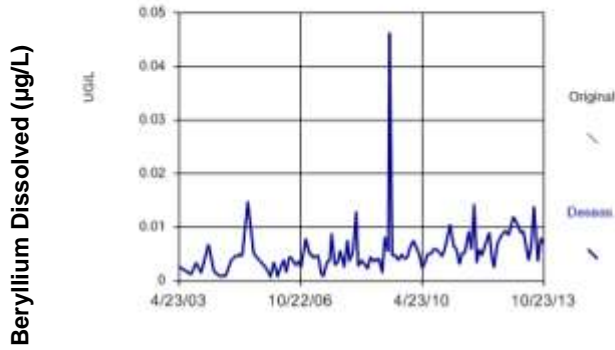


Date

Figure E850 Carrot River: Beryllium Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.5201  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 4 groups of this data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 0.5201  
 Adjusted Kruskal-Wallis statistic (H') = 0.3200



Date

Figure E851 Carrot River: Beryllium Dissolved



### Sen's Slope Estimator

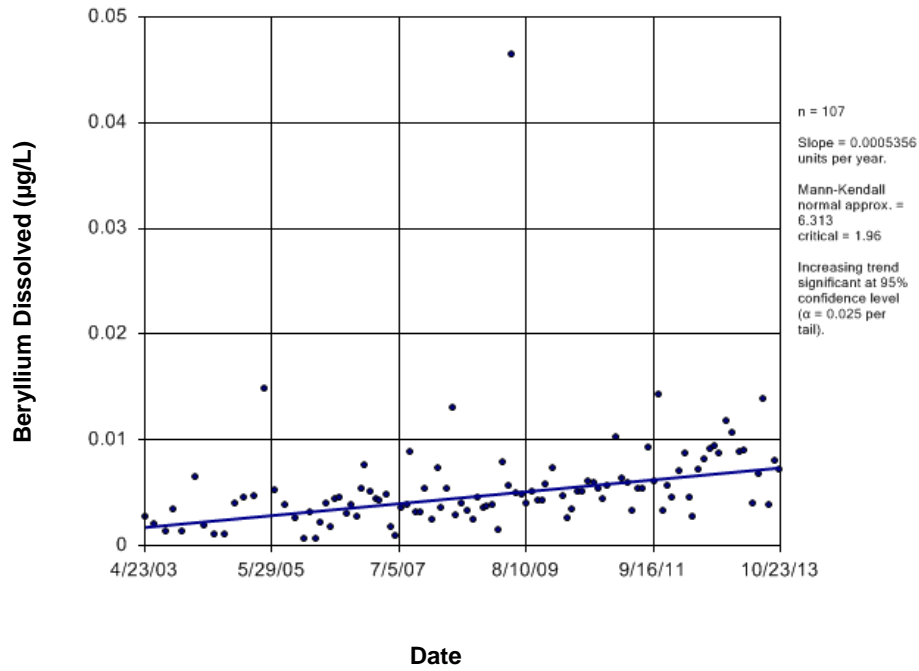


Figure E852 Carrot River: Beryllium Dissolved

### Time Series

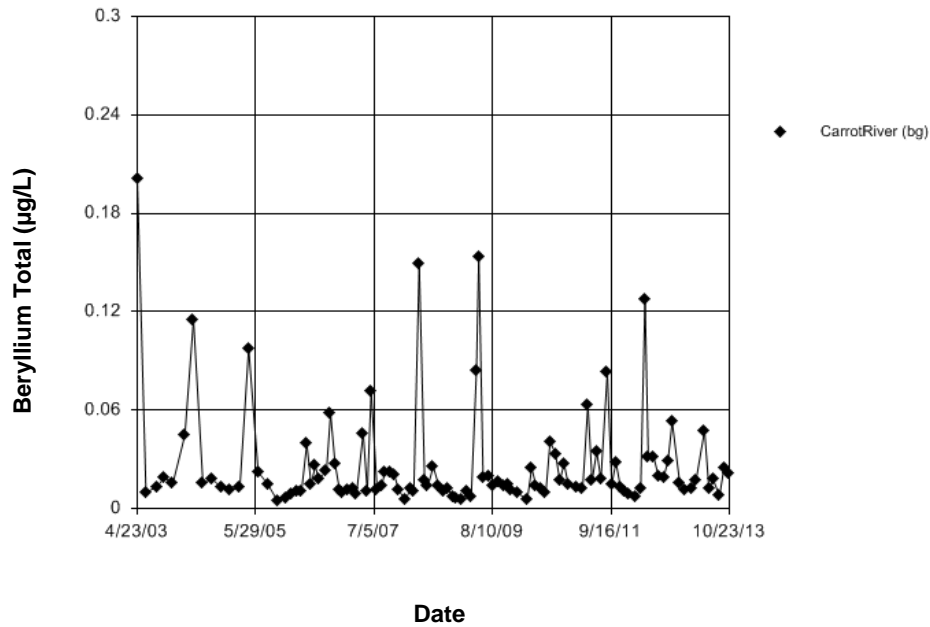
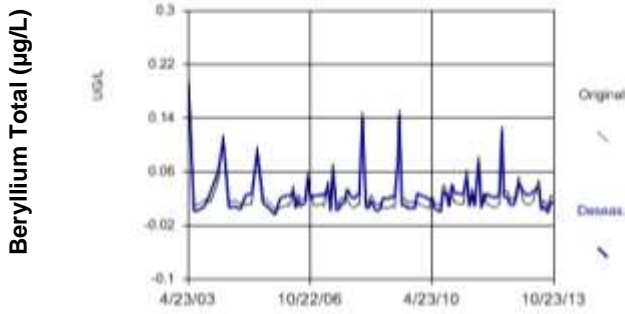


Figure E853 Carrot River: Beryllium Total

## Seasonality

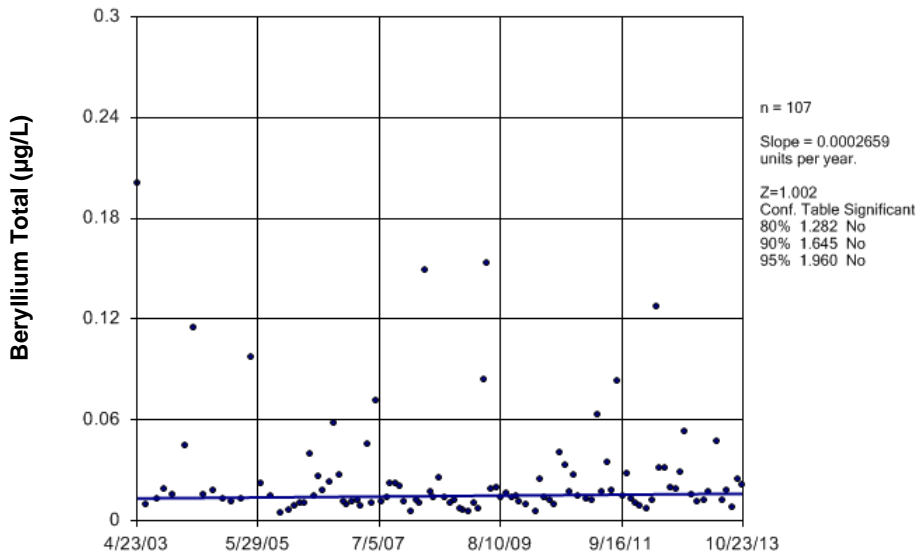
For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 37.43  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 0 groups of ties in the data, so an adjustment to the Kruskal-Wallis statistic (H) was necessary.



Date

Figure E854 Carrot River: Beryllium Total

## Seasonal Kendall



Date

Figure E855 Carrot River: Beryllium Total

## Time Series

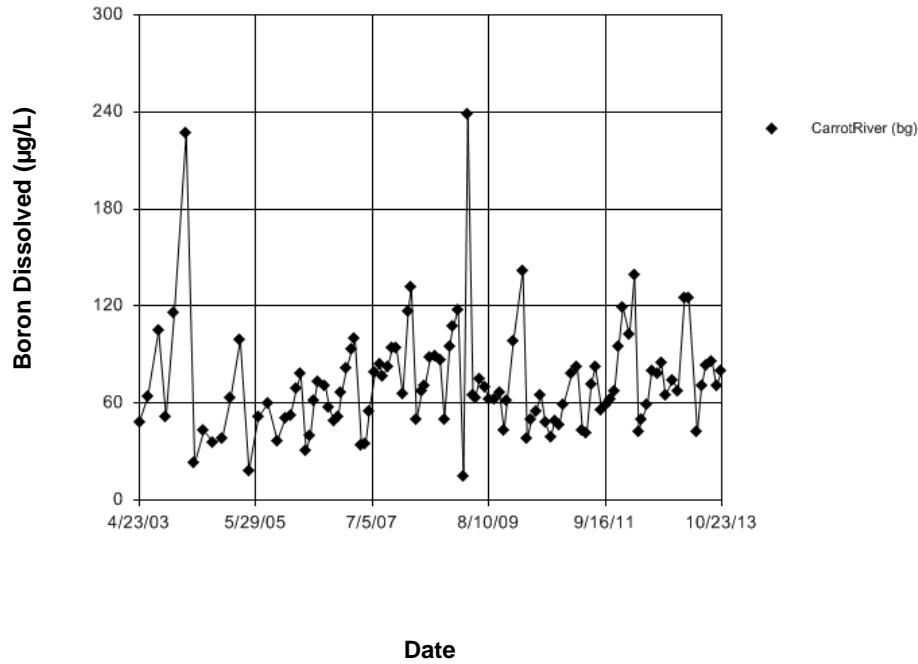


Figure E856 Carrot River: Boron Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 23.51  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 23.51  
 Adjusted Kruskal-Wallis statistic (H') = 23.51

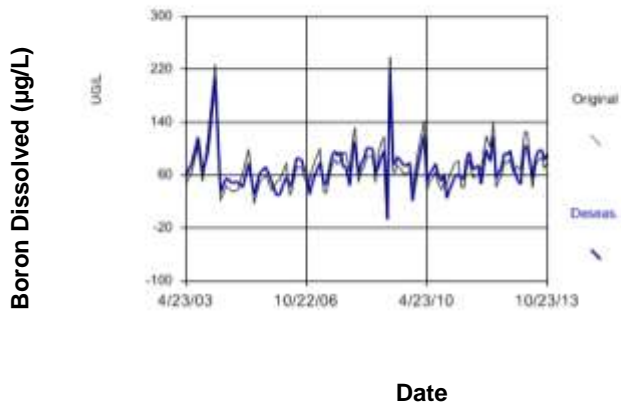


Figure E857 Carrot River: Boron Dissolved

### Seasonal Kendall

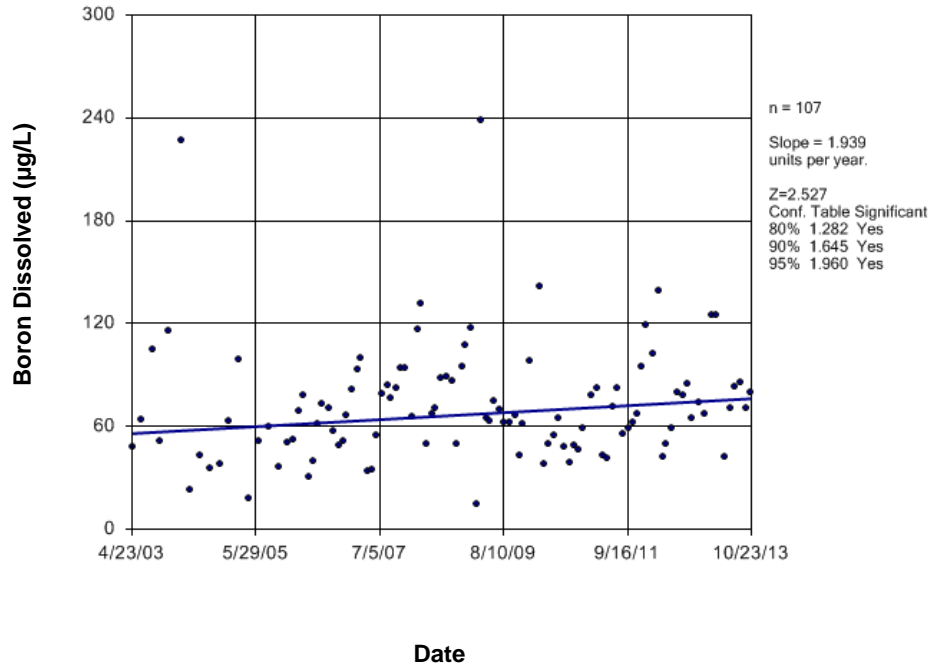


Figure E858 Carrot River: Boron Dissolved

### Time Series

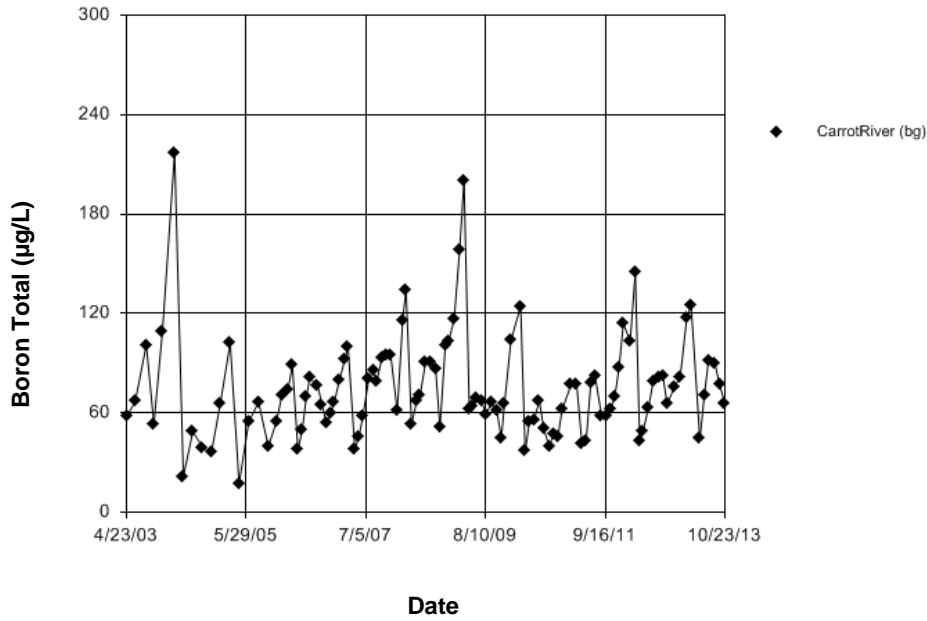


Figure E859 Carrot River: Boron Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 29.46  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 4 groups of data in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

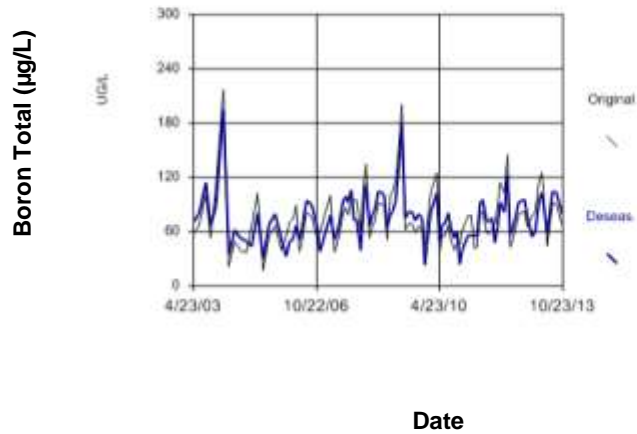


Figure E860 Carrot River: Boron Total

## Seasonal Kendall

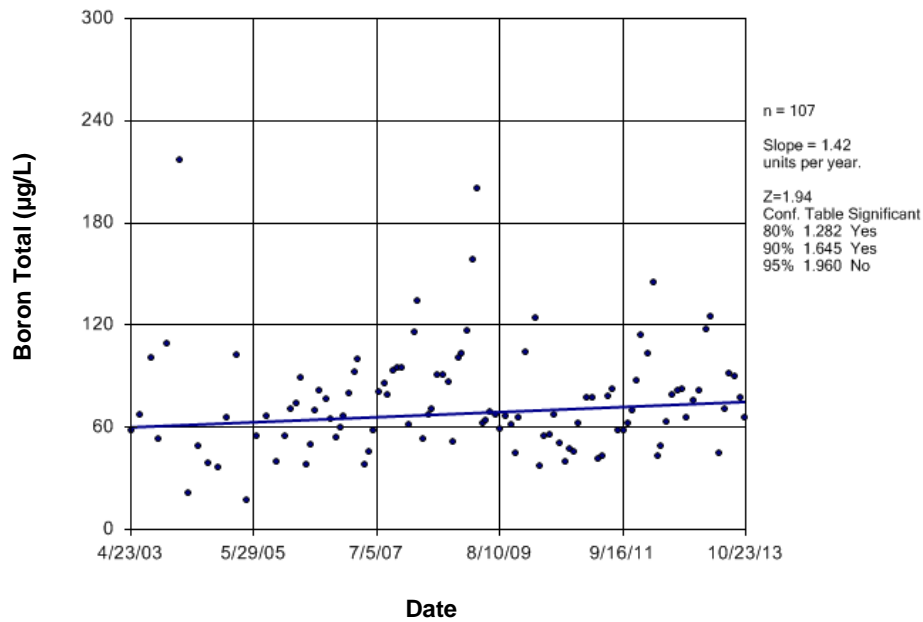
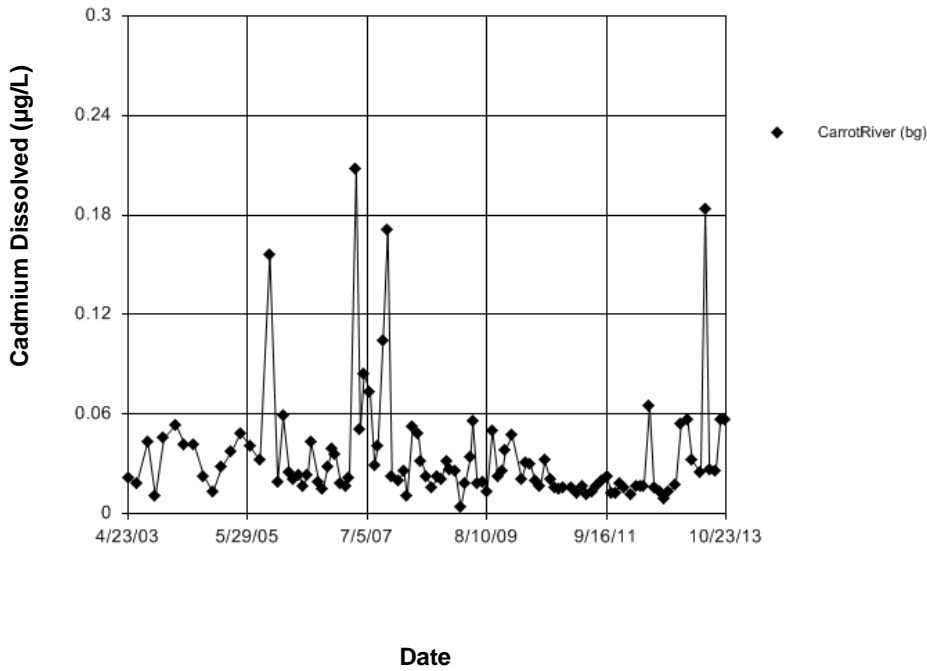


Figure E861 Carrot River: Boron Total

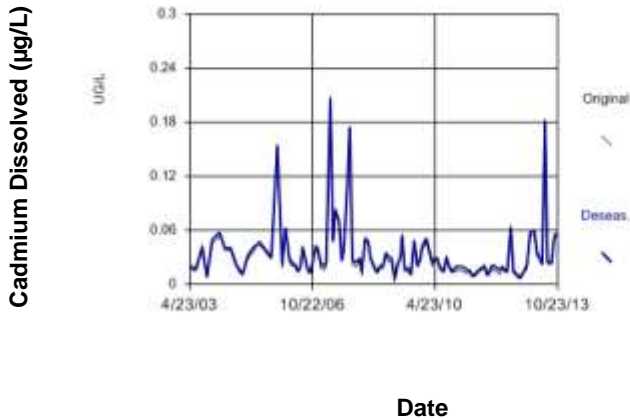
### Time Series



**Figure E862 Carrot River: Cadmium Dissolved**

### Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.6324. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal. Kruskal-Wallis statistic (H) = 0.6324. Adjusted Kruskal-Wallis statistic (H') = 0.6324.



**Figure E863 Carrot River: Cadmium Dissolved**

### Sen's Slope Estimator

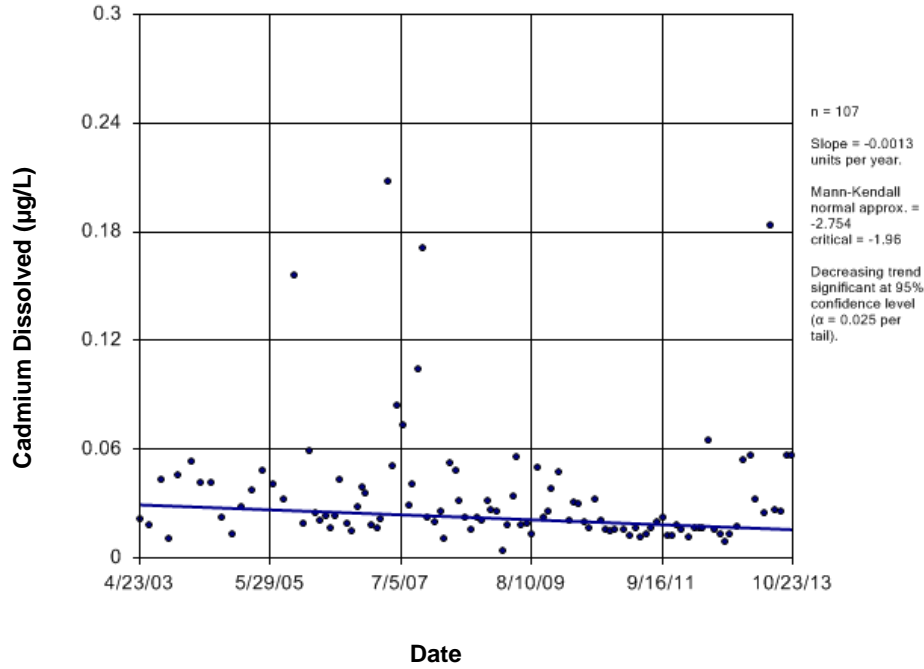


Figure E864 Carrot River: Cadmium Dissolved

### Time Series

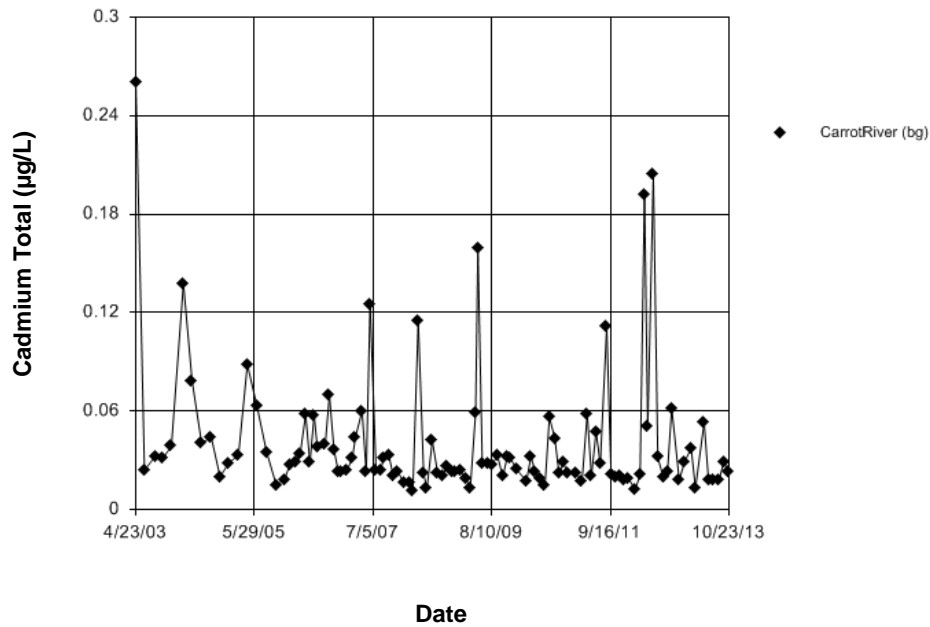
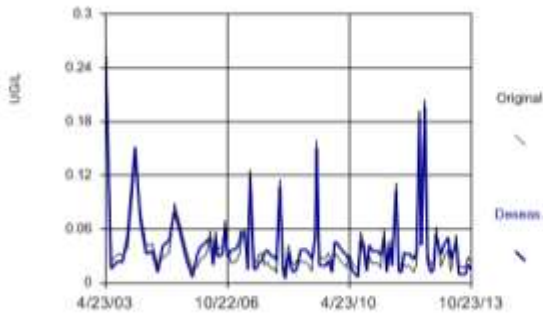


Figure E865 Carrot River: Cadmium Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 12.31  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
Kruskal-Wallis statistic (H) = 12.31  
Adjusted Kruskal-Wallis statistic (H') = 12.31

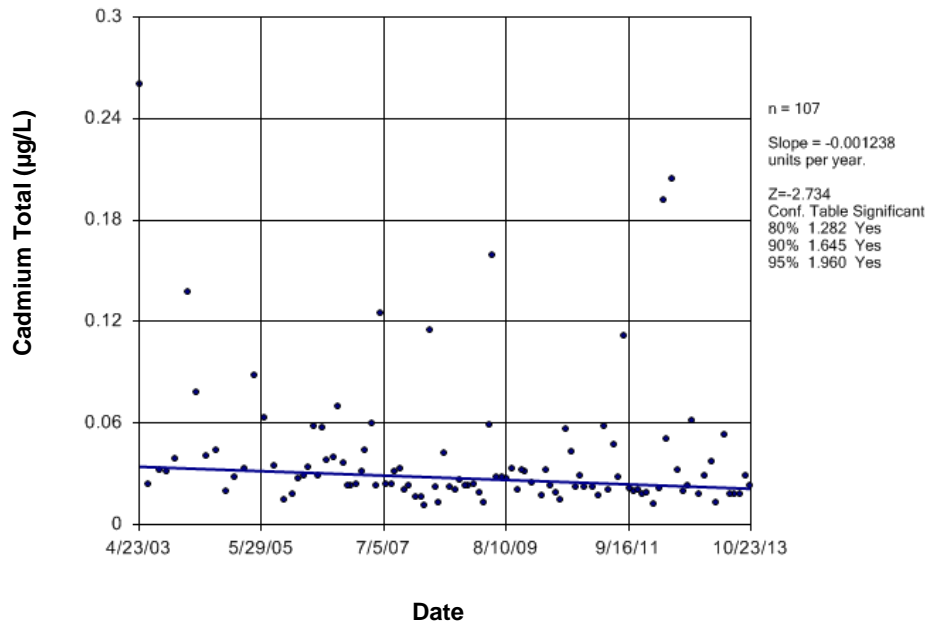
Cadmium Total (µg/L)



Date

Figure E866 Carrot River: Cadmium Total

## Seasonal Kendall



Date

Figure E867 Carrot River: Cadmium Total



## Time Series

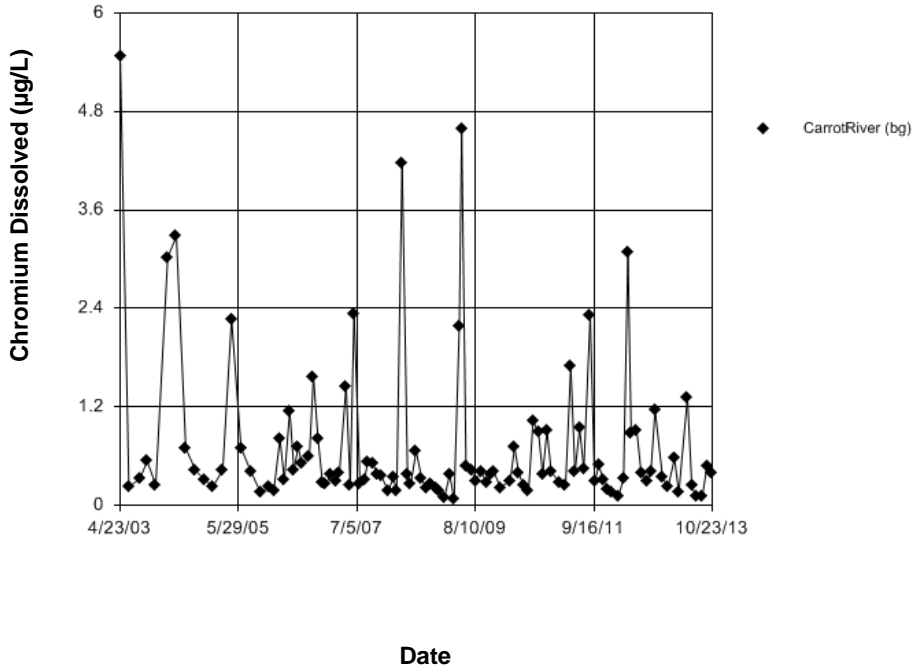


Figure E868 Carrot River: Chromium Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 20.9. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 8 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

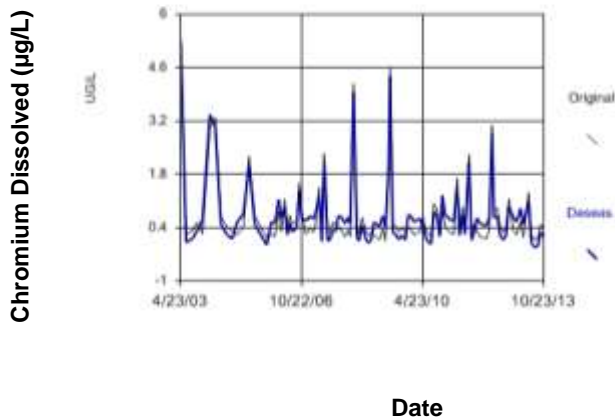


Figure E869 Carrot River: Chromium Dissolved

### Seasonal Kendall

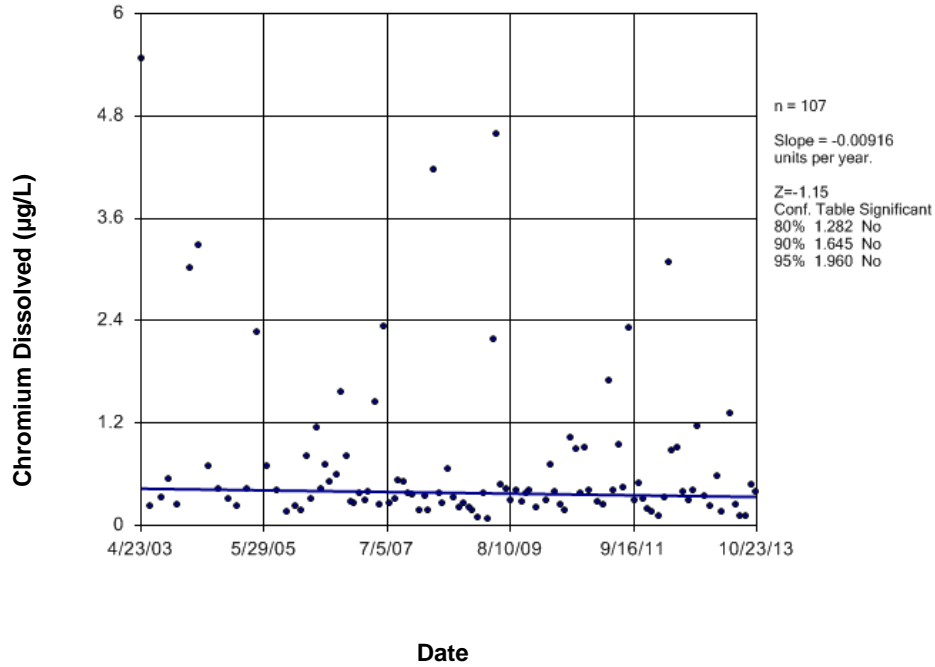


Figure E870 Carrot River: Chromium Dissolved

### Time Series

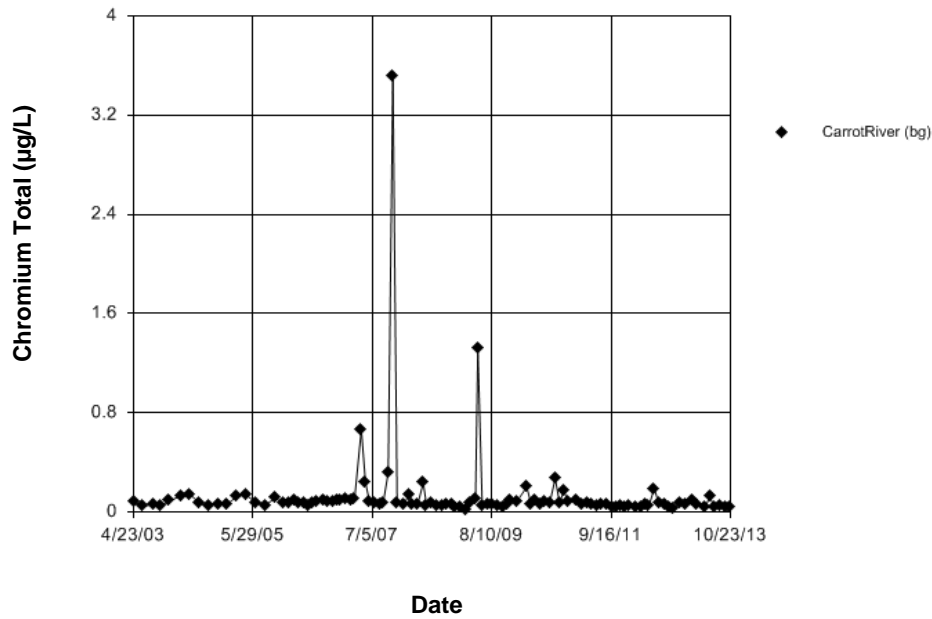
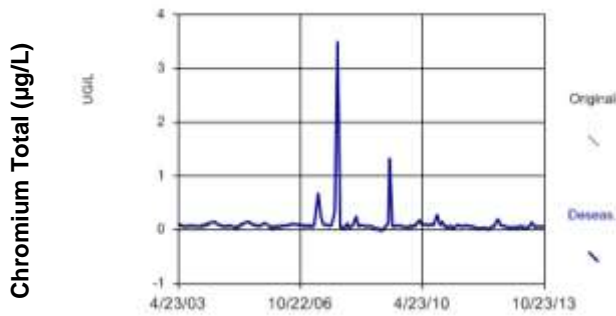


Figure E871 Carrot River: Chromium Total

# Seasonality

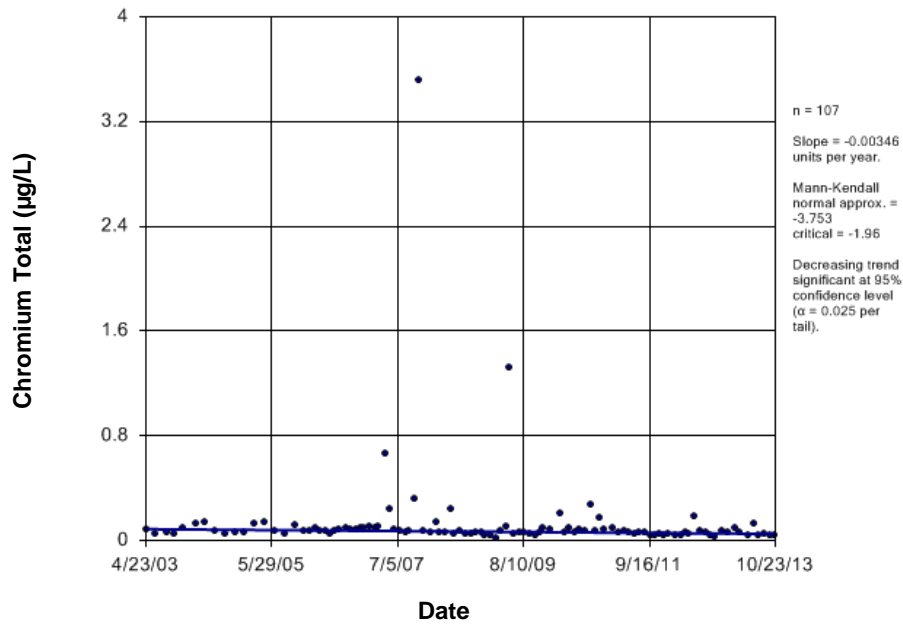
For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 2.043  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
Kruskal-Wallis statistic (H) = 2.043  
Adjusted Kruskal-Wallis statistic (H') = 2.041



Date

Figure E872 Carrot River: Chromium Total

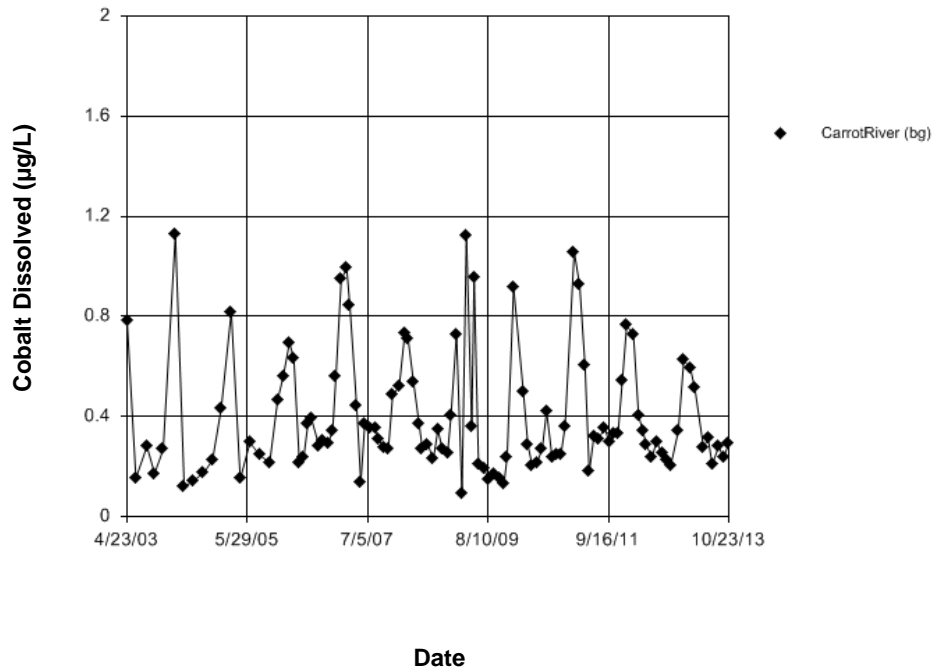
# Sen's Slope Estimator



Date

Figure E873 Carrot River: Chromium Total

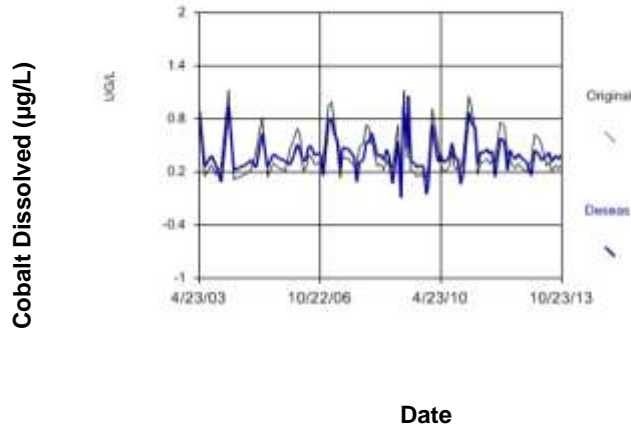
### Time Series



**Figure E874 Carrot River: Cobalt Dissolved**

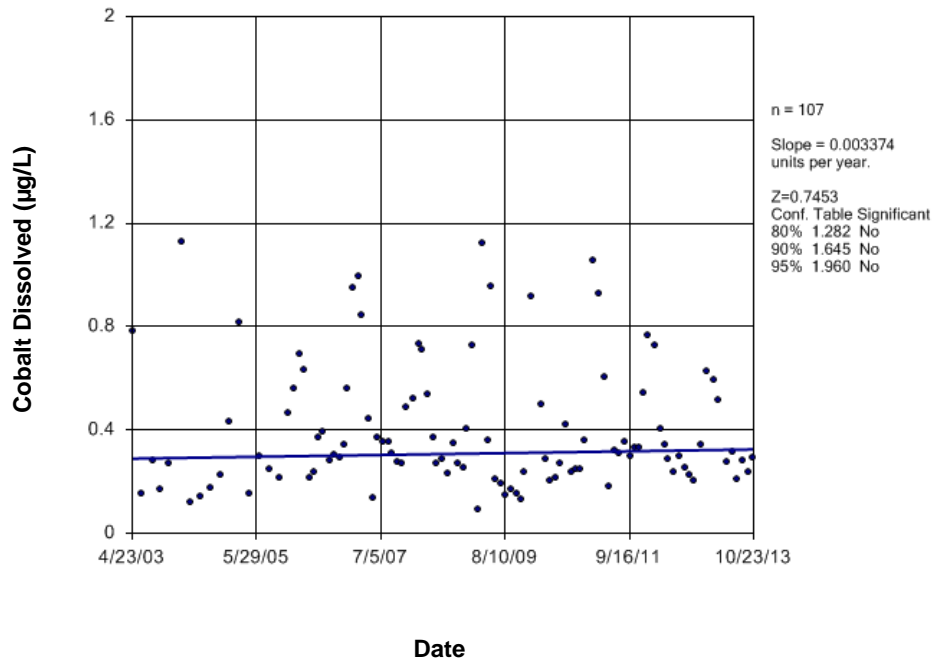
### Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 32.44  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 32.44  
 Adjusted Kruskal-Wallis statistic (H') = 32.44



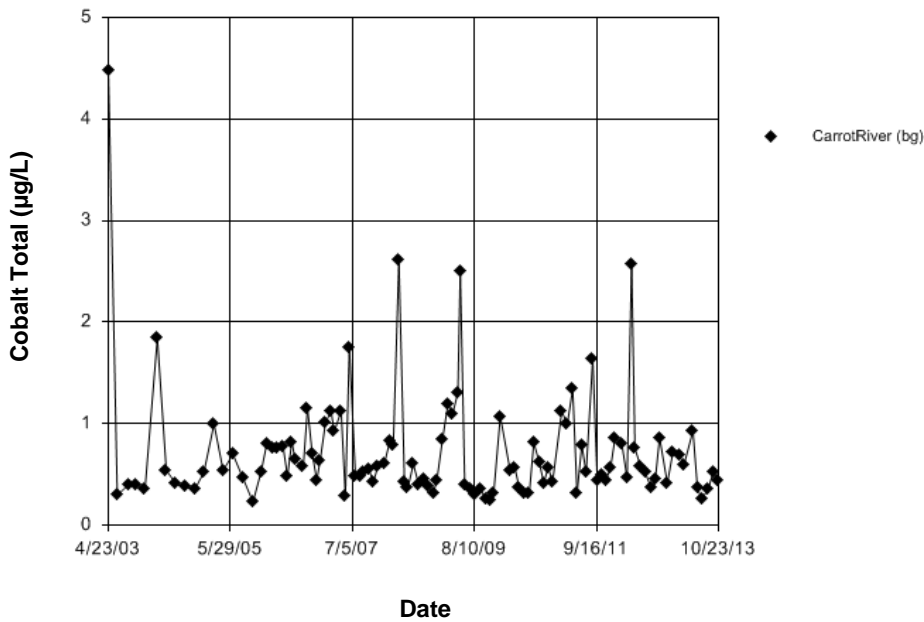
**Figure E875 Carrot River: Cobalt Dissolved**

### Seasonal Kendall



**Figure E876 Carrot River: Cobalt Dissolved**

### Time Series



**Figure E877 Carrot River: Cobalt Total**

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 5.314  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 5.314  
 Adjusted Kruskal-Wallis statistic (H') = 5.314

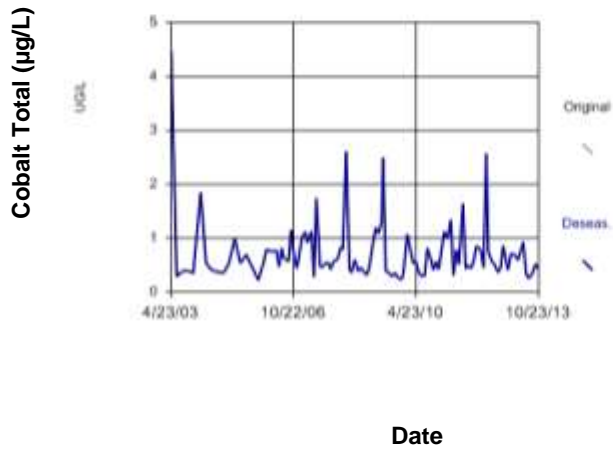


Figure 878 Carrot River: Cobalt Total

## Seasonal Kendall

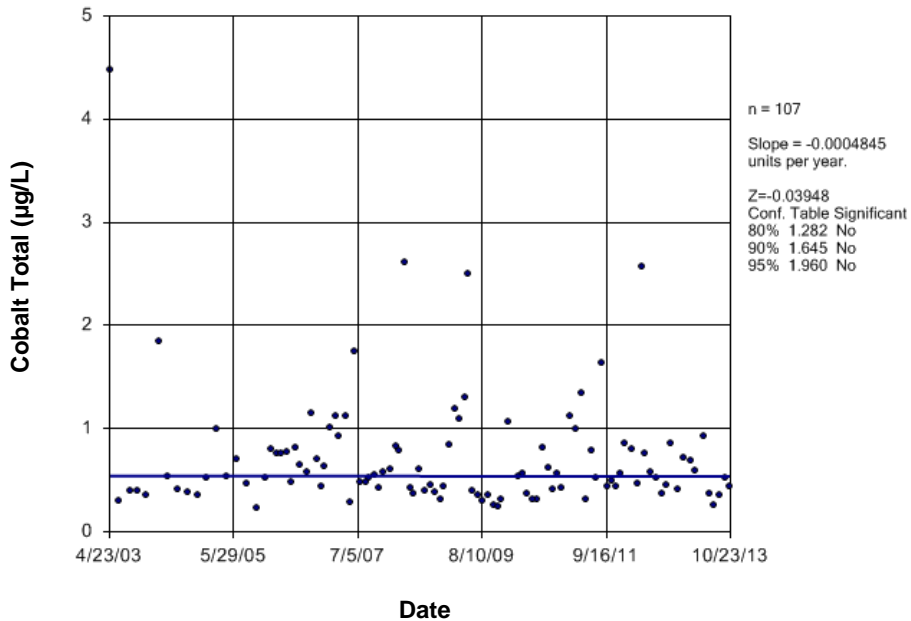


Figure E879 Carrot River: Cobalt Total

## Time Series

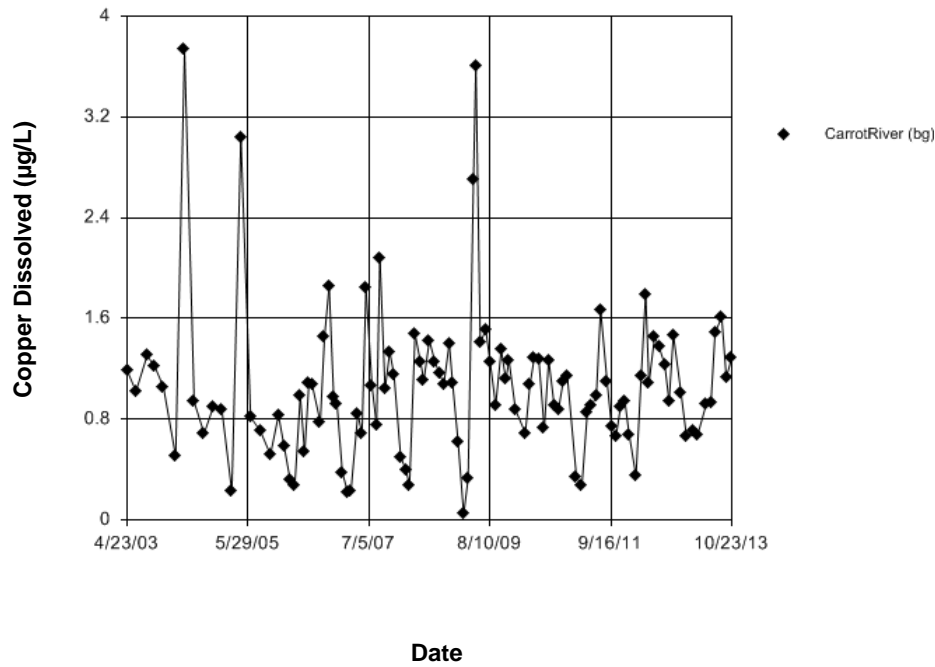


Figure E880 Carrot River: Copper Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 27.47. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

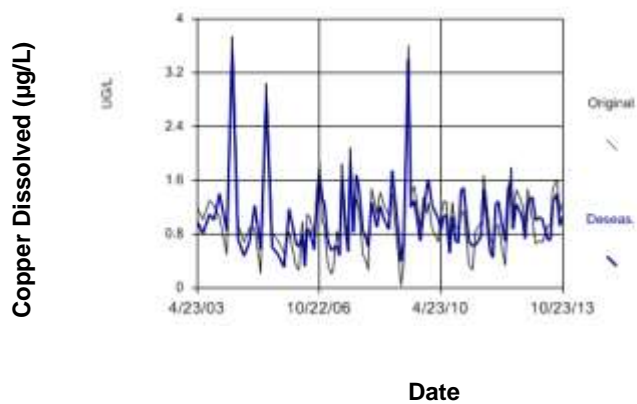


Figure E881 Carrot River: Copper Dissolved

### Seasonal Kendall

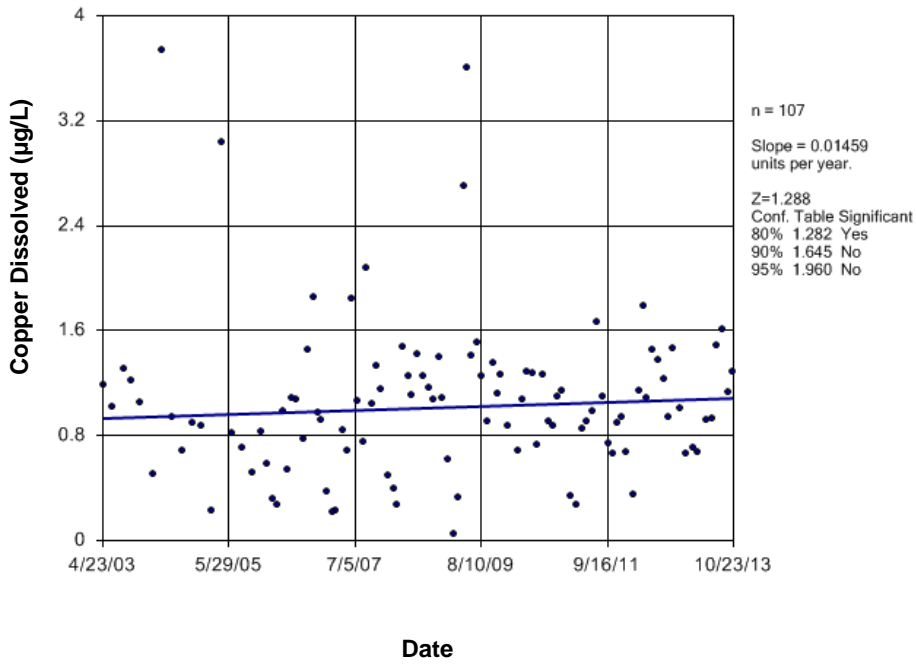


Figure E882 Carrot River: Copper Dissolved

### Time Series

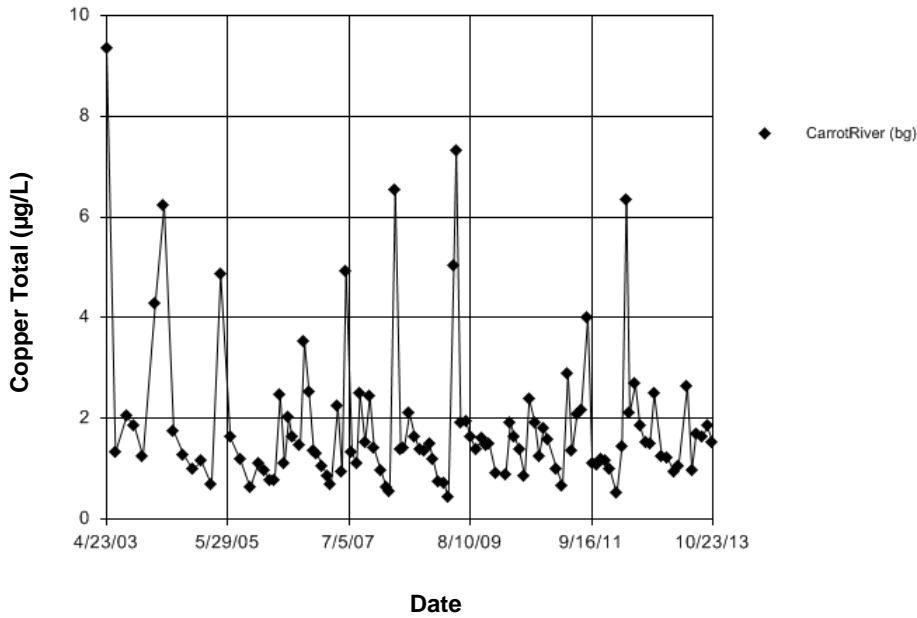


Figure E883 Carrot River: Copper Total



## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 34.94  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H<sub>1</sub>) was utilized to determine if the medians were equal.  
Kruskal-Wallis statistic (H) = 34.94  
Adjusted Kruskal-Wallis statistic (H<sub>1</sub>) = 34.94

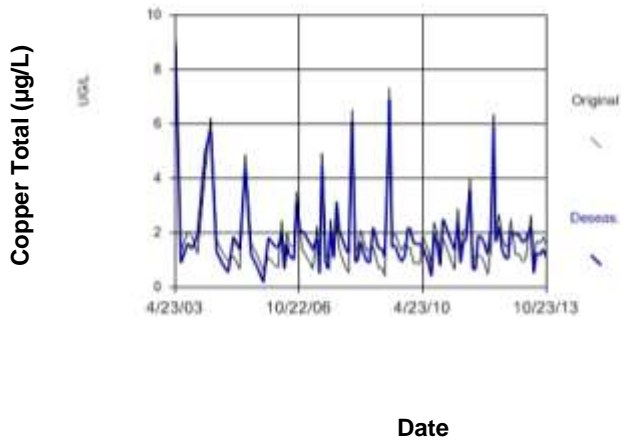


Figure E884 Carrot River: Copper Total

## Seasonal Kendall

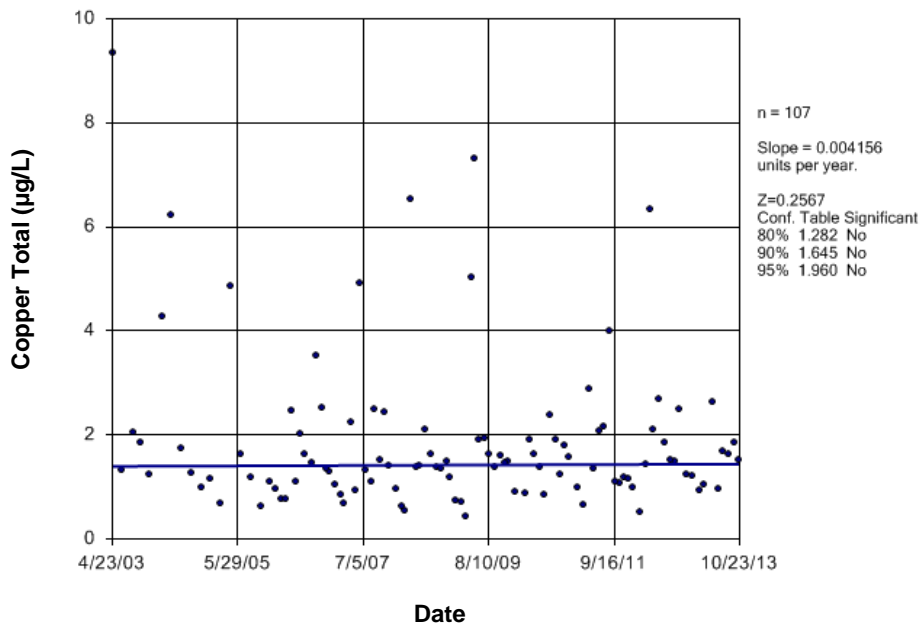


Figure E885 Carrot River: Copper Total

## Time Series

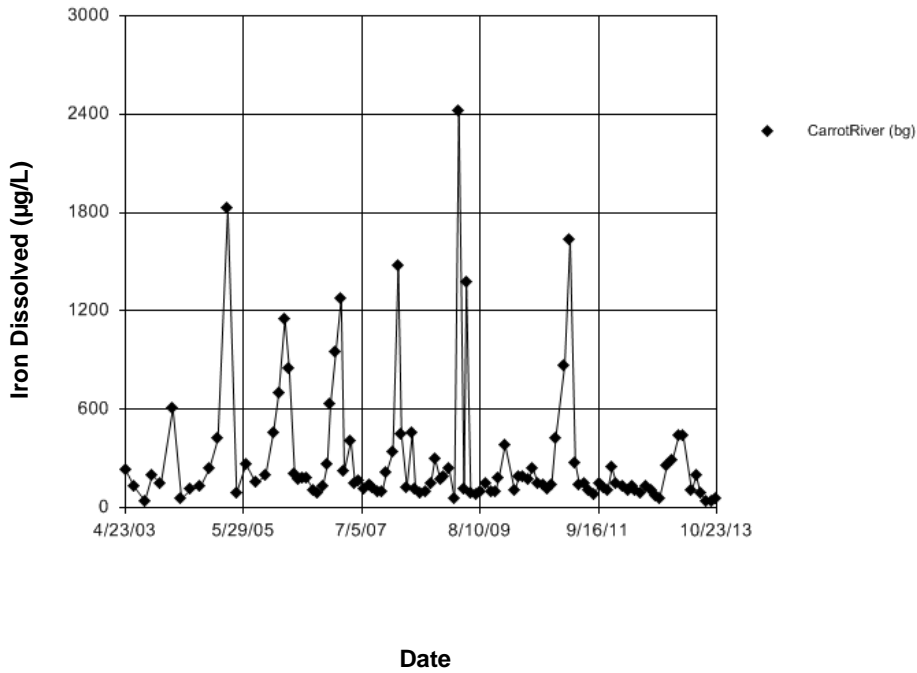


Figure E886 Carrot River: Iron Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 27.95  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 5 groups of data in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 27.95  
 Adjusted Kruskal-Wallis statistic (H') = 27.95

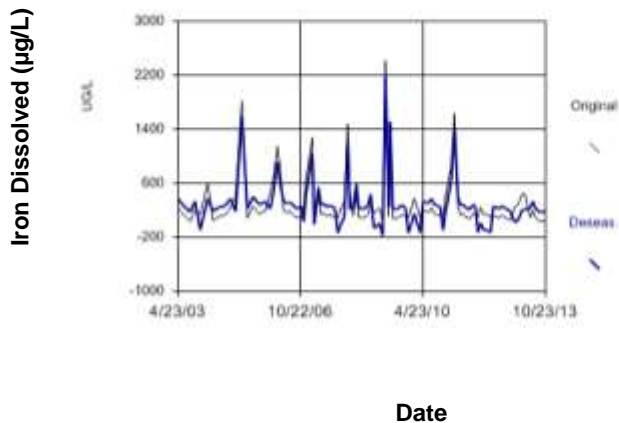


Figure E887 Carrot River: Iron Dissolved

### Seasonal Kendall

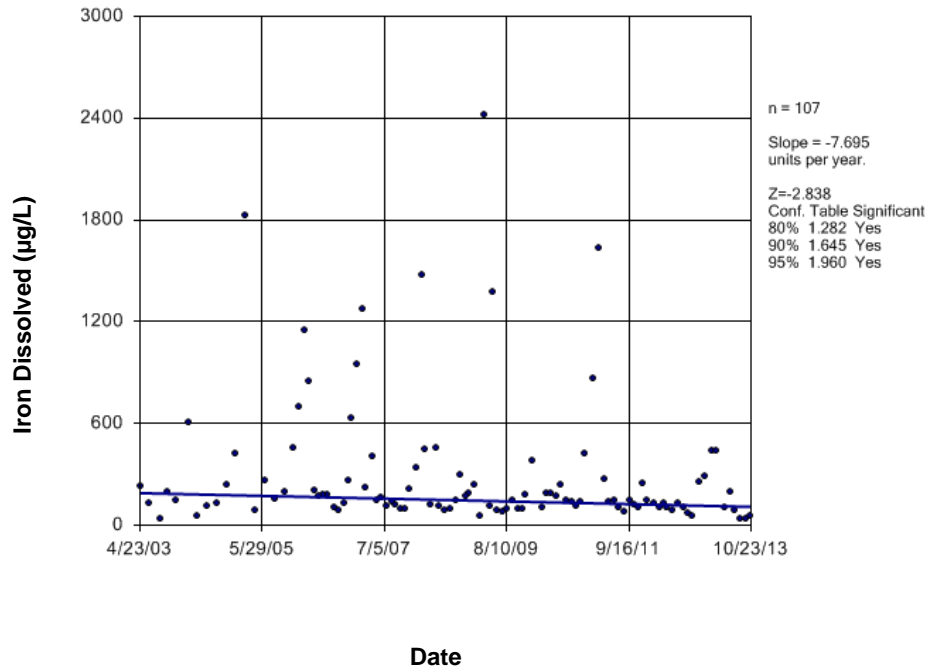


Figure E888 Carrot River: Iron Dissolved

### Time Series

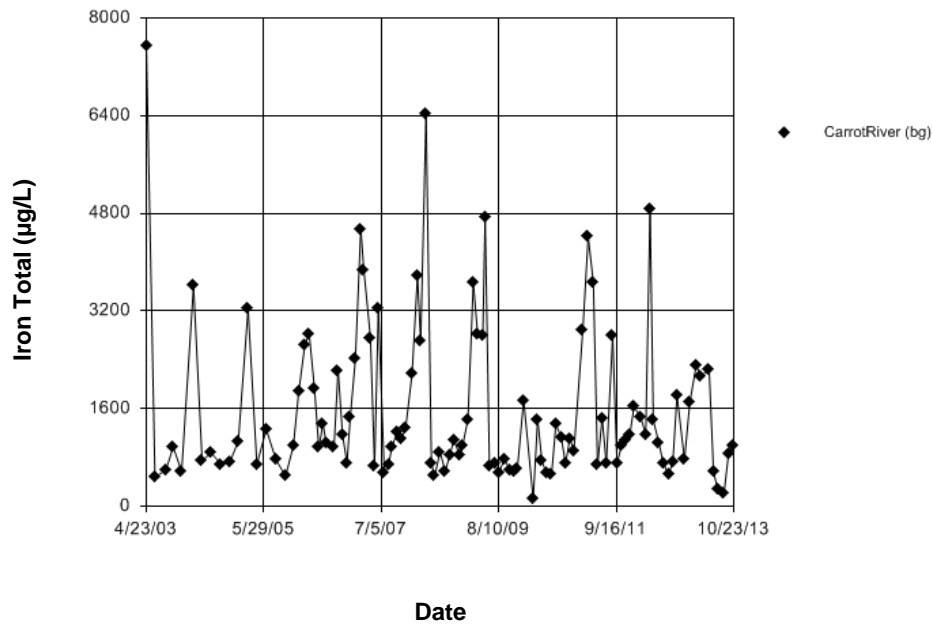


Figure E889 Carrot River: Iron Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 13.35  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
Kruskal-Wallis statistic (H) = 13.35  
Adjusted Kruskal-Wallis statistic (H') = 13.35

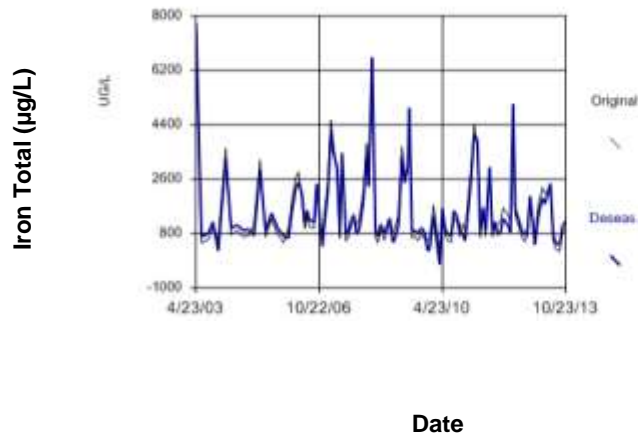


Figure E890 Carrot River: Iron Total

## Seasonal Kendall

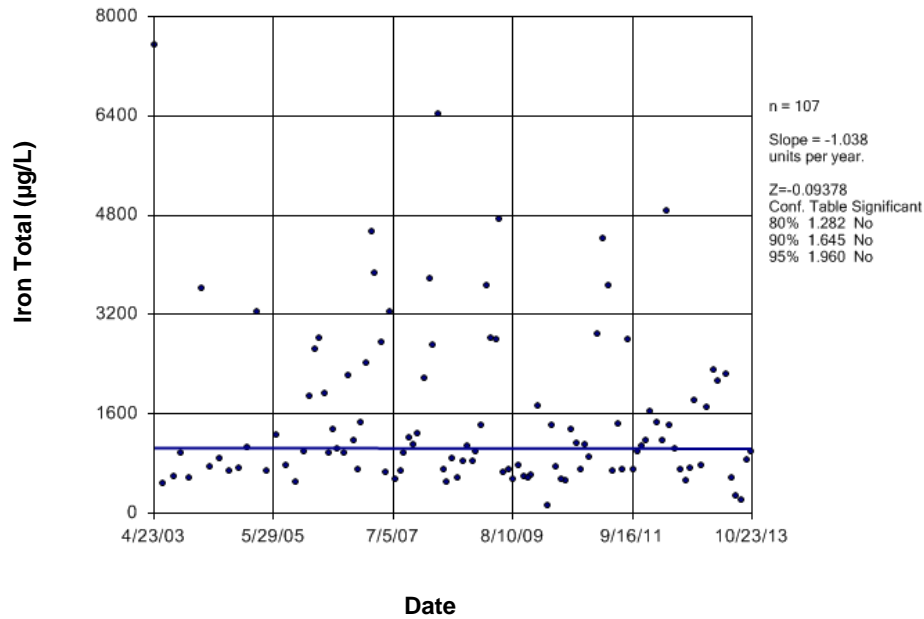


Figure E891 Carrot River: Iron Total

## Time Series

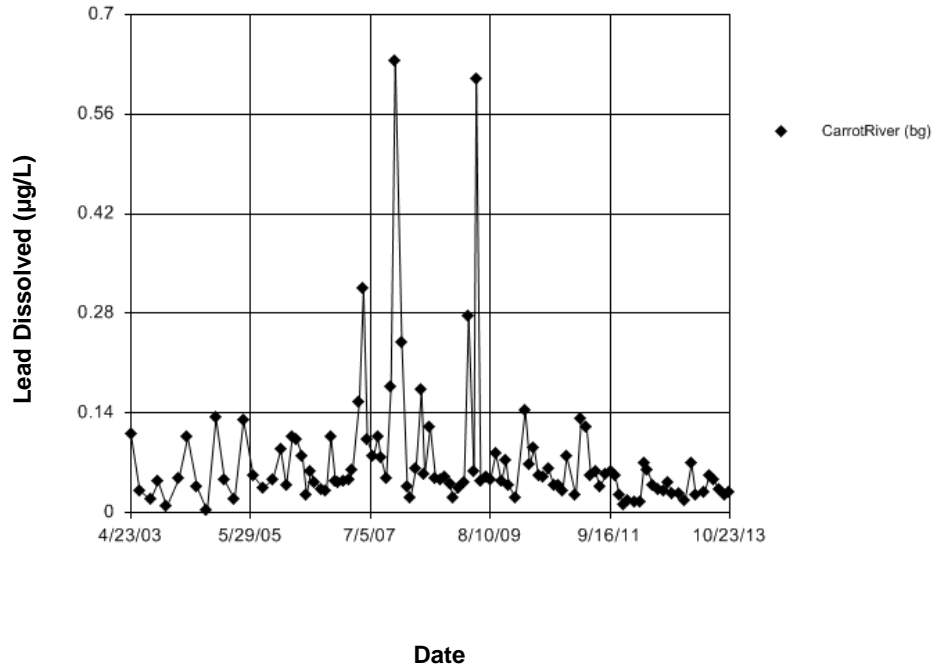


Figure E892 Carrot River: Lead Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates **SEASONALITY** at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 4.075  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 4 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 4.075  
 Adjusted Kruskal-Wallis statistic (H') = 4.075

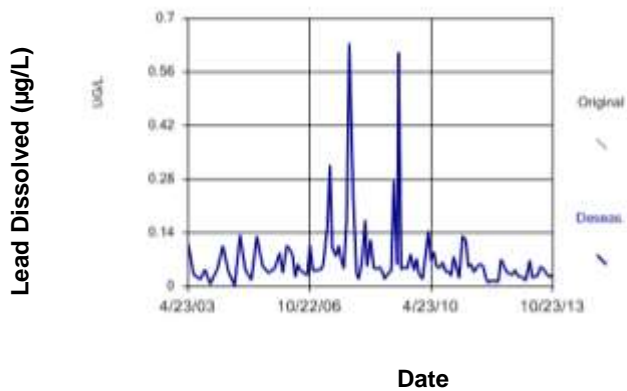


Figure E893 Carrot River: Lead Dissolved

### Seasonal Kendall

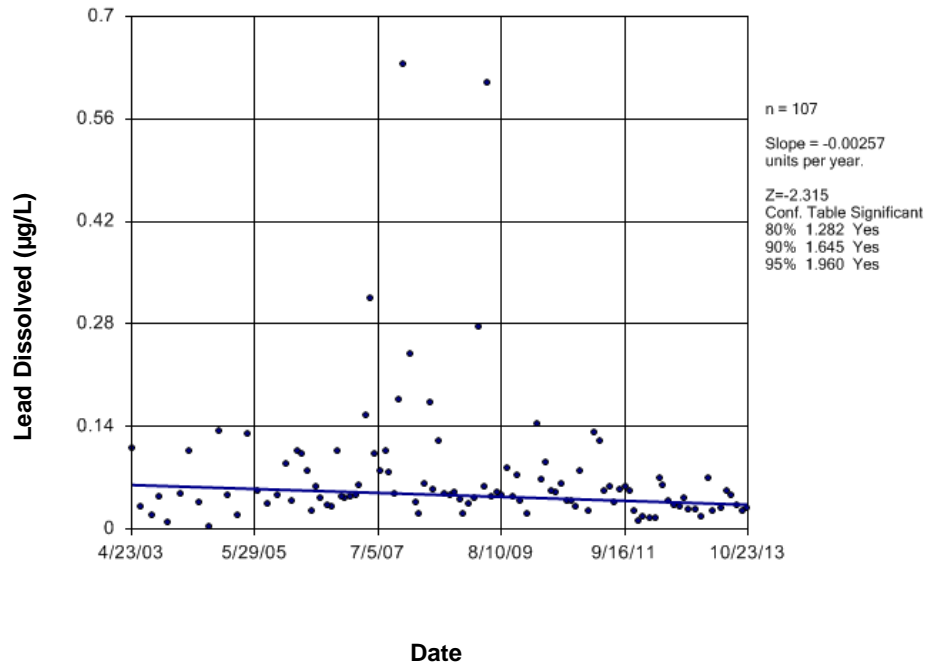


Figure E894 Carrot River: Lead Dissolved

### Time Series

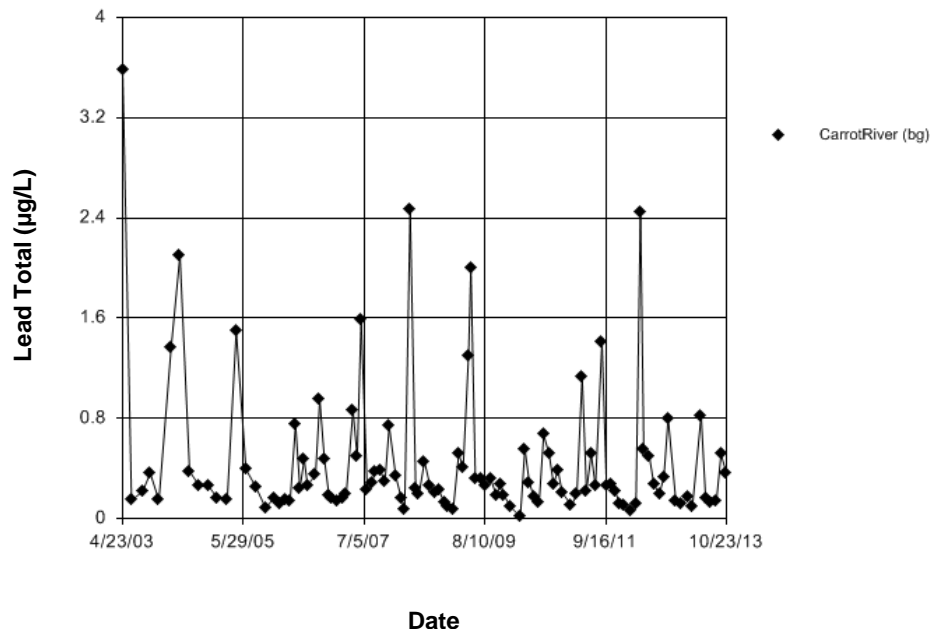
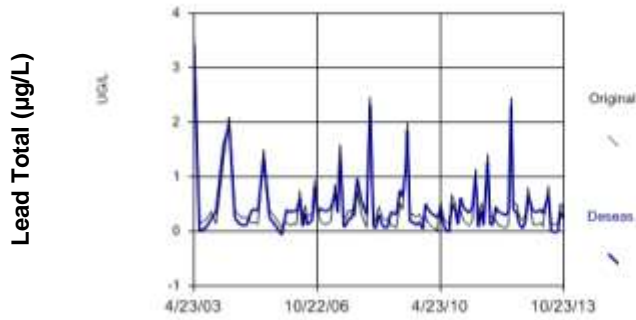


Figure E895 Carrot River: Lead Total

# Seasonality

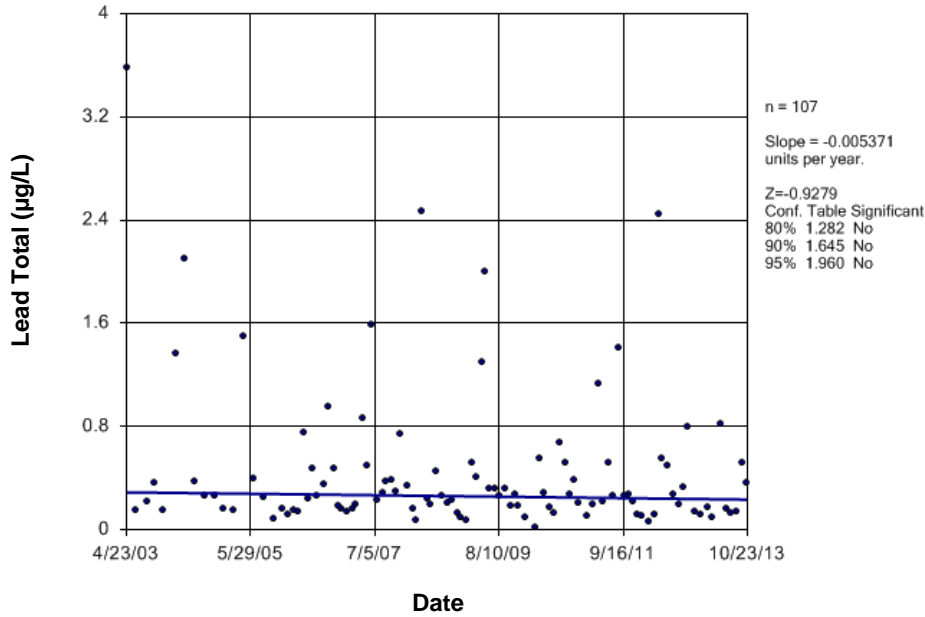
For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 32.77  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 32.77  
 Adjusted Kruskal-Wallis statistic (H') = 32.77



Date

Figure E896 Carrot River: Lead Total

# Seasonal Kendall



Date

Figure 897 Carrot River: Lead Total

## Time Series

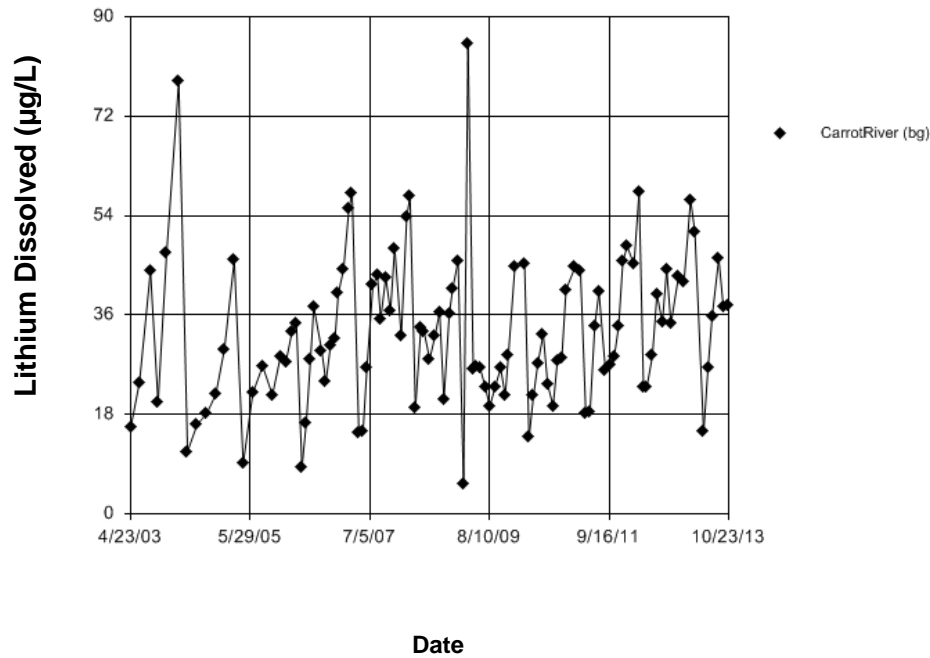


Figure E898 Carrot River: Lithium Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.  
 Calculated Kruskal-Wallis statistic = 37.38  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H<sub>adj</sub>) was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 37.38  
 Adjusted Kruskal-Wallis statistic (H<sub>adj</sub>) = 37.34

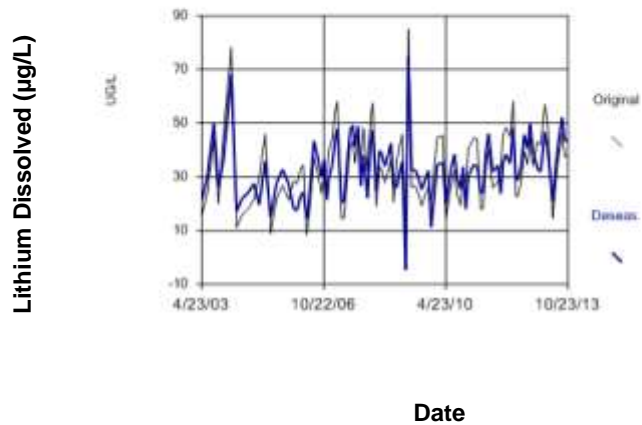


Figure E899 Carrot River: Lithium Dissolved



### Seasonal Kendall

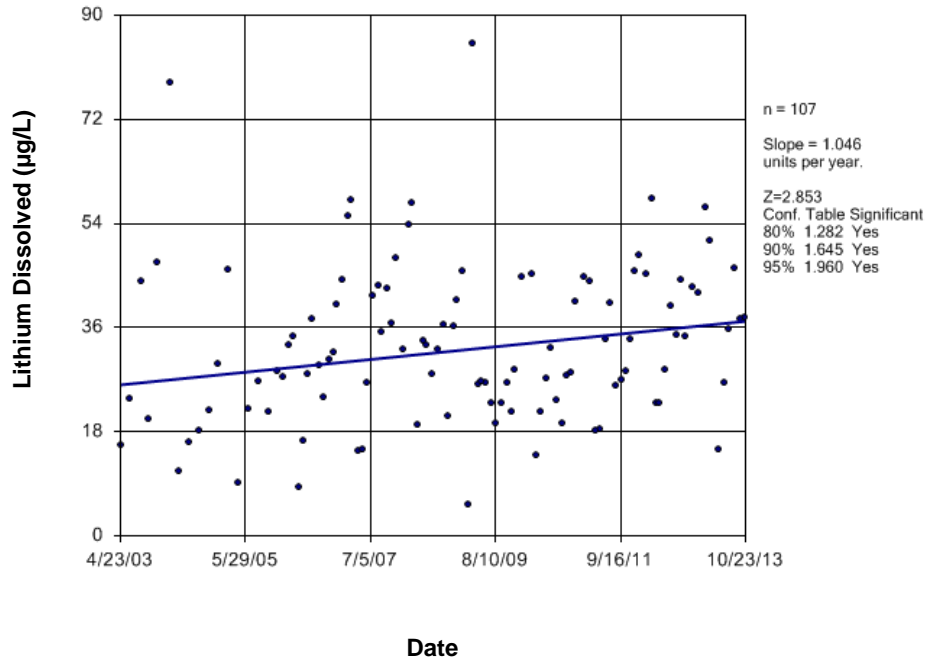


Figure E900 Carrot River: Lithium Dissolved

### Time Series

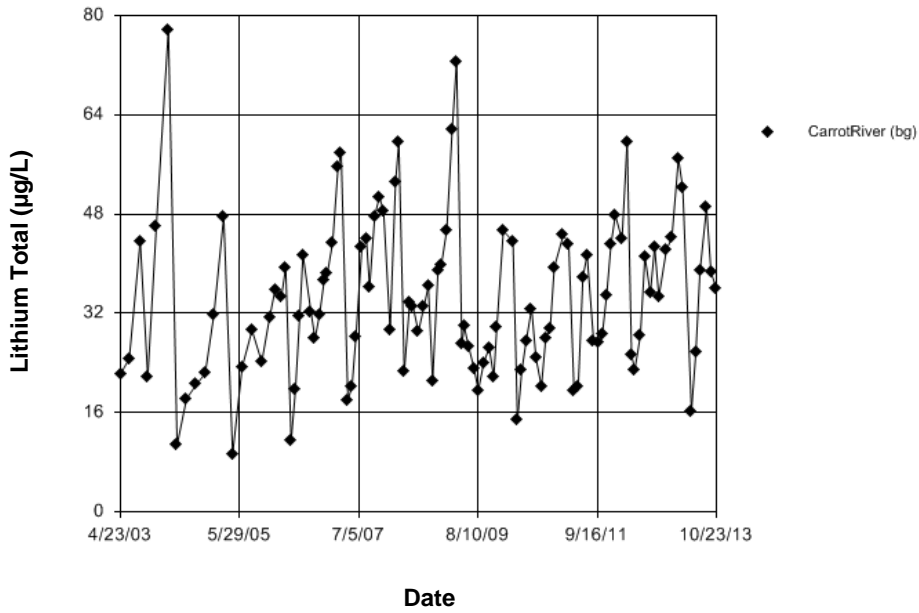
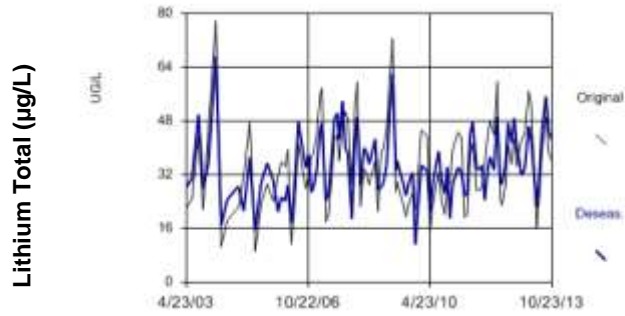


Figure E901 Carrot River: Lithium Total

# Seasonality

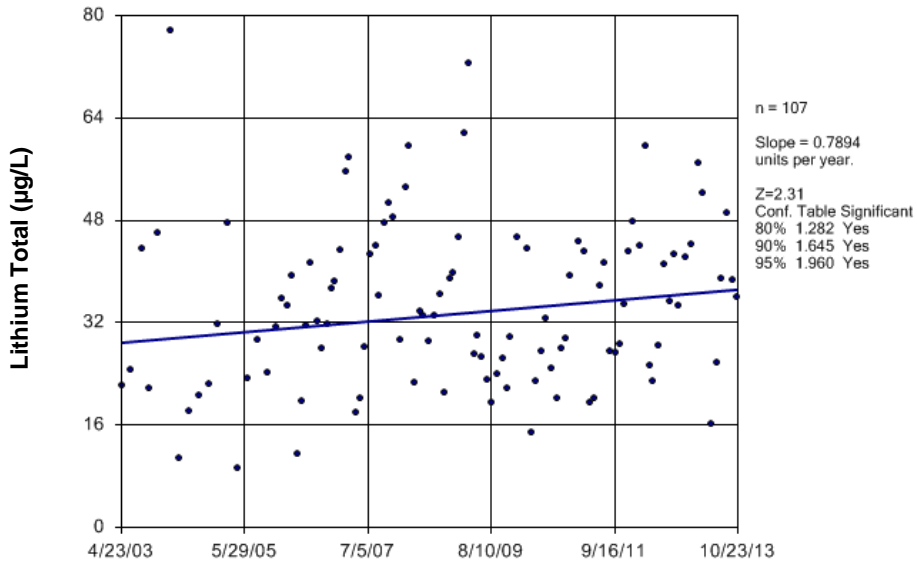
For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 43.18  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 43.18  
 Adjusted Kruskal-Wallis statistic (H') = 43.18



Date

Figure E902 Carrot River: Lithium Total

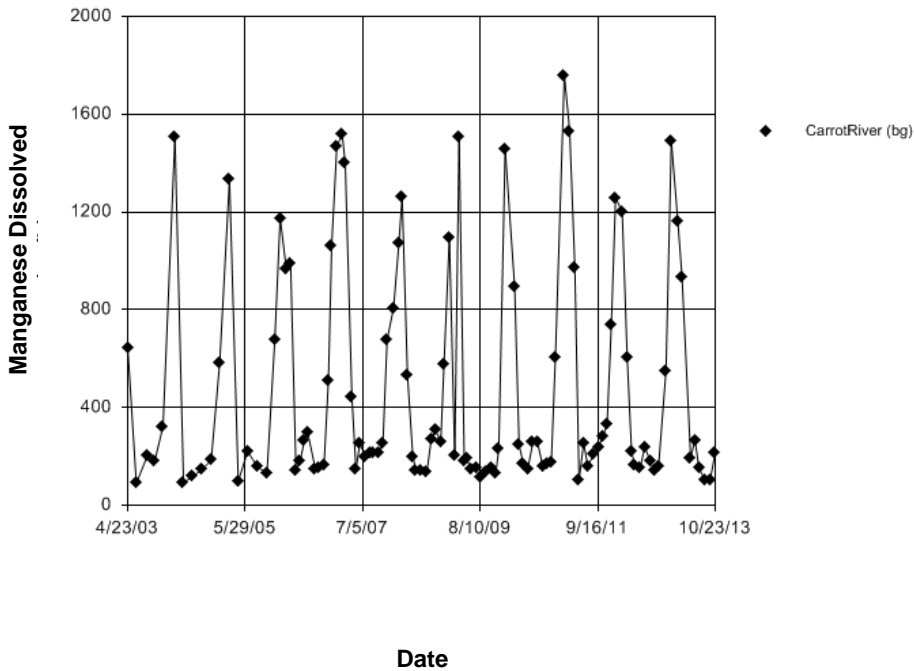
# Seasonal Kendall



Date

Figure E903 Carrot River: Lithium Total

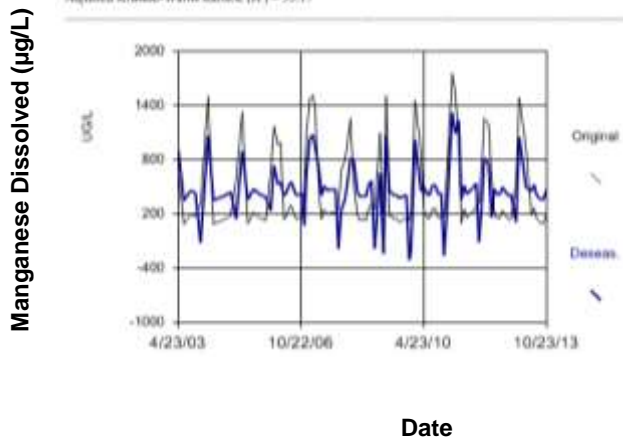
## Time Series



**Figure E904 Carrot River: Manganese Dissolved**

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 3% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 55.17  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 3% significance level.  
 There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 55.16  
 Adjusted Kruskal-Wallis statistic (H') = 55.17



**Figure E905 Carrot River: Manganese Dissolved**

## Seasonal Kendall

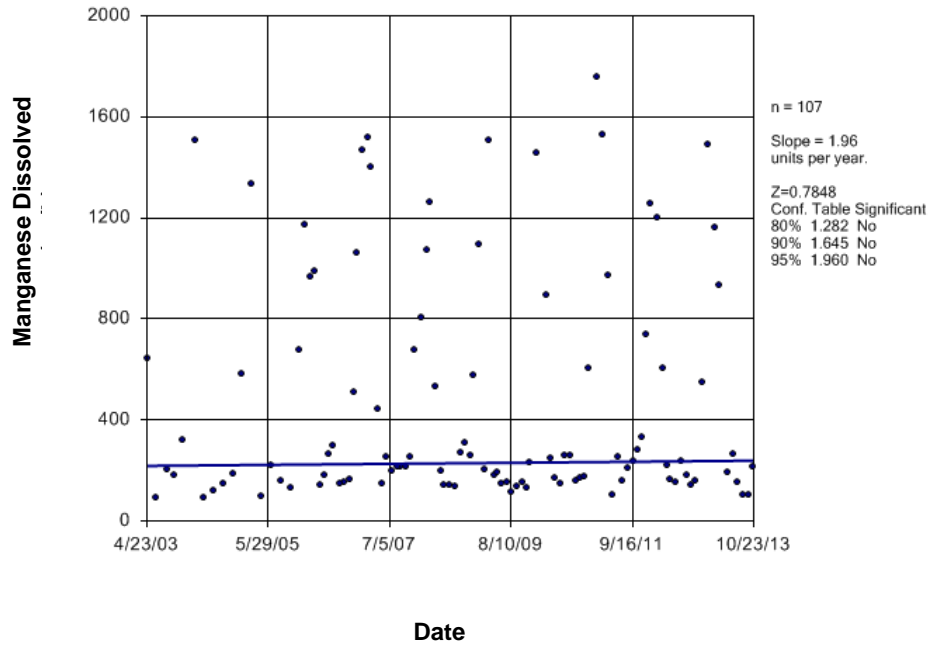


Figure E906 Carrot River: Manganese Dissolved

## Time Series

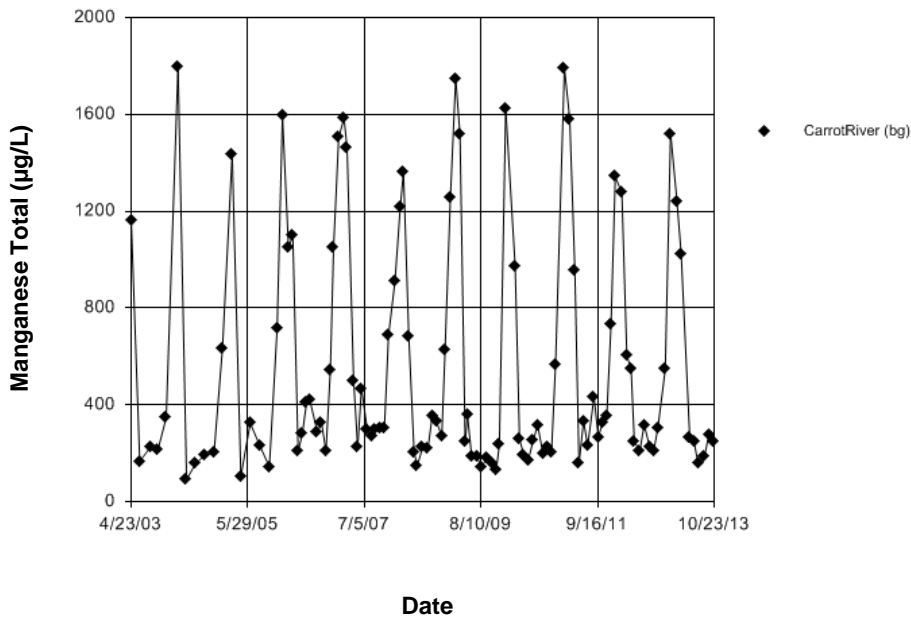


Figure E907 Carrot River: Manganese Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-Squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 49.76  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
Kruskal-Wallis statistic (H) = 49.76  
Adjusted Kruskal-Wallis statistic (H') = 49.76

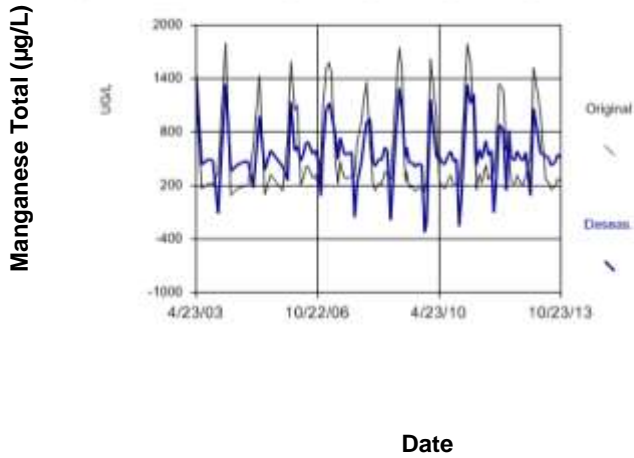


Figure E908 Carrot River: Manganese Total

## Seasonal Kendall

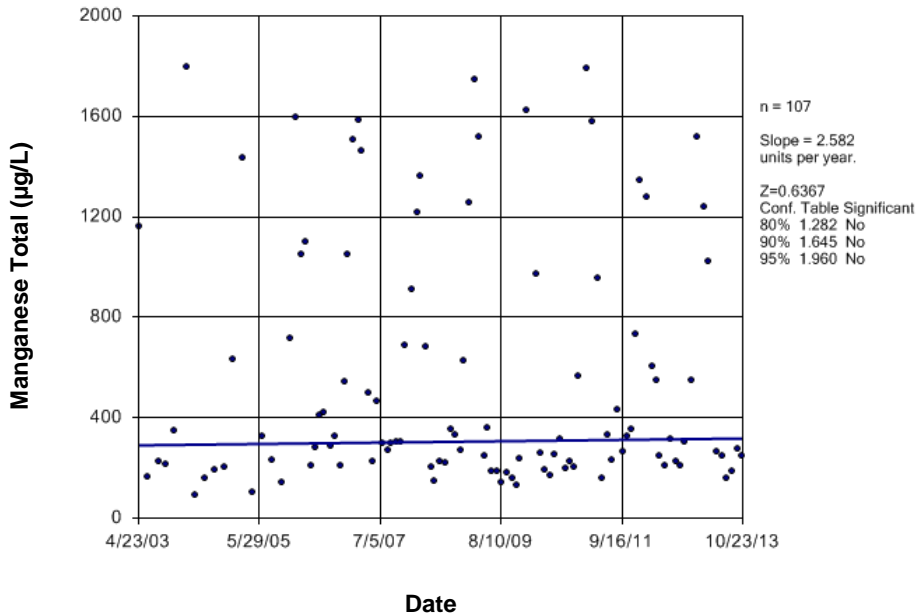


Figure E909 Carrot River: Manganese Total

## Time Series

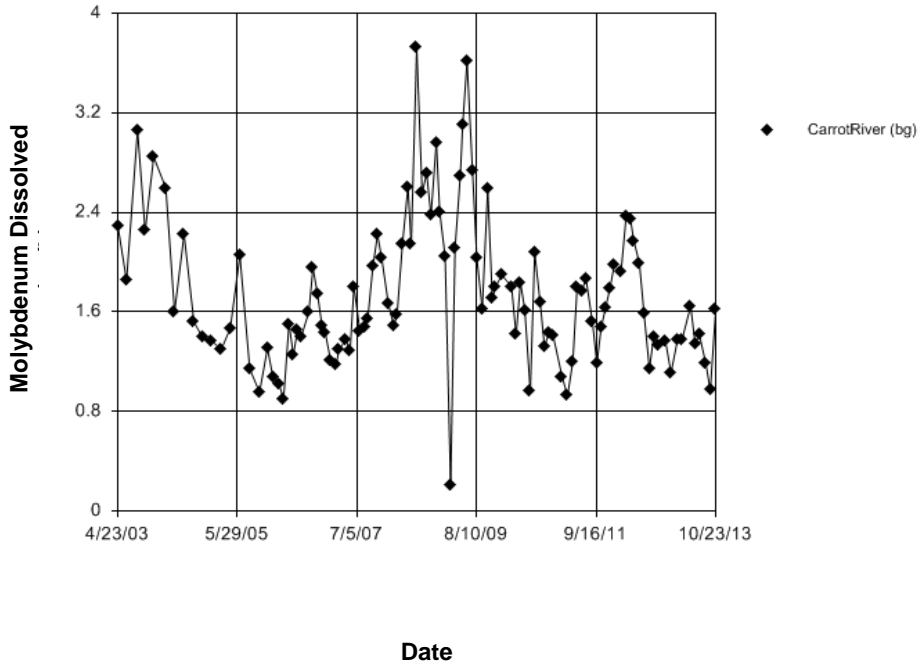


Figure E910 Carrot River: Molybdenum Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 2.738  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 2.738  
 Adjusted Kruskal-Wallis statistic (H') = 2.738

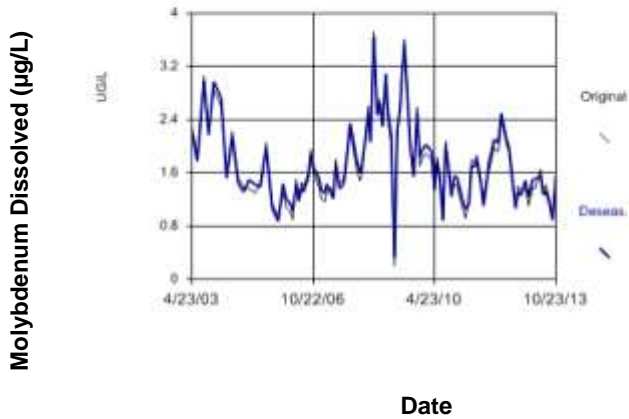


Figure E911 Carrot River: Molybdenum Dissolved

### Sen's Slope Estimator

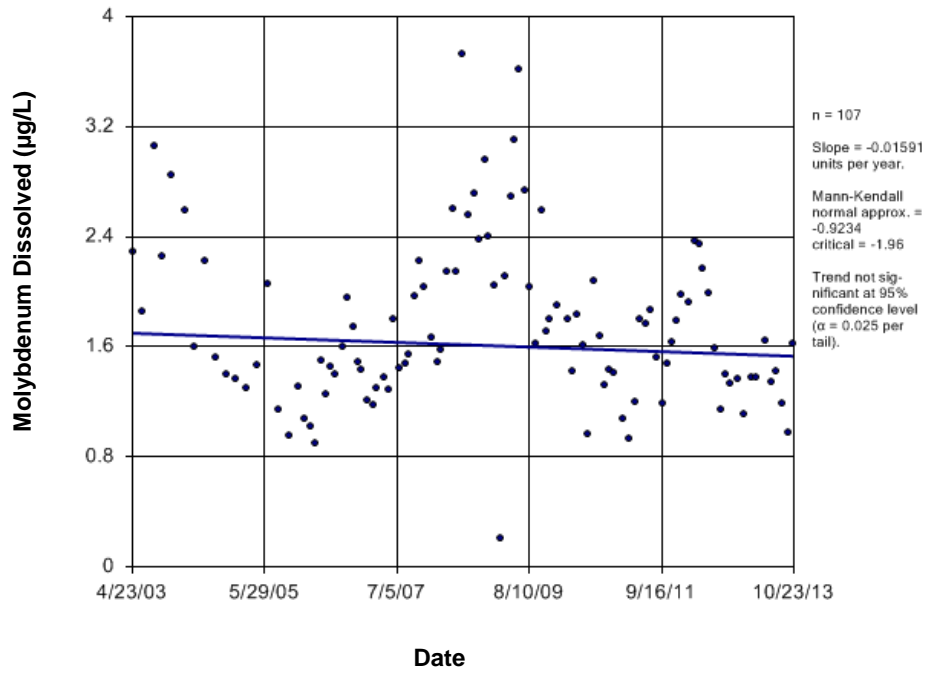


Figure E912 Carrot River: Molybdenum Dissolved

### Time Series

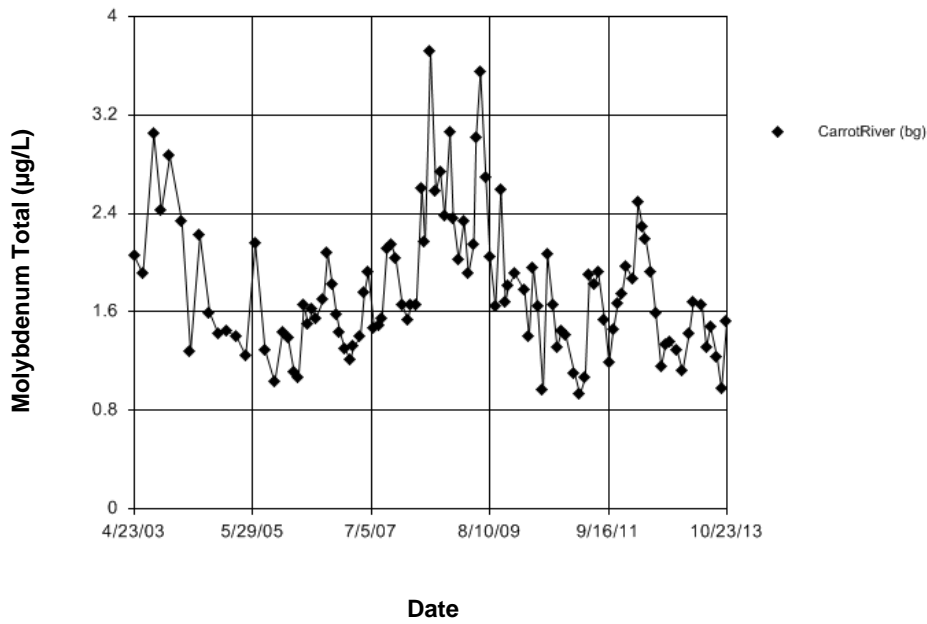
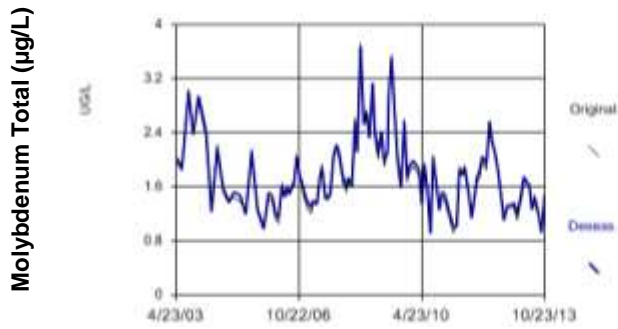


Figure E913 Carrot River: Molybdenum Total

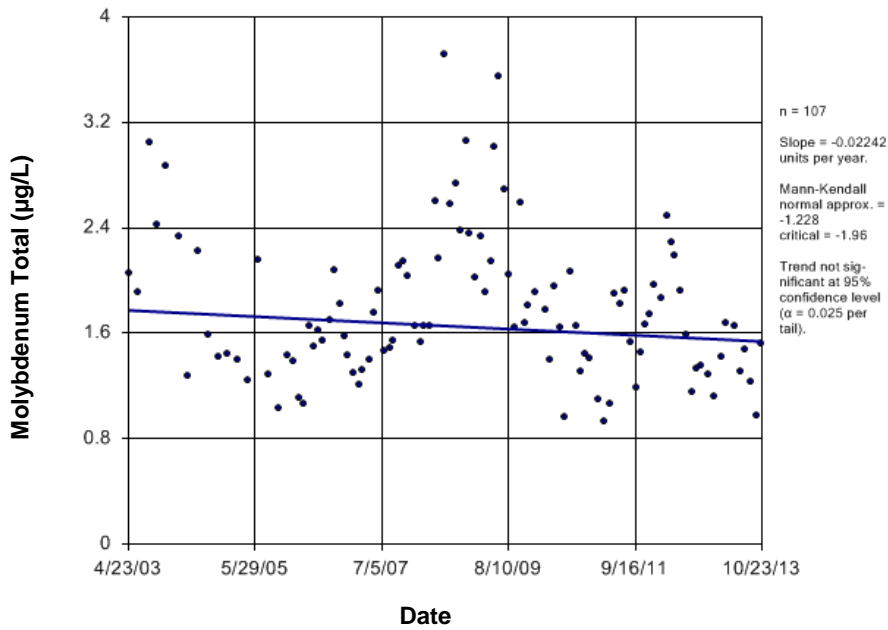
# Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 1.108  
Tabulated Chi-Squared value = 3.841 with 3 degrees of freedom at the 5% significance level.  
There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
Kruskal-Wallis statistic (H) = 1.108  
Adjusted Kruskal-Wallis statistic (H') = 1.108



**Figure E914 Carrot River: Molybdenum Total**

# Sen's Slope Estimator



**Figure E915 Carrot River: Molybdenum Total**



## Time Series

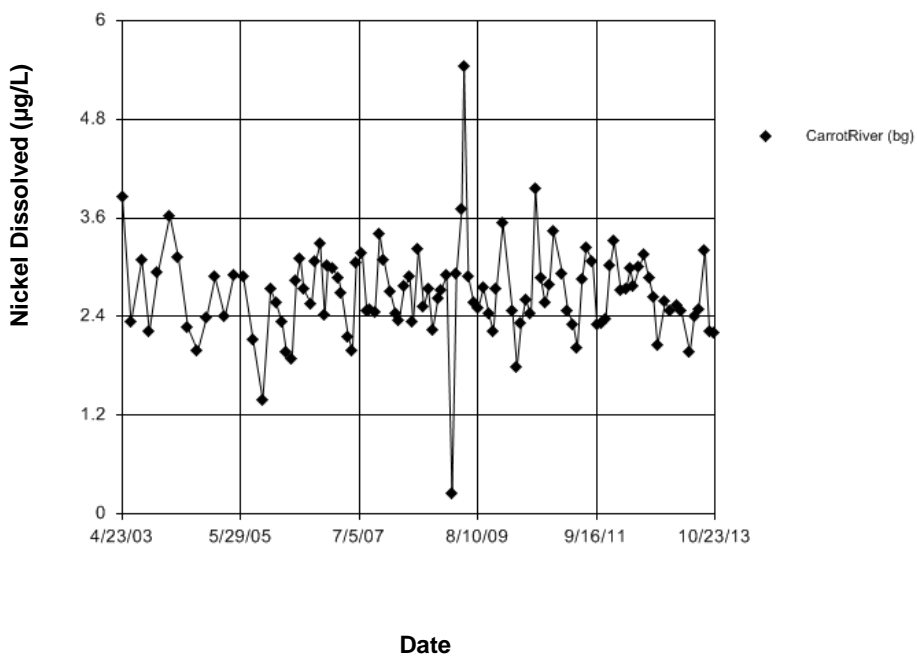


Figure E916 Carrot River: Nickel Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.9777  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 4 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
Kruskal-Wallis statistic (H) = 0.9777  
Adjusted Kruskal-Wallis statistic (H') = 0.8777

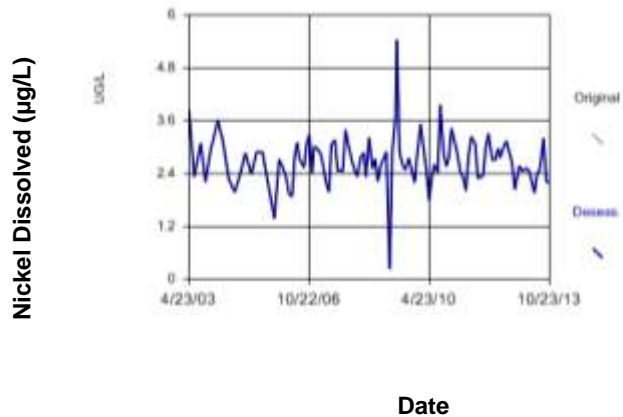


Figure E917 Carrot River: Nickel Dissolved

### Sen's Slope Estimator

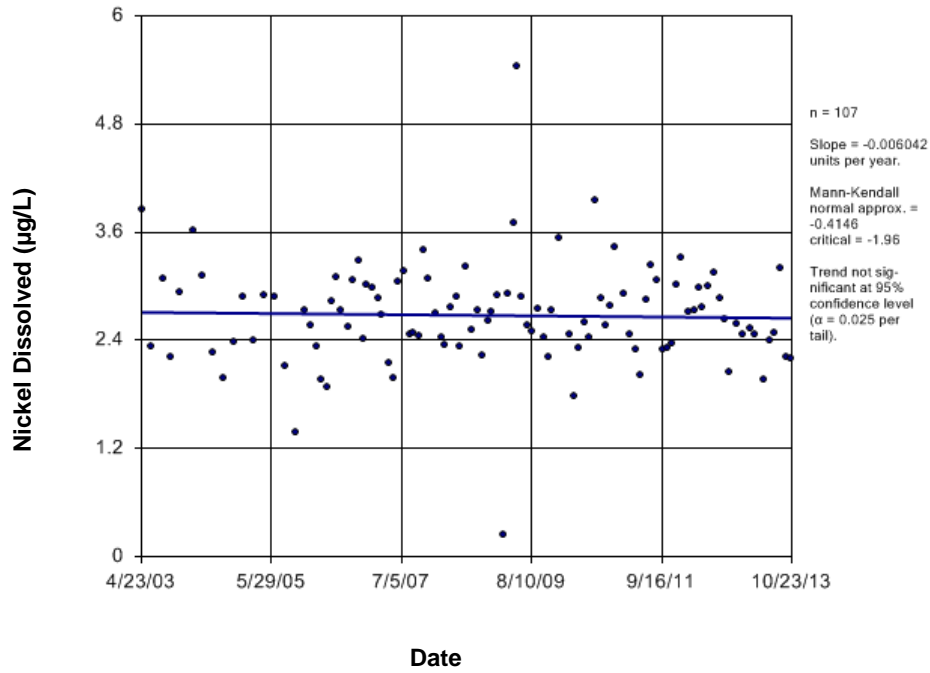


Figure E918 Carrot River: Nickel Dissolved

### Time Series

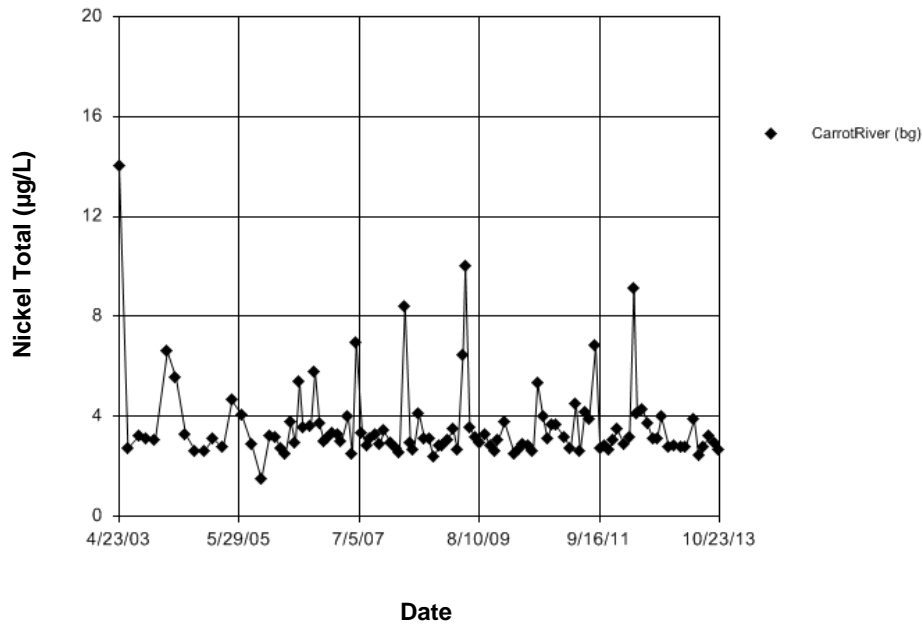
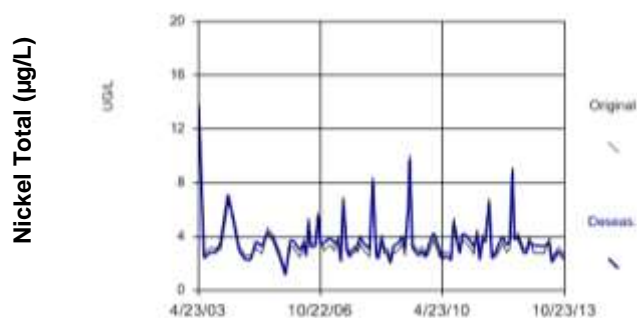


Figure E919 Carrot River: Nickel Total

## Seasonality

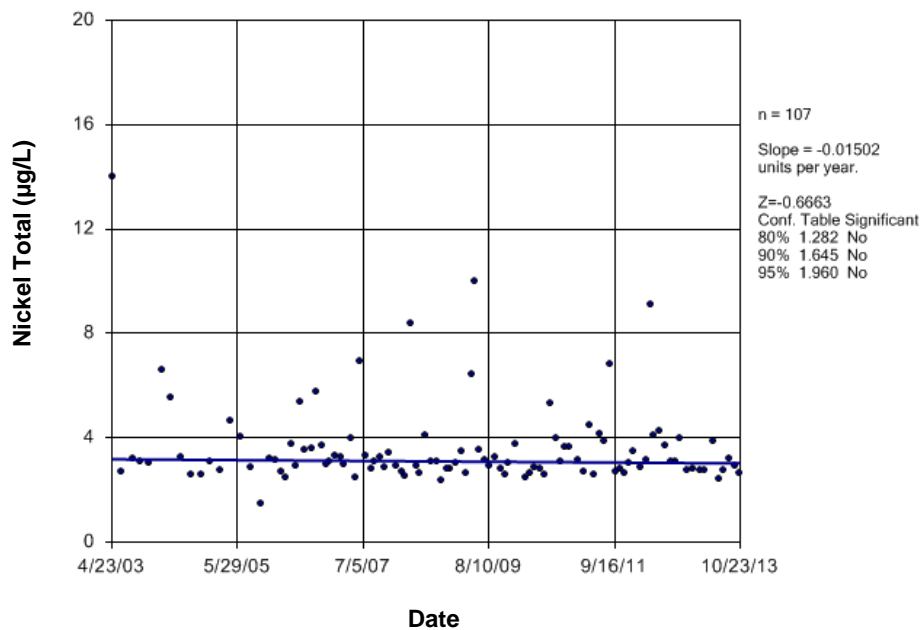
For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 6.868  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
Kruskal-Wallis statistic (H) = 6.868  
Adjusted Kruskal-Wallis statistic (H') = 6.868



Date

Figure E920 Carrot River: Nickel Total

## Seasonal Kendall



Date

Figure E921 Carrot River: Nickel Total

## Time Series

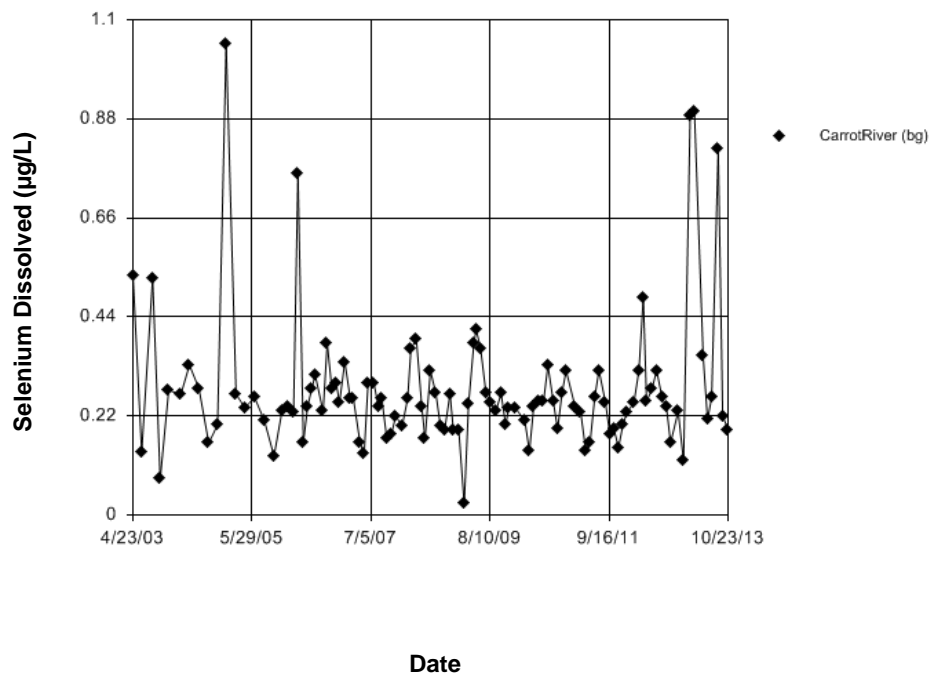


Figure E922 Carrot River: Selenium Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.007557  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 9 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
Kruskal-Wallis statistic (H) = 0.007556  
Adjusted Kruskal-Wallis statistic (H') = 0.007557

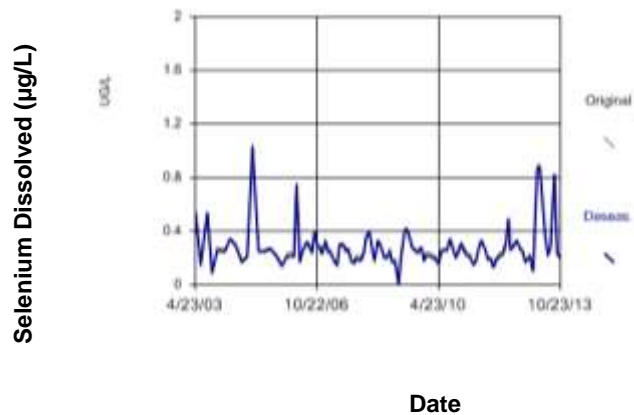


Figure E923 Carrot River: Selenium Dissolved

### Sen's Slope Estimator

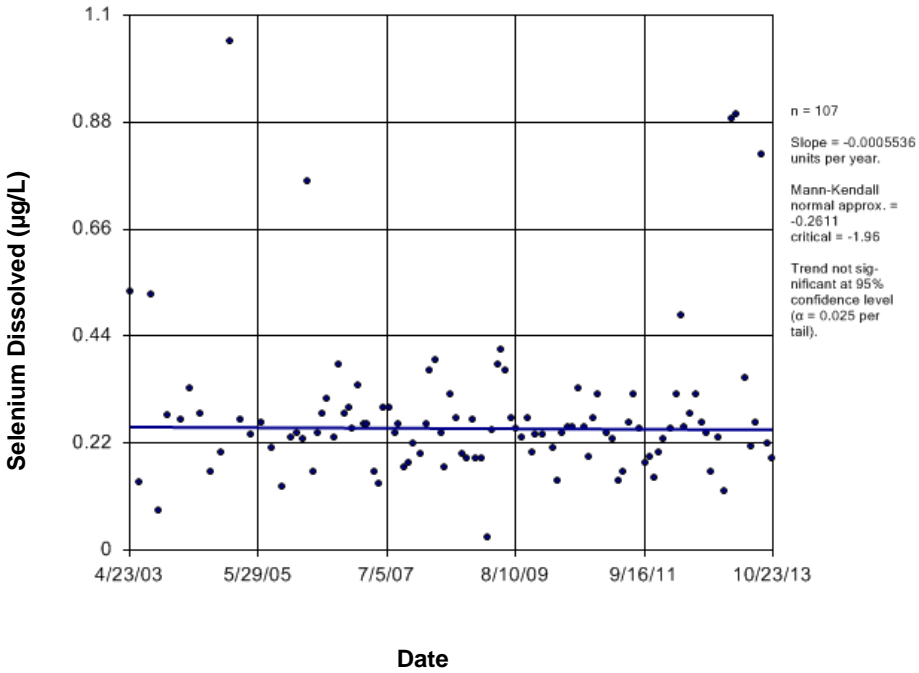


Figure E924 Carrot River: Selenium Dissolved

### Time Series

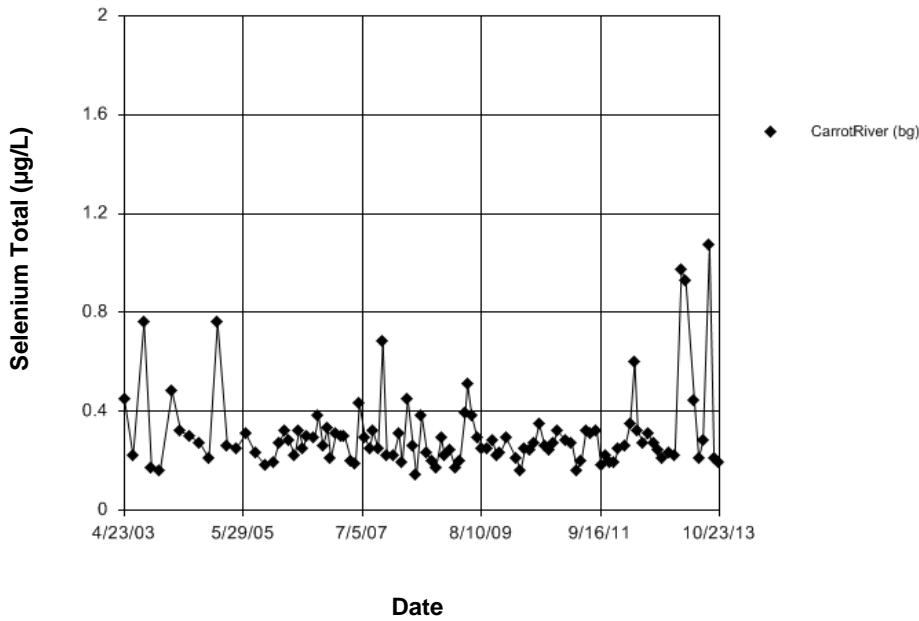


Figure E925 Carrot River: Selenium Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.1779  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 21 groups of six in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 0.1779  
 Adjusted Kruskal-Wallis statistic (H') = 0.1779

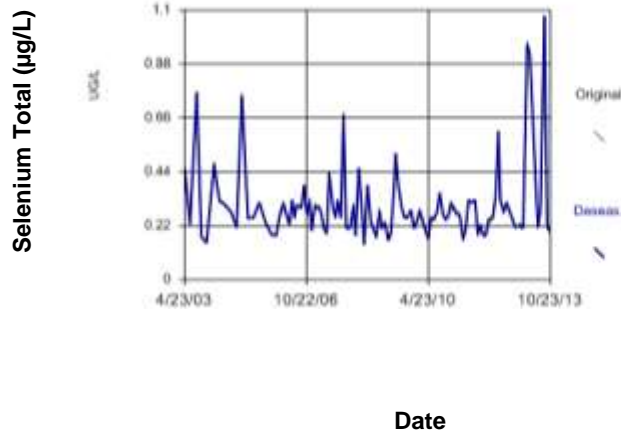


Figure E926 Carrot River: Selenium Total

## Sen's Slope Estimator

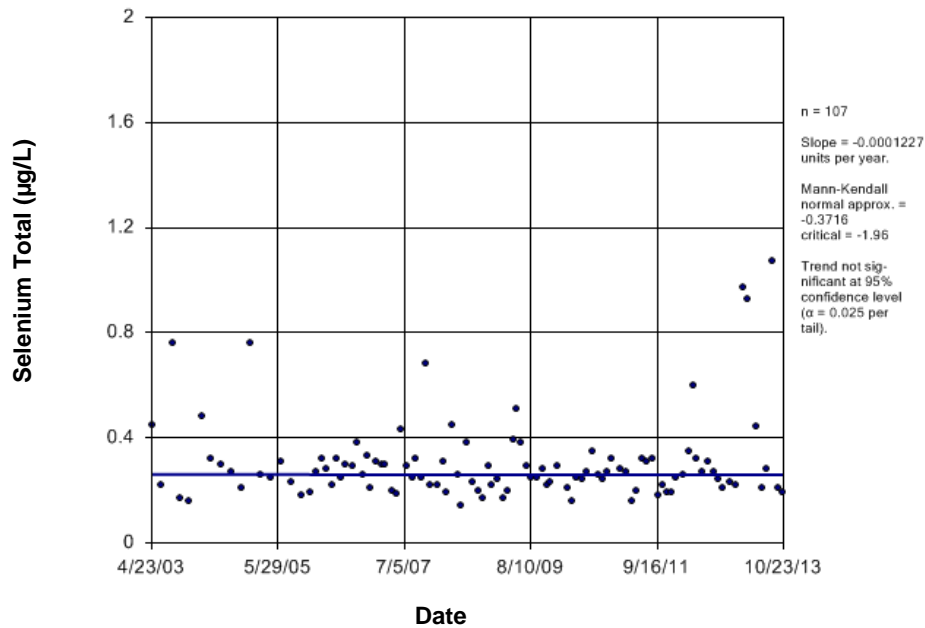


Figure E927 Carrot River: Selenium Total

## Time Series

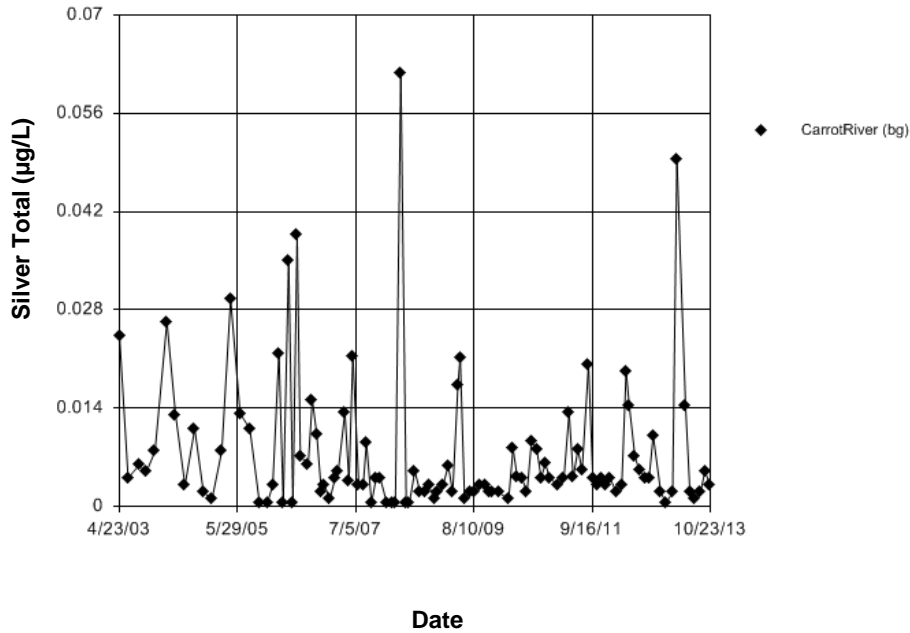


Figure E928 Carrot River: Silver Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 14.21. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal. Kruskal-Wallis statistic (H) = 14.21. Adjusted Kruskal-Wallis statistic (H') = 14.21.

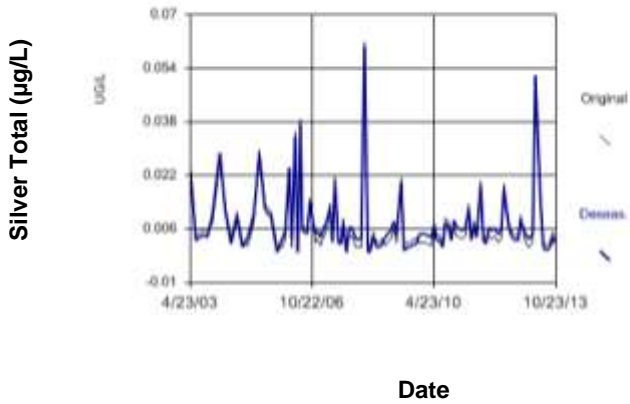


Figure E929 Carrot River: Silver Total

### Seasonal Kendall

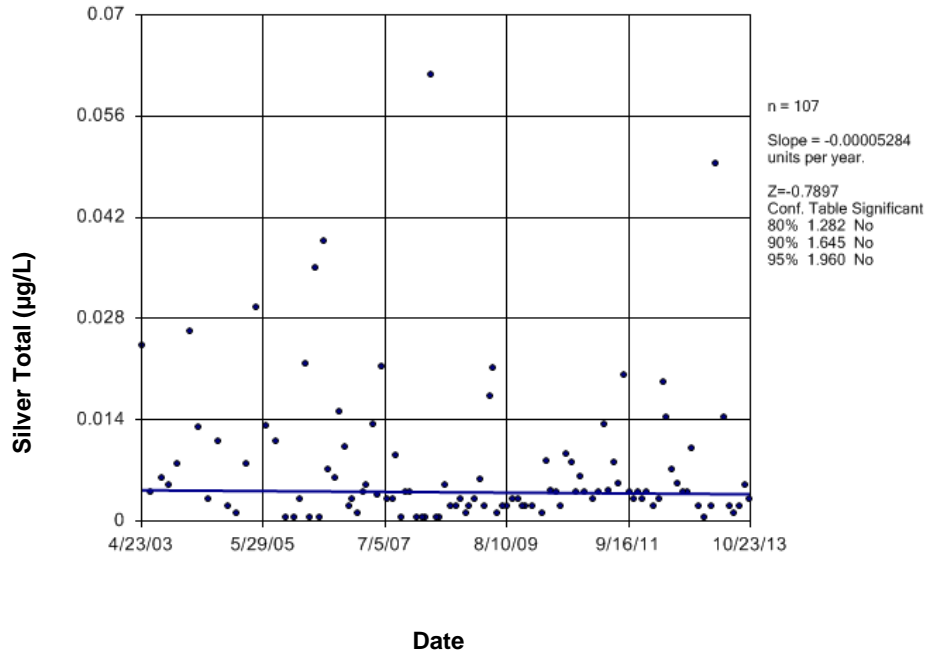


Figure E930 Carrot River: Silver Total

### Time Series

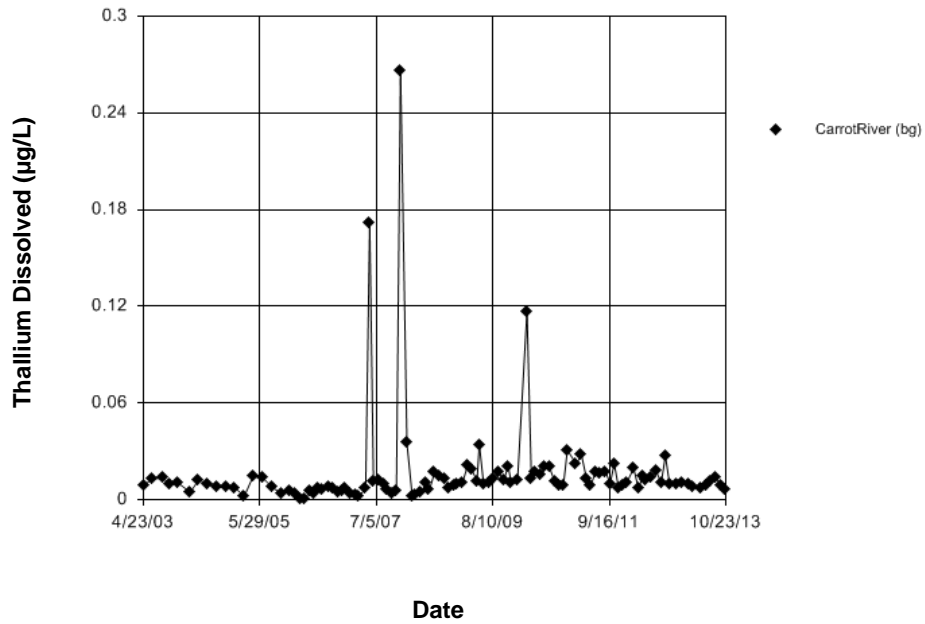


Figure E931 Carrot River: Thallium Dissolved



## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 3.124  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
Kruskal-Wallis statistic (H) = 3.124  
Adjusted Kruskal-Wallis statistic (H') = 3.124

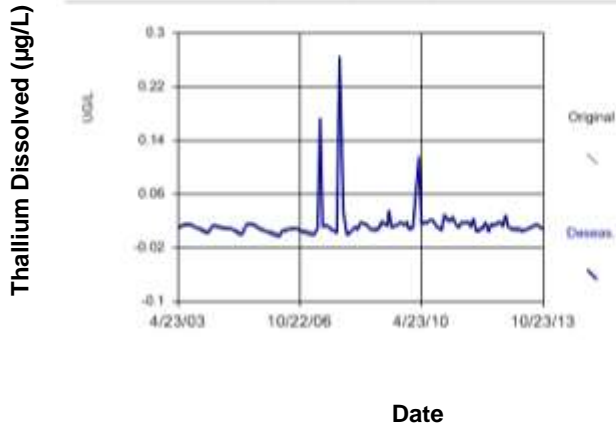


Figure E932 Carrot River: Thallium Dissolved

## Sen's Slope Estimator

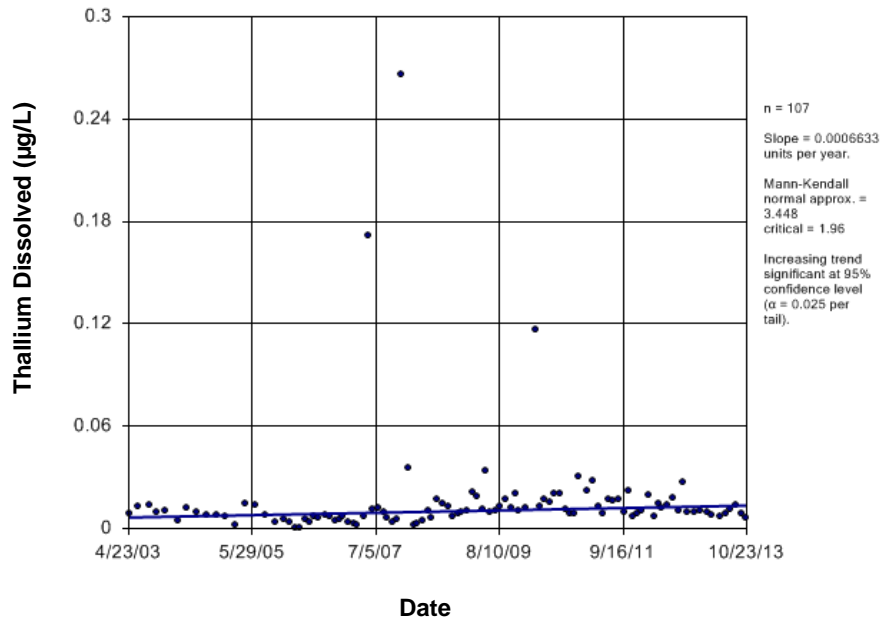


Figure E933 Carrot River: Thallium Dissolved

### Time Series

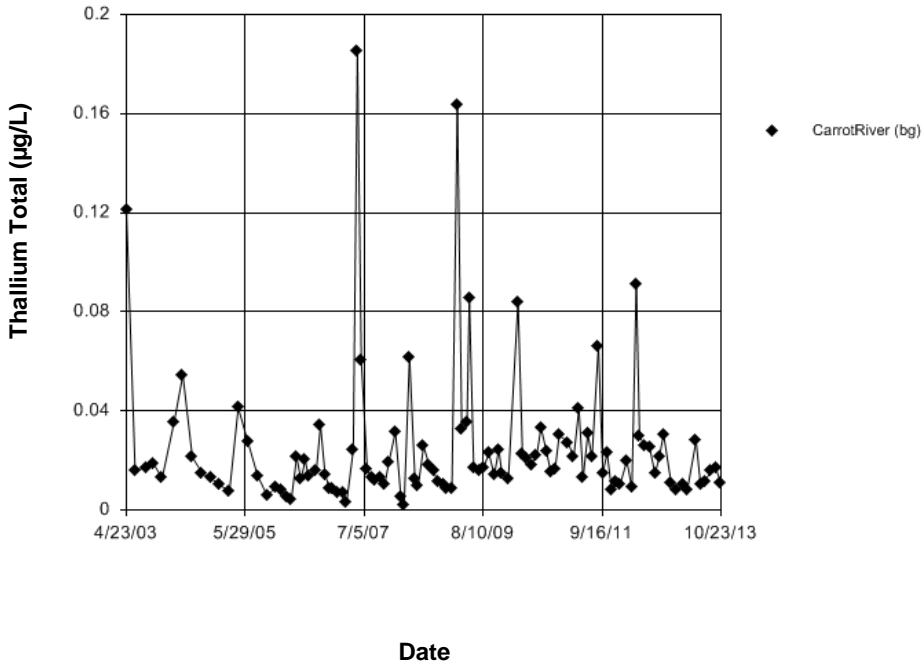


Figure E934 Carrot River: Thallium Total

### Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentrations of this constituent than any other season. Calculated Kruskal-Wallis statistic = 20.49. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal. Kruskal-Wallis statistic (H) = 20.49. Adjusted Kruskal-Wallis statistic (H') = 20.49.

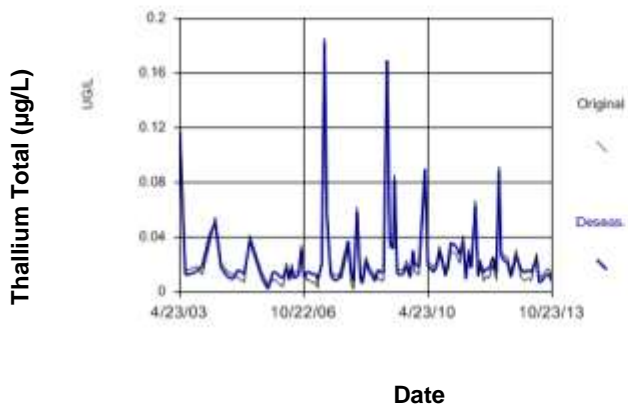


Figure E935 Carrot River: Thallium Total

### Seasonal Kendall

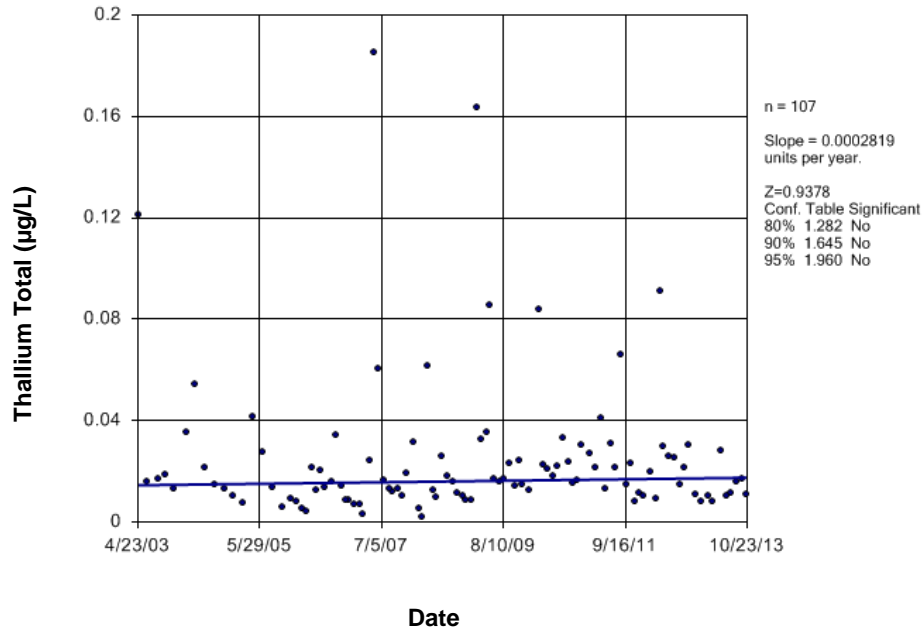


Figure E936 Carrot River: Thallium Total

### Time Series

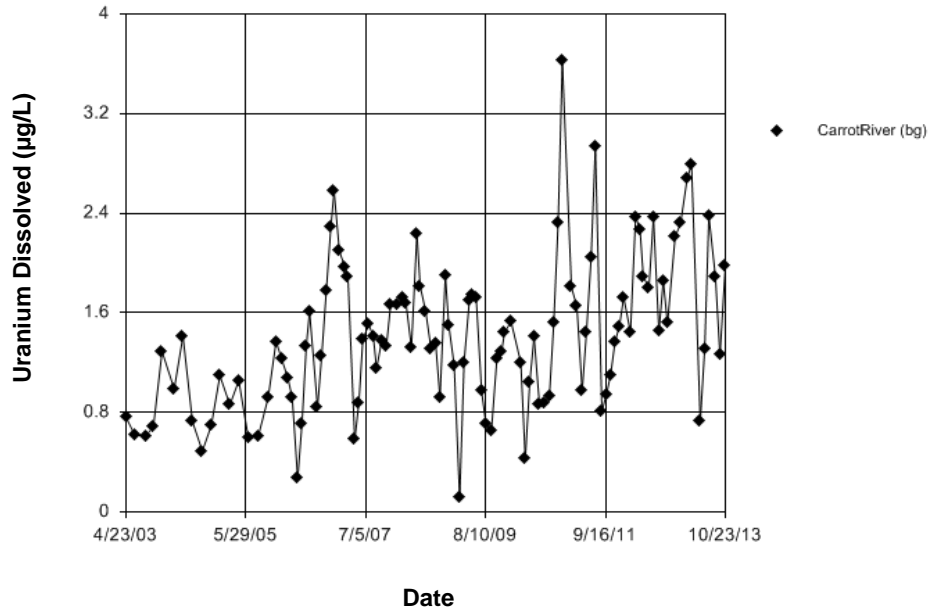


Figure E937 Carrot River: Uranium Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 10.97  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of data in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 10.97  
 Adjusted Kruskal-Wallis statistic (H') = 10.97

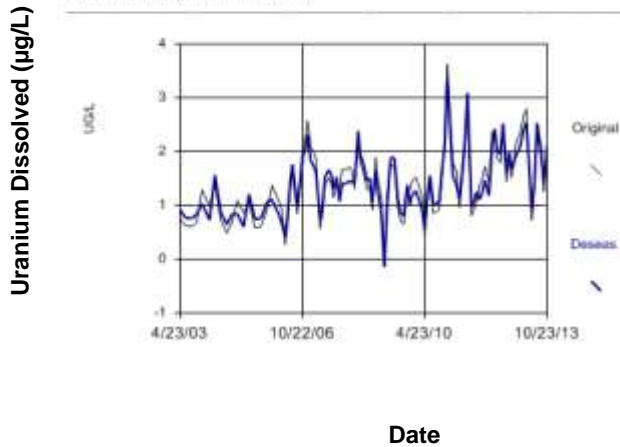


Figure E938 Carrot River: Uranium Dissolved

## Seasonal Kendall

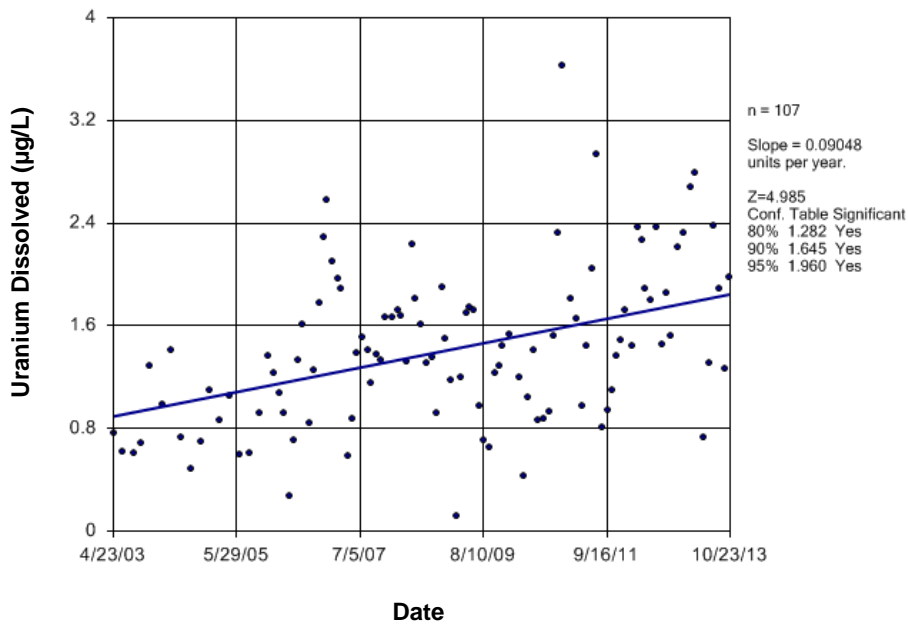


Figure E939 Carrot River: Uranium Dissolved

## Time Series

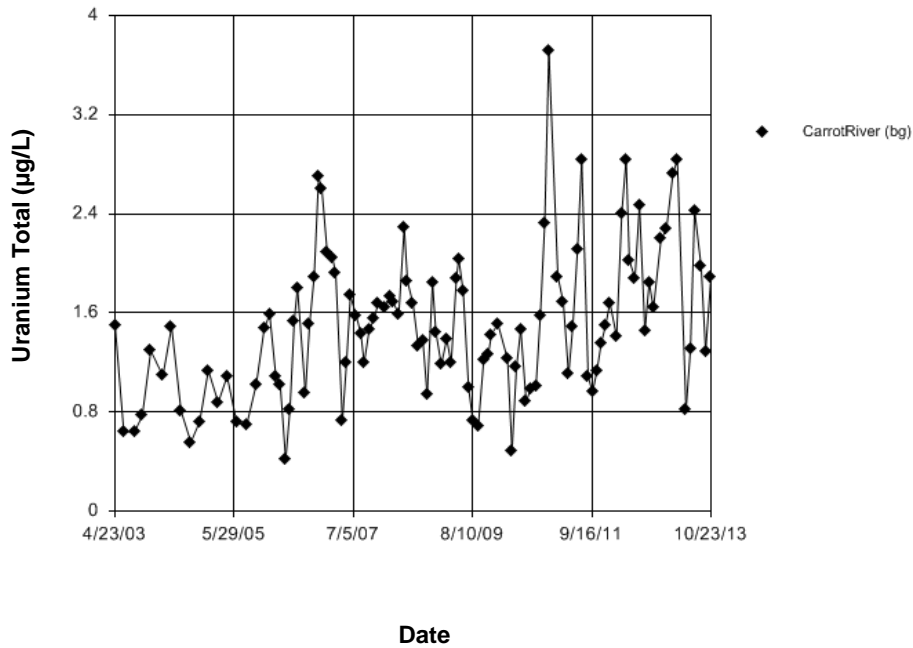


Figure E940 Carrot River: Uranium Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 9.217  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 9.217  
 Adjusted Kruskal-Wallis statistic (H') = 9.217

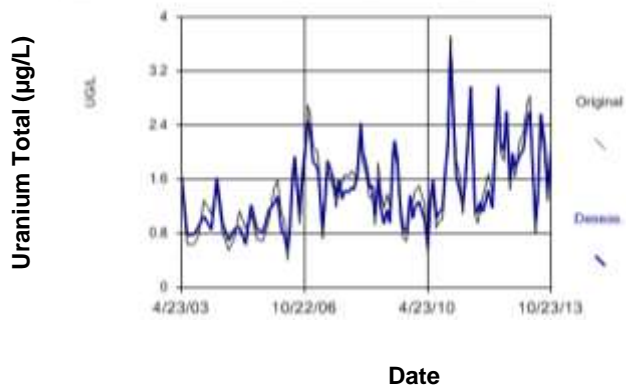


Figure E941 Carrot River: Uranium Total

### Seasonal Kendall

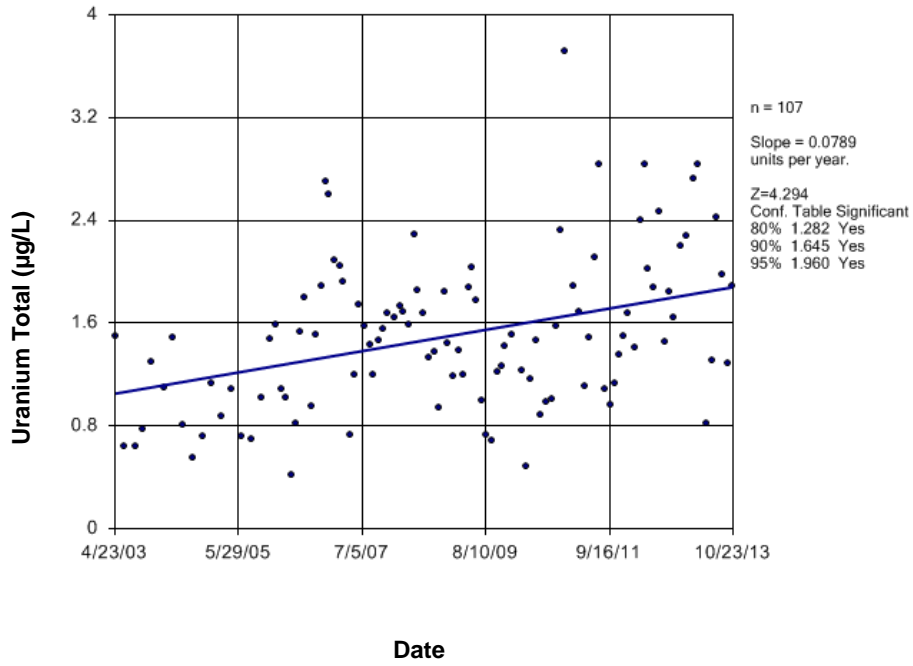


Figure E942 Carrot River: Uranium Total

### Time Series

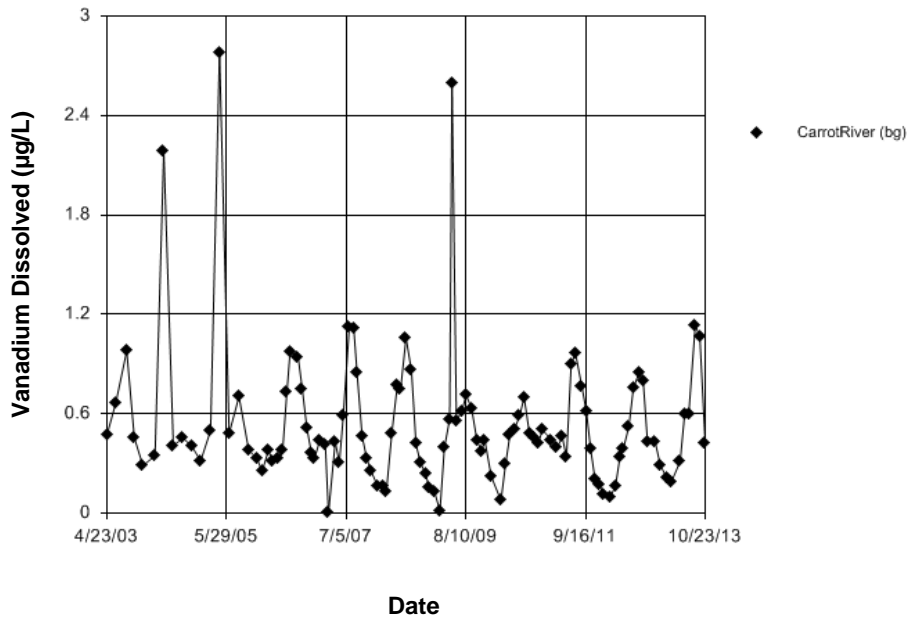


Figure E943 Carrot River: Vanadium Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-Squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 51.36  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

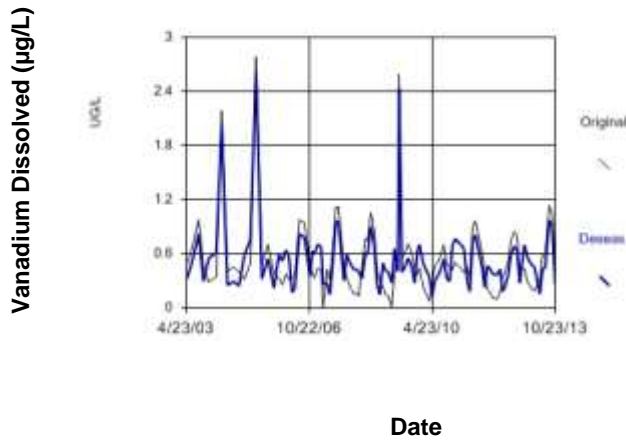


Figure E944 Carrot River: Vanadium Dissolved

## Seasonal Kendall

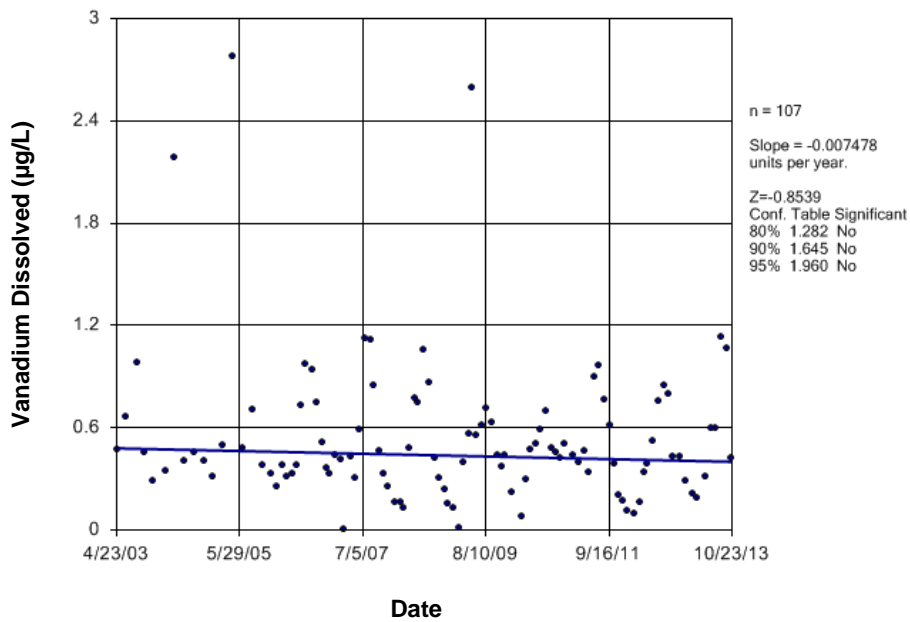


Figure E945 Carrot River: Vanadium Dissolved

## Time Series

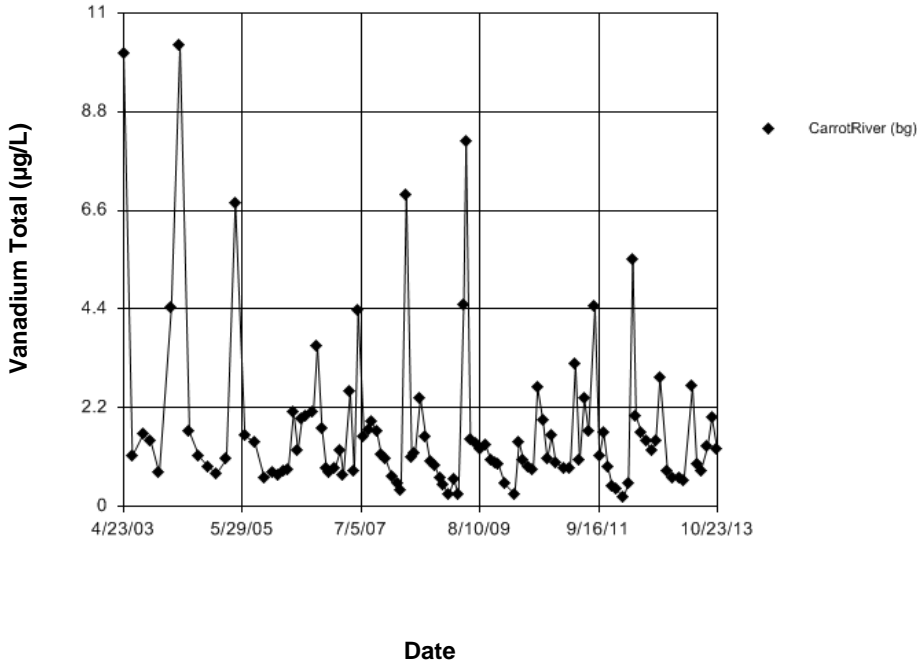


Figure E946 Carrot River: Vanadium Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 53.13. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal. Kruskal-Wallis statistic (H) = 53.13. Adjusted Kruskal-Wallis statistic (H') = 53.13.

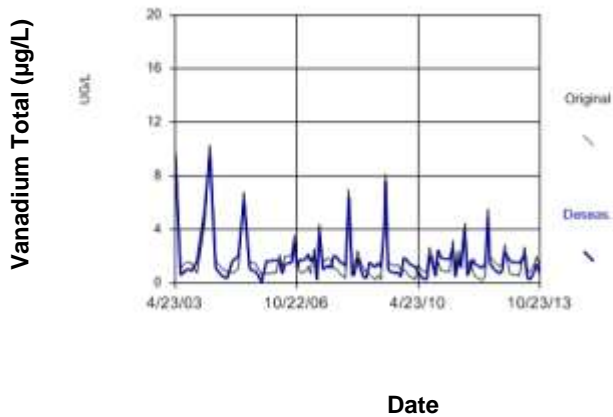


Figure E947 Carrot River: Vanadium Total



### Seasonal Kendall

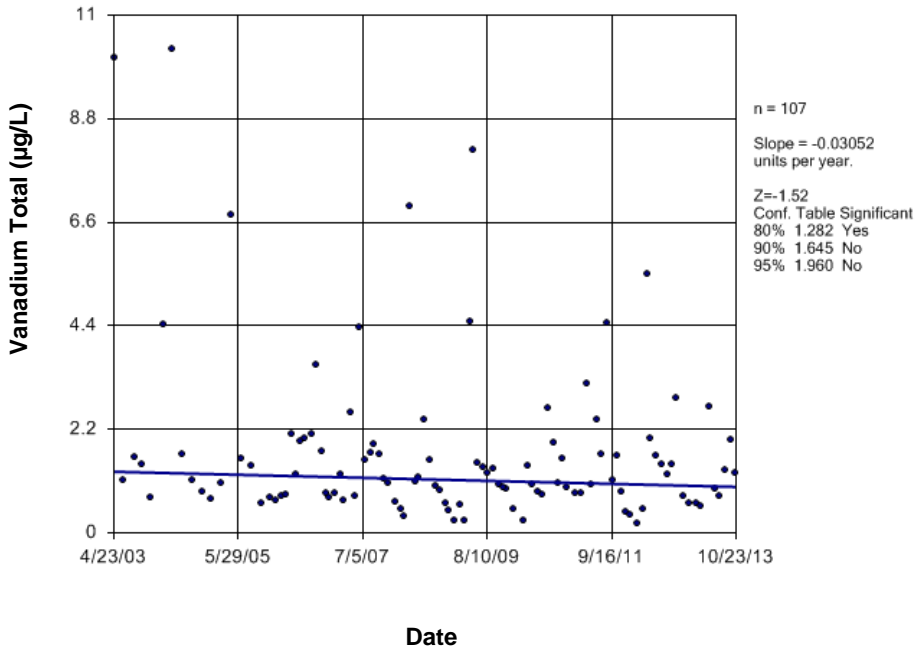


Figure E948 Carrot River: Vanadium Total

### Time Series

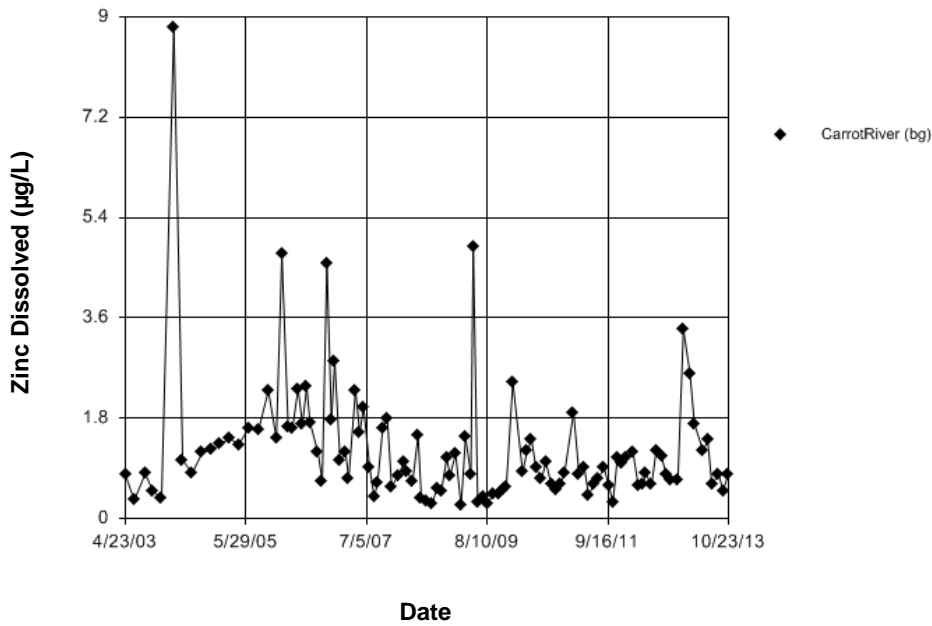


Figure E949 Carrot River: Zinc Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 5.181  
 Tabulated Chi-Squared value = 3.841 with 3 degrees of freedom at the 5% significance level.  
 There were 4 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 5.181  
 Adjusted Kruskal-Wallis statistic (H') = 5.181

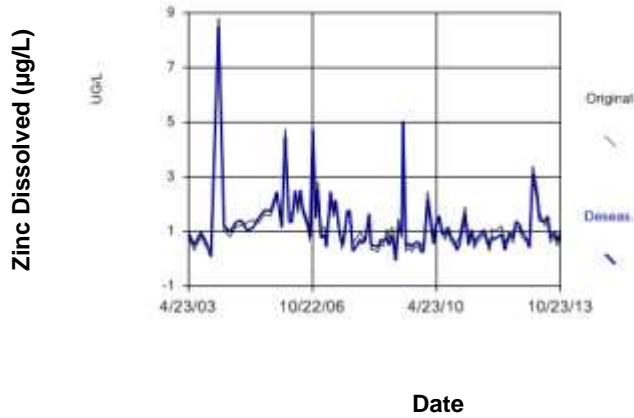


Figure E950 Carrot River: Zinc Dissolved

## Seasonal Kendall

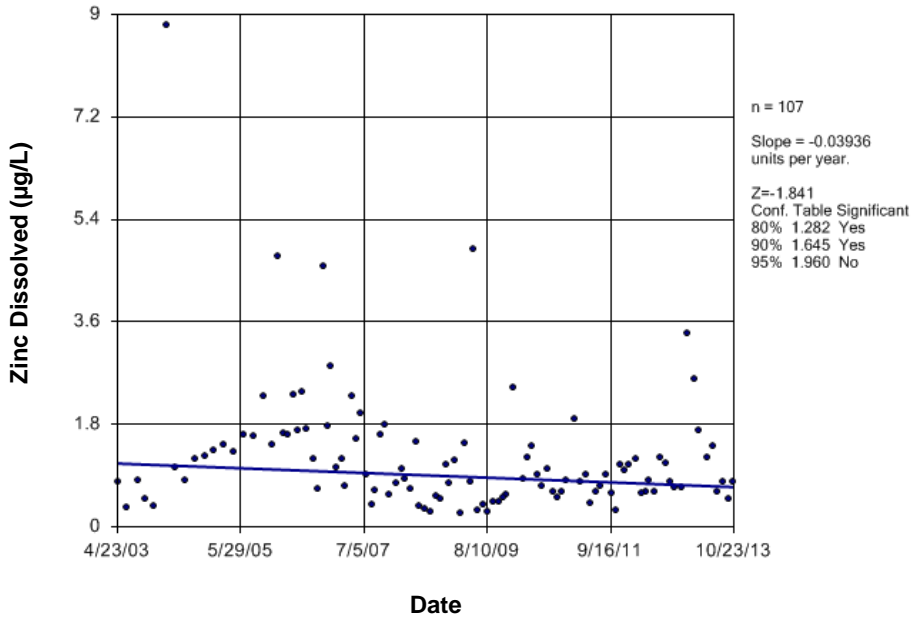


Figure E951 Carrot River: Zinc Dissolved

## Time Series

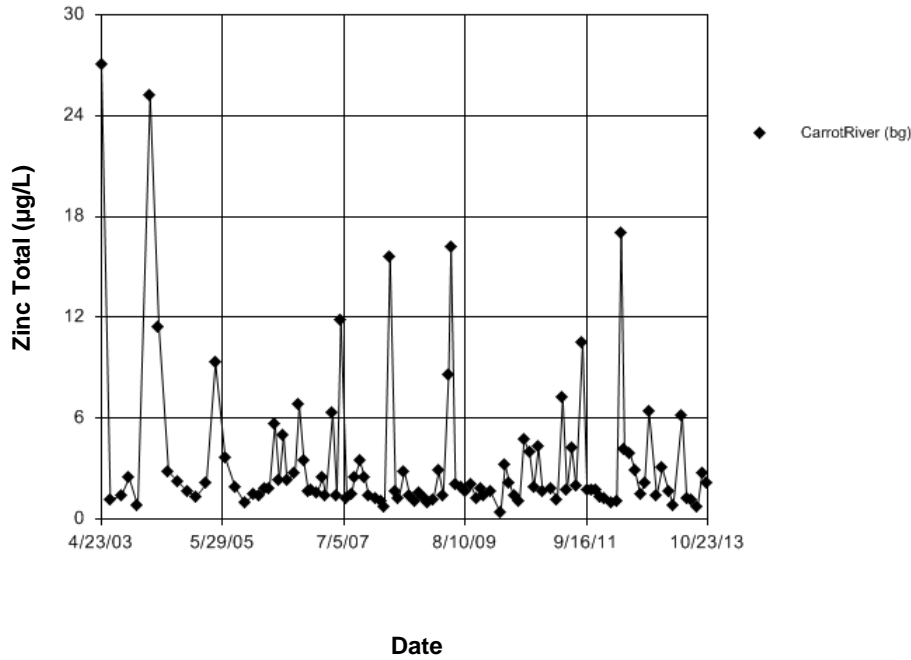


Figure E952 Carrot River: Zinc Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 18.39. Tabulated Chi-squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

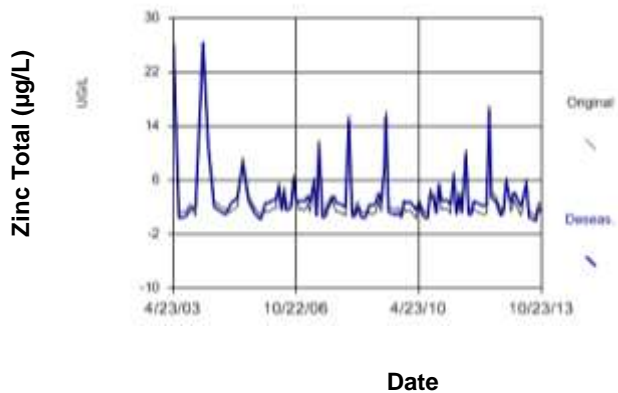


Figure E953 Carrot River: Zinc Total

## Seasonal Kendall

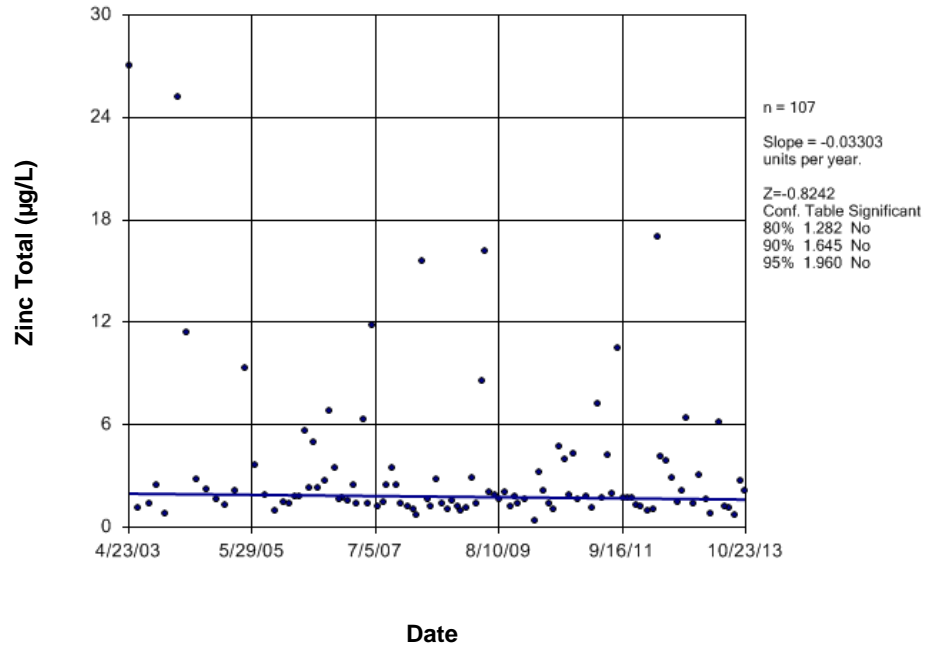
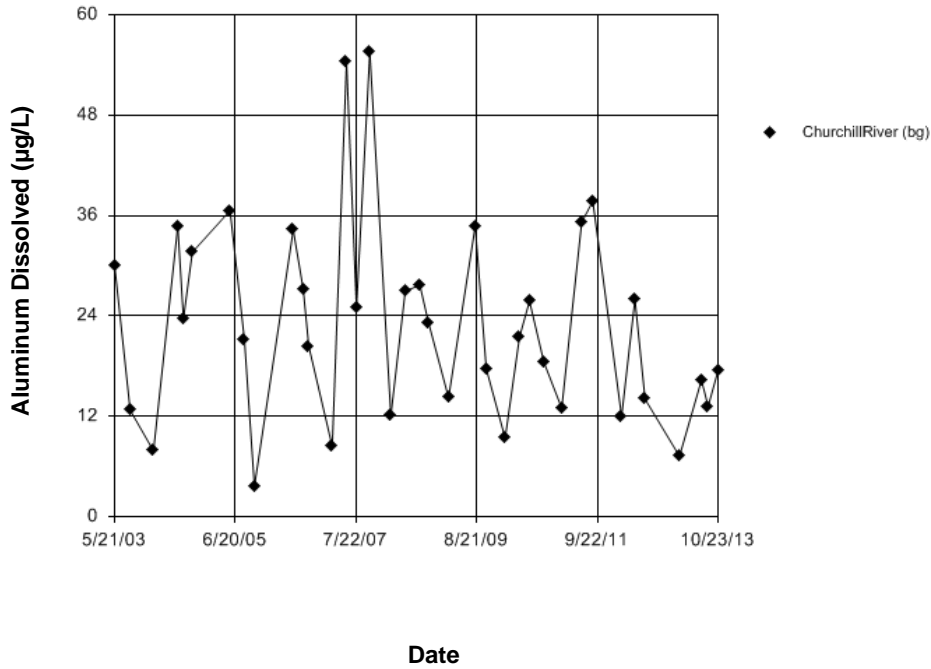


Figure E954 Carrot River: Zinc Total

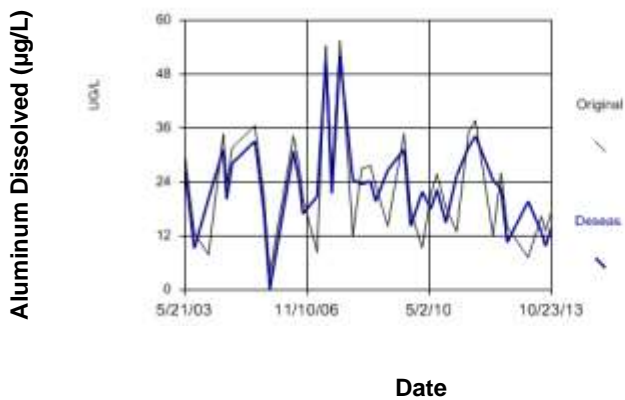
### Time Series



**Figure E955 Churchill River: Aluminum Dissolved**

### Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.  
 Calculated Kruskal-Wallis statistic = 14.72  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



**Figure E956 Churchill River: Aluminum Dissolved**

### Seasonal Kendall

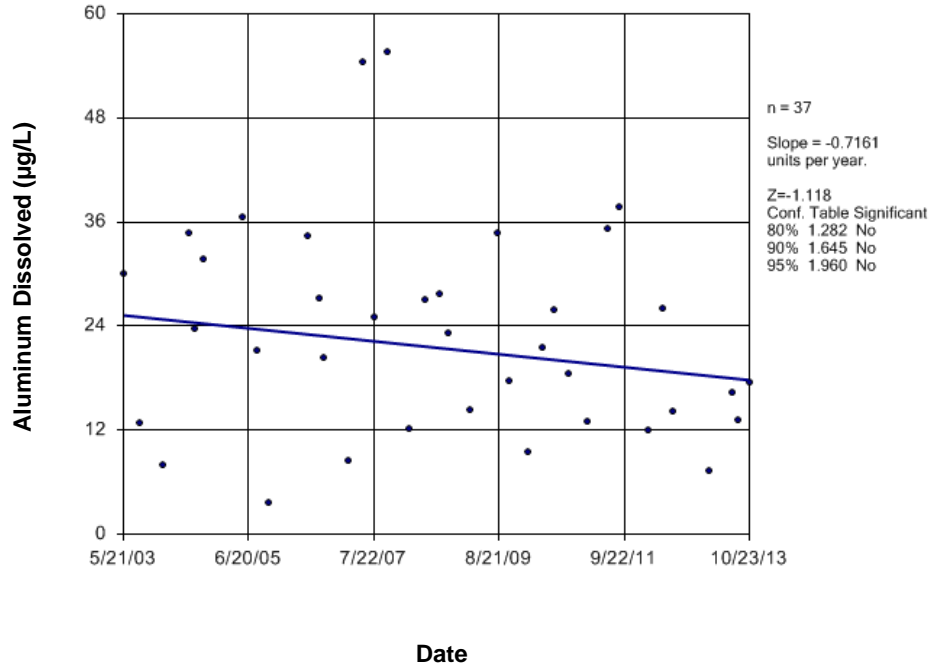


Figure E957 Churchill River: Aluminum Dissolved

### Time Series

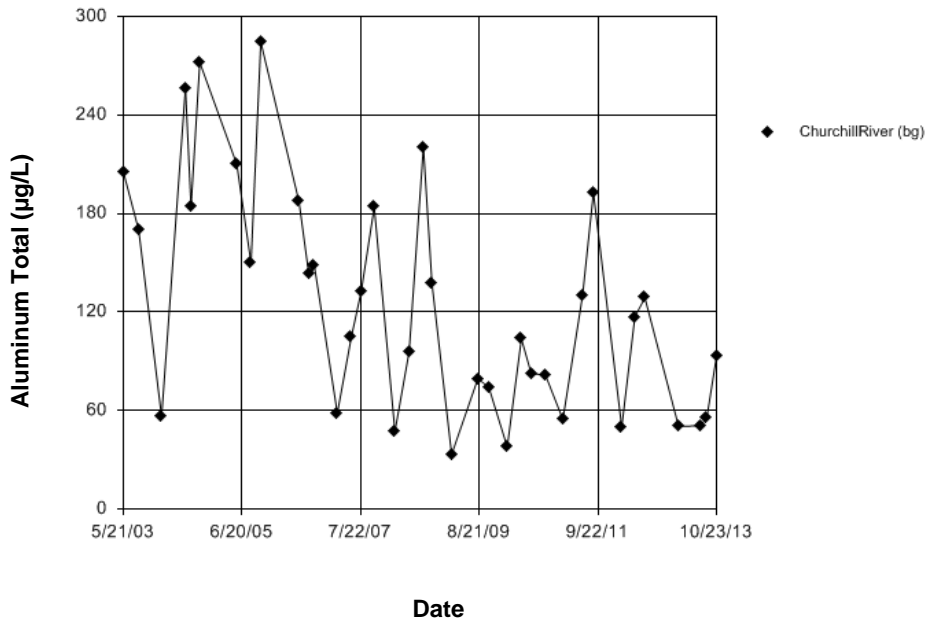
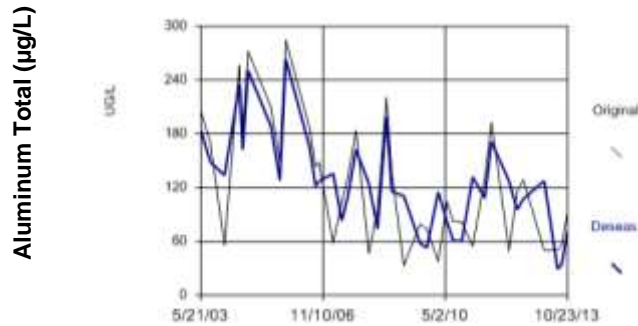


Figure E958 Churchill River: Aluminum Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 16.77  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



Date

Figure E959 Churchill River: Aluminum Total

## Seasonal Kendall

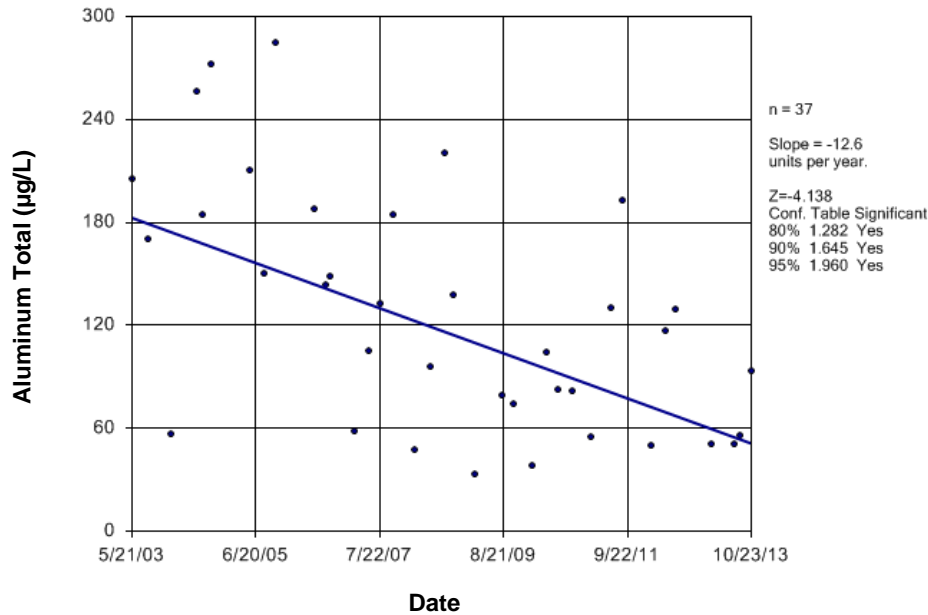
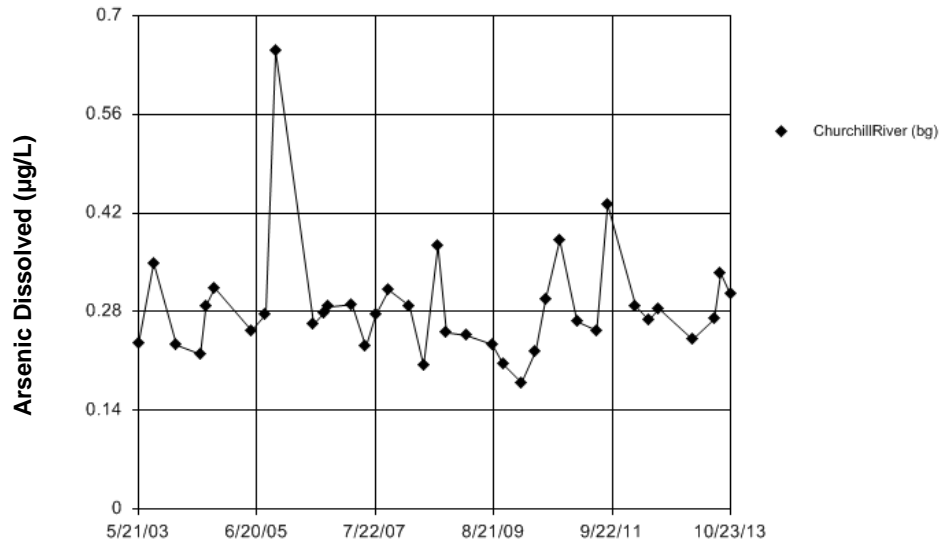


Figure E960 Churchill River: Aluminum Total

### Time Series

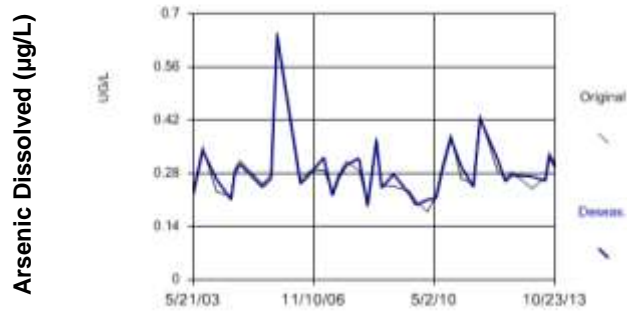


Date

Figure E961 Churchill River: Arsenic Dissolved

### Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 1.225. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

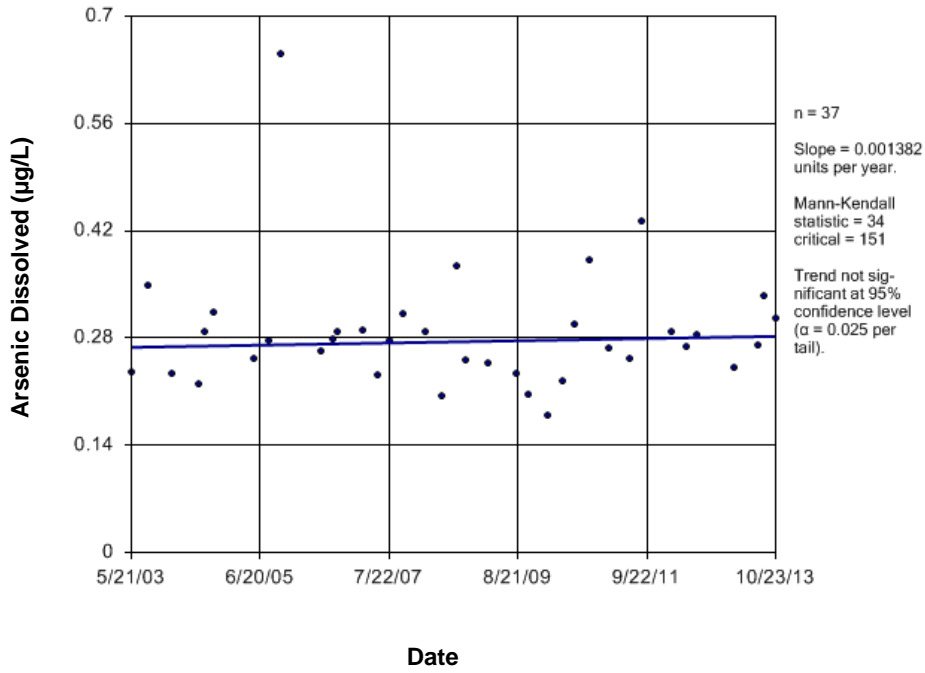


Date

Figure E962 Churchill River: Arsenic Dissolved

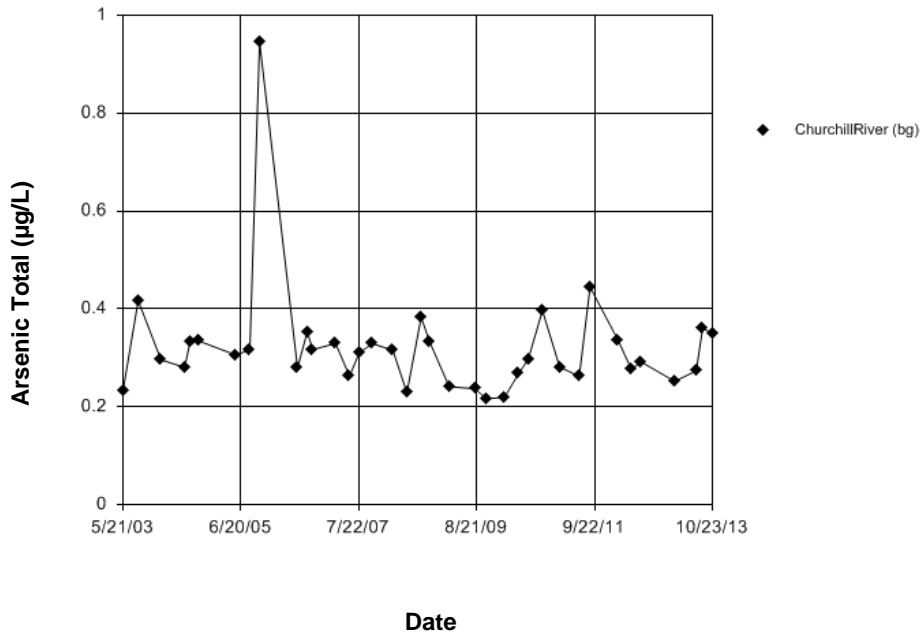


### Sen's Slope Estimator



**Figure E963 Churchill River: Arsenic Dissolved**

### Time Series



**Figure E964 Churchill River: Arsenic Total**

# Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 1.225  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (FD) was necessary.

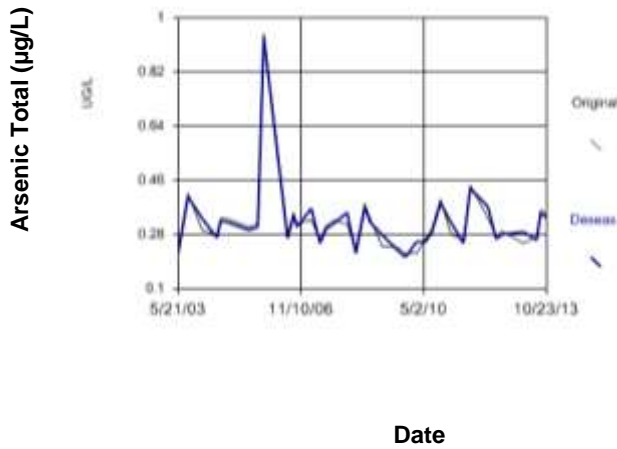


Figure E965 Churchill River: Arsenic Total

# Sen's Slope Estimator

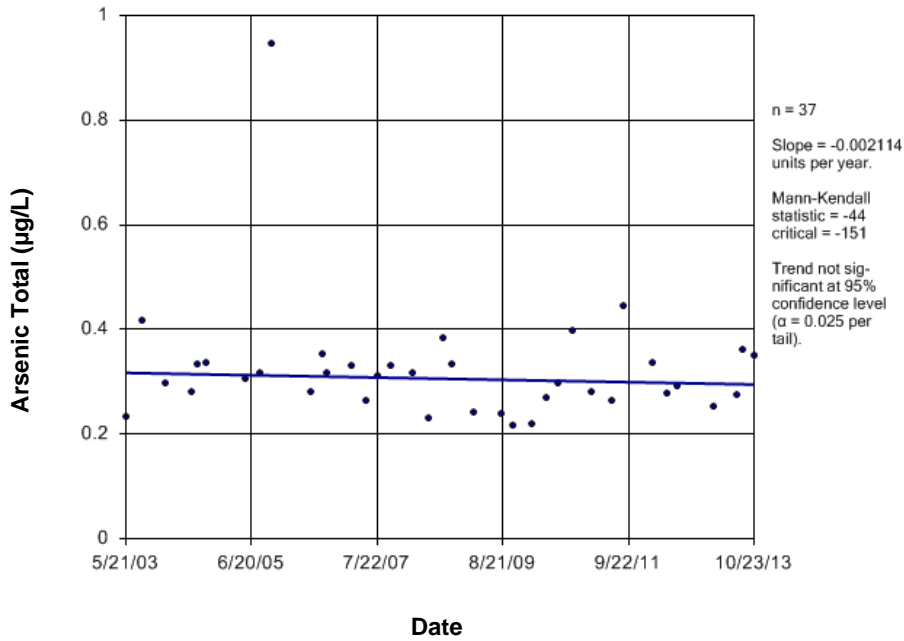
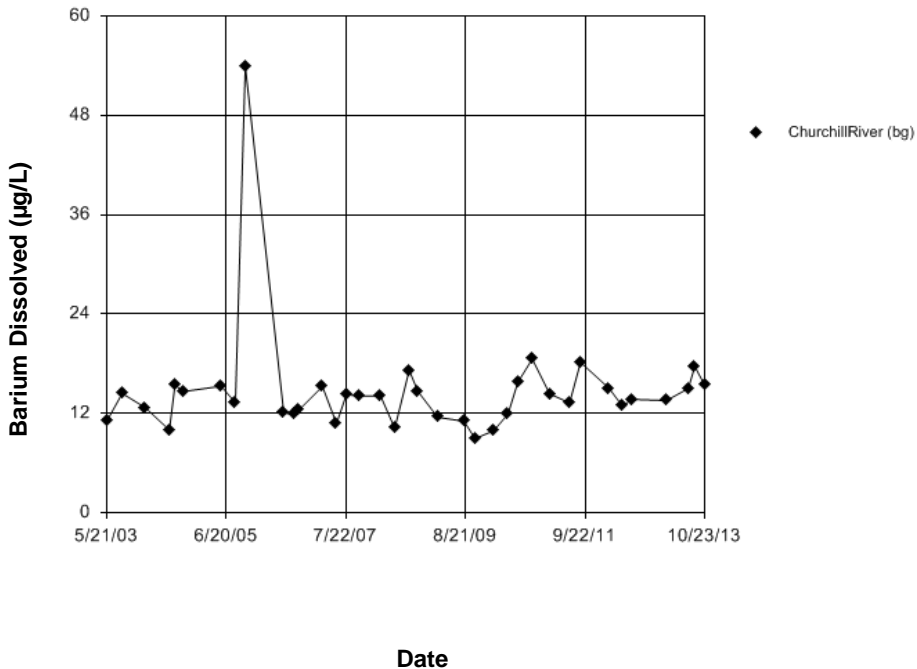


Figure E966 Churchill River: Arsenic Total

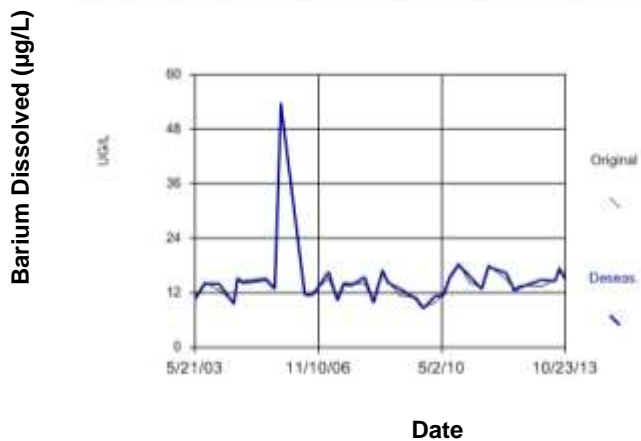
### Time Series



**Figure E967 Churchill River: Barium Dissolved**

### Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.3063. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



**Figure E968 Churchill River: Barium Dissolved**

### Sen's Slope Estimator

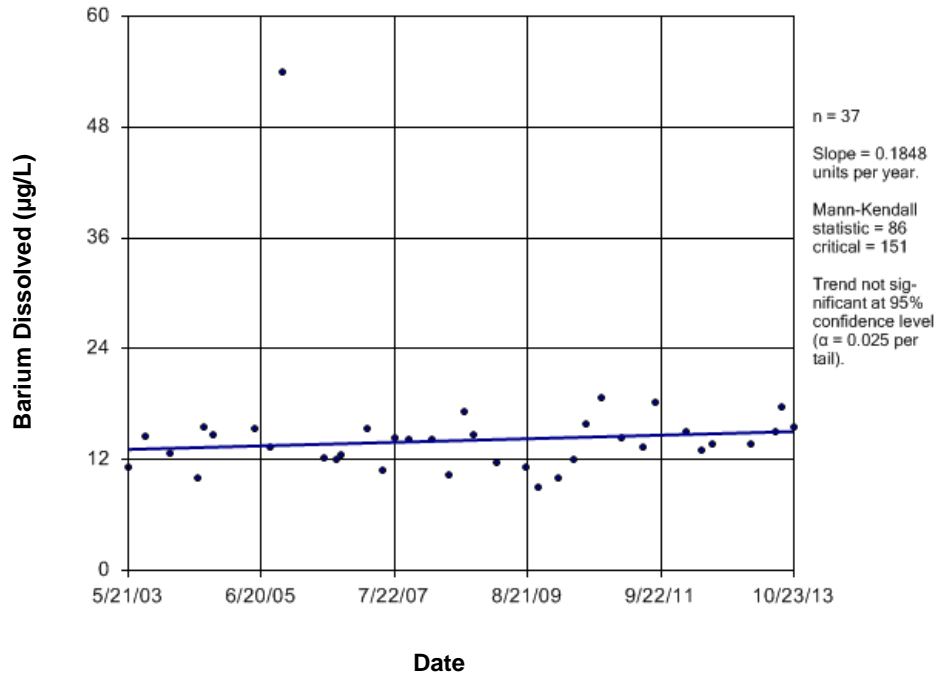


Figure E969 Churchill River: Barium Dissolved

### Time Series

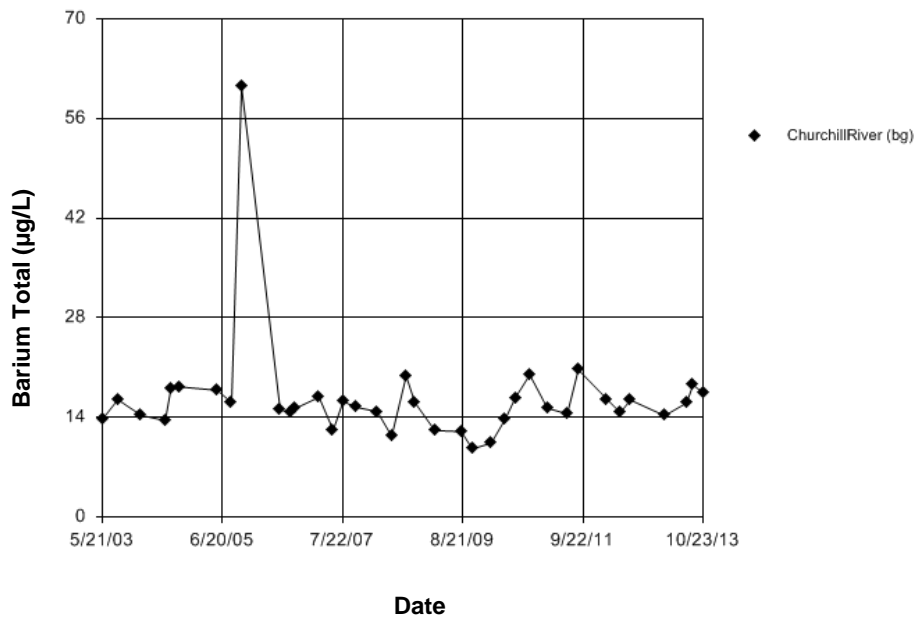


Figure E970 Churchill River: Barium Total

# Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 1.883  
Tabulated Chi-Squared value = 3.841 with 3 degrees of freedom at the 5% significance level.  
There were 4 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

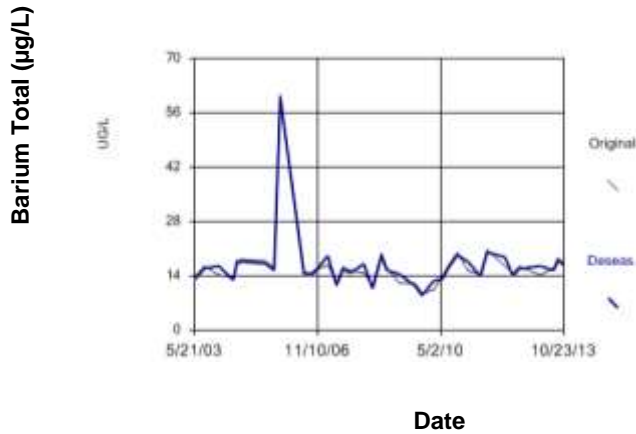


Figure E971 Churchill River: Barium Total

# Sen's Slope Estimator

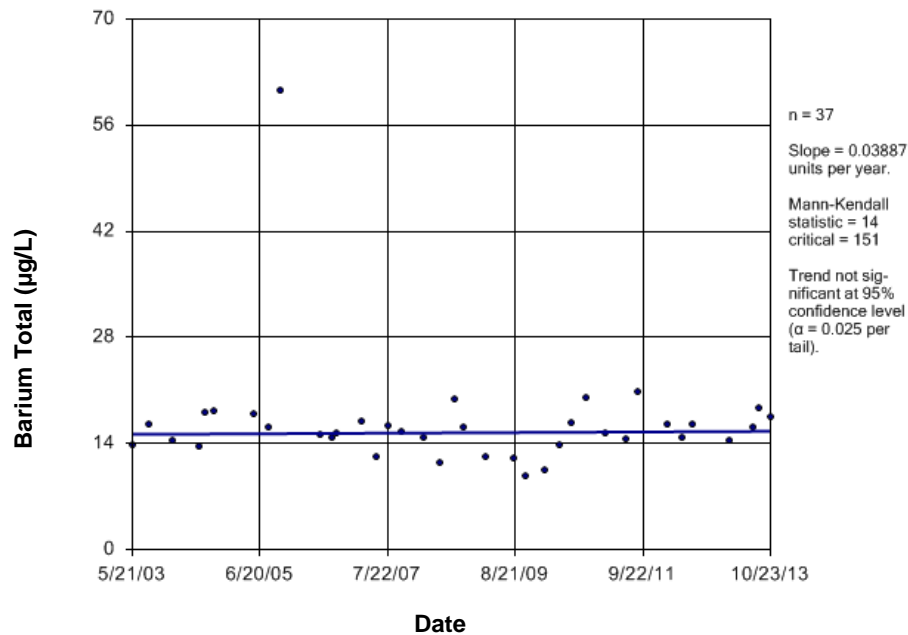
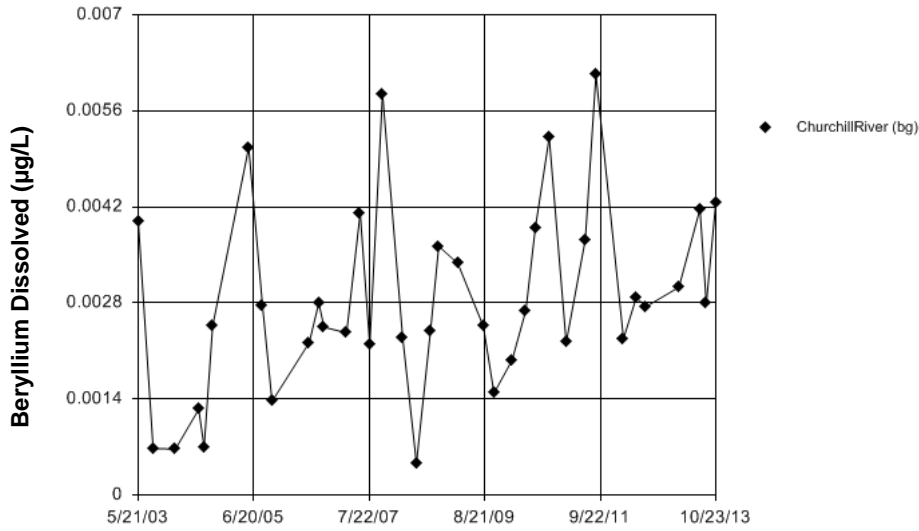


Figure E972 Churchill River: Barium Total

## Time Series

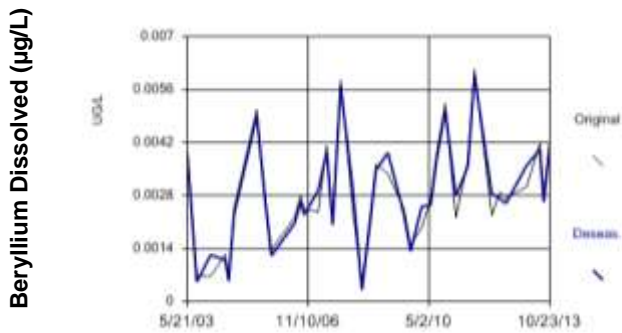


Date

Figure E973 Churchill River: Beryllium Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 2.288. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



Date

Figure E974 Churchill River: Beryllium Dissolved

### Sen's Slope Estimator

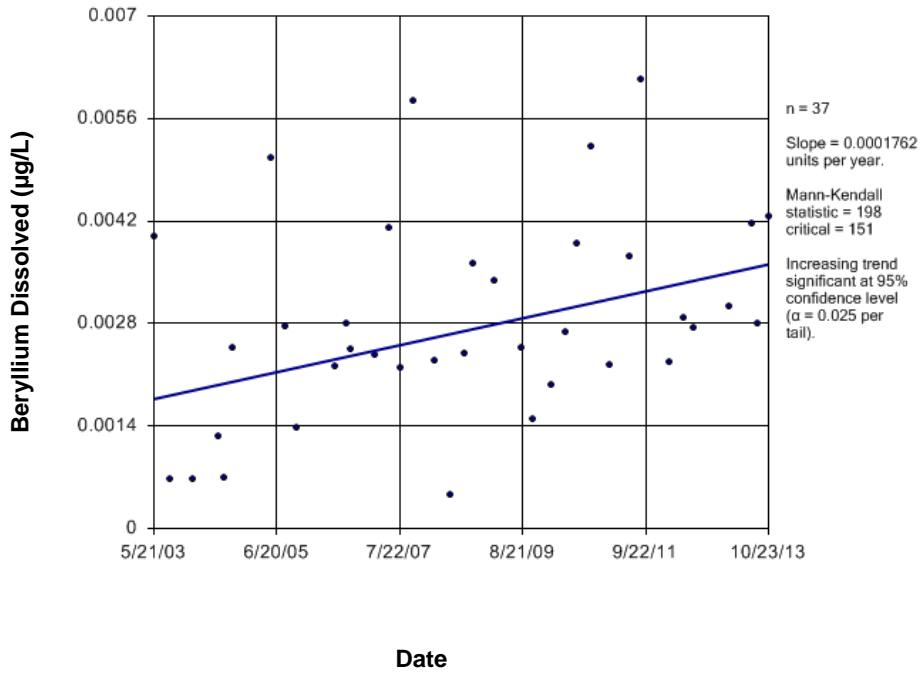


Figure E975 Churchill River: Beryllium Dissolved

### Time Series

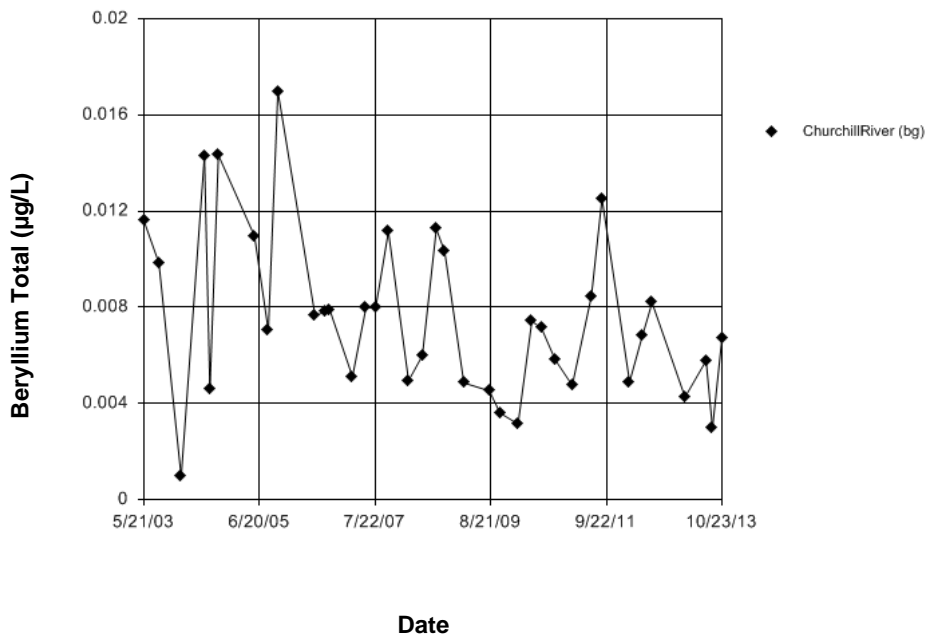
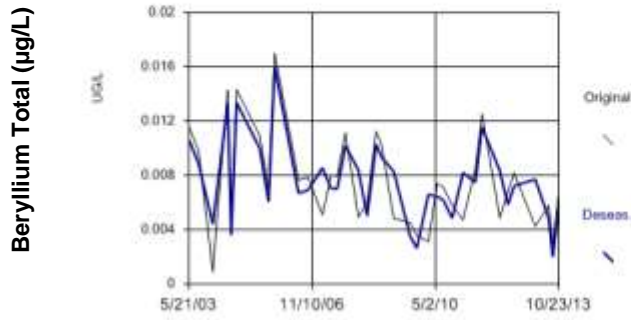


Figure E976 Churchill River: Beryllium Total

## Seasonality

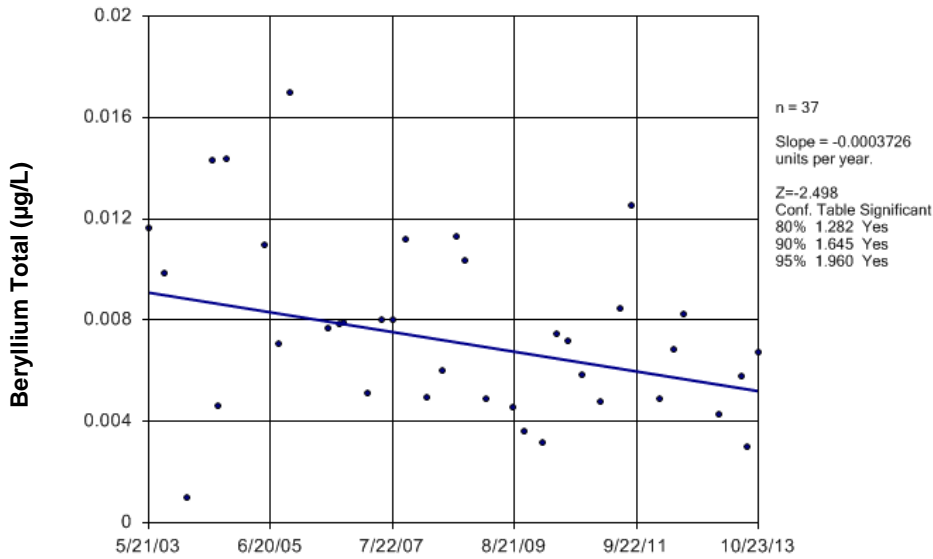
For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 11.77. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



Date

Figure E977 Churchill River: Beryllium Total

## Seasonal Kendall

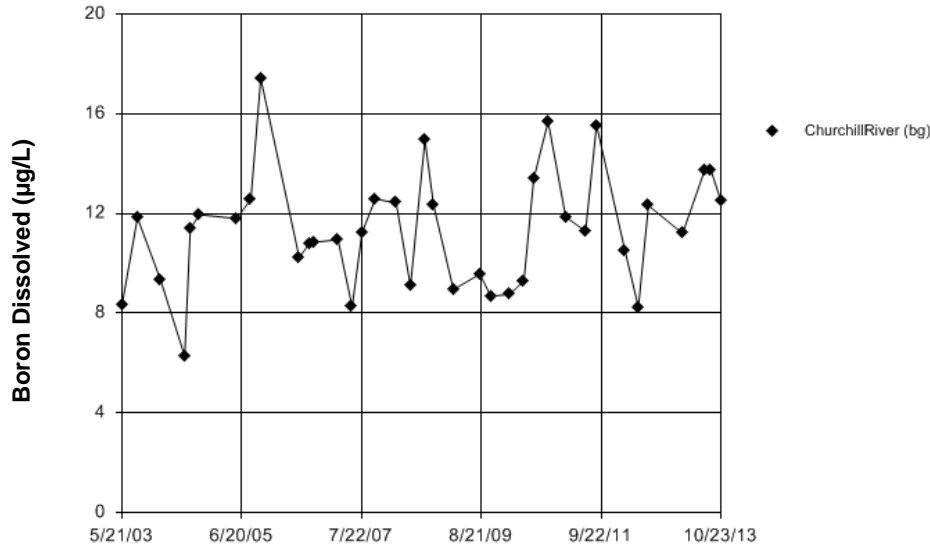


Date

Figure E978 Churchill River: Beryllium Total



### Time Series

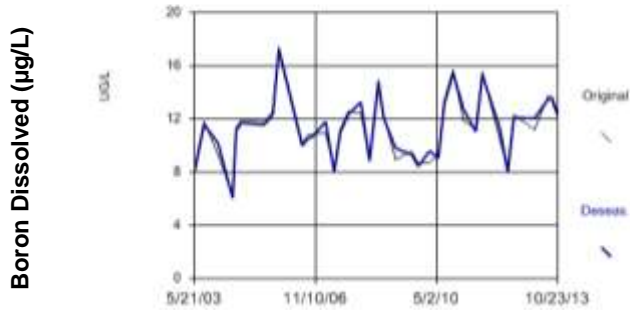


Date

**Figure E979 Churchill River: Boron Dissolved**

### Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent from any other season. Calculated Kruskal-Wallis statistic = 1.492. Tabulated Chi-Squared value = 3.841 with 3 degrees of freedom at the 5% significance level. There were 8 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



Date

**Figure E980 Churchill River: Boron Dissolved**

### Sen's Slope Estimator

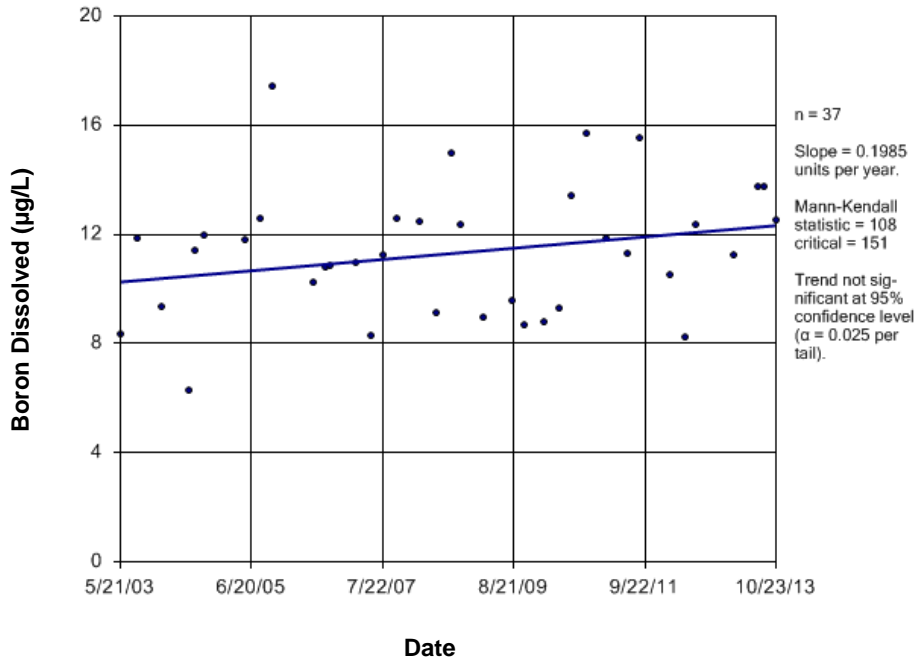


Figure E981 Churchill River: Boron Dissolved

### Time Series

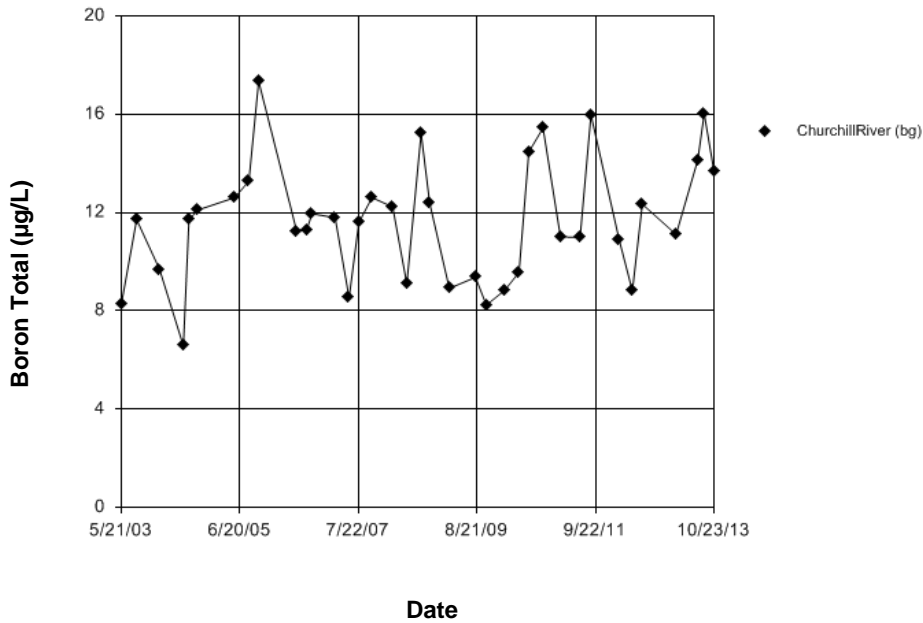
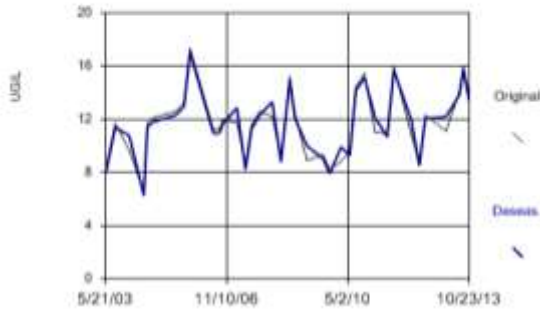


Figure E982 Churchill River: Boron Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 2.401  
 Tabulated Chi-Squared value = 3.841 with 3 degrees of freedom at the 5% significance level.  
 There were 4 groups of data in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 2.401  
 Adjusted Kruskal-Wallis statistic (H') = 2.401

Boron Total ( $\mu\text{g/L}$ )



Date

Figure E983 Churchill River: Boron Total

## Sen's Slope Estimator

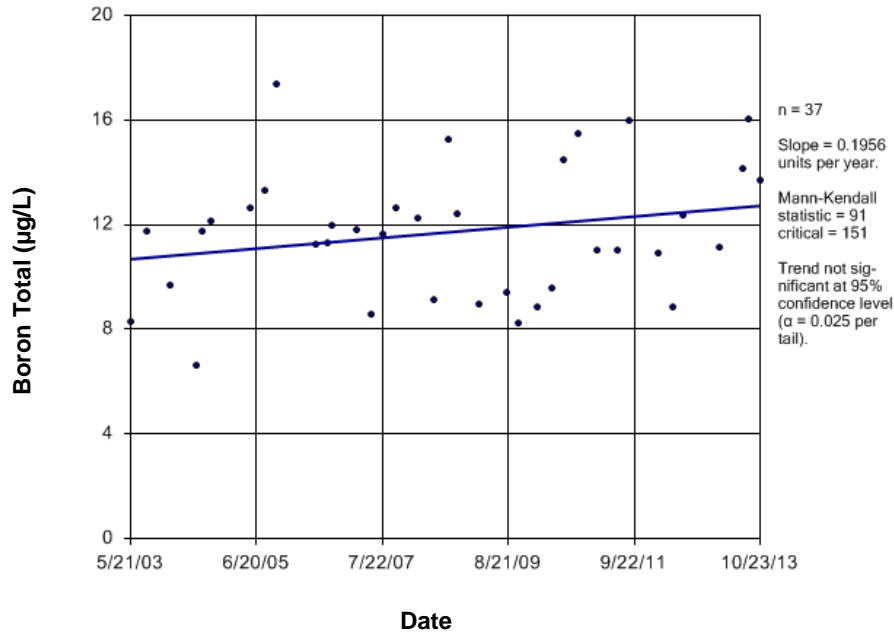


Figure E984 Churchill River: Boron Total

## Time Series

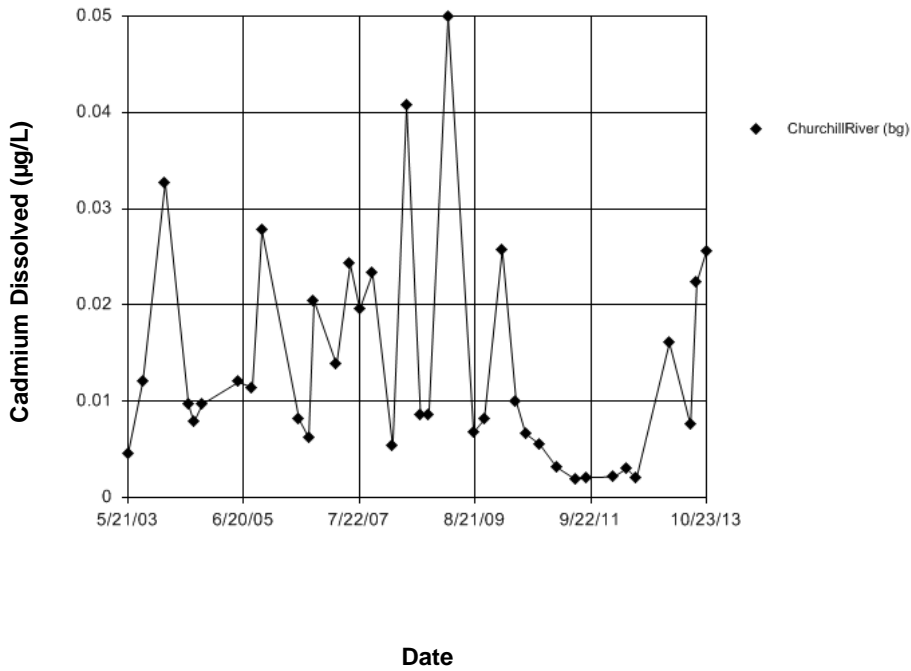


Figure E985 Churchill River: Cadmium Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-Squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.6588. Calculated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

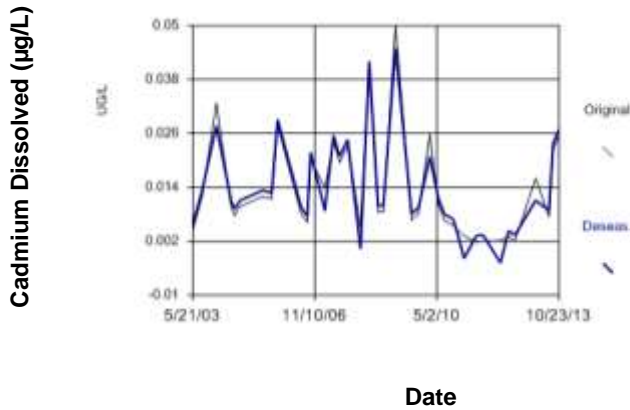
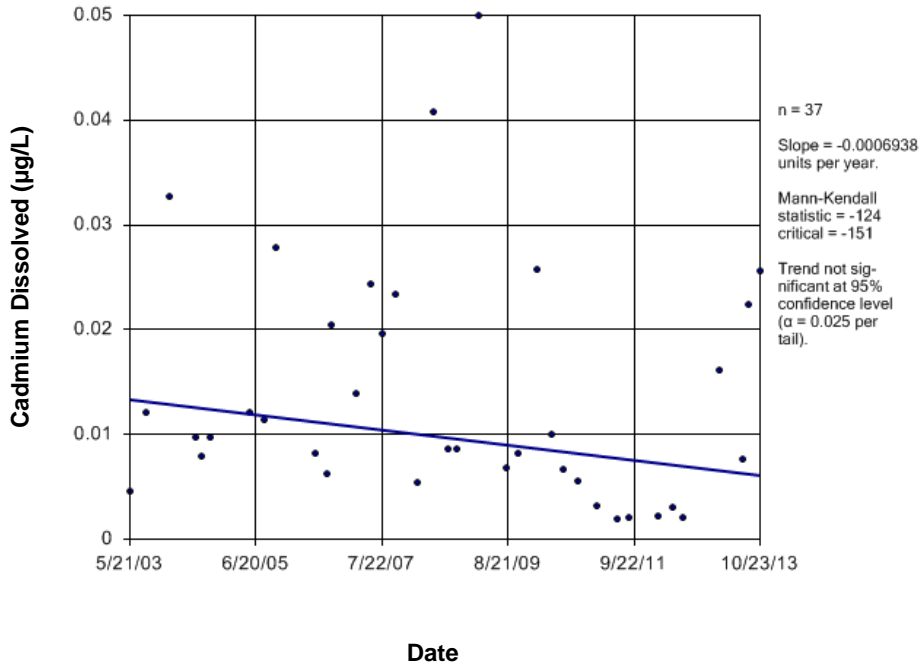


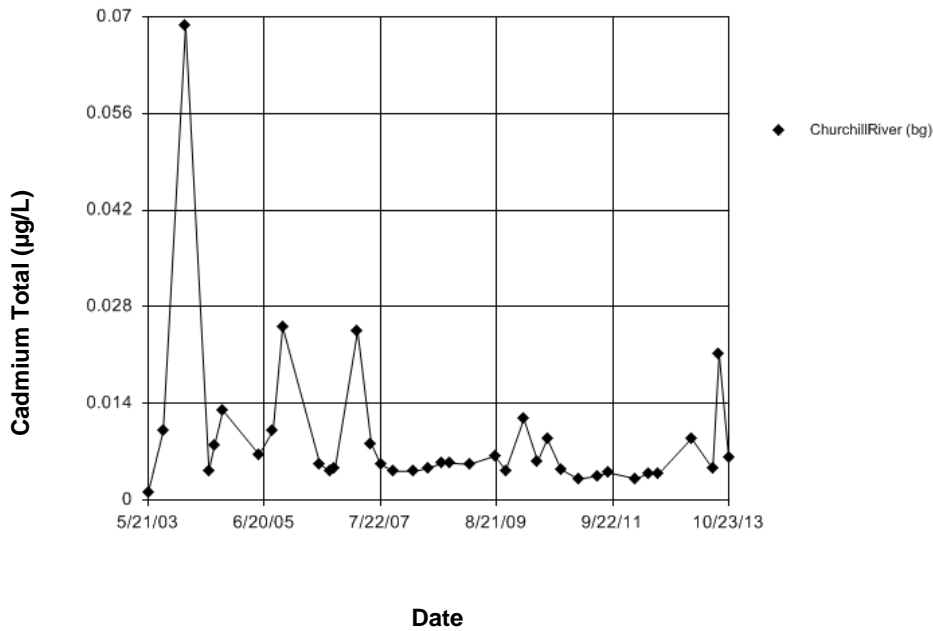
Figure E986 Churchill River: Cadmium Dissolved

### Sen's Slope Estimator



**Figure E987 Churchill River: Cadmium Dissolved**

### Time Series



**Figure E988 Churchill River: Cadmium Total**

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this contaminant than any other season. Calculated Kruskal-Wallis statistic = 0.23. Tabulated Chi-Squared value = 3.841 with 4 degrees of freedom at the 5% significance level. There were 8 groups of data in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

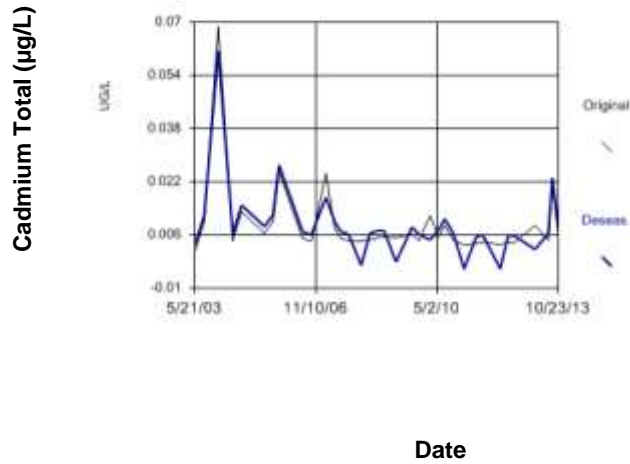


Figure E989 Churchill River: Cadmium Total

## Sen's Slope Estimator

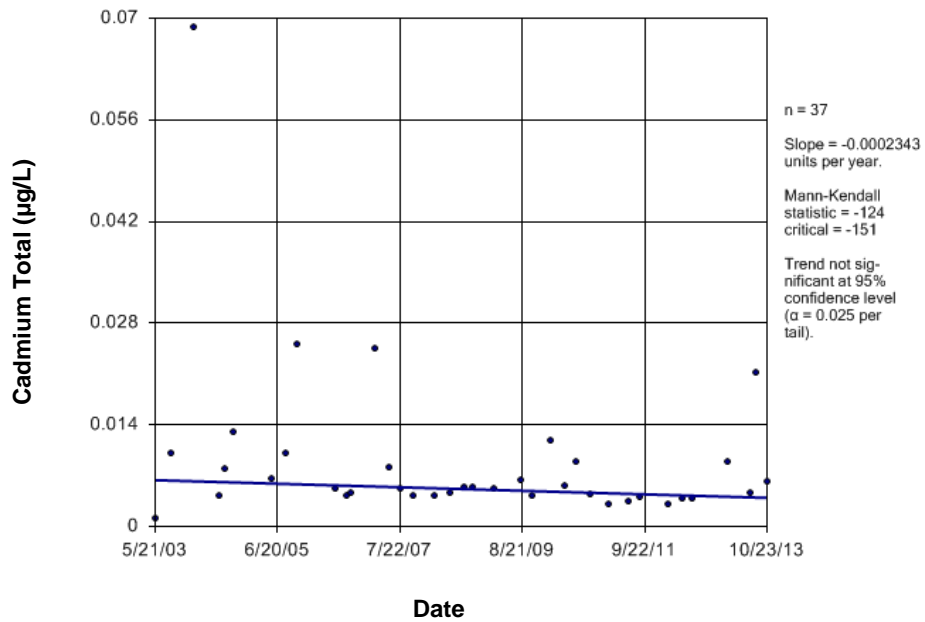


Figure E990 Churchill River: Cadmium Total

## Time Series

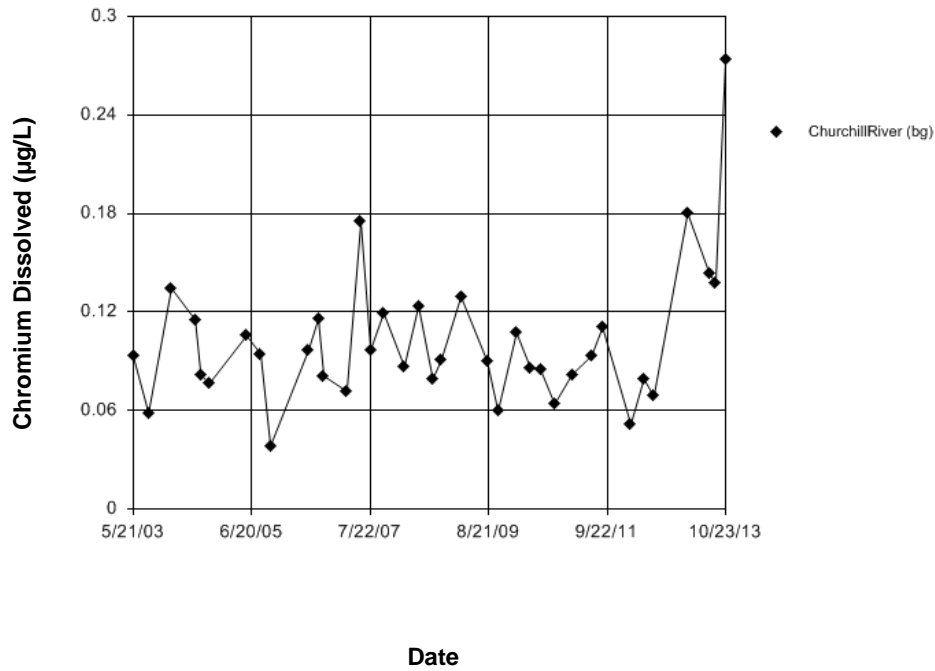


Figure E991 Churchill River: Chromium Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.1761. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

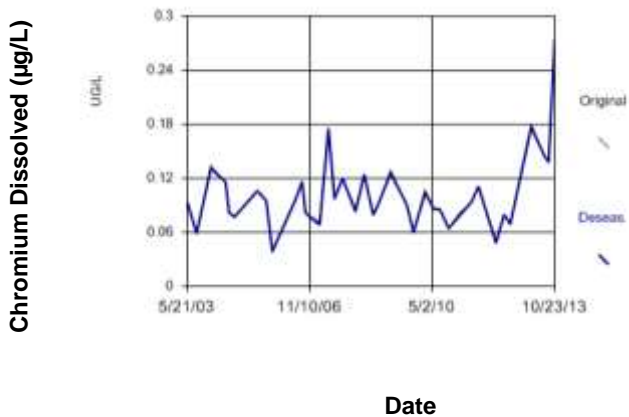


Figure E992 Churchill River: Chromium Dissolved

### Sen's Slope Estimator

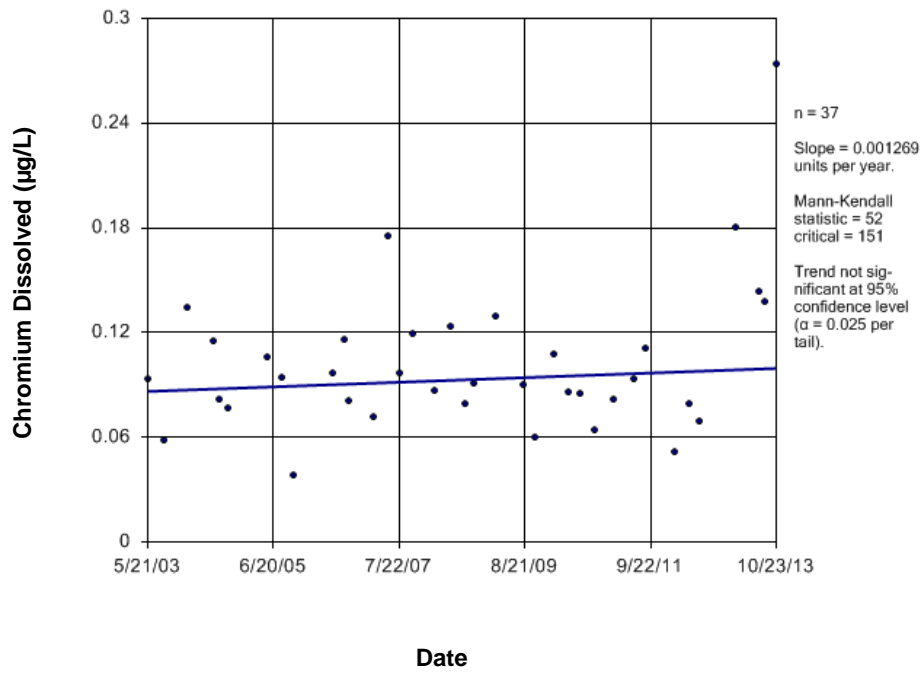


Figure E993 Churchill River: Chromium Dissolved

### Time Series

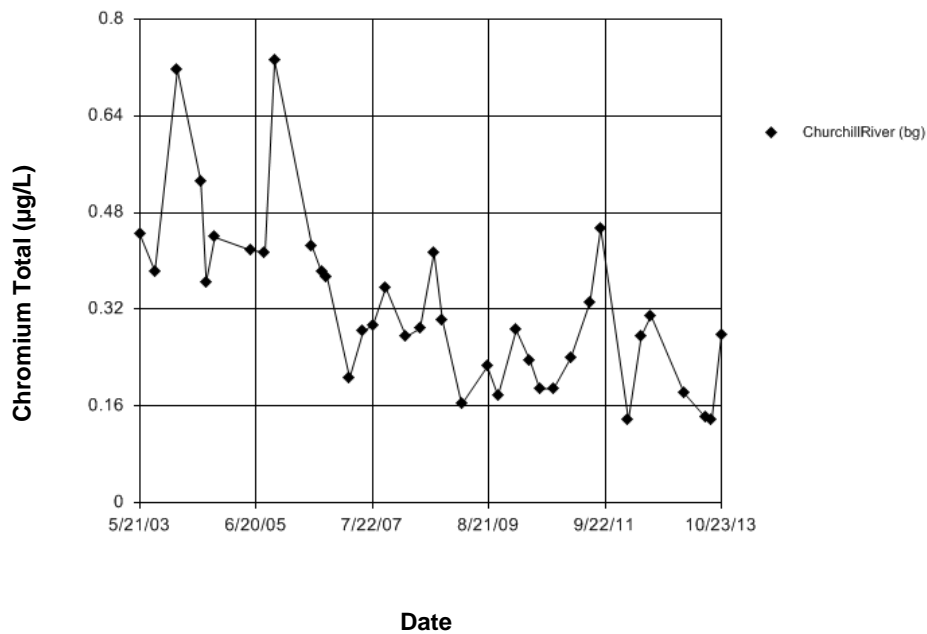
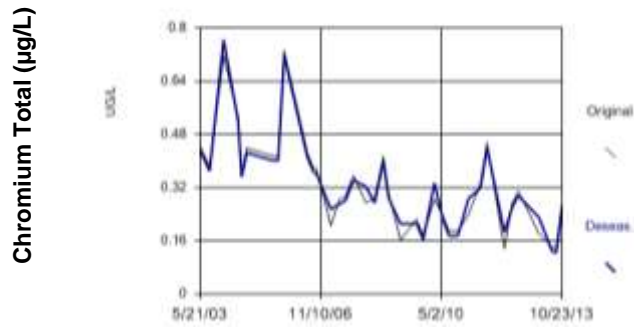


Figure E994 Churchill River: Chromium Total



## Seasonality

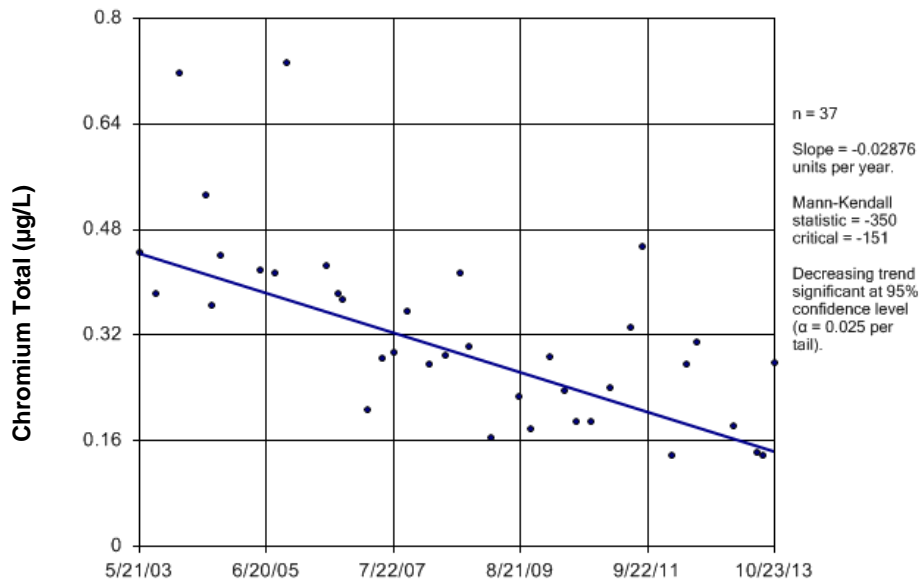
For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 3.824  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 9 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



Date

**Figure E995 Churchill River: Chromium Total**

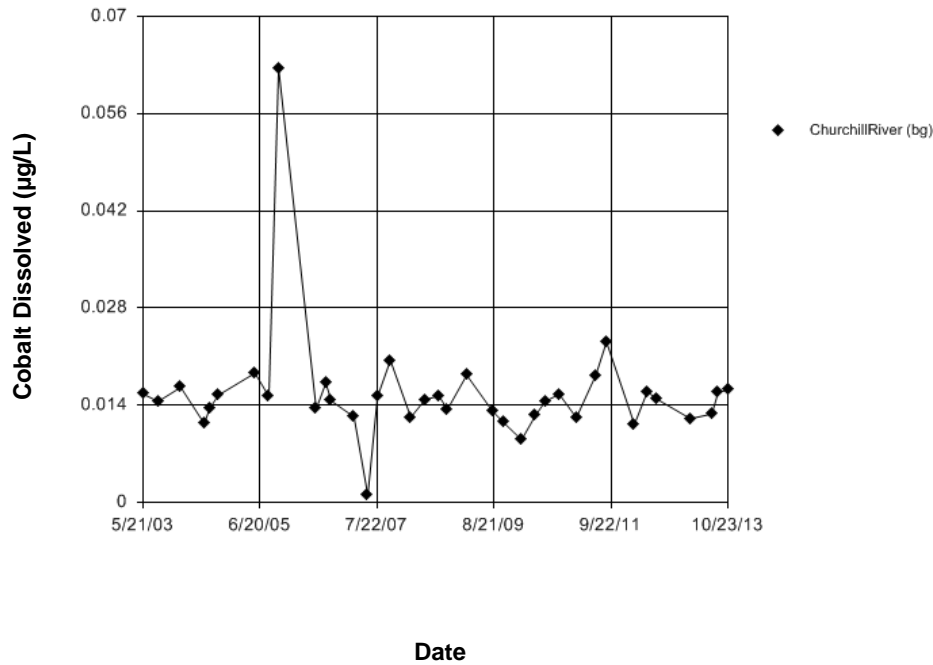
## Sen's Slope Estimator



Date

**Figure E996 Churchill River: Chromium Total**

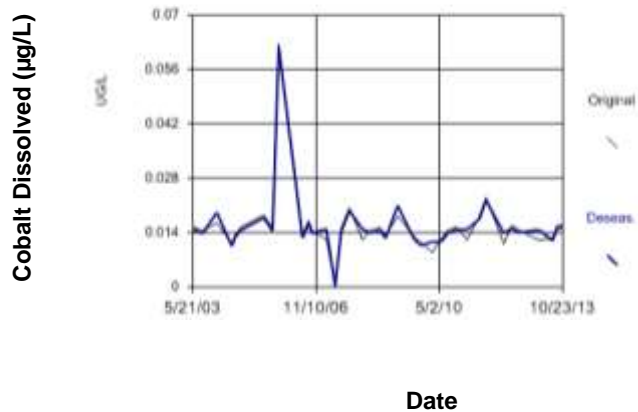
## Time Series



**Figure E997 Churchill River: Cobalt Dissolved**

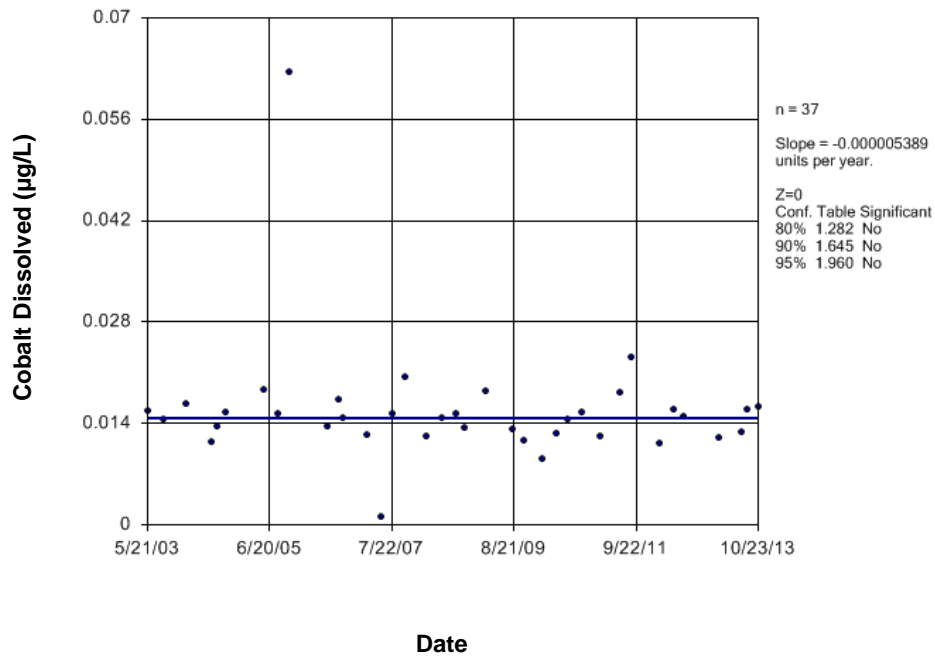
## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 3.969. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (D) was necessary.



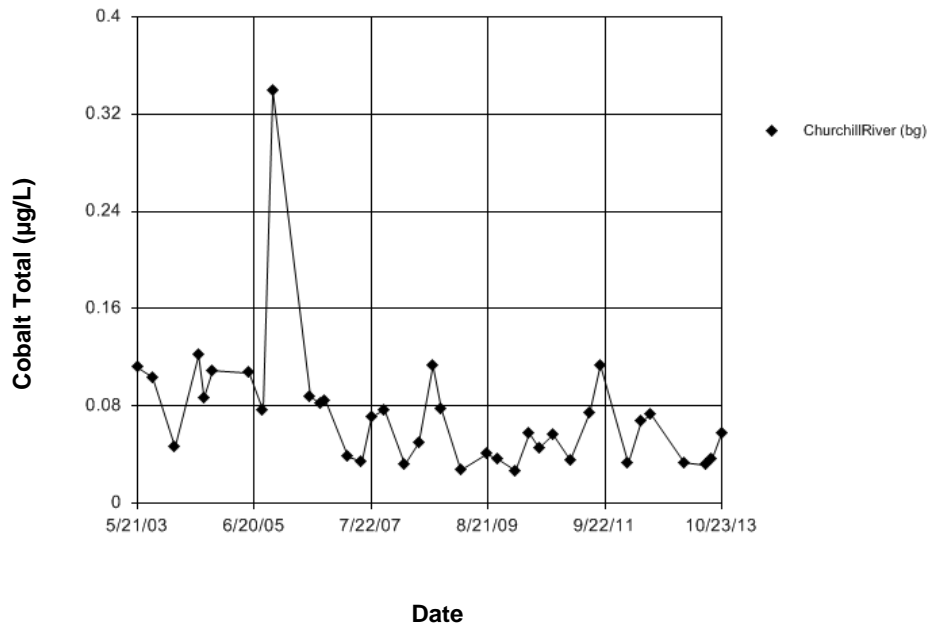
**Figure E998 Churchill River: Cobalt Dissolved**

### Seasonal Kendall



**Figure E999 Churchill River: Cobalt Dissolved**

### Time Series



**Figure E1000 Churchill River: Cobalt Total**

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 13.89  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 8 groups of data in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

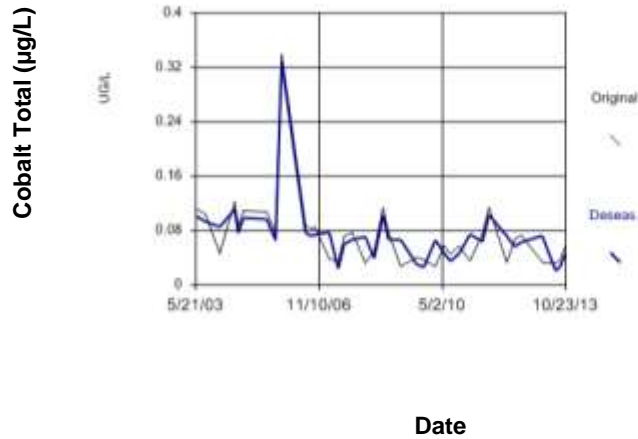


Figure E1001 Churchill River: Cobalt Total

## Seasonal Kendall

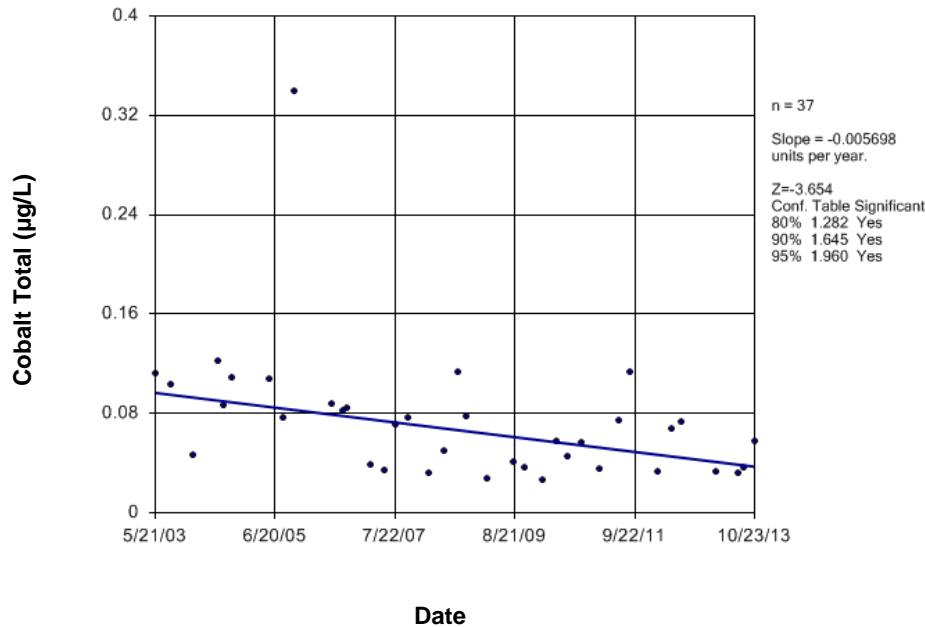
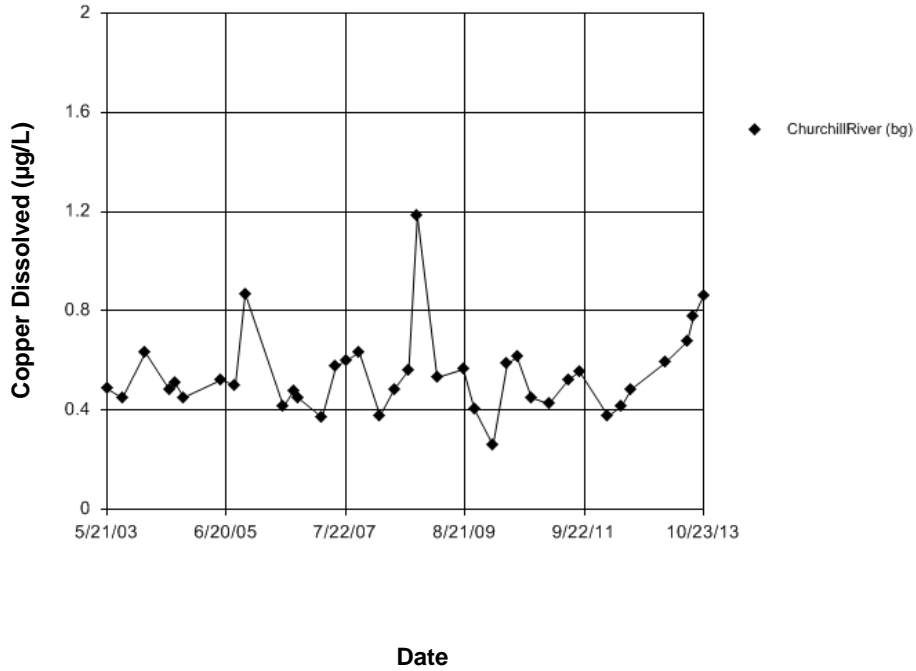


Figure E1002 Churchill River: Cobalt Total

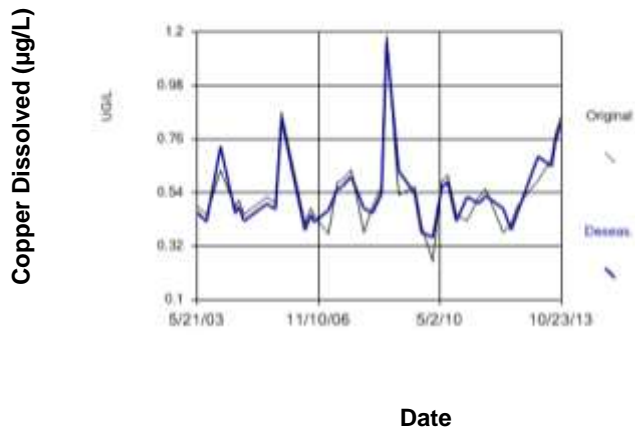
### Time Series



**Figure E1003 Churchill River: Copper Dissolved**

### Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 3.824. Tabulated Chi-Squared value = 3.841 with 4 degrees of freedom at the 5% significance level. There were 8 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



**Figure E1004 Churchill River: Copper Dissolved**

### Sen's Slope Estimator

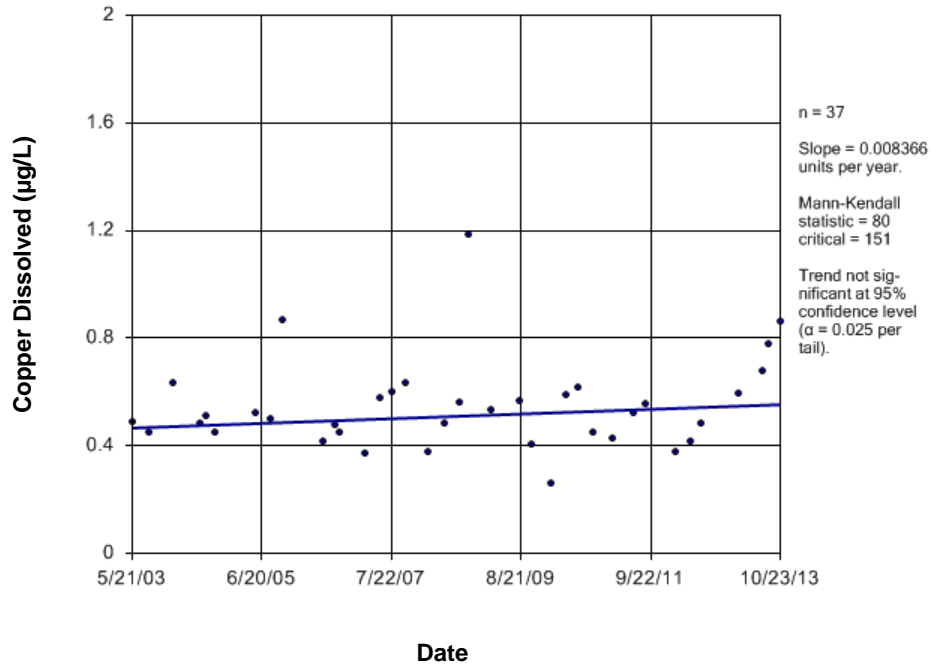


Figure E1005 Churchill River: Copper Dissolved

### Time Series

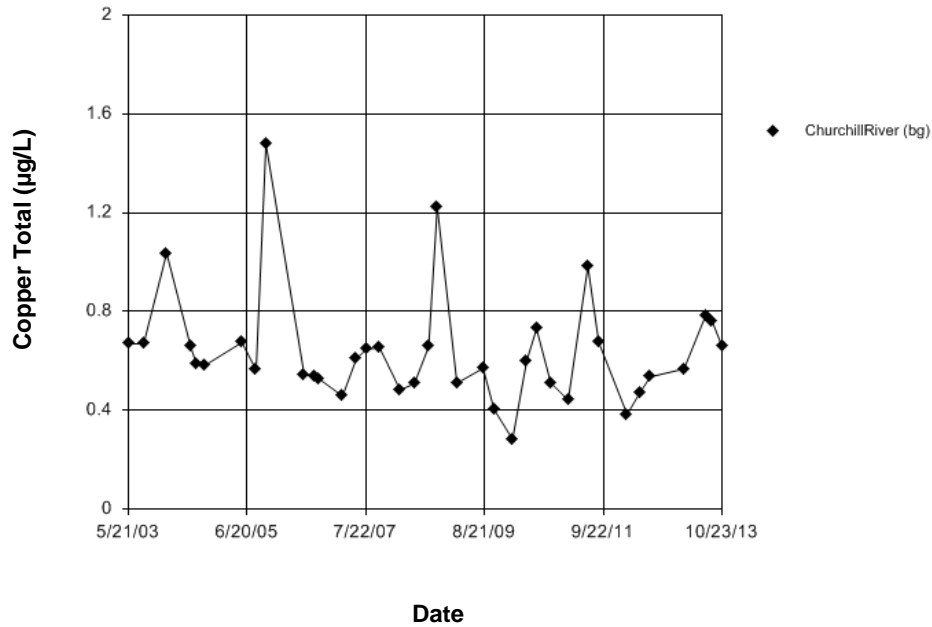


Figure E1006 Churchill River: Copper Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 7.254  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

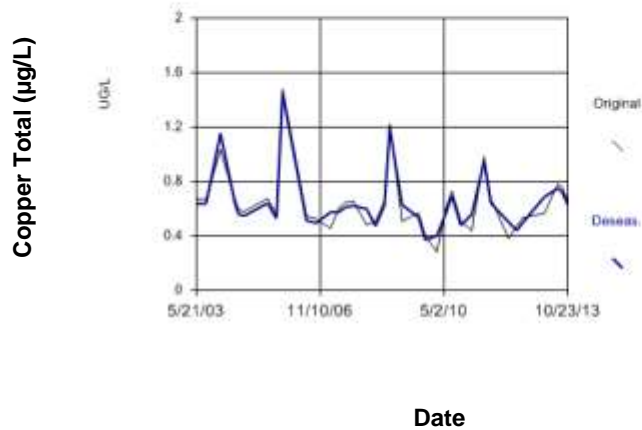


Figure E1007 Churchill River: Copper Total

## Seasonal Kendall

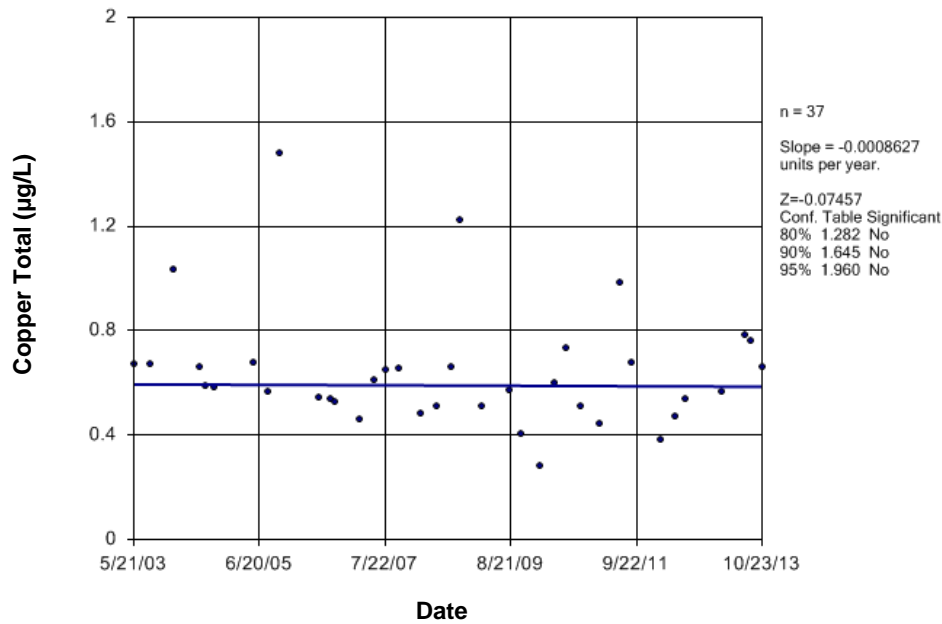
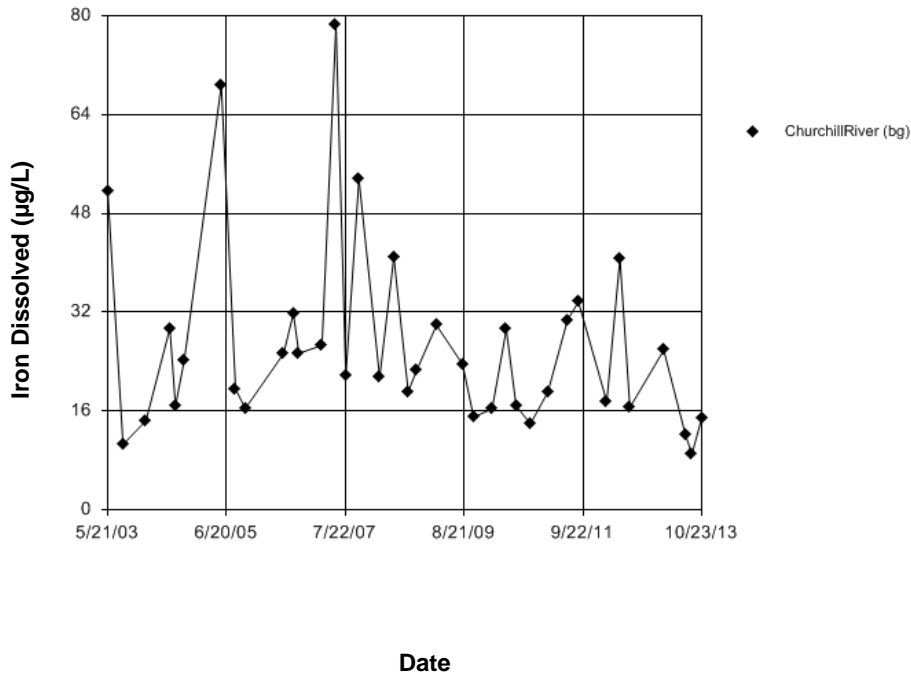


Figure E1008 Churchill River: Copper Total

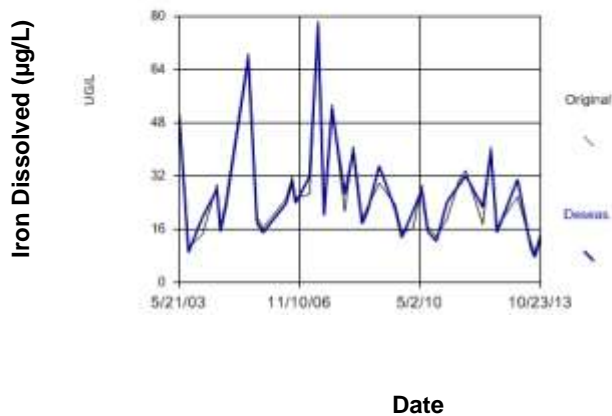
## Time Series



**Figure E1009 Churchill River: Iron Dissolved**

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.441. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



**Figure E1010 Churchill River: Iron Dissolved**



### Sen's Slope Estimator

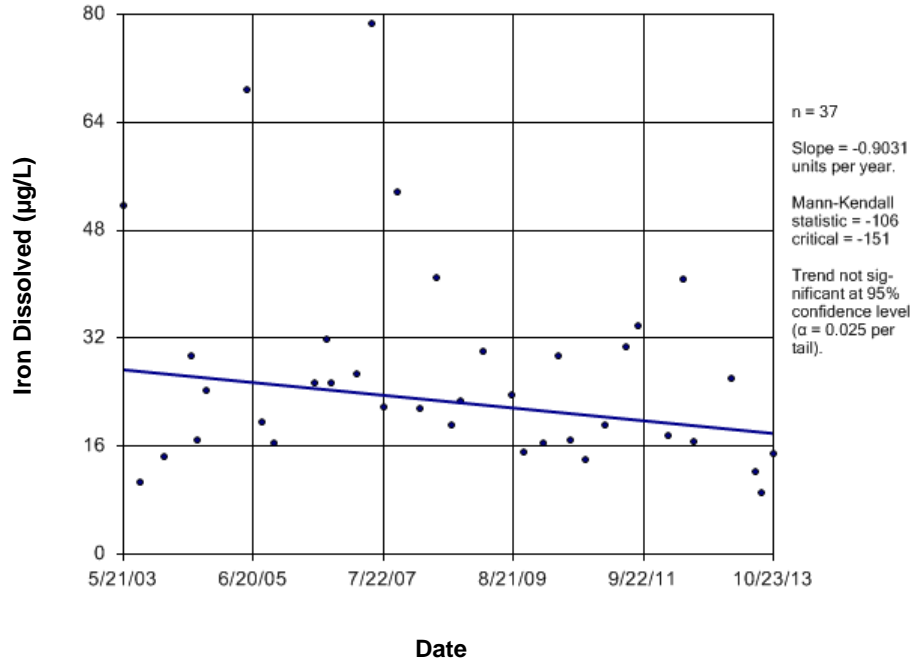


Figure E1011 Churchill River: Iron Dissolved

### Time Series

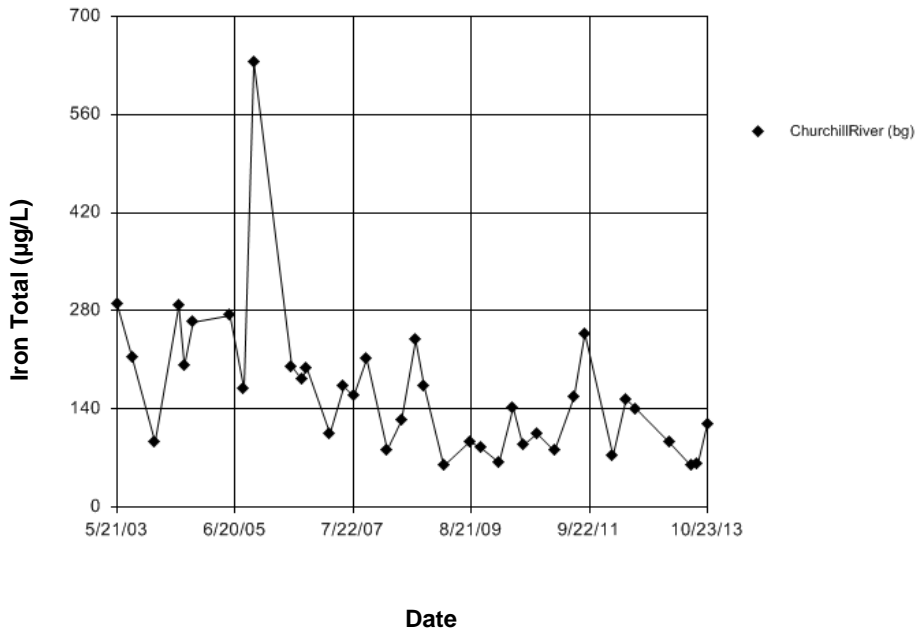
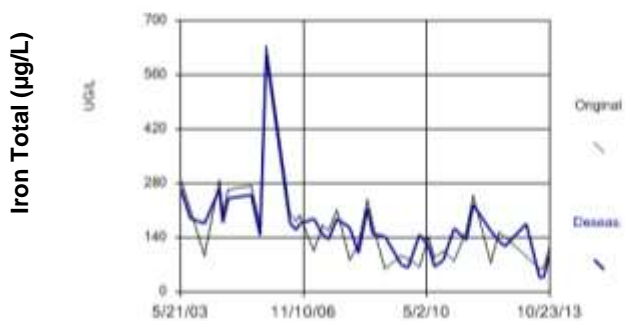


Figure E1012 Churchill River: Iron Total

## Seasonality

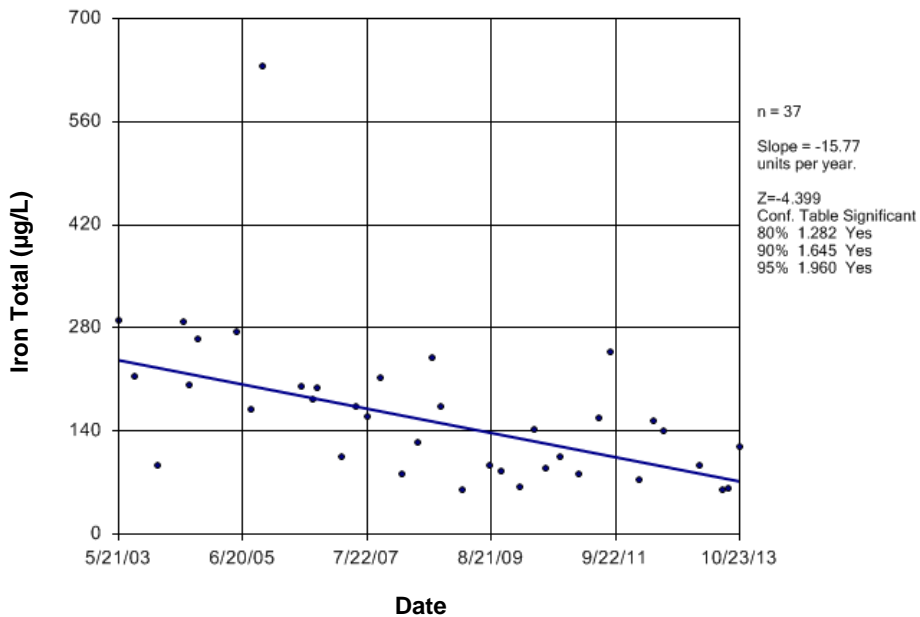
For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 12.03  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (FD) was necessary.



Date

Figure E1013 Churchill River: Iron Total

## Seasonal Kendall



Date

Figure E1014 Churchill River: Iron Total

## Time Series

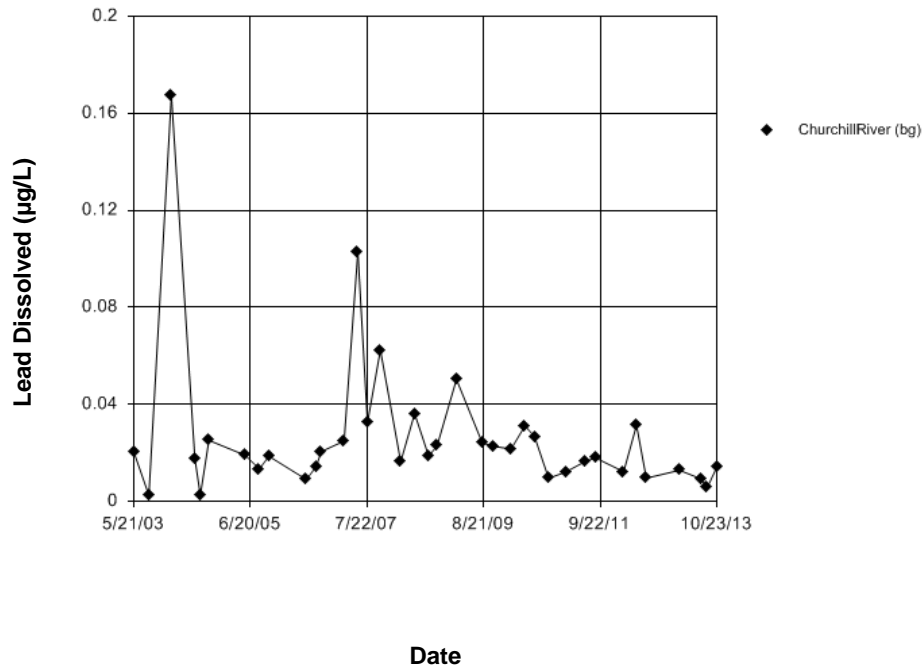


Figure E1015 Churchill River: Lead Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.1361. Tabulated Chi-Squared value = 3.841 with 3 degrees of freedom at the 5% significance level. There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

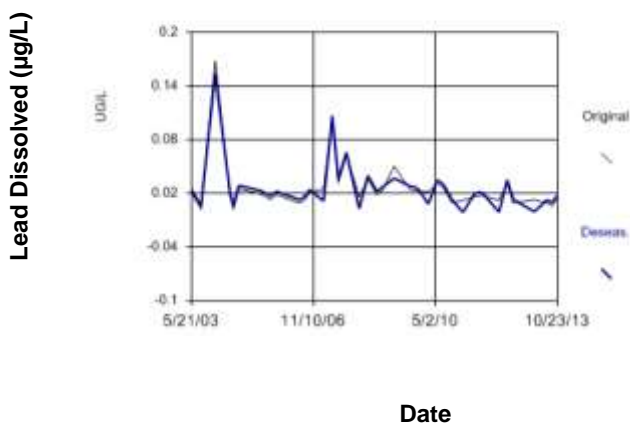


Figure E1016 Churchill River: Lead Dissolved

### Sen's Slope Estimator

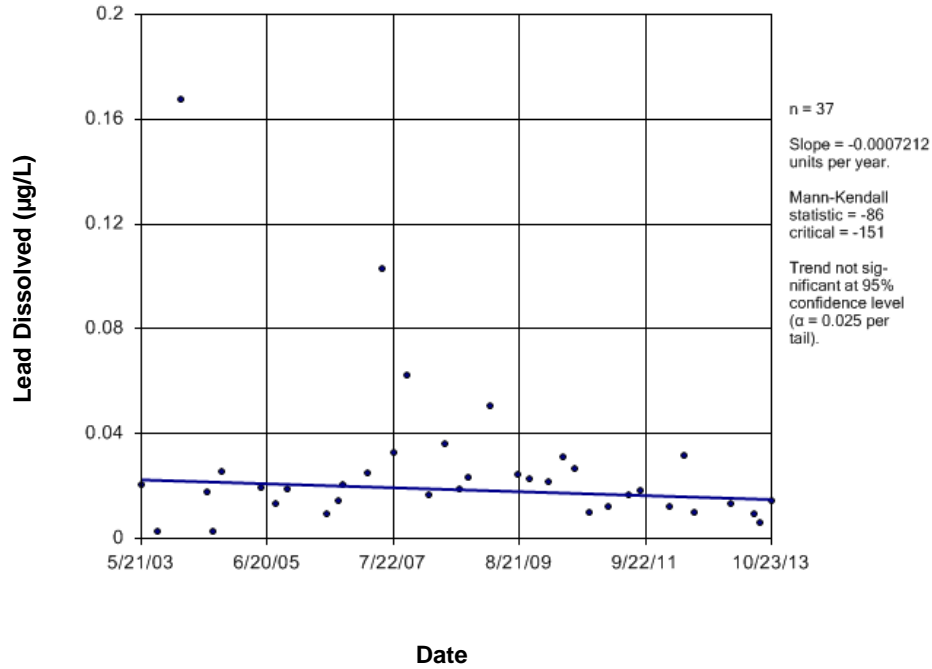


Figure E1017 Churchill River: Lead Dissolved

### Time Series

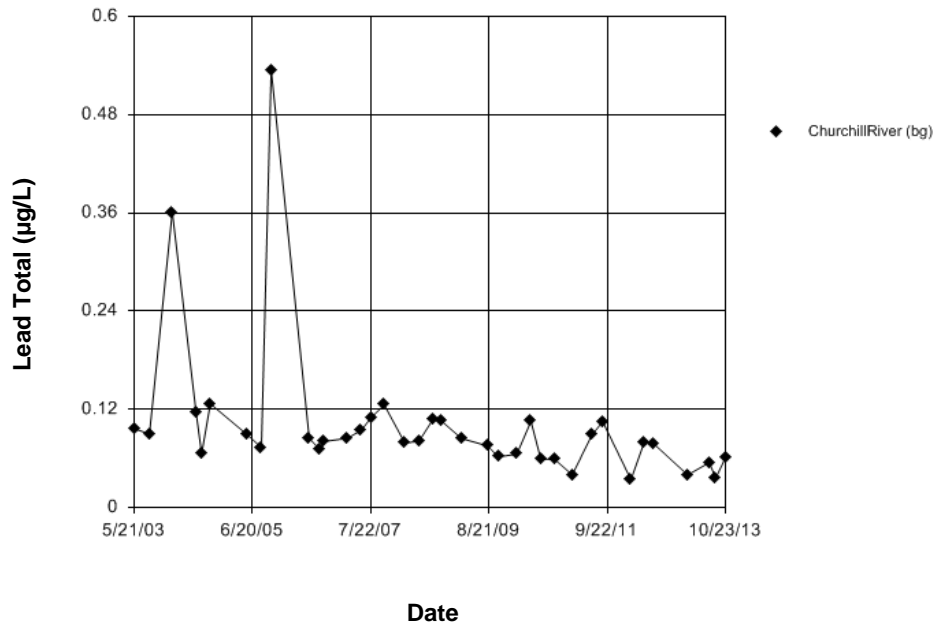
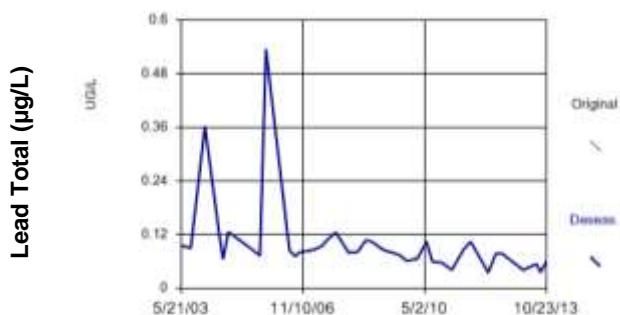


Figure E1018 Churchill River: Lead Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 2.288  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
Kruskal-Wallis statistic (H) = 2.288  
Adjusted Kruskal-Wallis statistic (H') = 2.288



Date

Figure E1019 Churchill River: Lead Total

## Sen's Slope Estimator

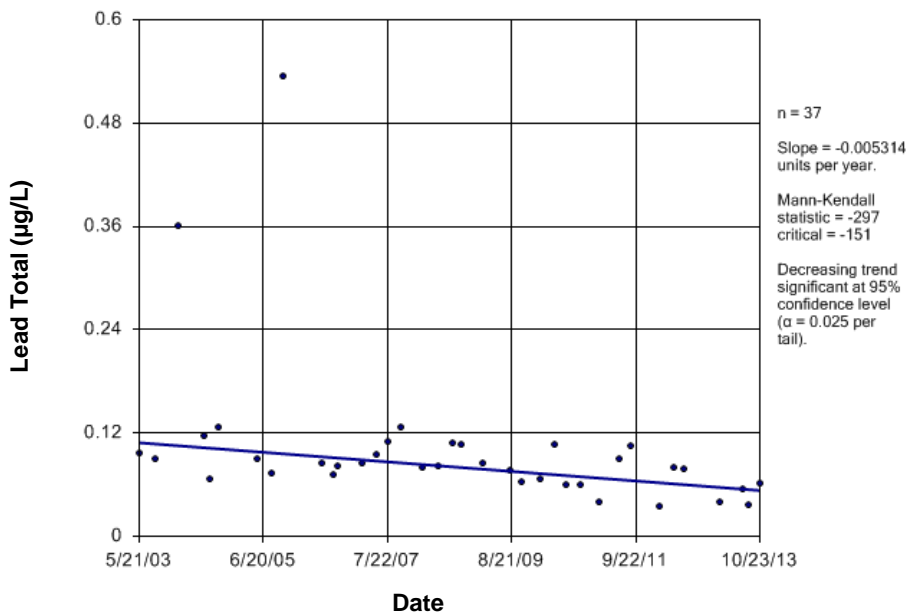
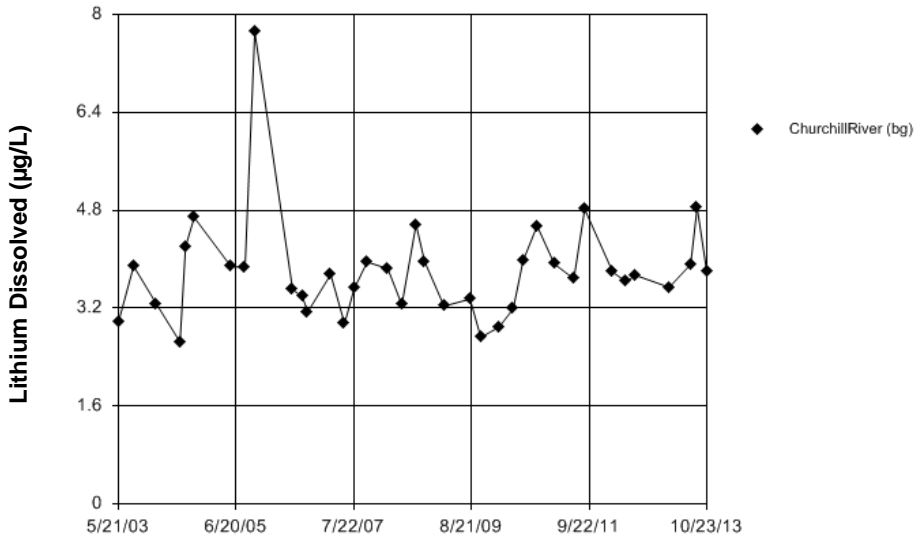


Figure E1020 Churchill River: Lead Total

### Time Series

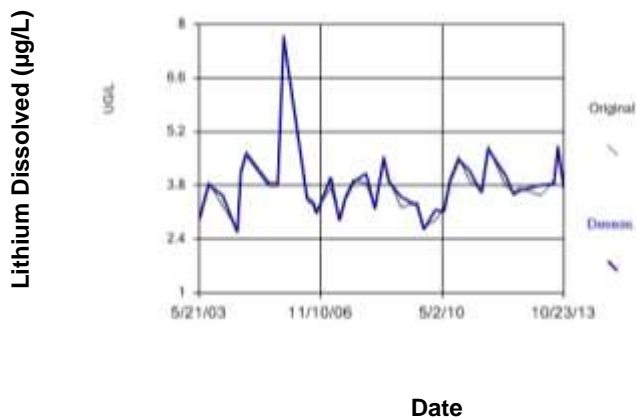


Date

Figure E1021 Churchill River: Lithium Dissolved

### Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 1.067. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



Date

Figure E1022 Churchill River: Lithium Dissolved

### Sen's Slope Estimator

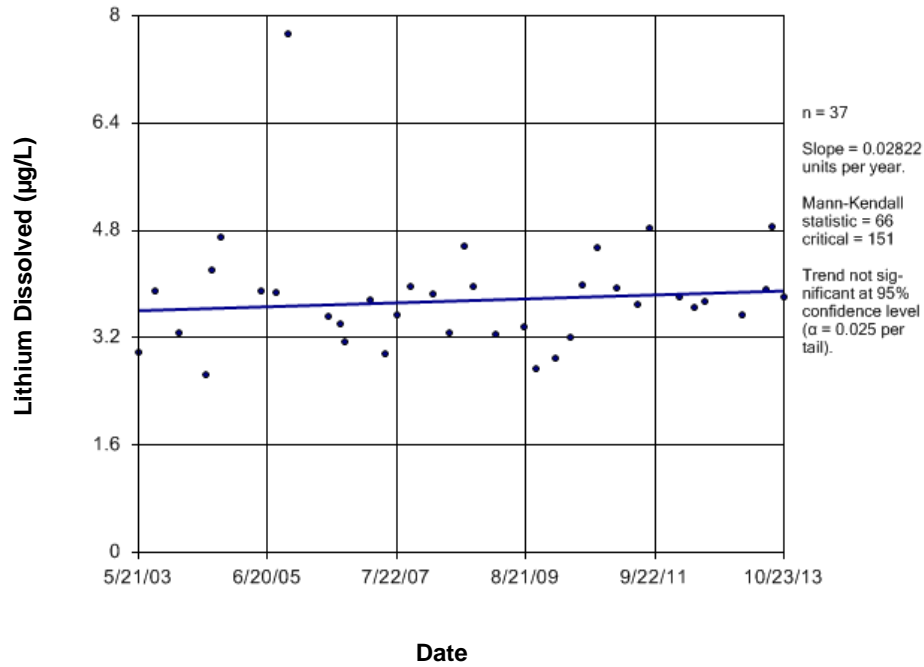


Figure E1023 Churchill River: Lithium Dissolved

### Time Series

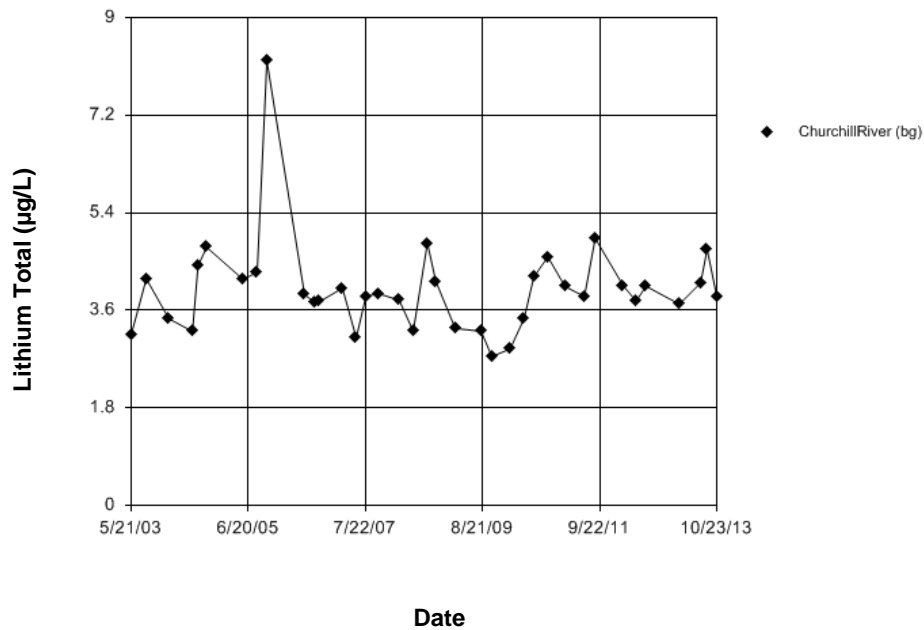


Figure E1024 Churchill River: Lithium Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 2.178  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

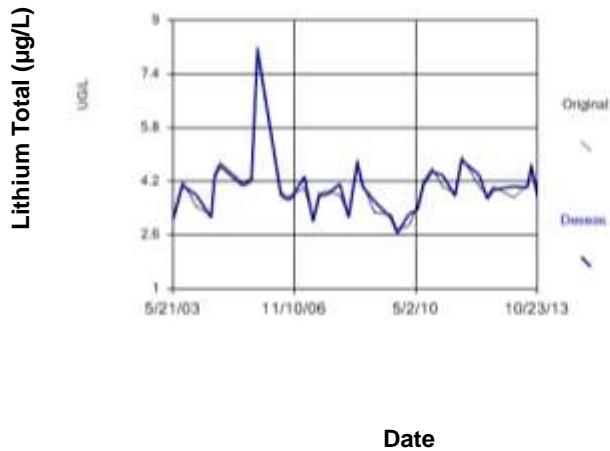


Figure E1025 Churchill River: Lithium Total

## Sen's Slope Estimator

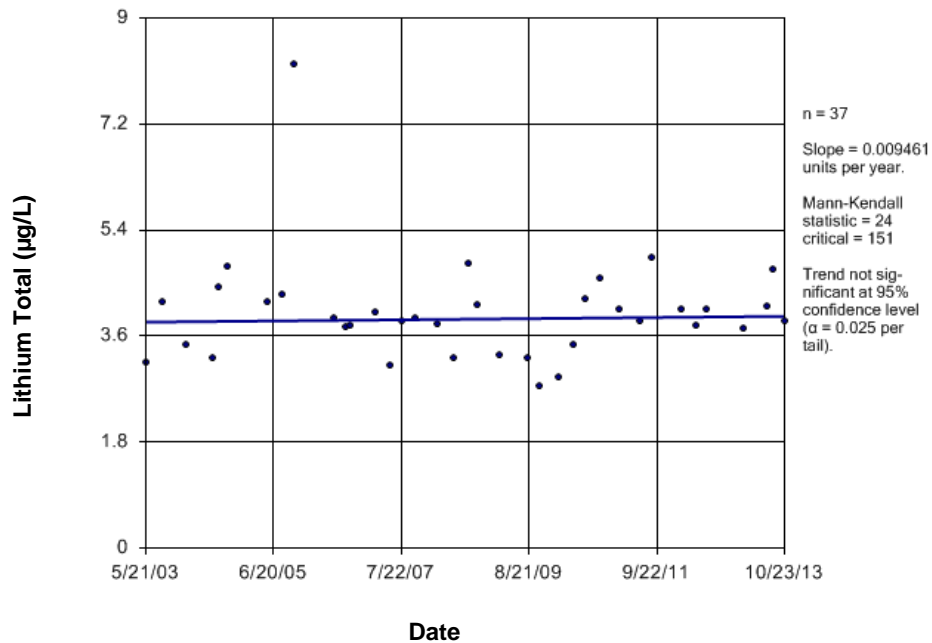
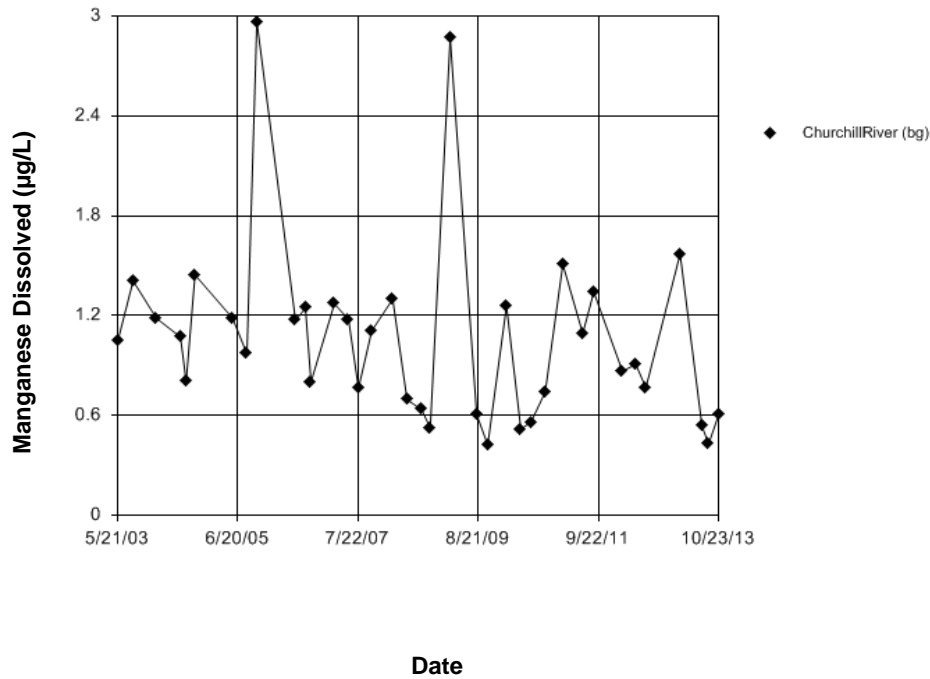


Figure E1026 Churchill River: Lithium Total



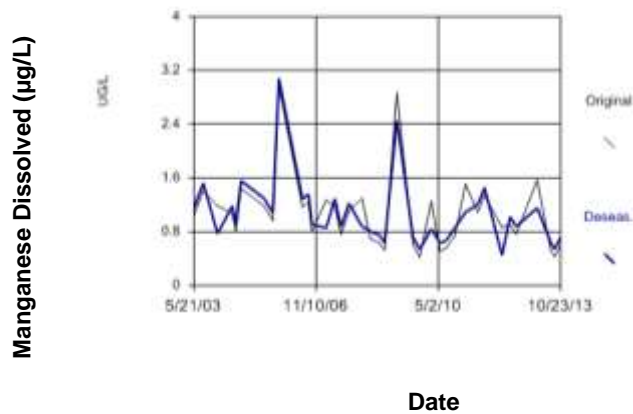
### Time Series



**Figure E1027 Churchill River: Manganese Dissolved**

### Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.  
 Calculated Kruskal-Wallis statistic = 9.042  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 9.041  
 Adjusted Kruskal-Wallis statistic (H') = 9.042



**Figure E1028 Churchill River: Manganese Dissolved**

### Seasonal Kendall

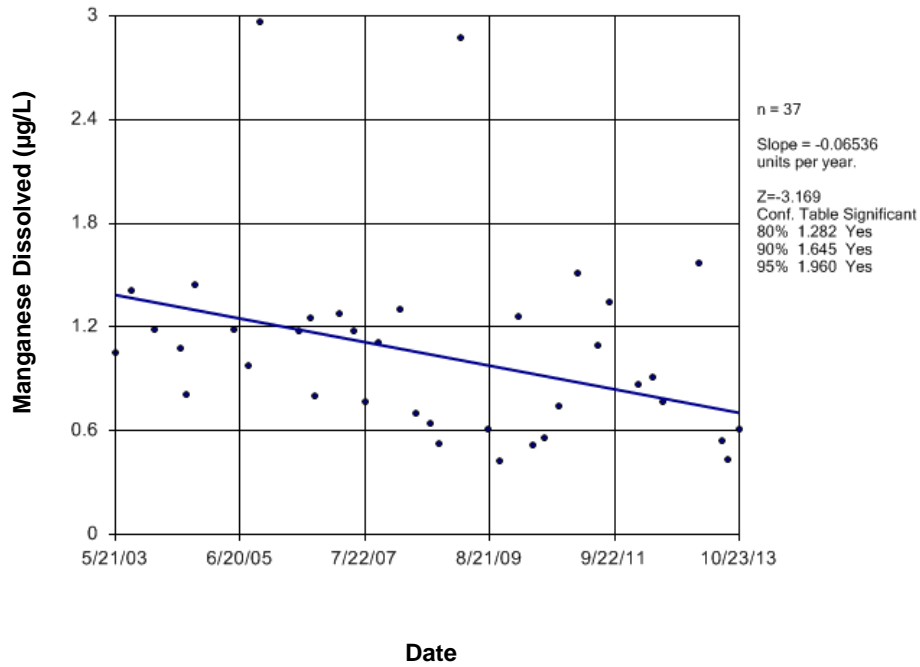


Figure E1029 Churchill River: Manganese Dissolved

### Time Series

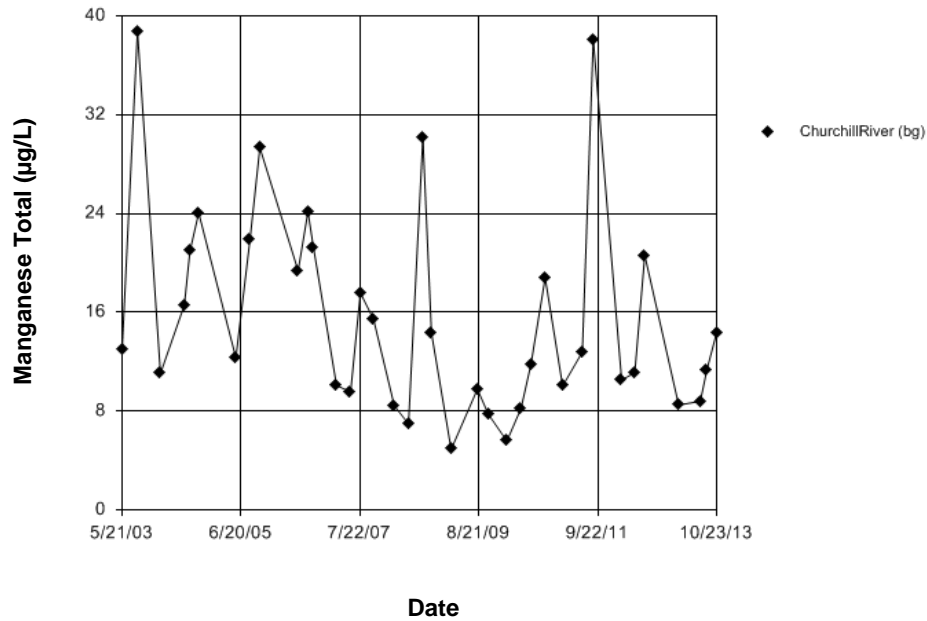


Figure E1030 Churchill River: Manganese Total

# Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 10.07  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

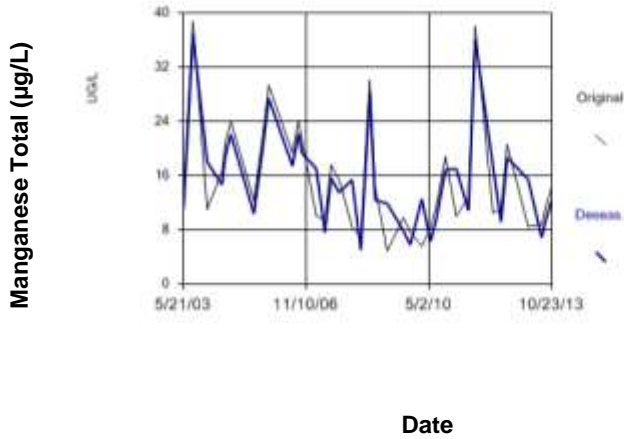


Figure E1031 Churchill River: Manganese Total

# Seasonal Kendall

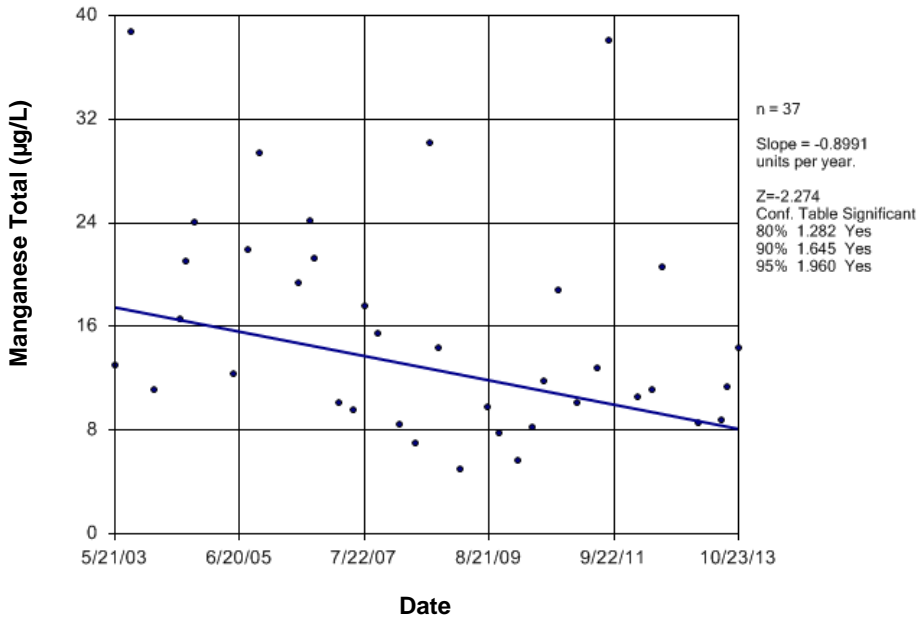
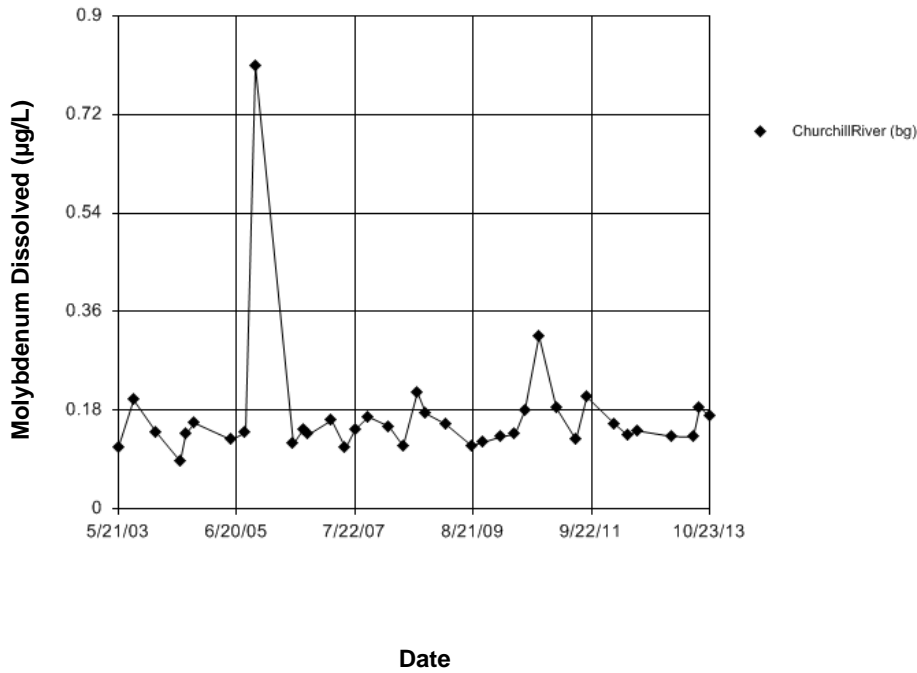


Figure E1032 Churchill River: Manganese Total

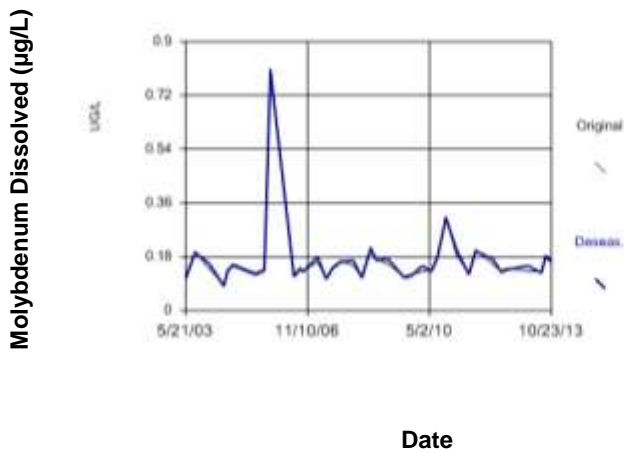
## Time Series



**Figure E1033 Churchill River: Molybdenum Dissolved**

## Seasonality

For the data shown, the Kruskal-Wallis test indicates **NO SEASONALITY** at the 5% significance level. Because the adjusted Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.3863. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



**Figure E1034 Churchill River: Molybdenum Dissolved**

### Sen's Slope Estimator

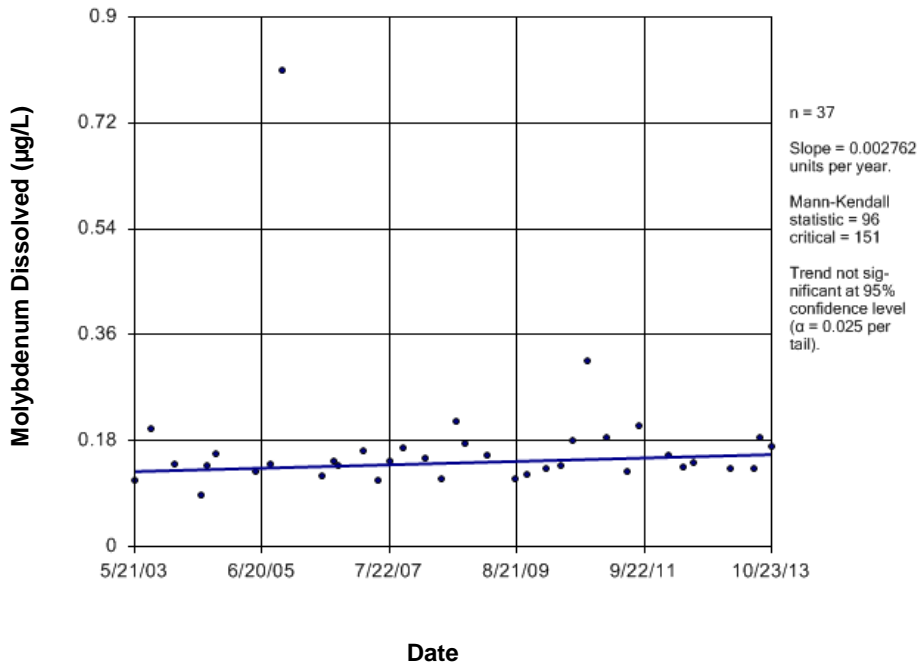


Figure E1035 Churchill River: Molybdenum Dissolved

### Time Series

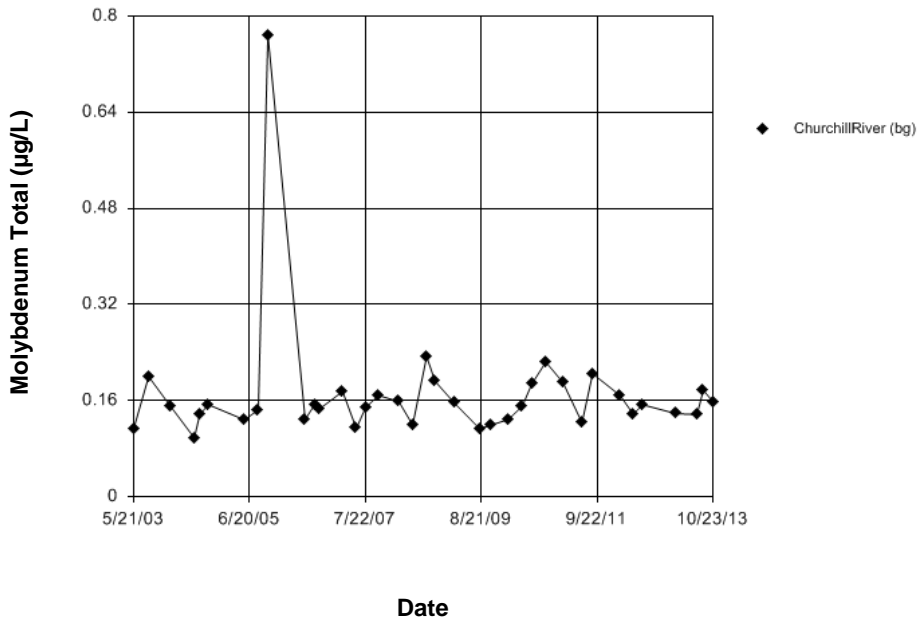
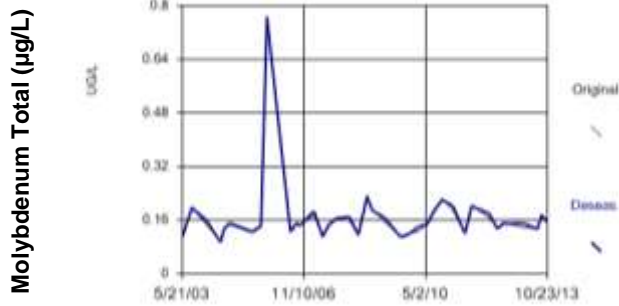


Figure E1036 Churchill River: Molybdenum Total

## Seasonality

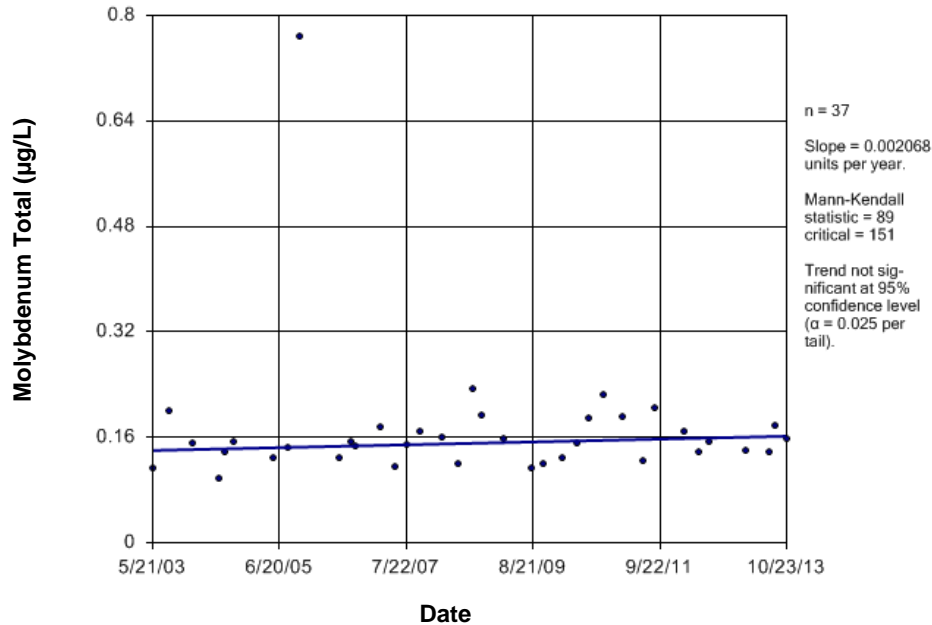
For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.6330  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
Kruskal-Wallis statistic (H) = 0.6588  
Adjusted Kruskal-Wallis statistic (H') = 0.6588



Date

Figure E1037 Churchill River: Molybdenum Total

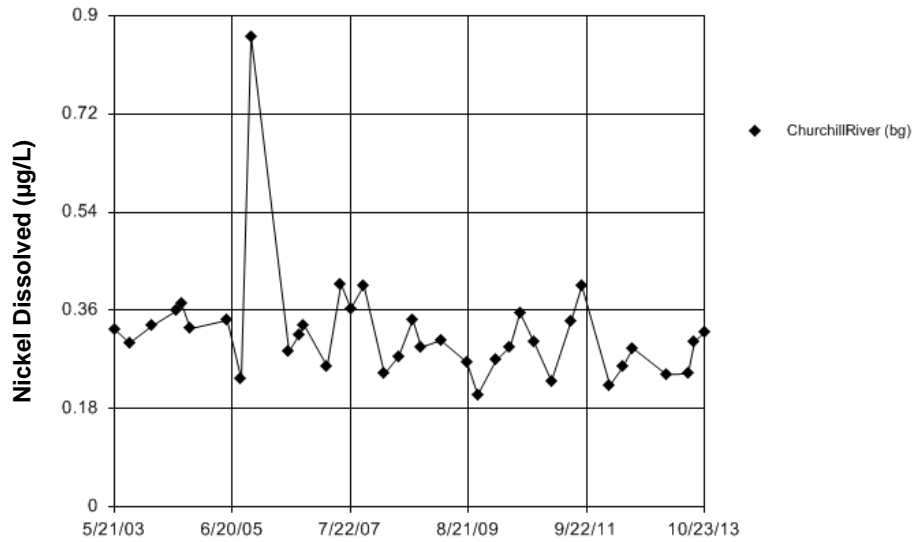
## Sen's Slope Estimator



Date

Figure E1038 Churchill River: Molybdenum Total

## Time Series

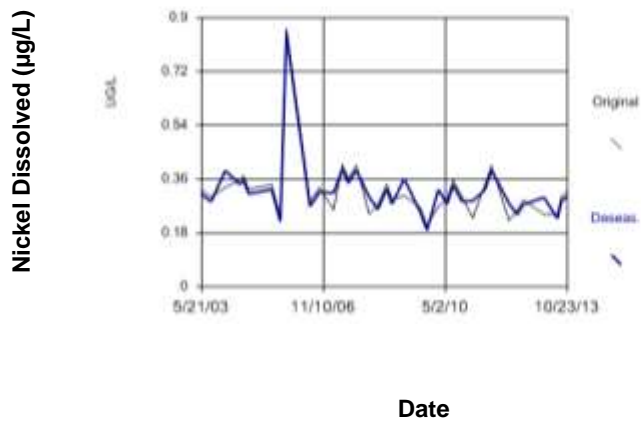


Date

Figure E1039 Churchill River: Nickel Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-Squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 6.67. Tabulated Chi-Squared value = 3.841 with 4 degrees of freedom at the 5% significance level. There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



Date

Figure E1040 Churchill River: Nickel Dissolved

### Seasonal Kendall

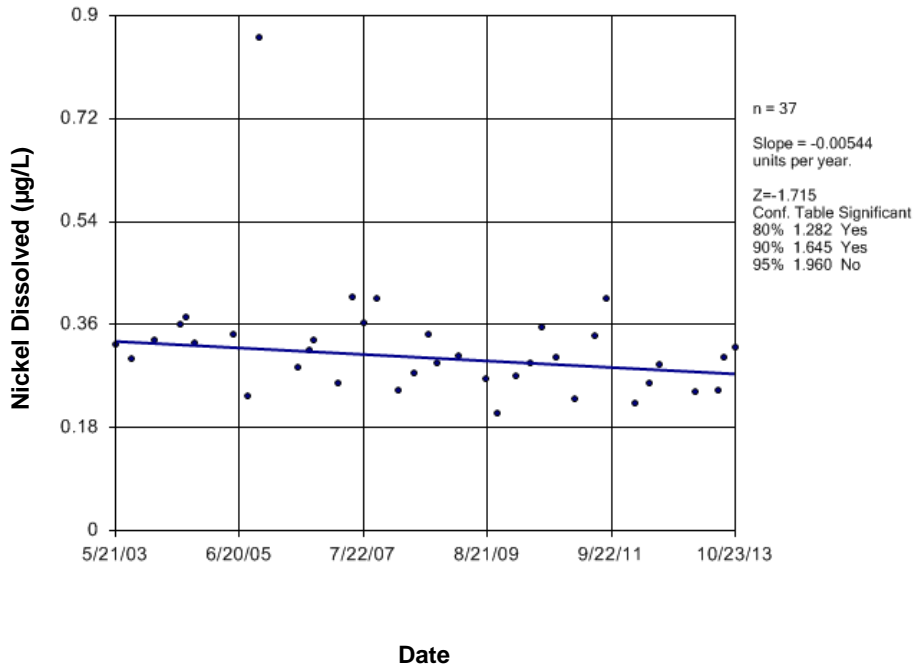


Figure E1041 Churchill River: Nickel Dissolved

### Time Series

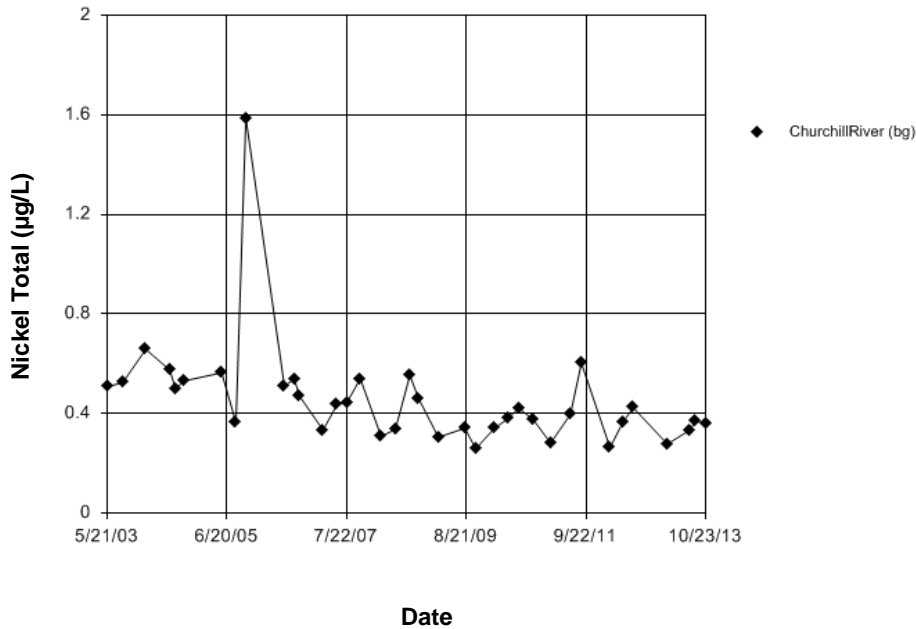


Figure E1042 Churchill River: Nickel Total



## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-Squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 8.281  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

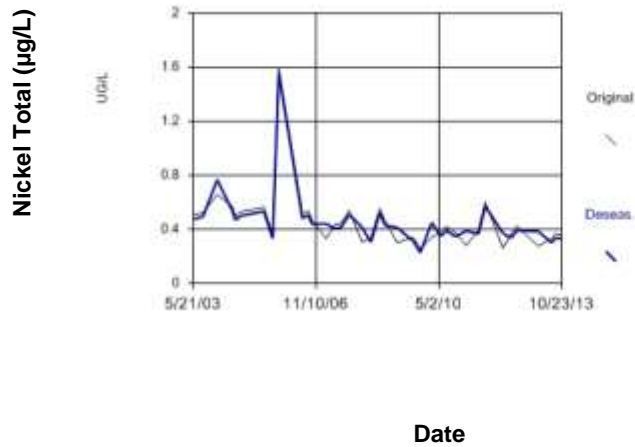


Figure E1043 Churchill River: Nickel Total

## Seasonal Kendall

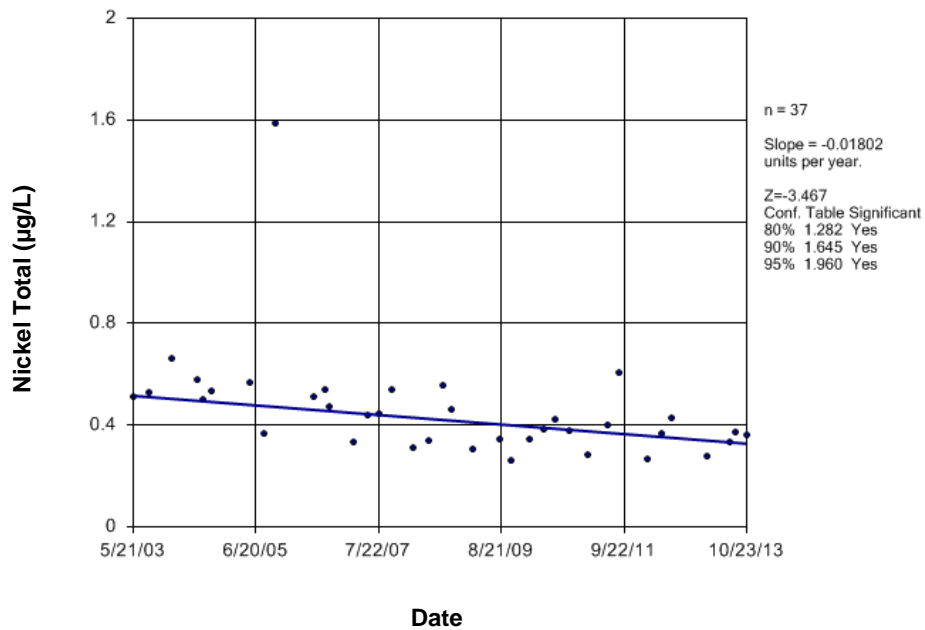


Figure E1044 Churchill River: Nickel Total

### Time Series

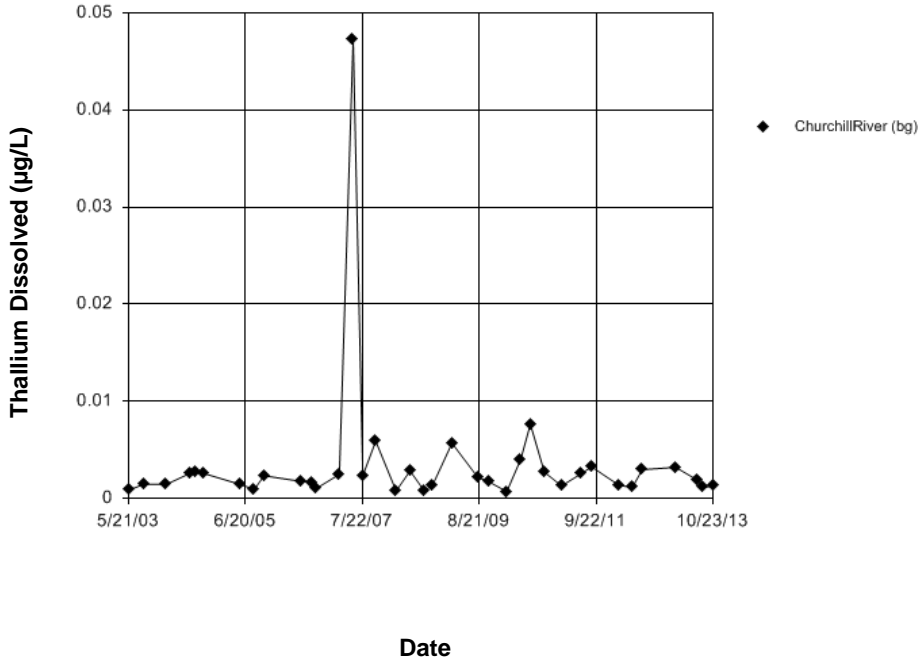


Figure E1045 Churchill River: Thallium Dissolved

### Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.9201  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

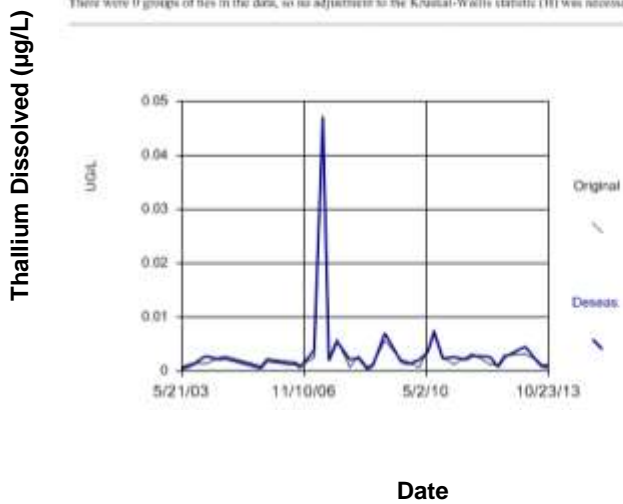


Figure E1046 Churchill River: Thallium Dissolved

### Sen's Slope Estimator

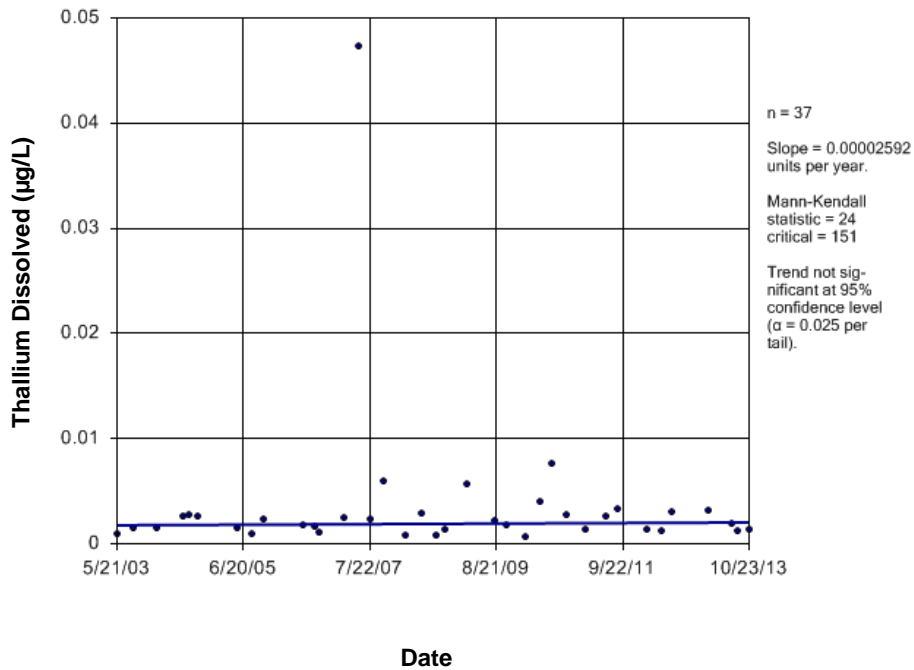


Figure E1047 Churchill River: Thallium Dissolved

### Time Series

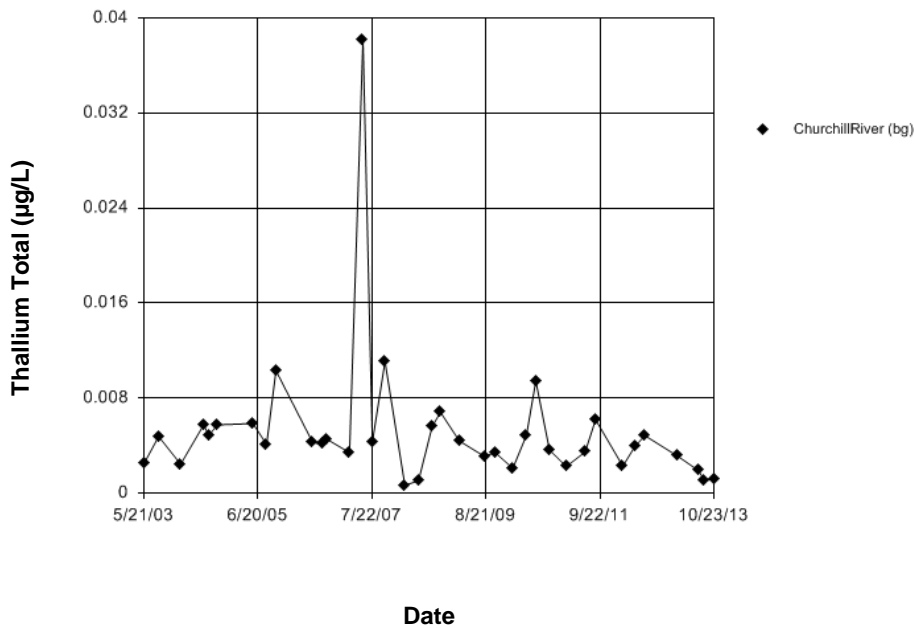
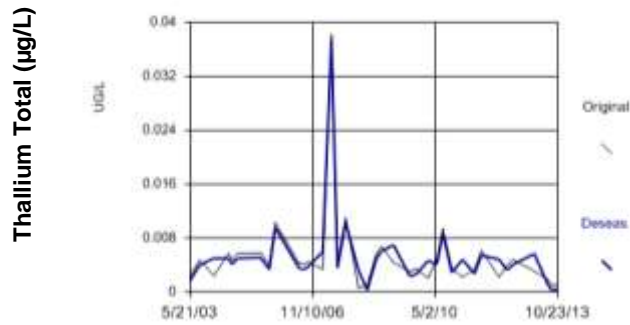


Figure E1048 Churchill River: Thallium Total

## Seasonality

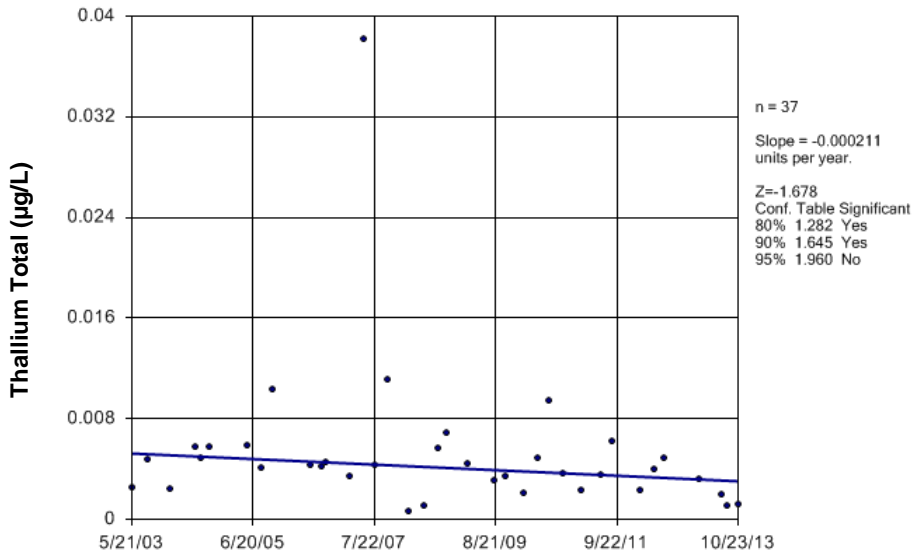
For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 7.454  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



Date

Figure E1049 Churchill River: Thallium Total

## Seasonal Kendall



Date

Figure E1050 Churchill River: Thallium Total

## Time Series

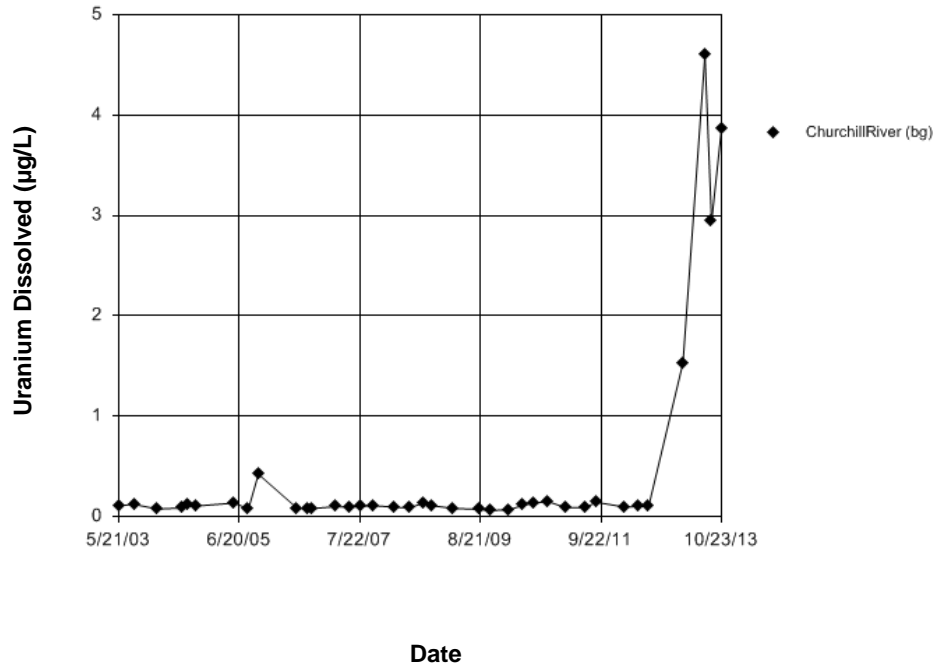


Figure E1051 Churchill River: Uranium Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 2.633. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

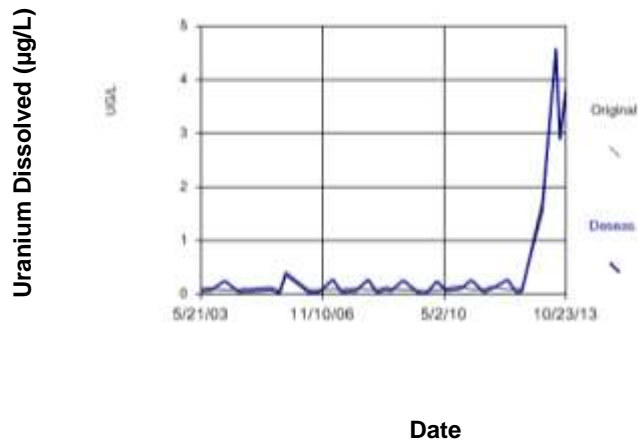


Figure E1052 Churchill River: Uranium Dissolved

### Sen's Slope Estimator

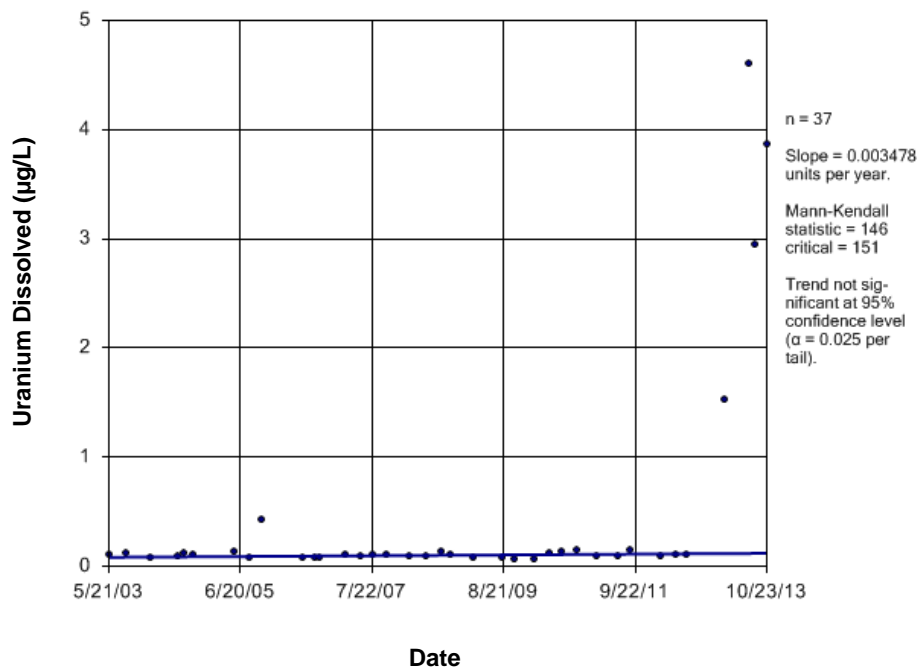


Figure E1053 Churchill River: Uranium Dissolved

### Time Series

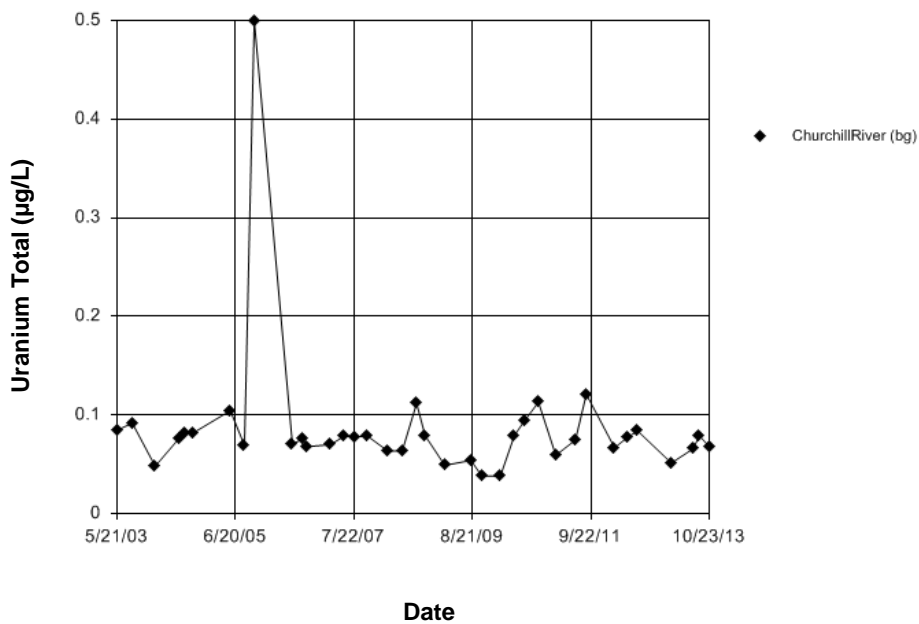


Figure E1054 Churchill River: Uranium Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 15.07  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

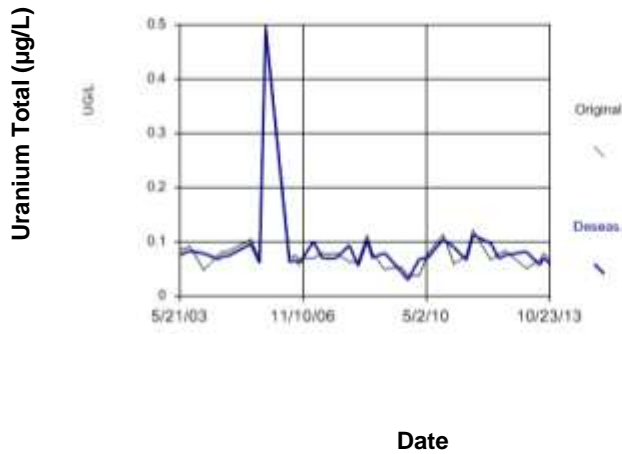


Figure E1055 Churchill River: Uranium Total

## Seasonal Kendall

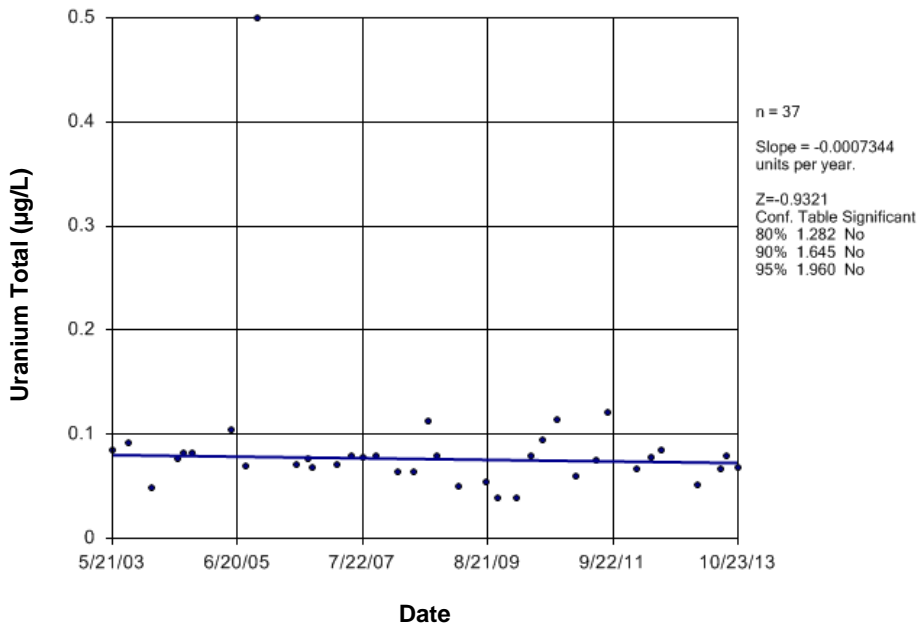
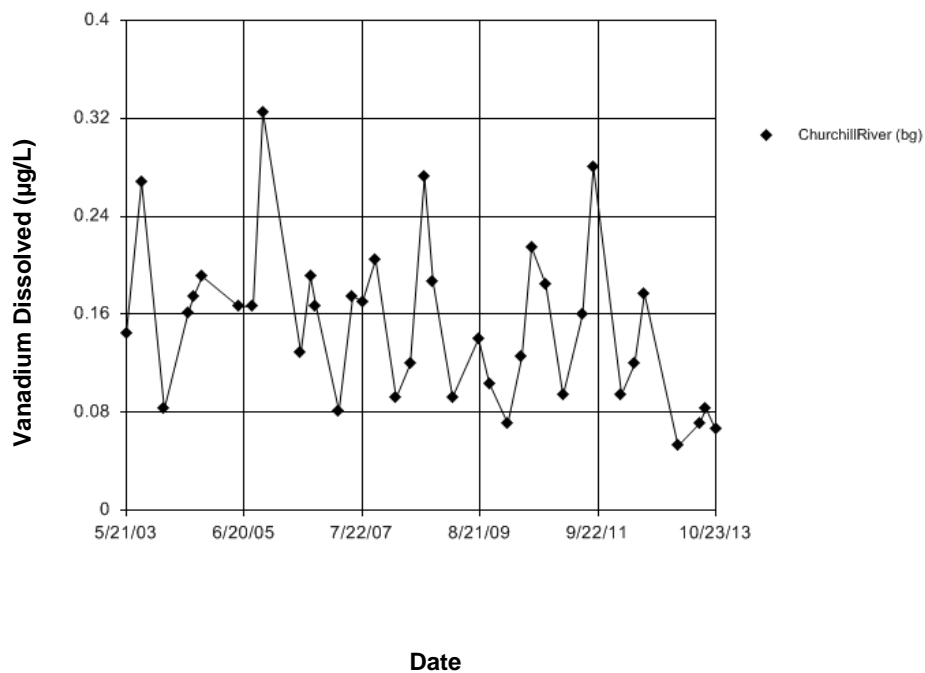


Figure E1056 Churchill River: Uranium Total

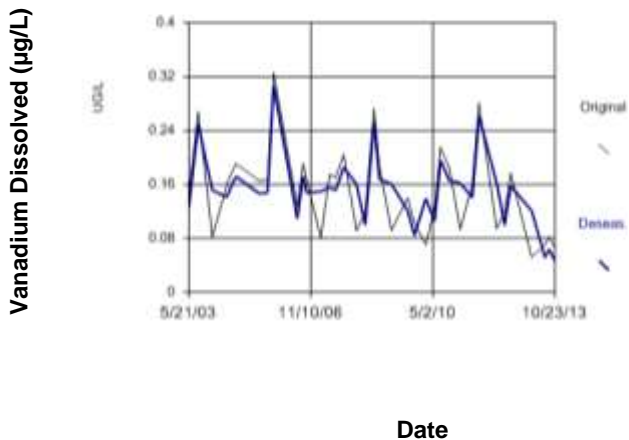
## Time Series



**Figure E1057 Churchill River: Vanadium Dissolved**

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 13.34. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal. Kruskal-Wallis statistic (H) = 13.34. Adjusted Kruskal-Wallis statistic (H') = 13.34.



**Figure E1058 Churchill River: Vanadium Dissolved**



### Seasonal Kendall

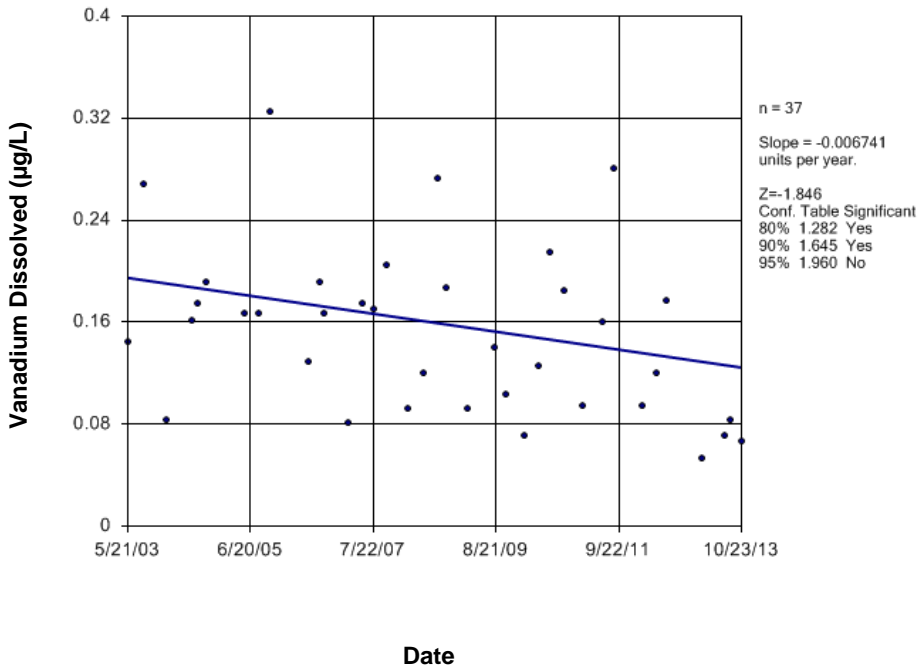


Figure E1059 Churchill River: Vanadium Dissolved

### Time Series

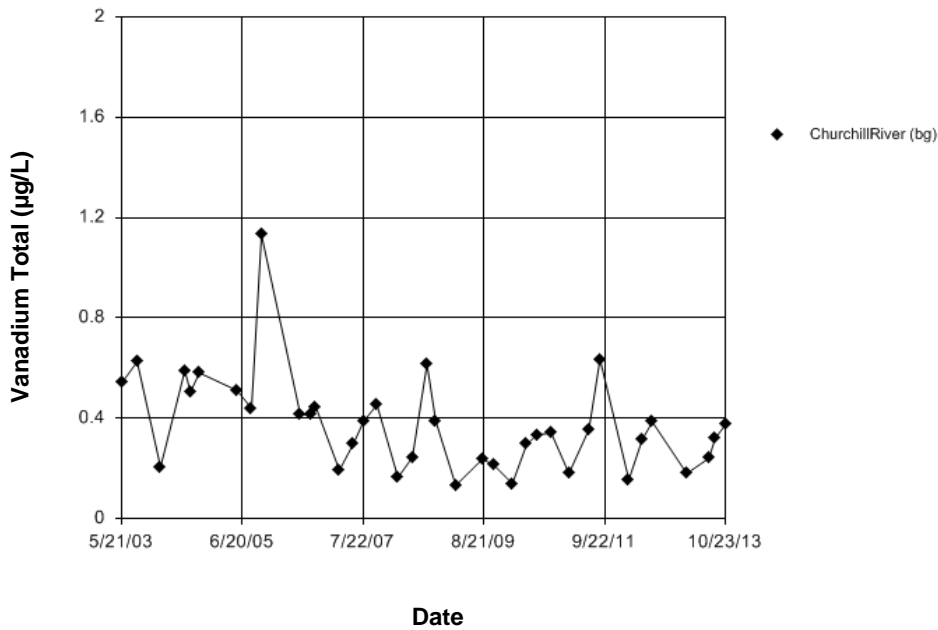
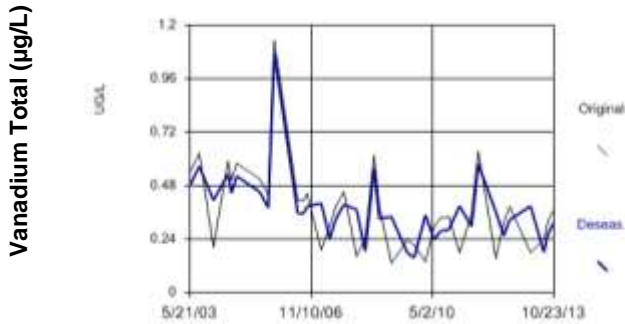


Figure E1060 Churchill River: Vanadium Total

# Seasonality

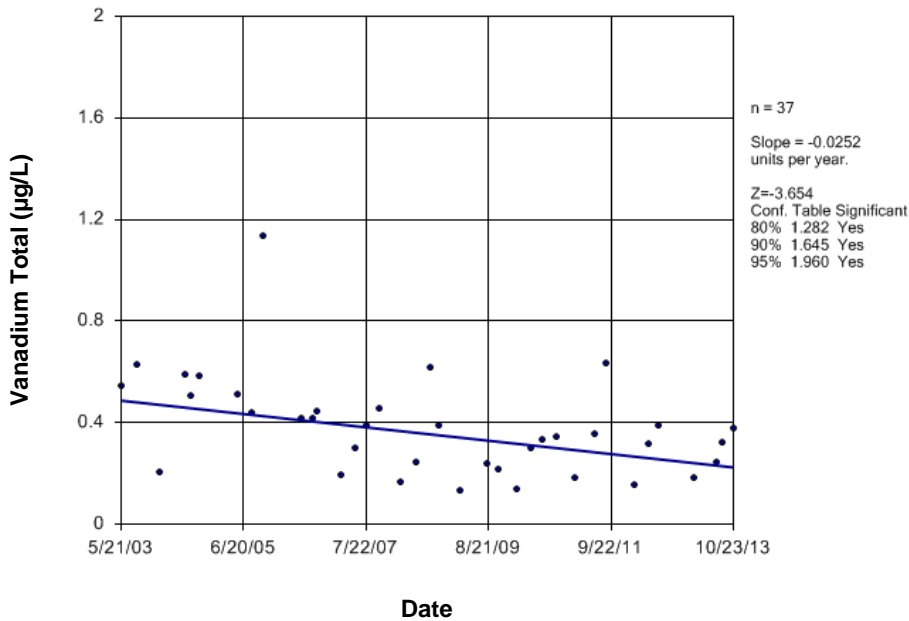
For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 18.32. Tabulated Chi-Squared value = 3.843 with 1 degree of freedom at the 5% significance level. There were 8 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



Date

Figure E1061 Churchill River: Vanadium Total

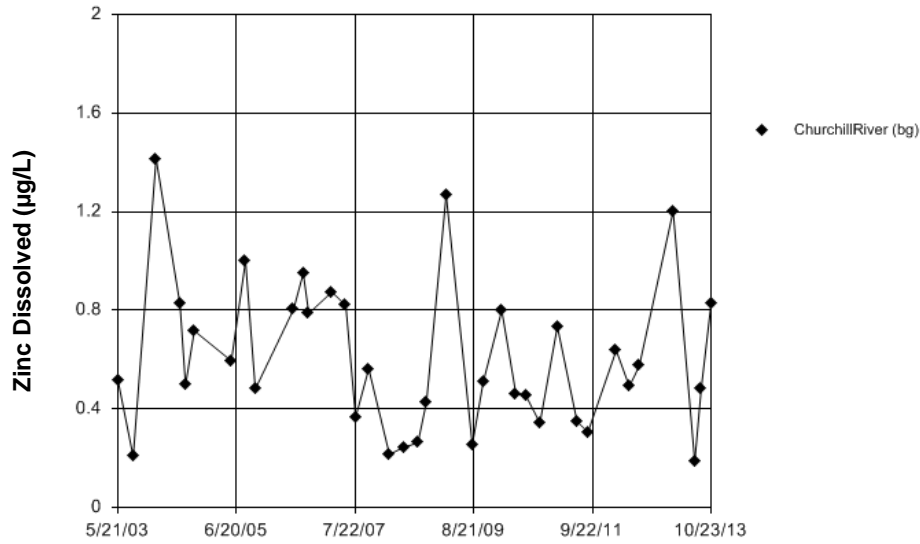
# Seasonal Kendall



Date

Figure E1062 Churchill River: Vanadium Total

## Time Series

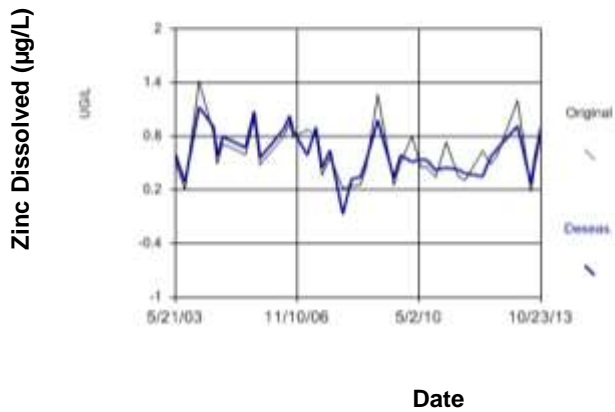


Date

Figure E1063 Churchill River: Zinc Dissolved

## Seasonality

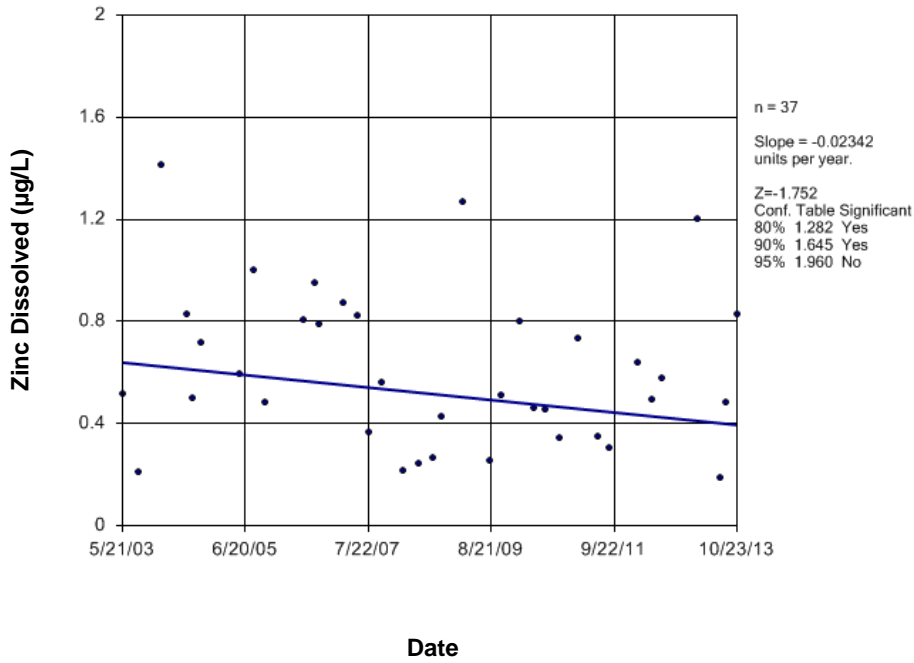
For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 5.929. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



Date

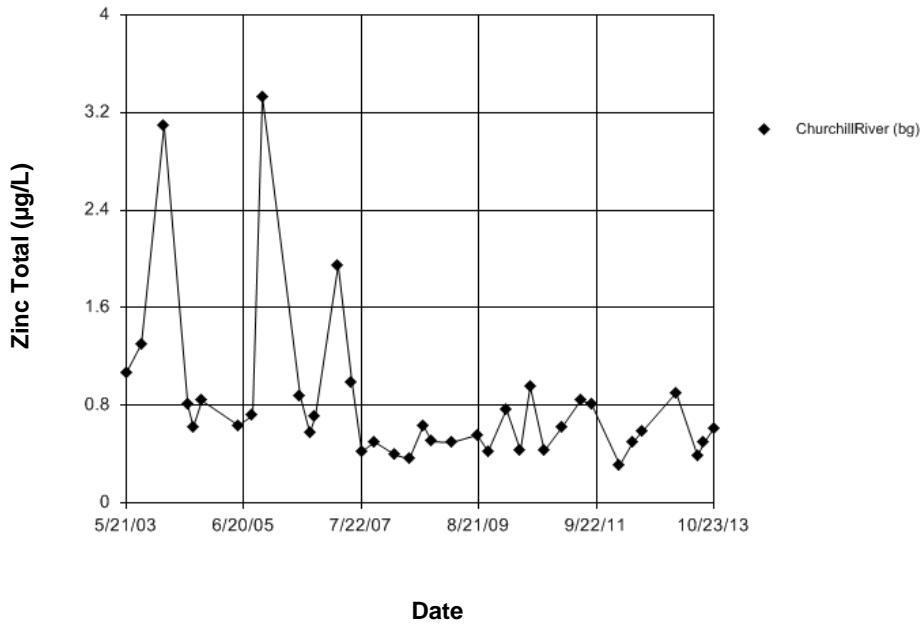
Figure E1064 Churchill River: Zinc Dissolved

### Seasonal Kendall



**Figure E1065 Churchill River: Zinc Dissolved**

### Time Series



**Figure E1066 Churchill River: Zinc Total**

# Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.049  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 6 groups of ties in the data, so an adjustment to the Kruskal-Wallis statistic (H) was necessary.

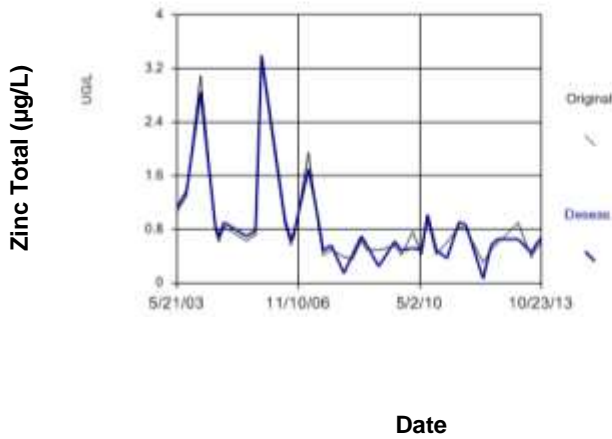


Figure E1067 Churchill River: Zinc Total

# Sen's Slope Estimator

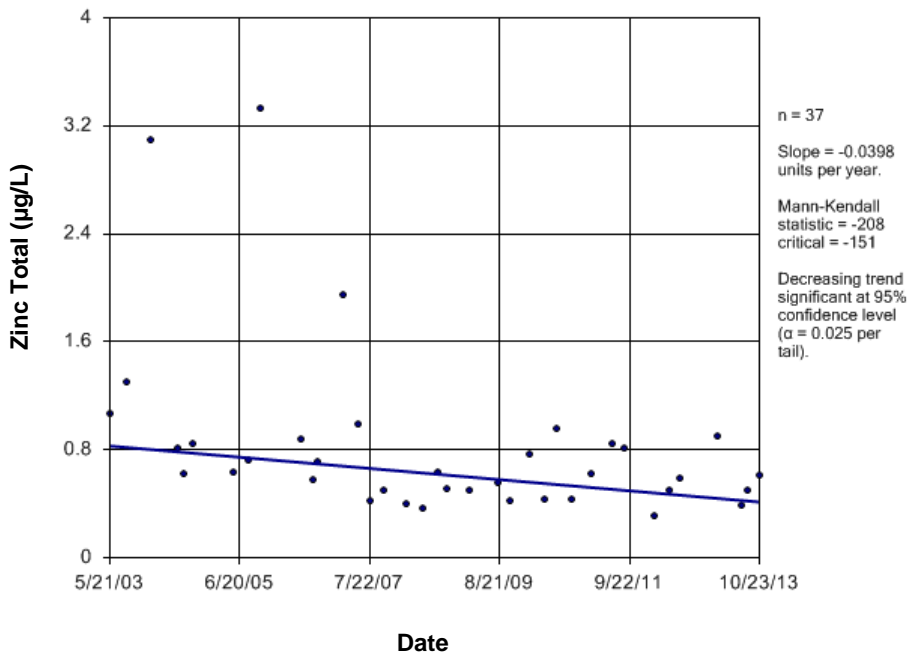


Figure E1068 Churchill River: Zinc Total

## Time Series

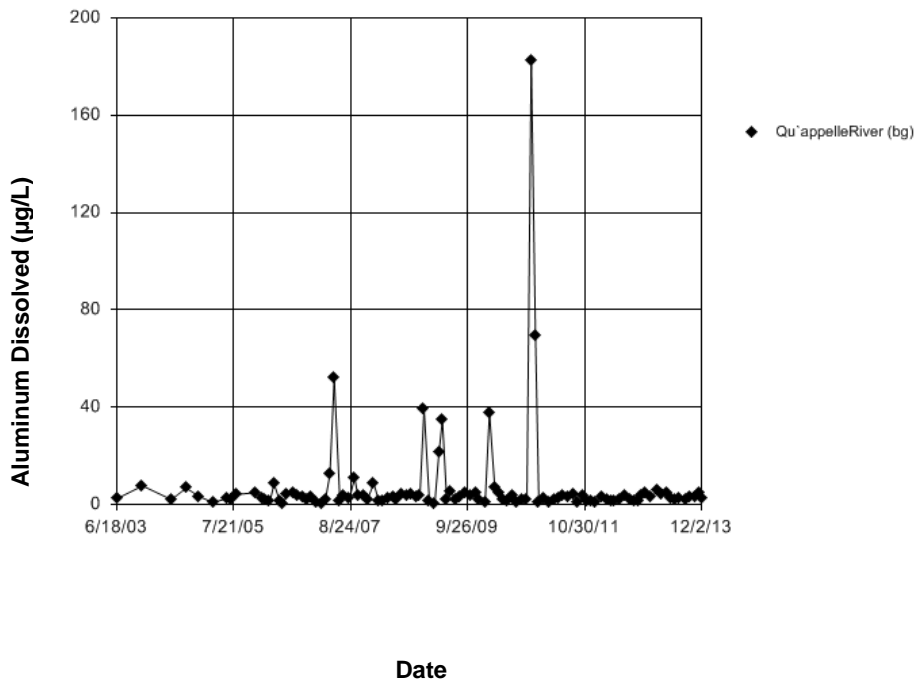


Figure E1069 Qu'Appelle River: Aluminum Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-Squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.06659  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 4 groups of data in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 0.06699  
 Adjusted Kruskal-Wallis statistic (H') = 0.06699

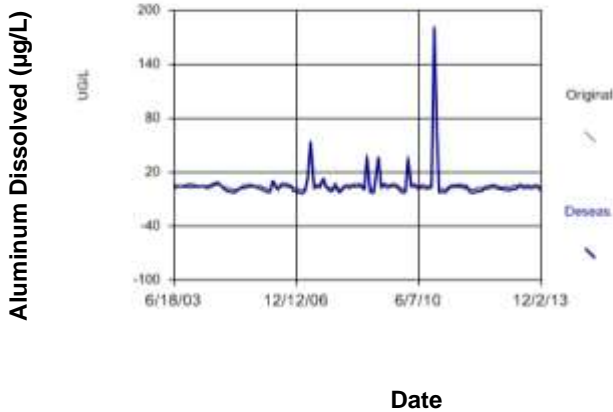


Figure E1070 Qu'Appelle River: Aluminum Dissolved

### Sen's Slope Estimator

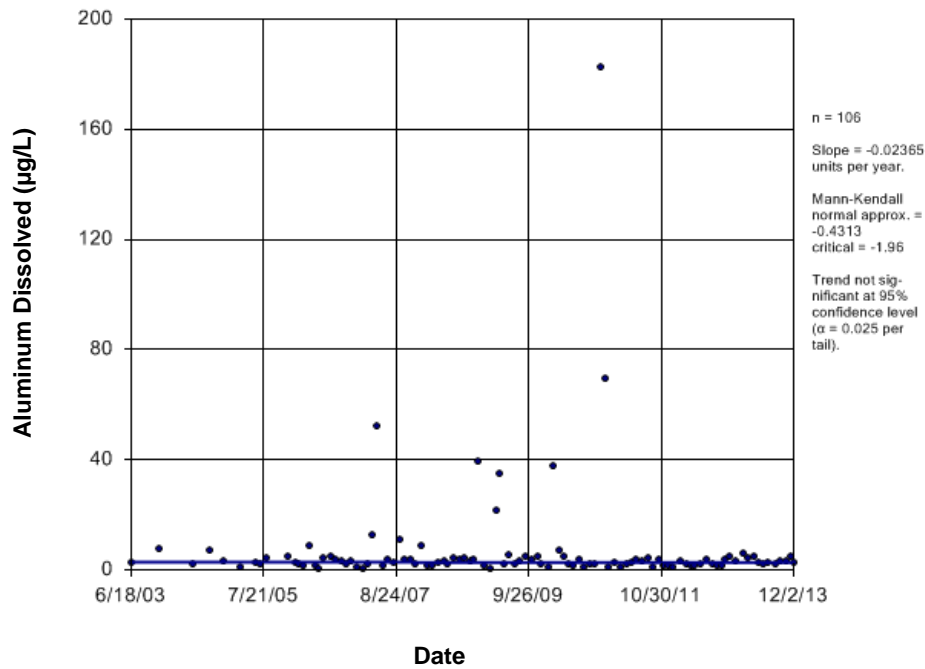


Figure E1071 Qu'Appelle River: Aluminum Dissolved

### Time Series

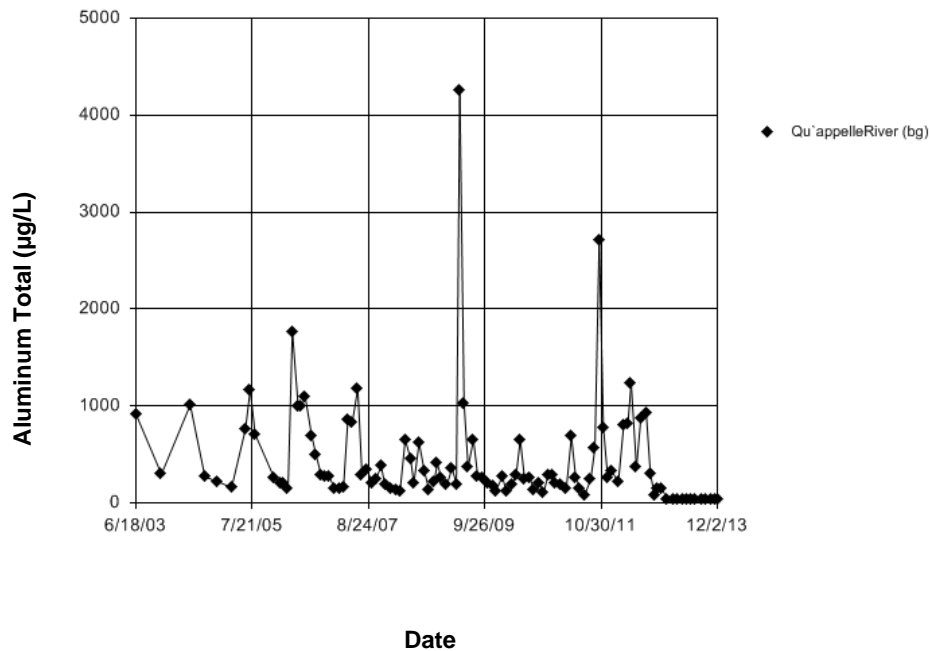
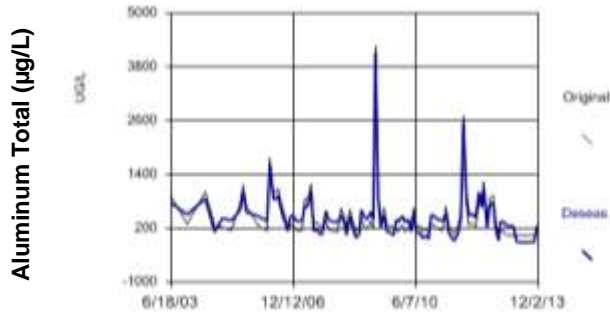


Figure E1072 Qu'Appelle River: Aluminum Total

## Seasonality

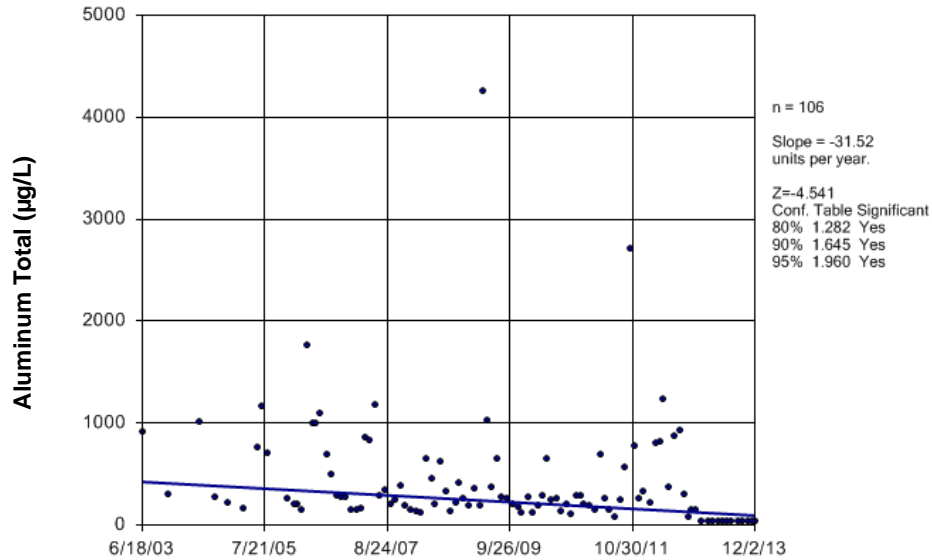
For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent from any other season. Calculated Kruskal-Wallis statistic = 13.45  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 3 groups of data in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
Kruskal-Wallis statistic (H) = 13.45  
Adjusted Kruskal-Wallis statistic (H') = 13.45



Date

Figure E1073 Qu'Appelle River: Aluminum Total

## Seasonal Kendall



Date

Figure E1074 Qu'Appelle River: Aluminum Total



## Time Series

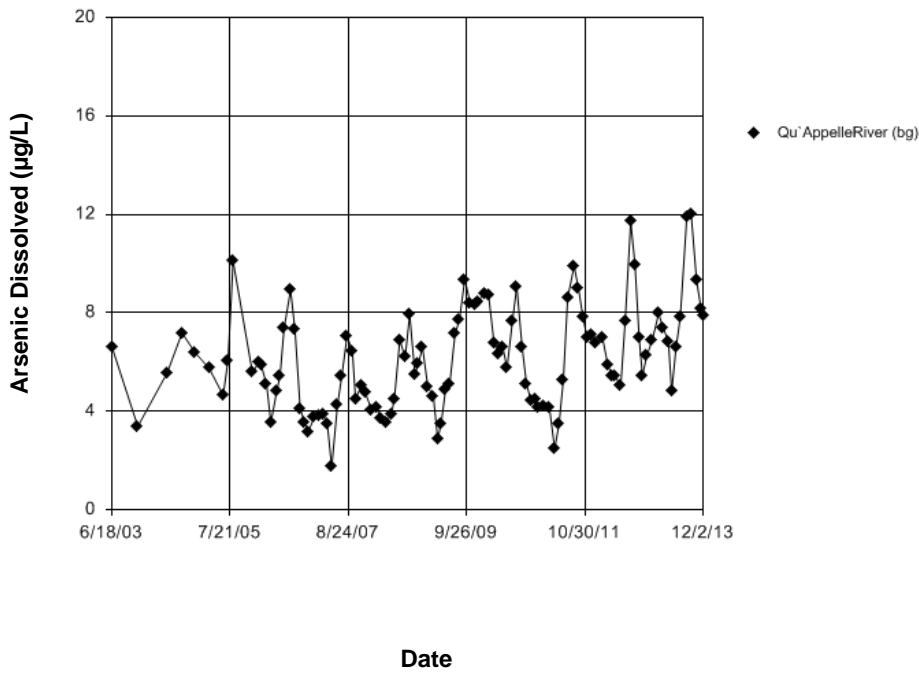


Figure E1075 Qu'Appelle River: Arsenic Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 3.602. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal. Kruskal-Wallis statistic (H) = 3.602. Adjusted Kruskal-Wallis statistic (H') = 3.602.

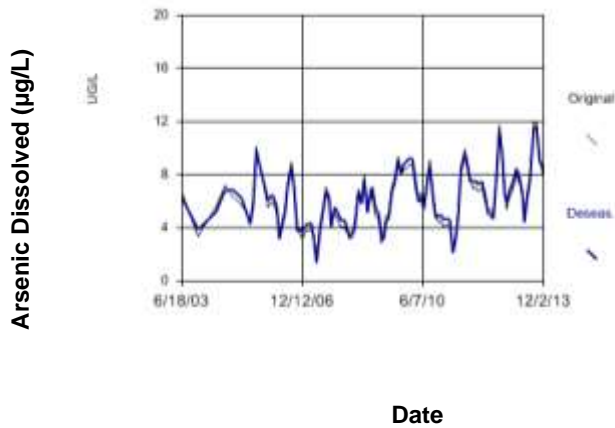


Figure E1076 Qu'Appelle River: Arsenic Dissolved

## Sen's Slope Estimator

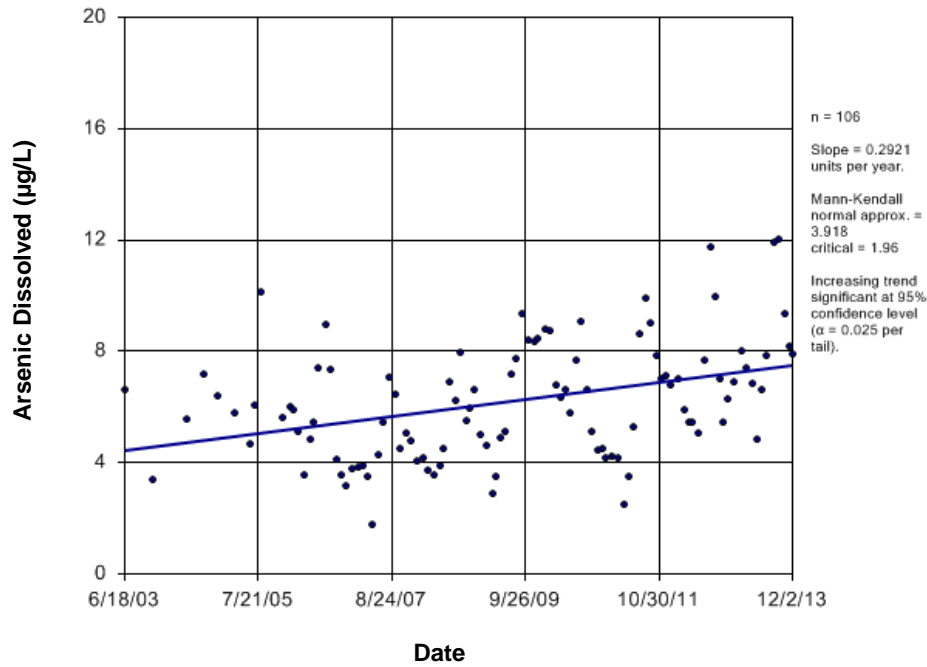


Figure E1077 Qu'Appelle River: Arsenic Dissolved

## Time Series

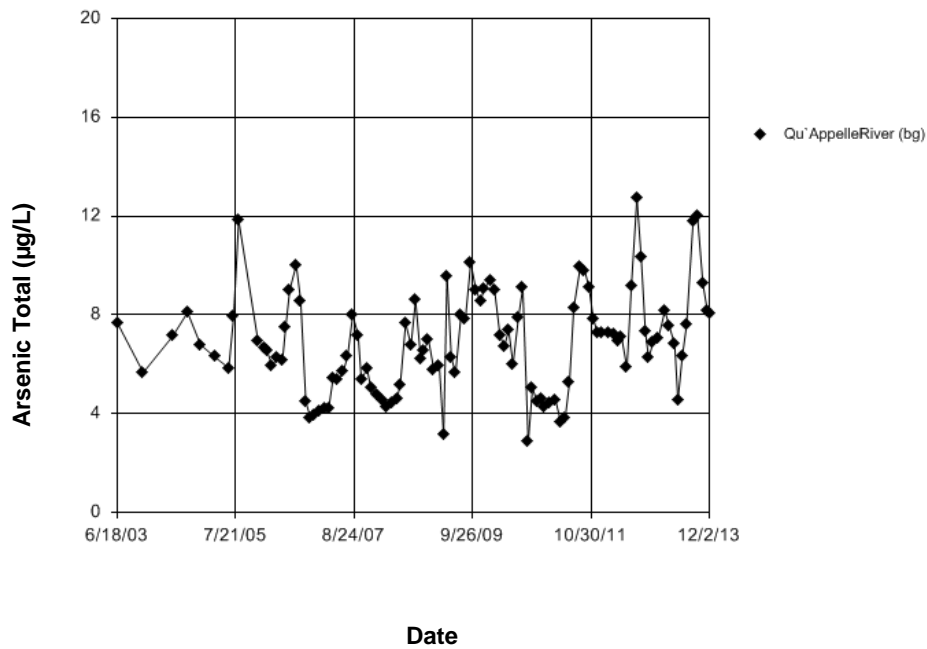


Figure E1078 Qu'Appelle River: Arsenic Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 7.531  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

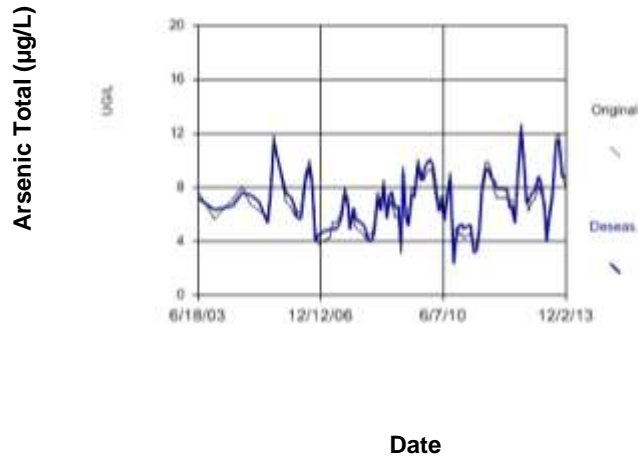


Figure E1079 Qu'Appelle River: Arsenic Total

## Seasonal Kendall

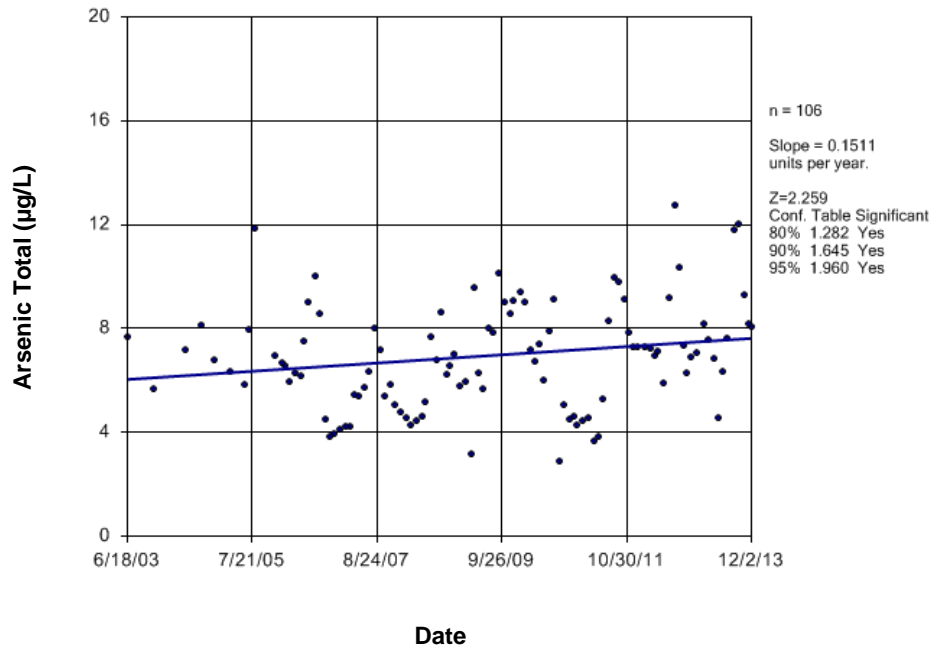
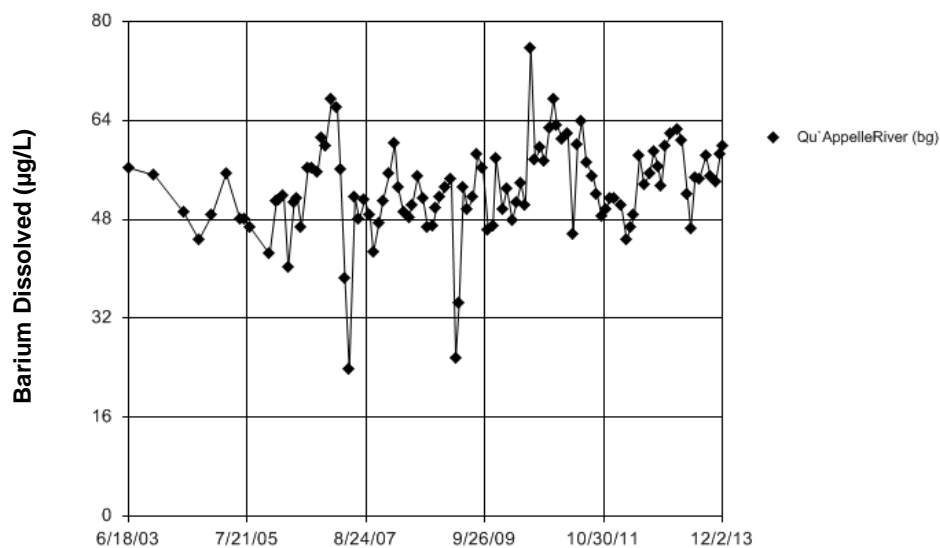


Figure E1080 Qu'Appelle River: Arsenic Total

### Time Series



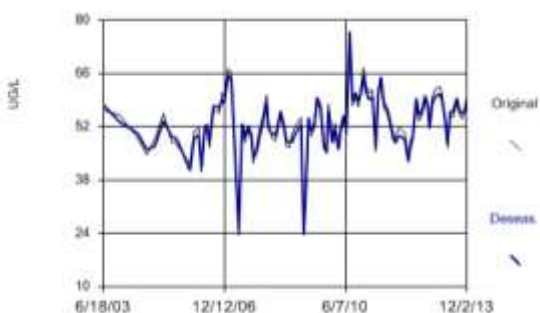
Date

Figure E1081 Qu'Appelle River: Barium Dissolved

### Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 6.237  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 6.237  
 Adjusted Kruskal-Wallis statistic (H') = 6.237

Barium Dissolved (µg/L)



Date

Figure E1082 Qu'Appelle River: Barium Dissolved

### Seasonal Kendall

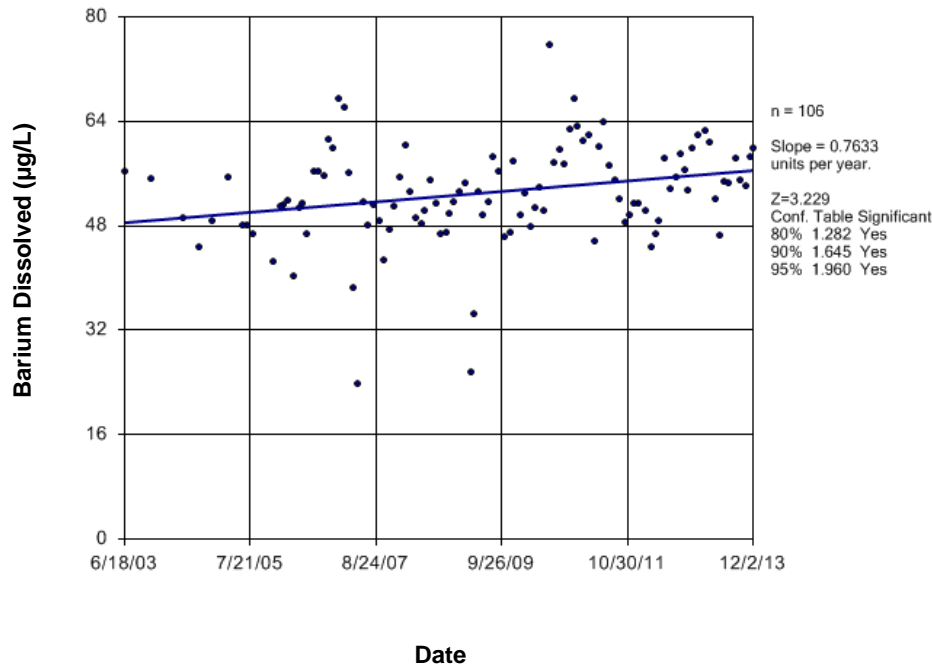


Figure E1083 Qu'Appelle River: Barium Dissolved

### Time Series

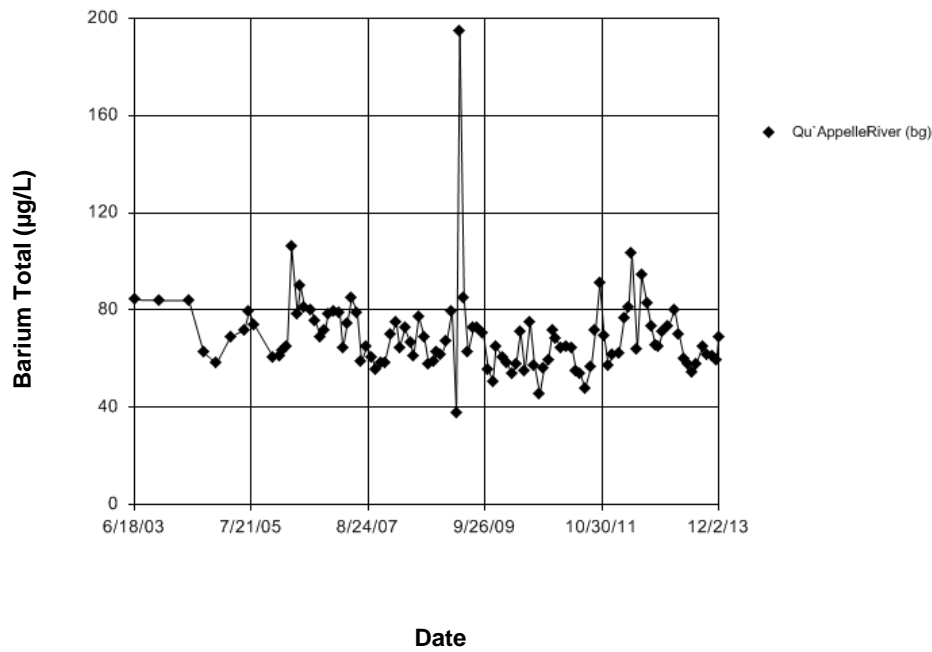
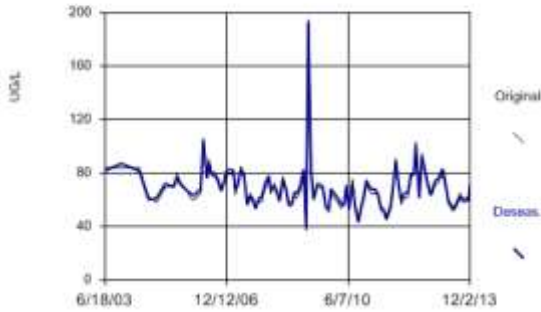


Figure E1084 Qu'Appelle River: Barium Total

# Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 1.195  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
Kruskal-Wallis statistic (H) = 1.195  
Adjusted Kruskal-Wallis statistic (H') = 1.195

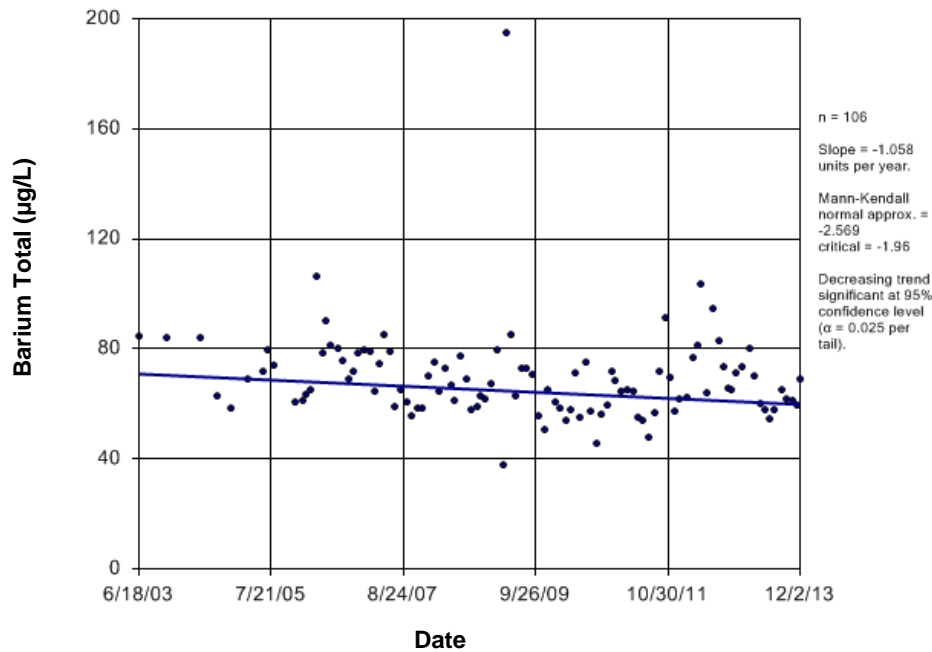
Barium Total ( $\mu\text{g/L}$ )



Date

Figure E1085 Qu'Appelle River: Barium Total

# Sen's Slope Estimator



Date

Figure E1086 Qu'Appelle River: Barium Total

## Time Series

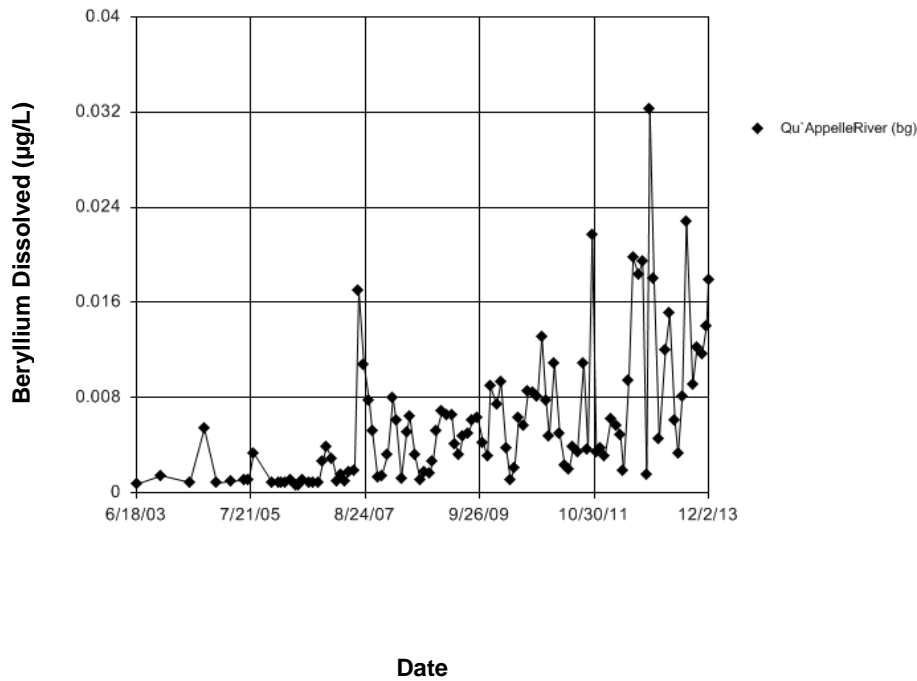


Figure E1087 Qu'Appelle River: Beryllium Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.3367  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 1 groups of data in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 0.3367  
 Adjusted Kruskal-Wallis statistic (H') = 0.3367

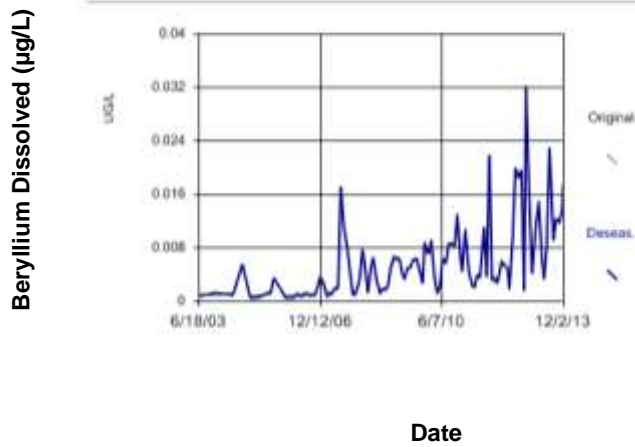


Figure E1088 Qu'Appelle River: Beryllium Dissolved

### Sen's Slope Estimator

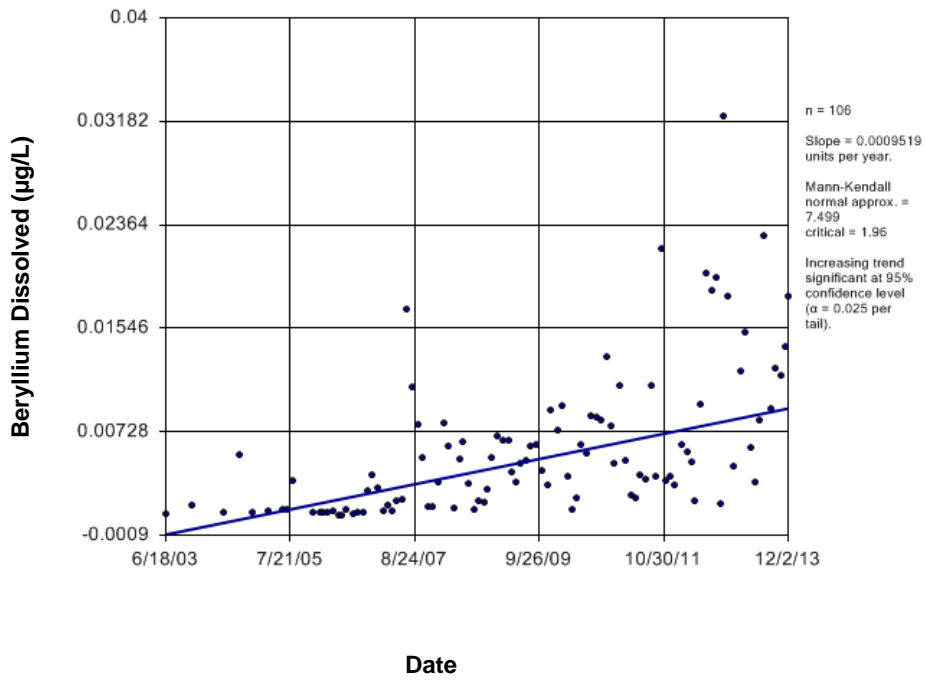


Figure E1089 Qu'Appelle River: Beryllium Dissolved

### Time Series

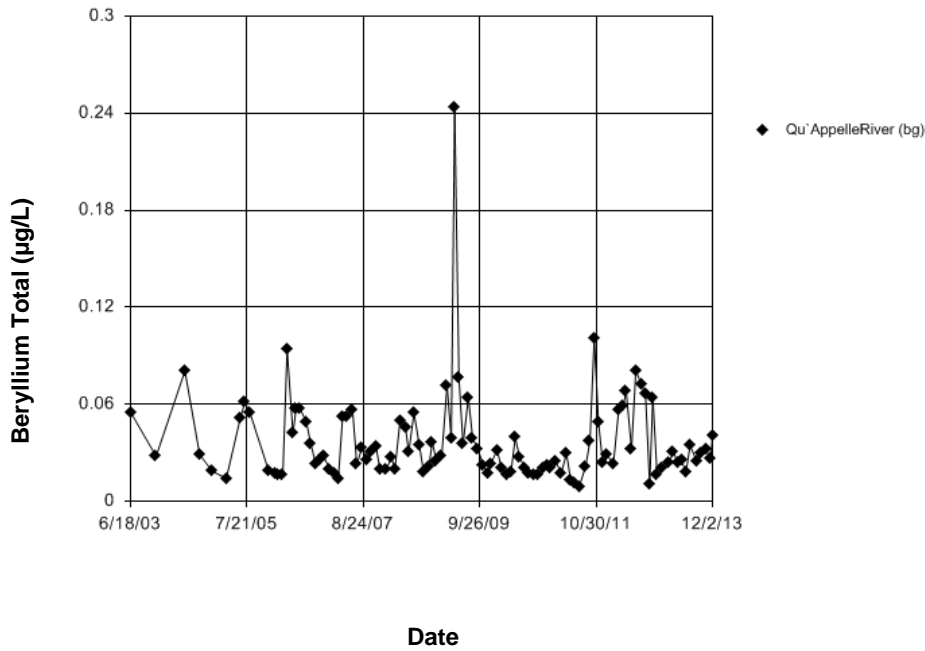


Figure E1090 Qu'Appelle River: Beryllium Total



# Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 13.45  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

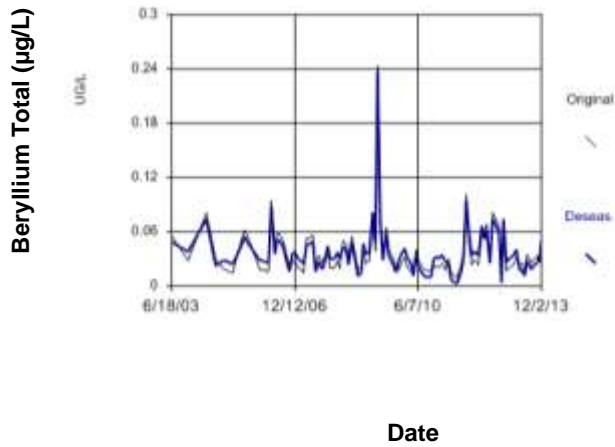


Figure E1091 Qu'Appelle River: Beryllium Total

# Seasonal Kendall

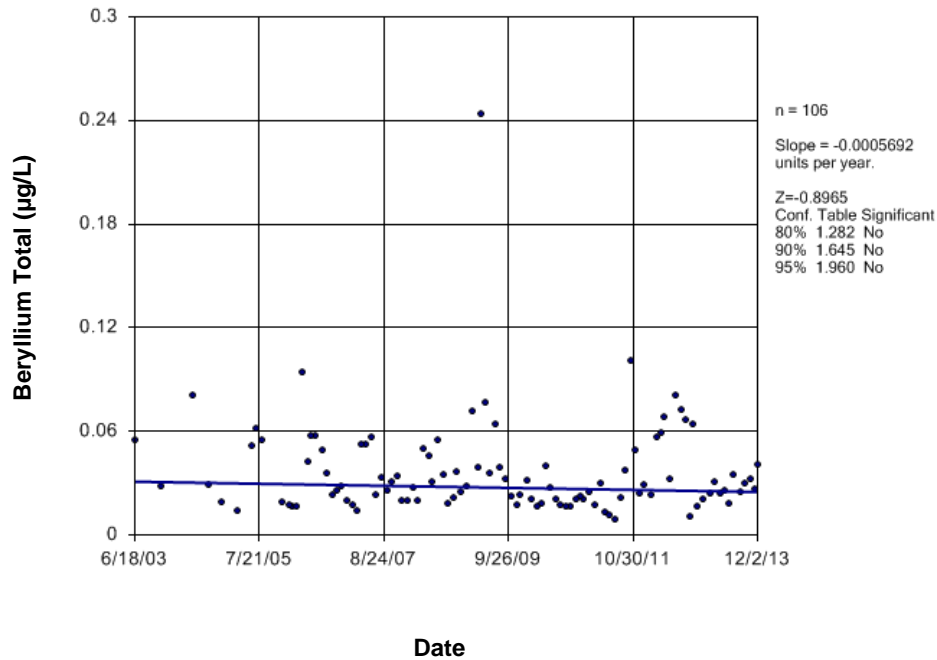
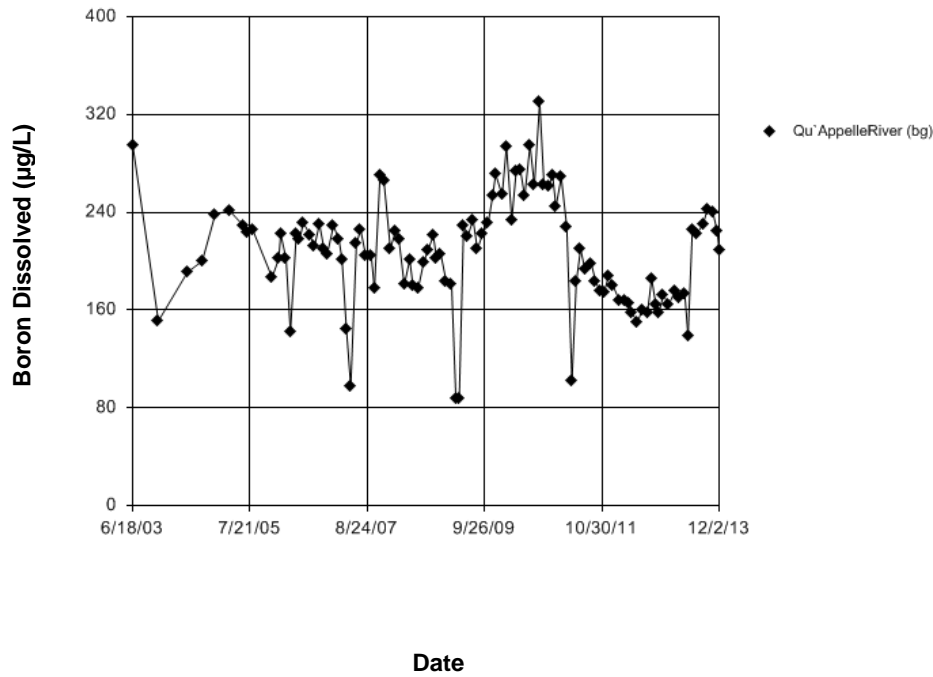


Figure E1092 Qu'Appelle River: Beryllium Total

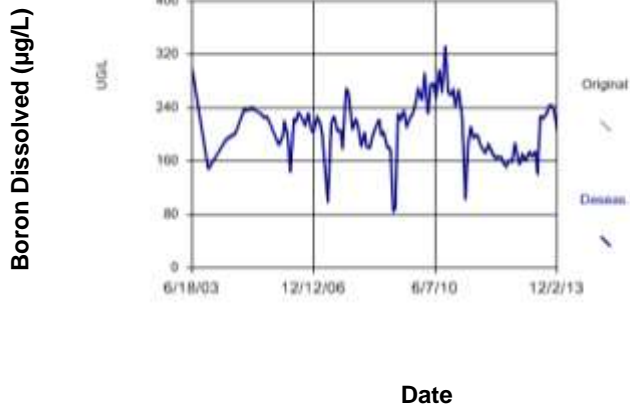
## Time Series



**Figure E1093 Qu'Appelle River: Boron Dissolved**

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.3556. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal. Kruskal-Wallis statistic (H) = 0.3556. Adjusted Kruskal-Wallis statistic (H') = 0.3556.



**Figure E1094 Qu'Appelle River: Boron Dissolved**

## Sen's Slope Estimator

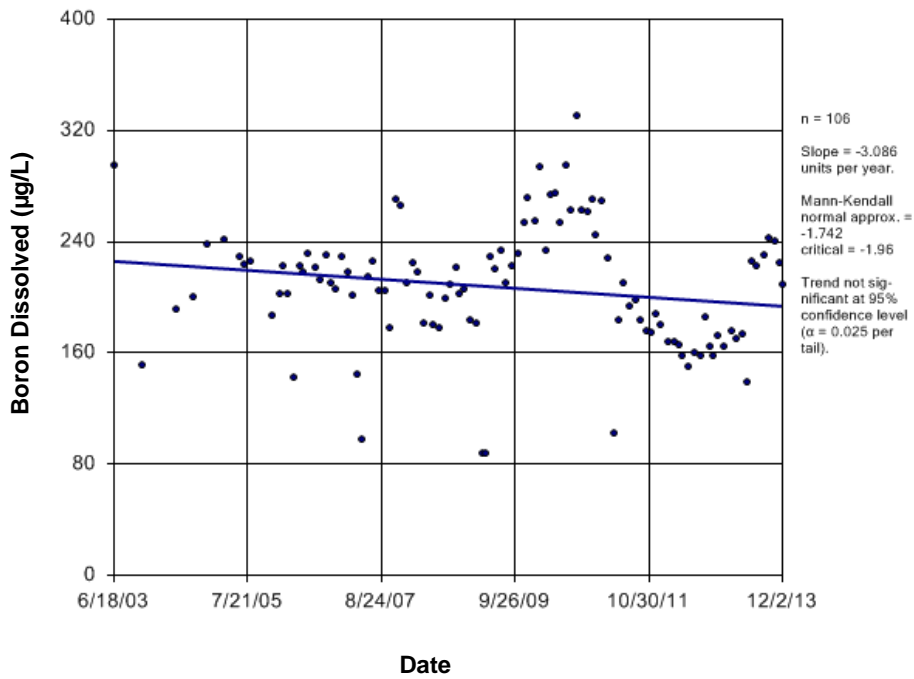


Figure E1095 Qu'Appelle River: Boron Dissolved

## Time Series

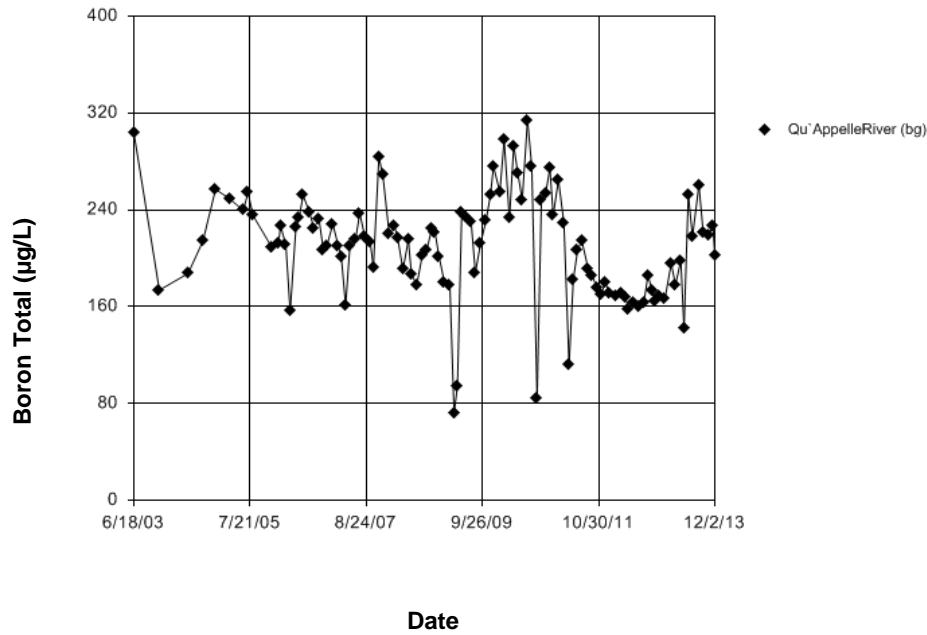


Figure E1096 Qu'Appelle River: Boron Total

# Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.1818  
Tabulated Chi-Squared value = 3.841 with 3 degrees of freedom at the 5% significance level.  
There were 4 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
Kruskal-Wallis statistic (H) = 0.1818  
Adjusted Kruskal-Wallis statistic (H') = 0.1818

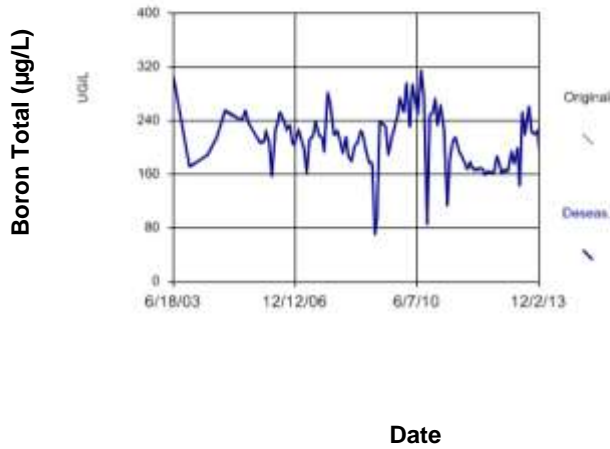


Figure E1097 Qu'Appelle River: Boron Total

# Sen's Slope Estimator

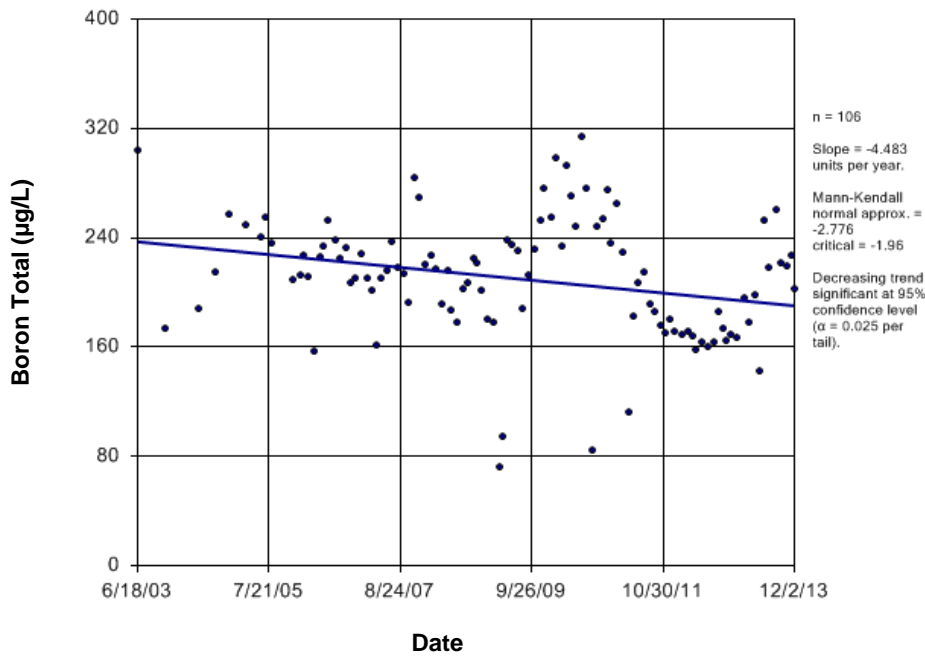
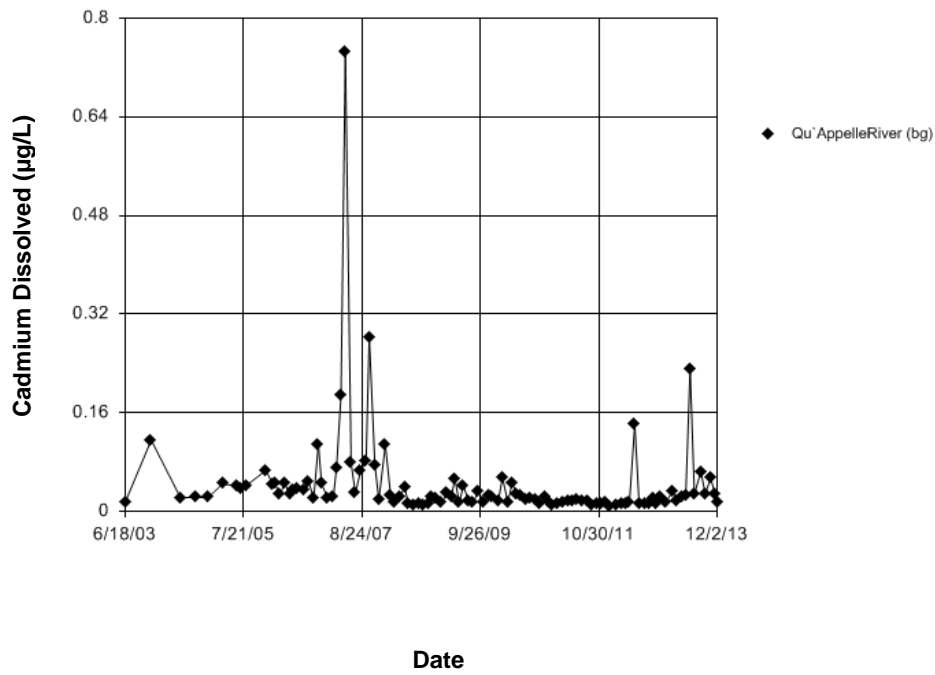


Figure E1098 Qu'Appelle River: Boron Total

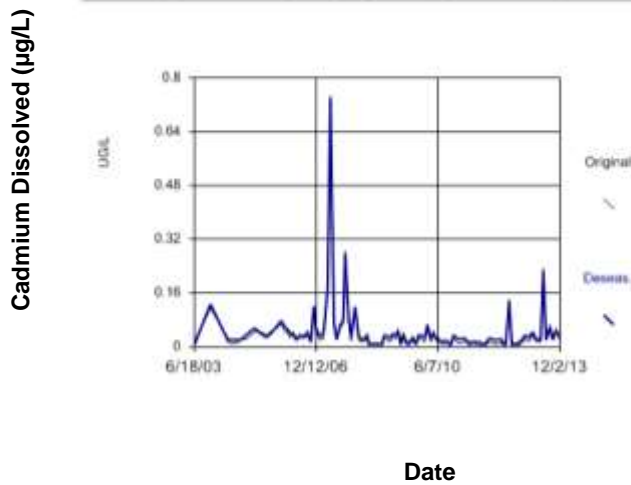
### Time Series



**Figure E1099 Qu'Appelle River: Cadmium Dissolved**

### Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.1554. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



**Figure E1100 Qu'Appelle River: Cadmium Dissolved**

### Sen's Slope Estimator

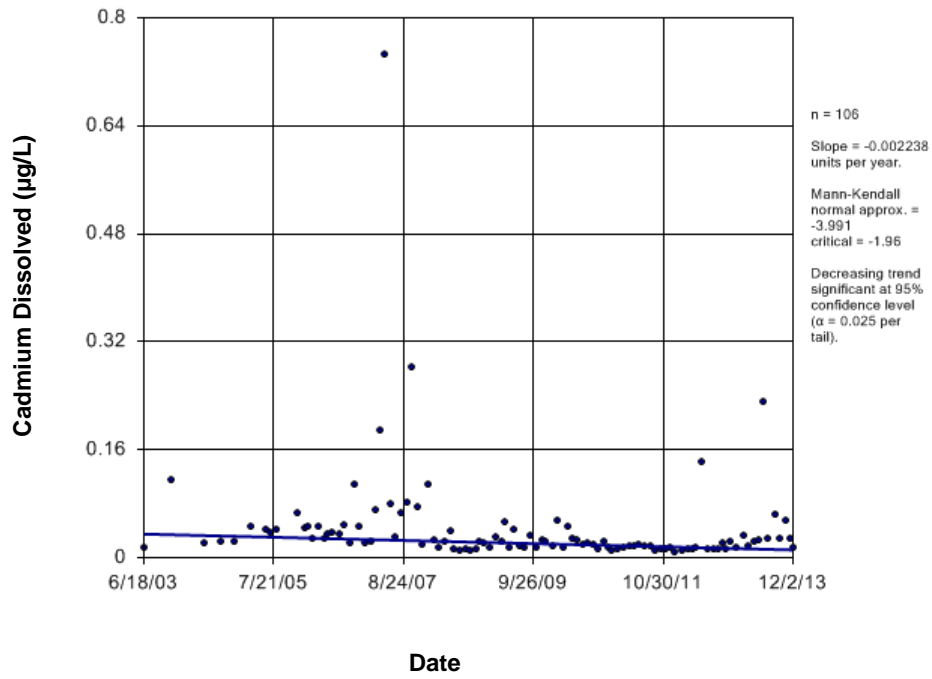


Figure E1101 Qu'Appelle River: Cadmium Dissolved

### Time Series

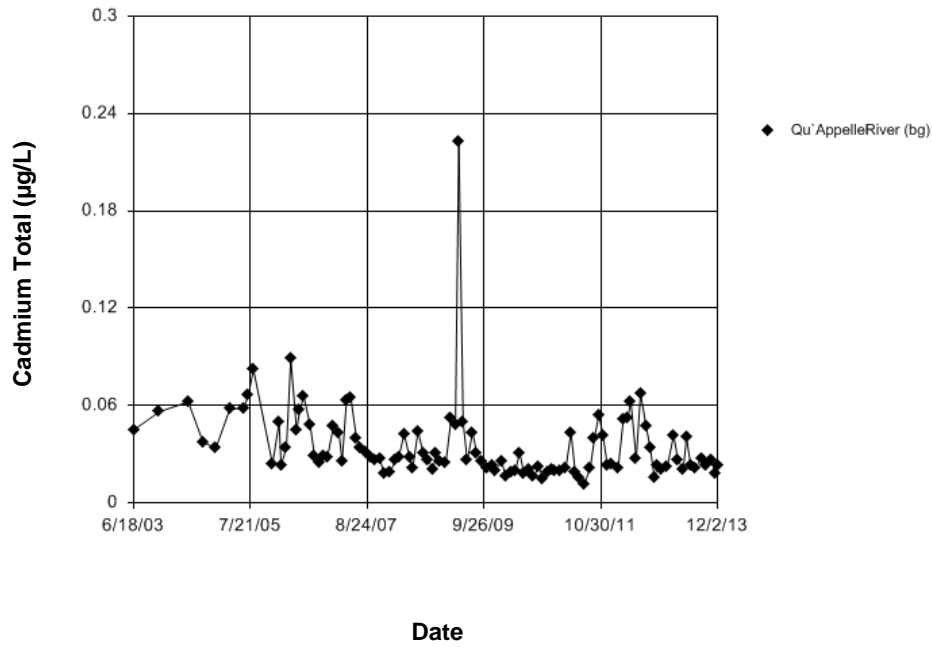


Figure E1102 Qu'Appelle River: Cadmium Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent from any other season. Calculated Kruskal-Wallis statistic = 4.823  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 4.823  
 Adjusted Kruskal-Wallis statistic (H') = 4.823

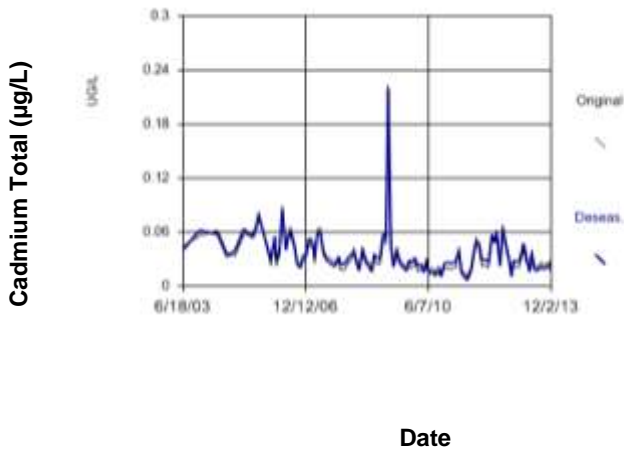


Figure E1103 Qu'Appelle River: Cadmium Total

## Seasonal Kendall

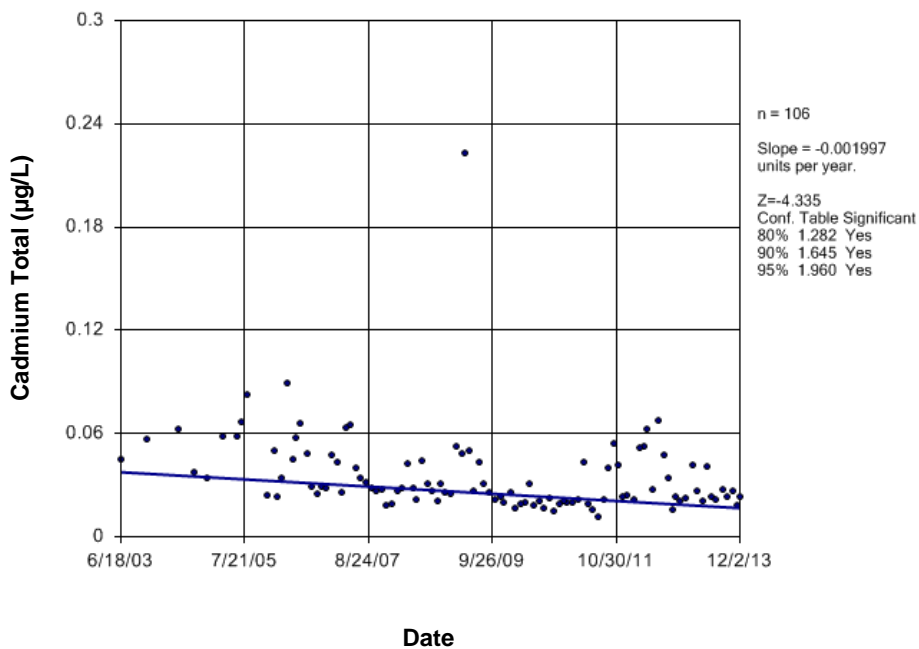


Figure E1104 Qu'Appelle River: Cadmium Total

## Time Series

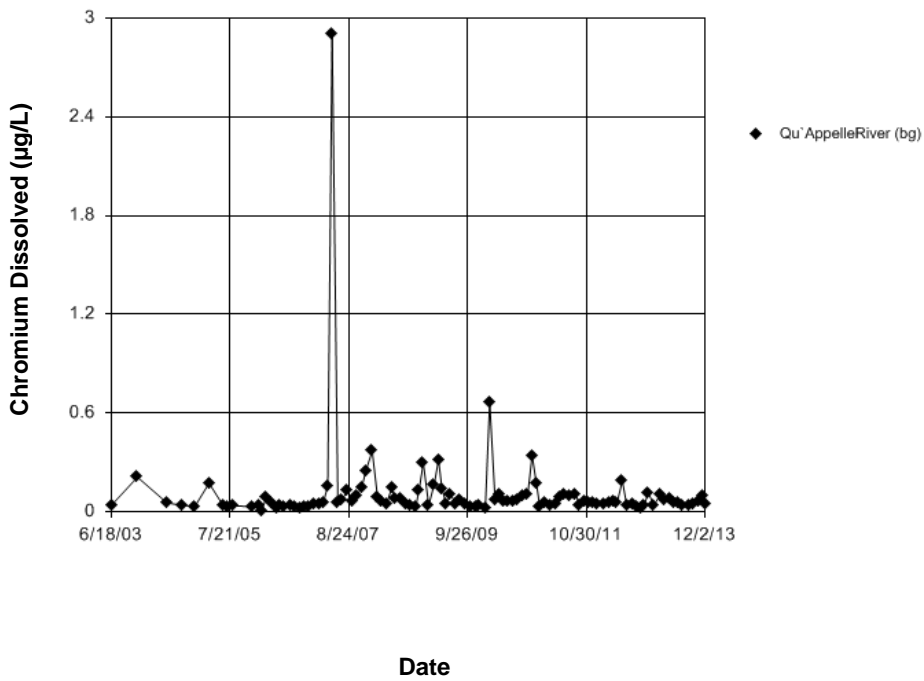


Figure E1105 Qu'Appelle River: Chromium Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates **NO SEASONALITY** at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.8631. Calculated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 4 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

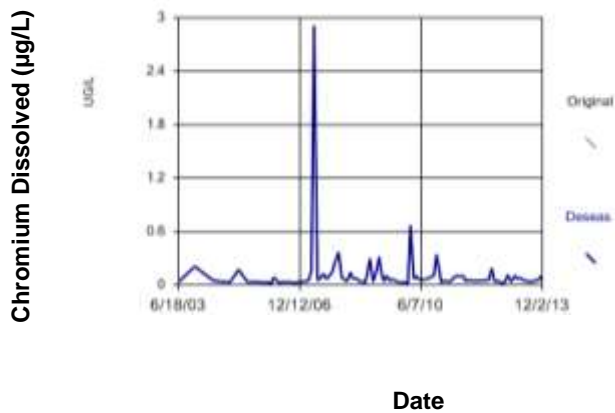


Figure E1106 Qu'Appelle River: Chromium Dissolved



### Sen's Slope Estimator

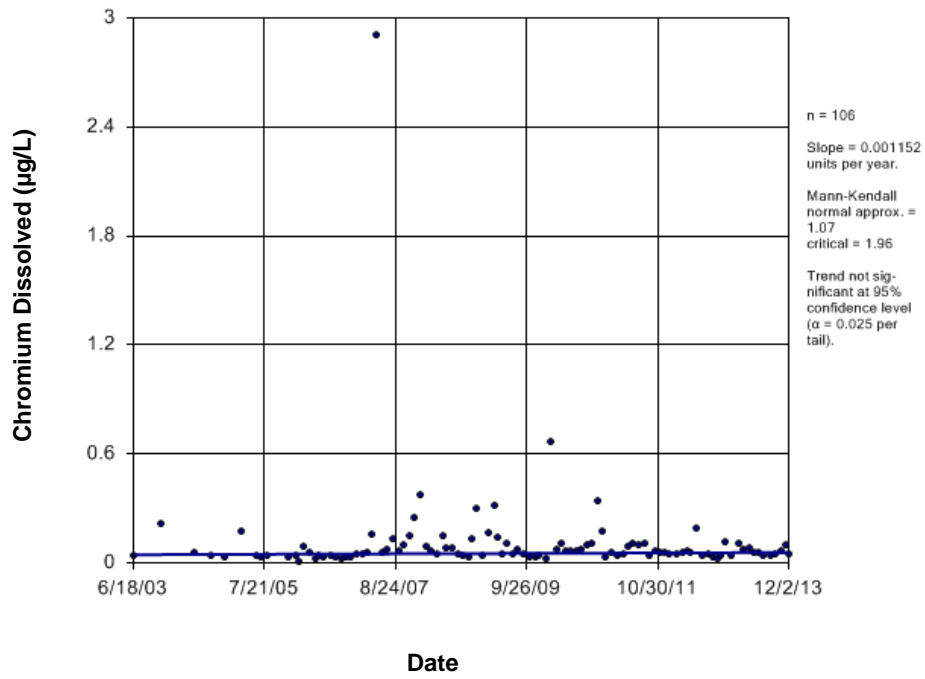


Figure E1107 Qu'Appelle River: Chromium Dissolved

### Time Series

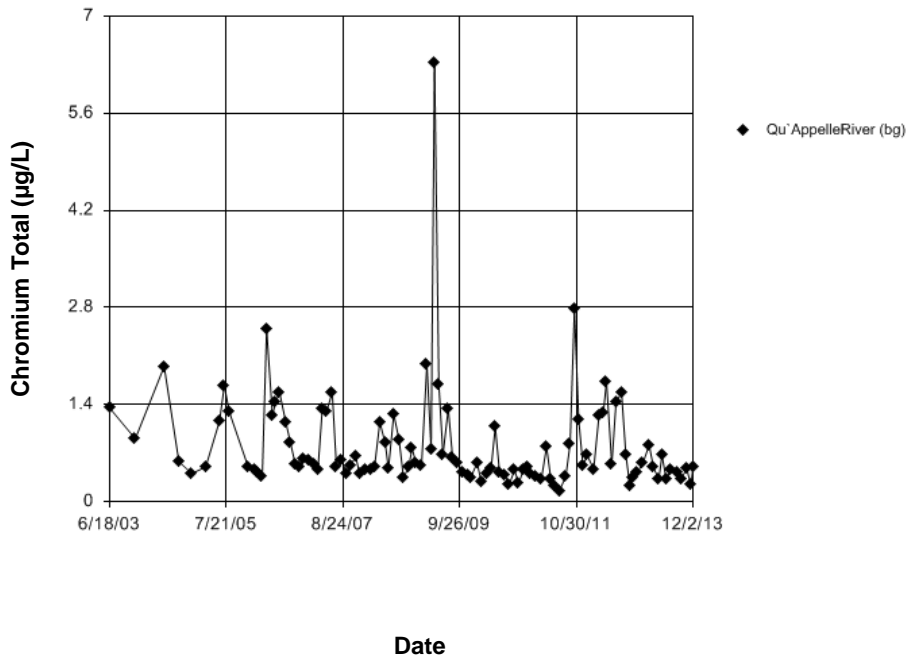


Figure E1108 Qu'Appelle River: Chromium Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 6.894  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
Kruskal-Wallis statistic (H) = 6.894  
Adjusted Kruskal-Wallis statistic (H') = 6.894

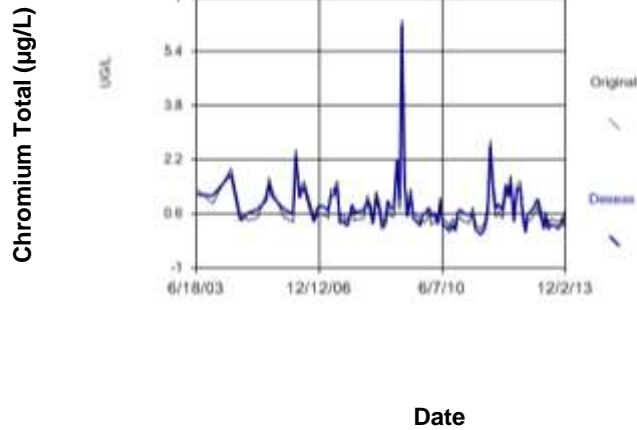


Figure E1109 Qu'Appelle River: Chromium Total

## Seasonal Kendall

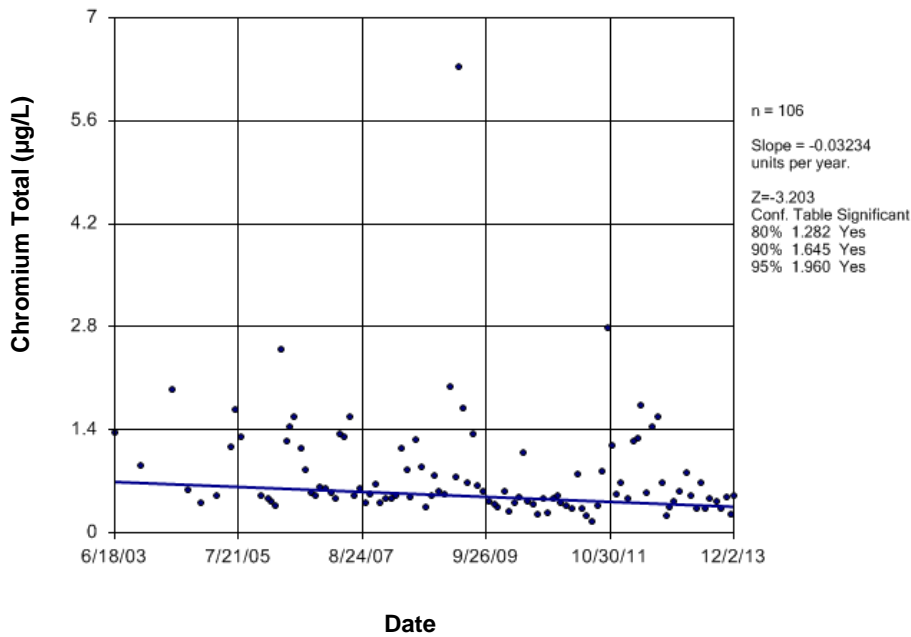


Figure E1110 Qu'Appelle River: Chromium Total

### Time Series

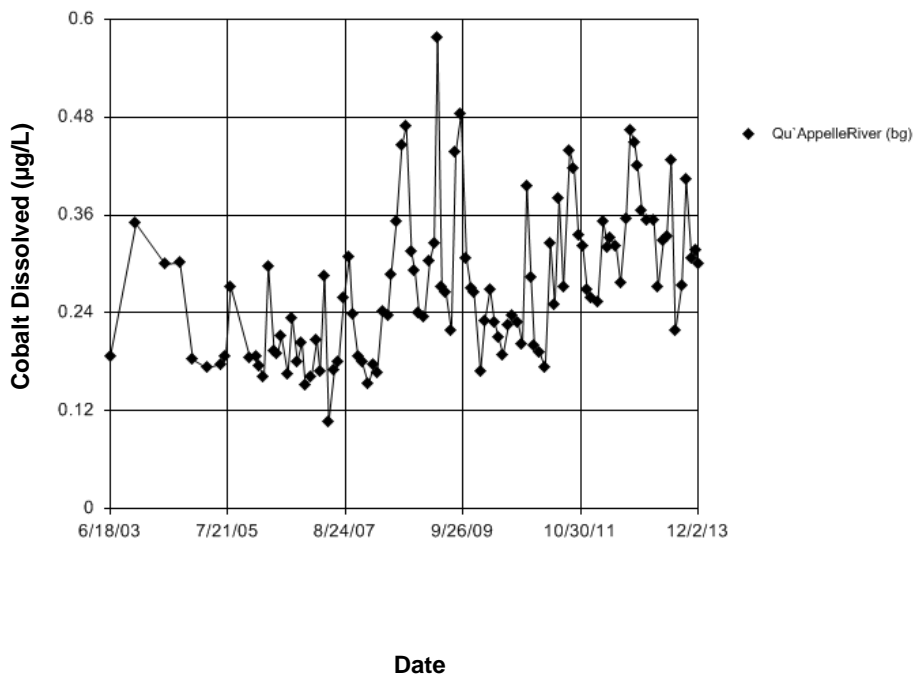


Figure E1111 Qu'Appelle River: Cobalt Dissolved

### Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 6.743  
 Tabulated Chi-Squared value = 3.841 with 3 degrees of freedom at the 5% significance level.  
 There were 4 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 6.743  
 Adjusted Kruskal-Wallis statistic (H') = 6.743

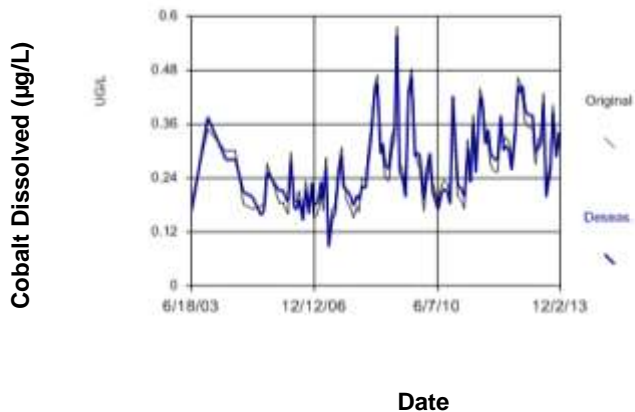


Figure E1112 Qu'Appelle River: Cobalt Dissolved

### Seasonal Kendall

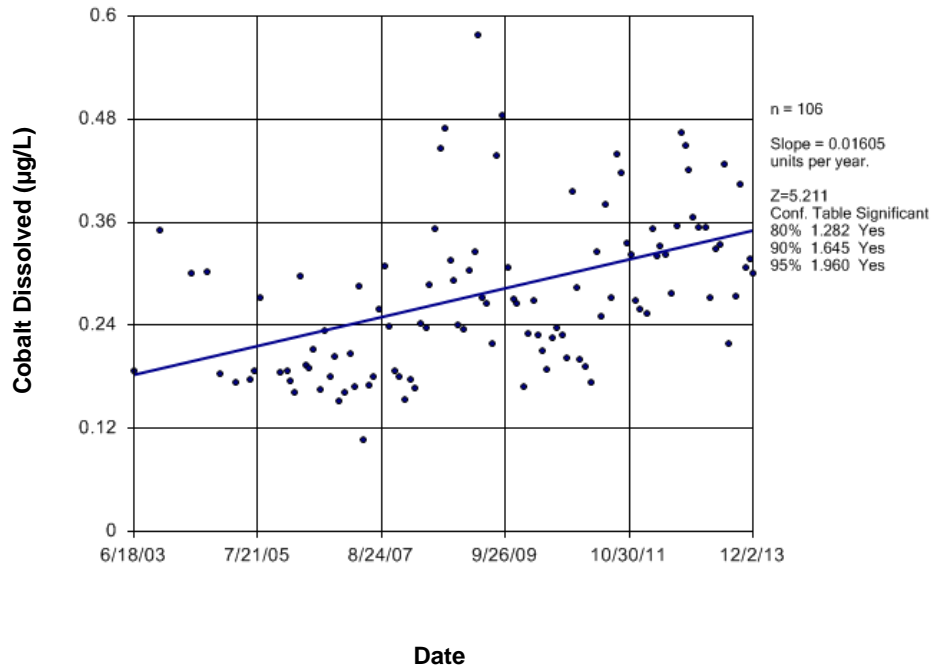


Figure E1113 Qu'Appelle River: Cobalt Dissolved

### Time Series

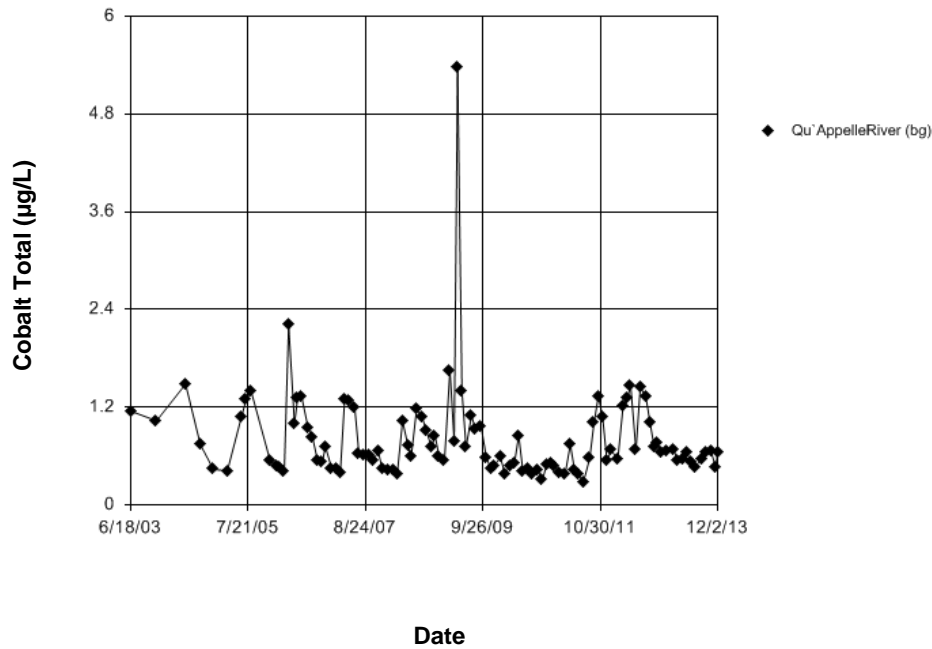


Figure E1114 Qu'Appelle River: Cobalt Total

# Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 17.69  
 Calculated Chi-Squared value = 13.41 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 17.69  
 Adjusted Kruskal-Wallis statistic (H') = 17.69

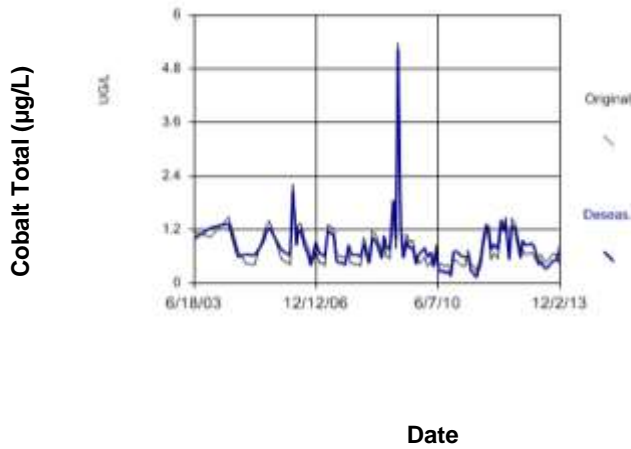


Figure E1115 Qu'Appelle River: Cobalt Total

# Seasonal Kendall

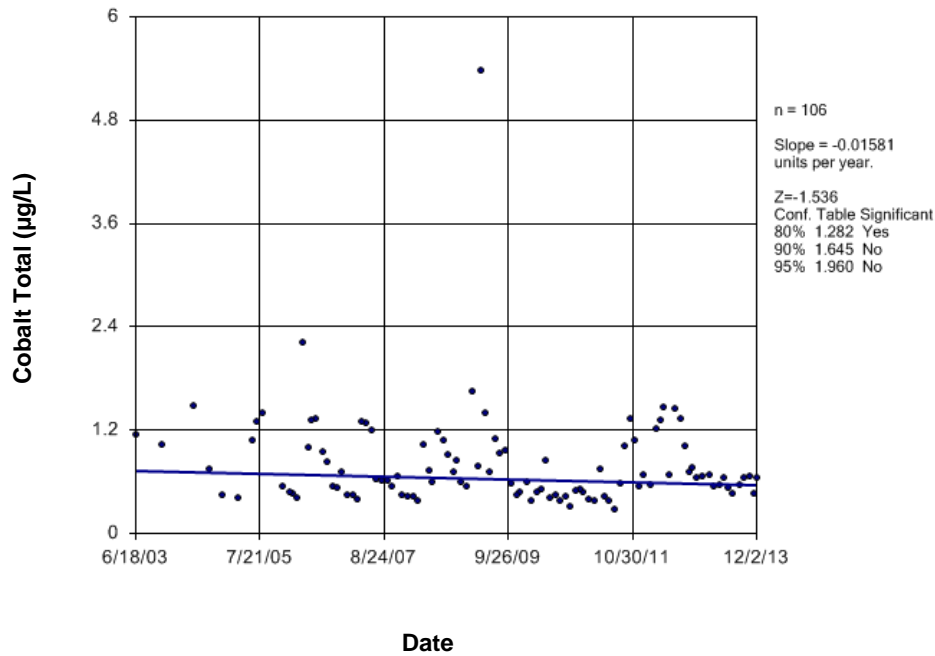
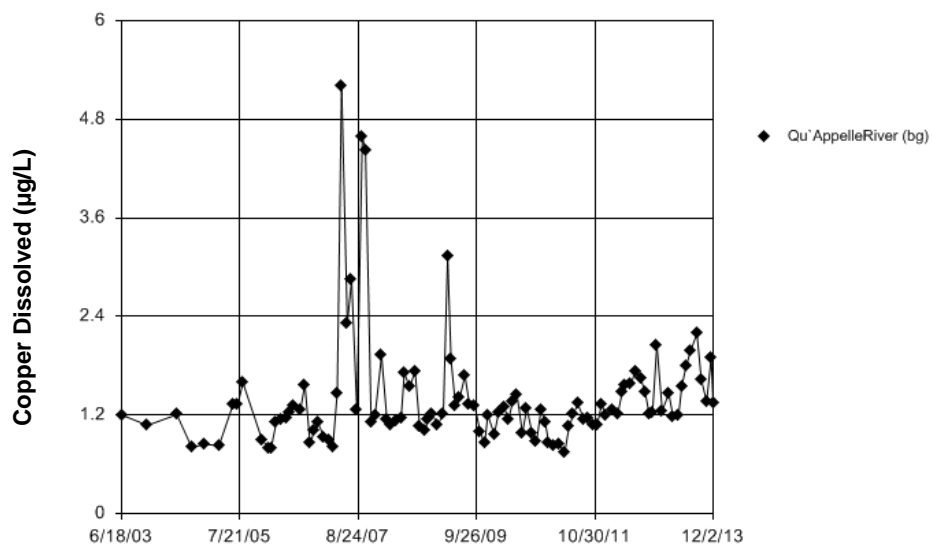


Figure E1116 Qu'Appelle River: Cobalt Total

### Time Series

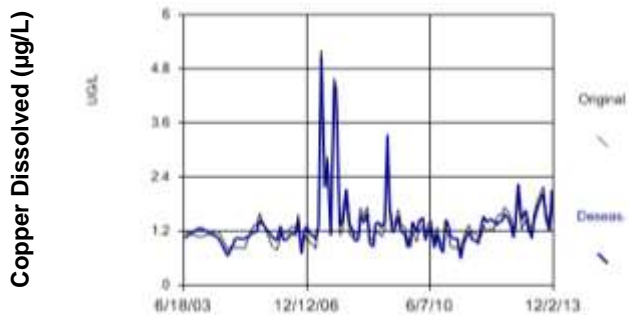


Date

**Figure E1117 Qu'Appelle River: Copper Dissolved**

### Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 14.43  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 4 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 14.43  
 Adjusted Kruskal-Wallis statistic (H') = 14.43



Date

**Figure E1118 Qu'Appelle River: Copper Dissolved**

### Seasonal Kendall

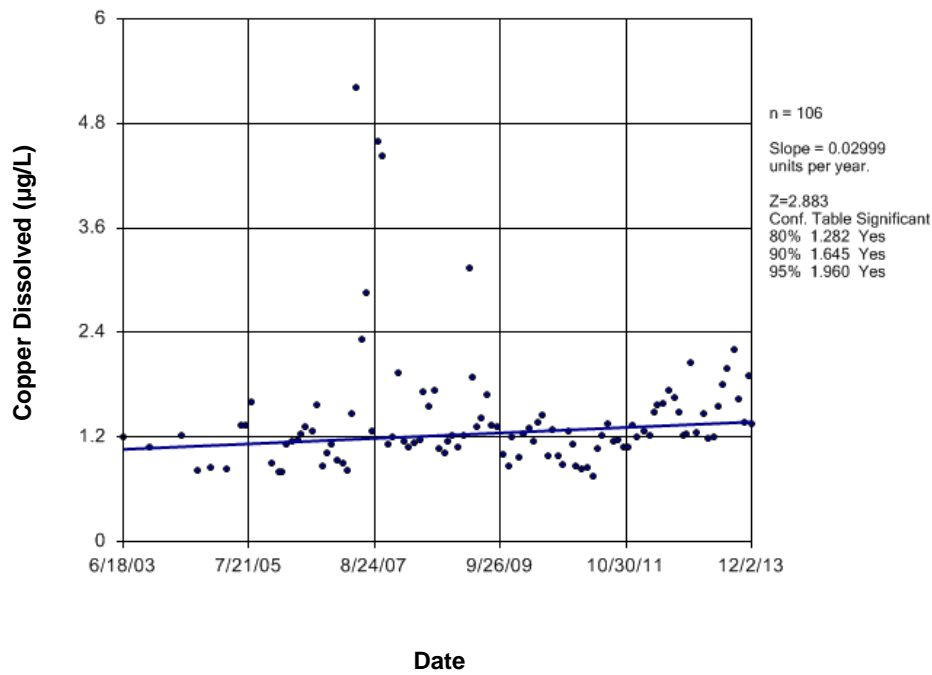


Figure E1119 Qu'Appelle River: Copper Dissolved

### Time Series

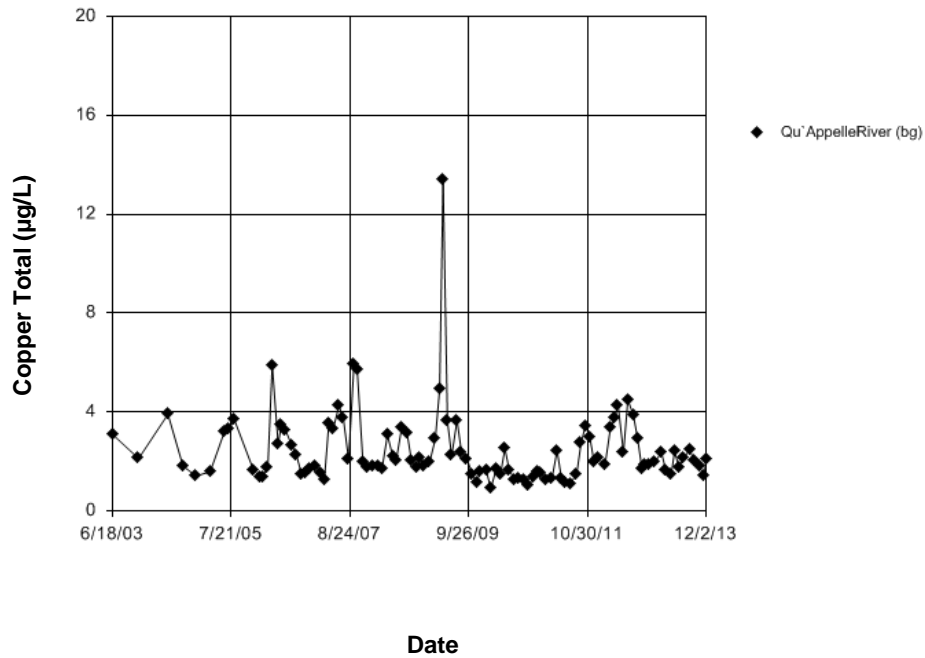


Figure E1120 Qu'Appelle River: Copper Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-Squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 17.37  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (FD) was necessary.

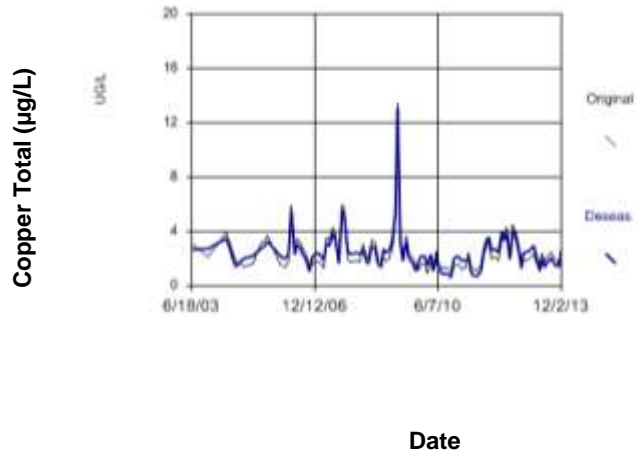


Figure E1121 Qu'Appelle River: Copper Total

## Seasonal Kendall

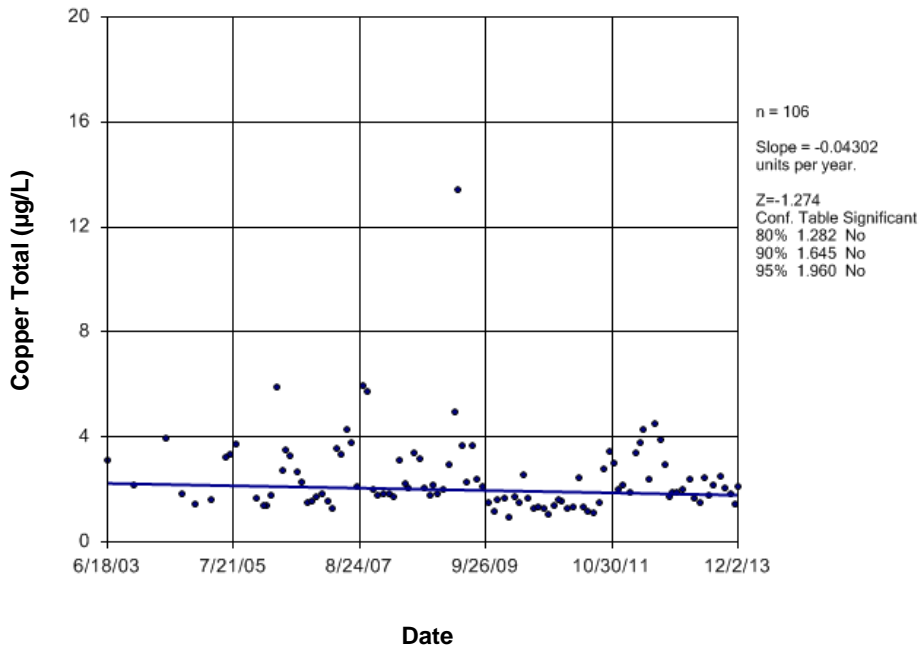


Figure E1122 Qu'Appelle River: Copper Total



## Time Series

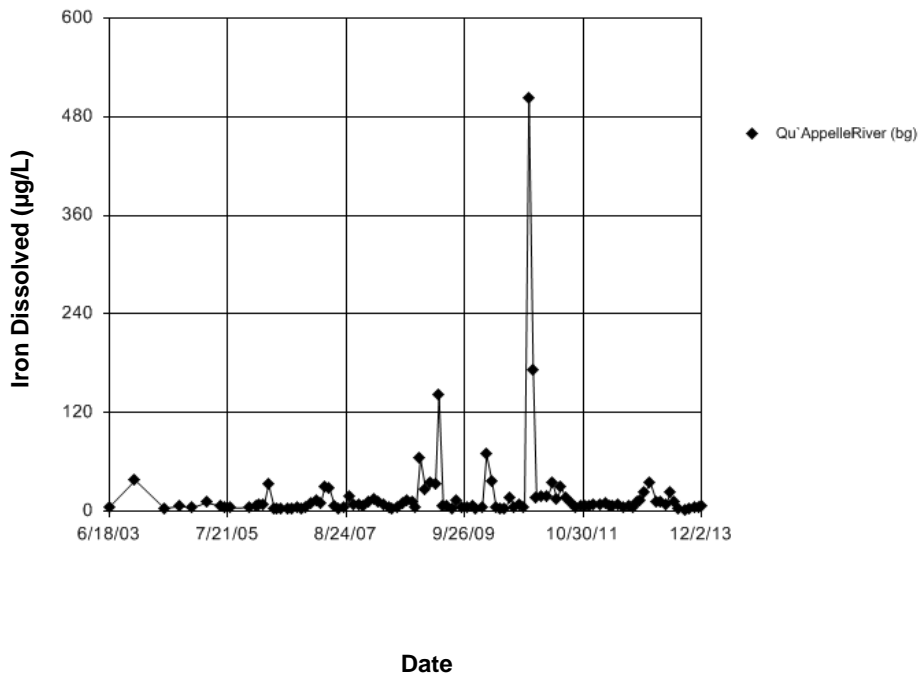


Figure E1123 Qu'Appelle River: Iron Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates **SEASONALITY** at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.  
 Calculated Kruskal-Wallis statistic = 12.12  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 12.12  
 Adjusted Kruskal-Wallis statistic (H') = 12.12

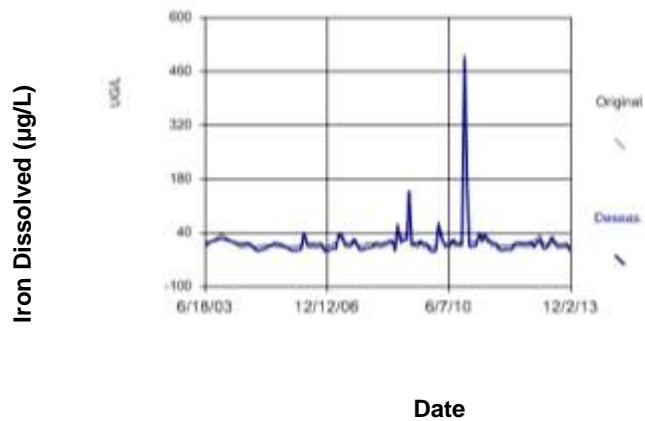


Figure E1124 Qu'Appelle River: Iron Dissolved

### Seasonal Kendall

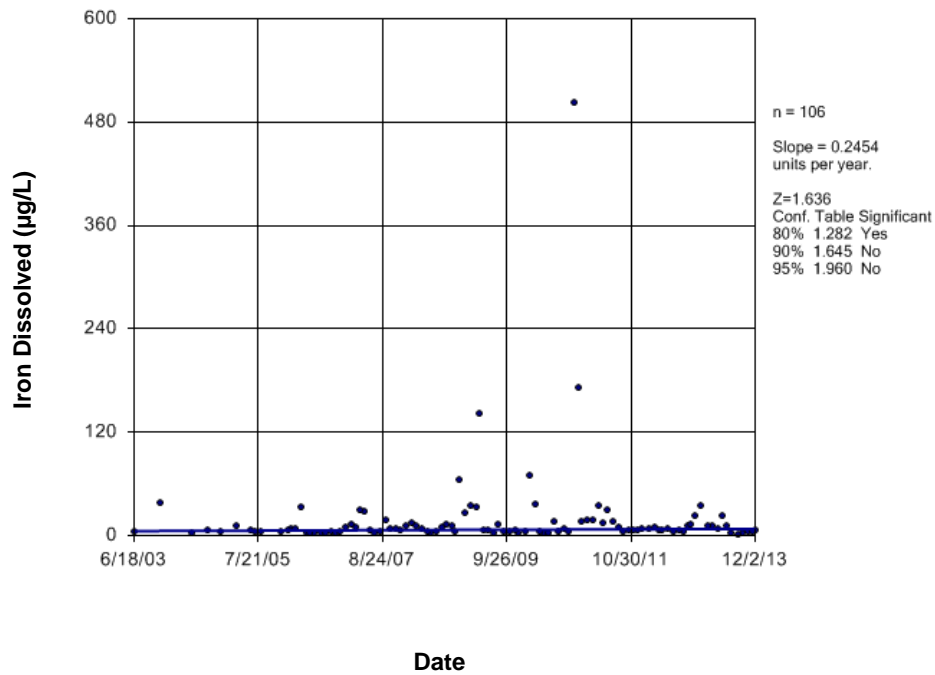


Figure E1125 Qu'Appelle River: Iron Dissolved

### Time Series

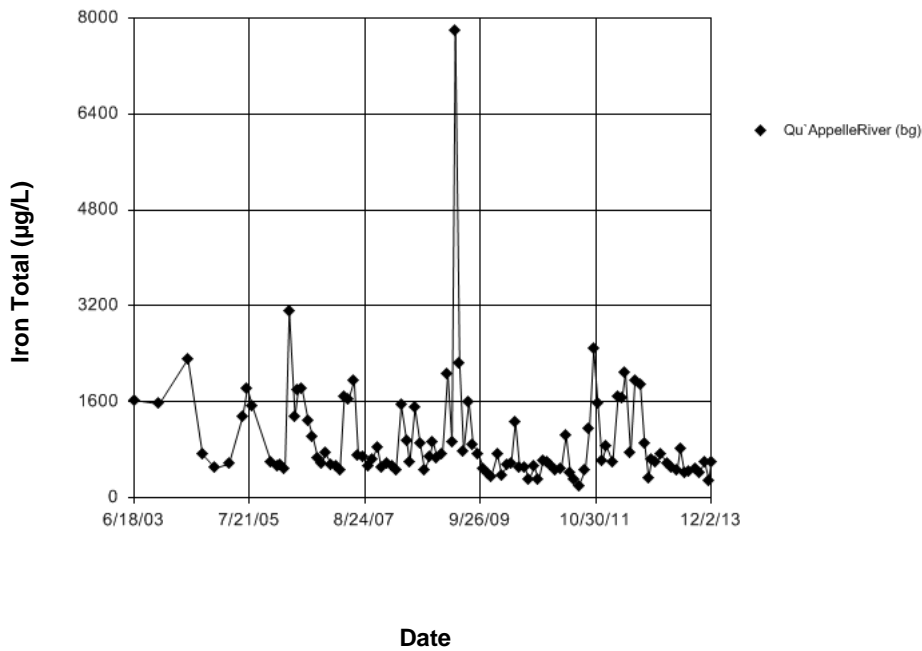


Figure E1126 Qu'Appelle River: Iron Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 7.566  
 Calculated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 1 groups of six in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 7.566  
 Adjusted Kruskal-Wallis statistic (H') = 7.566

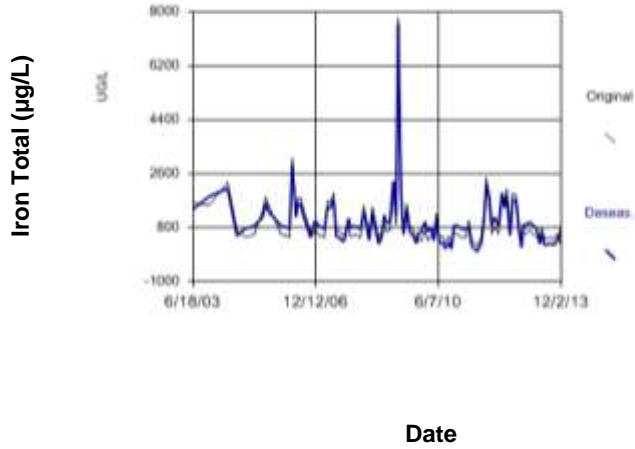


Figure E1127 Qu'Appelle River: Iron Total

## Seasonal Kendall

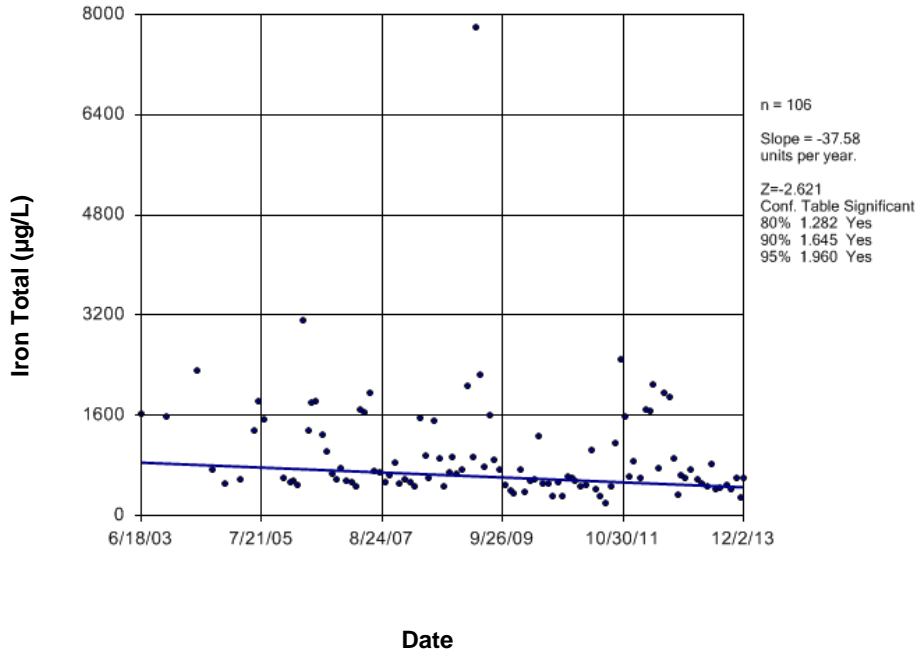


Figure E1128 Qu'Appelle River: Iron Total

## Time Series

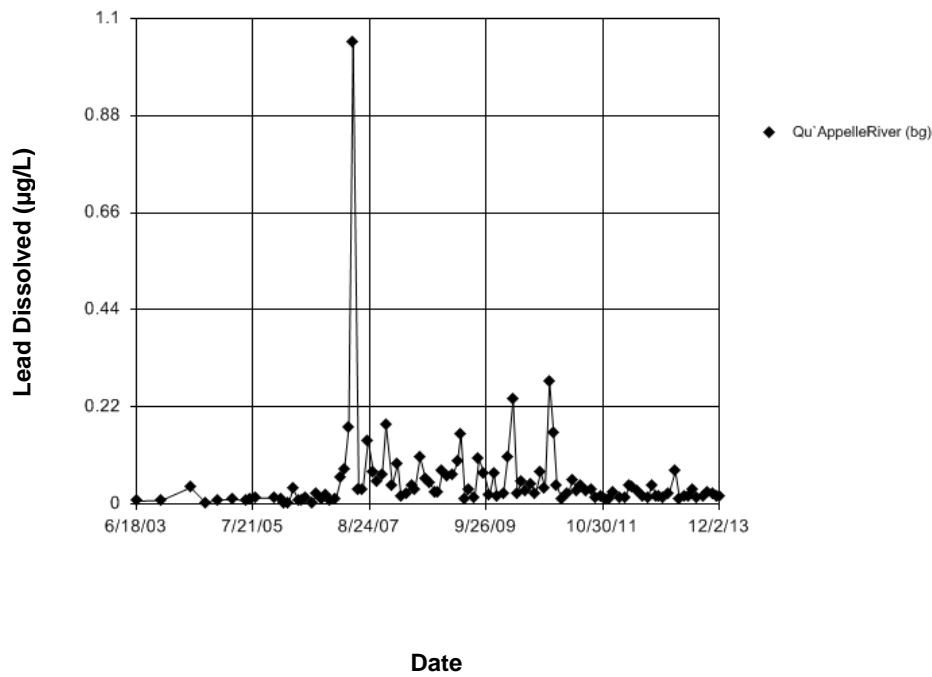


Figure E1129 Qu'Appelle River: Lead Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.2598  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H<sub>adj</sub>) was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 0.2598  
 Adjusted Kruskal-Wallis statistic (H<sub>adj</sub>) = 0.2598

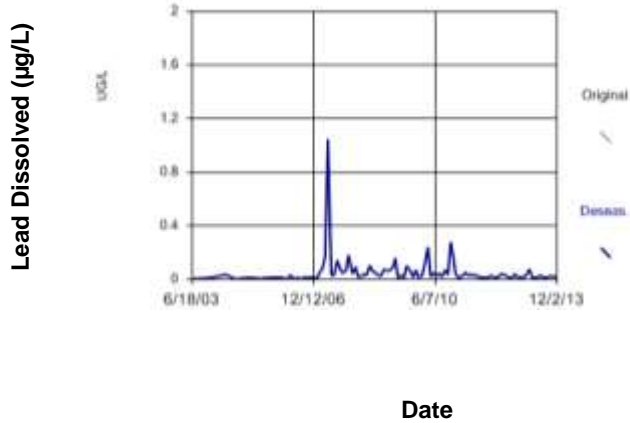


Figure E1130 Qu'Appelle River: Lead Dissolved

### Sen's Slope Estimator

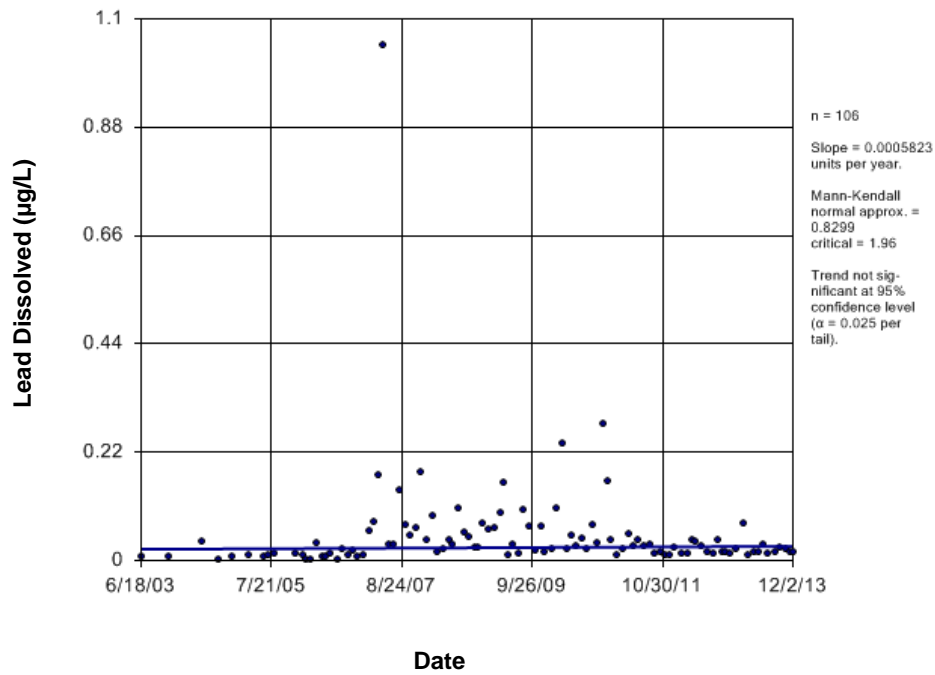


Figure E1131 Qu'Appelle River: Lead Dissolved

### Time Series

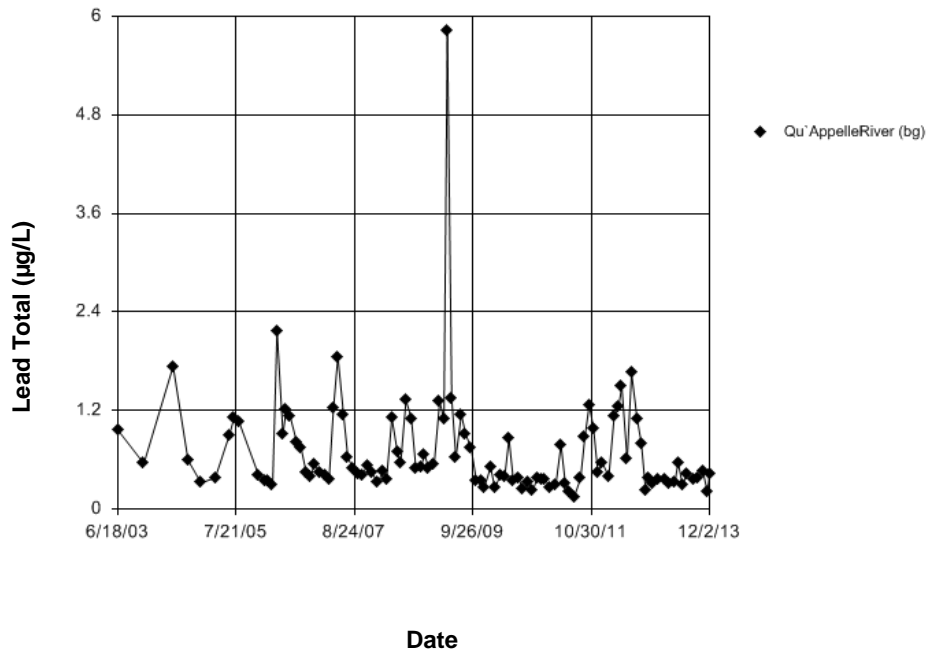


Figure E1132 Qu'Appelle River: Lead Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 15.05  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of bins in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 15.05  
 Adjusted Kruskal-Wallis statistic (H') = 15.05

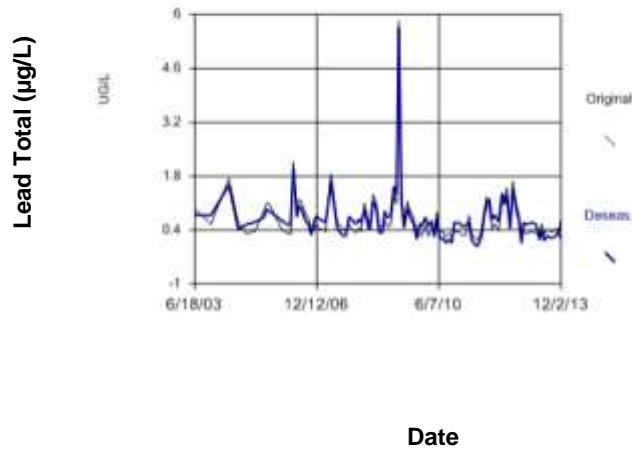


Figure E1133 Qu'Appelle River: Lead Total

## Seasonal Kendall

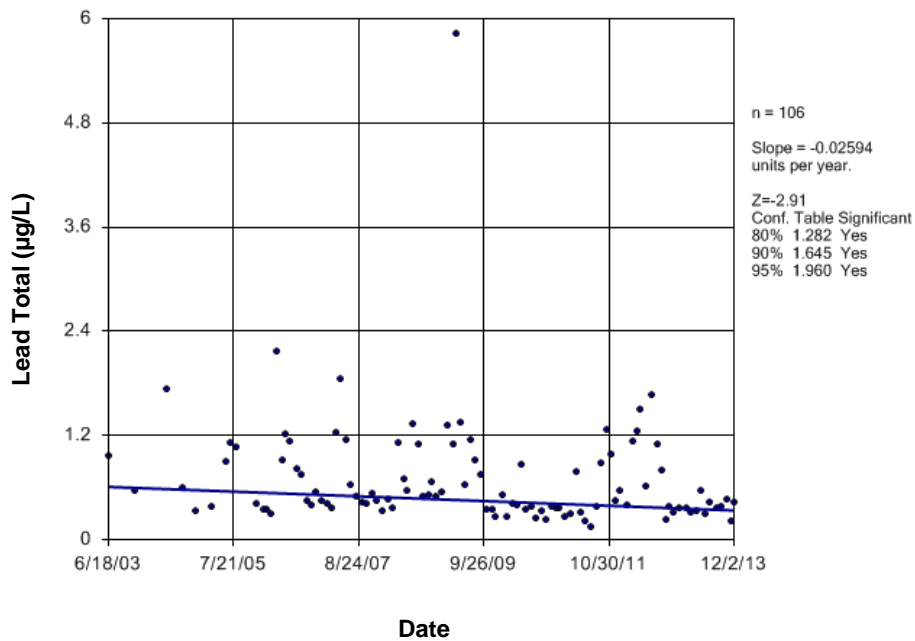
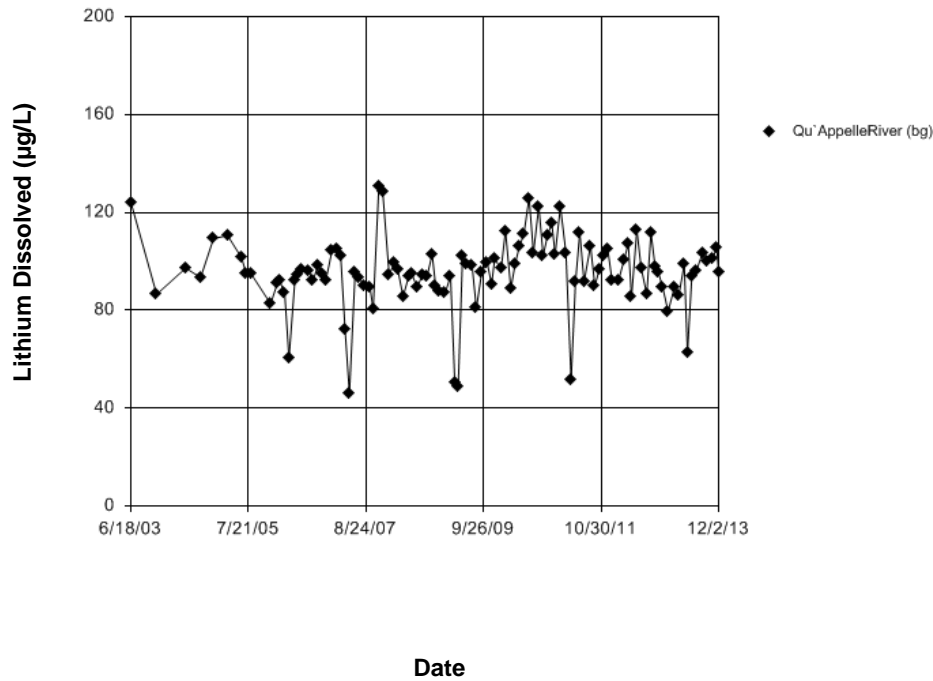


Figure E1134 Qu'Appelle River: Lead Total

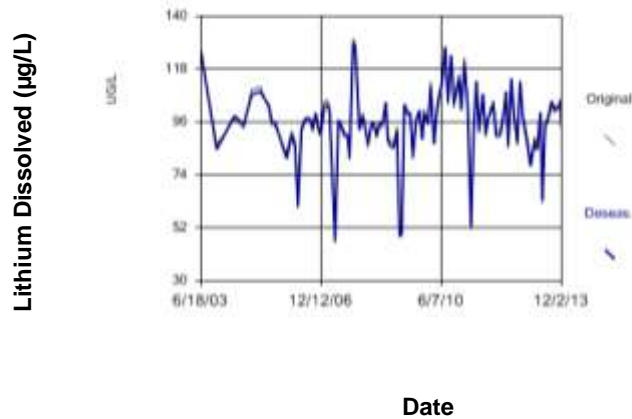
## Time Series



**Figure E1135 Qu'Appelle River: Lithium Dissolved**

## Seasonality

For the data shown, the Kruskal-Wallis test indicates **NO SEASONALITY** at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.1986. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal. Kruskal-Wallis statistic (H) = 0.1986. Adjusted Kruskal-Wallis statistic (H') = 0.1986.



**Figure E1136 Qu'Appelle River: Lithium Dissolved**

## Sen's Slope Estimator

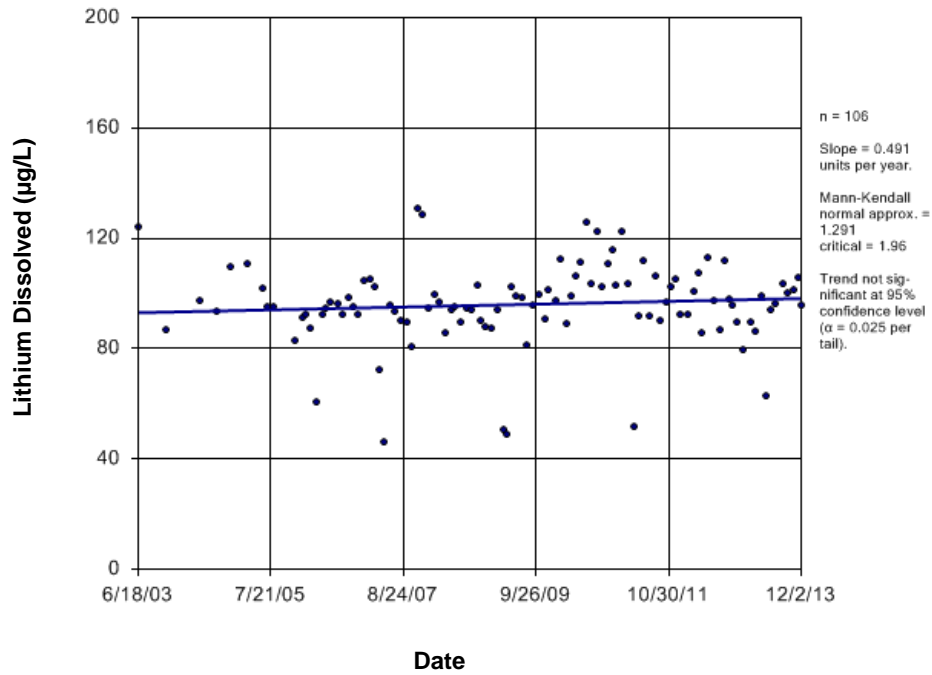


Figure E1137 Qu'Appelle River: Lithium Dissolved

## Time Series

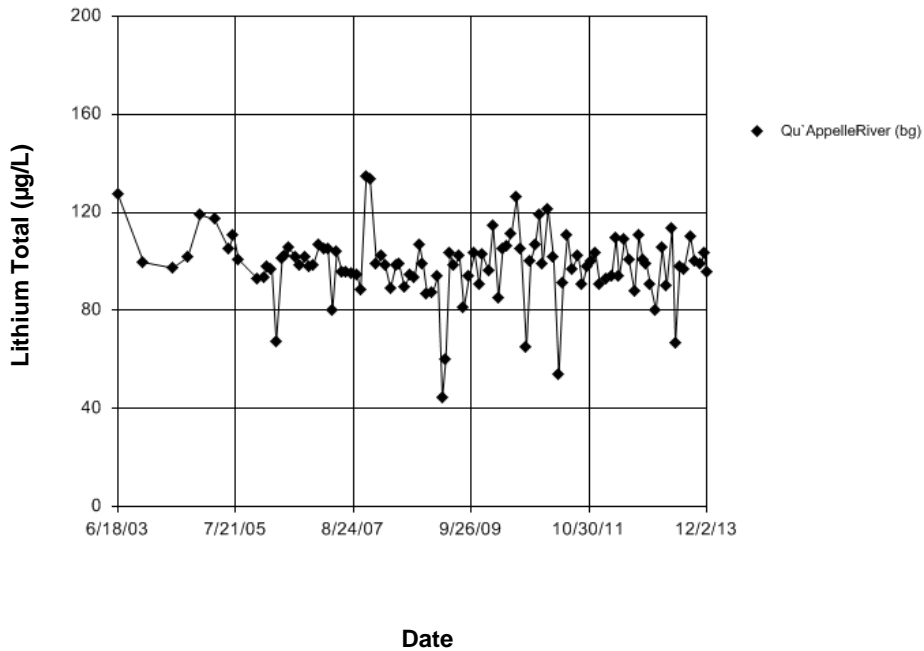
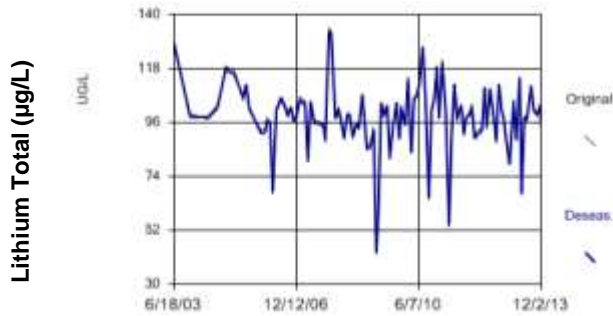


Figure E1138 Qu'Appelle River: Lithium Total



## Seasonality

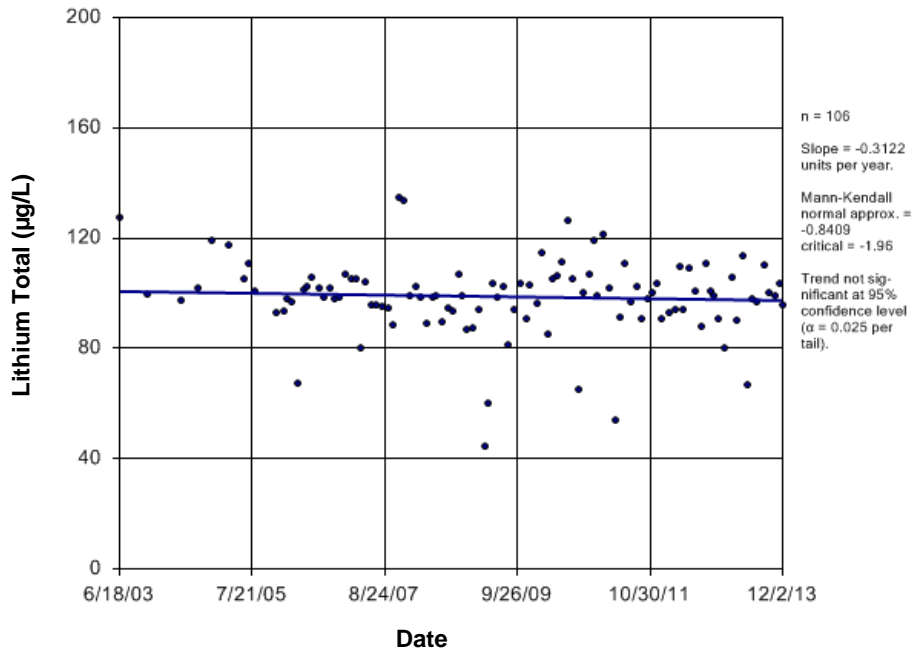
For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.019  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 10 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 0.019  
 Adjusted Kruskal-Wallis statistic (H') = 0.019



Date

Figure E1139 Qu'Appelle River: Lithium Total

## Sen's Slope Estimator



Date

Figure E1140 Qu'Appelle River: Lithium Total

## Time Series

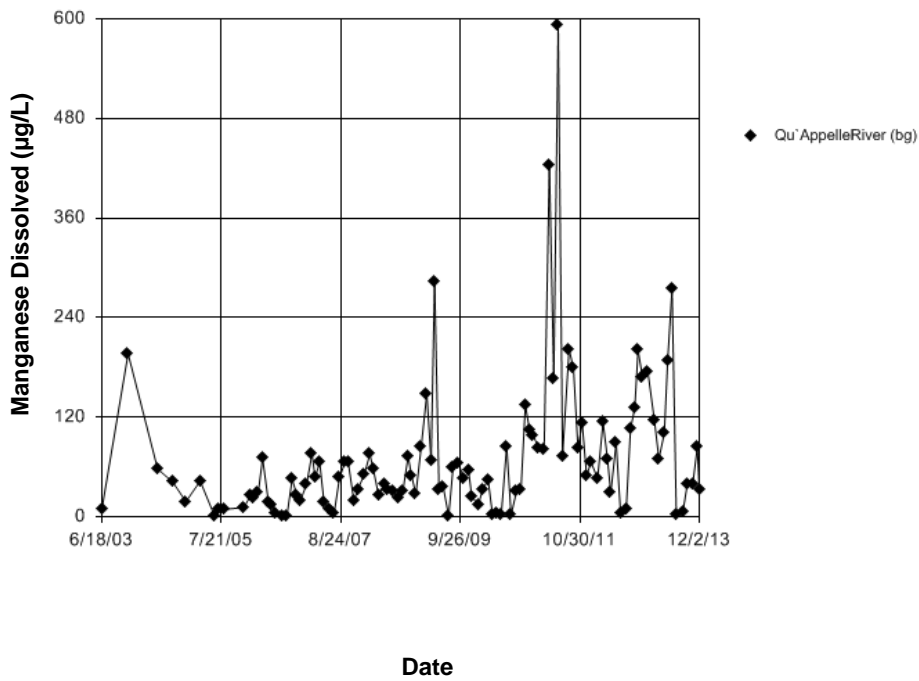


Figure E1141 Qu'Appelle River: Manganese Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 4.78. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

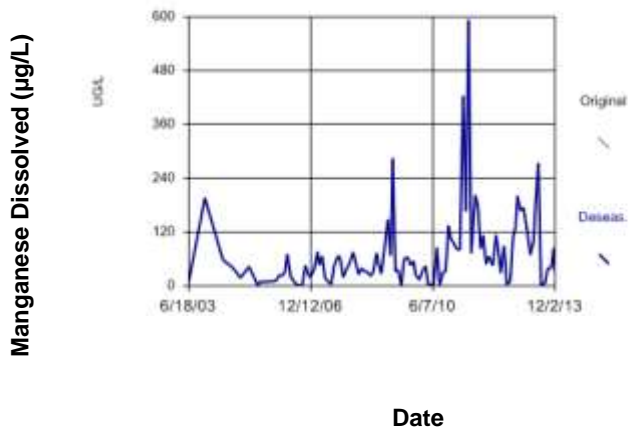


Figure E1142 Qu'Appelle River: Manganese Dissolved

### Seasonal Kendall

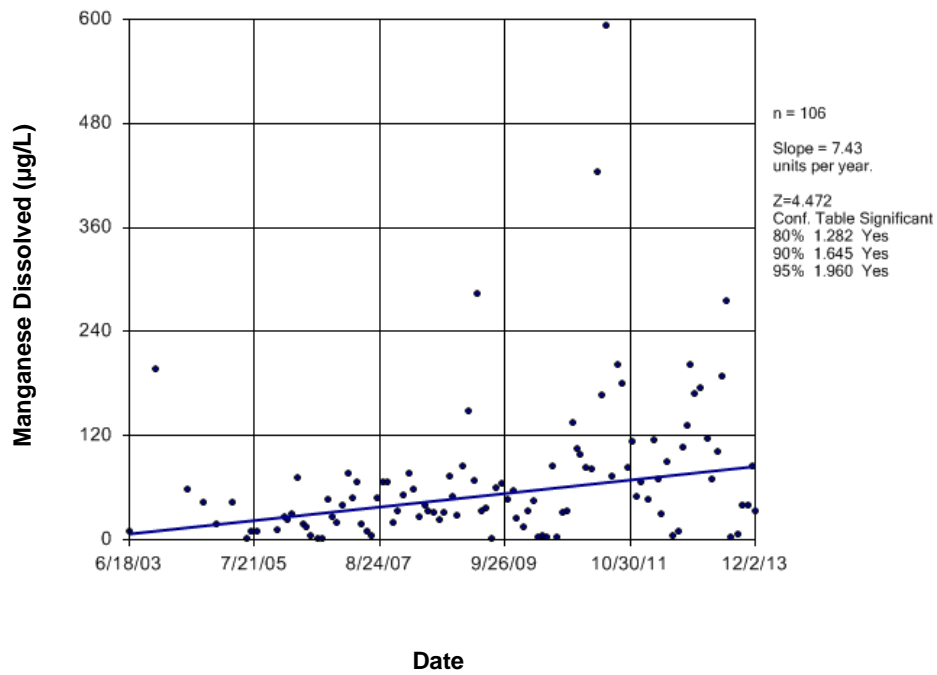


Figure E1143 Qu'Appelle River: Manganese Dissolved

### Time Series

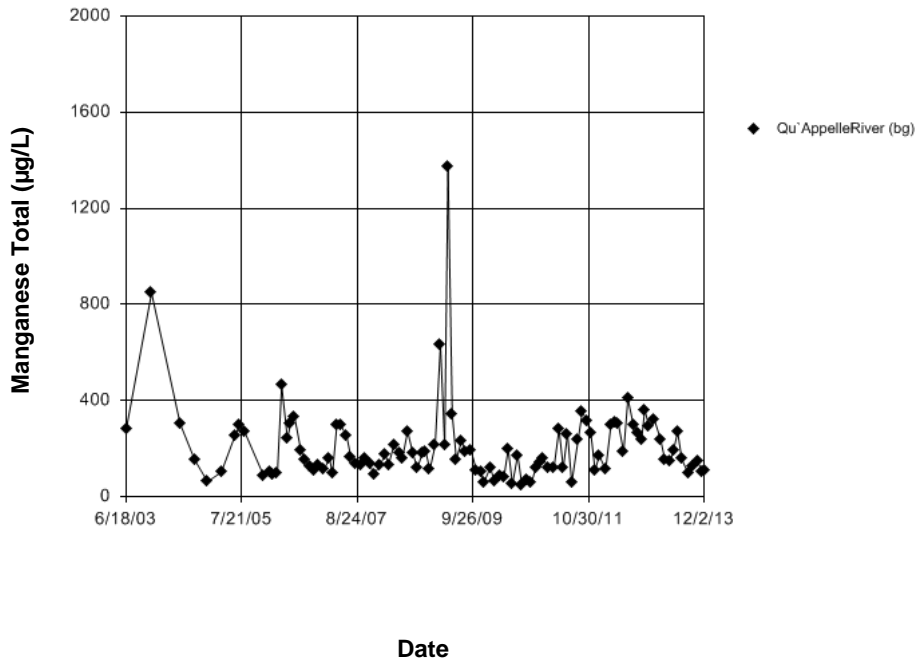
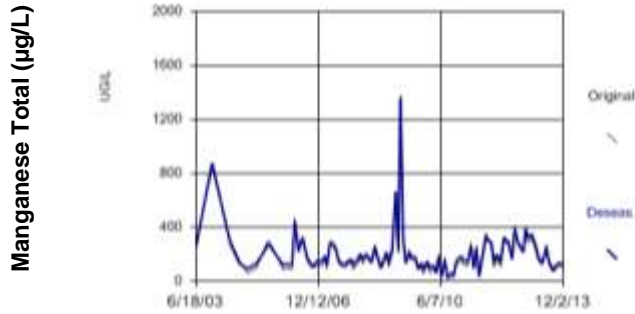


Figure E1144 Qu'Appelle River: Manganese Total

## Seasonality

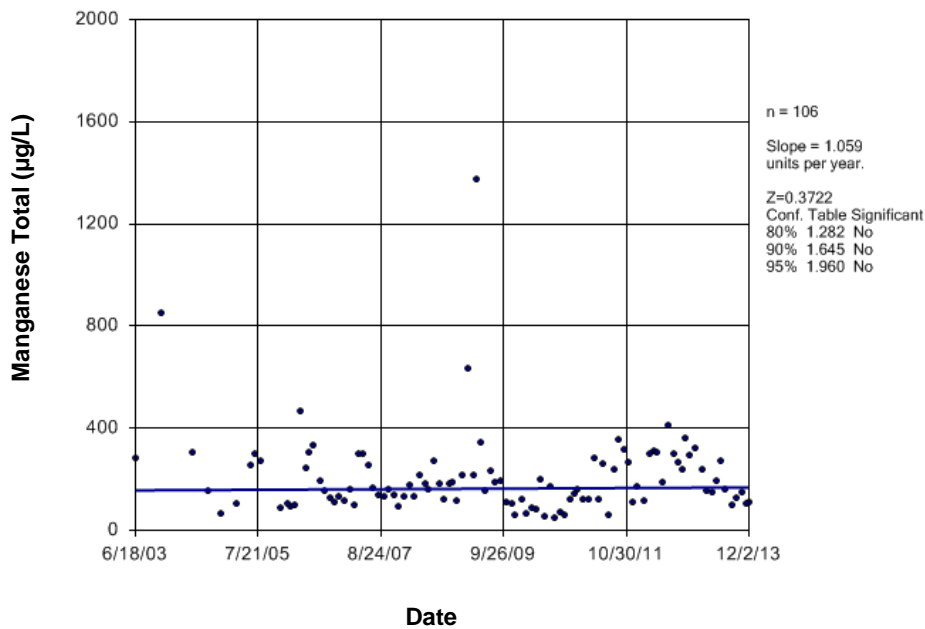
For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent from any other season. Calculated Kruskal-Wallis statistic = 11.33  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of data in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 11.33  
 Adjusted Kruskal-Wallis statistic (H') = 11.33



Date

Figure E1145 Qu'Appelle River: Manganese Total

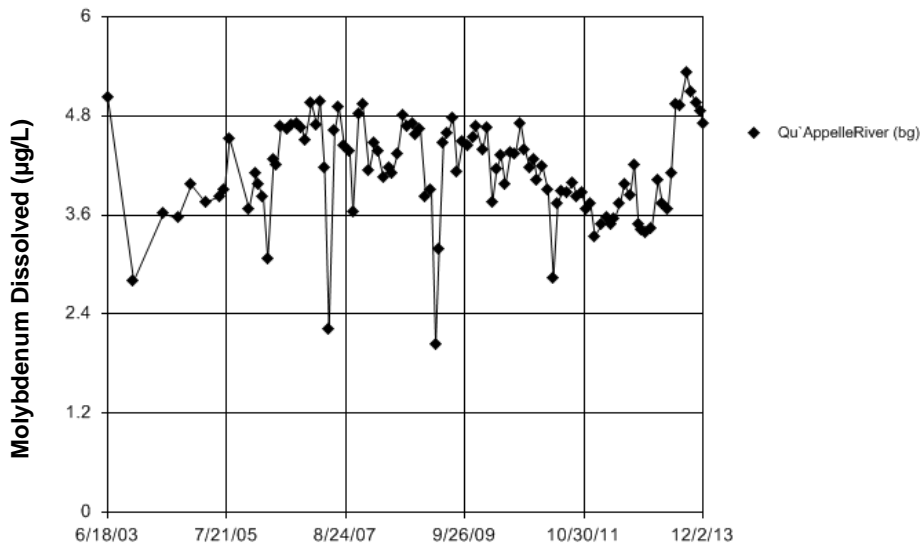
## Seasonal Kendall



Date

Figure E1146 Qu'Appelle River: Manganese Total

### Time Series



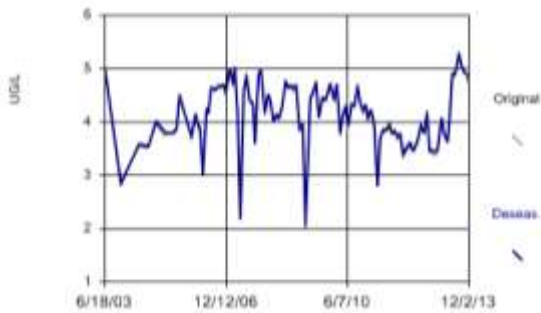
Date

**Figure E1147 Qu'Appelle River: Molybdenum Dissolved**

### Seasonality

For the data shown, the Kruskal-Wallis test indicates **NO SEASONALITY** at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.  
 Calculated Kruskal-Wallis statistic = 0.8584  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 0.8584  
 Adjusted Kruskal-Wallis statistic (H') = 0.8584

Molybdenum Dissolved



Date

**Figure E1148 Qu'Appelle River: Molybdenum Dissolved**

### Sen's Slope Estimator

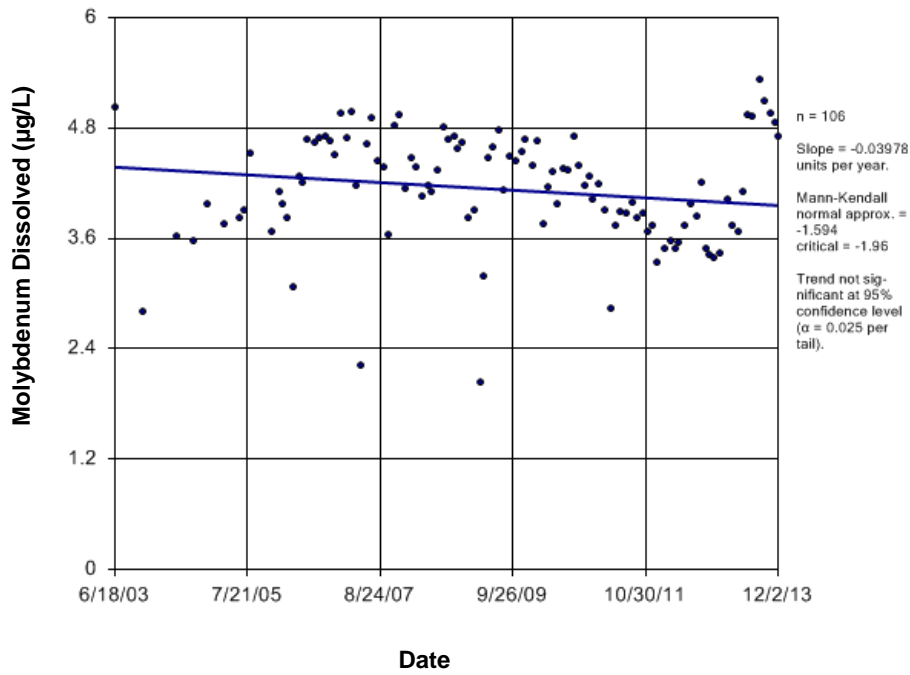


Figure E1149 Qu'Appelle River: Molybdenum Dissolved

### Time Series

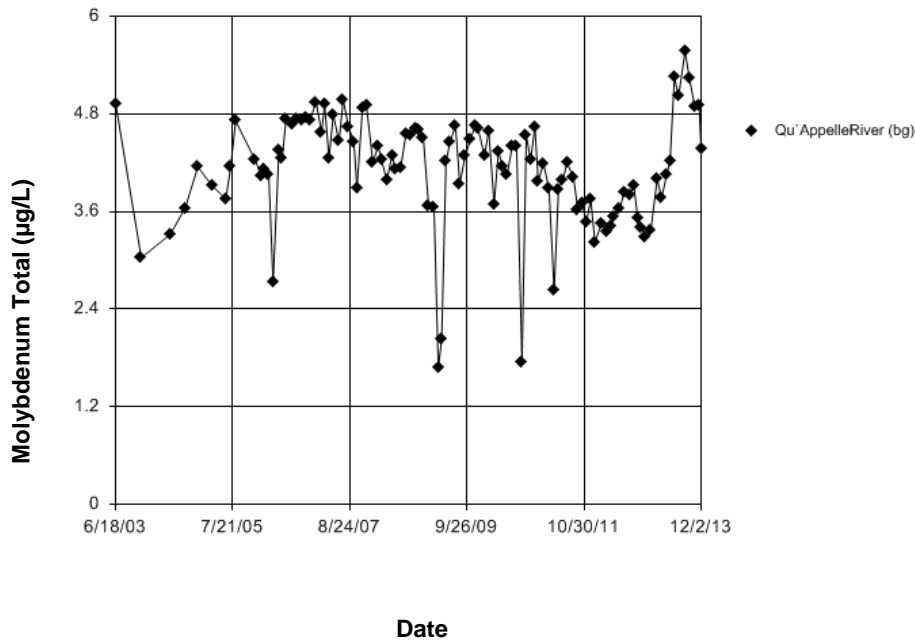


Figure E1150 Qu'Appelle River: Molybdenum Total

# Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.6948  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
Kruskal-Wallis statistic (H) = 0.6948  
Adjusted Kruskal-Wallis statistic (H') = 0.6948

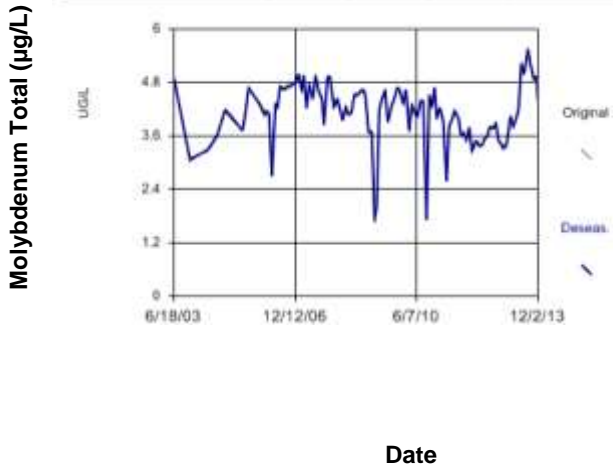


Figure E1151 Qu'Appelle River: Molybdenum Total

# Sen's Slope Estimator

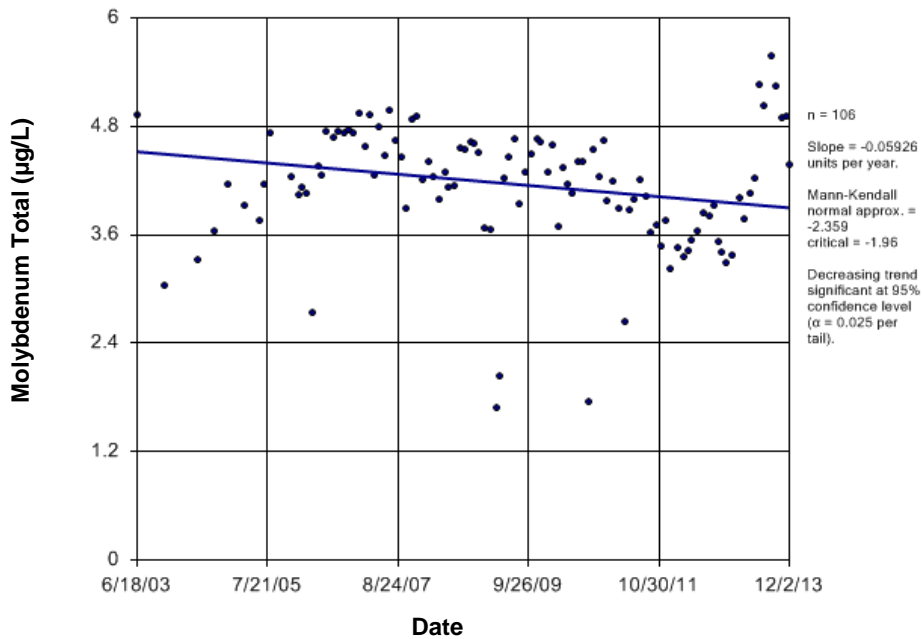


Figure E1152 Qu'Appelle River: Molybdenum Total

## Time Series

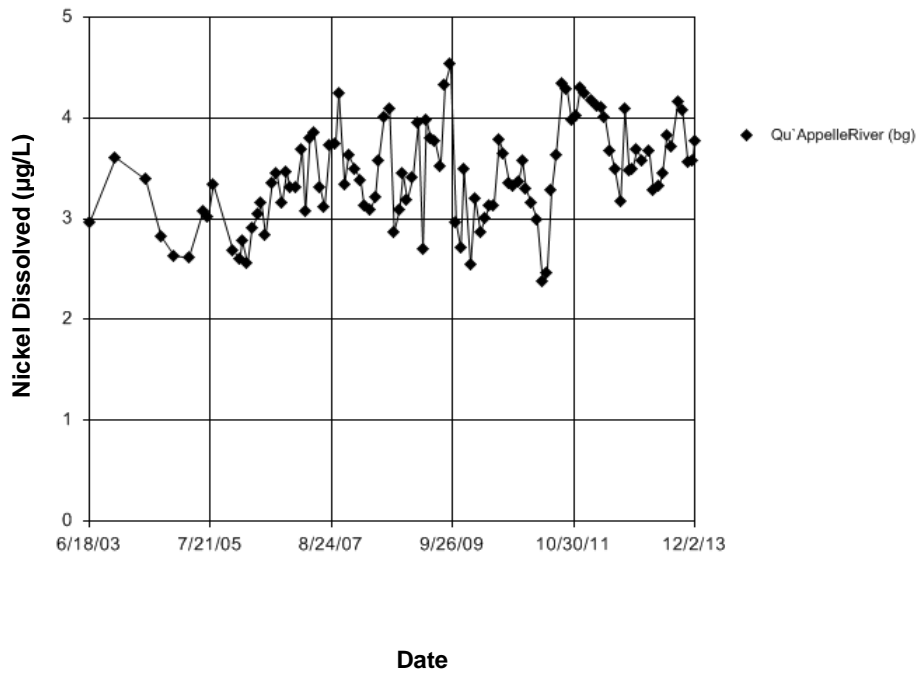


Figure E1153 Qu'Appelle River: Nickel Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 2.063  
 Tabulated Chi-Squared value = 3.941 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of data in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 2.063  
 Adjusted Kruskal-Wallis statistic (H') = 2.063

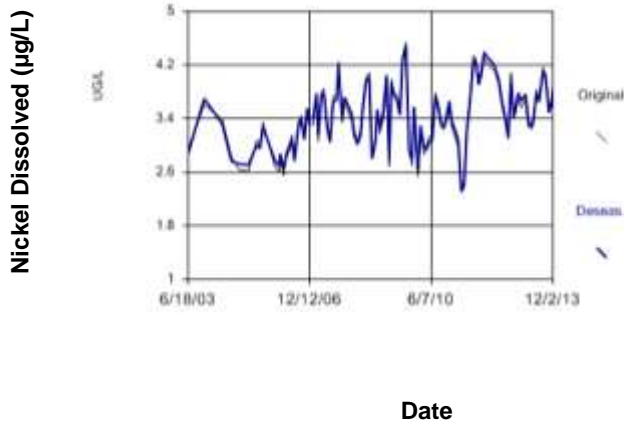


Figure E1154 Qu'Appelle River: Nickel Dissolved



## Sen's Slope Estimator

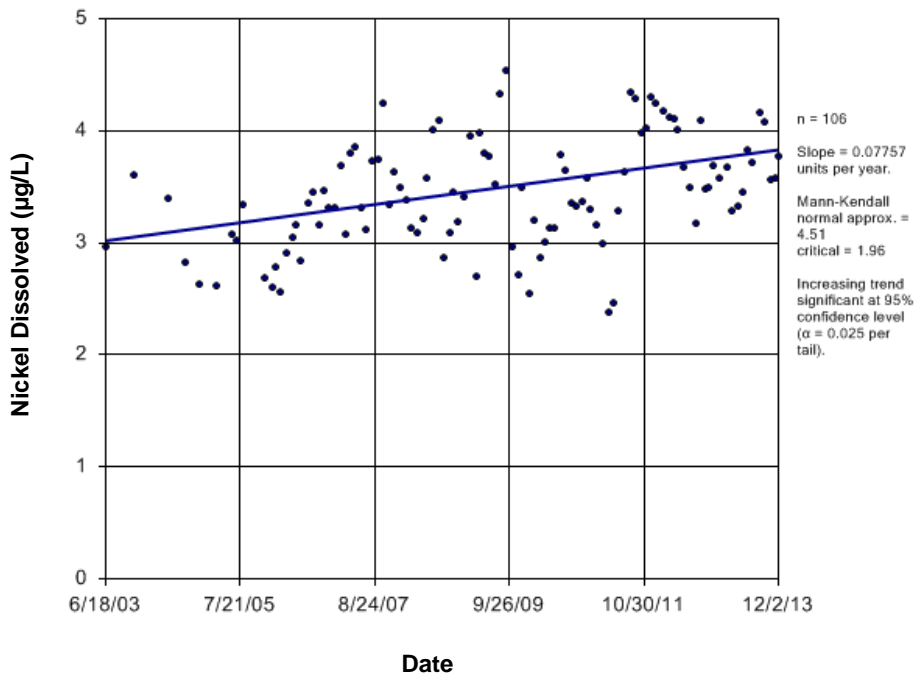


Figure E1155 Qu'Appelle River: Nickel Dissolved

## Time Series

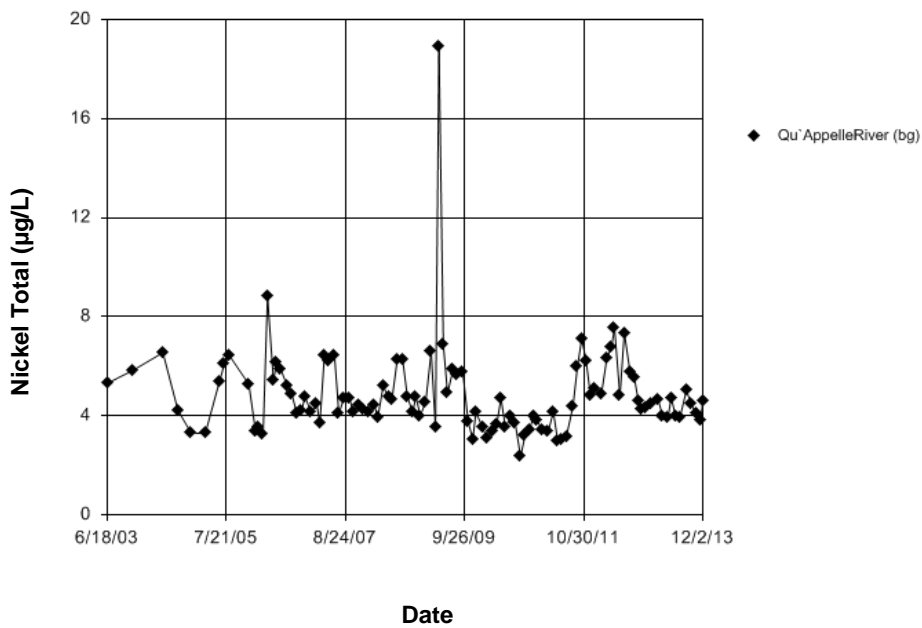
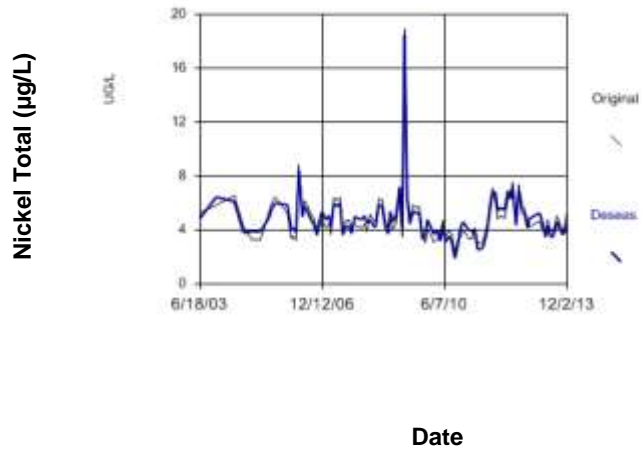


Figure E1156 Qu'Appelle River: Nickel Total

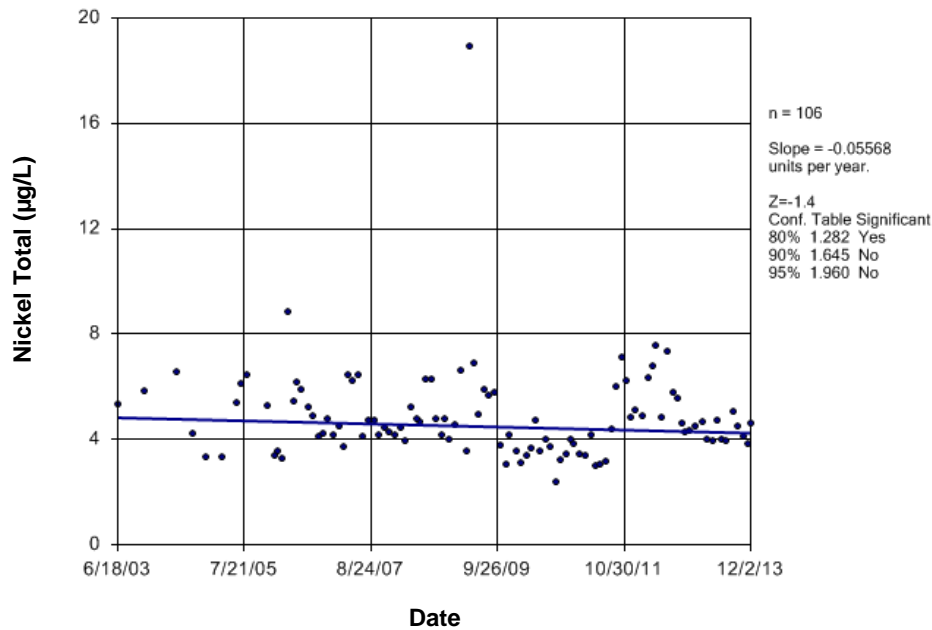
## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 12.75  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of data in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 12.75  
 Adjusted Kruskal-Wallis statistic (H') = 12.75



**Figure E1157 Qu'Appelle River: Nickel Total**

## Seasonal Kendall



**Figure E1158 Qu'Appelle River: Nickel Total**

## Time Series

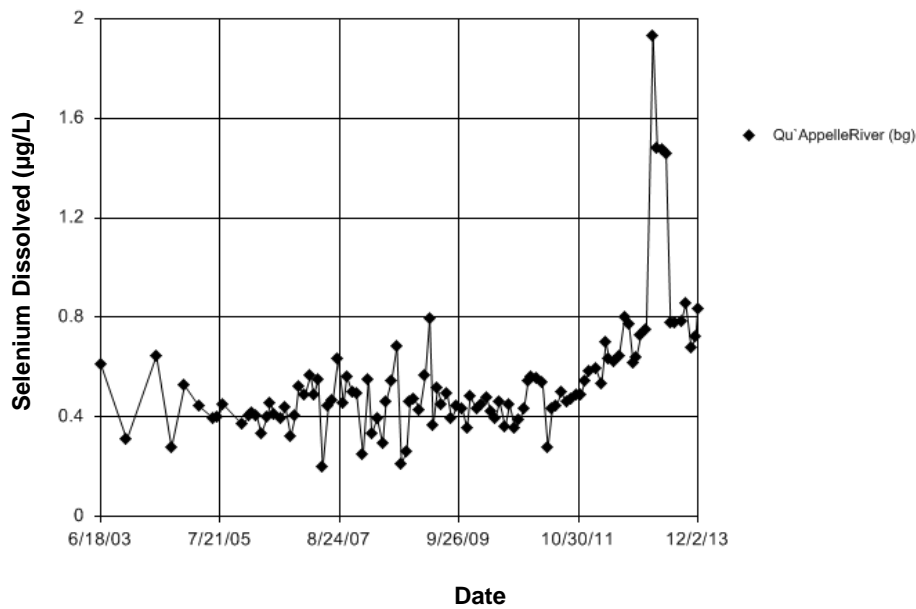


Figure E1159 Qu'Appelle River: Selenium Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 1.787  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 1.787  
 Adjusted Kruskal-Wallis statistic (H') = 1.787

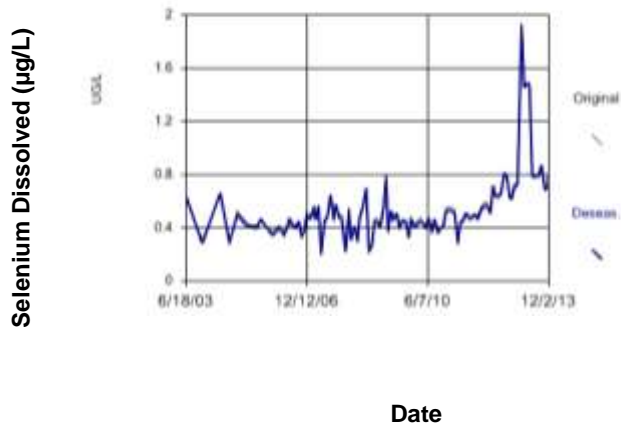


Figure E1160 Qu'Appelle River: Selenium Dissolved

### Sen's Slope Estimator

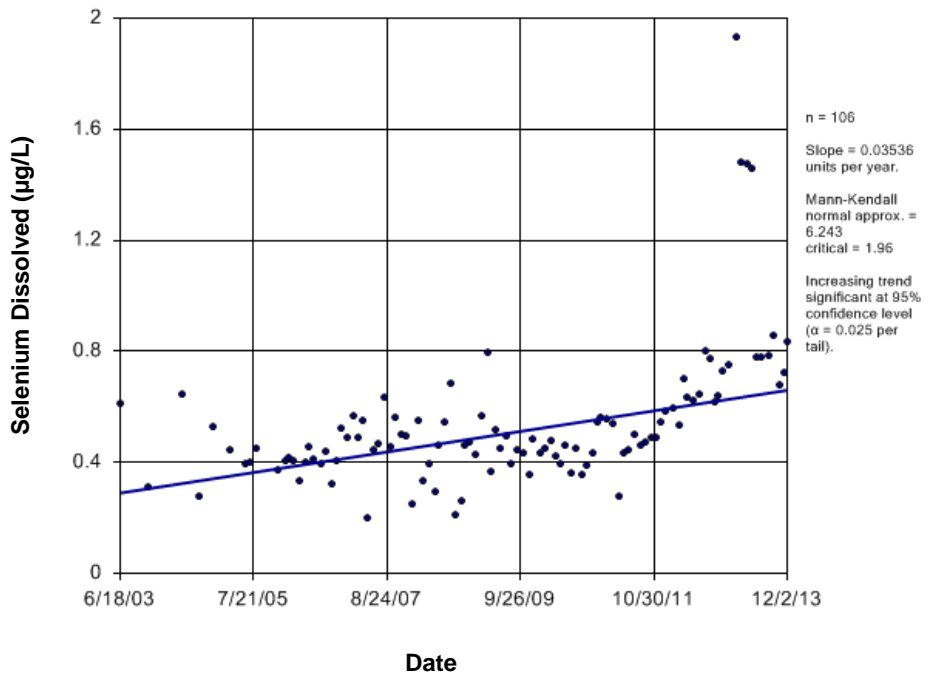


Figure E1161 Qu'Appelle River: Selenium Dissolved

### Time Series

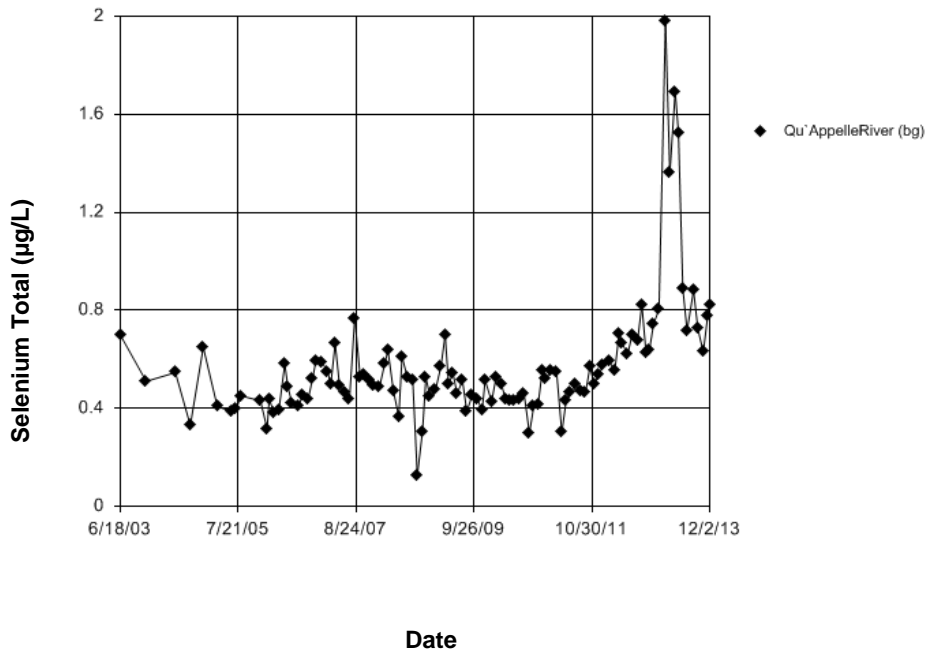


Figure E1162 Qu'Appelle River: Selenium Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 2.508  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 3 groups of data in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 2.508  
 Adjusted Kruskal-Wallis statistic (H') = 2.508

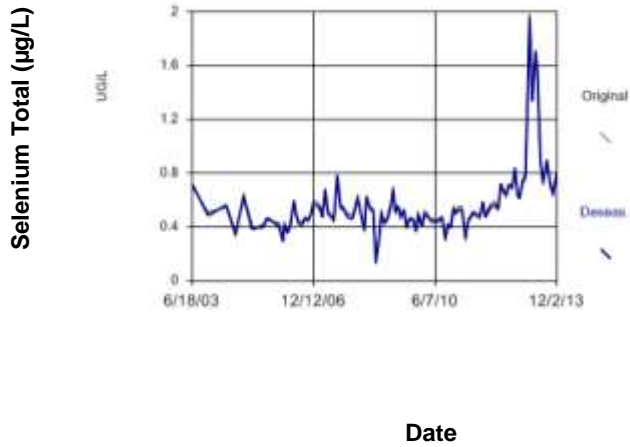


Figure E1163 Qu'Appelle River: Selenium Total

## Sen's Slope Estimator

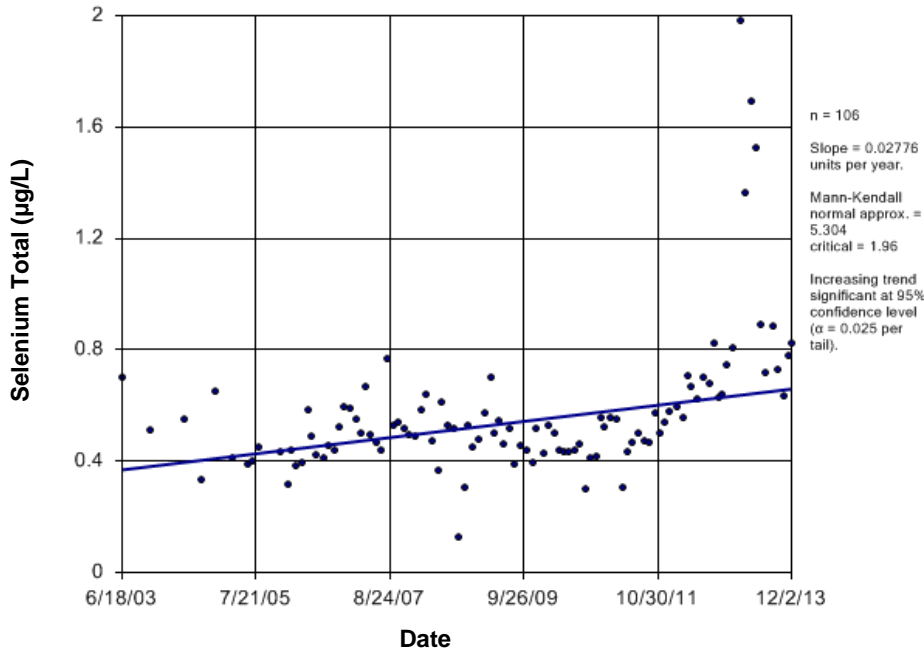


Figure E1164 Qu'Appelle River: Selenium Total

## Time Series

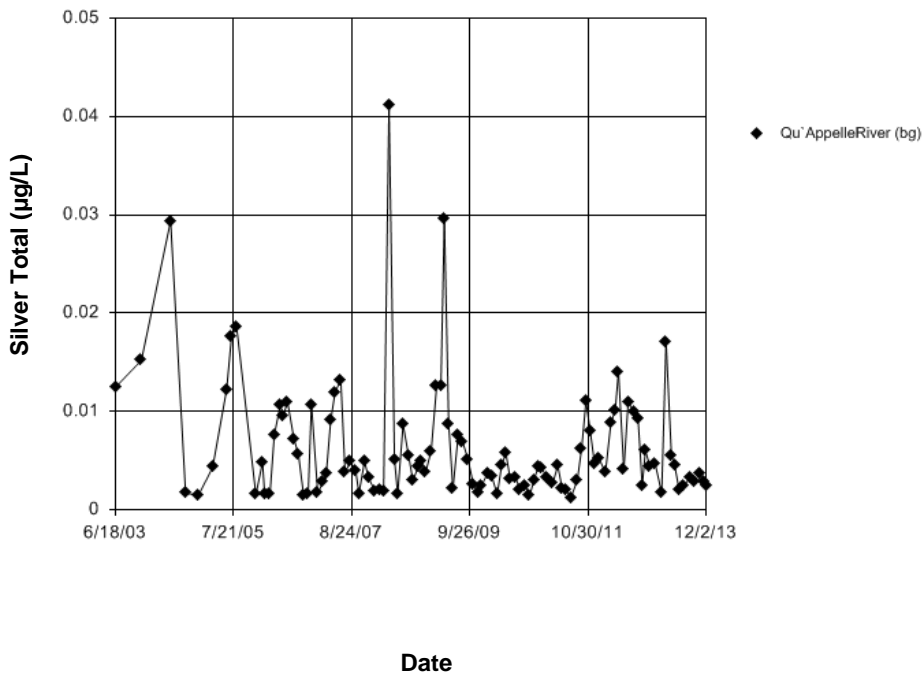


Figure E1165 Qu'Appelle River: Silver Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 5.372  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 5.372  
 Adjusted Kruskal-Wallis statistic (H') = 5.372

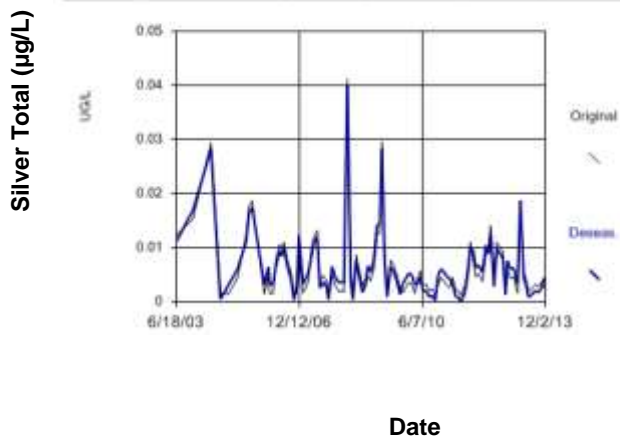


Figure E1166 Qu'Appelle River: Silver Total

### Seasonal Kendall

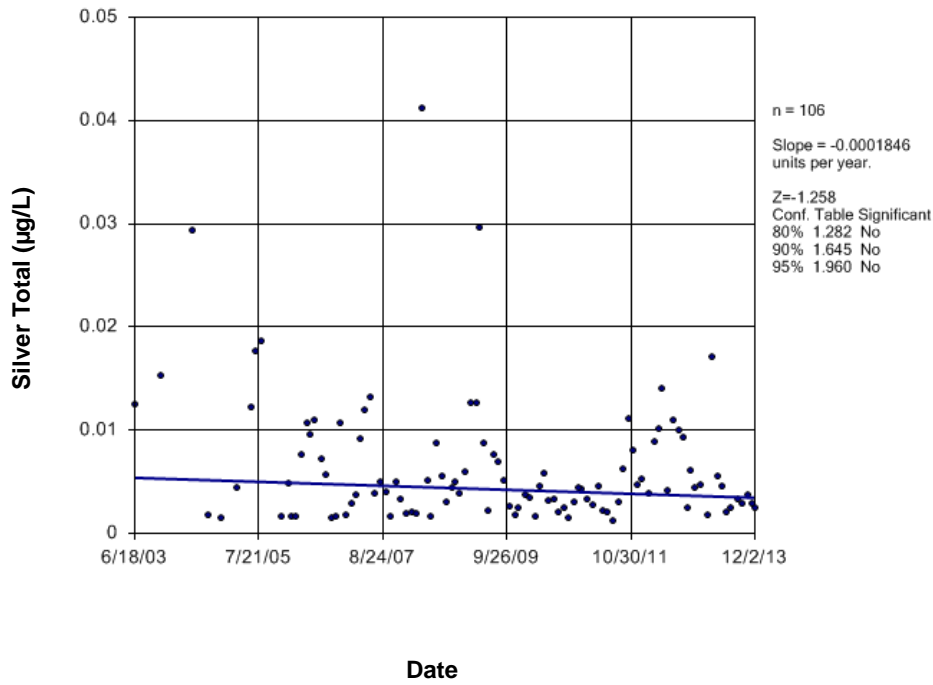


Figure E1167 Qu'Appelle River: Silver Total

### Time Series

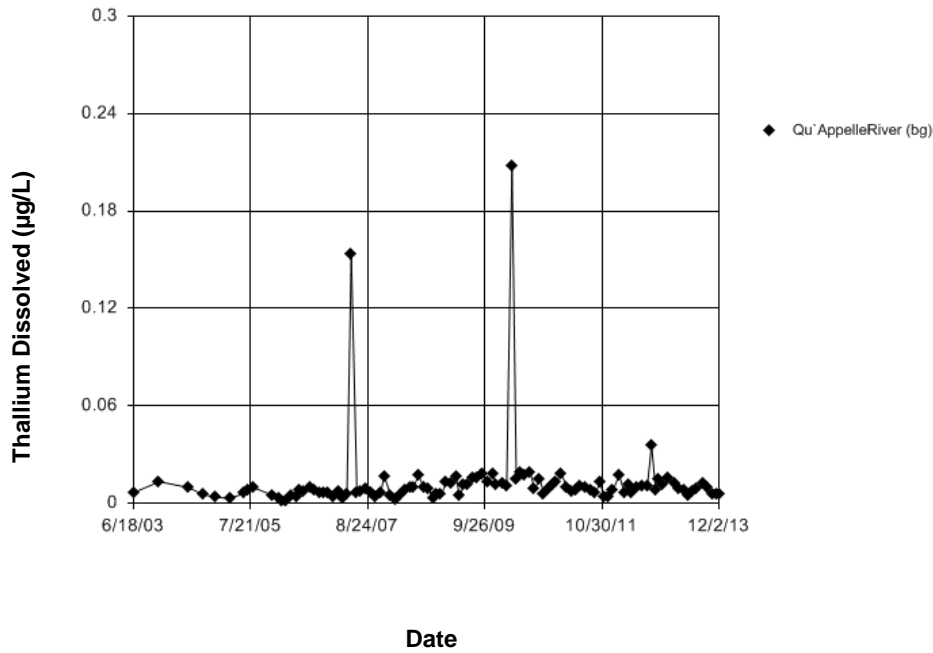
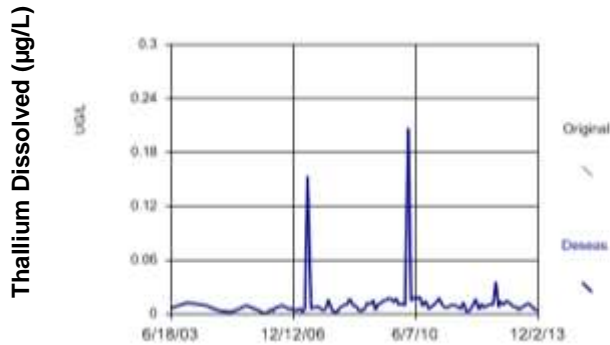


Figure E1168 Qu'Appelle River: Thallium Dissolved

# Seasonality

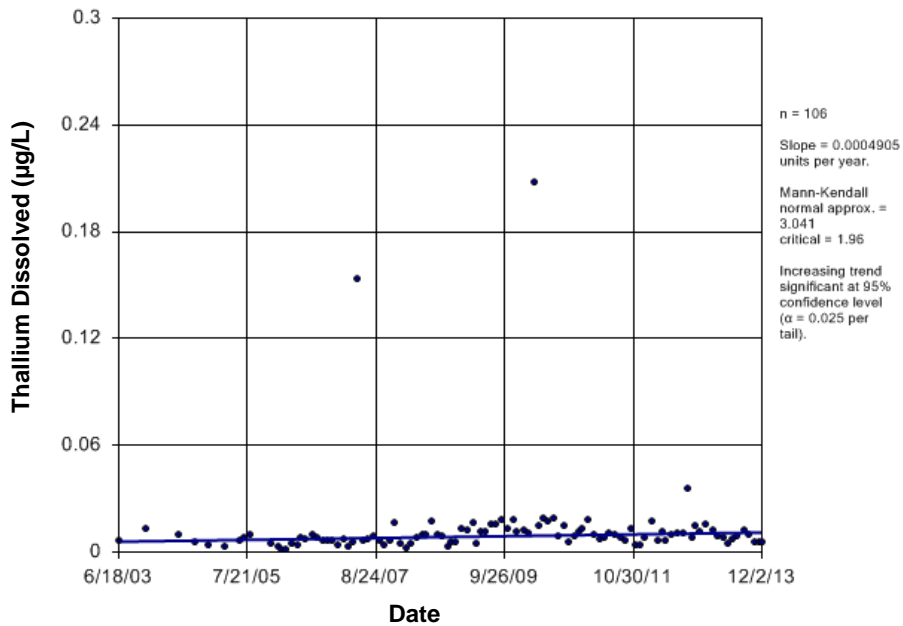
For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 1.5  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



Date

Figure E1169 Qu'Appelle River: Thallium Dissolved

# Sen's Slope Estimator

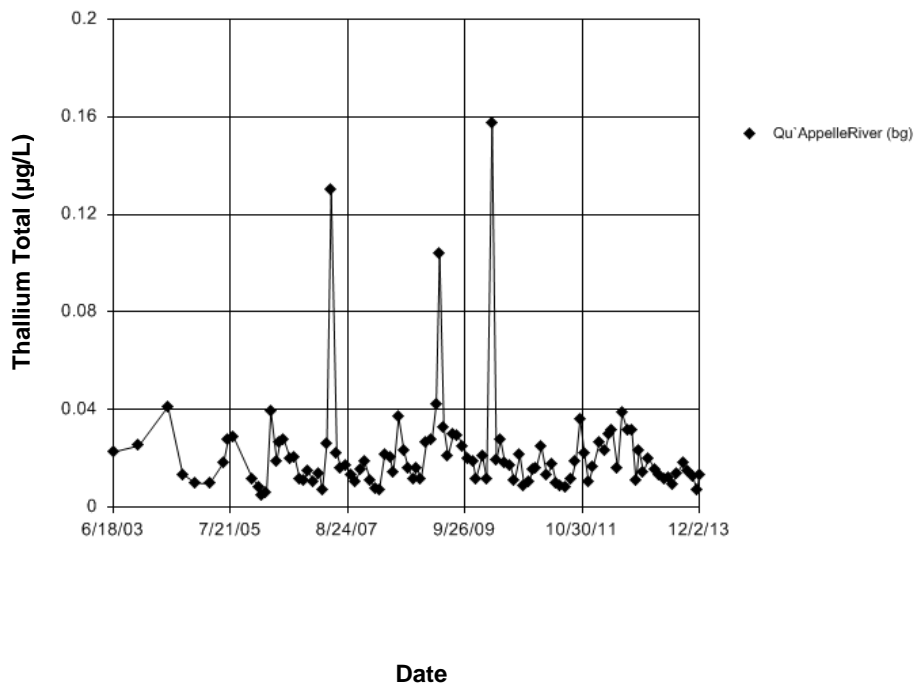


Date

Figure E1170 Qu'Appelle River: Thallium Dissolved



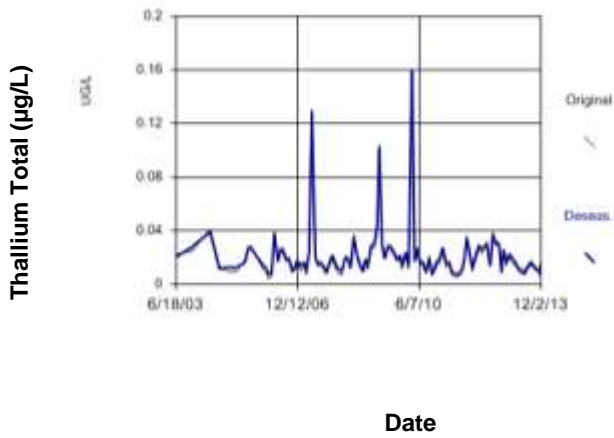
## Time Series



**Figure E1171 Qu'Appelle River: Thallium Total**

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 9.101  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 9.101  
 Adjusted Kruskal-Wallis statistic (H') = 9.101



**Figure E1172 Qu'Appelle River: Thallium Total**

### Seasonal Kendall

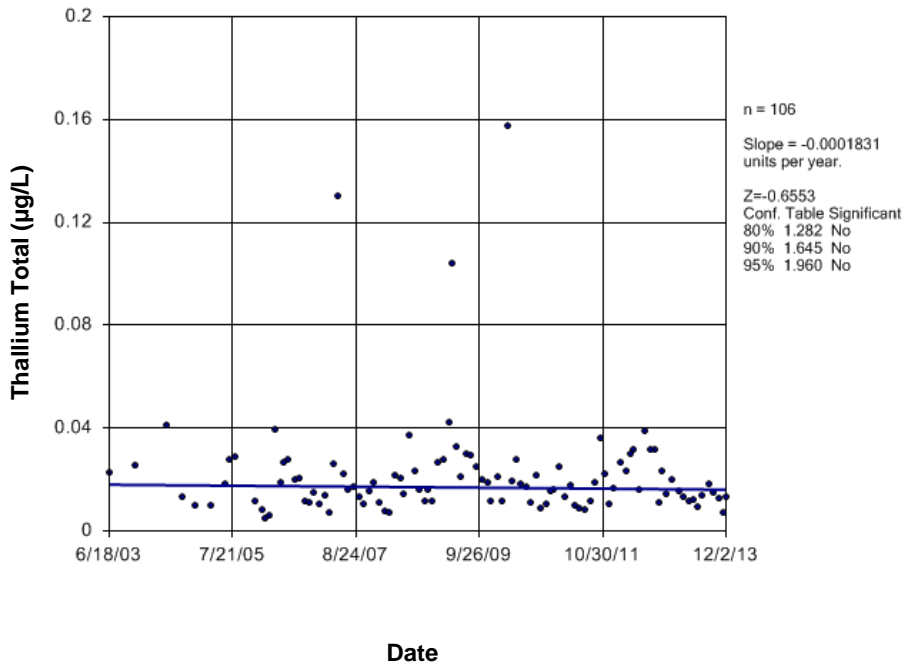


Figure E1173 Qu'Appelle River: Thallium Total

### Time Series

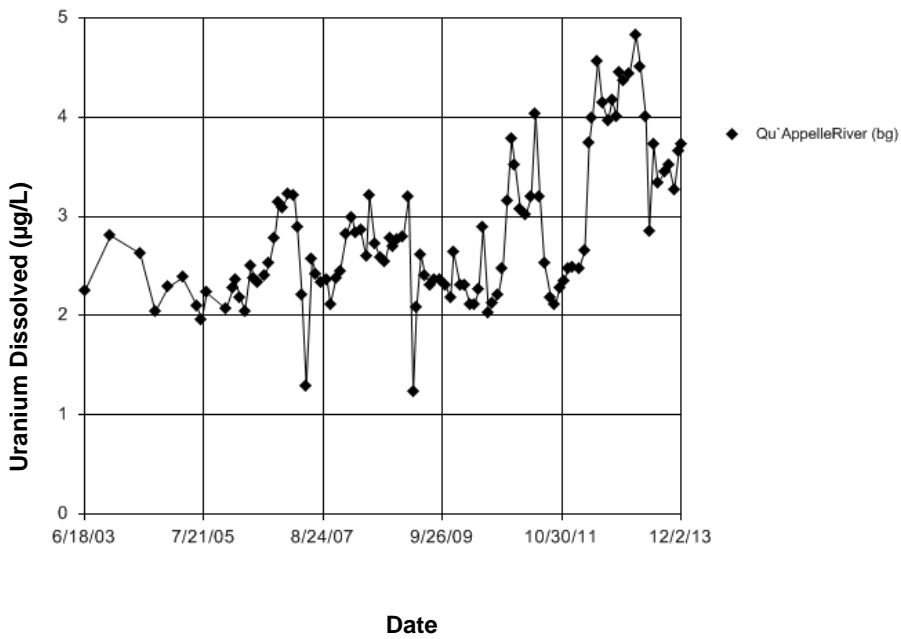


Figure E1174 Qu'Appelle River: Uranium Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 2.822  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 4 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 2.822  
 Adjusted Kruskal-Wallis statistic (H') = 2.822

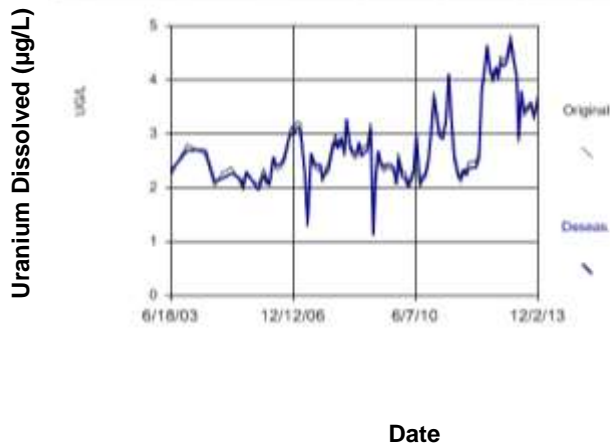


Figure E1175 Qu'Appelle River: Uranium Dissolved

## Sen's Slope Estimator

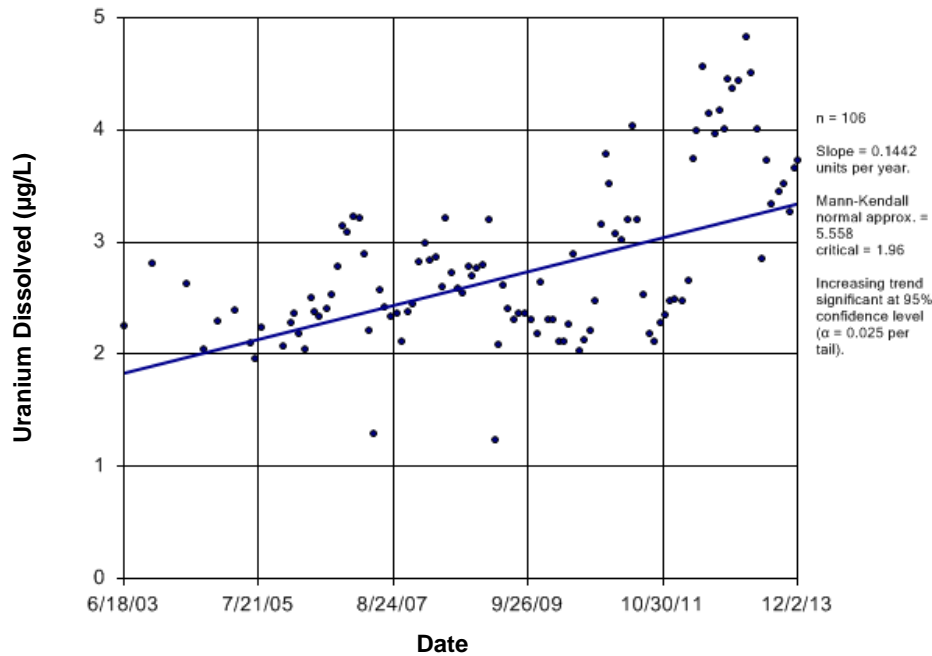


Figure E1176 Qu'Appelle River: Uranium Dissolved

## Time Series

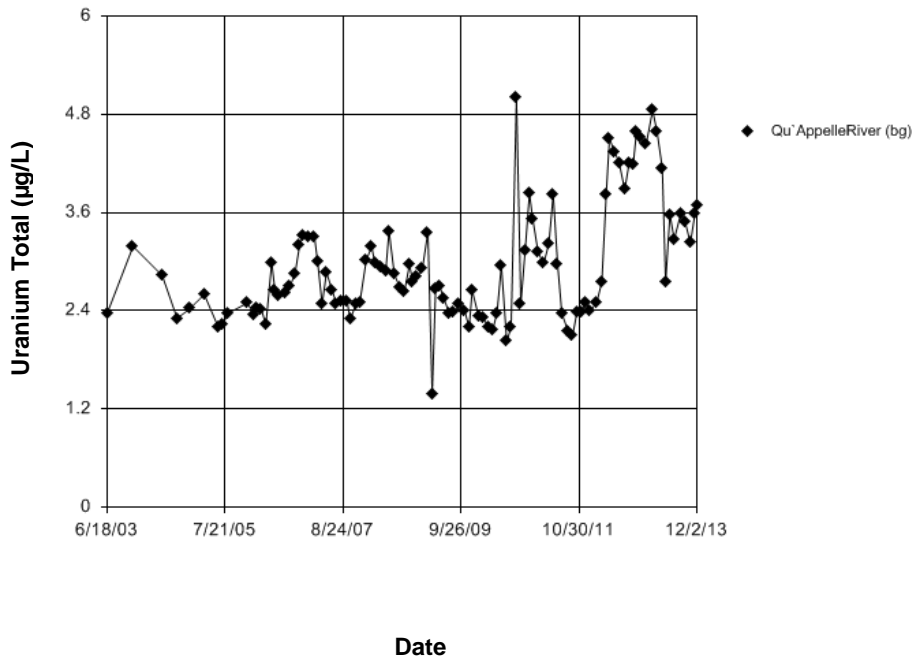


Figure E1177 Qu'Appelle River: Uranium Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 1.281  
 Calculated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 1.281  
 Adjusted Kruskal-Wallis statistic (H') = 1.281

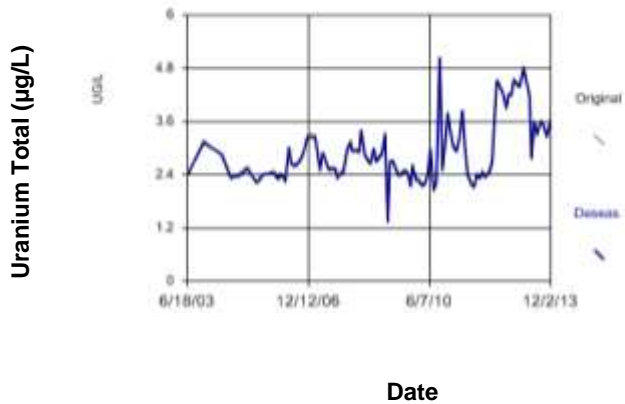


Figure E1178 Qu'Appelle River: Uranium Total

## Sen's Slope Estimator

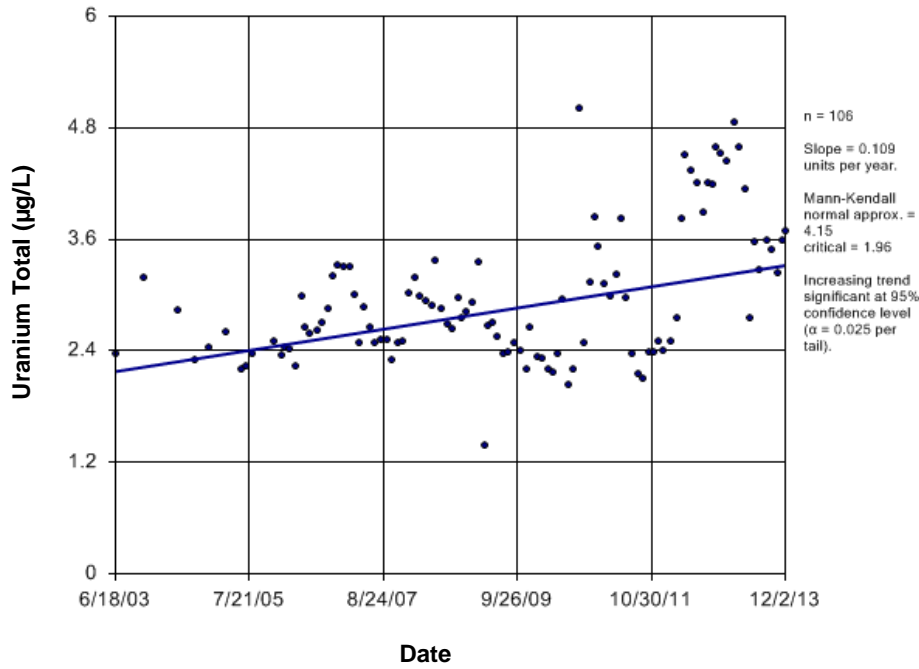


Figure E1179 Qu'Appelle River: Uranium Total

## Time Series

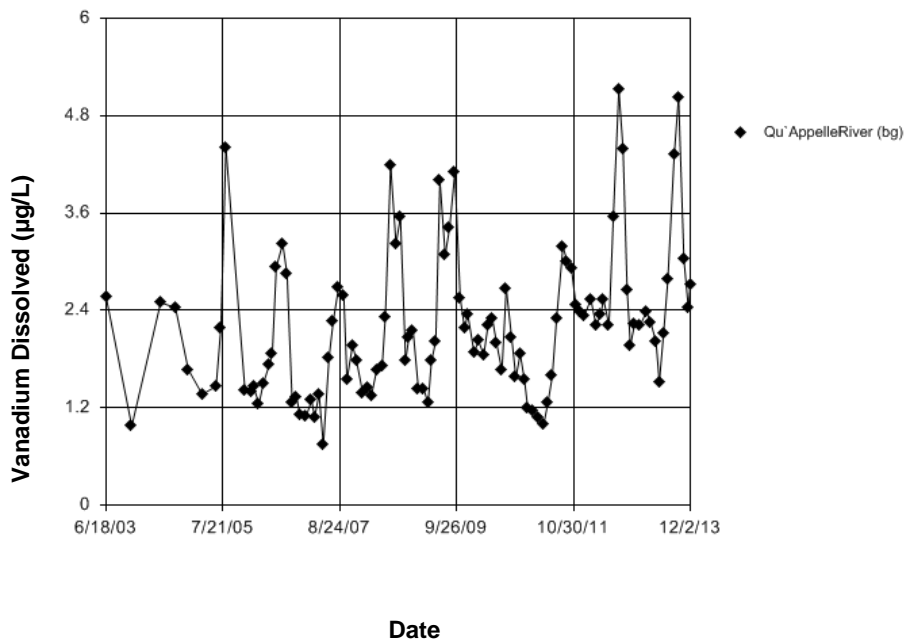


Figure E1180 Qu'Appelle River: Vanadium Dissolved

# Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 20.2  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 20.2  
 Adjusted Kruskal-Wallis statistic (H') = 20.2

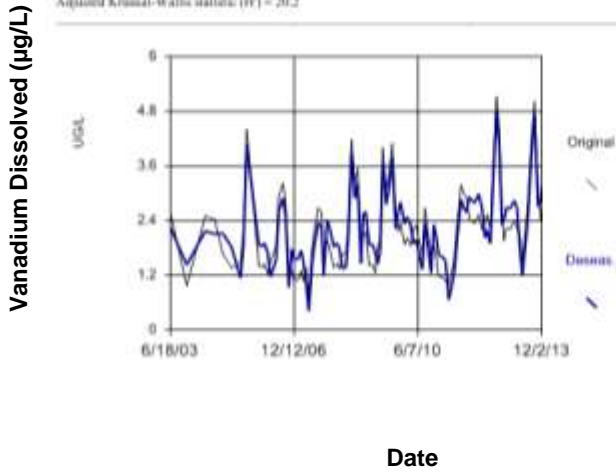


Figure E1181 Qu'Appelle River: Vanadium Dissolved

# Seasonal Kendall

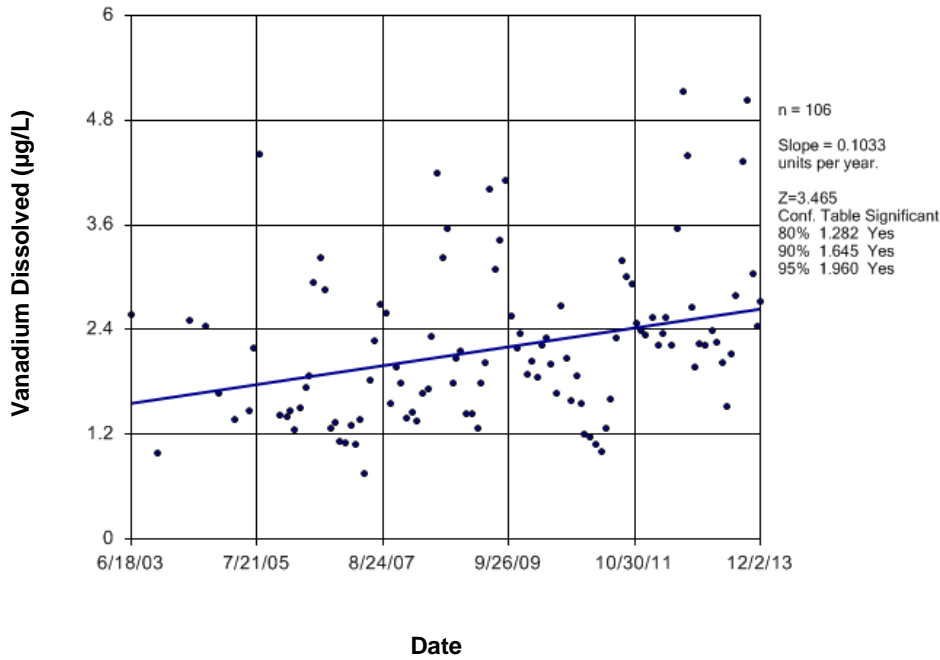


Figure E1182 Qu'Appelle River: Vanadium Dissolved

## Time Series

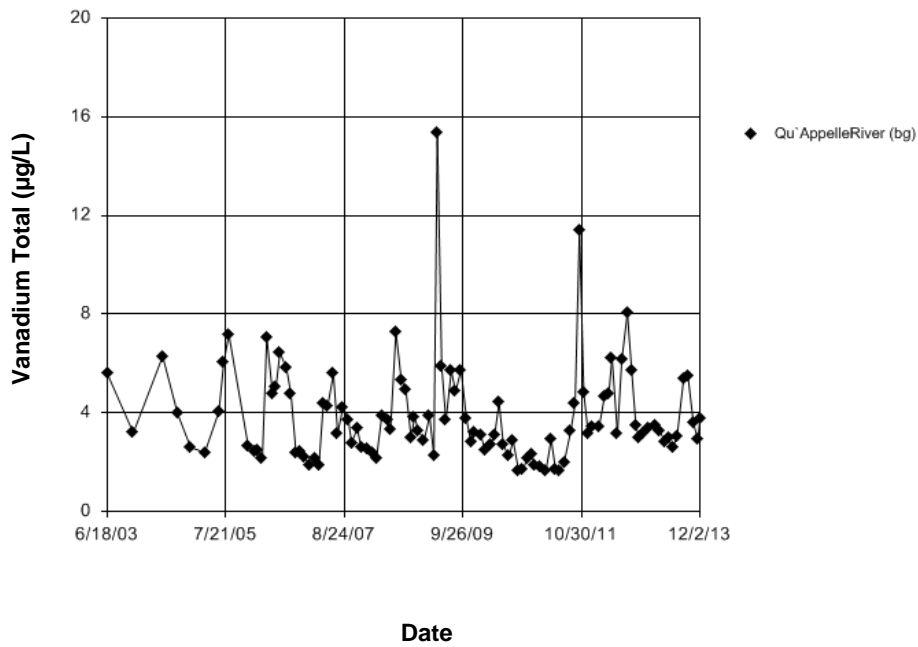


Figure E1183 Qu'Appelle River: Vanadium Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 25.72  
 Tabulated Chi-Squared value = 7.841 with 1 degree of freedom at the 5% significance level.  
 There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 23.72  
 Adjusted Kruskal-Wallis statistic (H') = 25.72

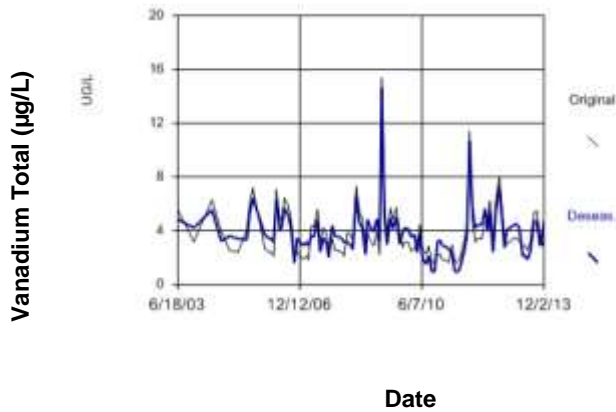


Figure E1184 Qu'Appelle River: Vanadium Total

### Seasonal Kendall

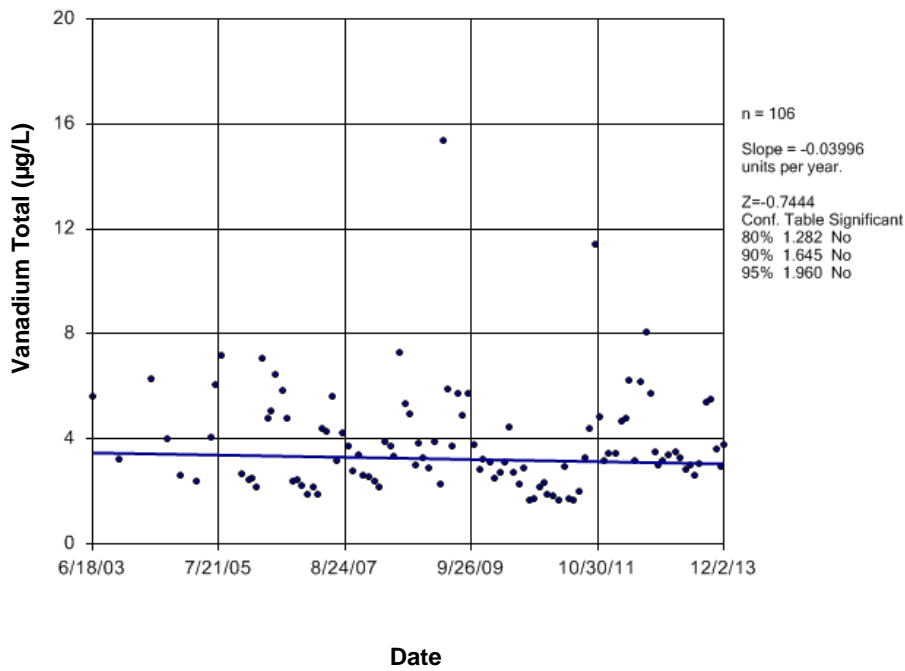


Figure E1185 Qu'Appelle River: Vanadium Total

### Time Series

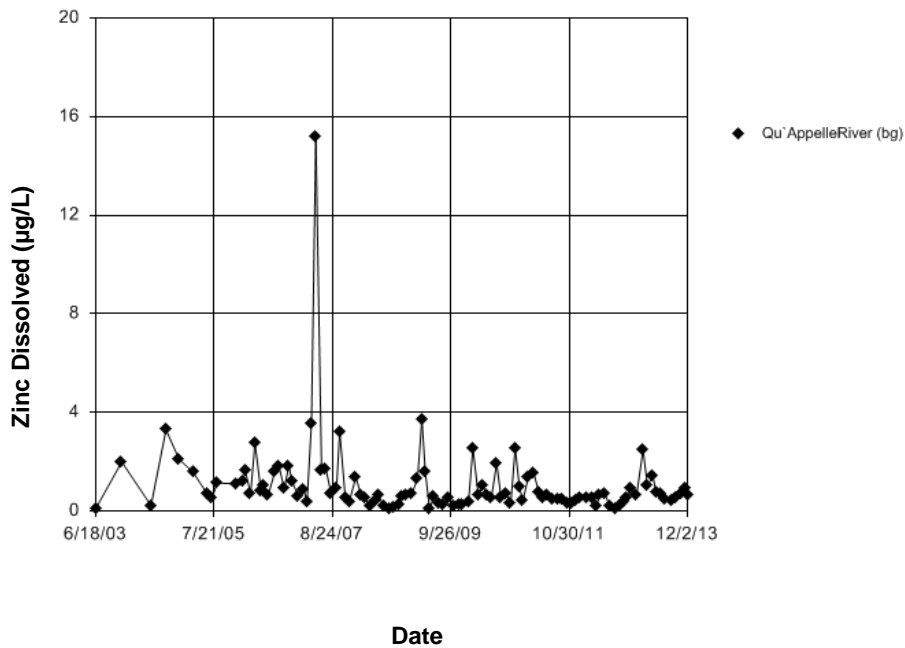
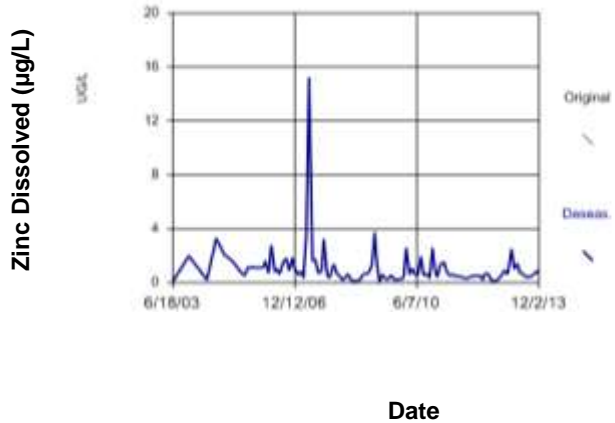


Figure E1186 Qu'Appelle River: Zinc Dissolved



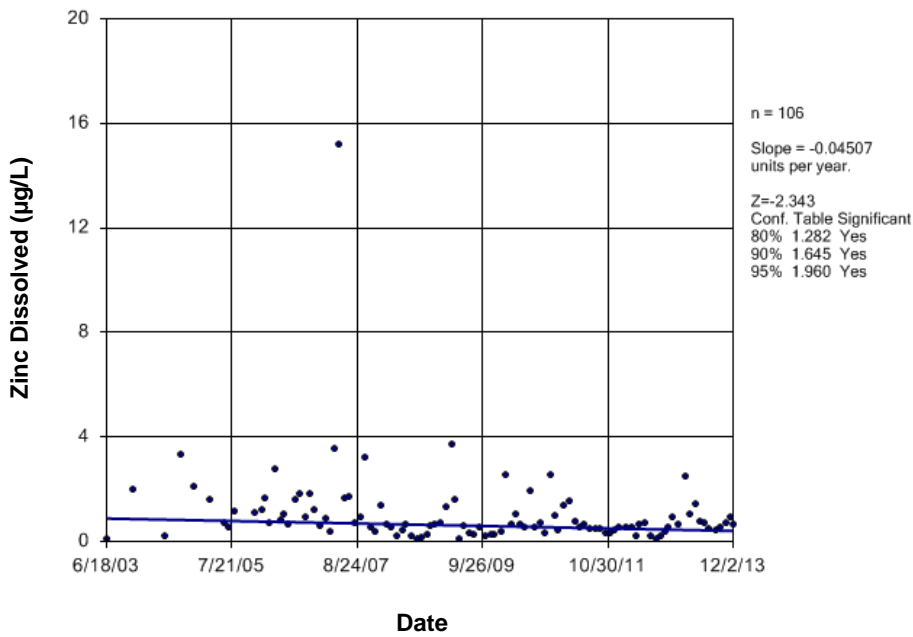
# Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 4.586  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 4.586  
 Adjusted Kruskal-Wallis statistic (H') = 4.586



**Figure E1187 Qu'Appelle River: Zinc Dissolved**

# Seasonal Kendall



**Figure E1188 Qu'Appelle River: Zinc Dissolved**

## Time Series

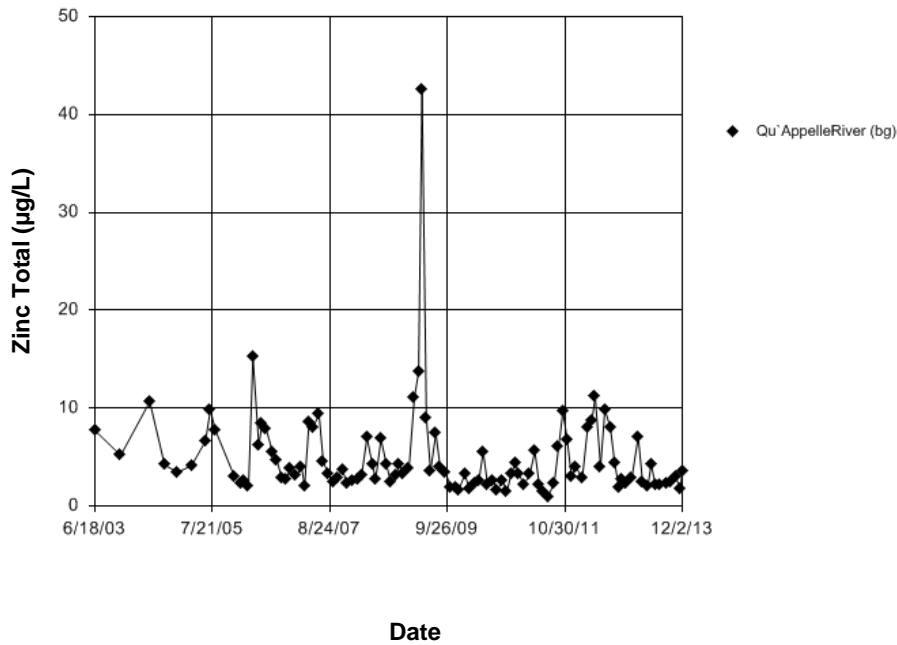


Figure E1189 Qu'Appelle River: Zinc Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent from any other season. Calculated Kruskal-Wallis statistic = 4.851  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 1 groups of five in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 4.851  
 Adjusted Kruskal-Wallis statistic (H') = 4.851

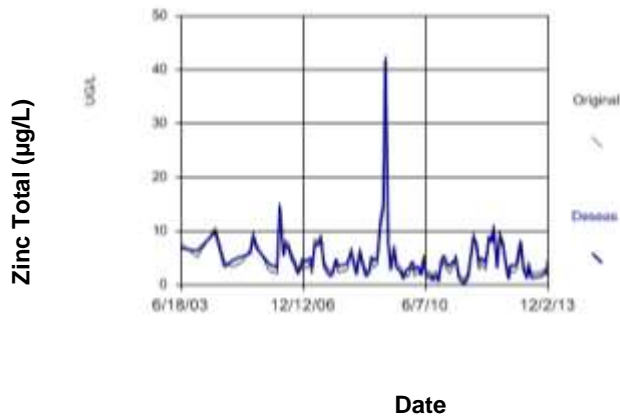


Figure E1190 Qu'Appelle River: Zinc Total

# Seasonal Kendall

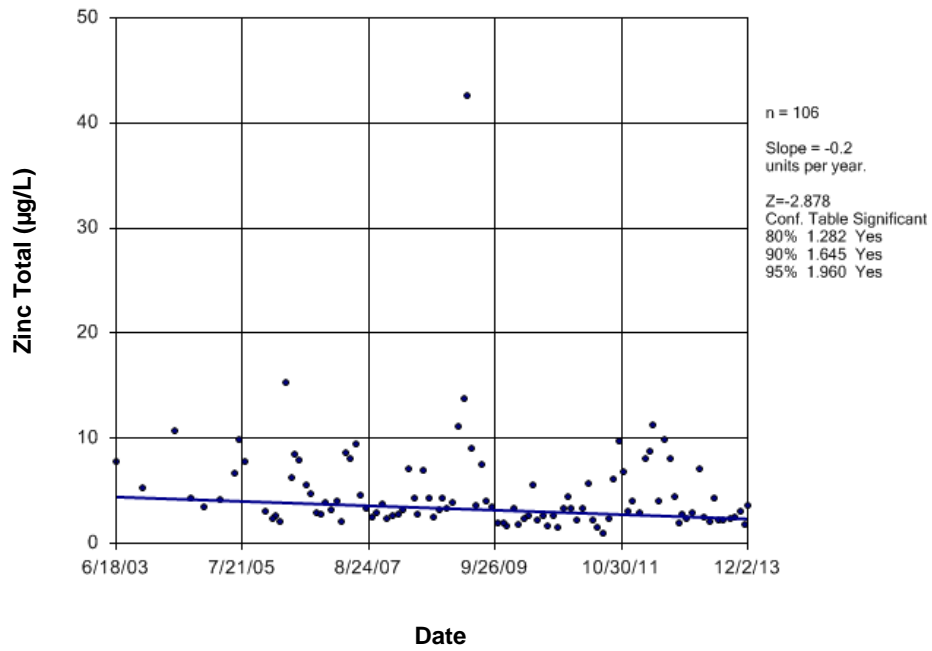


Figure E1191 Qu'Appelle River: Zinc Total

## Time Series

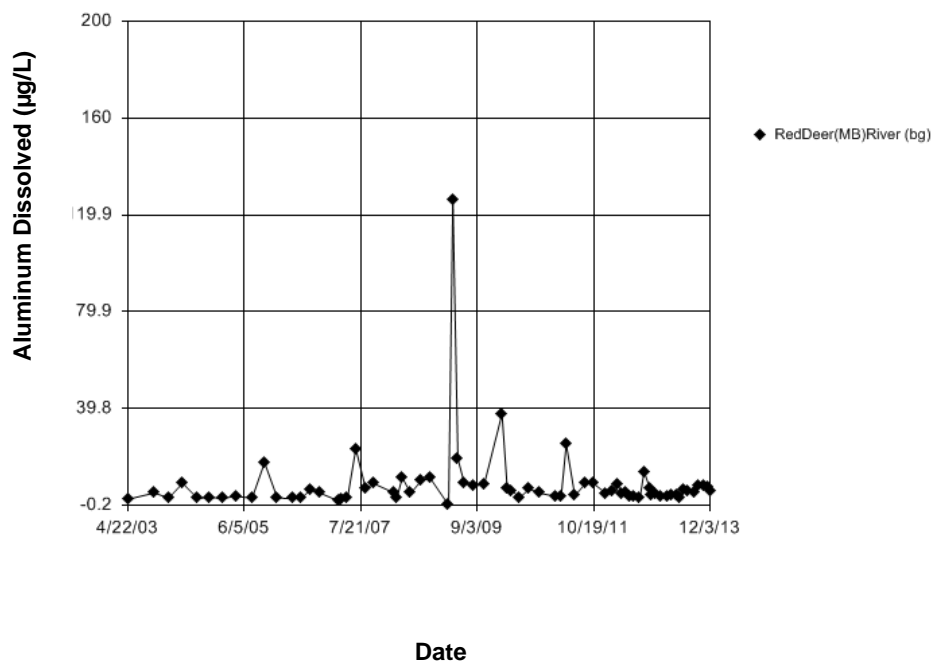


Figure E1192 Red Deer River (SK-MB): Aluminum Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 2.946. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (ID) was necessary.

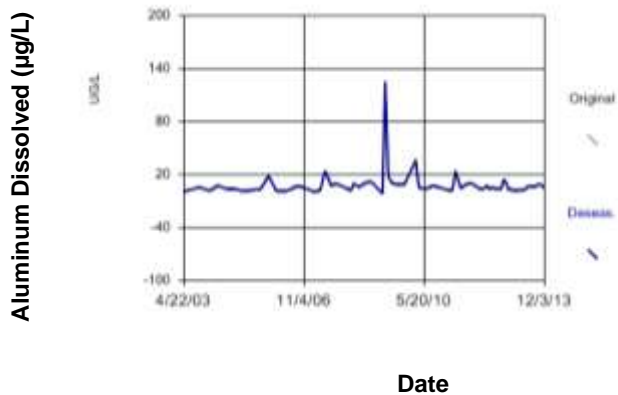


Figure E1193 Red Deer River (SK-MB): Aluminum Dissolved

## Sen's Slope Estimator

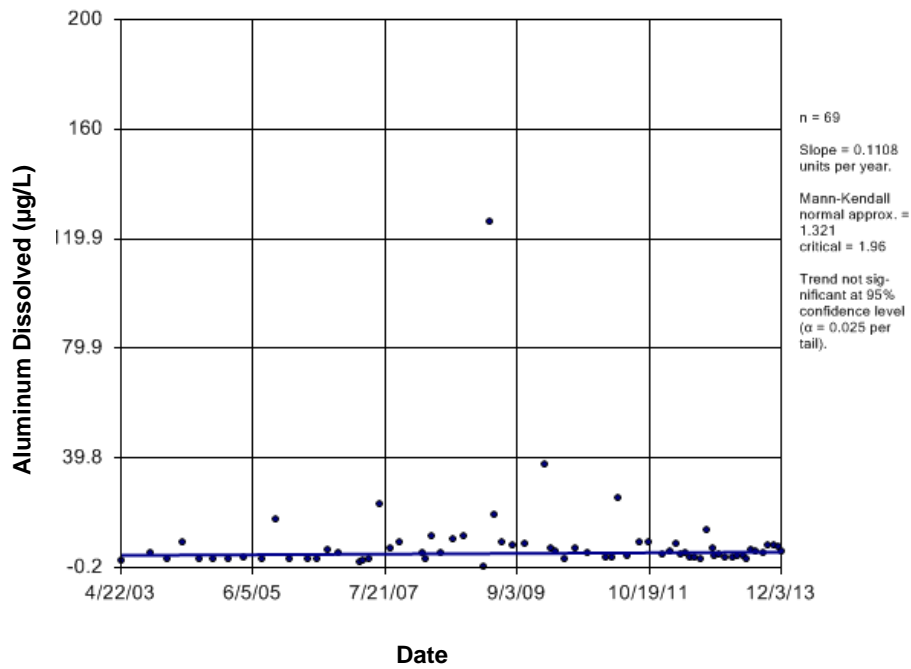


Figure E1194 Red Deer River (SK-MB): Aluminum Dissolved

## Time Series

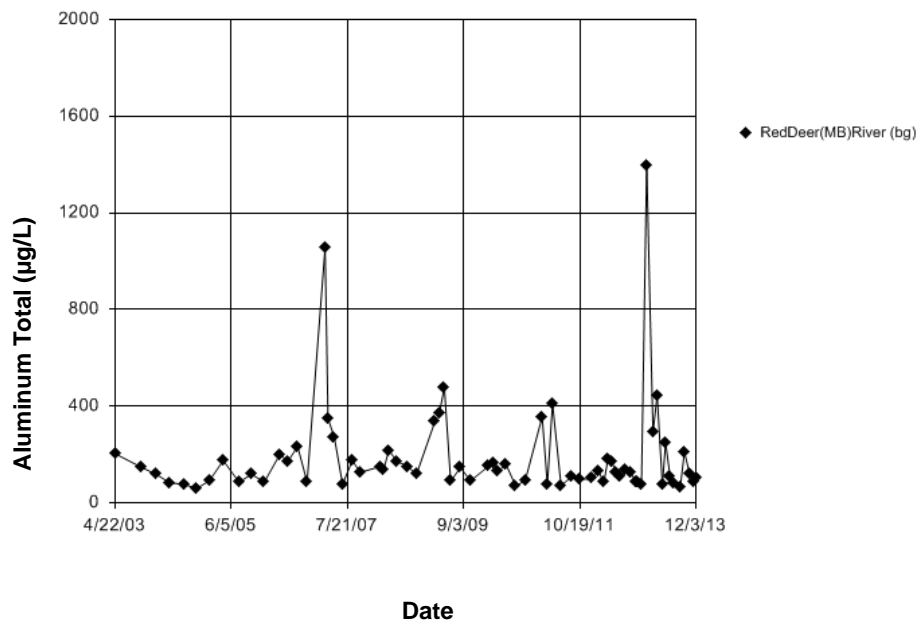
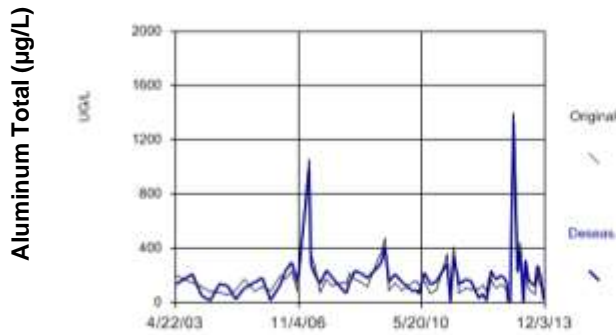


Figure E1195 Red Deer River (SK-MB): Aluminum Total

## Seasonality

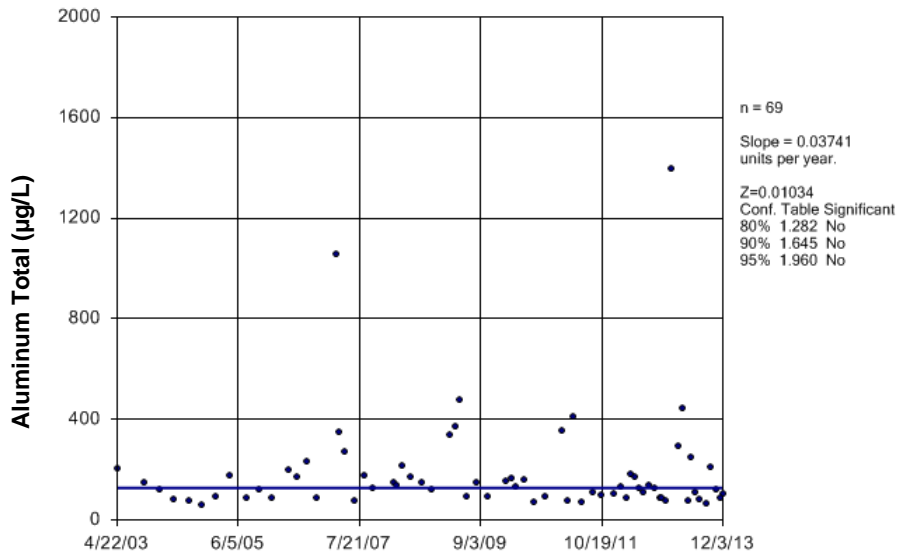
For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 6.659  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



Date

Figure E1196 Red Deer River (SK-MB): Aluminum Total

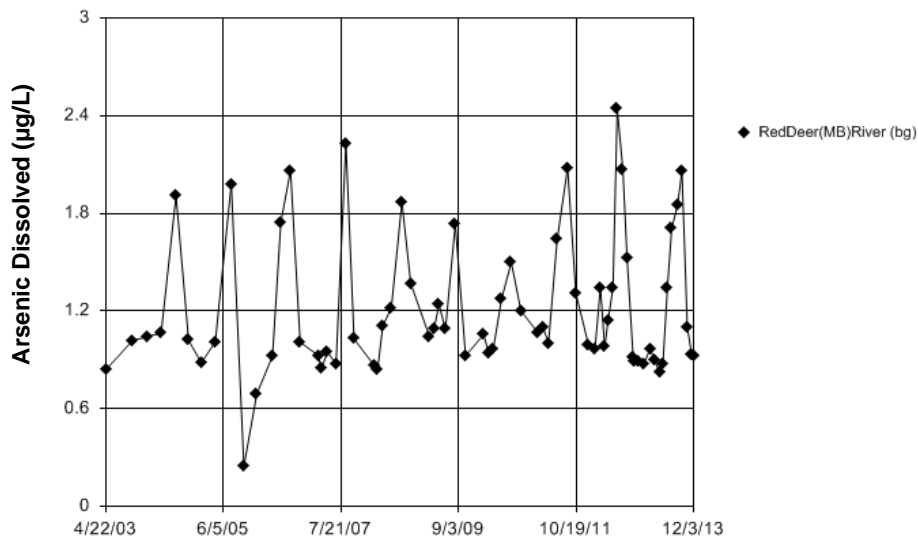
## Seasonal Kendall



Date

Figure E1197 Red Deer River (SK-MB): Aluminum Total

### Time Series

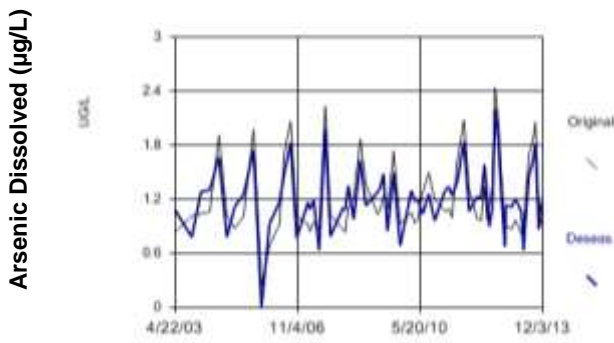


Date

**Figure E1198 Red Deer River (SK-MB): Arsenic Dissolved**

### Seasonality

For the data shown, the Kruskal-Wallis test indicates **SEASONALITY** at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 23.28. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



Date

**Figure E1199 Red Deer River (SK-MB): Arsenic Dissolved**

### Seasonal Kendall

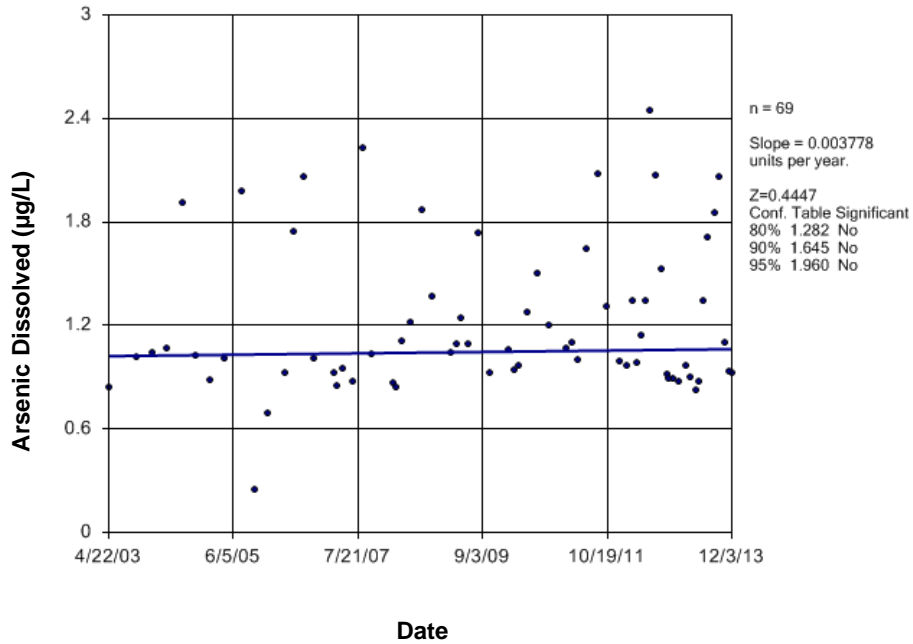


Figure E1200 Red Deer River (SK-MB): Arsenic Dissolved

### Time Series

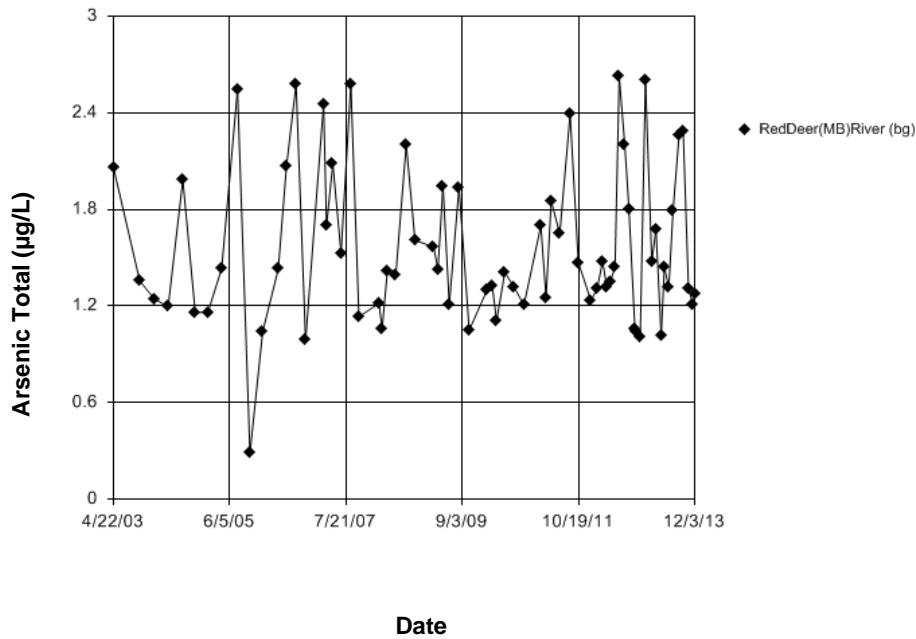
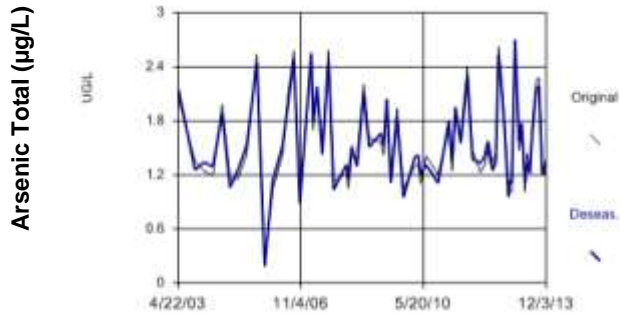


Figure E1201 Red Deer River (SK-MB): Arsenic Total



## Seasonality

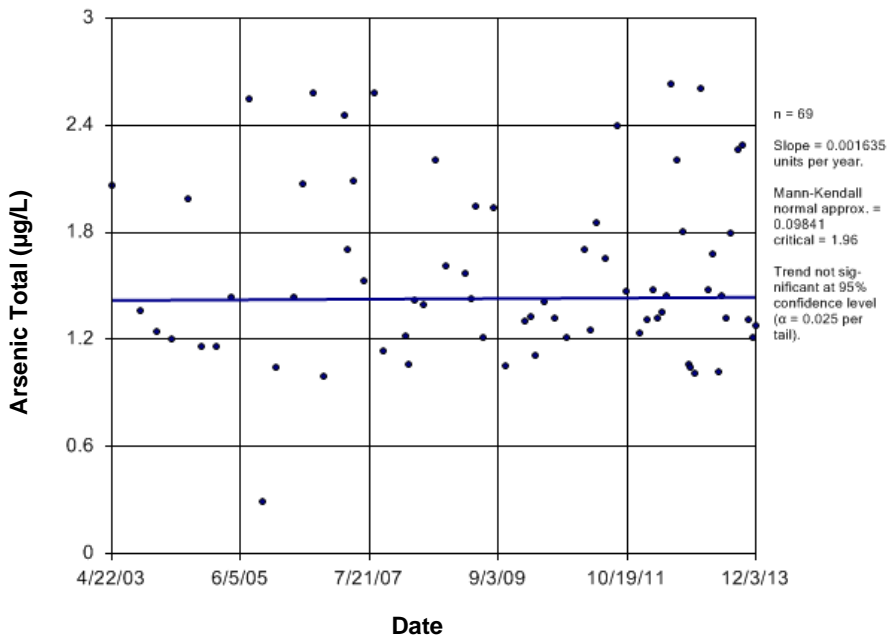
For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 2.824. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 2 groups of data in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal. Kruskal-Wallis statistic (H) = 2.824. Adjusted Kruskal-Wallis statistic (H') = 2.824.



Date

Figure E1202 Red Deer River (SK-MB): Arsenic Total

## Sen's Slope Estimator



Date

Figure E1203 Red Deer River (SK-MB): Arsenic Total

## Time Series

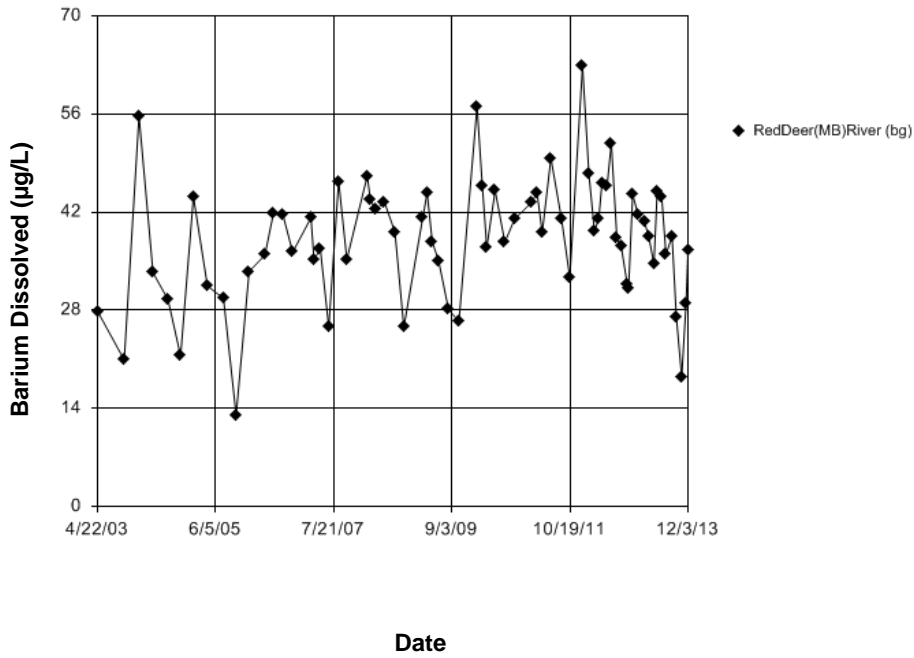


Figure E1204 Red Deer River (SK-MB): Barium Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 3.351. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 6 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

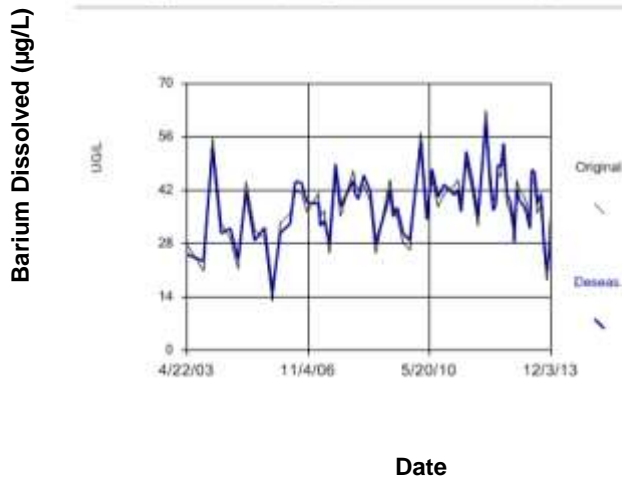


Figure E1205 Red Deer River (SK-MB): Barium Dissolved

### Sen's Slope Estimator

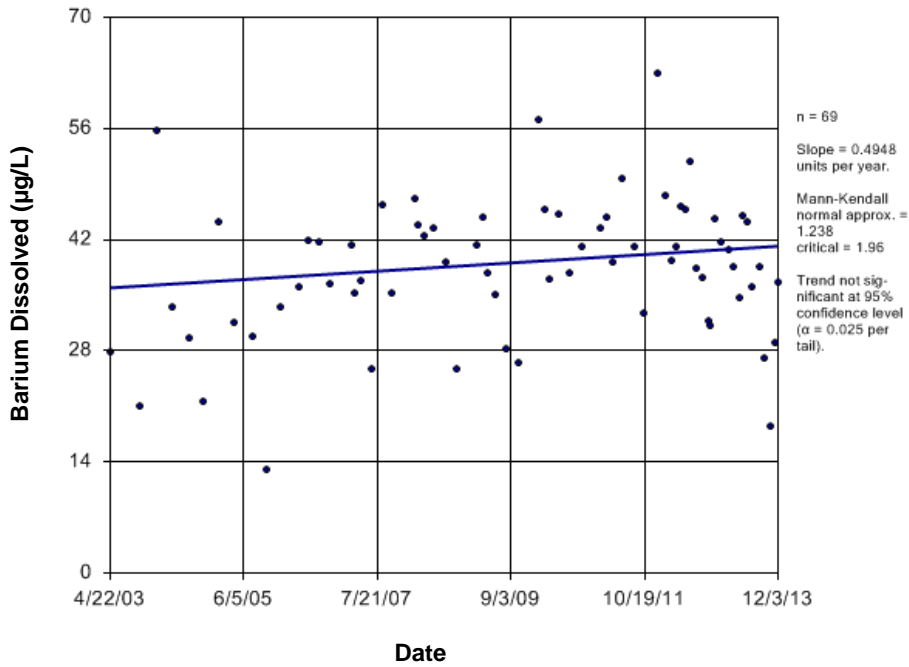


Figure E1206 Red Deer River (SK-MB): Barium Dissolved

### Time Series

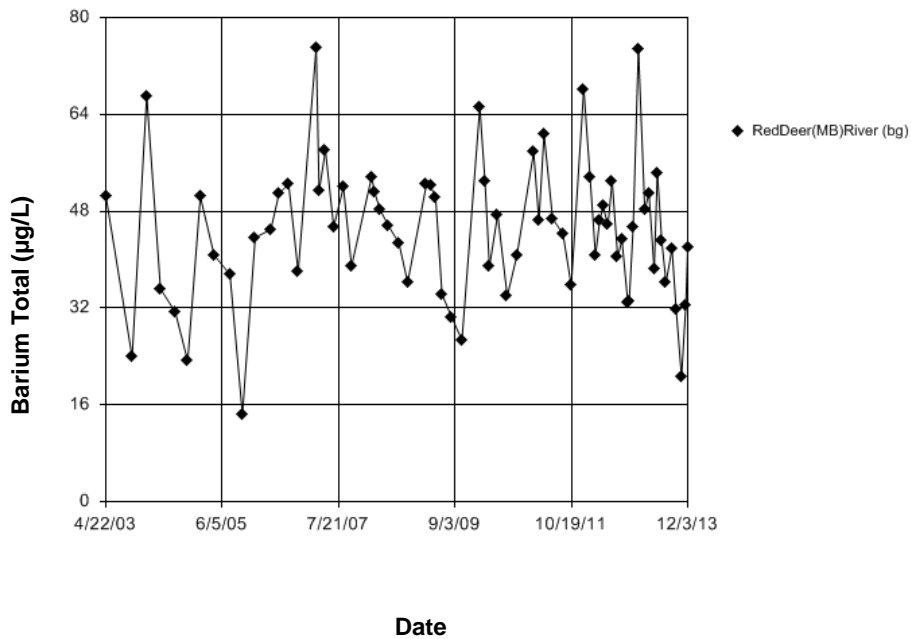
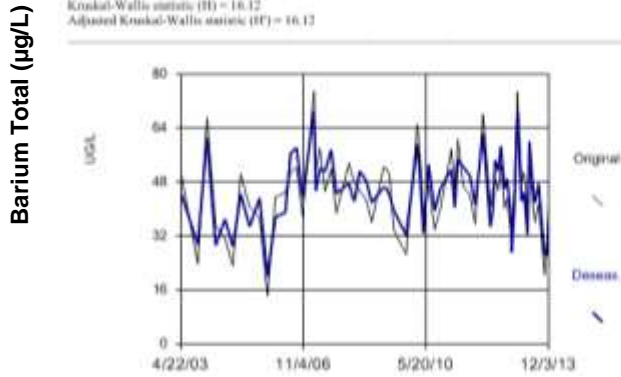


Figure E1207 Red Deer River (SK-MB): Barium Total

## Seasonality

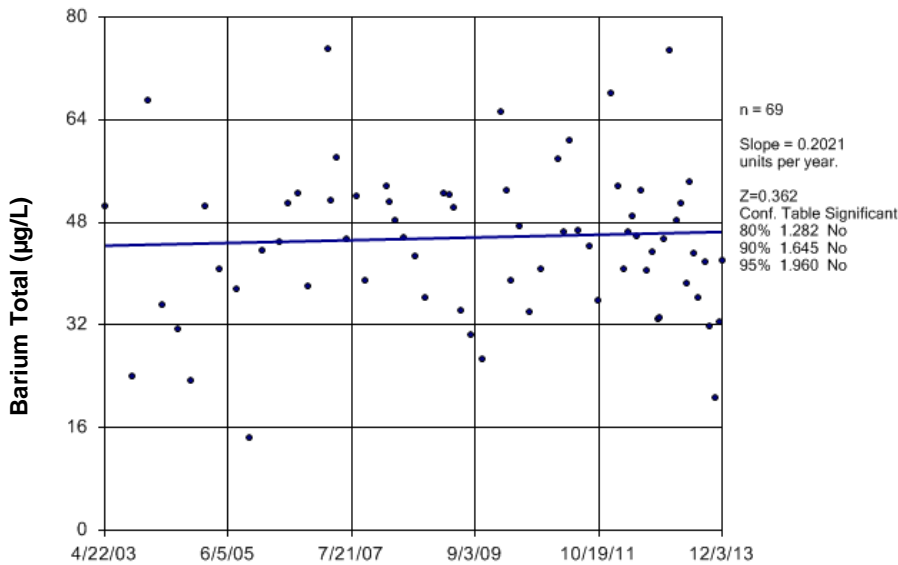
For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 16.12  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 16.12  
 Adjusted Kruskal-Wallis statistic (H') = 16.12



Date

Figure E1208 Red Deer River (SK-MB): Barium Total

## Seasonal Kendall



Date

Figure E1209 Red Deer River (SK-MB): Barium Total

## Time Series

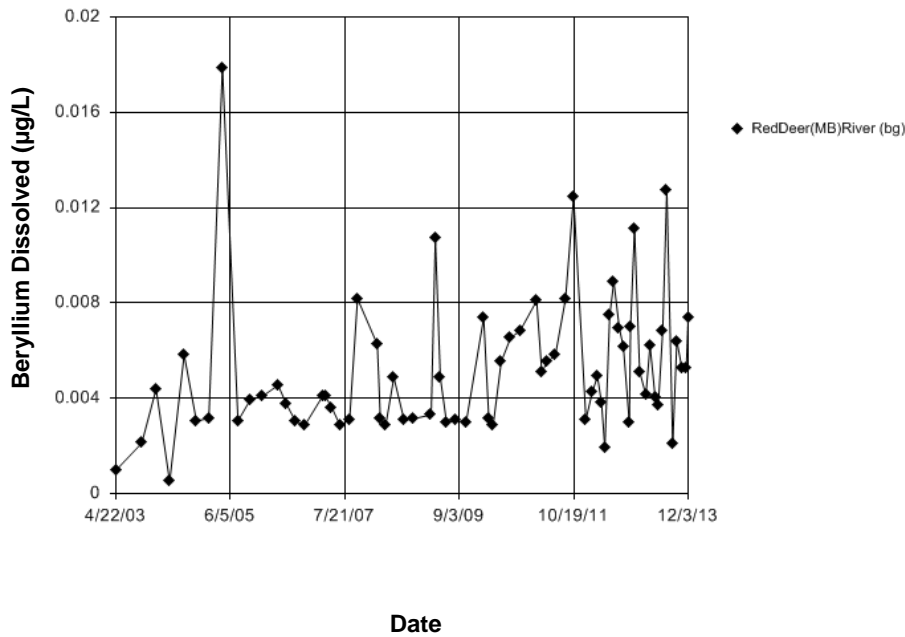


Figure E1210 Red Deer River (SK-MB): Beryllium Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.3422. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

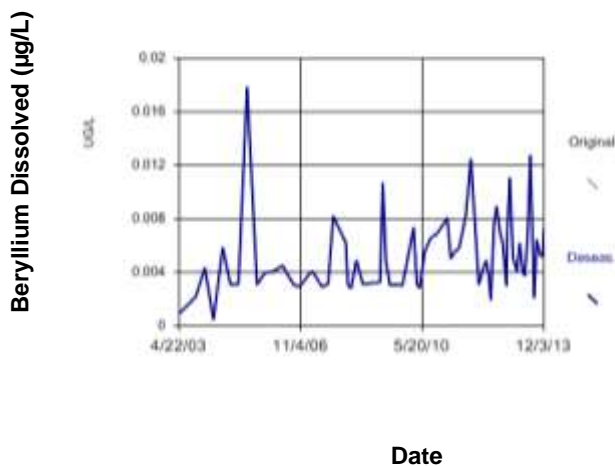


Figure E1211 Red Deer River (SK-MB): Beryllium Dissolved

## Sen's Slope Estimator

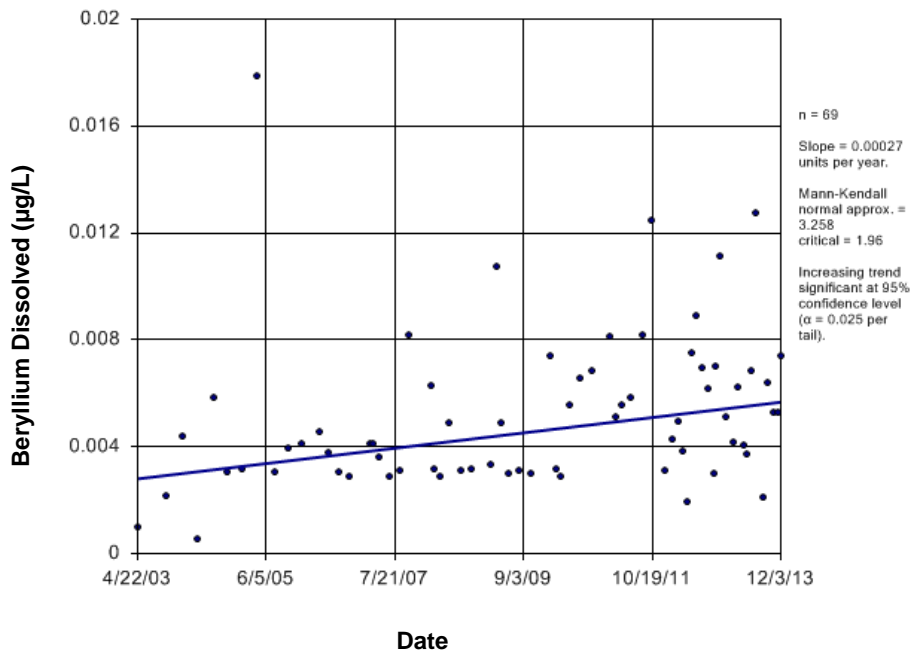


Figure E1212 Red Deer River (SK-MB): Beryllium Dissolved

## Time Series

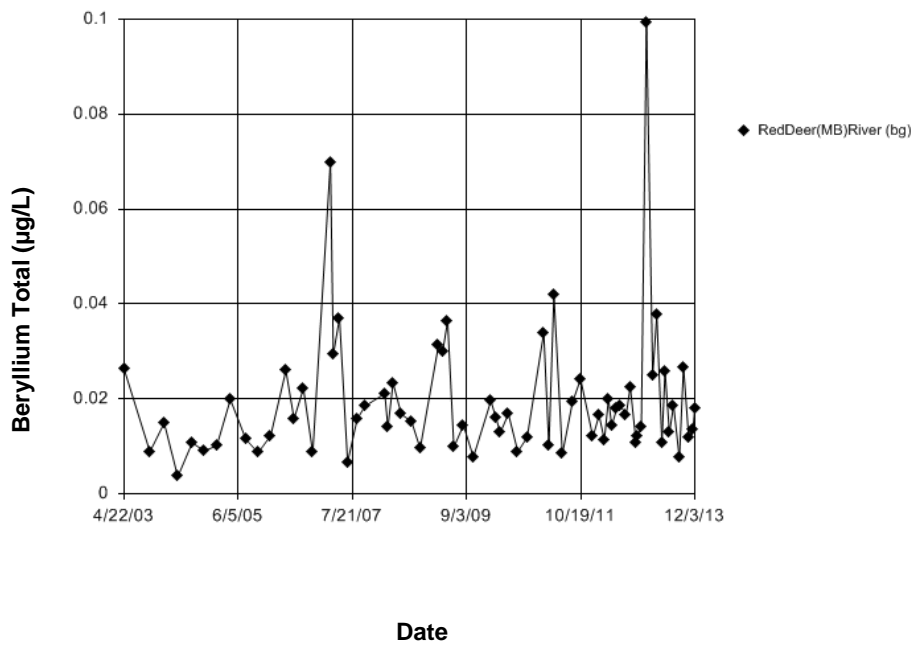
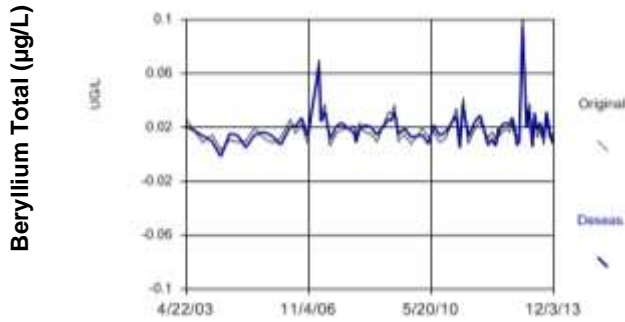


Figure E1213 Red Deer River (SK-MB): Beryllium Total

## Seasonality

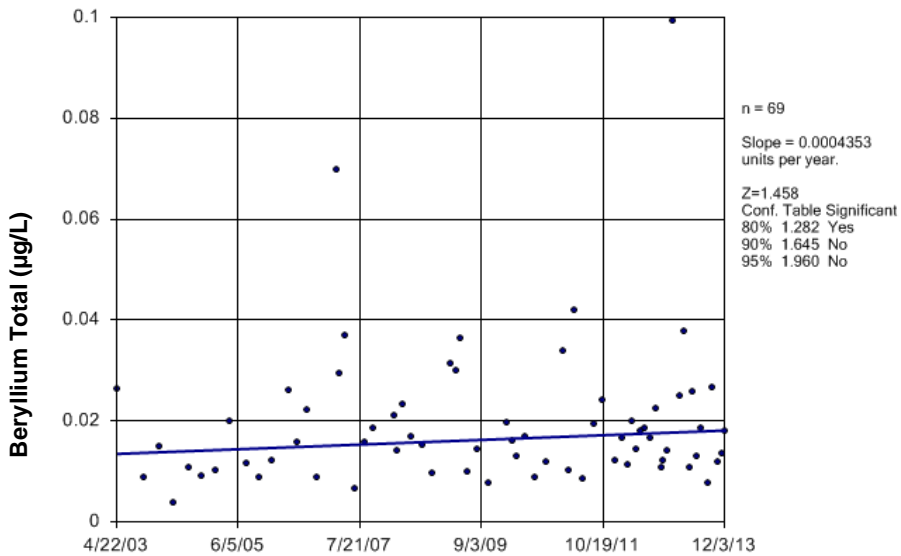
For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 9.813  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



Date

Figure E1214 Red Deer River (SK-MB): Beryllium Total

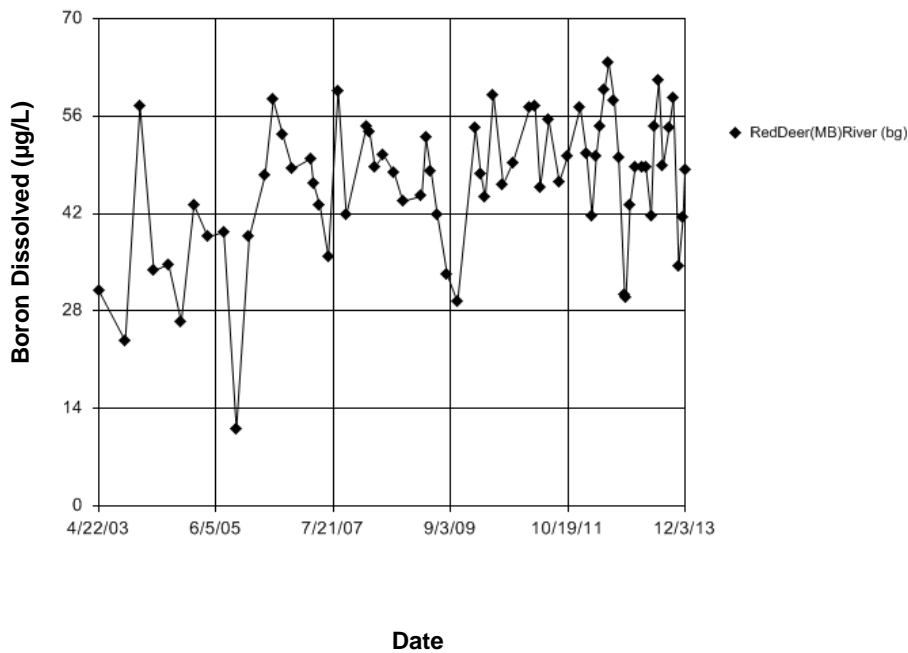
## Seasonal Kendall



Date

Figure E1215 Red Deer River (SK-MB): Beryllium Total

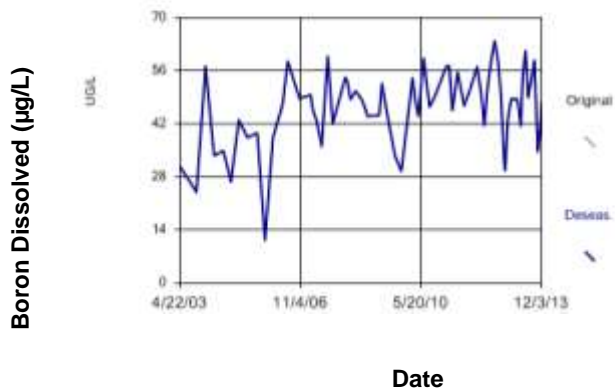
## Time Series



**Figure E1216 Red Deer River (SK-MB): Boron Dissolved**

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.3319  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H\*) was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 0.3319  
 Adjusted Kruskal-Wallis statistic (H\*) = 0.3319



**Figure E1217 Red Deer River (SK-MB): Boron Dissolved**



## Sen's Slope Estimator

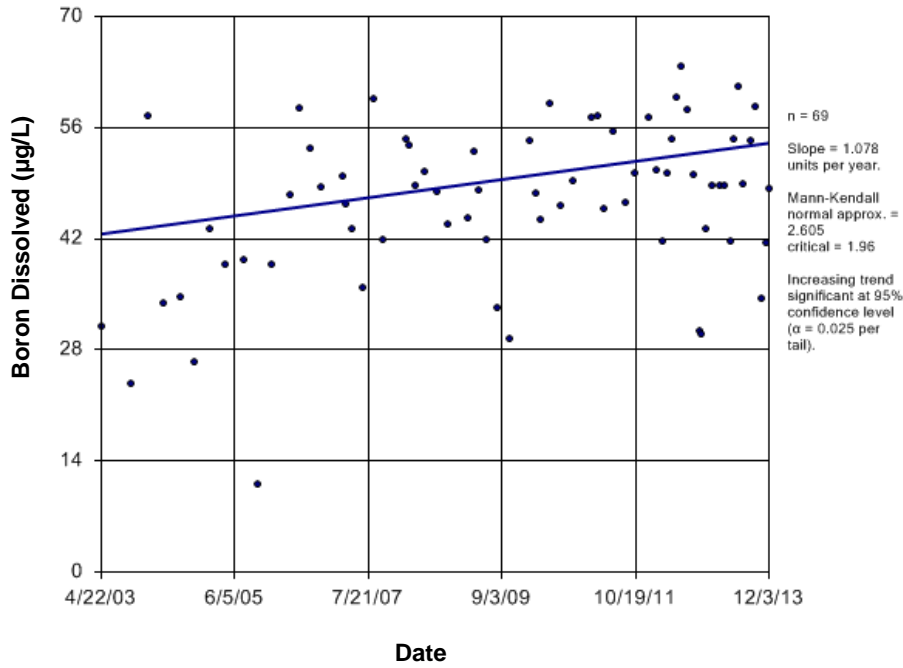


Figure E1218 Red Deer River (SK-MB): Boron Dissolved

## Time Series

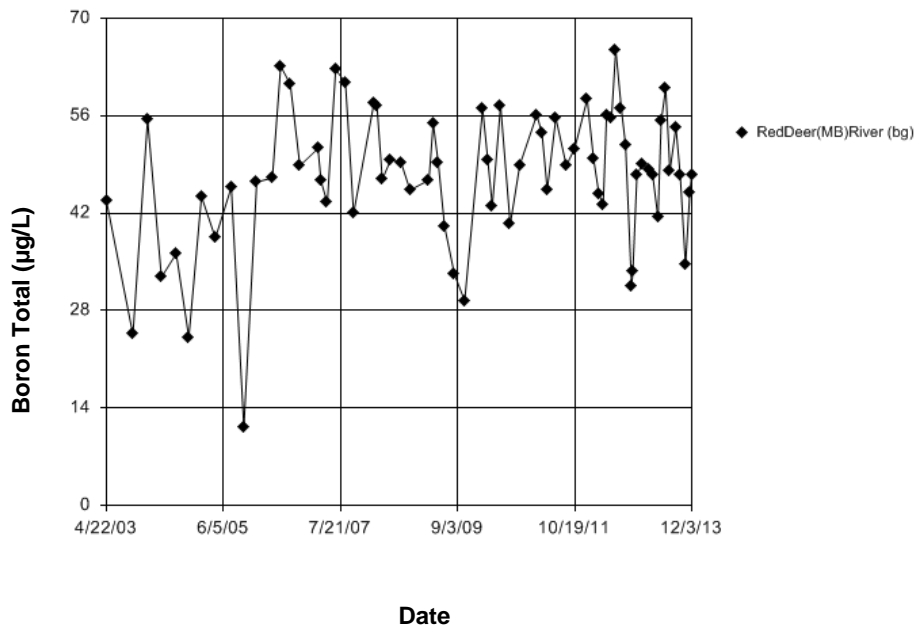
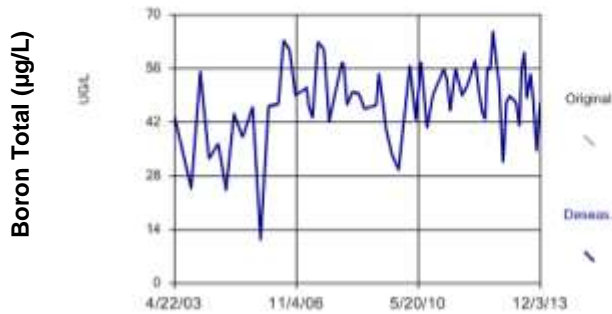


Figure E1219 Red Deer River (SK-MB): Boron Total

## Seasonality

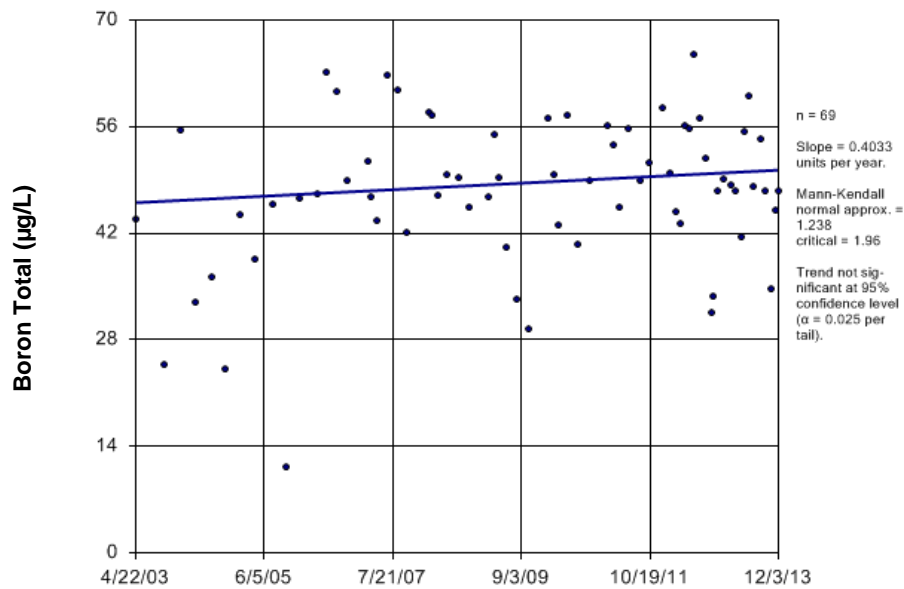
For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.3821  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 0.3821  
 Adjusted Kruskal-Wallis statistic (H') = 0.3821



Date

Figure E1220 Red Deer River (SK-MB): Boron Total

## Sen's Slope Estimator



Date

Figure E1221 Red Deer River (SK-MB): Boron Total

## Time Series

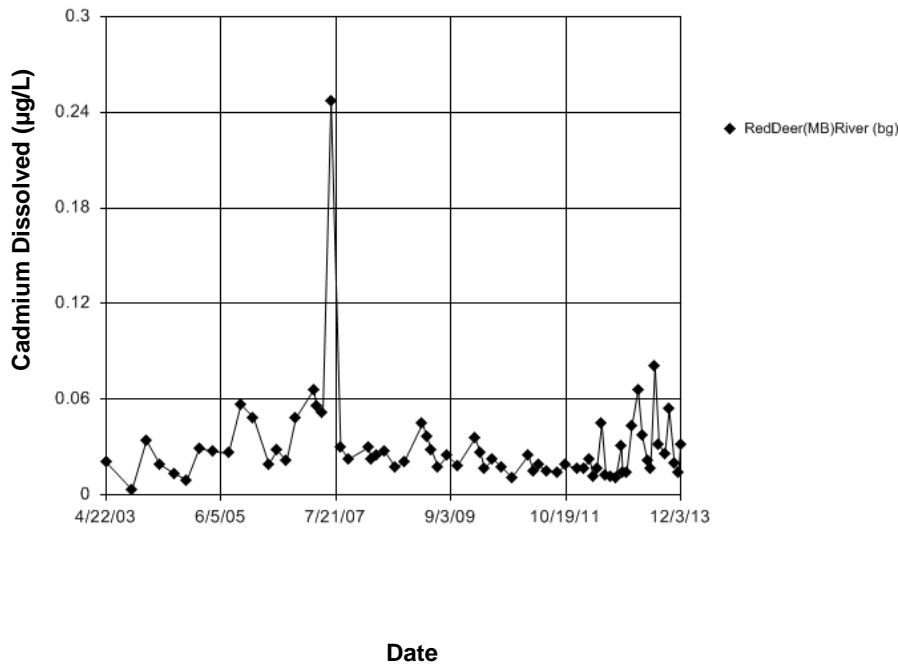


Figure E1222 Red Deer River (SK-MB): Cadmium Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 2.397  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 4 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
Kruskal-Wallis statistic (H) = 2.397  
Adjusted Kruskal-Wallis statistic (H') = 2.397

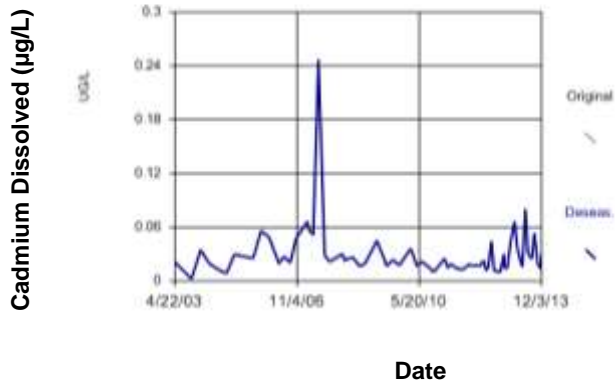


Figure E1223 Red Deer River (SK-MB): Cadmium Dissolved

### Sen's Slope Estimator

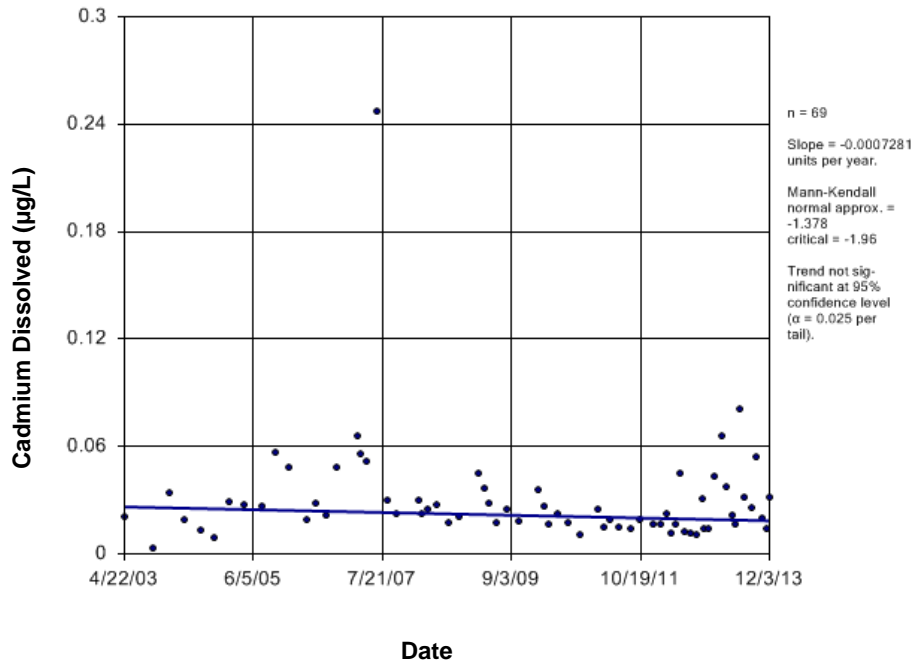


Figure E1224 Red Deer River (SK-MB): Cadmium Dissolved

### Time Series

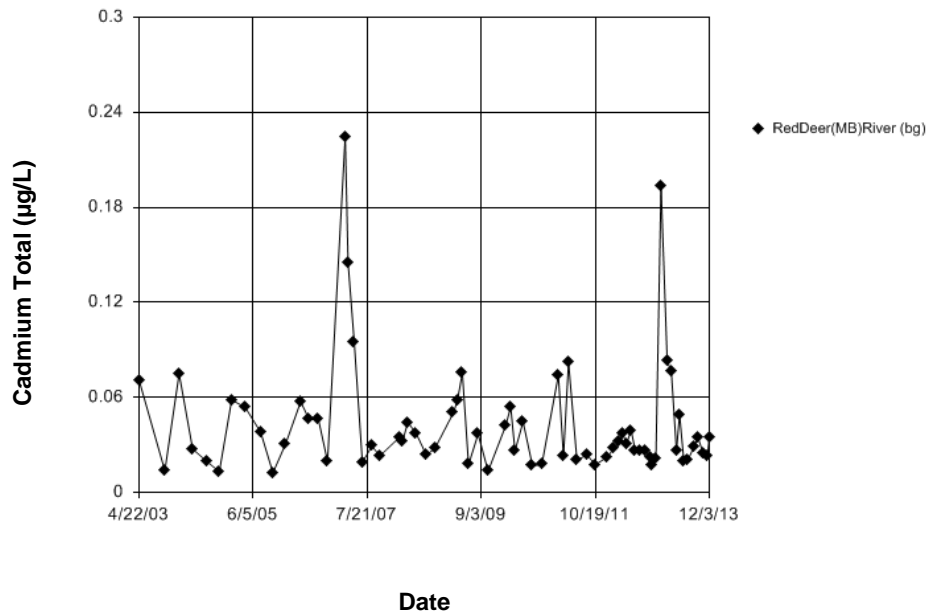


Figure E1225 Red Deer River (SK-MB): Cadmium Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 19.56  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 19.56  
 Adjusted Kruskal-Wallis statistic (H') = 19.56

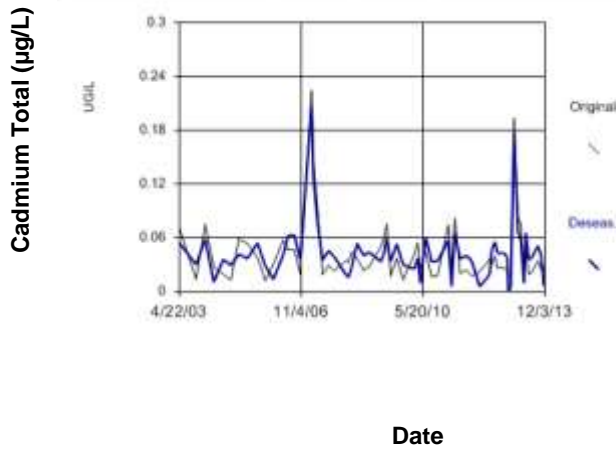


Figure E1226 Red Deer River (SK-MB): Cadmium Total

## Seasonal Kendall

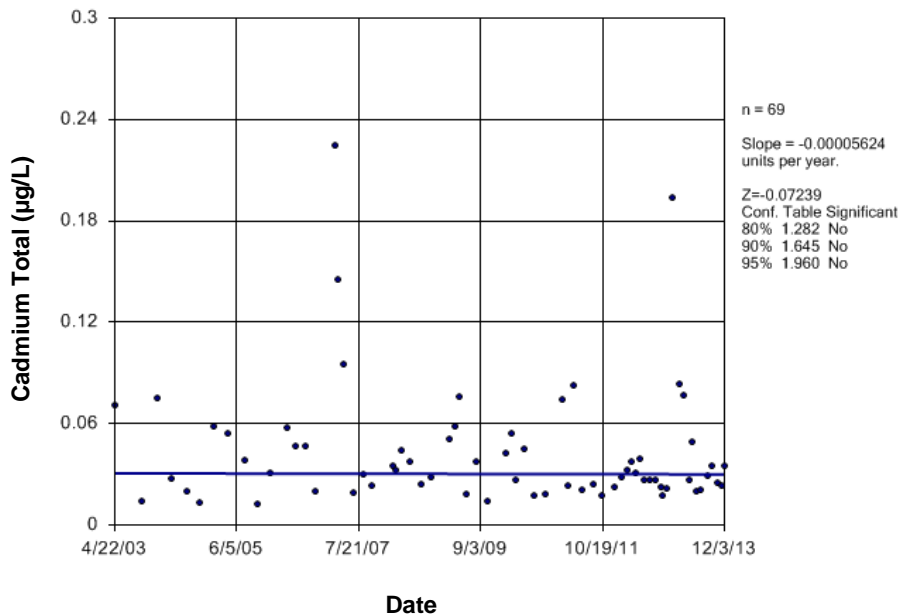


Figure E1227 Red Deer River (SK-MB): Cadmium Total

## Time Series

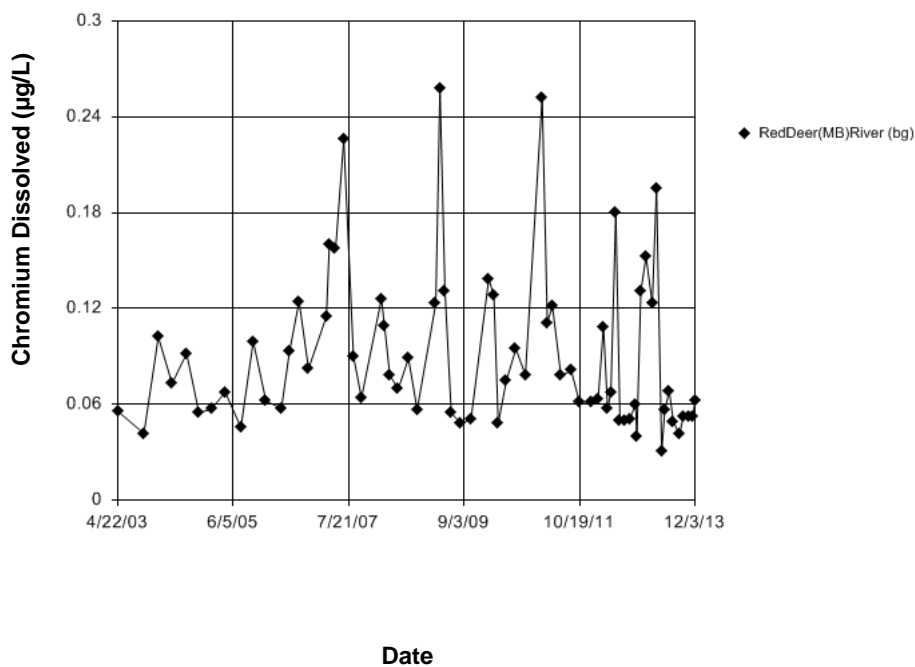


Figure E1228 Red Deer River (SK-MB): Chromium Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 7.621. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 4 groups of data in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal. Kruskal-Wallis statistic (H) = 7.621. Adjusted Kruskal-Wallis statistic (H') = 7.621.

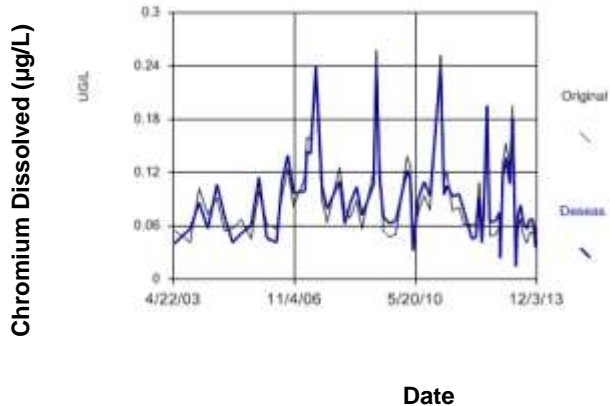


Figure E1229 Red Deer River (SK-MB): Chromium Dissolved

### Seasonal Kendall

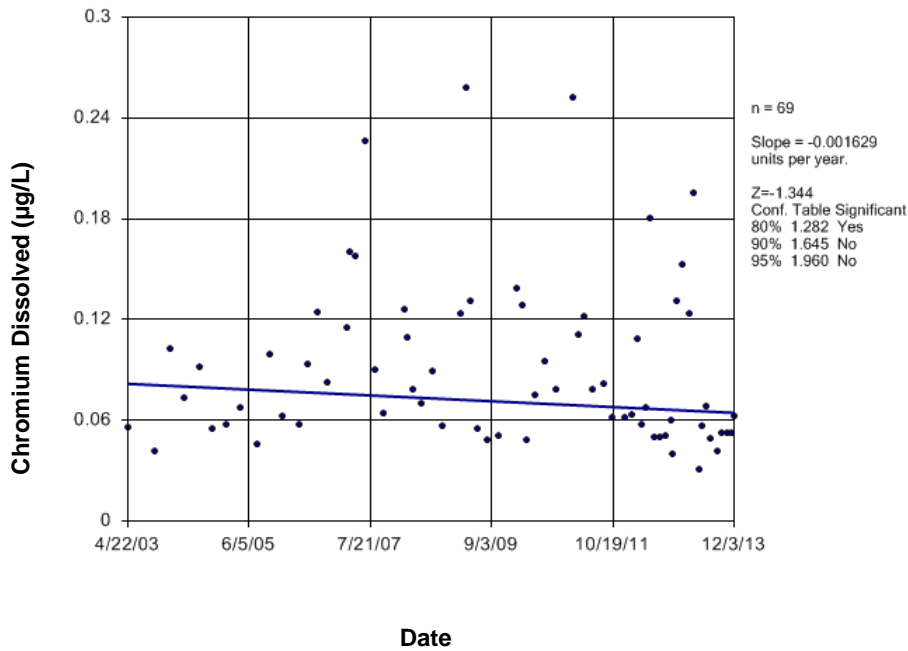


Figure E1230 Red Deer River (SK-MB): Chromium Dissolved

### Time Series

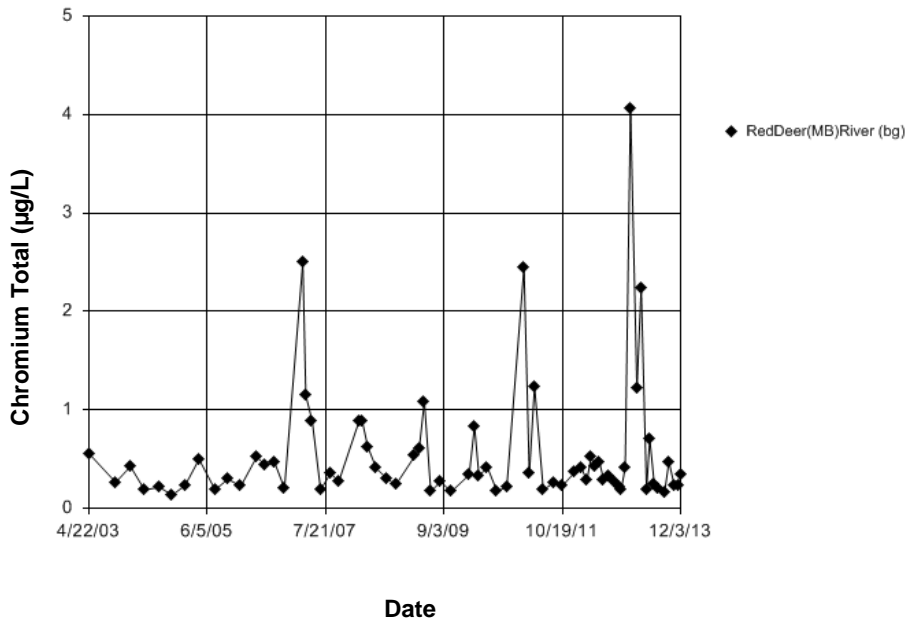
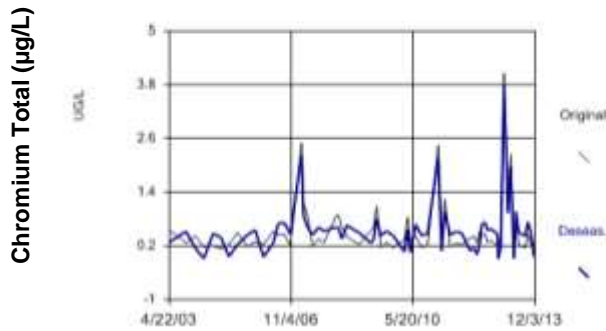


Figure E1231 Red Deer River (SK-MB): Chromium Total

# Seasonality

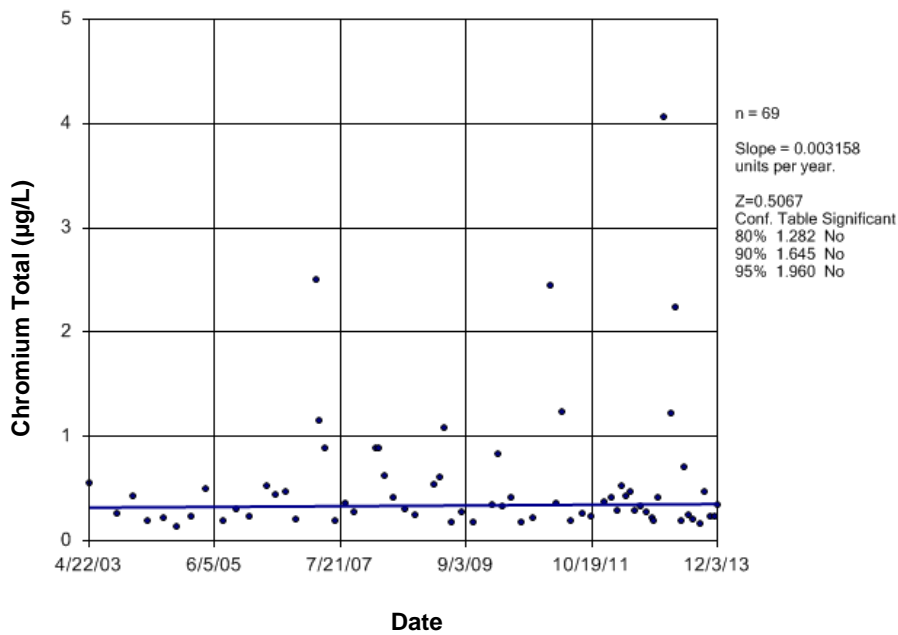
For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 18.46  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



Date

Figure E1232 Red Deer River (SK-MB): Chromium Total

# Seasonal Kendall



Date

Figure E1233 Red Deer River (SK-MB): Chromium Total



## Time Series

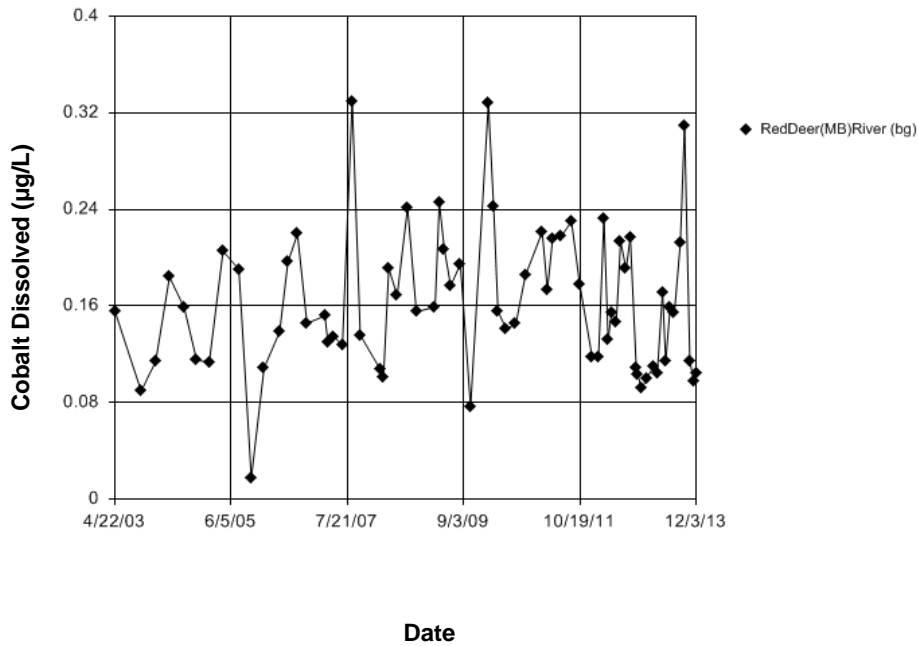


Figure E1234 Red Deer River (SK-MB): Cobalt Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 2.006. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

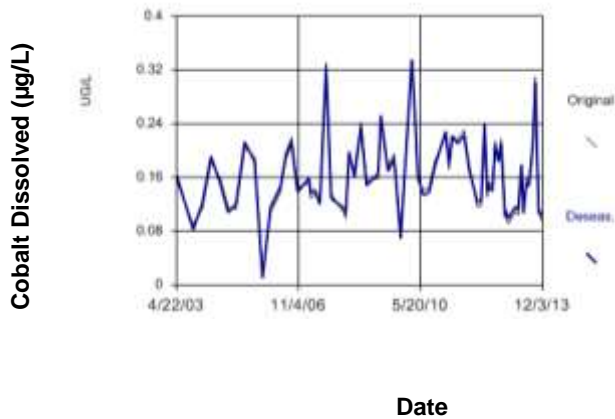


Figure E1235 Red Deer River (SK-MB): Cobalt Dissolved

### Sen's Slope Estimator

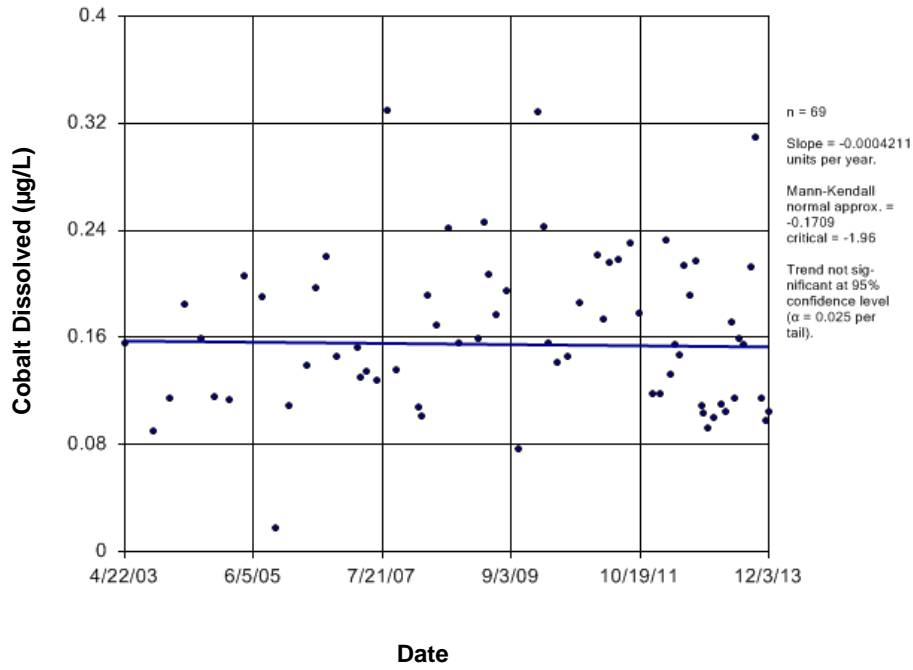


Figure E1236 Red Deer River (SK-MB): Cobalt Dissolved

### Time Series

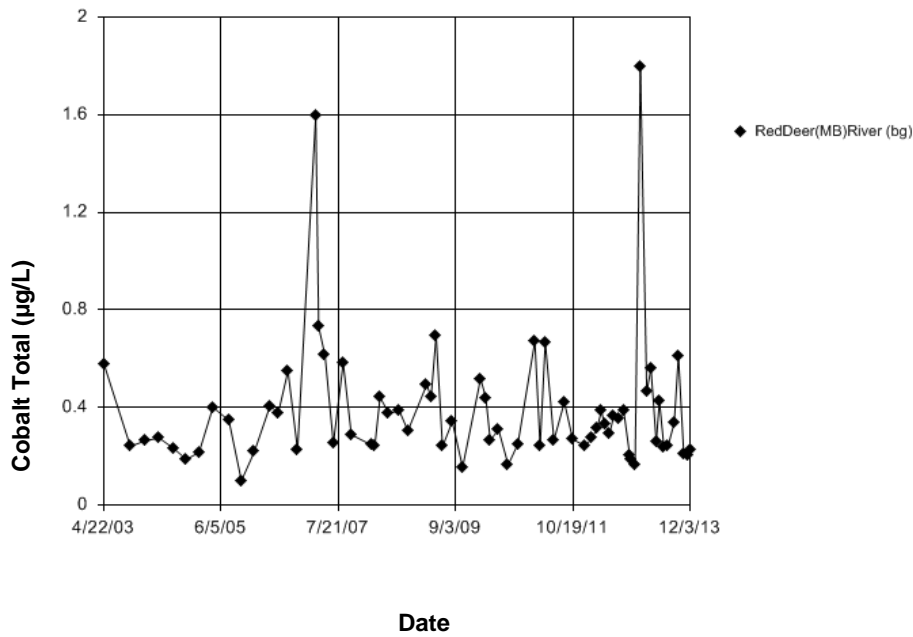
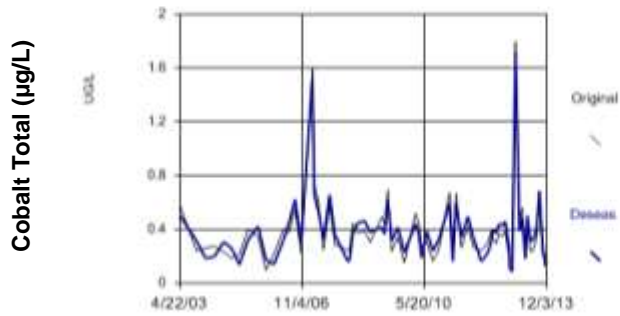


Figure E1237 Red Deer River (SK-MB): Cobalt Total

# Seasonality

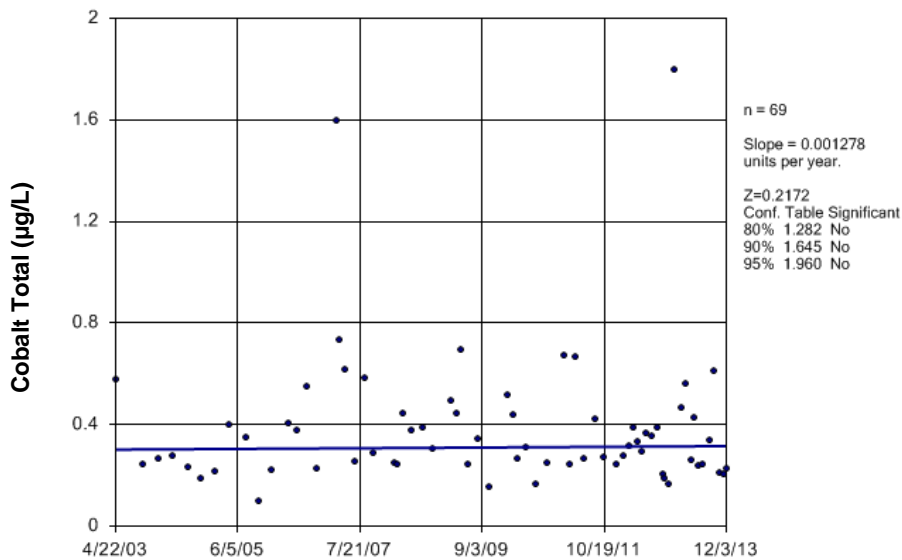
For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 3.851  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 3.851  
 Adjusted Kruskal-Wallis statistic (H') = 3.851



Date

Figure E1238 Red Deer River (SK-MB): Cobalt Total

# Seasonal Kendall



Date

Figure E1239 Red Deer River (SK-MB): Cobalt Total

## Time Series

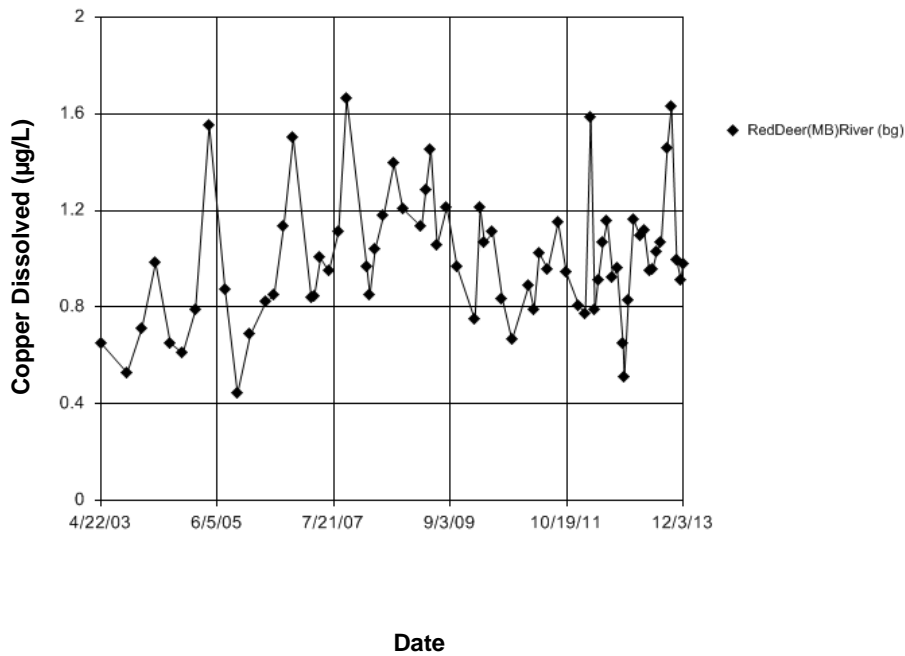


Figure E1240 Red Deer River (SK-MB): Copper Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.  
 Calculated Kruskal-Wallis statistic = 1.355  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

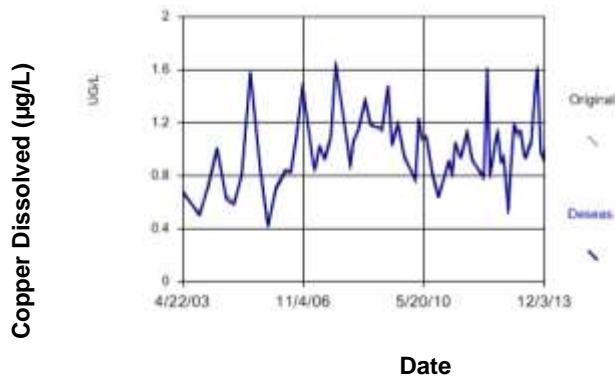


Figure E1241 Red Deer River (SK-MB): Copper Dissolved

## Sen's Slope Estimator

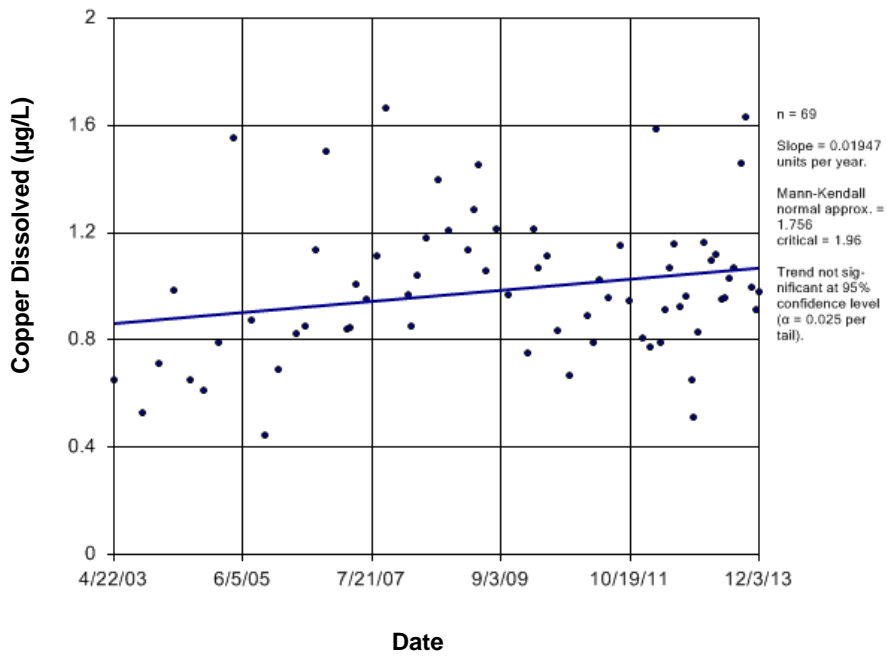


Figure E1242 Red Deer River (SK-MB): Copper Dissolved

## Time Series

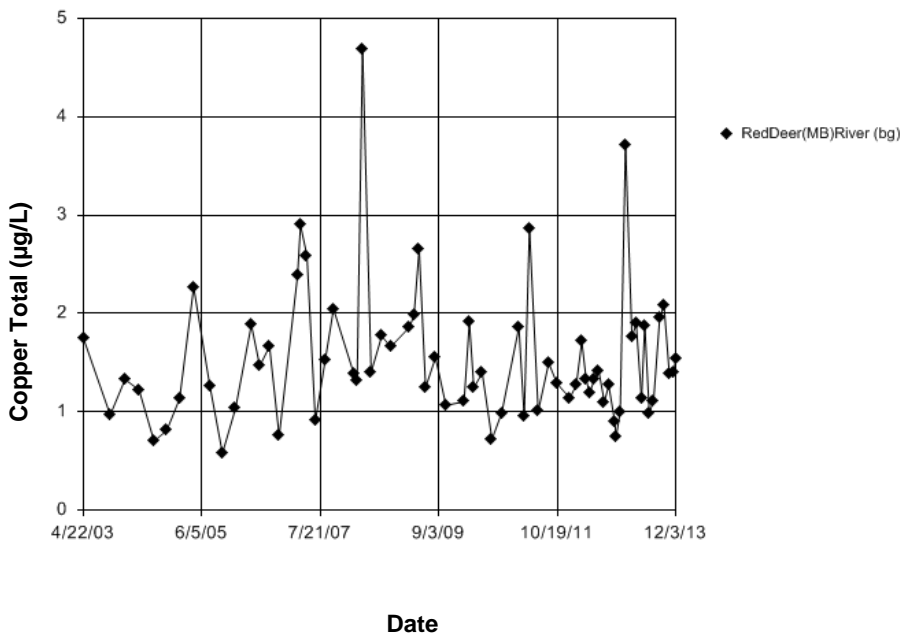
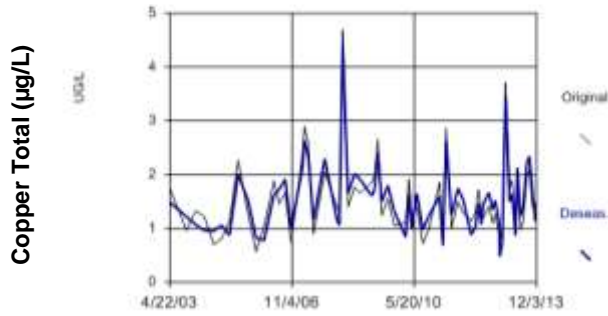


Figure E1243 Red Deer River (SK-MB): Copper Total

## Seasonality

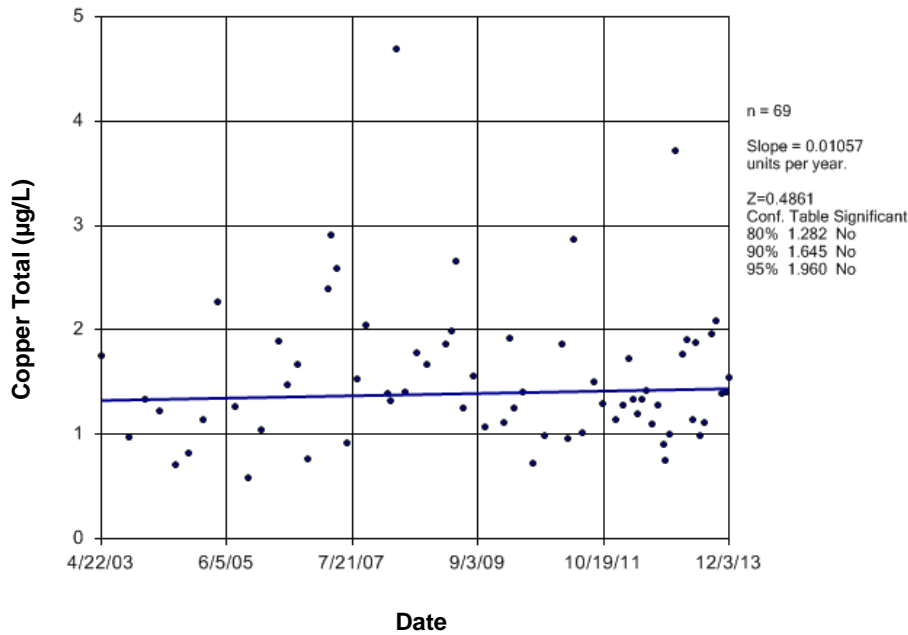
For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 7.588  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 7.588  
 Adjusted Kruskal-Wallis statistic (H') = 7.588



Date

Figure E1244 Red Deer River (SK-MB): Copper Total

## Seasonal Kendall



Date

Figure E1245 Red Deer River (SK-MB): Copper Total

## Time Series

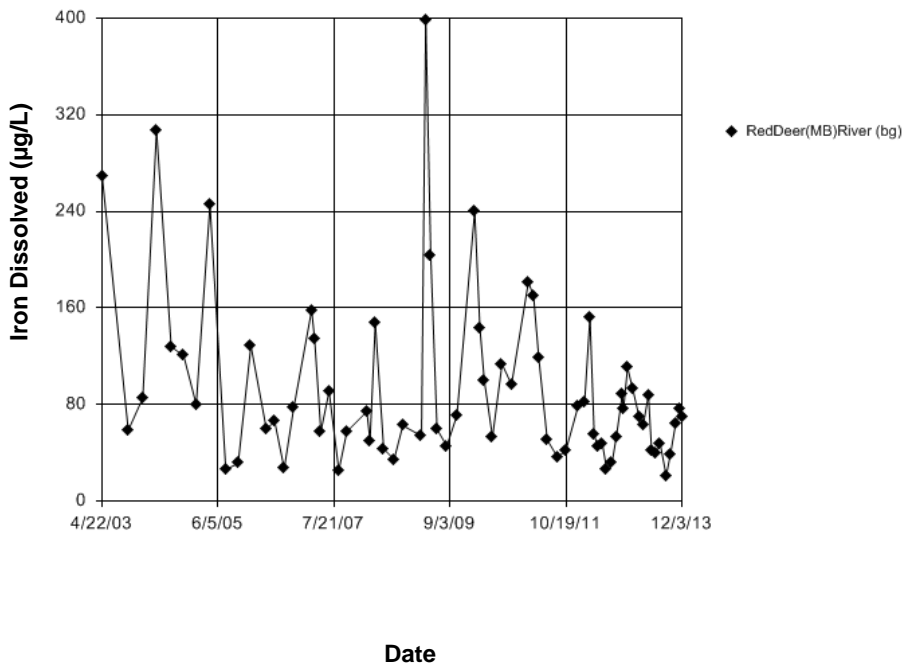


Figure E1246 Red Deer River (SK-MB): Iron Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 27.38. Tabulated Chi-squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 0 groups of ties in the data, so an adjustment to the Kruskal-Wallis statistic (H) was necessary.

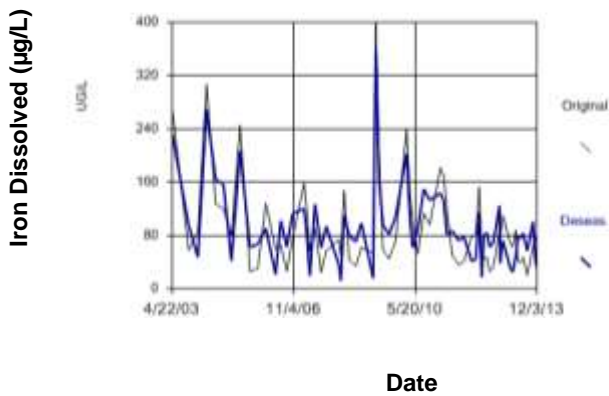


Figure E1247 Red Deer River (SK-MB): Iron Dissolved

### Seasonal Kendall

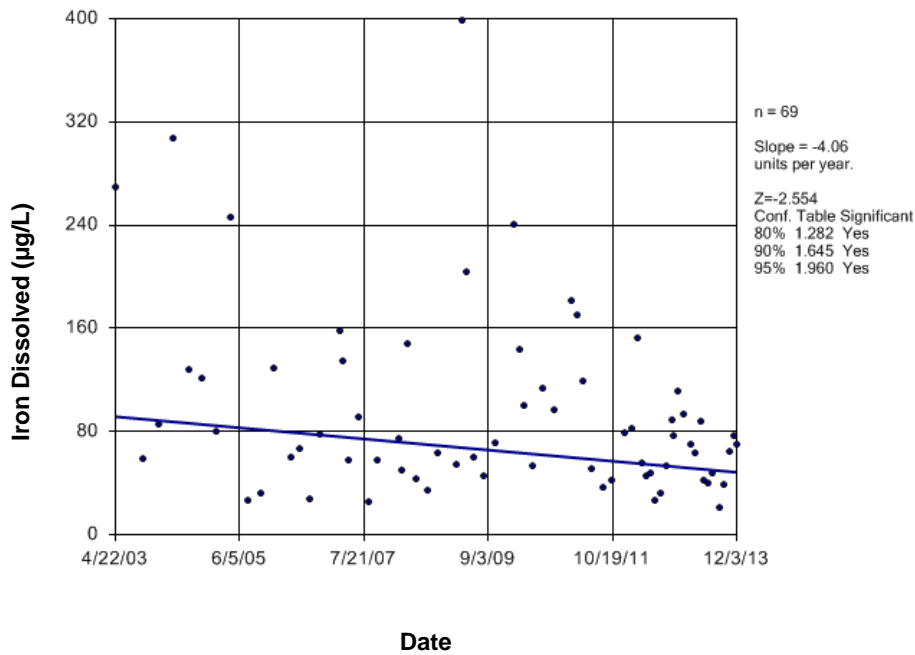


Figure E1248 Red Deer River (SK-MB): Iron Dissolved

### Time Series

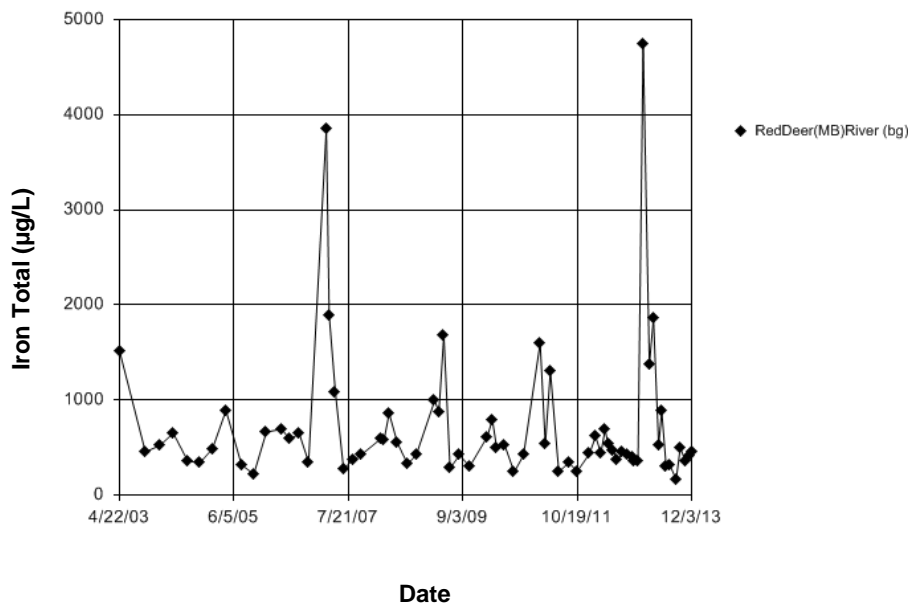


Figure E1249 Red Deer River (SK-MB): Iron Total



## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 31.82. Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level. There were 6 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (D) was necessary.

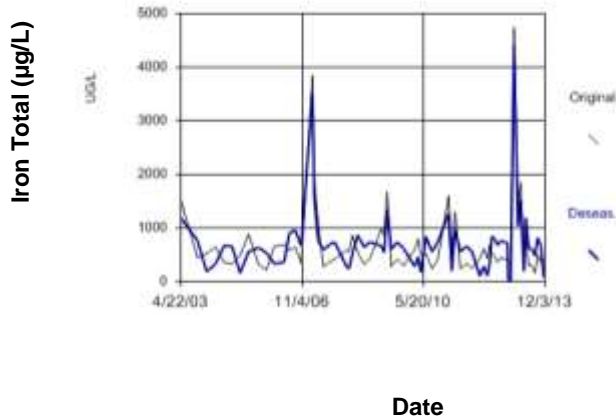


Figure E1250 Red Deer River (SK-MB): Iron Total

## Seasonal Kendall

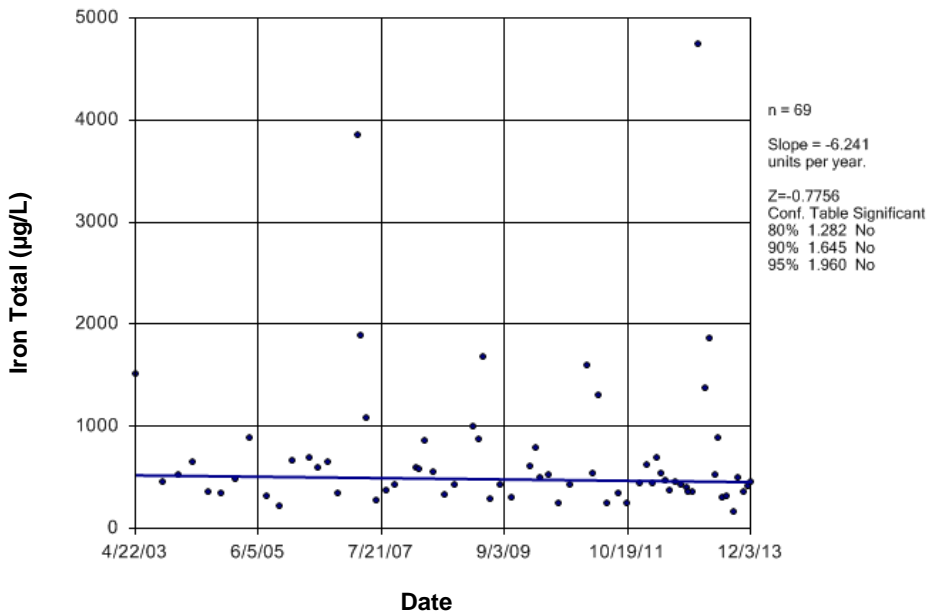


Figure E1251 Red Deer River (SK-MB): Iron Total

## Time Series

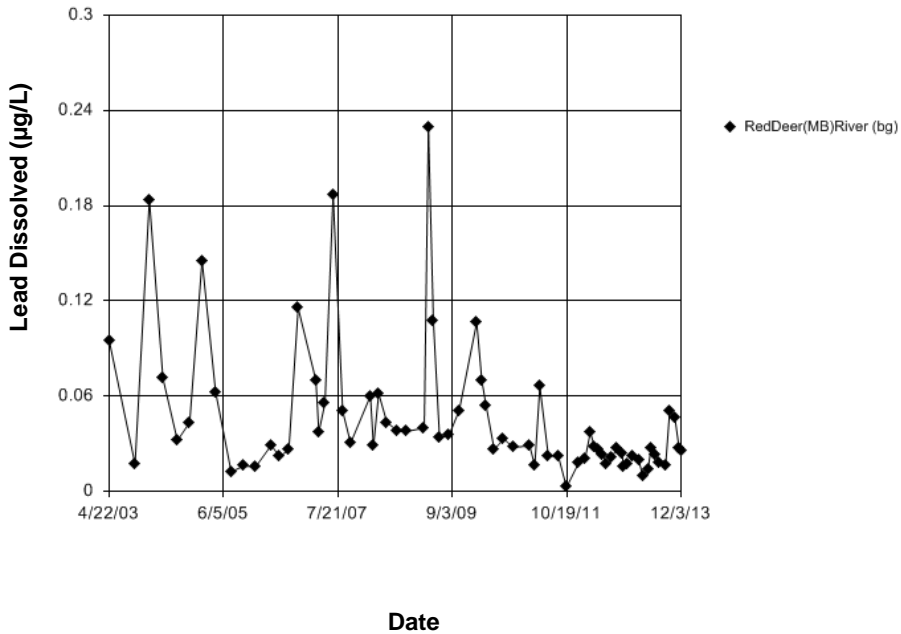


Figure E1252 Red Deer River (SK-MB): Lead Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 2.803  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 2.803  
 Adjusted Kruskal-Wallis statistic (H') = 2.803

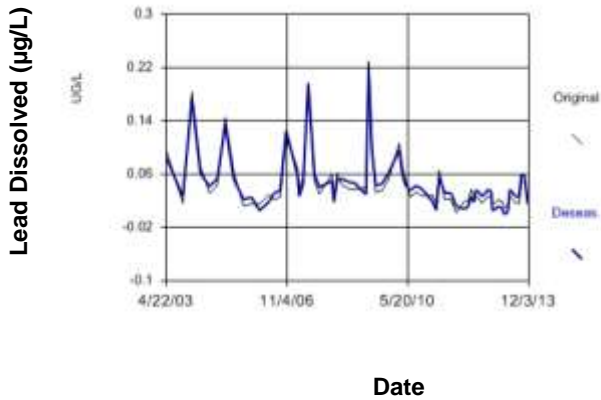


Figure E1253 Red Deer River (SK-MB): Lead Dissolved

## Sen's Slope Estimator

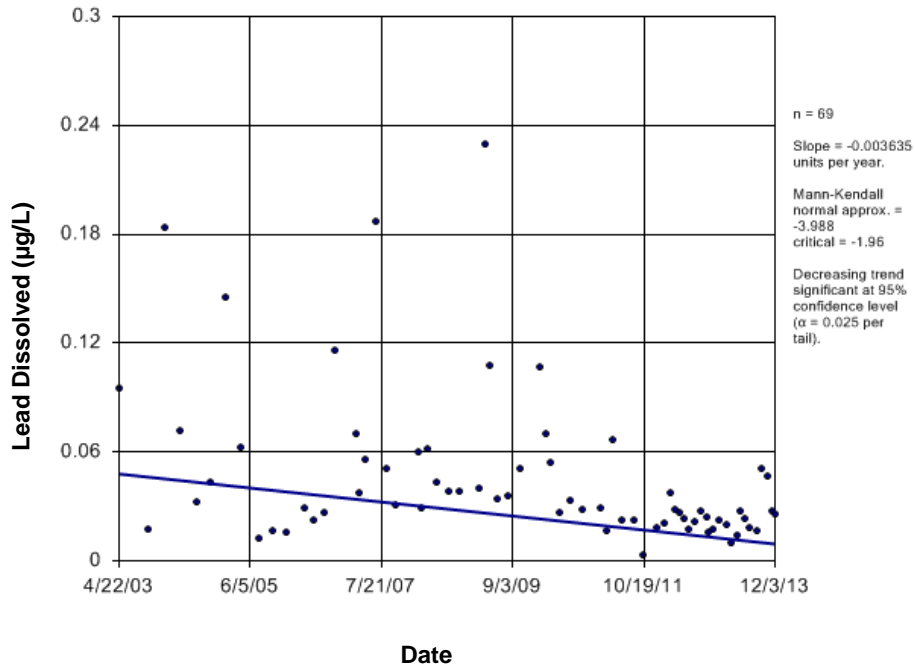


Figure E1254 Red Deer River (SK-MB): Lead Dissolved

## Time Series

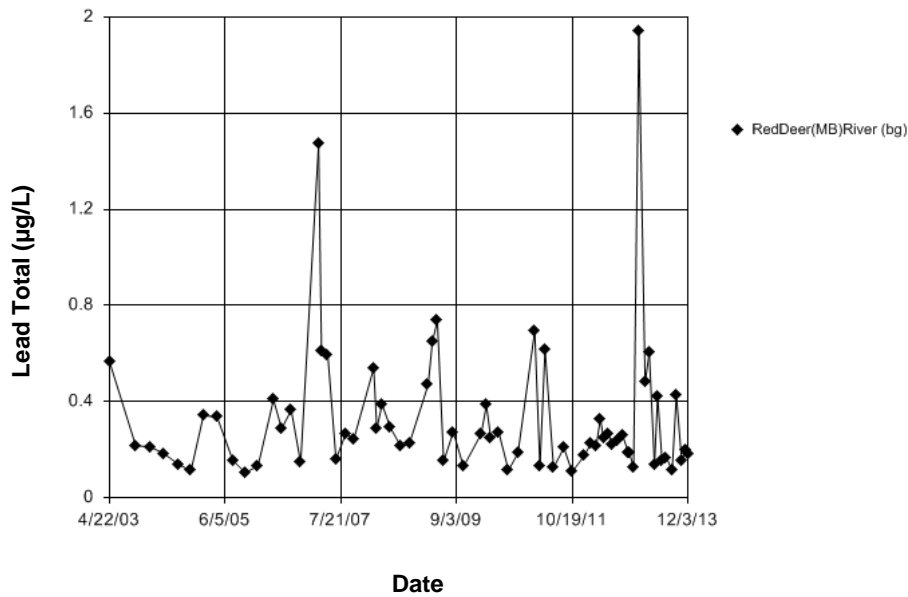
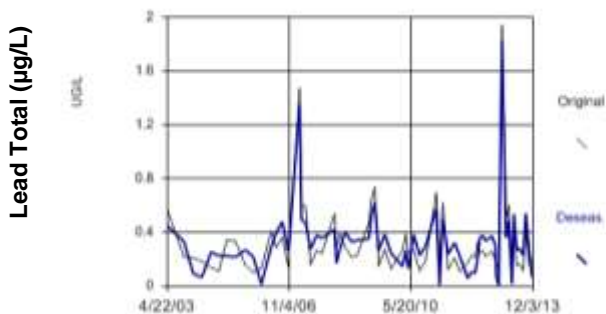


Figure E1255 Red Deer River (SK-MB): Lead Total

## Seasonality

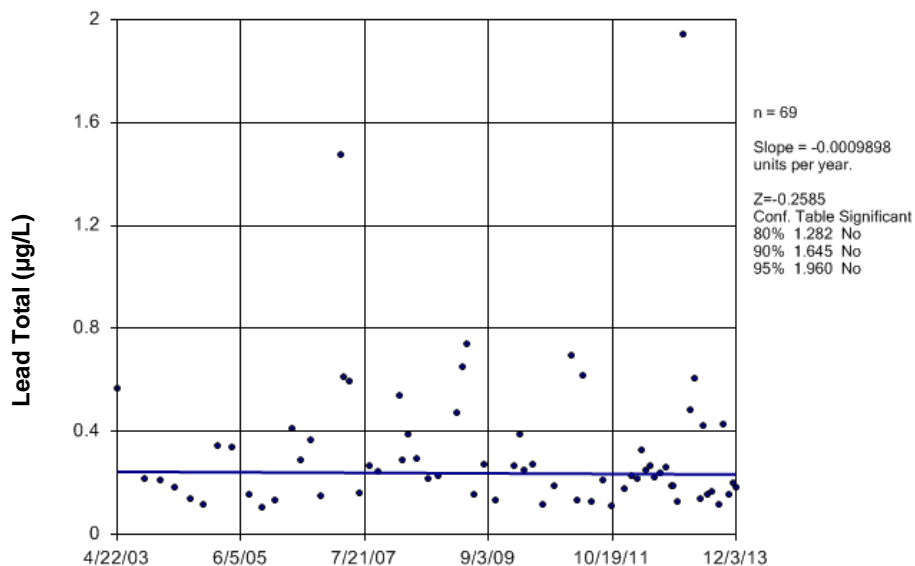
For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 12.79  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



Date

Figure E1256 Red Deer River (SK-MB): Lead Total

## Seasonal Kendall



Date

Figure E1257 Red Deer River (SK-MB): Lead Total

### Time Series

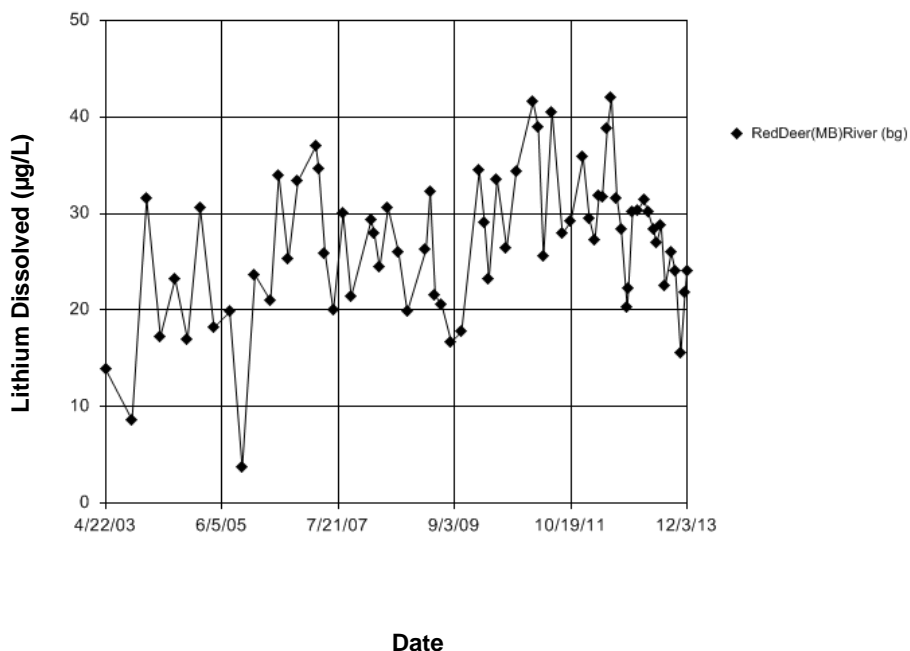


Figure E1258 Red Deer River (SK-MB): Lithium Dissolved

### Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 1.649. Tabulated Chi-squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

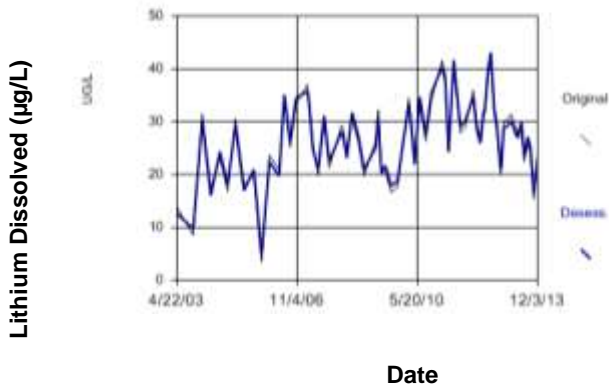


Figure E1259 Red Deer River (SK-MB): Lithium Dissolved

## Sen's Slope Estimator

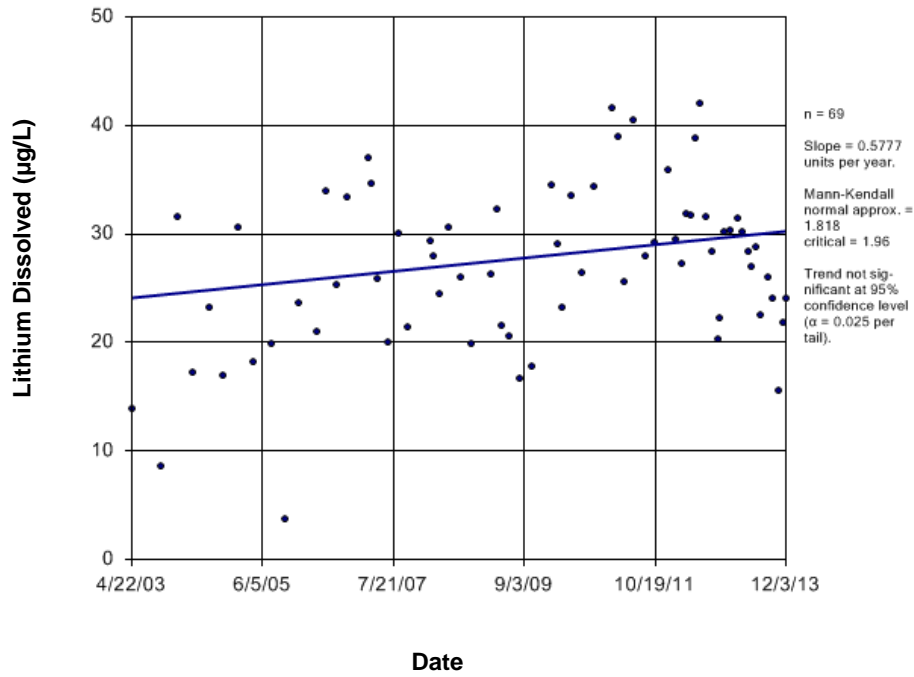


Figure E1260 Red Deer River (SK-MB): Lithium Dissolved

## Time Series

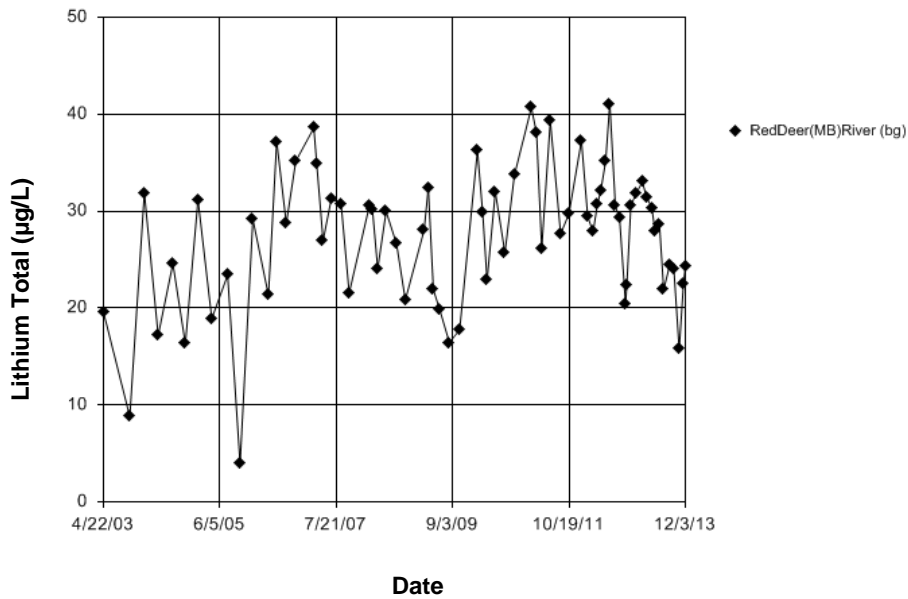
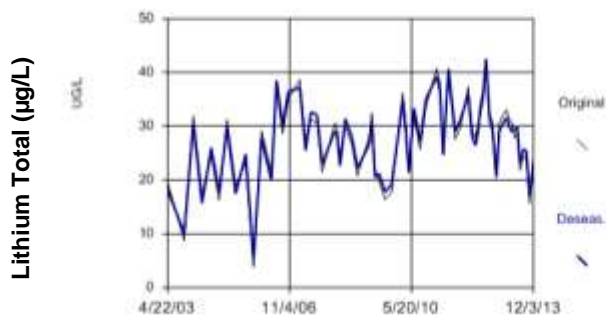


Figure E1261 Red Deer River (SK-MB): Lithium Total

## Seasonality

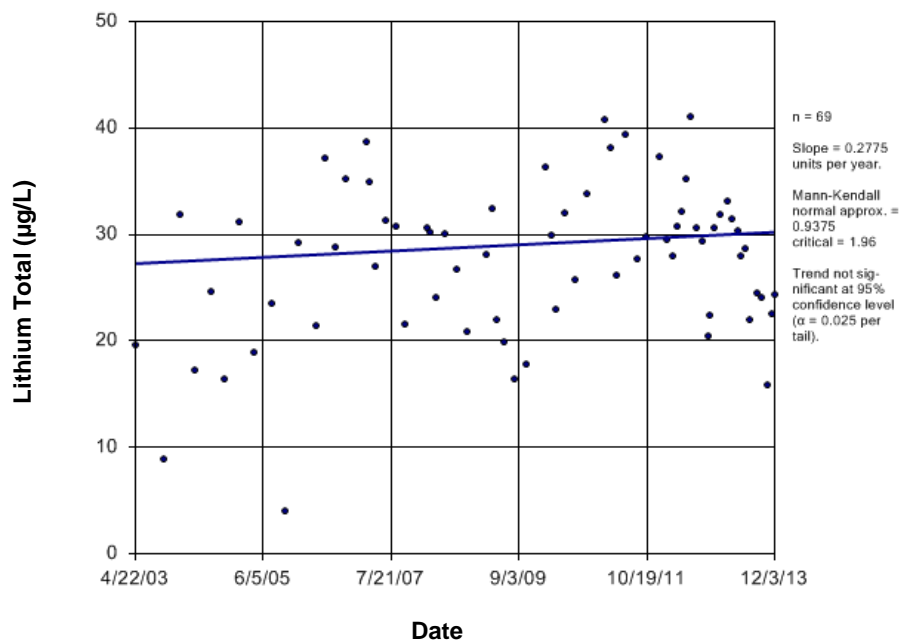
For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 2.04. Tabulated Chi-Squared value = 3.841 with 3 degrees of freedom at the 5% significance level. There were 4 groups of data in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



Date

Figure E1262 Red Deer River (SK-MB): Lithium Total

## Sen's Slope Estimator



Date

Figure E1263 Red Deer River (SK-MB): Lithium Total

## Time Series

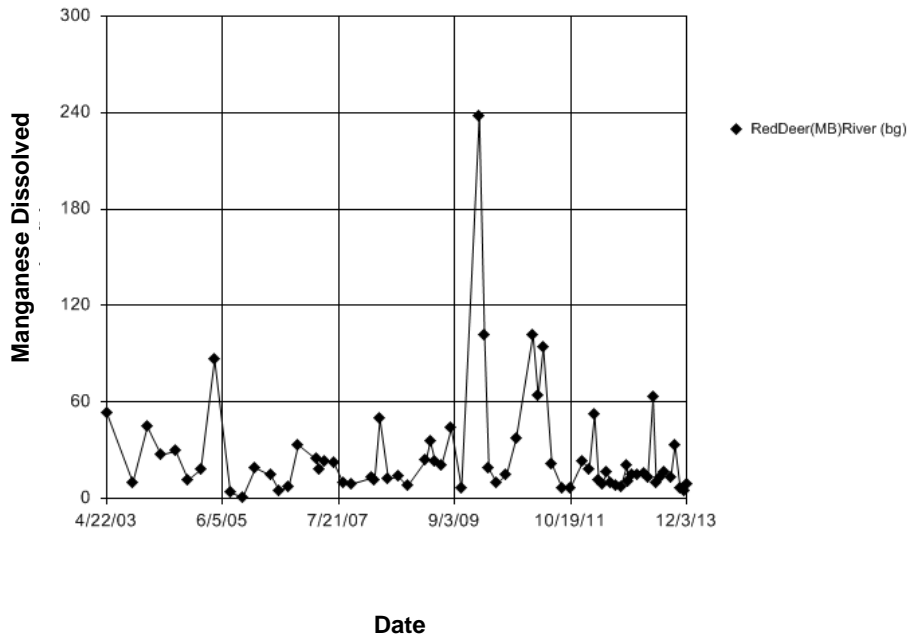


Figure E1264 Red Deer River (SK-MB): Manganese Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates **SEASONALITY** at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 16.26. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 4 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

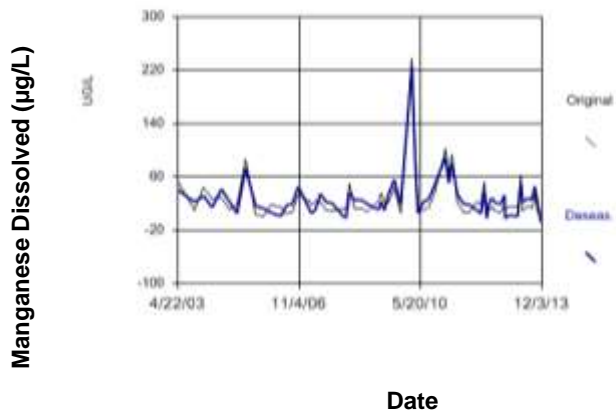


Figure E1265 Red Deer River (SK-MB): Manganese Dissolved



### Seasonal Kendall

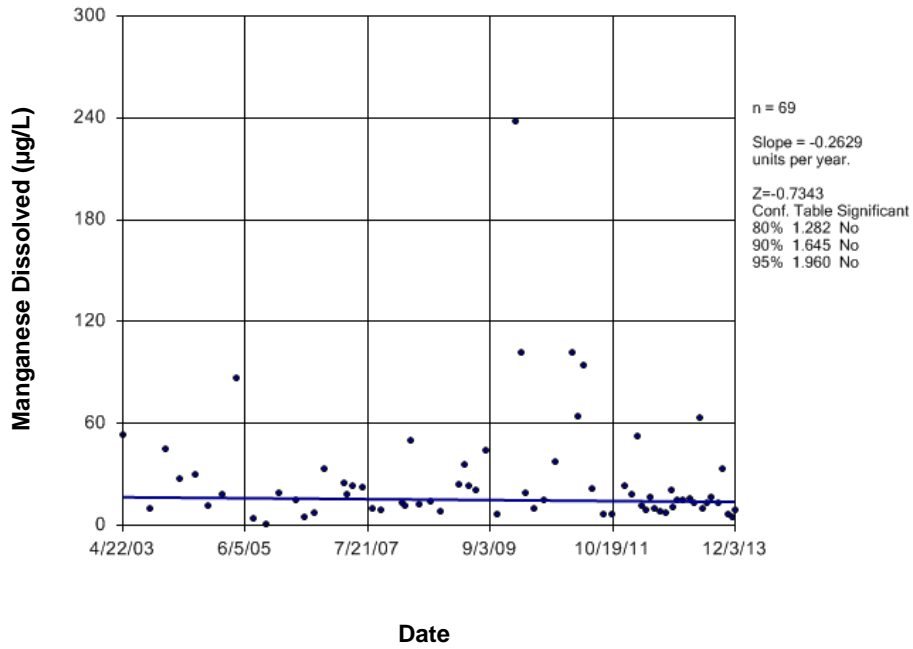


Figure 1266 Red Deer River (SK-MB): Manganese Dissolved

### Time Series

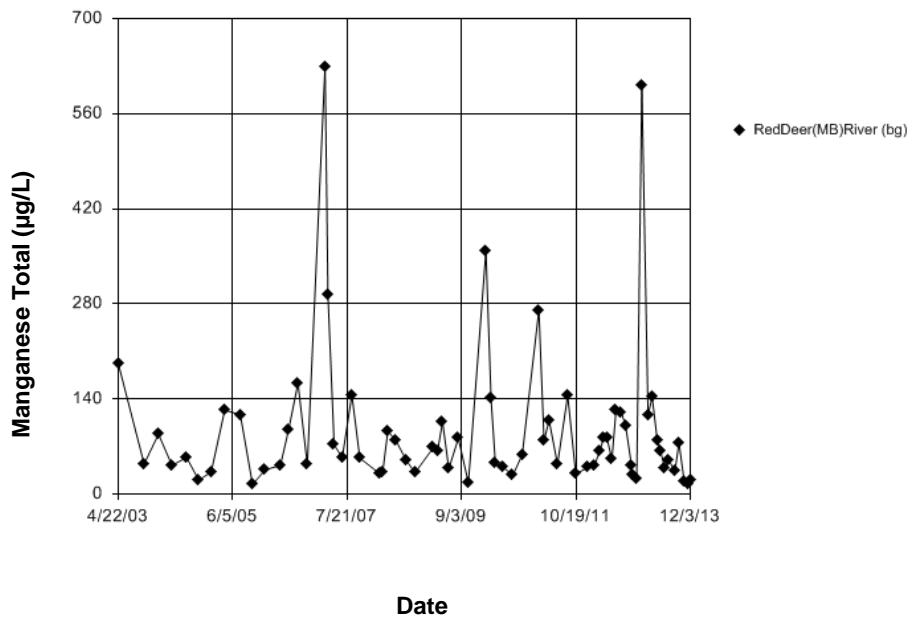
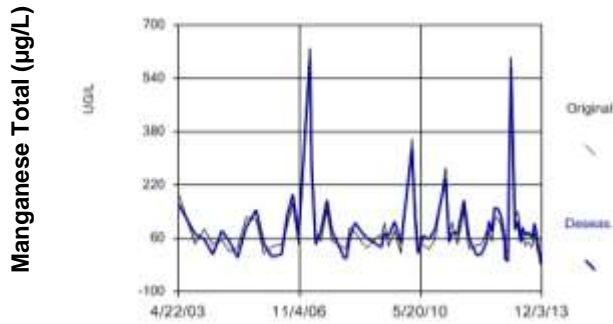


Figure E1267 Red Deer River (SK-MB): Manganese Total

# Seasonality

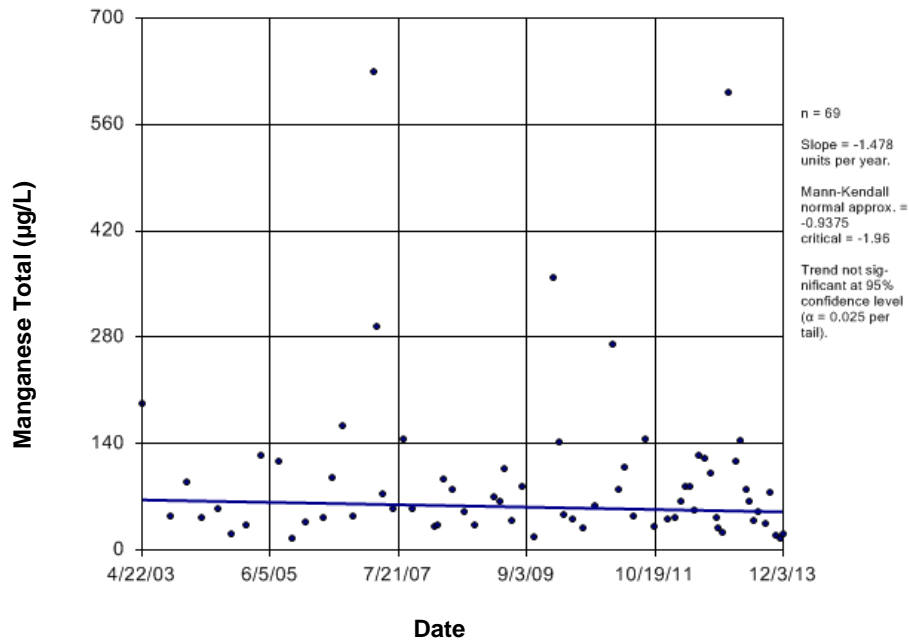
For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 2.04. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 8 groups of data in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



Date

Figure E1268 Red Deer River (SK-MB): Manganese Total

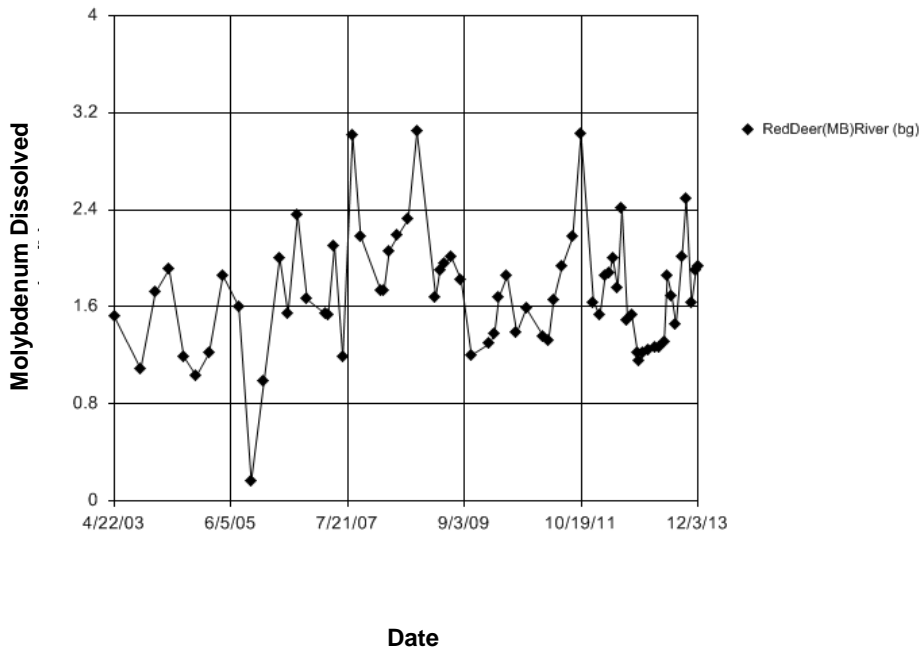
# Sen's Slope Estimator



Date

Figure E1269 Red Deer River (SK-MB): Manganese Total

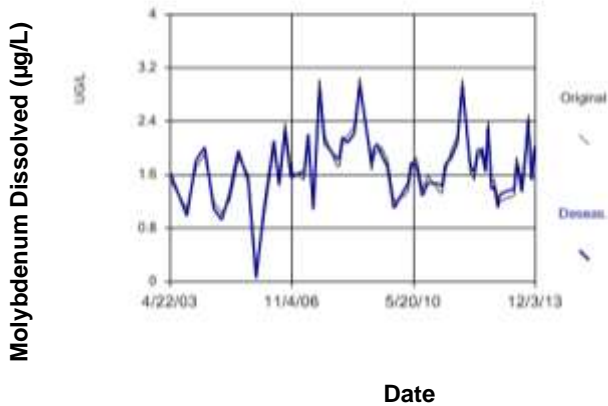
### Time Series



**Figure E1270 Red Deer River (SK-MB): Molybdenum Dissolved**

### Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 2.231. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



**Figure E1271 Red Deer River (SK-MB): Molybdenum Dissolved**

## Sen's Slope Estimator

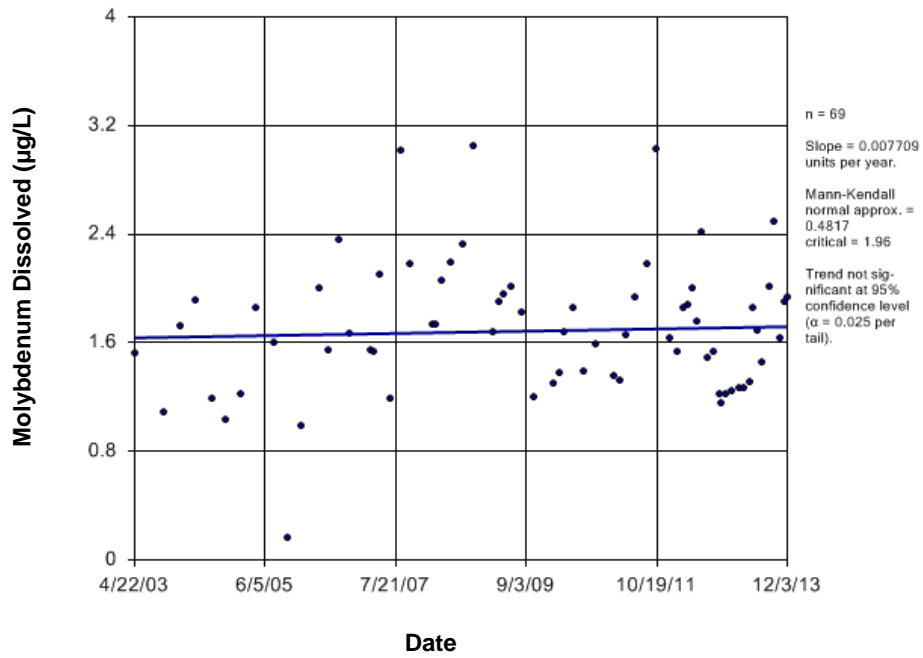


Figure E1272 Red Deer River (SK-MB): Molybdenum Dissolved

## Time Series

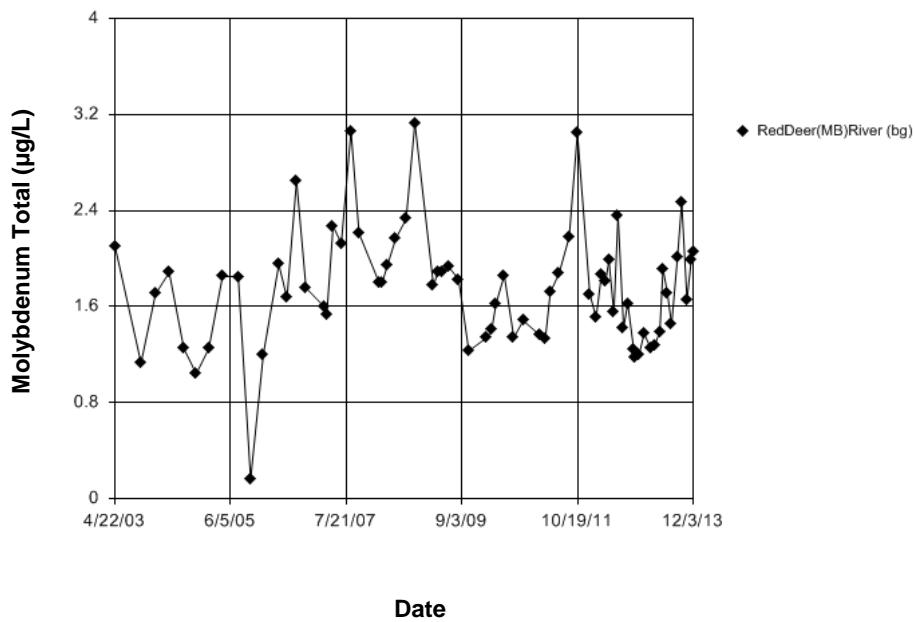
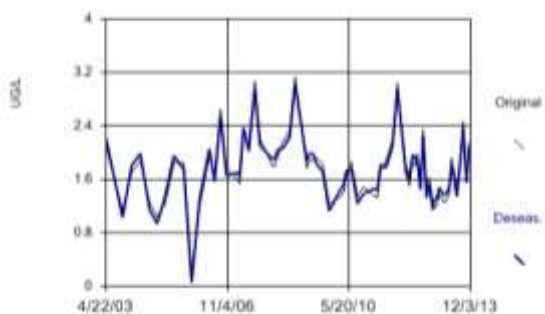


Figure E1273 Red Deer River (SK-MB): Molybdenum Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 2.783  
 Tabulated Chi-Squared value = 3.841 with 3 degrees of freedom at the 5% significance level.  
 There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 2.783  
 Adjusted Kruskal-Wallis statistic (H') = 2.783

Molybdenum Total ( $\mu\text{g/L}$ )



Date

Figure E1274 Red Deer River (SK-MB): Molybdenum Total

## Sen's Slope Estimator

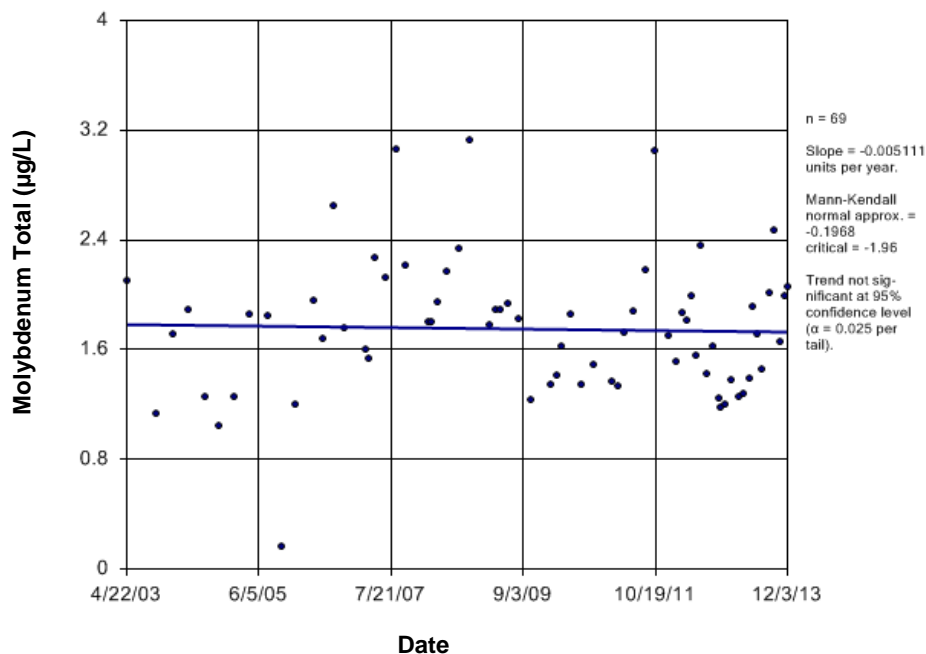


Figure E1275 Red Deer River (SK-MB): Molybdenum Total

### Time Series

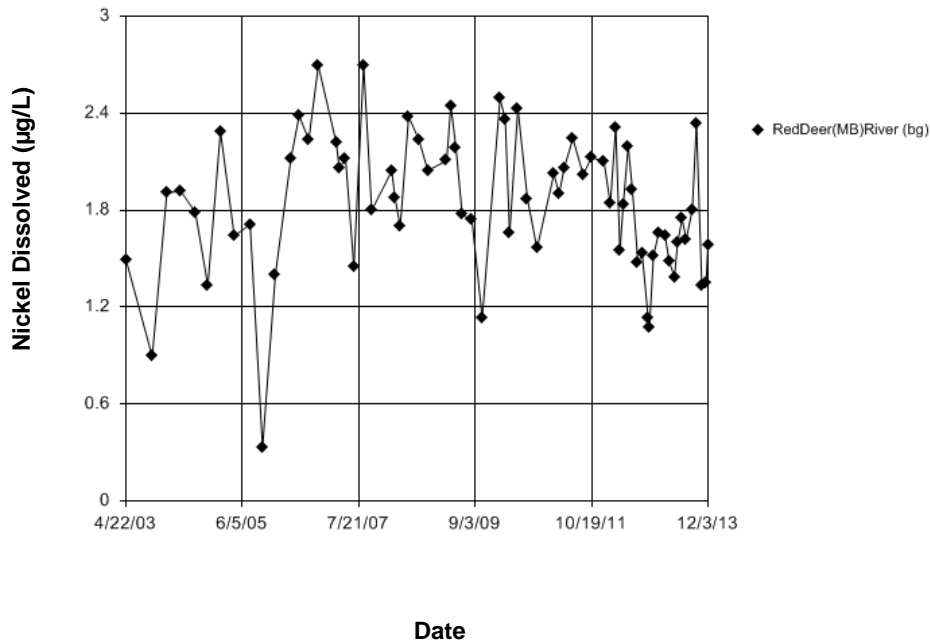


Figure E1276 Red Deer River (SK-MB): Nickel Dissolved

### Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.105  
 Tabulated Chi-Squared value = 3.841 with 3 degrees of freedom at the 5% significance level.  
 There were 4 groups of data in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 0.105  
 Adjusted Kruskal-Wallis statistic (H') = 0.105

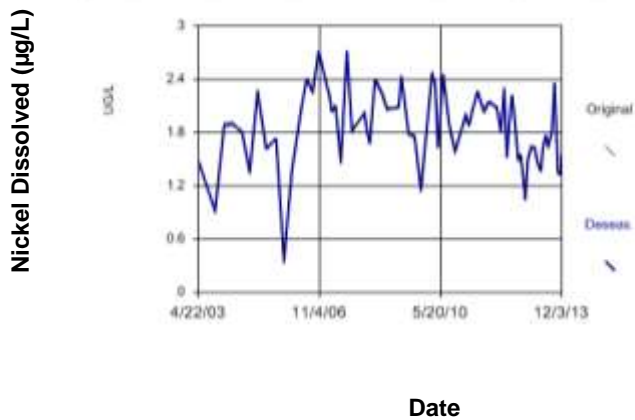


Figure E1277 Red Deer River (SK-MB): Nickel Dissolved

### Sen's Slope Estimator

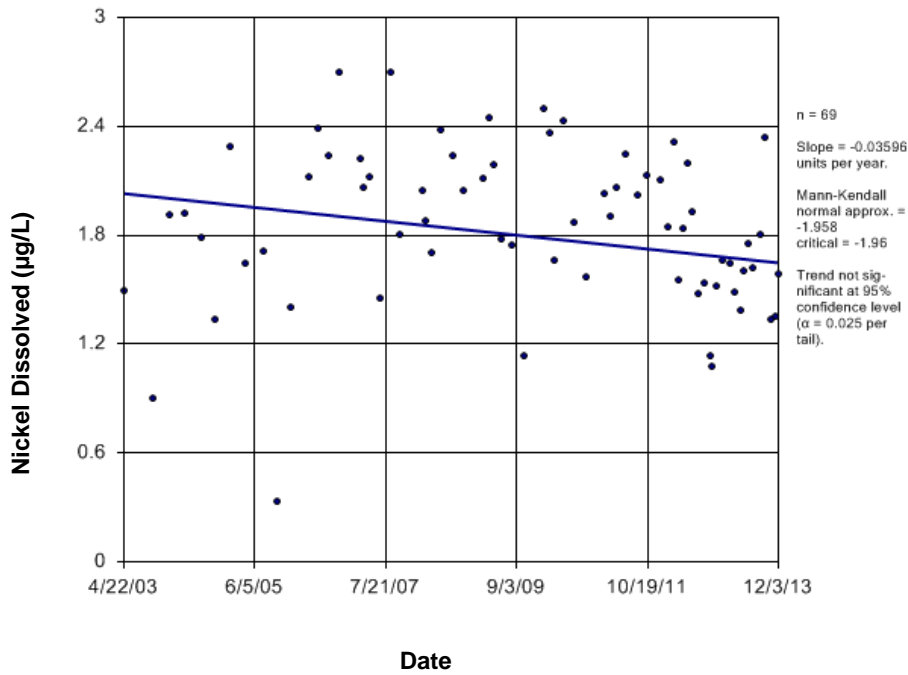


Figure E1278 Red Deer River (SK-MB): Nickel Dissolved

### Time Series

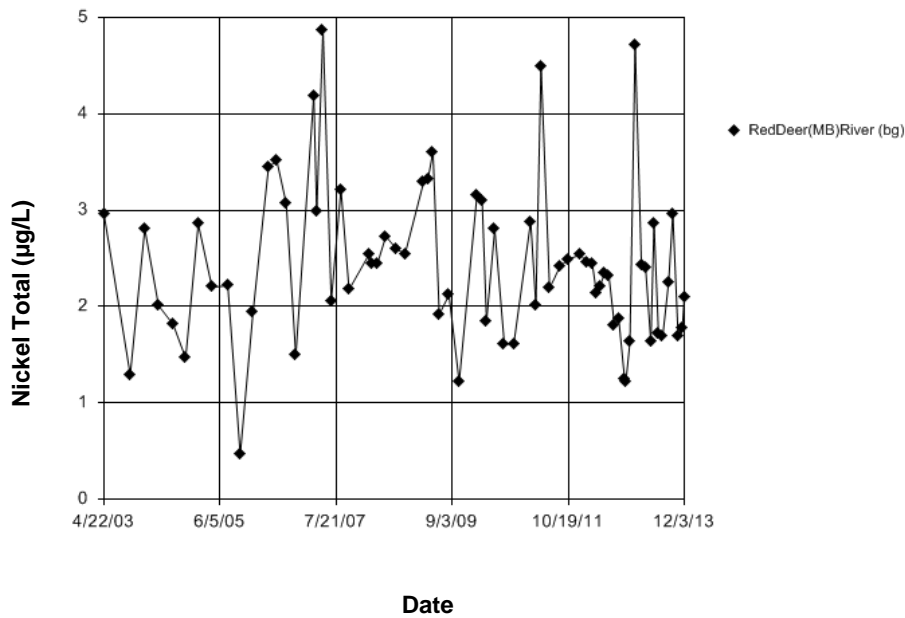
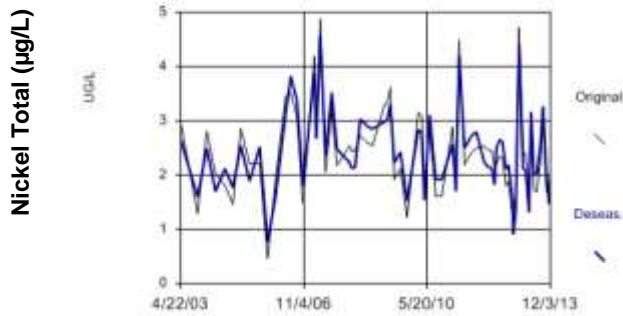


Figure E1279 Red Deer River (SK-MB): Nickel Total

# Seasonality

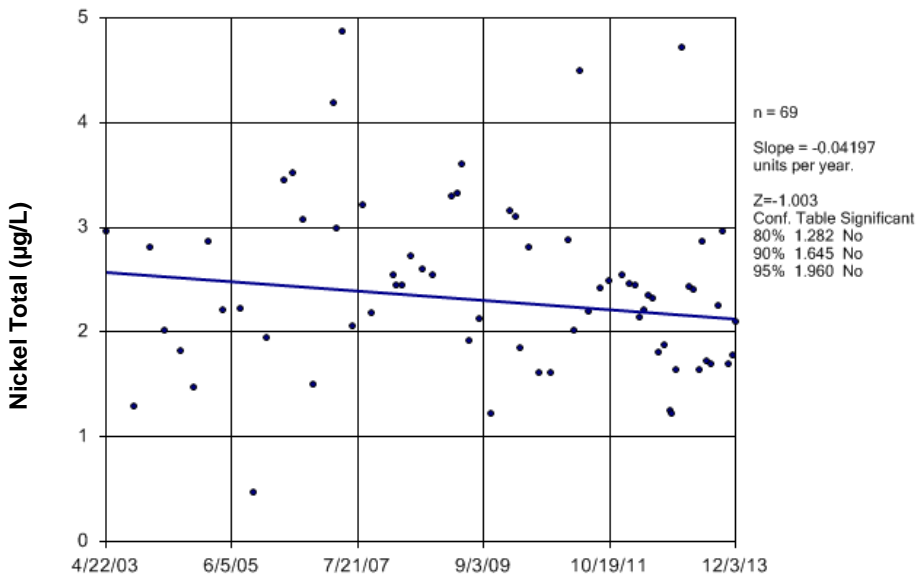
For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 8.437  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



Date

Figure E1280 Red Deer River (SK-MB): Nickel Total

# Seasonal Kendall



Date

Figure E1281 Red Deer River (SK-MB): Nickel Total



## Time Series

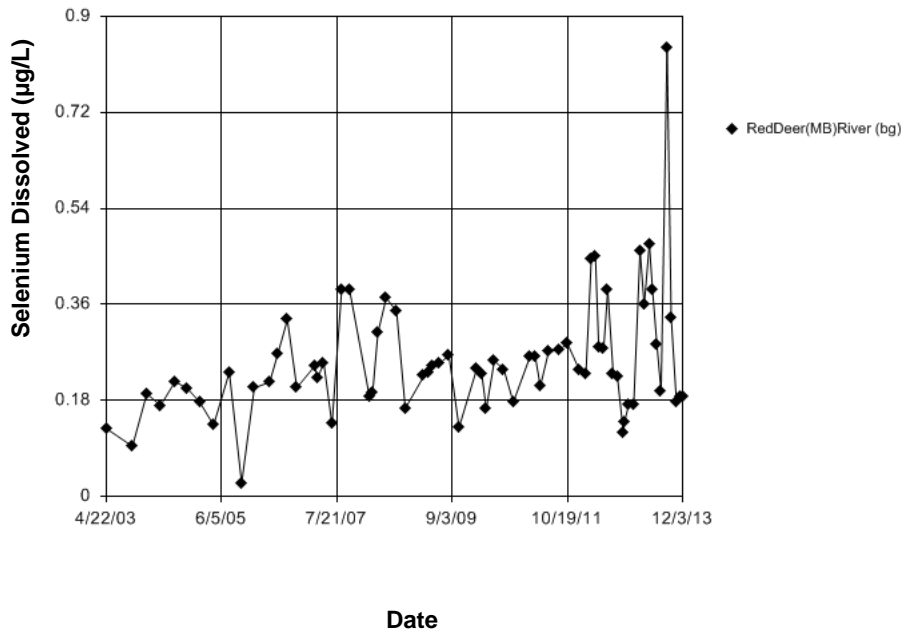


Figure E1282 Red Deer River (SK-MB): Selenium Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates **NO SEASONALITY** at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 1.68. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

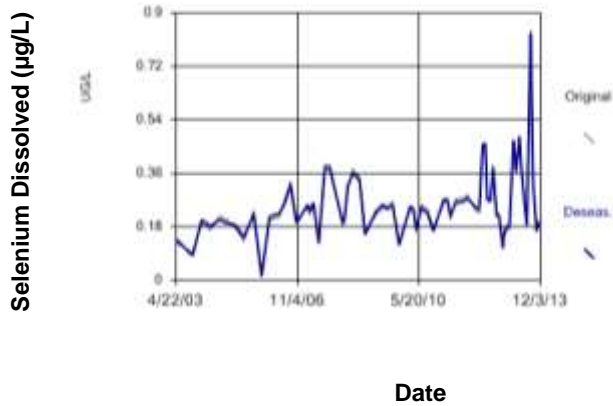


Figure E1283 Red Deer River (SK-MB): Selenium Dissolved

## Sen's Slope Estimator

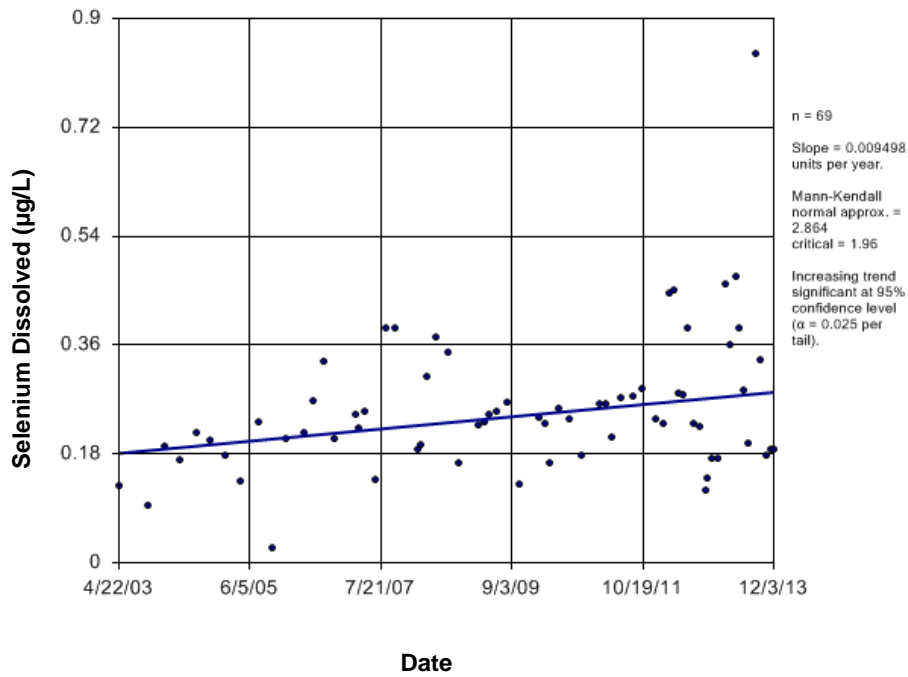


Figure E1284 Red Deer River (SK-MB): Selenium Dissolved

## Time Series

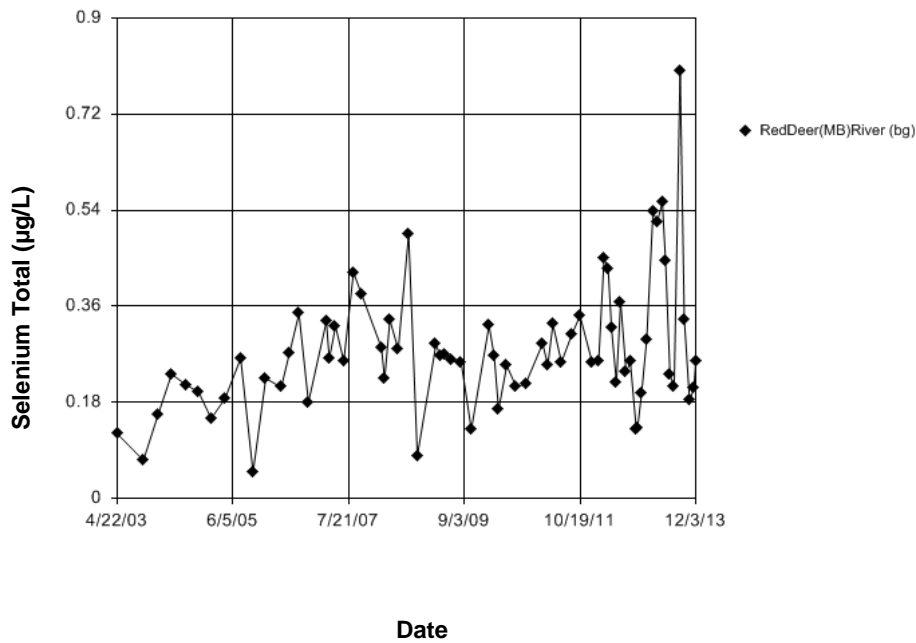
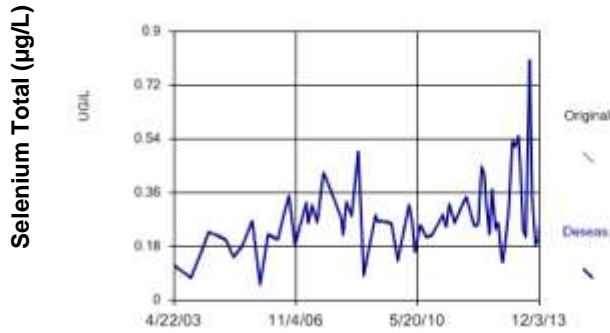


Figure E1285 Red Deer River (SK-MB): Selenium Total

# Seasonality

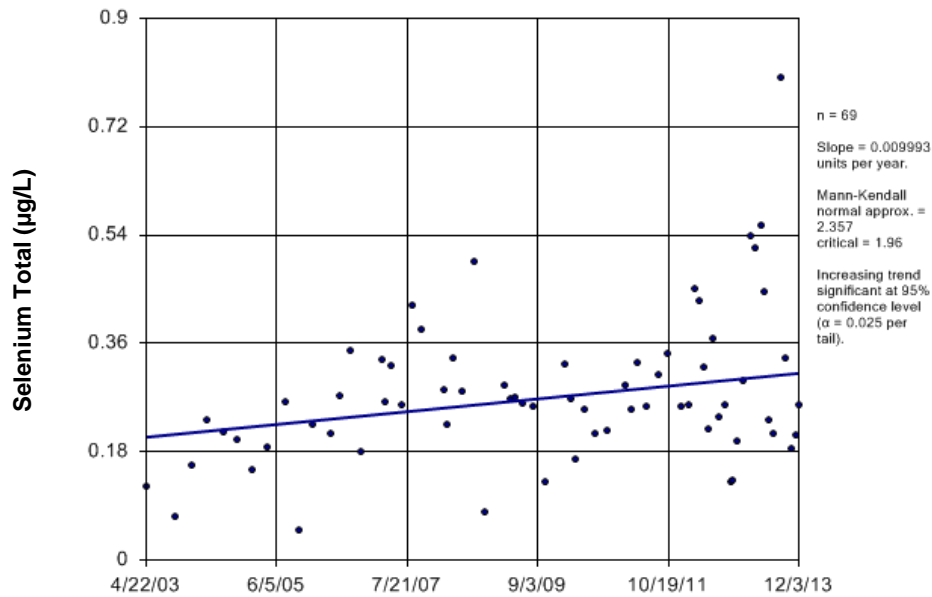
For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.3319. Tabulated Chi-Squared value = 3.841 with 3 degrees of freedom at the 5% significance level. There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



Date

Figure E1286 Red Deer River (SK-MB): Selenium Total

# Sen's Slope Estimator



Date

Figure E1287 Red Deer River (SK-MB): Selenium Total

## Time Series

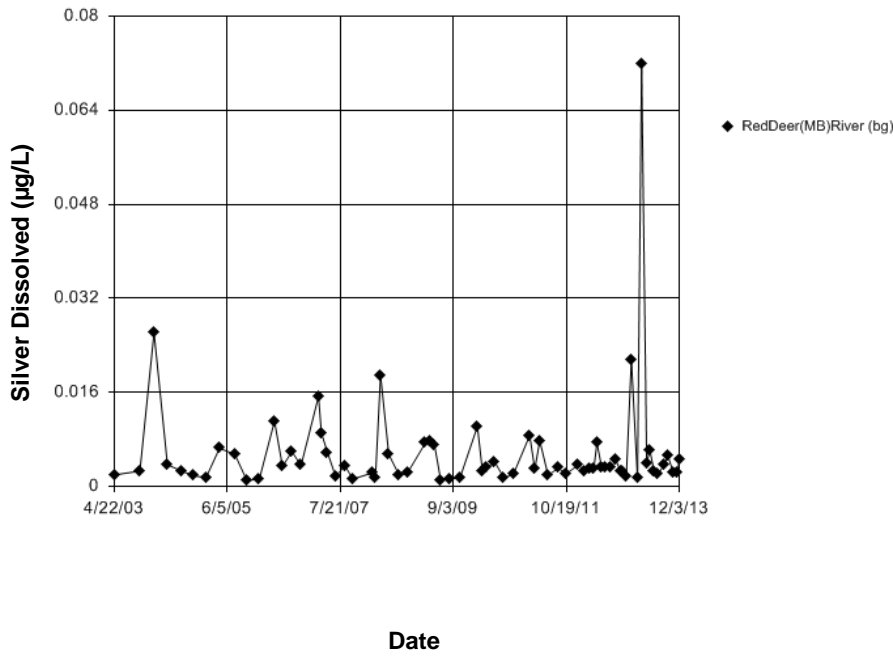


Figure E1288 Red Deer River (SK-MB): Silver Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 7.1. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 8 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

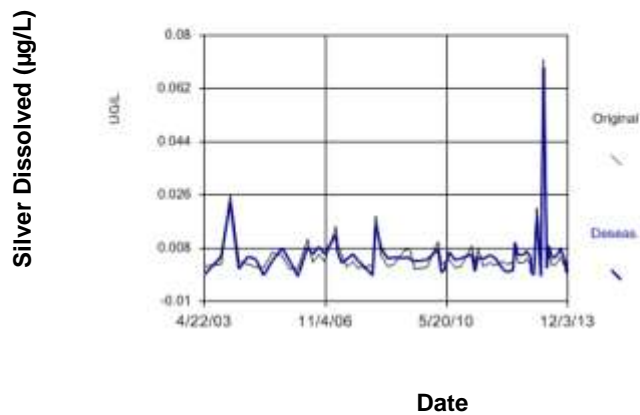


Figure E1289 Red Deer River (SK-MB): Silver Total

### Seasonal Kendall

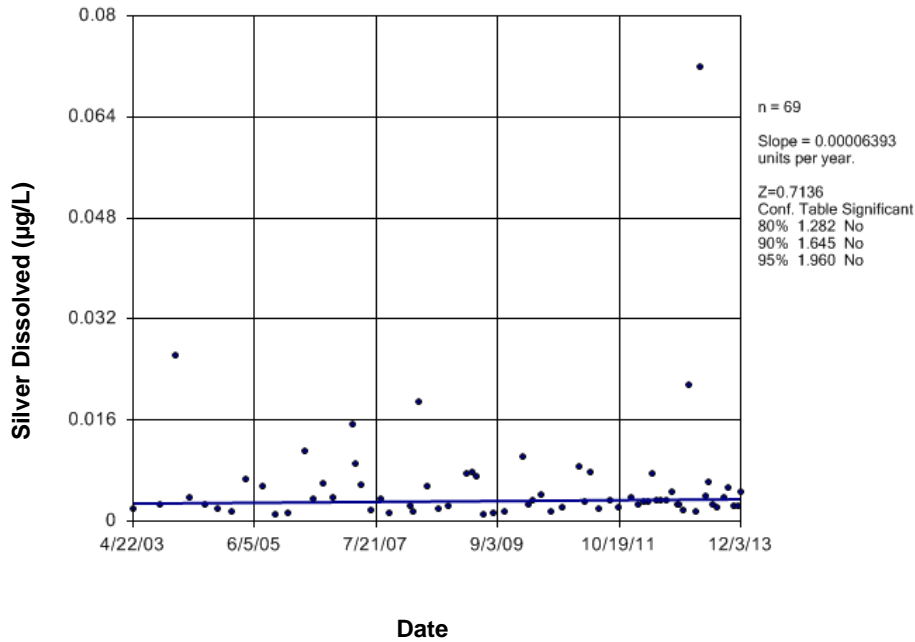


Figure E1290 Red Deer River (SK-MB): Silver Total

### Time Series

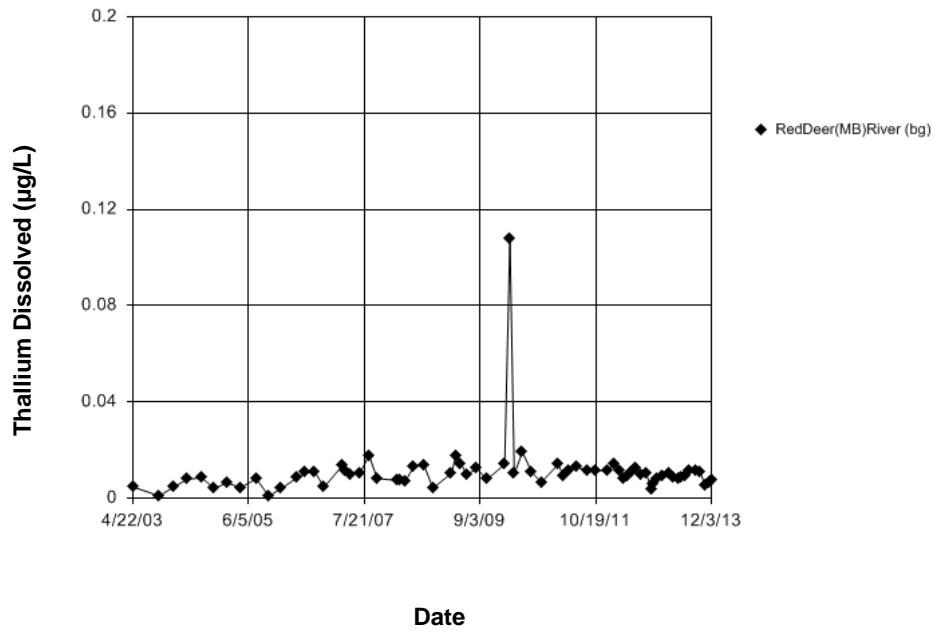


Figure E1291 Red Deer River (SK-MB): Thallium Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-Squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.1212  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

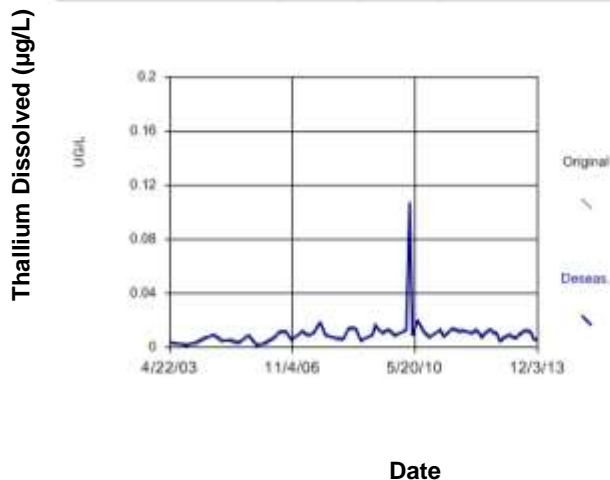


Figure E1292 Red Deer River (SK-MB): Thallium Dissolved

## Sen's Slope Estimator

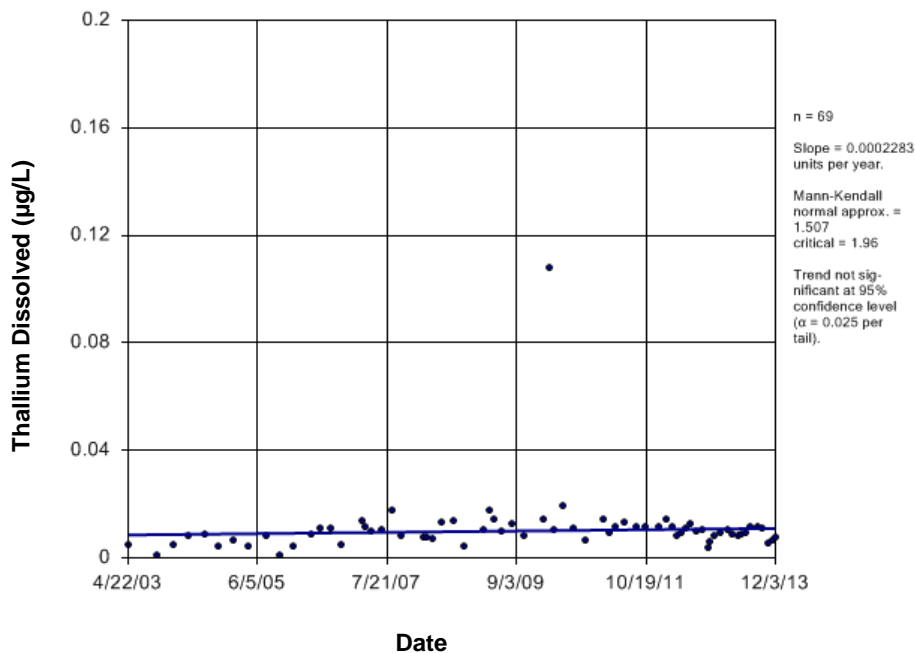


Figure E1293 Red Deer River (SK-MB): Thallium Dissolved

## Time Series

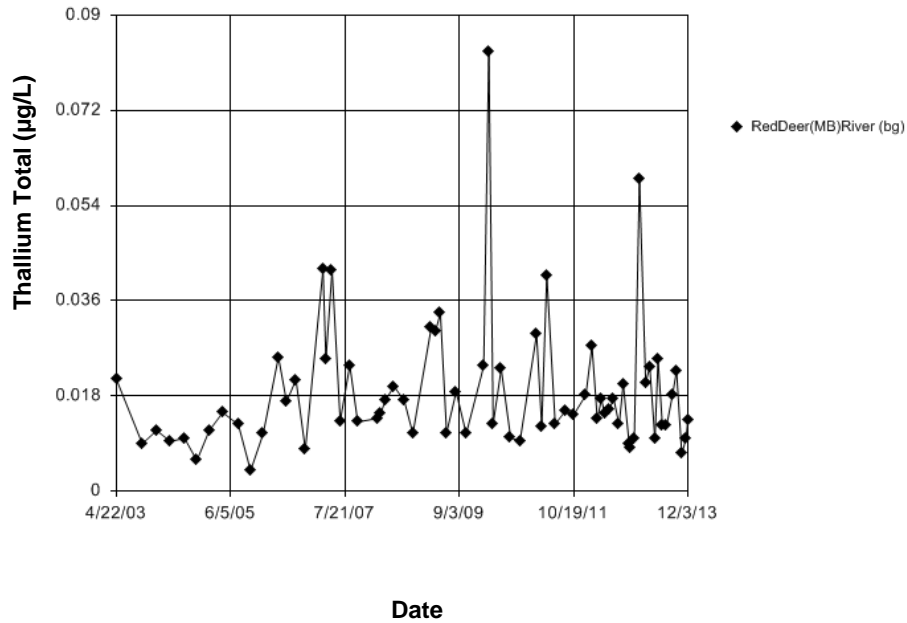


Figure E1294 Red Deer River (SK-MB): Thallium Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 4.972. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (D) was necessary.

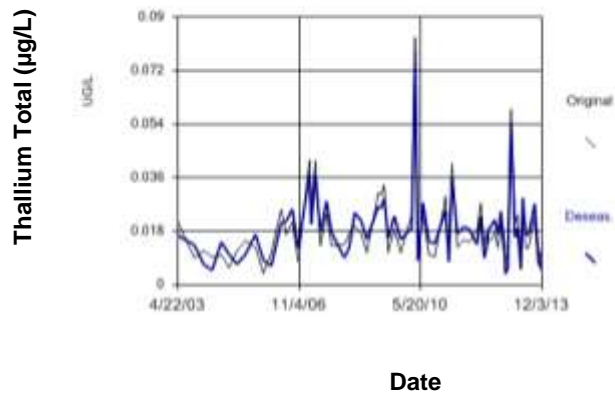


Figure E1295 Red Deer River (SK-MB): Thallium Total

### Seasonal Kendall

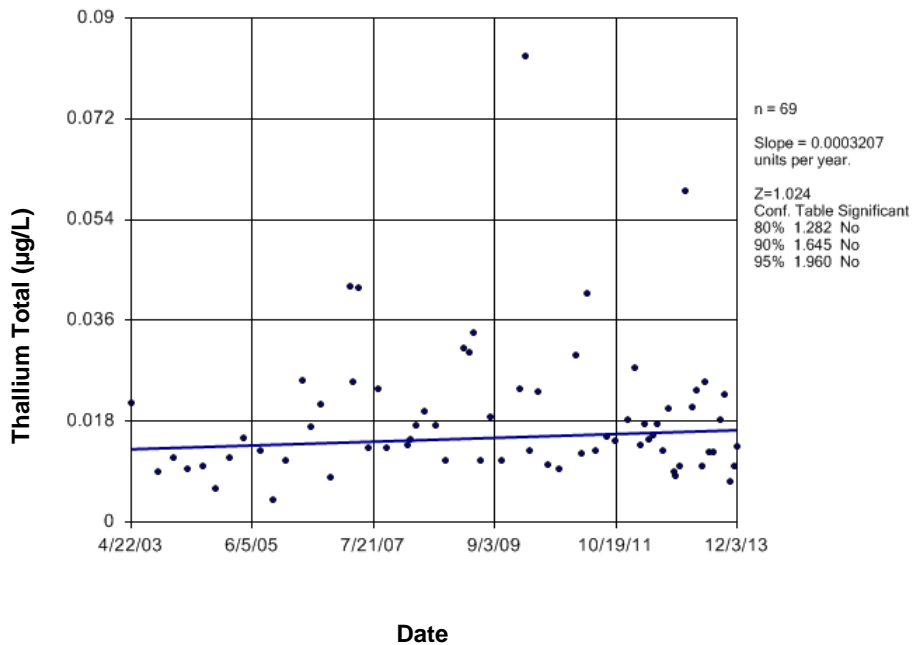


Figure E1296 Red Deer River (SK-MB): Thallium Total

### Time Series

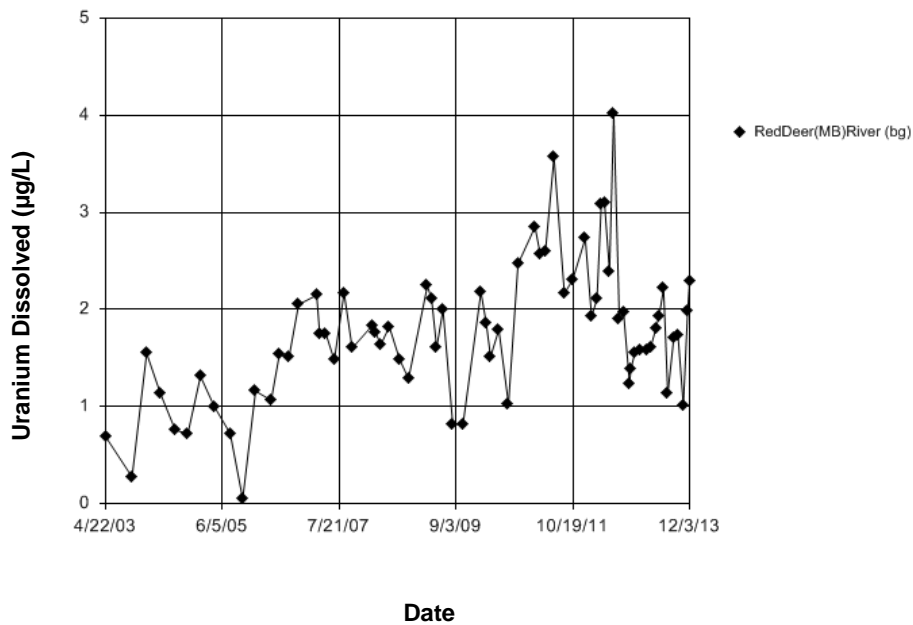


Figure E1297 Red Deer River (SK-MB): Uranium Dissolved



## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 1.041

Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.

There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.

Kruskal-Wallis statistic (H) = 1.041

Adjusted Kruskal-Wallis statistic (H') = 1.041

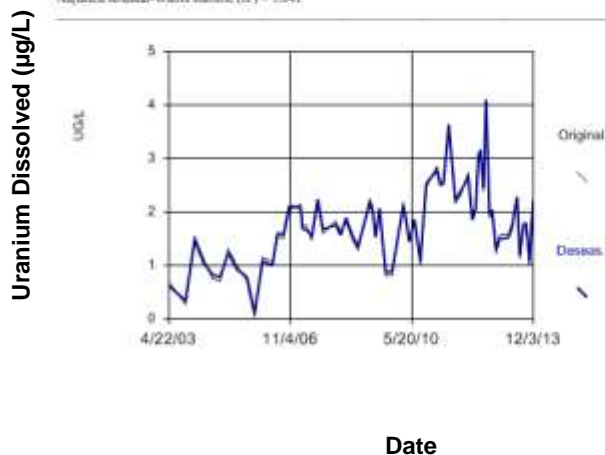


Figure E1298 Red Deer River (SK-MB): Uranium Dissolved

## Sen's Slope Estimator

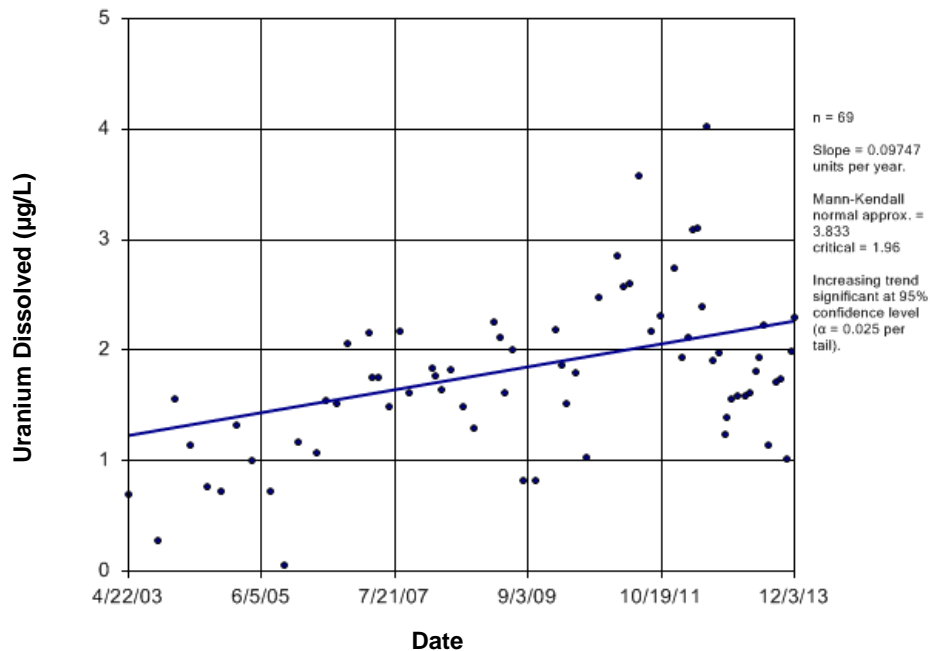
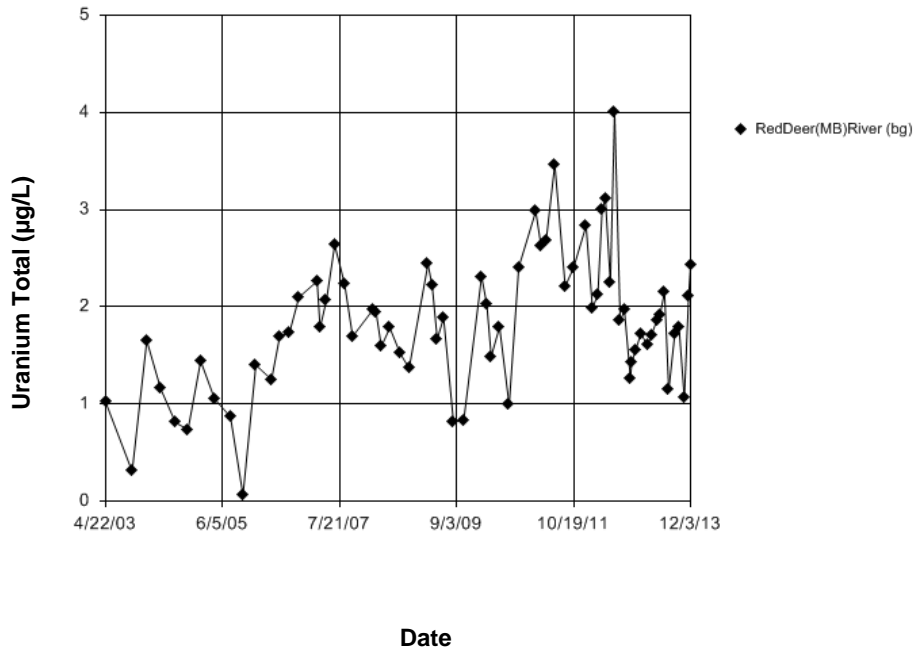


Figure E1299 Red Deer River (SK-MB): Uranium Dissolved

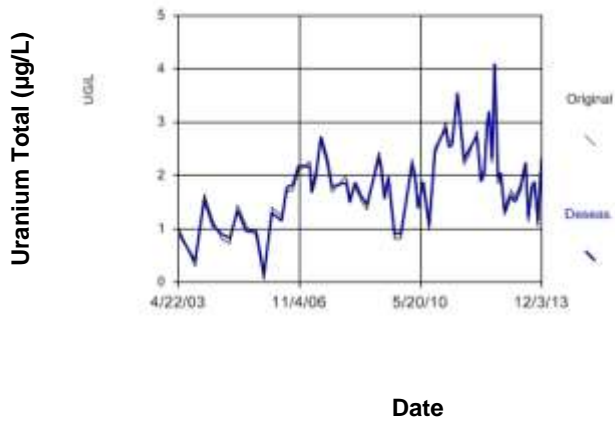
### Time Series



**Figure E1300 Red Deer River (SK-MB): Uranium Total**

### Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 1.412. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 4 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



**Figure E1301 Red Deer River (SK-MB): Uranium Total**

## Sen's Slope Estimator

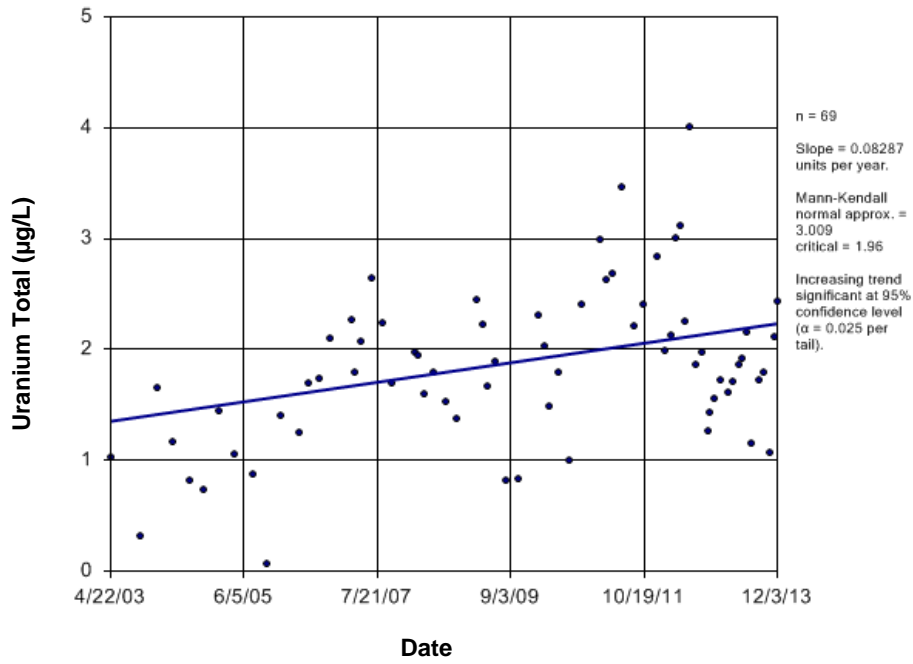


Figure E1302 Red Deer River (SK-MB): Uranium Total

## Time Series

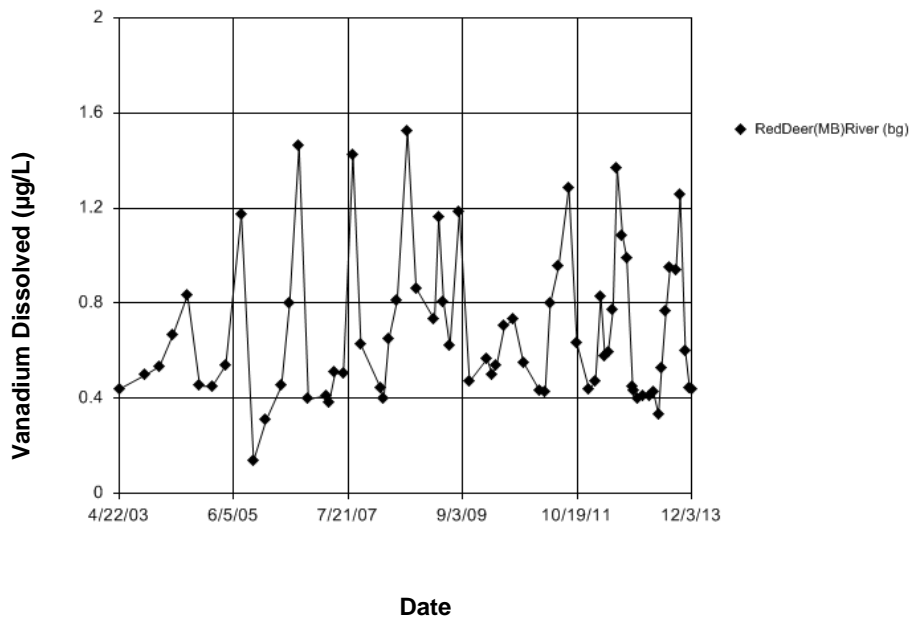
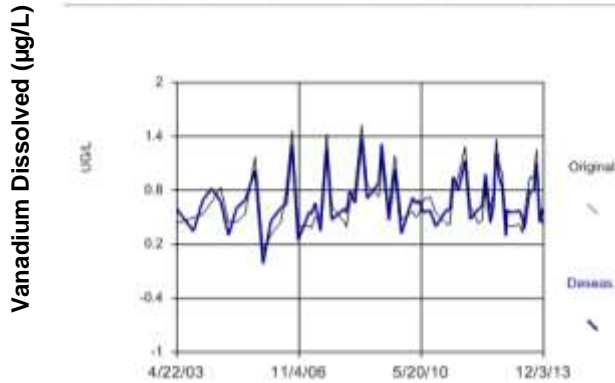


Figure E1303 Red Deer River (SK-MB): Vanadium Dissolved

## Seasonality

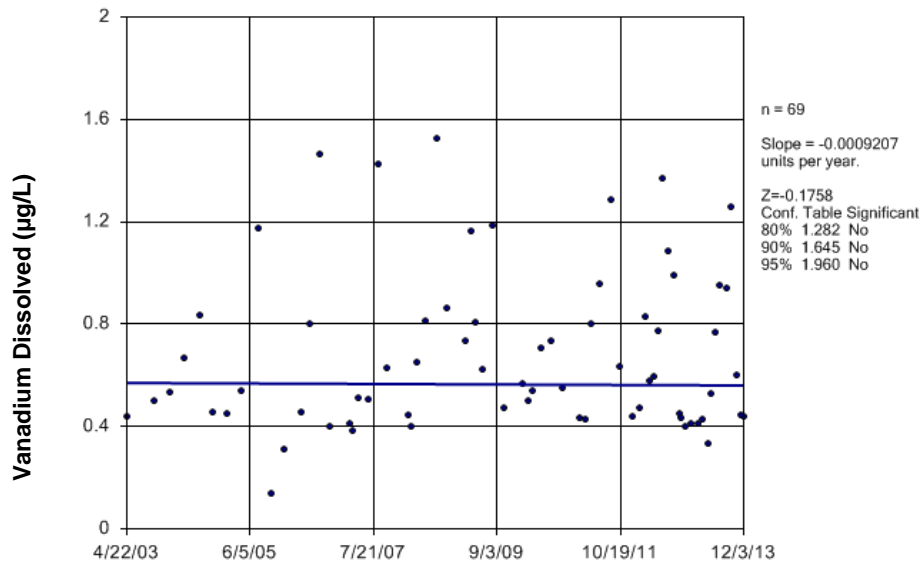
For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 19.72. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 2 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



Date

Figure E1304 Red Deer River (SK-MB): Vanadium Dissolved

## Seasonal Kendall



Date

Figure E1305 Red Deer River (SK-MB): Vanadium Dissolved

## Time Series

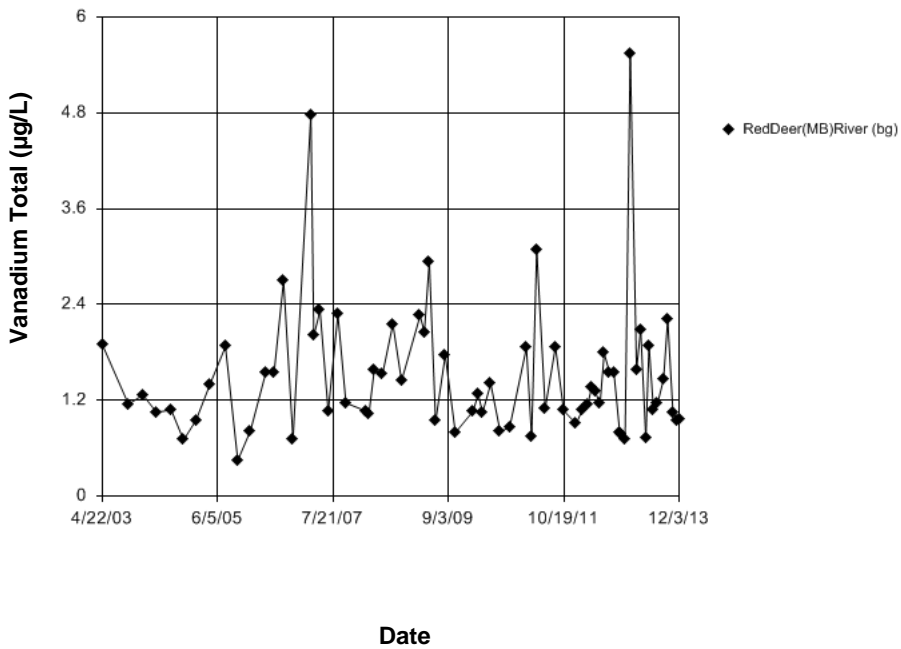


Figure E1306 Red Deer River (SK-MB): Vanadium Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.1617  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 0.1617  
 Adjusted Kruskal-Wallis statistic (H') = 0.1617

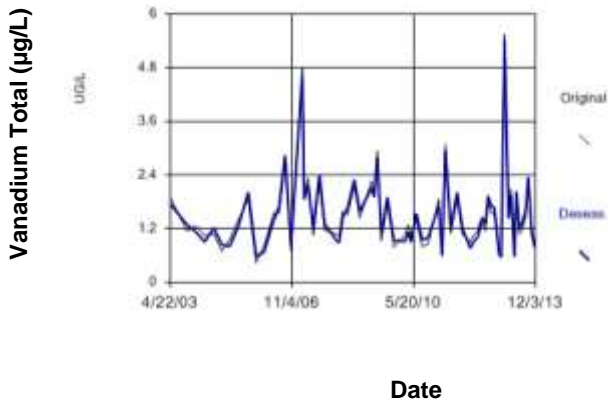


Figure E1307 Red Deer River (SK-MB): Vanadium Total

### Sen's Slope Estimator

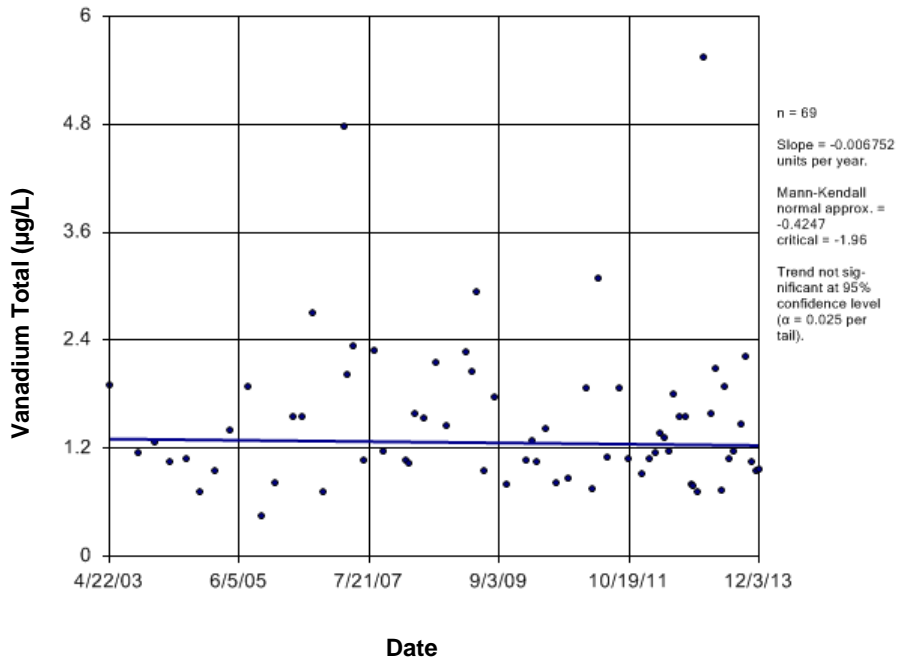


Figure E1308 Red Deer River (SK-MB): Vanadium Total

### Time Series

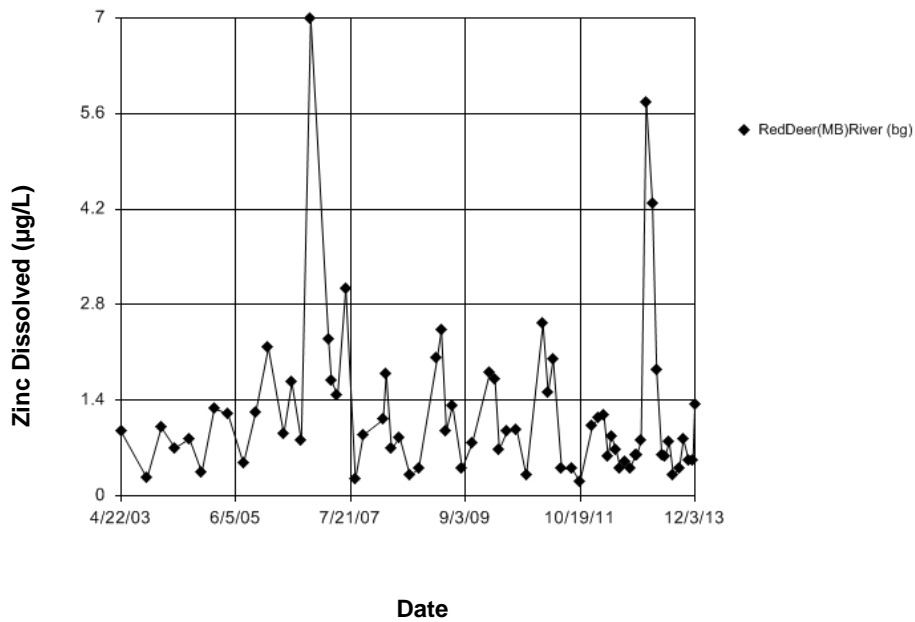
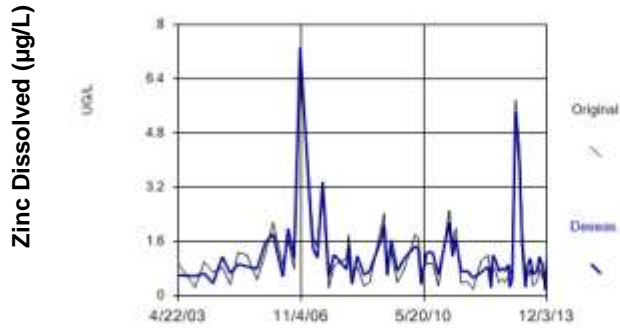


Figure E1309 Red Deer River (SK-MB): Zinc Dissolved

## Seasonality

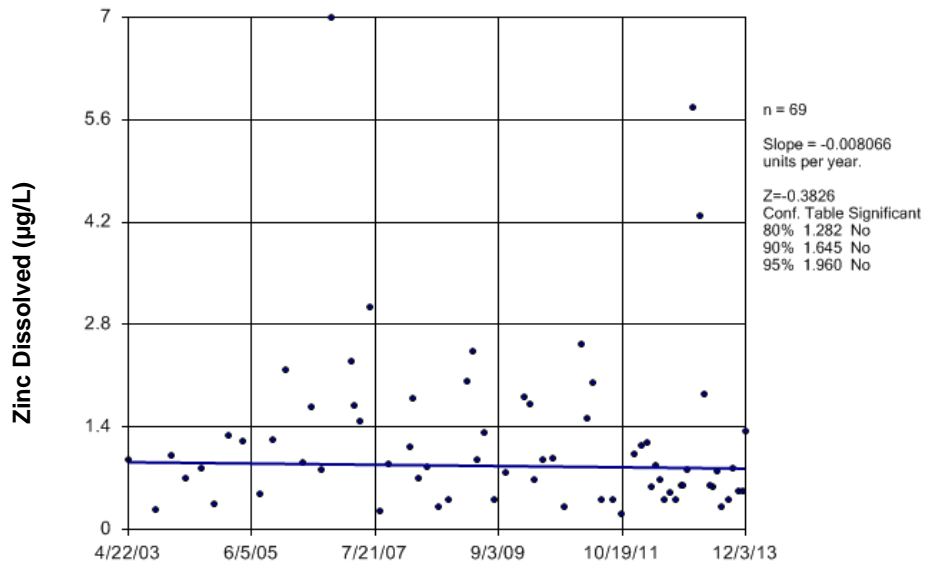
For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 21.13  
Tabulated Chi-Squared value = 3.841 with 3 degrees of freedom at the 5% significance level.  
There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



Date

Figure E1310 Red Deer River (SK-MB): Zinc Dissolved

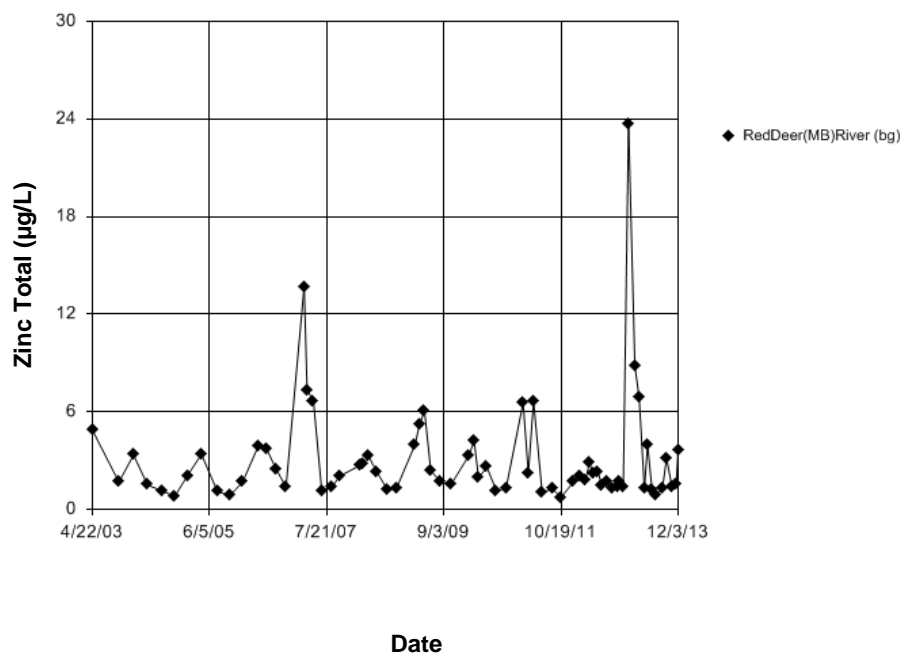
## Seasonal Kendall



Date

Figure E1311 Red Deer River (SK-MB): Zinc Dissolved

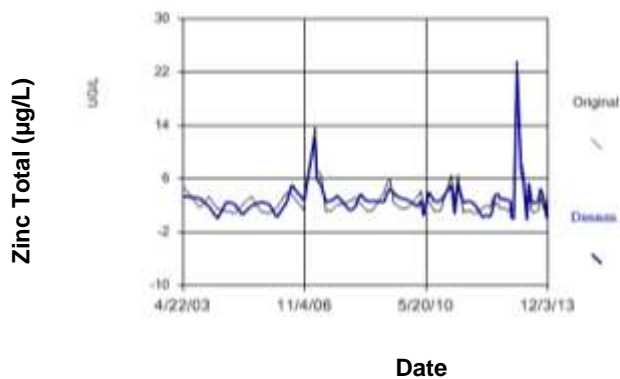
## Time Series



**Figure E1312 Red Deer River (SK-MB): Zinc Total**

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 27.13. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



**Figure E1313 Red Deer River (SK-MB): Zinc Total**



# Seasonal Kendall

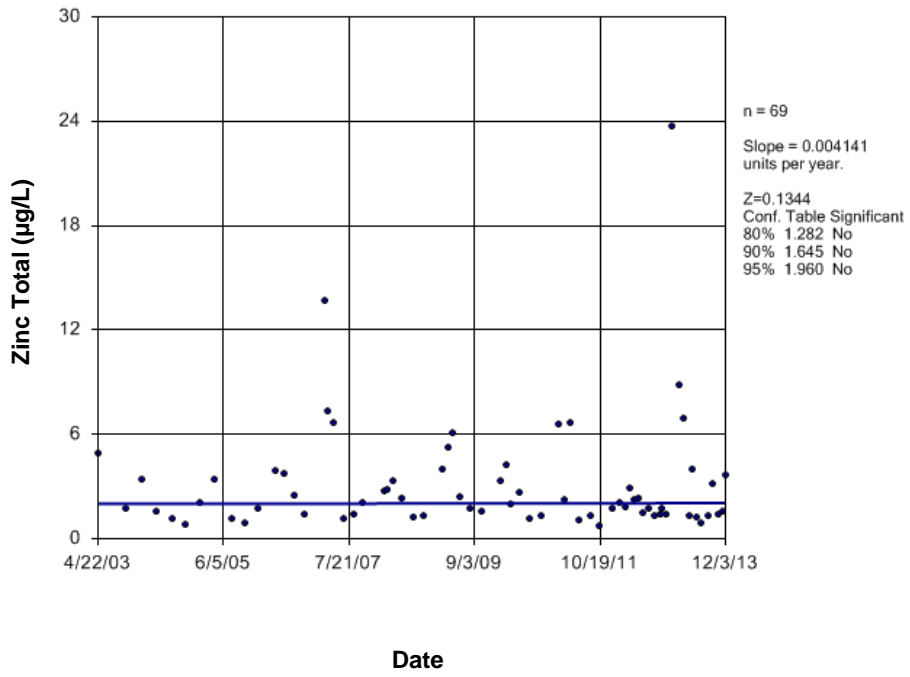


Figure E1314 Red Deer River (SK-MB): Zinc Total

### Time Series

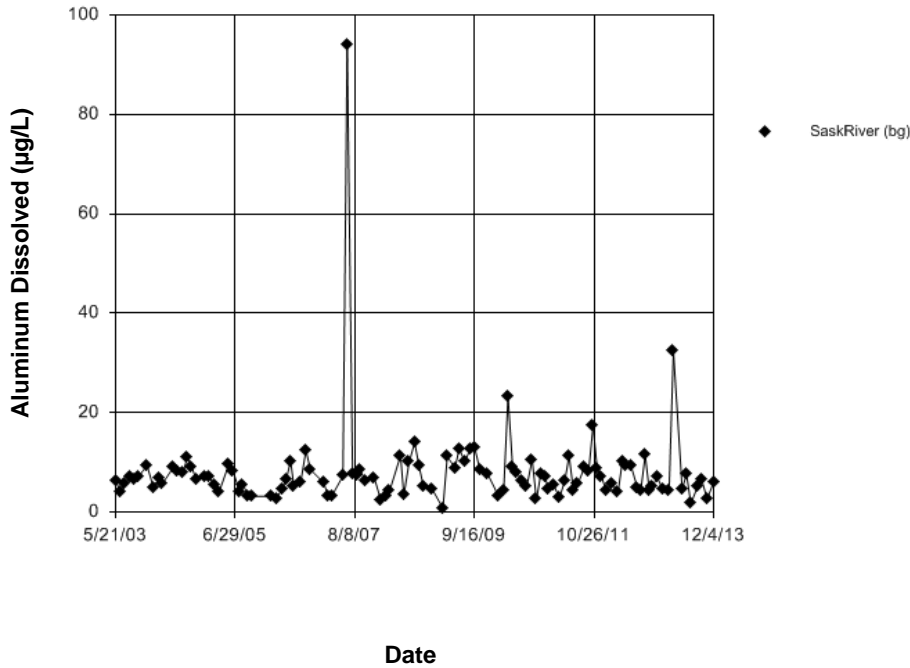


Figure E1315 Saskatchewan River: Aluminum Dissolved

### Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 13.82. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal. Kruskal-Wallis statistic (H) = 13.82. Adjusted Kruskal-Wallis statistic (H') = 13.82.

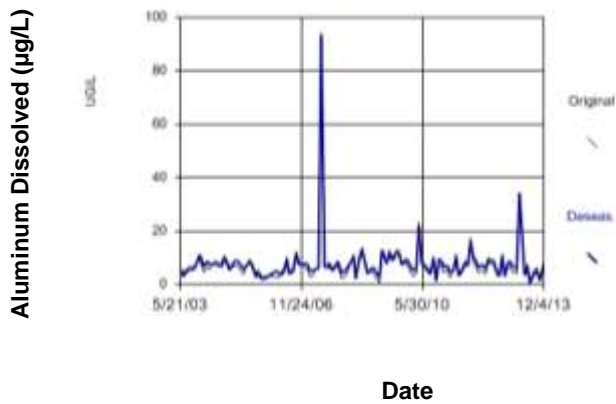


Figure E1316 Saskatchewan River: Aluminum Dissolved

### Seasonal Kendall

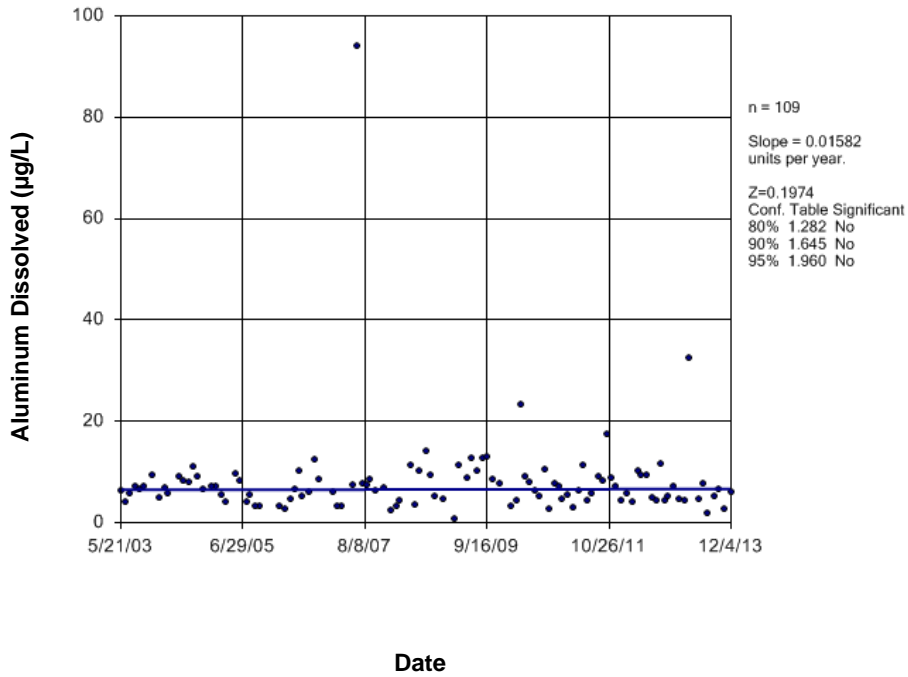


Figure E1317 Saskatchewan River: Aluminum Dissolved

### Time Series

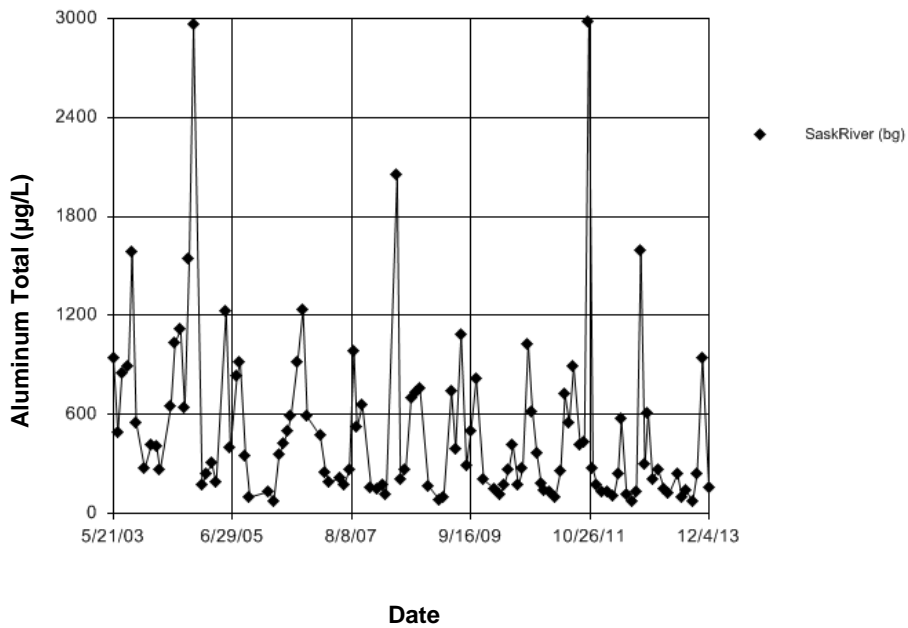
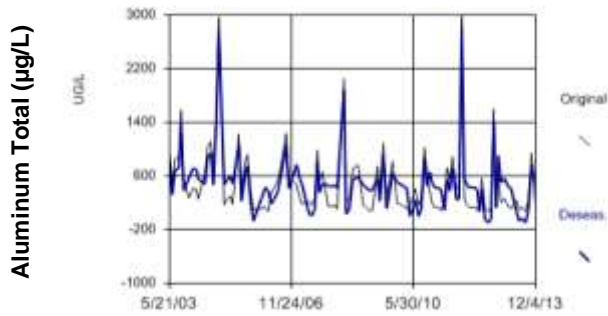


Figure E1318 Saskatchewan River: Aluminum Total

# Seasonality

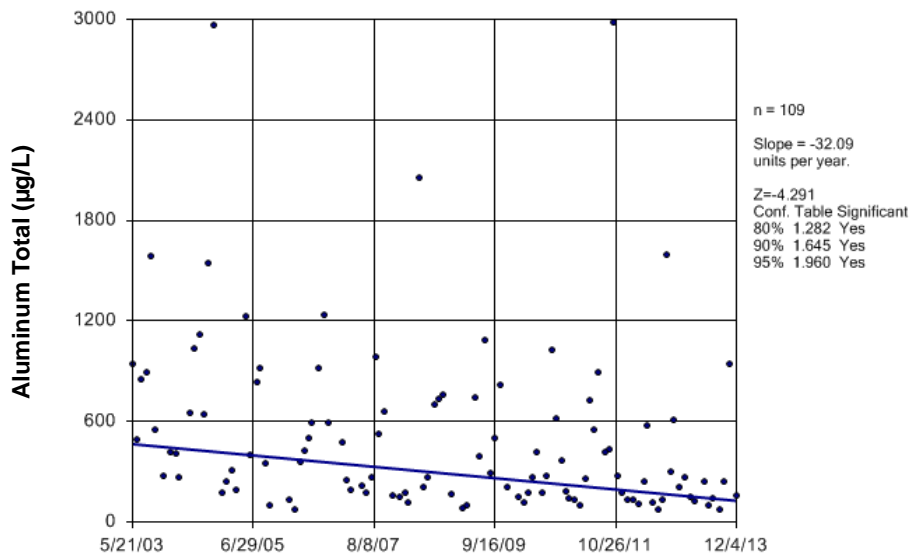
For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 9% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 33.75  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



Date

Figure E1319 Saskatchewan River: Aluminum Total

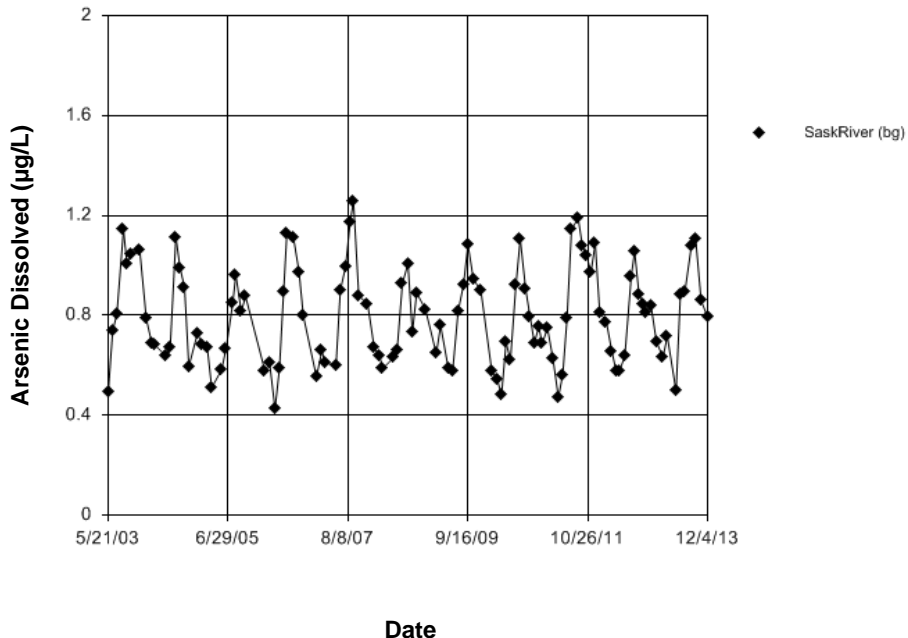
# Seasonal Kendall



Date

Figure E1320 Saskatchewan River: Aluminum Total

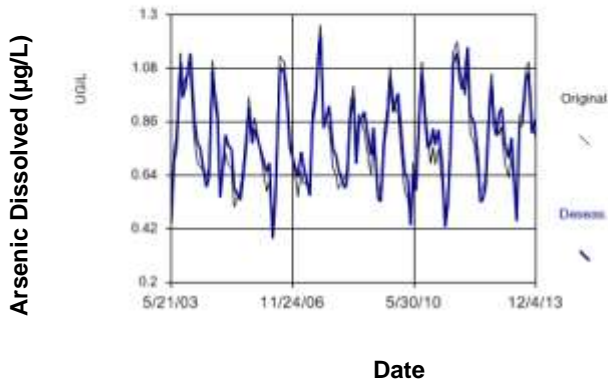
### Time Series



**Figure E1321 Saskatchewan River: Arsenic Dissolved**

### Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.  
 Calculated Kruskal-Wallis statistic = 9.438  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H<sub>1</sub>) was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H<sub>1</sub>) = 9.438  
 Adjusted Kruskal-Wallis statistic (H<sub>1</sub>) = 9.438



**Figure E1322 Saskatchewan River: Arsenic Dissolved**

### Seasonal Kendall

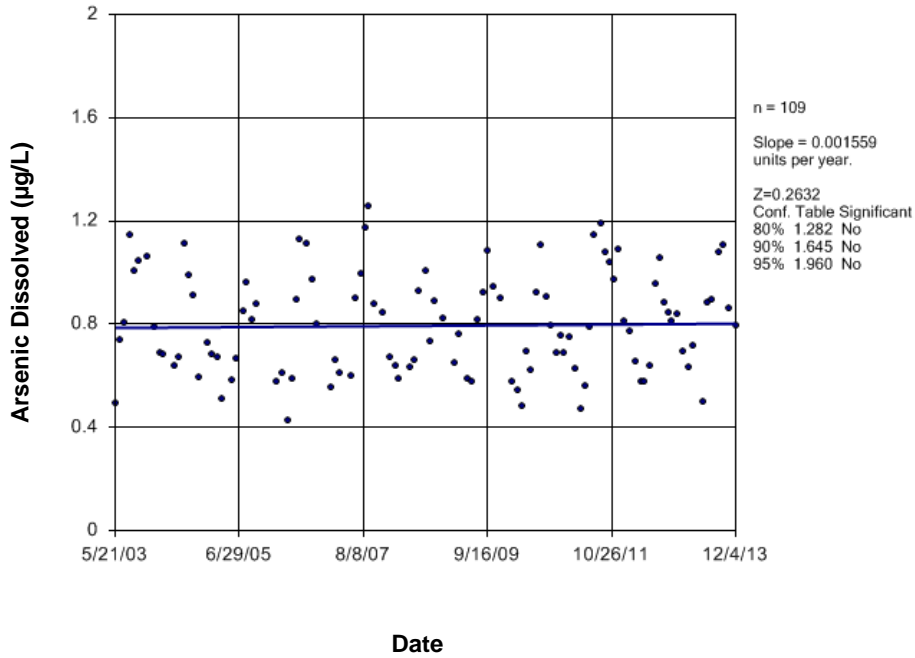


Figure E1323 Saskatchewan River: Arsenic Dissolved

### Time Series

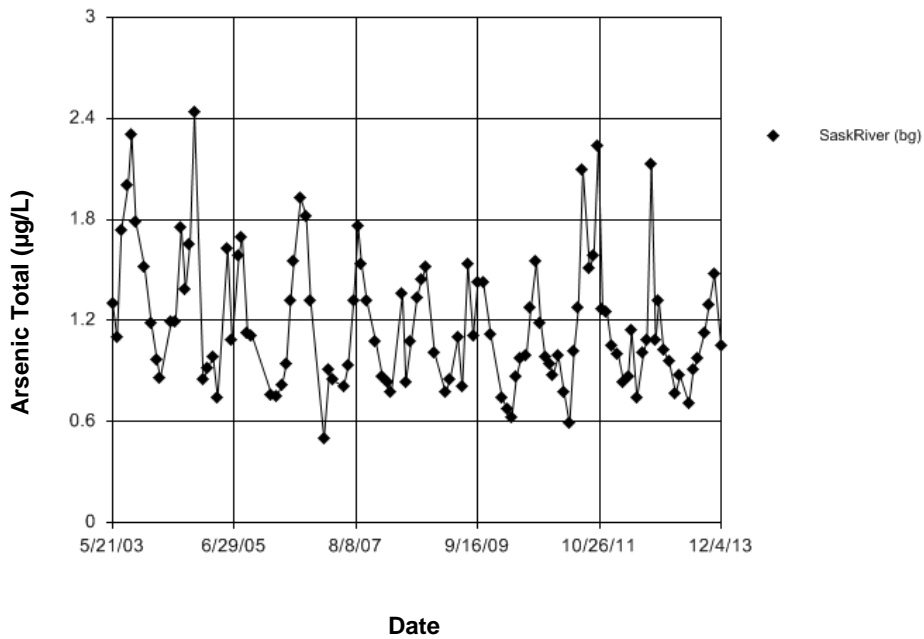
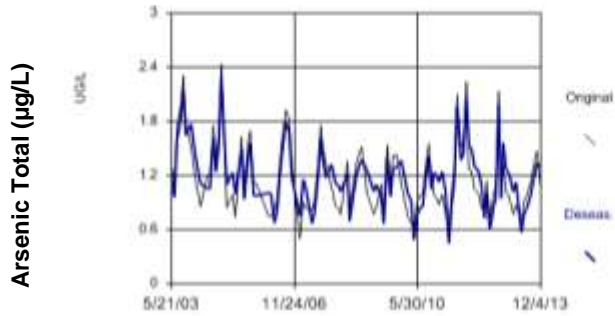


Figure E1324 Saskatchewan River: Arsenic Total

## Seasonality

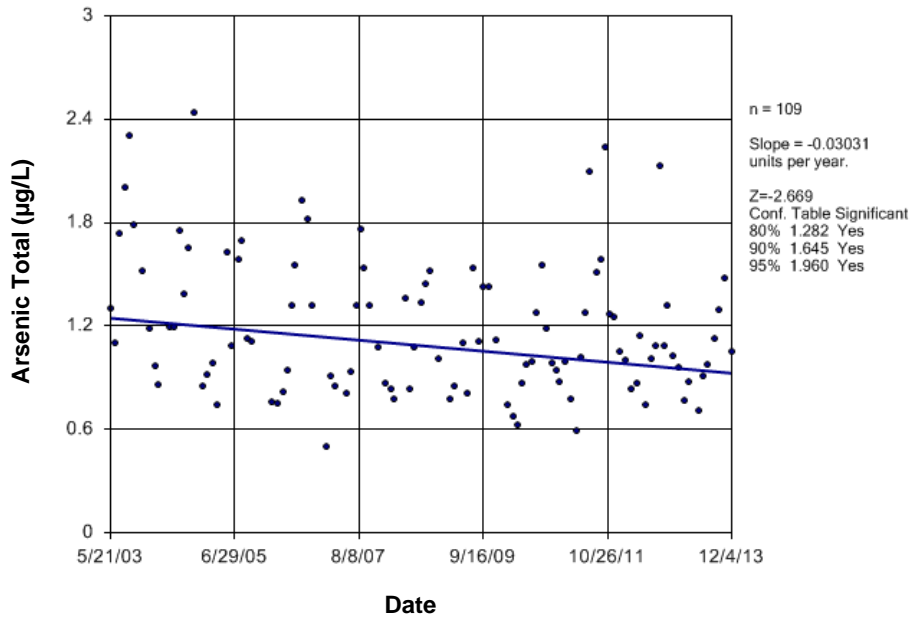
For the data shown, the Kruskal-Wallis test indicates **SEASONALITY** at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 28.43  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 28.43  
 Adjusted Kruskal-Wallis statistic (H') = 28.43



Date

**Figure E1325 Saskatchewan River: Arsenic Total**

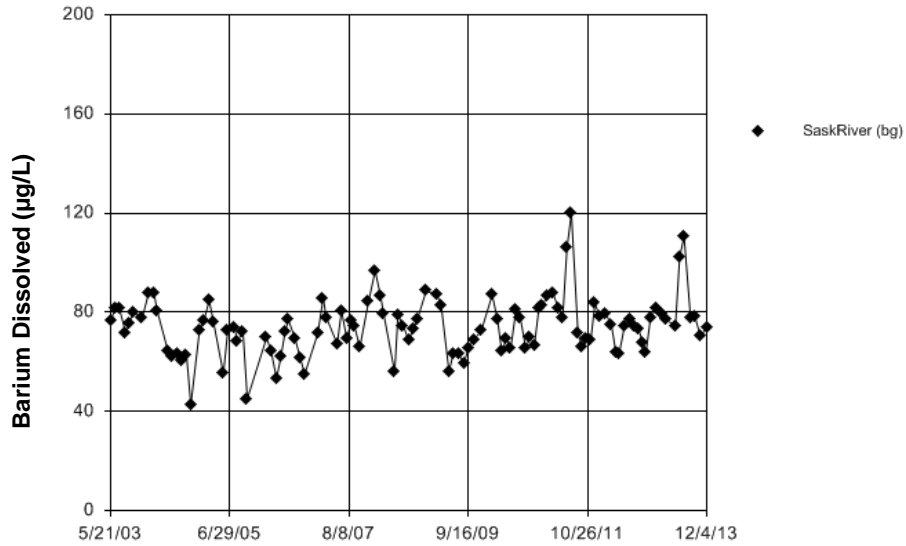
## Seasonal Kendall



Date

**Figure E1326 Saskatchewan River: Arsenic Total**

## Time Series

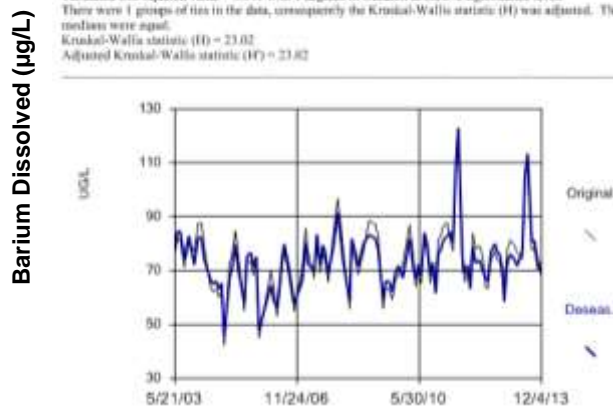


Date

Figure E1327 Saskatchewan River: Barium Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 23.02  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H<sub>adj</sub>) was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 23.02  
 Adjusted Kruskal-Wallis statistic (H<sub>adj</sub>) = 23.82



Date

Figure E1328 Saskatchewan River: Barium Dissolved



### Seasonal Kendall

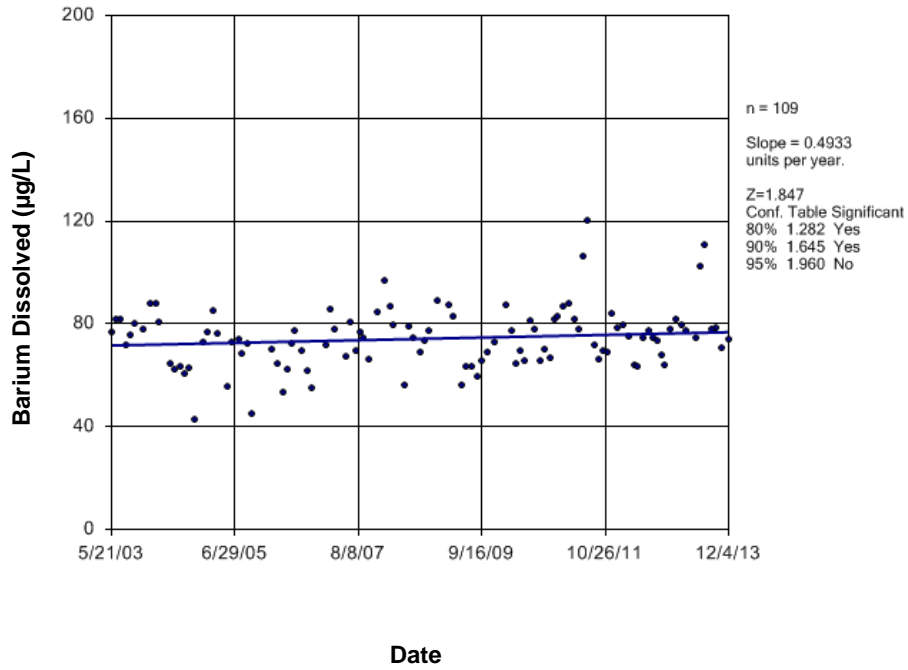


Figure E1329 Saskatchewan River: Barium Dissolved

### Time Series

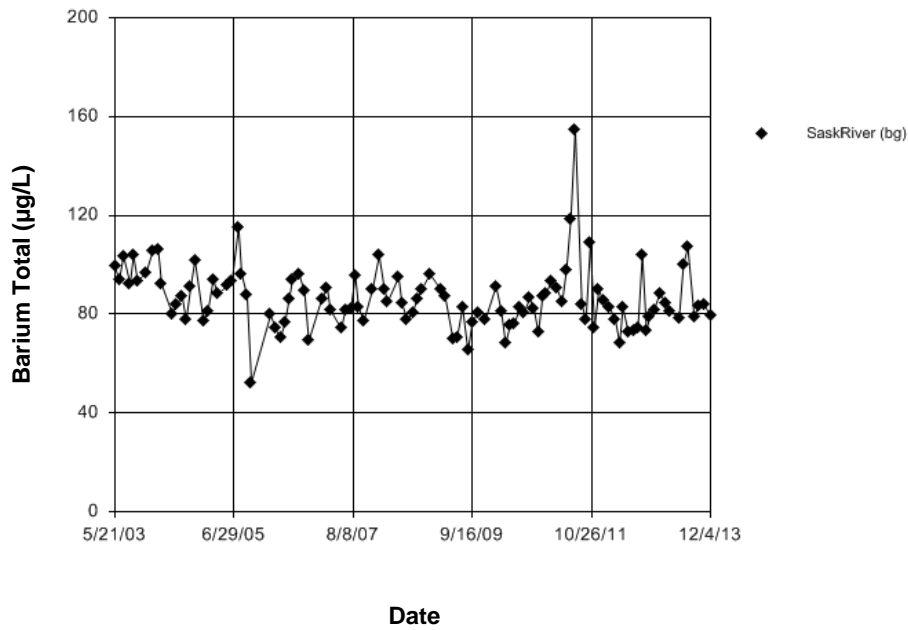


Figure E1330 Saskatchewan River: Barium Total

# Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.6805  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
Kruskal-Wallis statistic (H) = 0.6805  
Adjusted Kruskal-Wallis statistic (H') = 0.6805

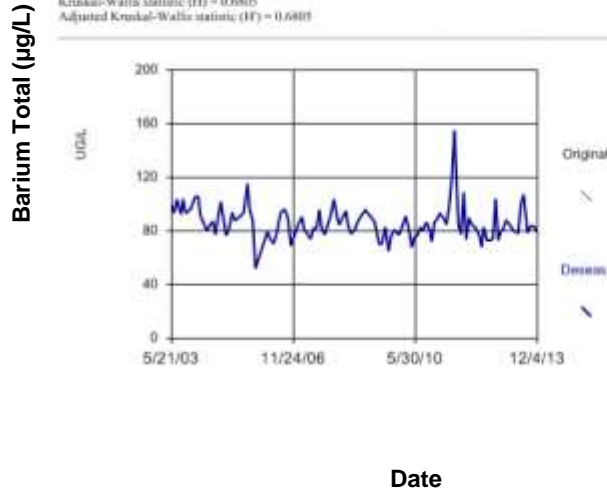


Figure E1331 Saskatchewan River: Barium Total

# Sen's Slope Estimator

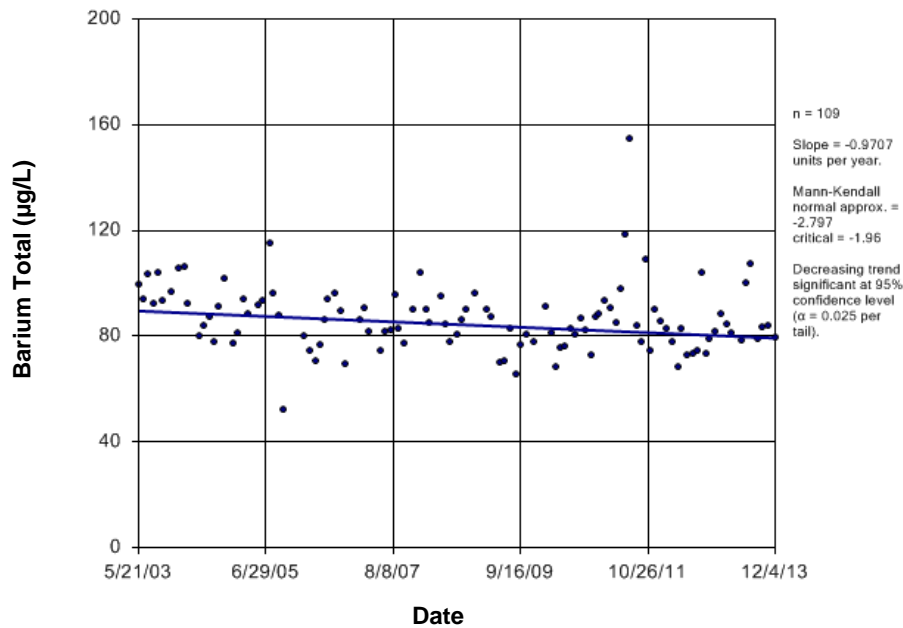


Figure E1332 Saskatchewan River: Barium Total

## Time Series

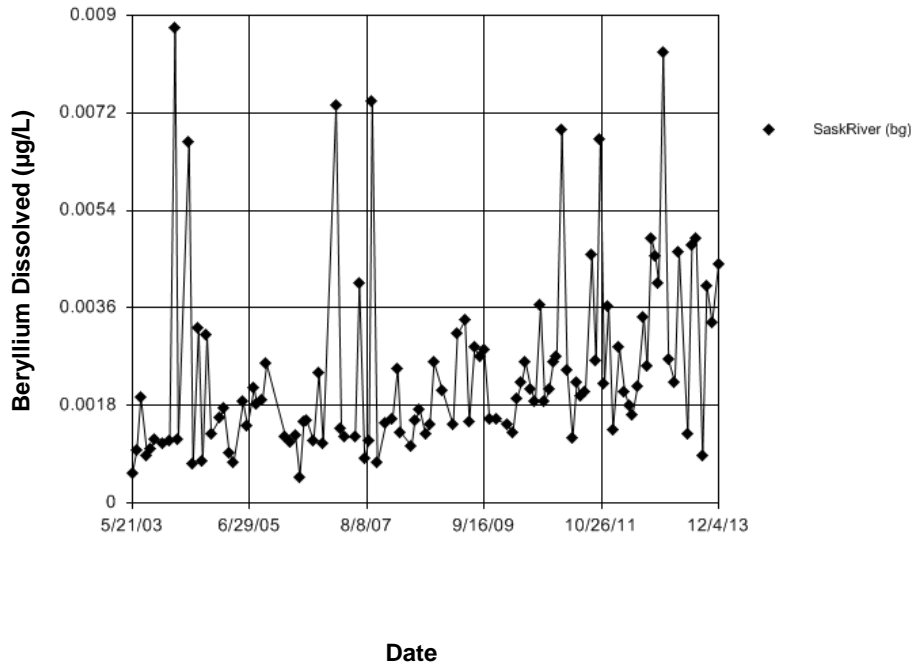


Figure E1333 Saskatchewan River: Beryllium Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates **NO SEASONALITY** at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.2786. Calculated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal. Kruskal-Wallis statistic (H) = 0.2786. Adjusted Kruskal-Wallis statistic (H') = 0.2786.

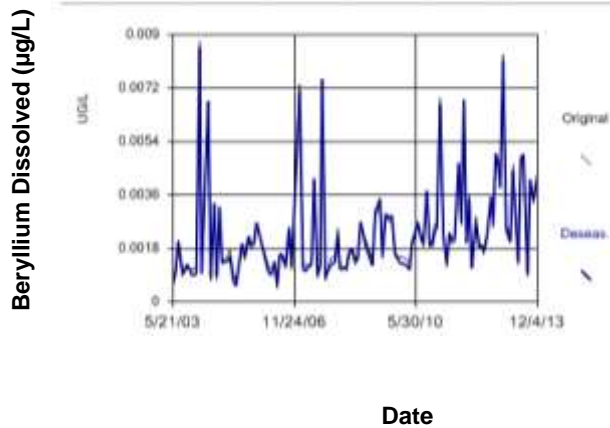


Figure E1334 Saskatchewan River: Beryllium Dissolved

## Sen's Slope Estimator

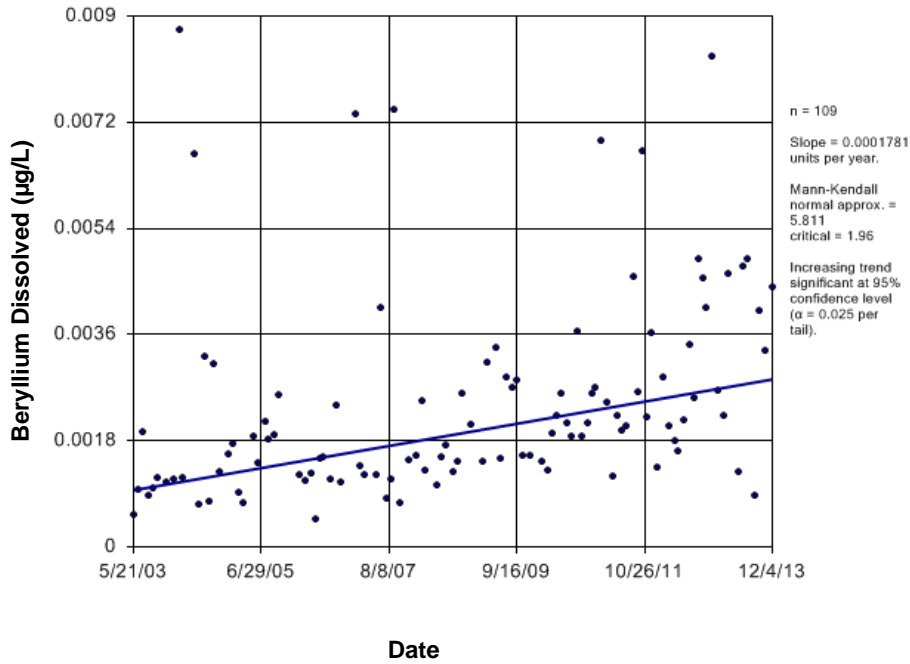


Figure E1335 Saskatchewan River: Beryllium Dissolved

## Time Series

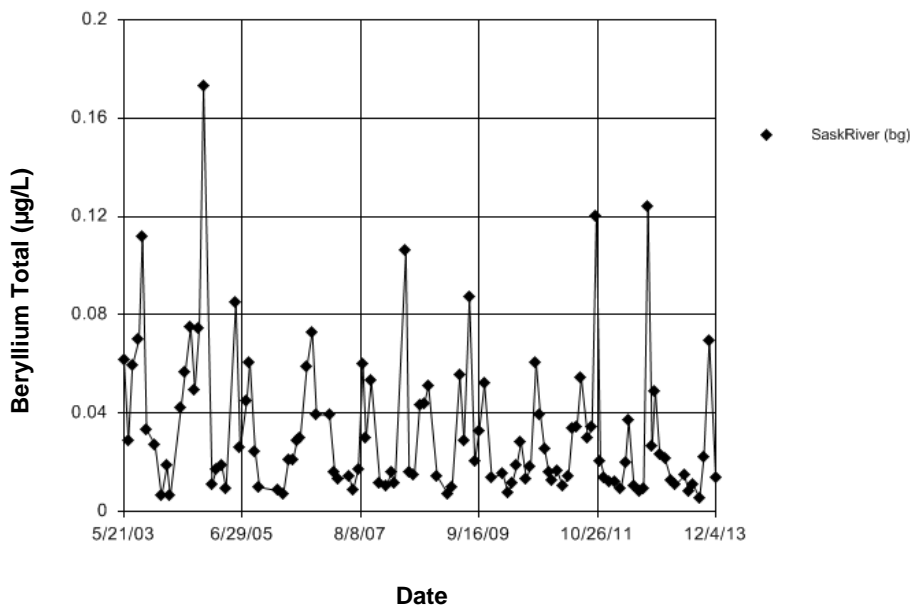
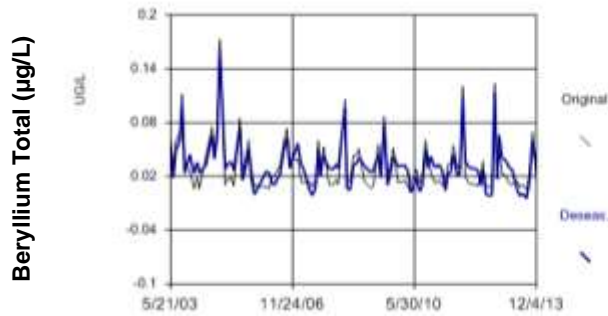


Figure E1336 Saskatchewan River: Beryllium Total

## Seasonality

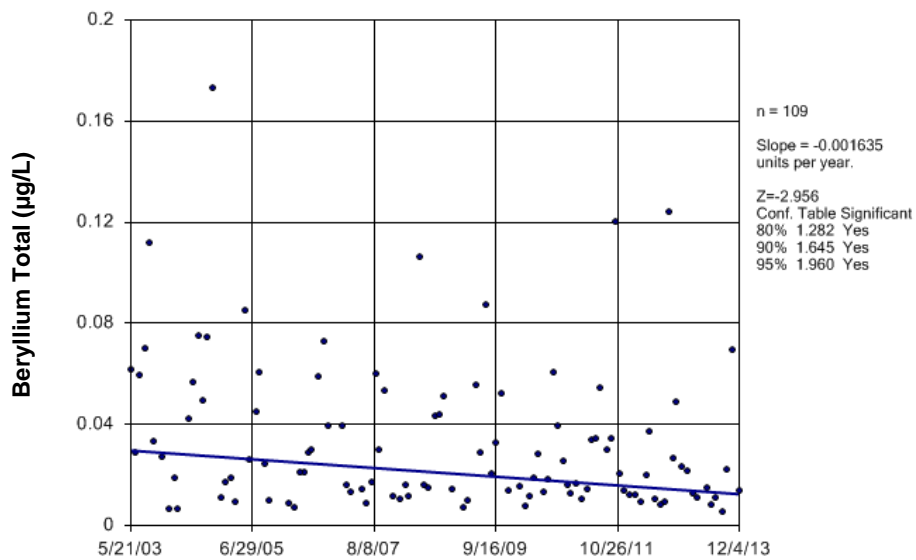
For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 31.31  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



Date

Figure E1337 Saskatchewan River: Beryllium Total

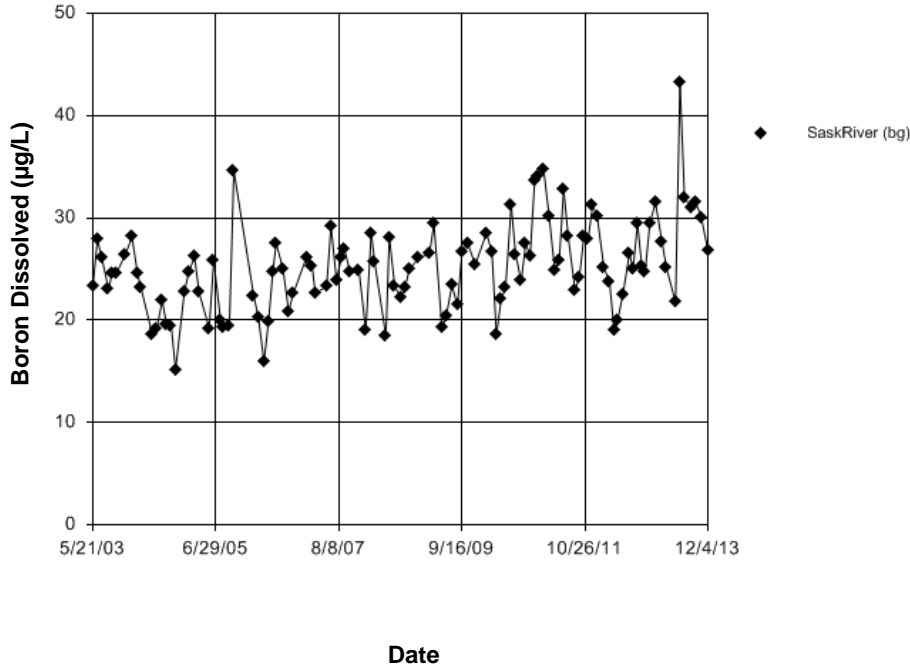
## Seasonal Kendall



Date

Figure E1338 Saskatchewan River: Beryllium Total

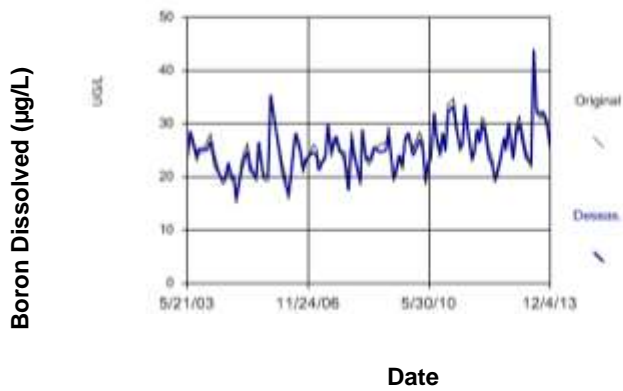
### Time Series



**Figure E1339 Saskatchewan River: Boron Dissolved**

### Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 8.456  
 Tabulated Chi-Squared value = 3.841 with 3 degrees of freedom at the 5% significance level.  
 There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H\*) was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 8.456  
 Adjusted Kruskal-Wallis statistic (H\*) = 8.456



**Figure E1340 Saskatchewan River: Boron Dissolved**

### Seasonal Kendall

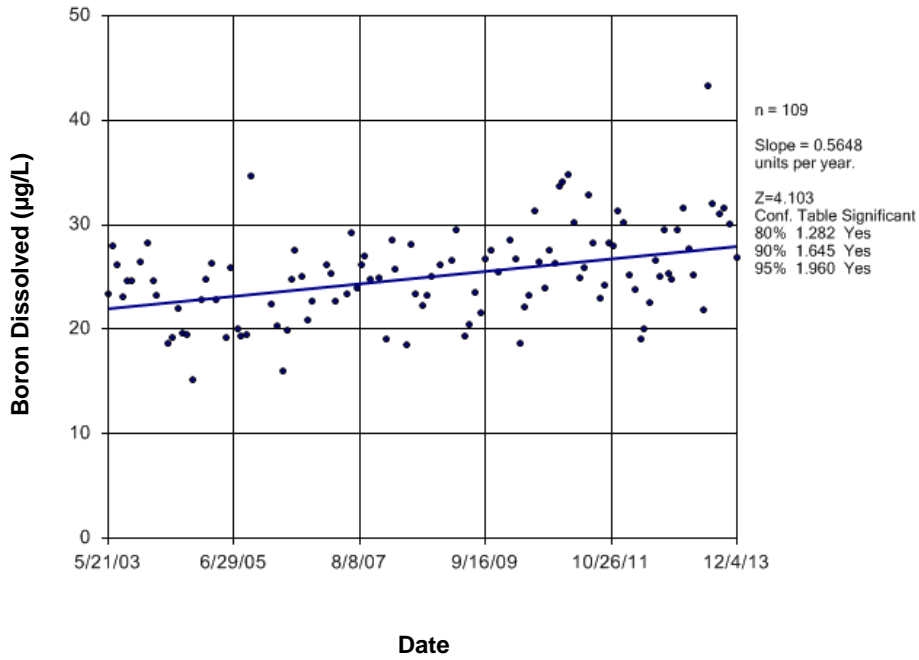


Figure E1341 Saskatchewan River: Boron Dissolved

### Time Series

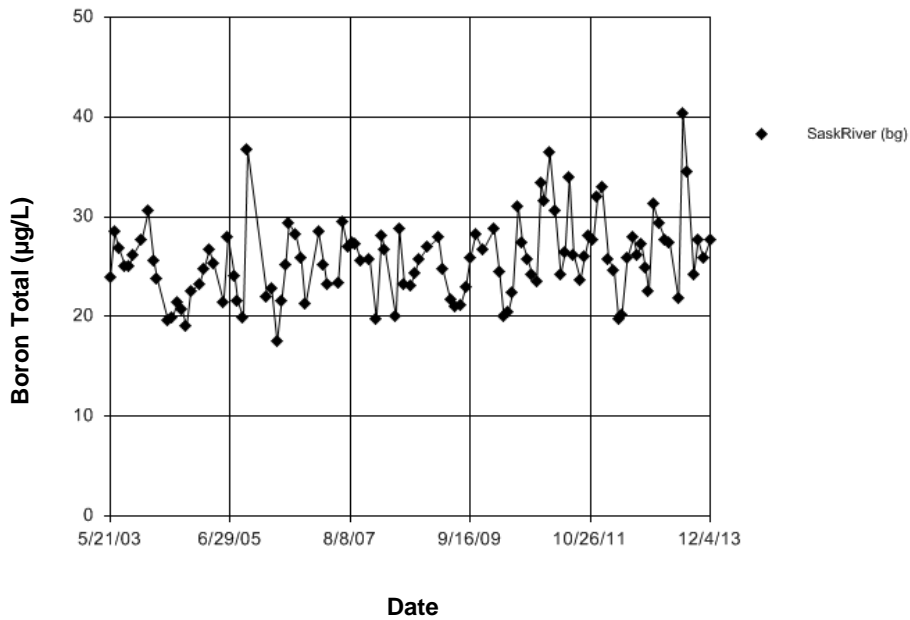
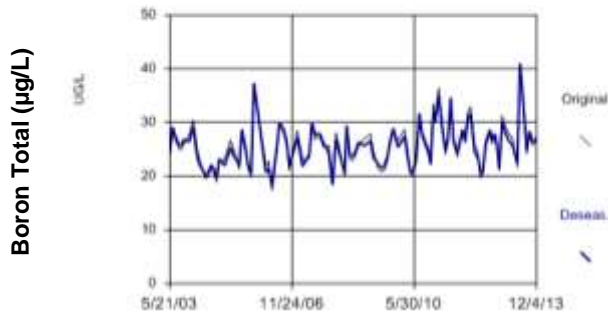


Figure E1342 Saskatchewan River: Boron Total

# Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 7.44  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 4 groups of data in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 7.44  
 Adjusted Kruskal-Wallis statistic (H') = 7.44



Date

Figure E1343 Saskatchewan River: Boron Total

# Seasonal Kendall

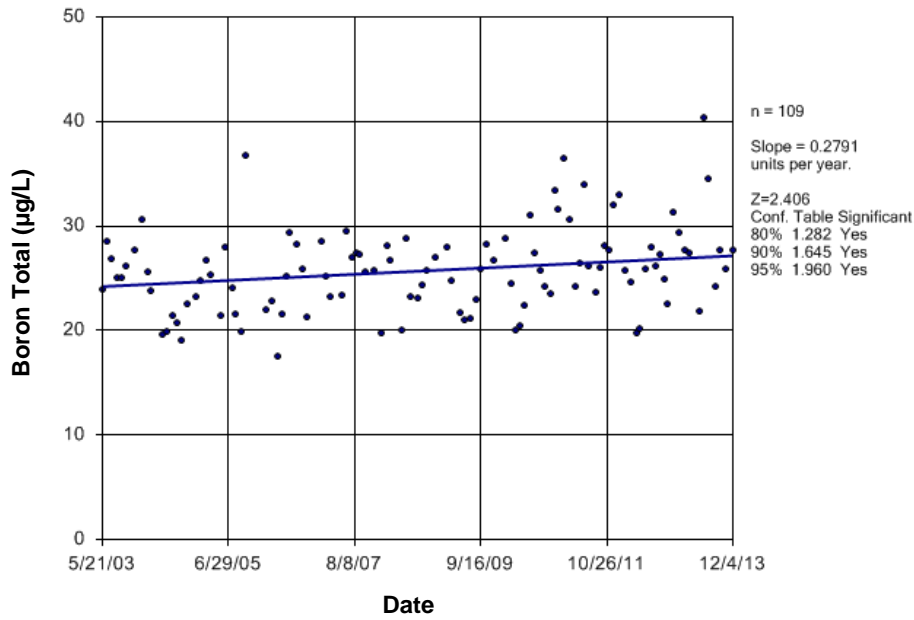


Figure E1344 Saskatchewan River: Boron Total



### Time Series

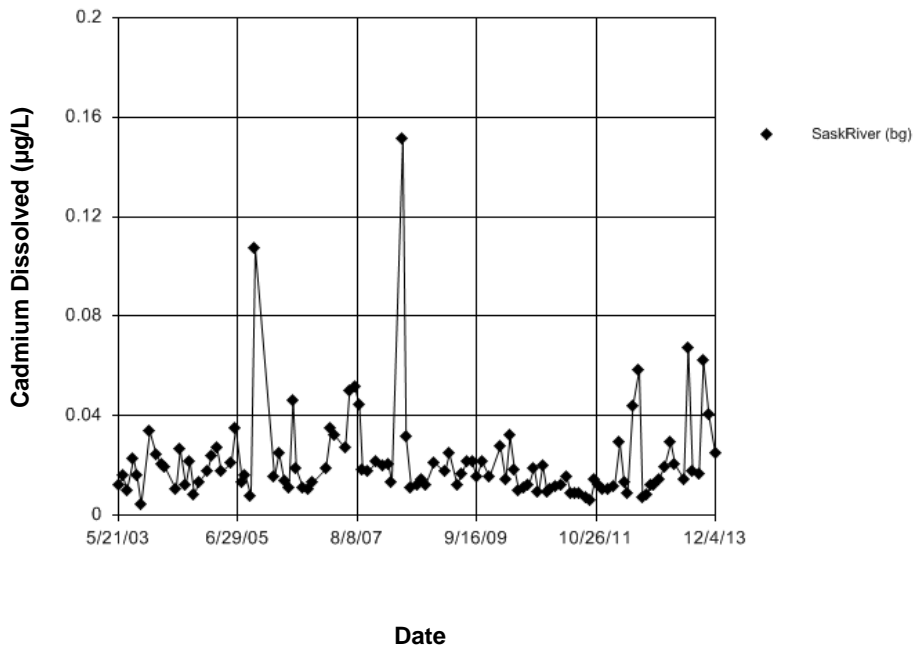


Figure E1345 Saskatchewan River: Cadmium Dissolved

### Seasonality

For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 2.528  
 Tabulated Chi-Squared value = 3.841 with 3 degrees of freedom at the 5% significance level.  
 There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 2.528  
 Adjusted Kruskal-Wallis statistic (H') = 2.528

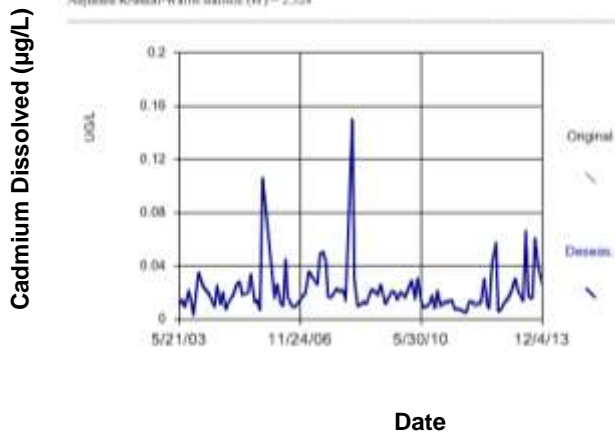


Figure E1346 Saskatchewan River: Cadmium Dissolved

## Sen's Slope Estimator

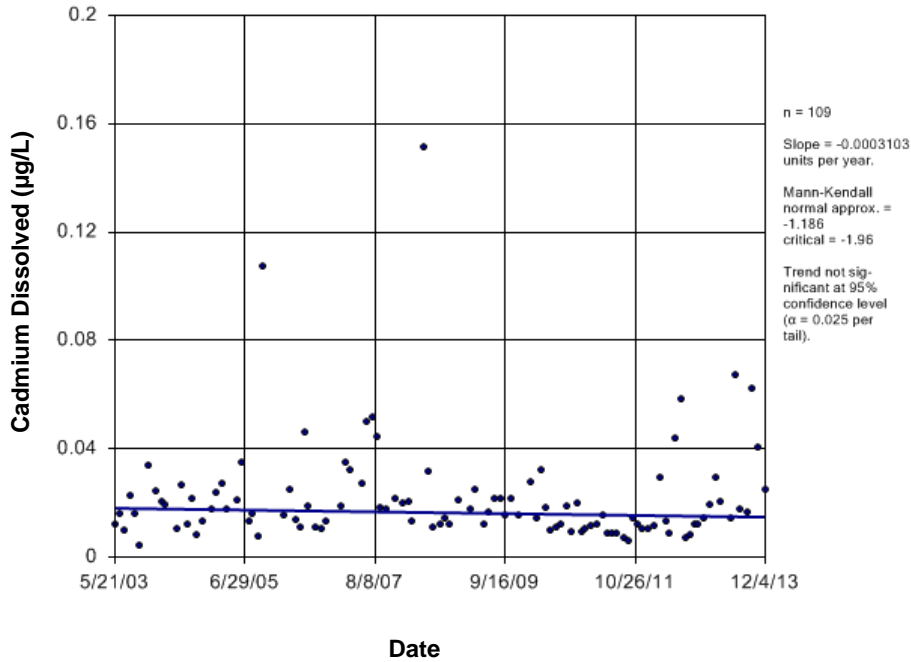


Figure E1347 Saskatchewan River: Cadmium Dissolved

## Time Series

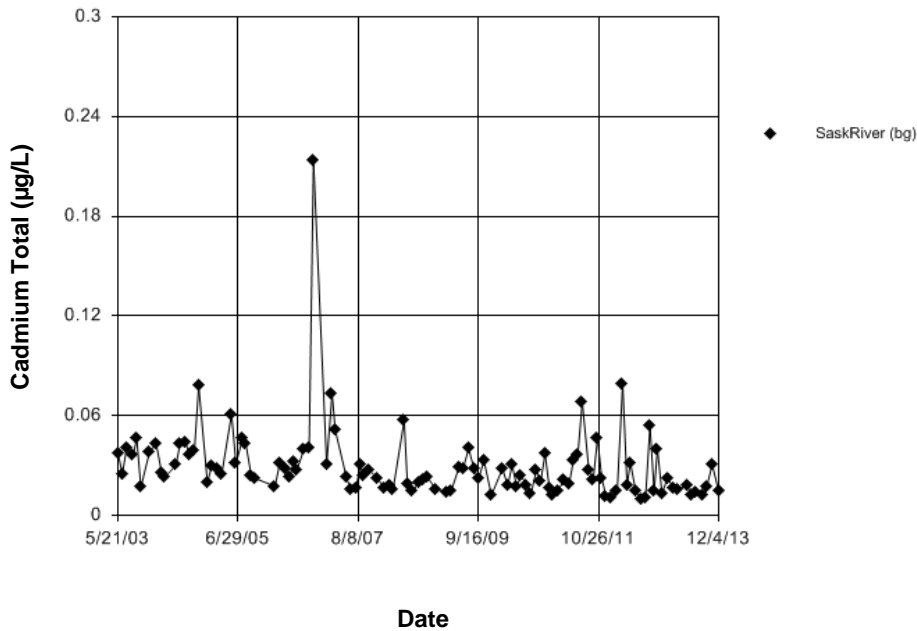
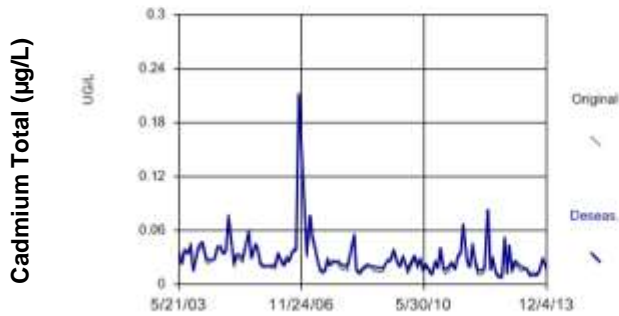


Figure E1348 Saskatchewan River: Cadmium Total

## Seasonality

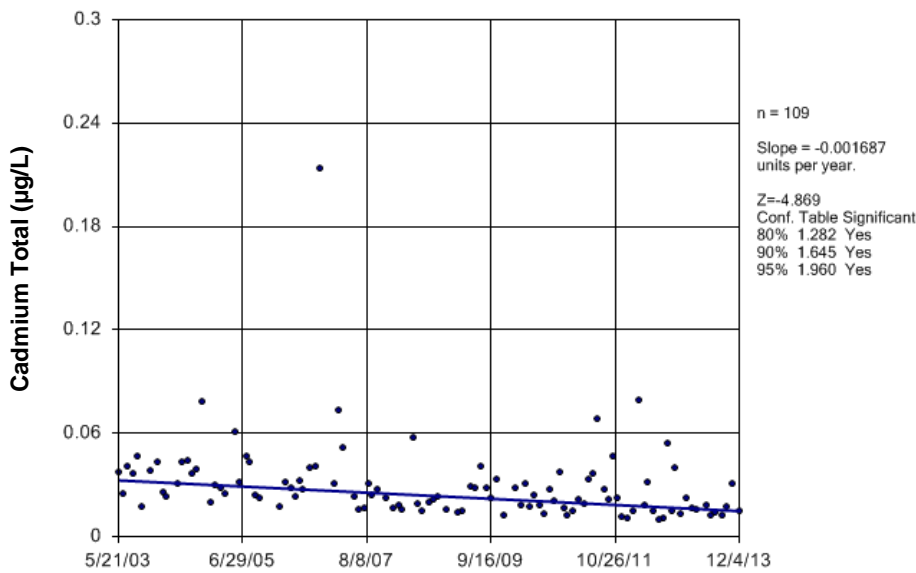
For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 5.939  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of sites in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 5.938  
 Adjusted Kruskal-Wallis statistic (H') = 5.939



Date

Figure E1349 Saskatchewan River: Cadmium Total

## Seasonal Kendall



Date

Figure E1350 Saskatchewan River: Cadmium Total

## Time Series

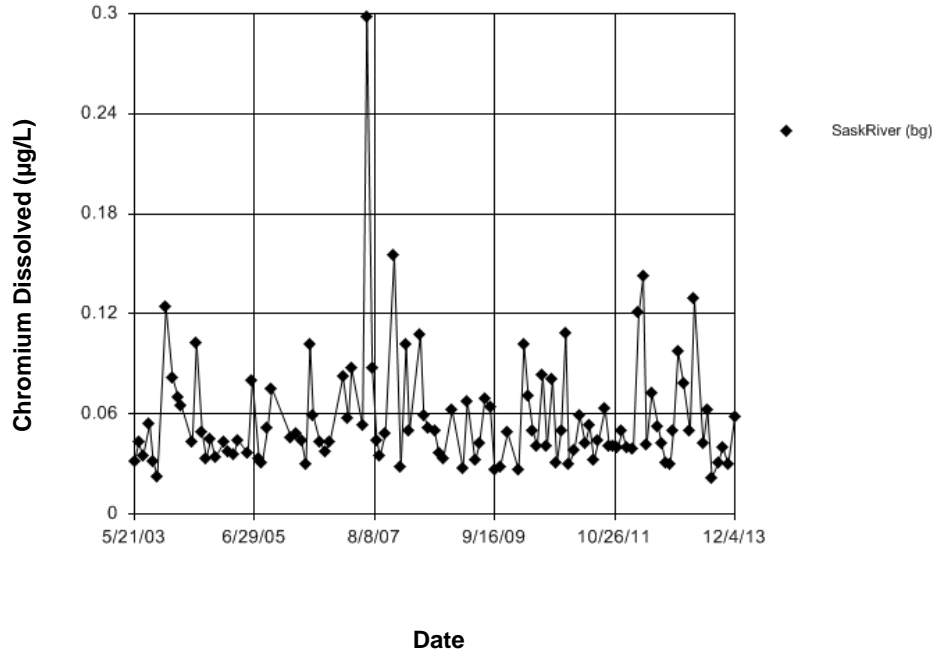


Figure E1351 Saskatchewan River: Chromium Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 6.078. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

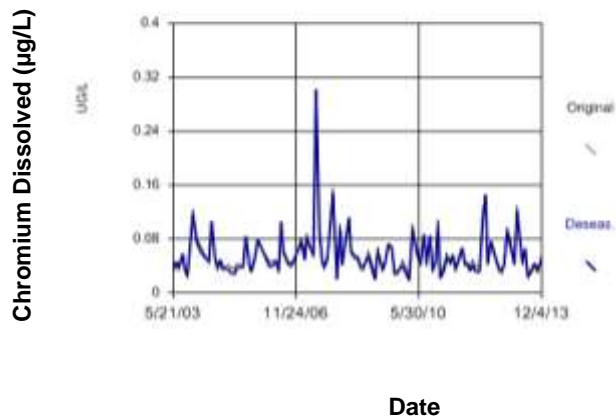


Figure E1352 Saskatchewan River: Chromium Dissolved

### Seasonal Kendall

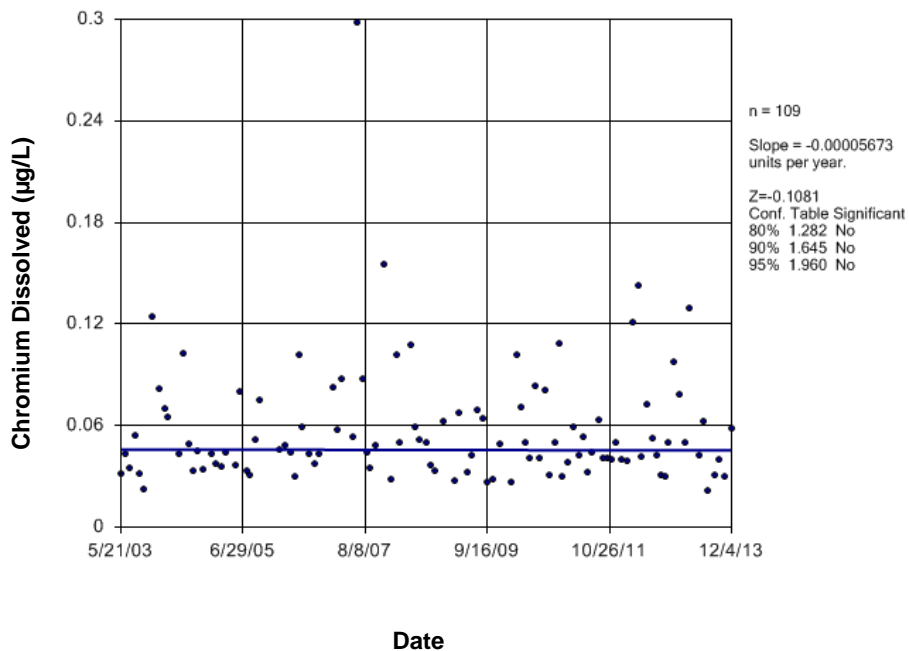


Figure E1353 Saskatchewan River: Chromium Dissolved

### Time Series

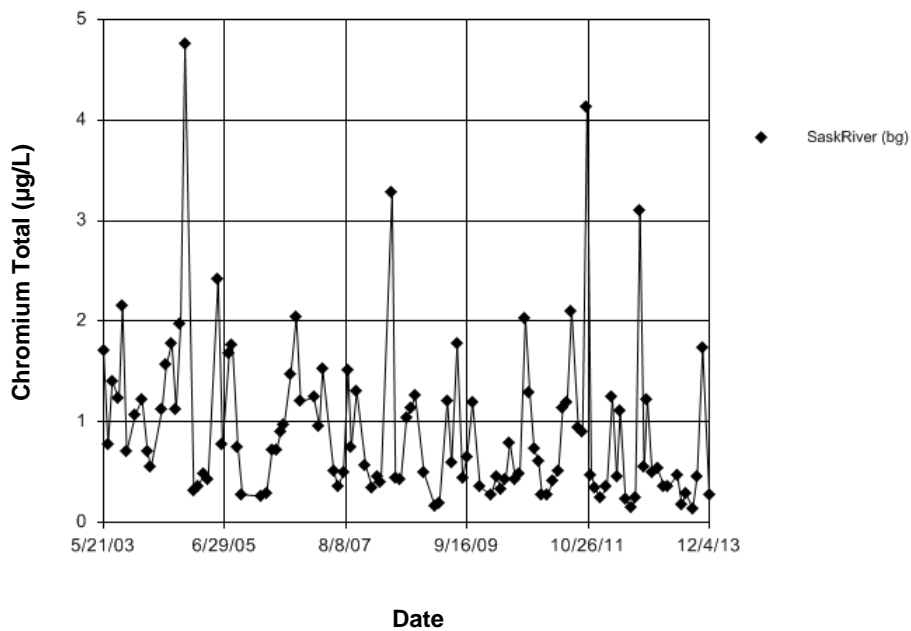
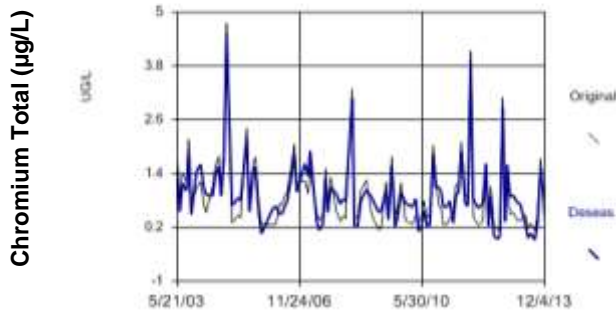


Figure E1354 Saskatchewan River: Chromium Total

# Seasonality

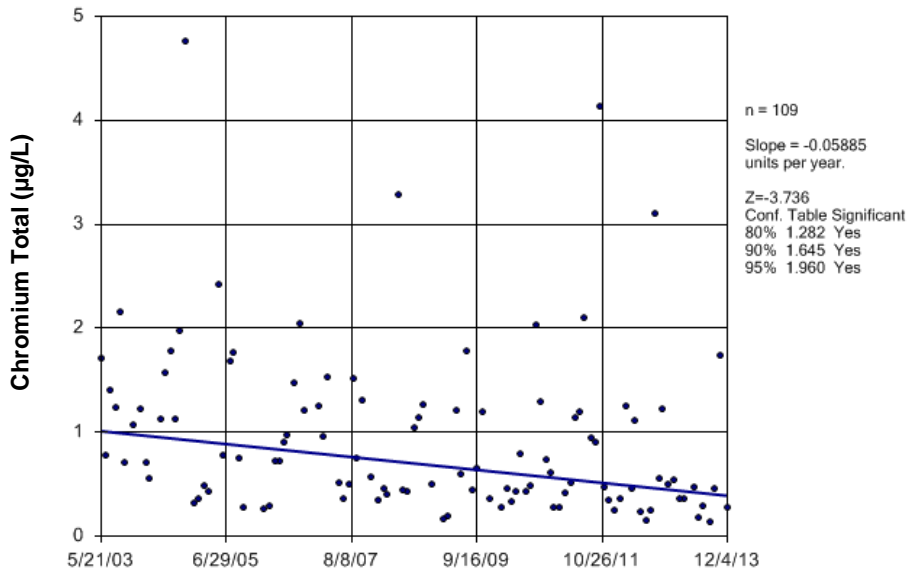
For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 18.48  
 Calculated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 18.48  
 Adjusted Kruskal-Wallis statistic (H') = 18.48



Date

Figure E1355 Saskatchewan River: Chromium Total

# Seasonal Kendall



Date

Figure E1356 Saskatchewan River: Chromium Total

## Time Series

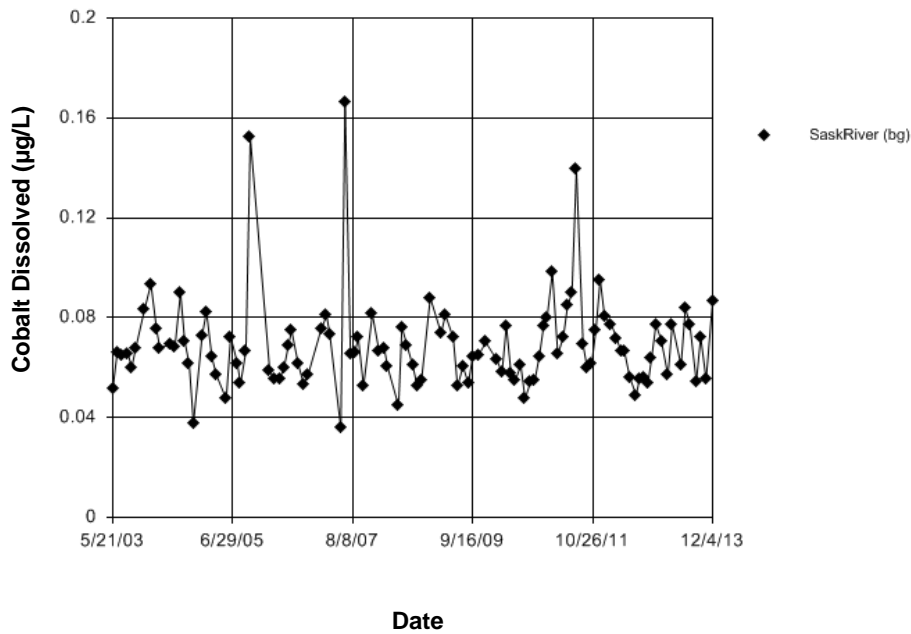


Figure E1357 Saskatchewan River: Cobalt Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 17.04. Calculated Chi-Squared value = 3.844 with 1 degree of freedom at the 5% significance level. There were 8 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

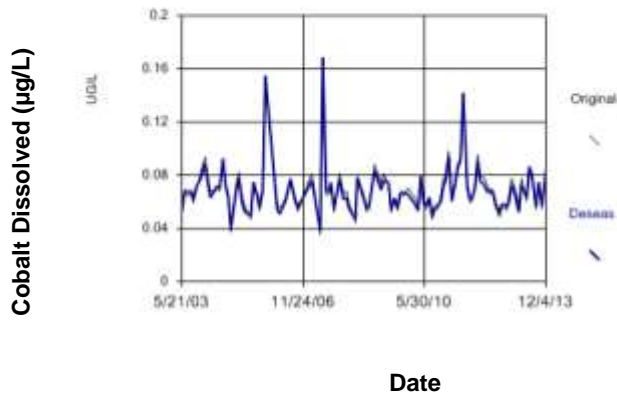


Figure E1358 Saskatchewan River: Cobalt Dissolved

### Seasonal Kendall

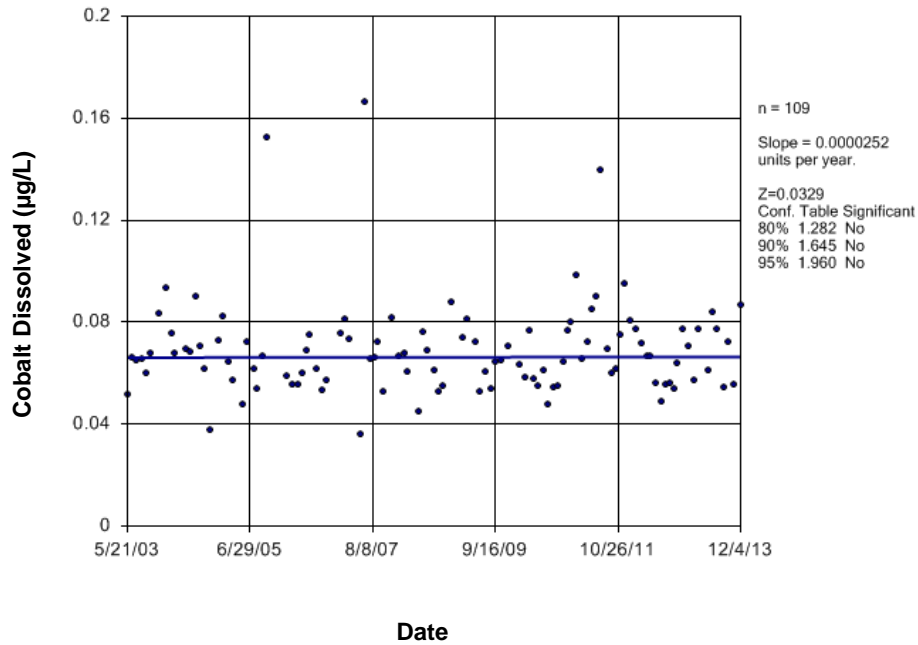


Figure E1359 Saskatchewan River: Cobalt Dissolved

### Time Series

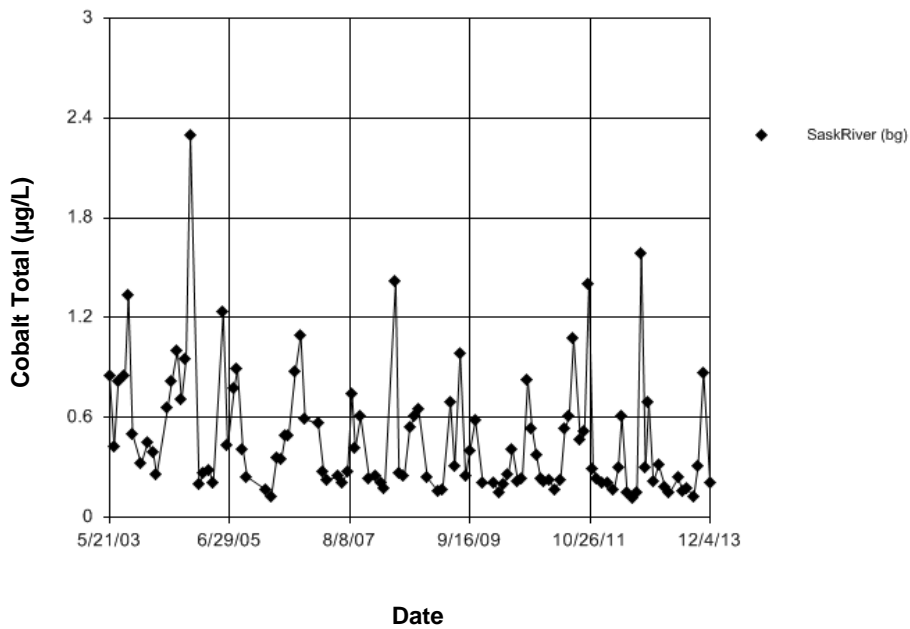
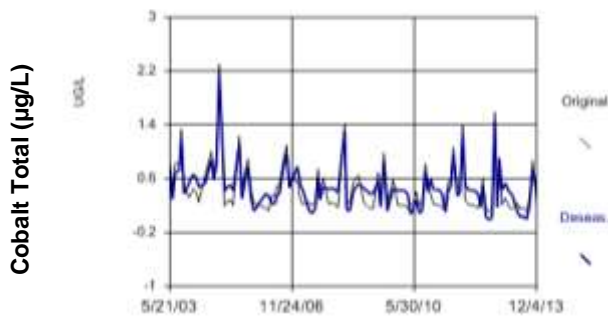


Figure E1360 Saskatchewan River: Cobalt Total



## Seasonality

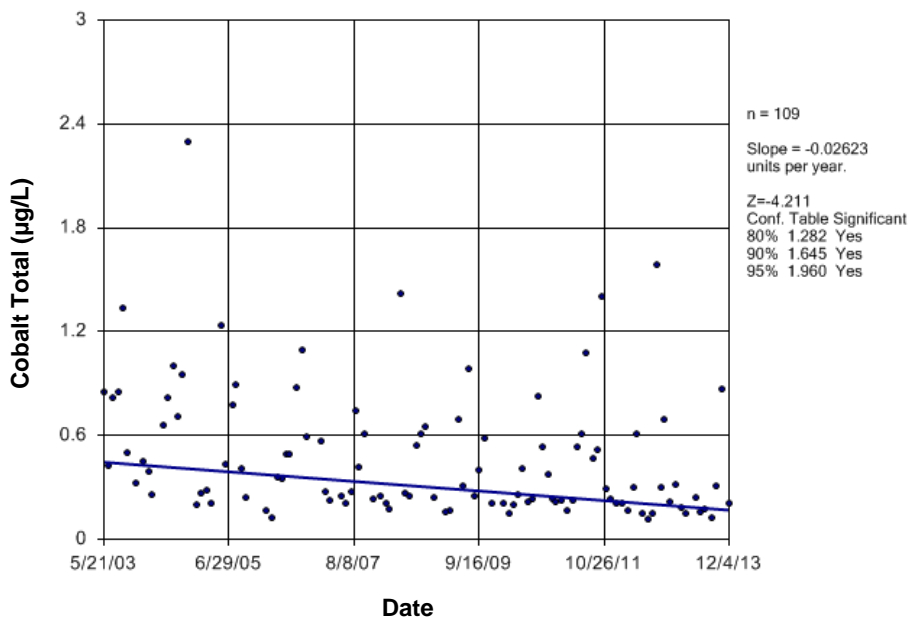
For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 9% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 29.86  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 29.86  
 Adjusted Kruskal-Wallis statistic (H') = 29.86



Date

Figure E1361 Saskatchewan River: Cobalt Total

## Seasonal Kendall



Date

Figure E1362 Saskatchewan River: Cobalt Total

## Time Series

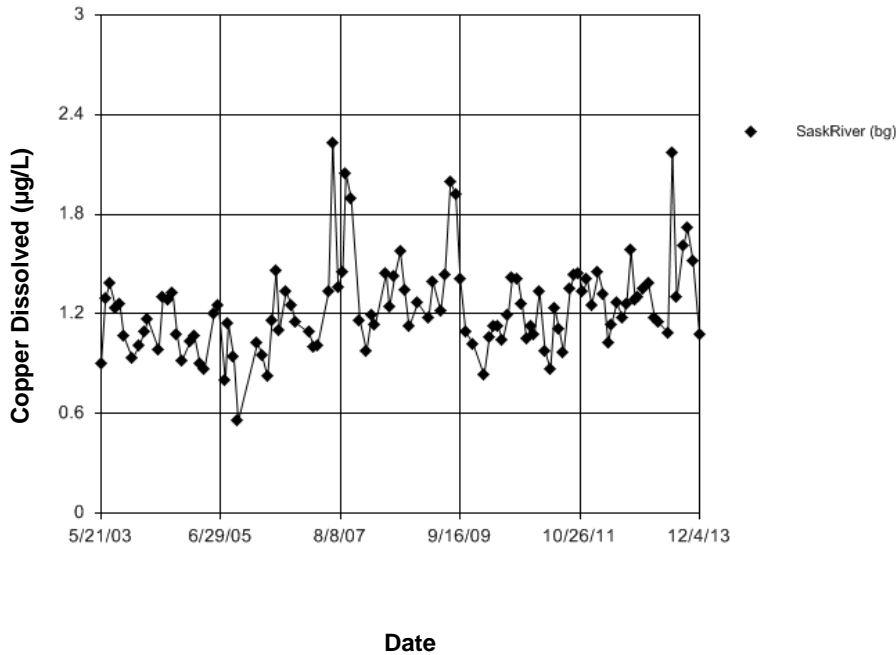


Figure E1363 Saskatchewan River: Copper Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 10.25  
Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
There were 4 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
Kruskal-Wallis statistic (H) = 10.25  
Adjusted Kruskal-Wallis statistic (H') = 10.25

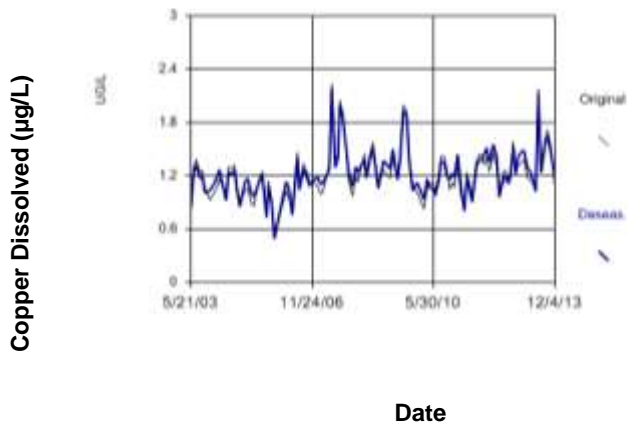


Figure E1364 Saskatchewan River: Copper Dissolved

### Seasonal Kendall

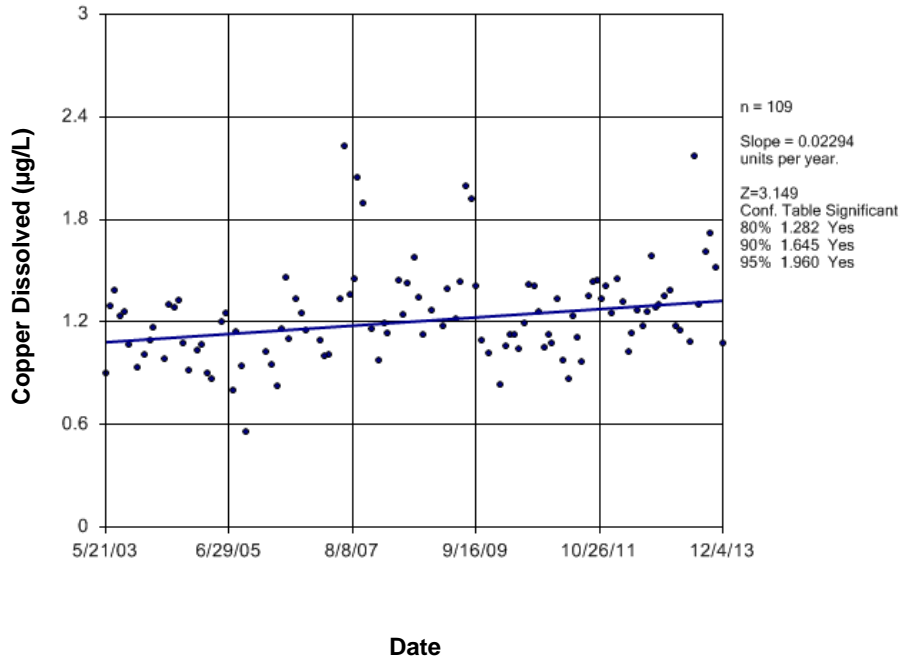


Figure E1365 Saskatchewan River: Copper Dissolved

### Time Series

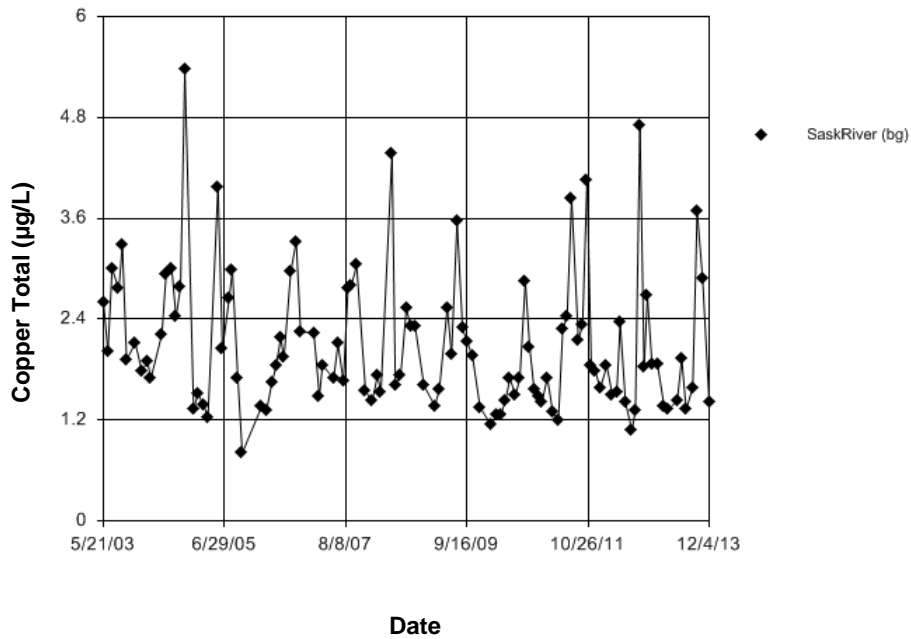
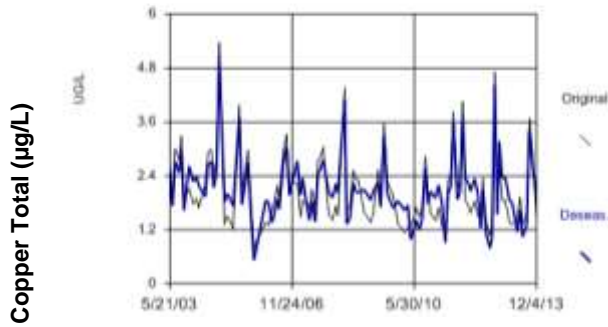


Figure E1366 Saskatchewan River: Copper Total

# Seasonality

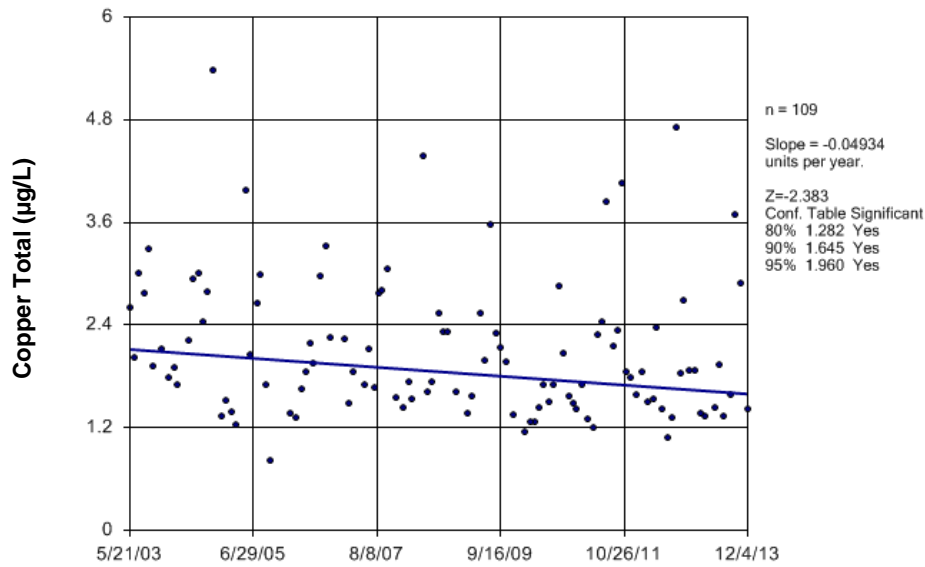
For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 28.5  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 5 groups of this in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 28.5  
 Adjusted Kruskal-Wallis statistic (H') = 28.5



Date

Figure E1367 Saskatchewan River: Copper Total

# Seasonal Kendall



Date

Figure E1368 Saskatchewan River: Copper Total

### Time Series

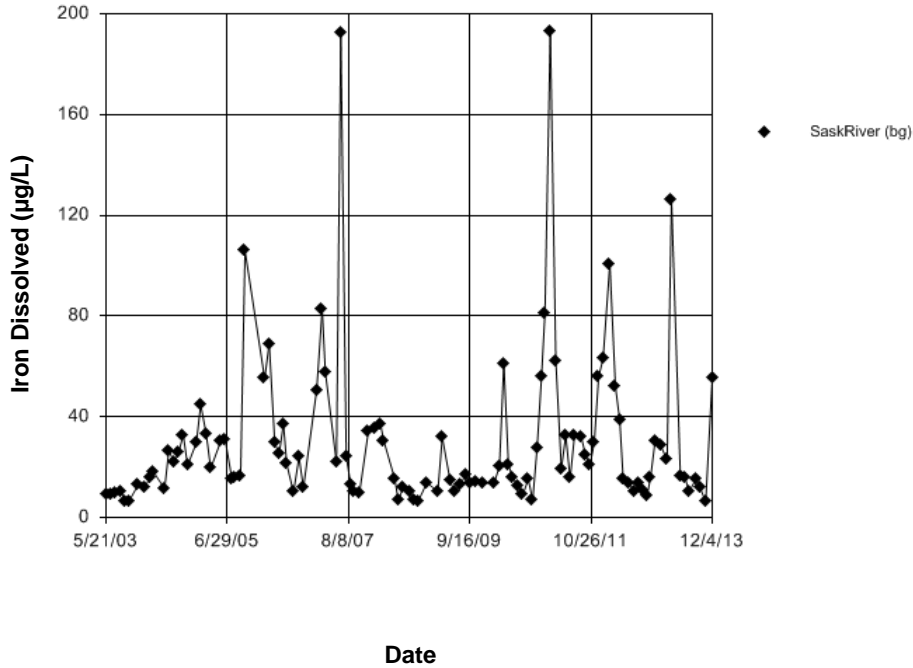


Figure E1369 Saskatchewan River: Iron Dissolved

### Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.  
 Calculated Kruskal-Wallis statistic = 27.2  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 27.2  
 Adjusted Kruskal-Wallis statistic (H') = 27.2

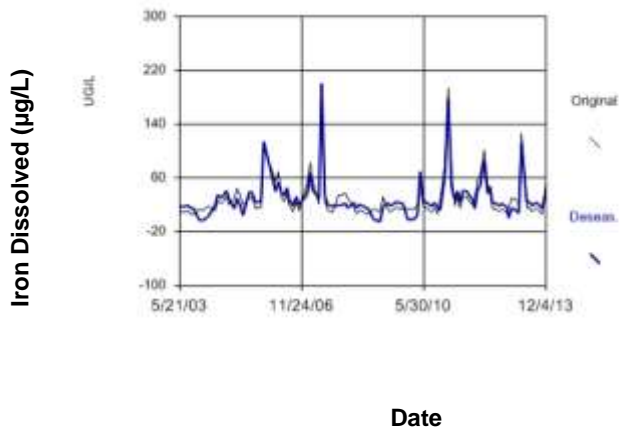


Figure E1370 Saskatchewan River: Iron Dissolved

### Seasonal Kendall

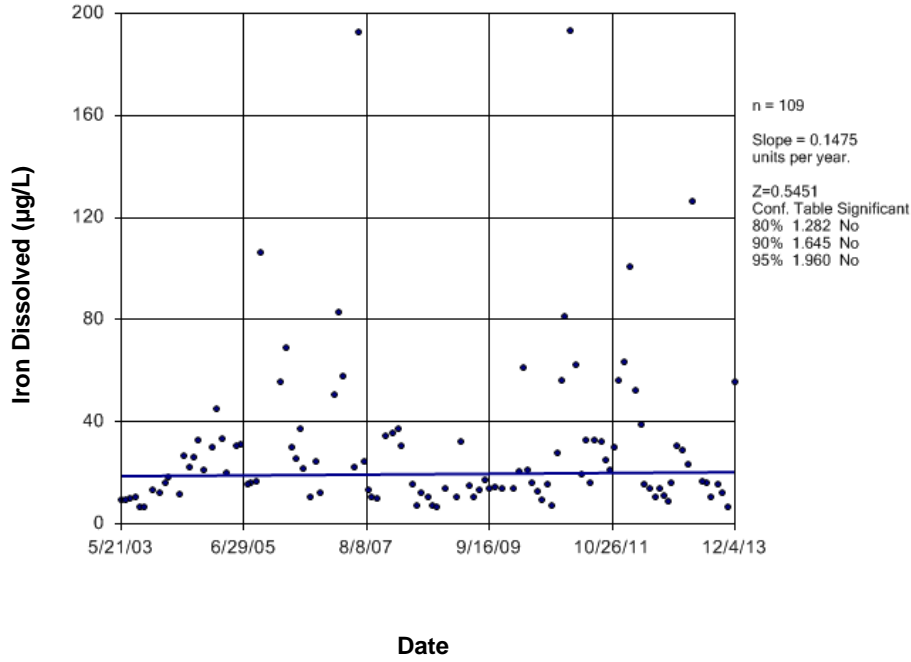


Figure E1371 Saskatchewan River: Iron Dissolved

### Time Series

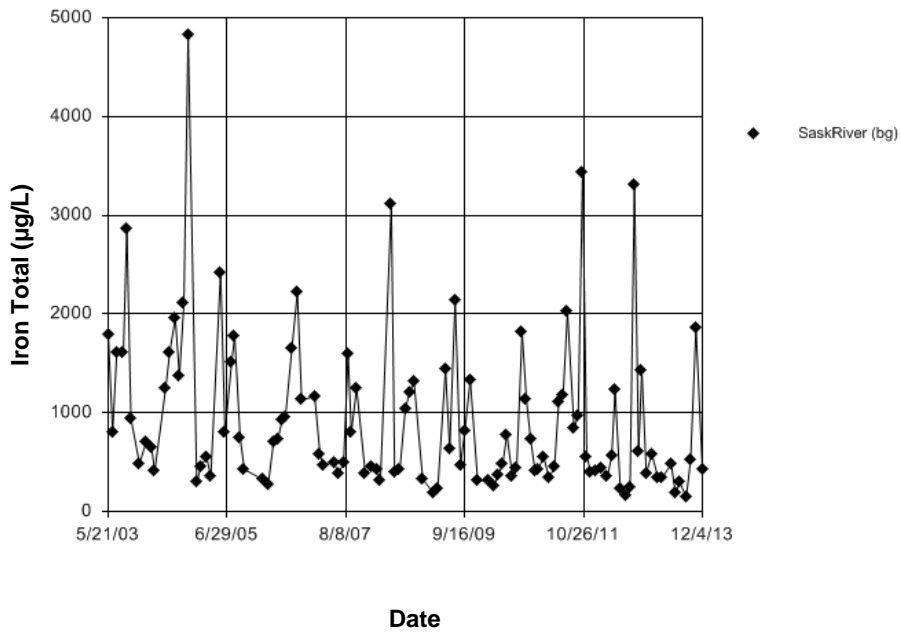
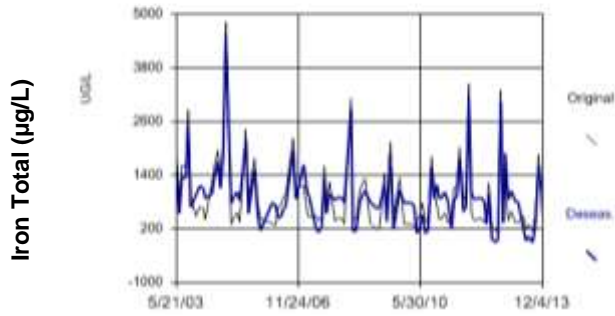


Figure E1372 Saskatchewan River: Iron Total

## Seasonality

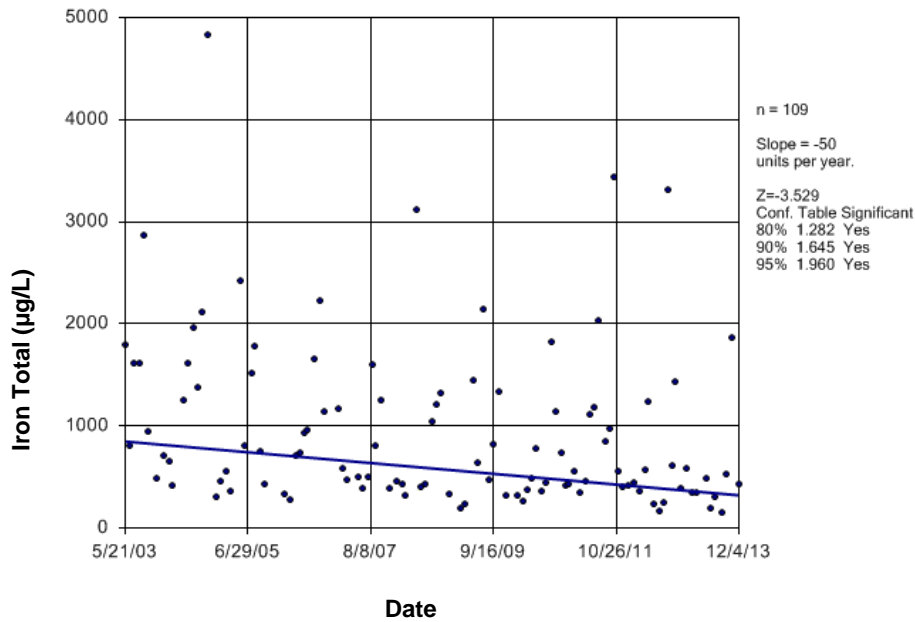
For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the colorized Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.  
 Calculated Kruskal-Wallis statistic = 29.71  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 29.71  
 Adjusted Kruskal-Wallis statistic (H') = 29.71



Date

Figure E1373 Saskatchewan River: Iron Total

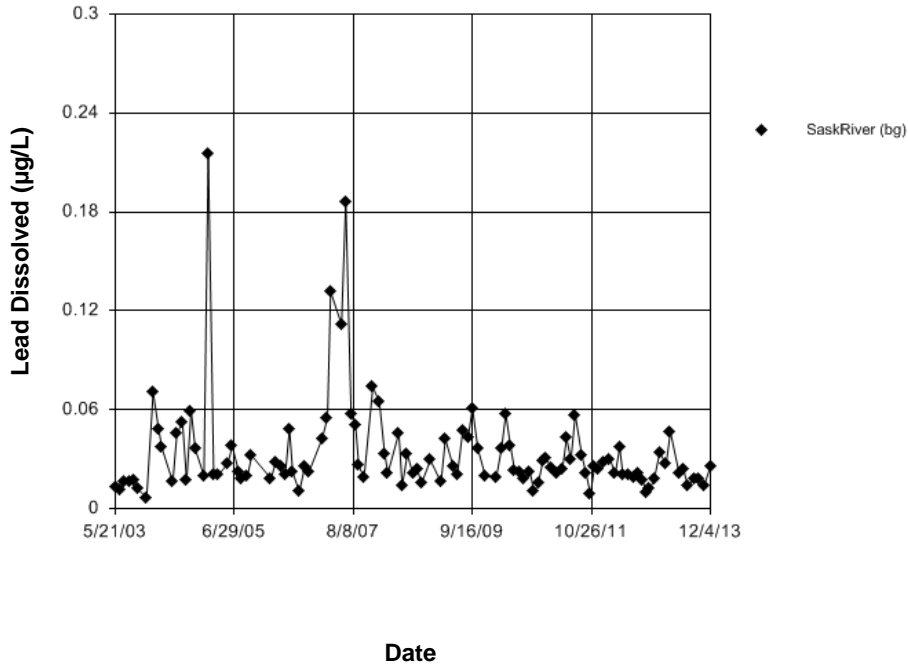
## Seasonal Kendall



Date

Figure E1374 Saskatchewan River: Iron Total

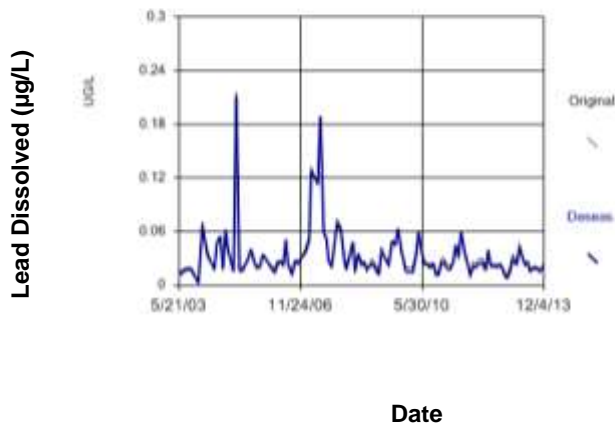
### Time Series



**Figure E1375 Saskatchewan River: Lead Dissolved**

### Seasonality

For the data shown, the Kruskal-Wallis test indicates **NO SEASONALITY** at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 2.389. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal. Kruskal-Wallis statistic (H) = 2.389. Adjusted Kruskal-Wallis statistic (H') = 2.389.



**Figure E1376 Saskatchewan River: Lead Dissolved**



### Sen's Slope Estimator

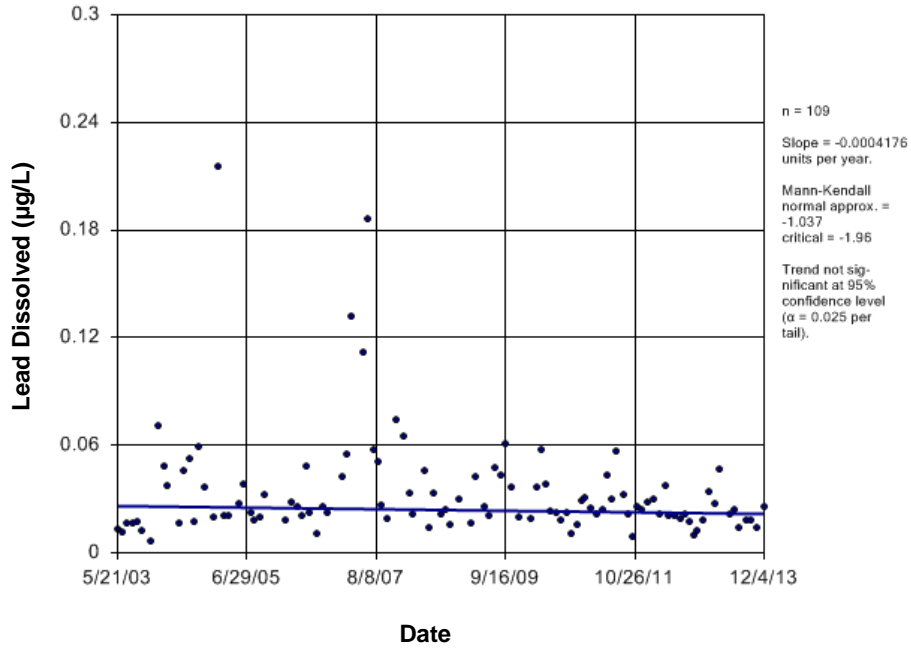


Figure E1377 Saskatchewan River: Lead Dissolved

### Time Series

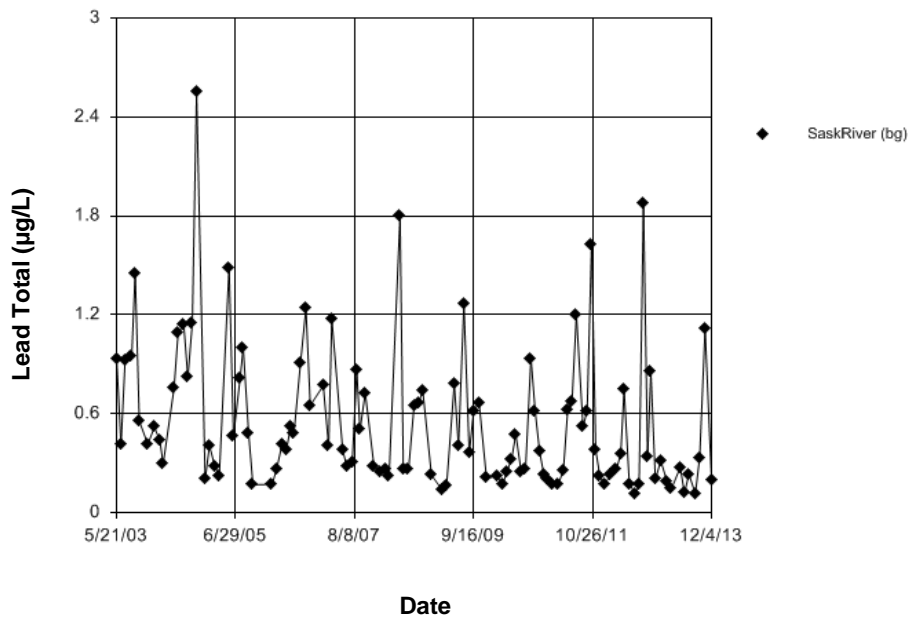
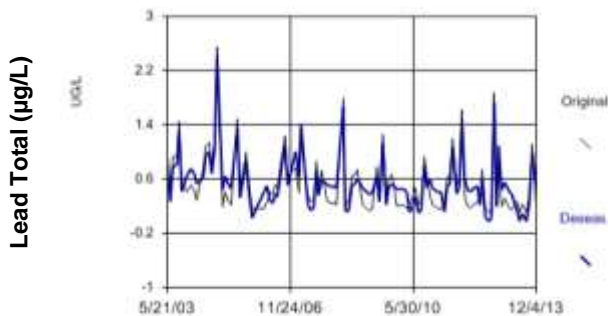


Figure E1378 Saskatchewan River: Lead Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 26.71  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 26.71  
 Adjusted Kruskal-Wallis statistic (H') = 26.71



Date

Figure E1379 Saskatchewan River: Lead Total

## Seasonal Kendall

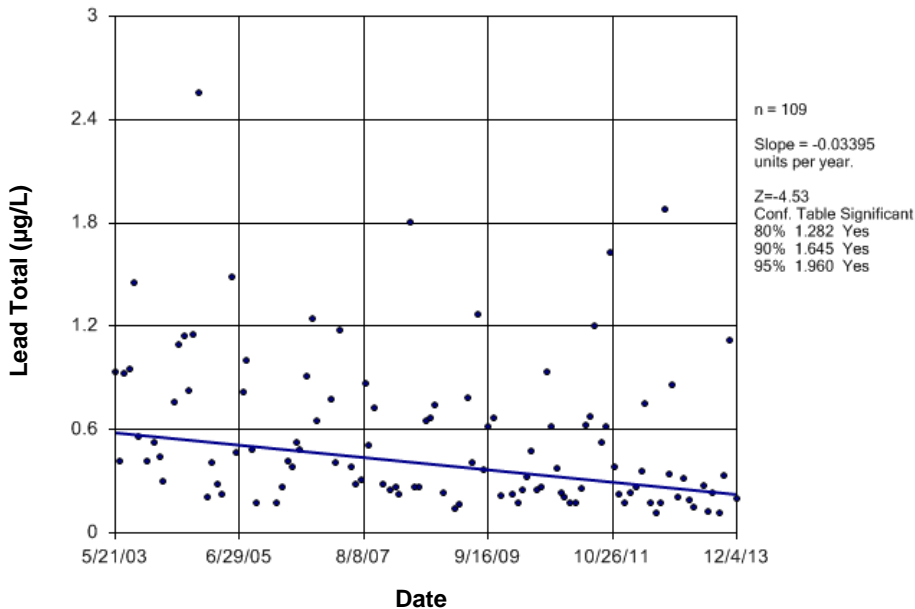


Figure E1380 Saskatchewan River: Lead Total

## Time Series

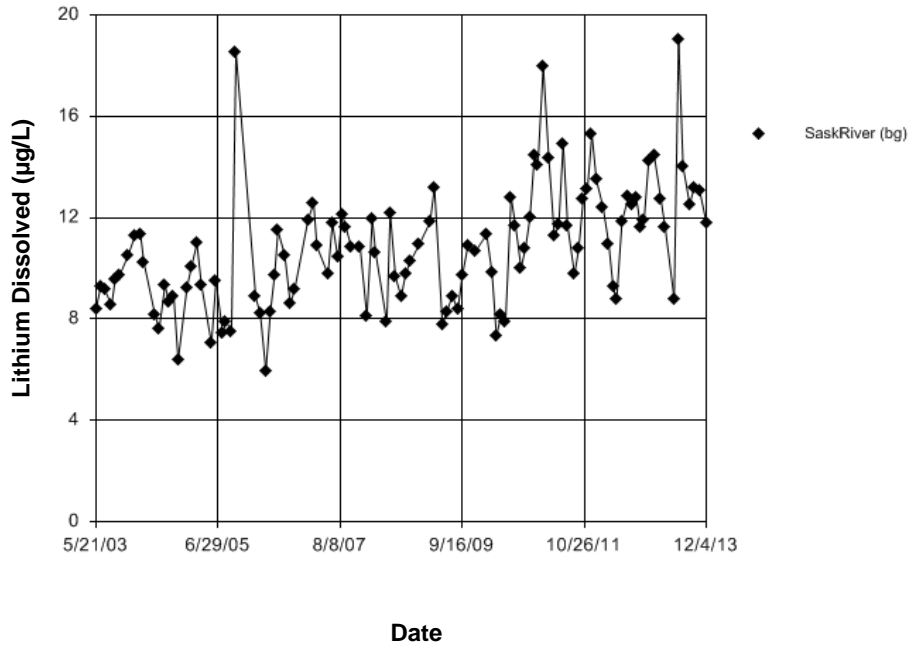


Figure E1381 Saskatchewan River: Lithium Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 14. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal. Kruskal-Wallis statistic (H) = 14. Adjusted Kruskal-Wallis statistic (H') = 14.

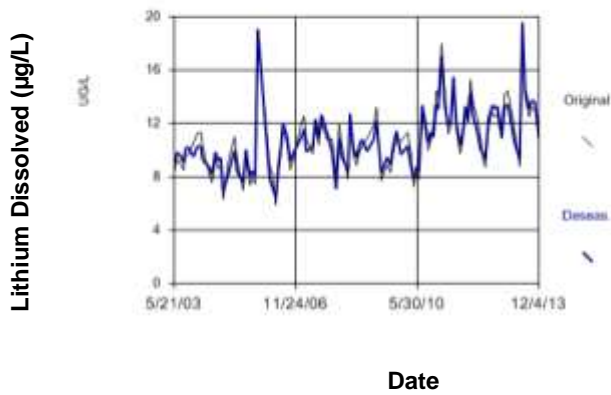


Figure E1382 Saskatchewan River: Lithium Dissolved

### Seasonal Kendall

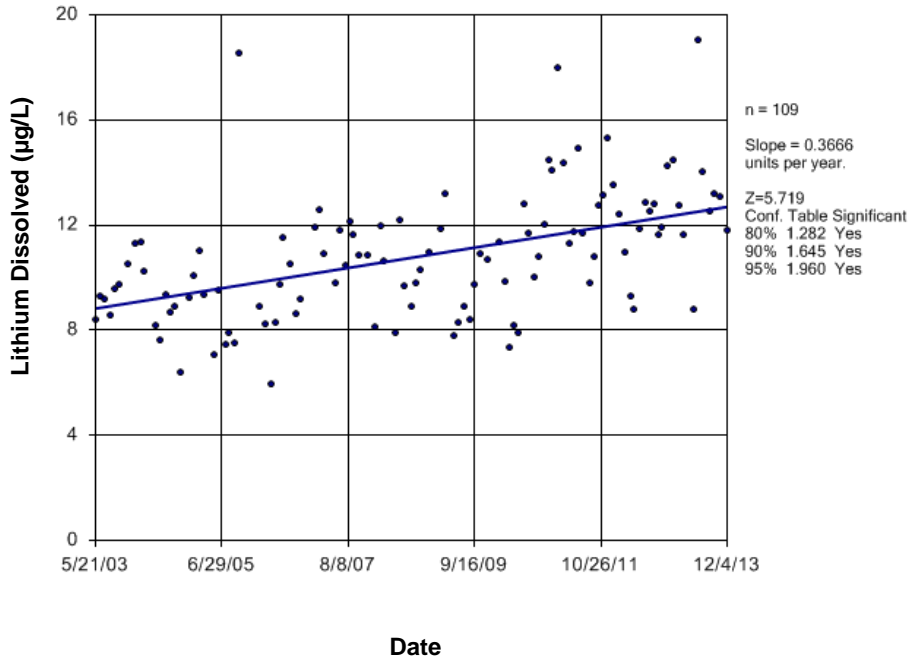


Figure E1383 Saskatchewan River: Lithium Dissolved

### Time Series

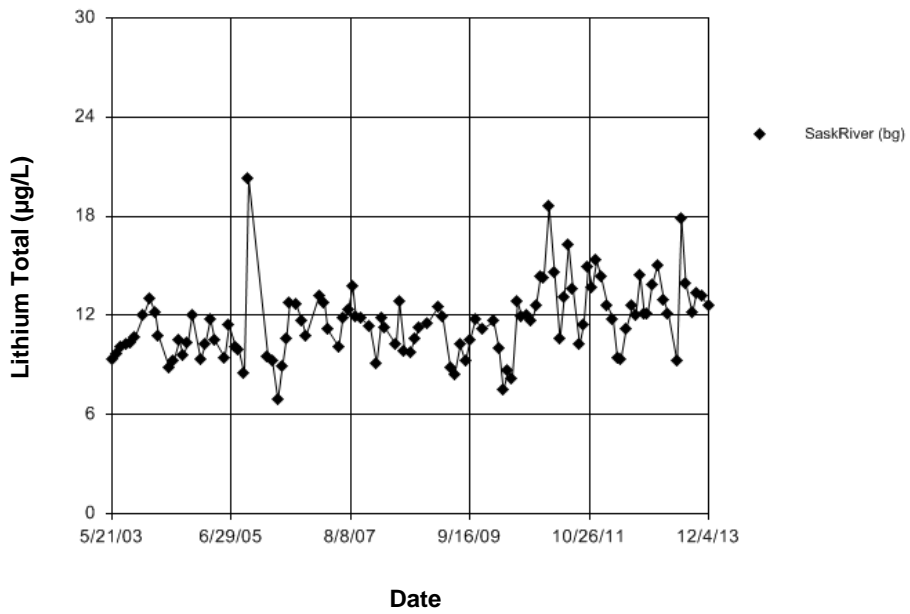
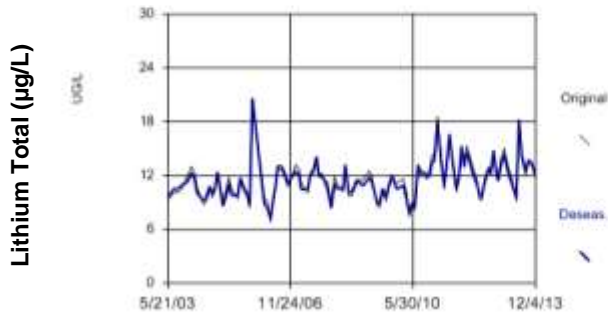


Figure E1384 Saskatchewan River: Lithium Total

## Seasonality

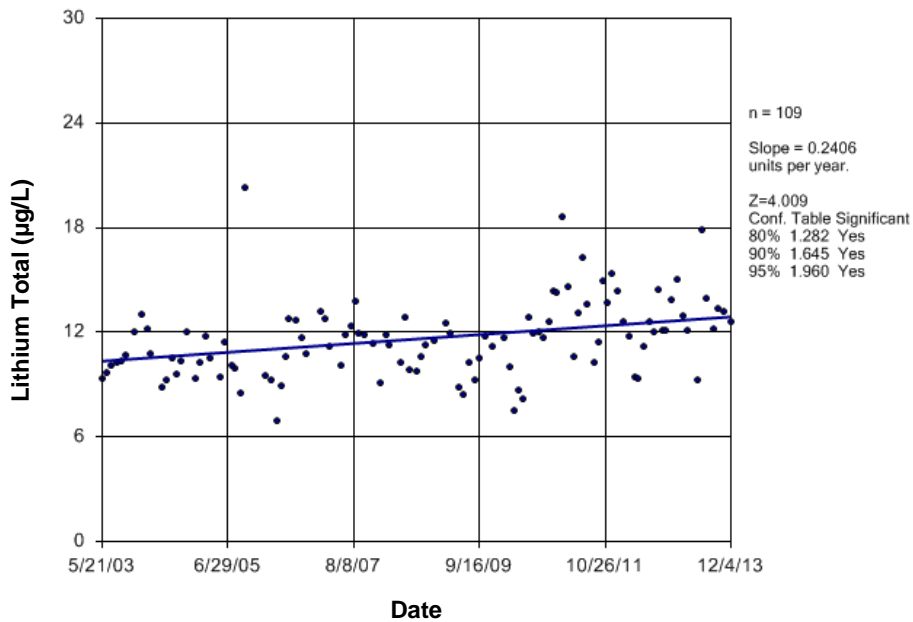
For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 8.622  
Tabulated Chi-Squared value = 5.841 with 1 degree of freedom at the 5% significance level.  
There were 9 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
Kruskal-Wallis statistic (H) = 8.622  
Adjusted Kruskal-Wallis statistic (H') = 8.622



Date

Figure E1385 Saskatchewan River: Lithium Total

## Seasonal Kendall



Date

Figure E1386 Saskatchewan River: Lithium Total

## Time Series

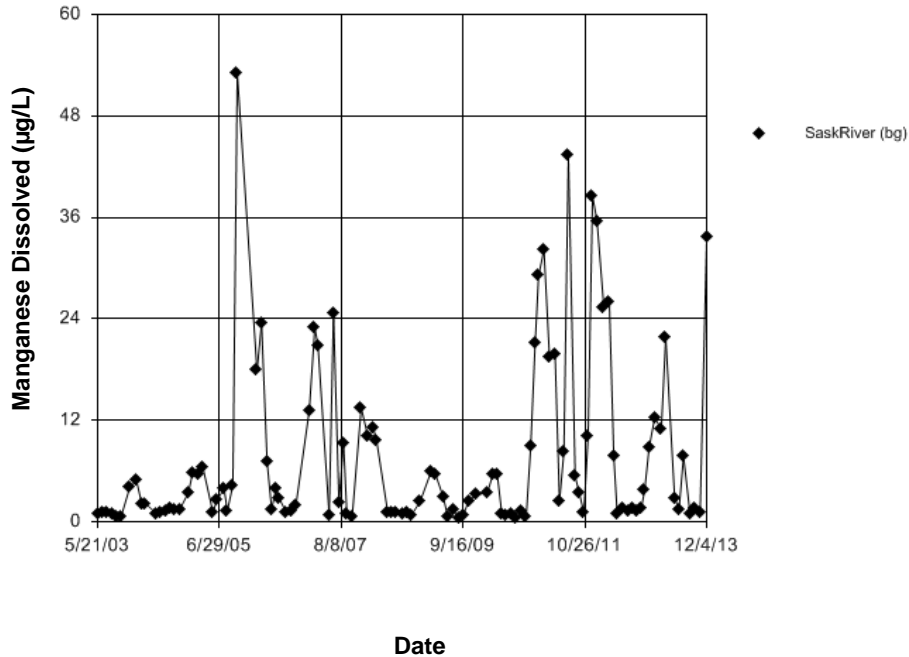


Figure E1387 Saskatchewan River: Manganese Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.  
 Calculated Kruskal-Wallis statistic = 47.17  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 4 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 47.17  
 Adjusted Kruskal-Wallis statistic (H') = 47.17

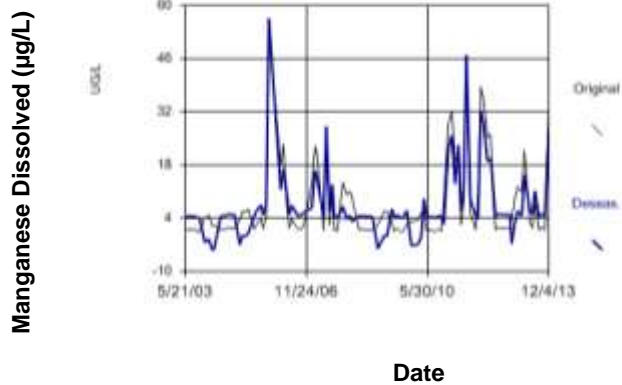


Figure E1388 Saskatchewan River: Manganese Dissolved

### Seasonal Kendall

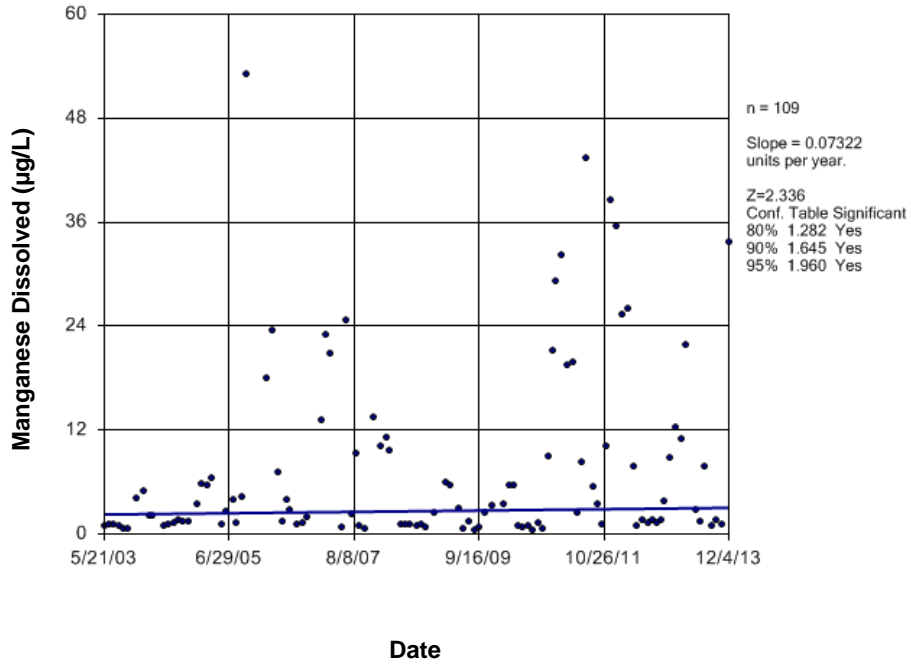


Figure E1389 Saskatchewan River: Manganese Dissolved

### Time Series

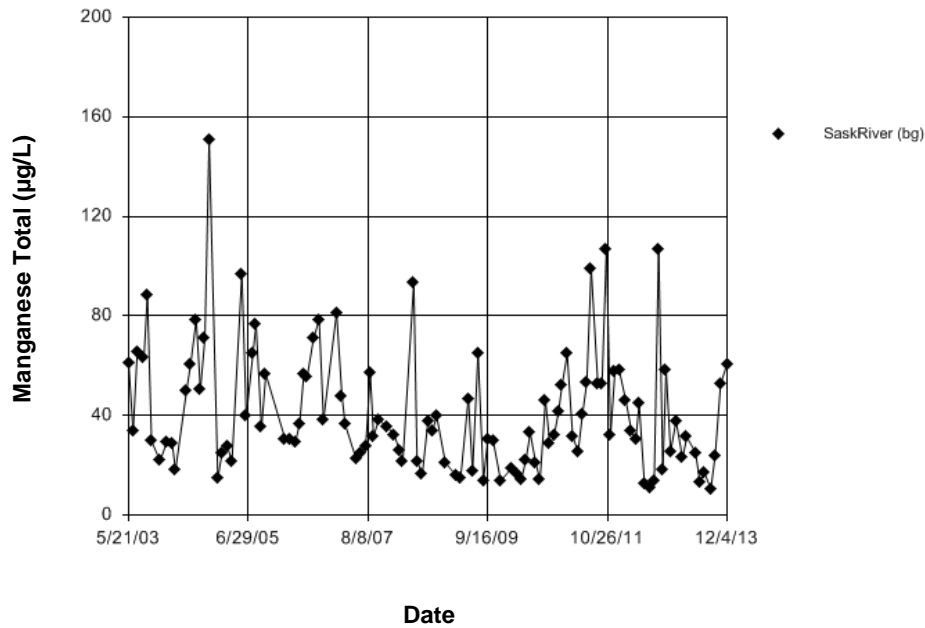
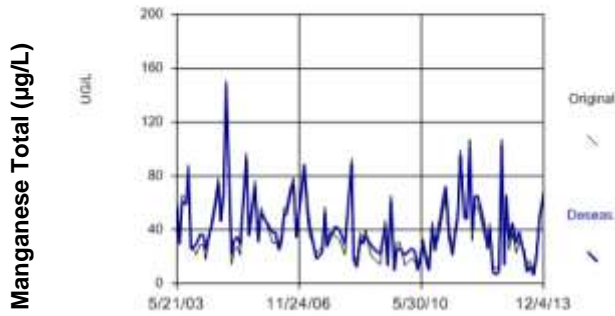


Figure E1390 Saskatchewan River: Manganese Total

## Seasonality

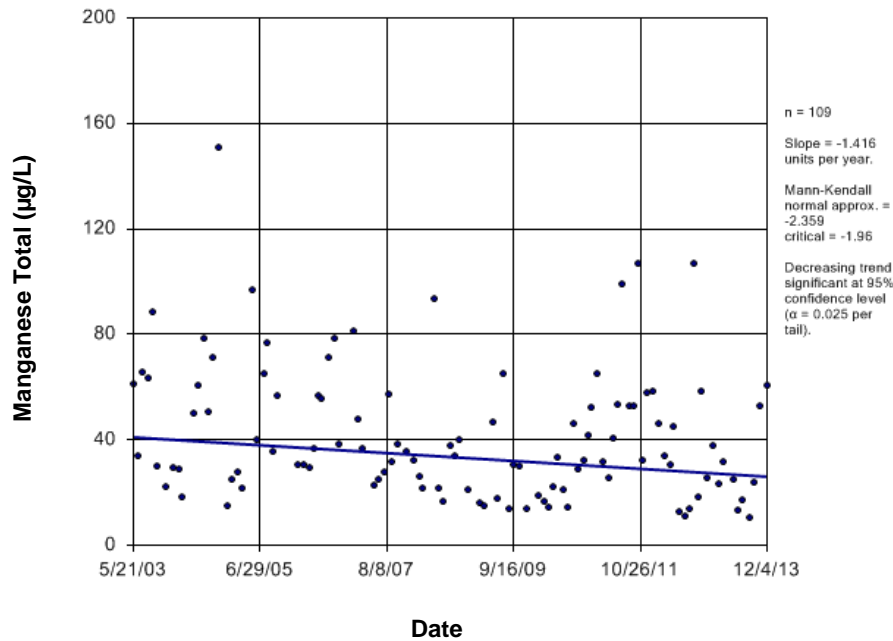
For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 3.669  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 3.669  
 Adjusted Kruskal-Wallis statistic (H') = 3.669



Date

Figure E1391 Saskatchewan River: Manganese Total

## Sen's Slope Estimator



Date

Figure E1392 Saskatchewan River: Manganese Total



## Time Series

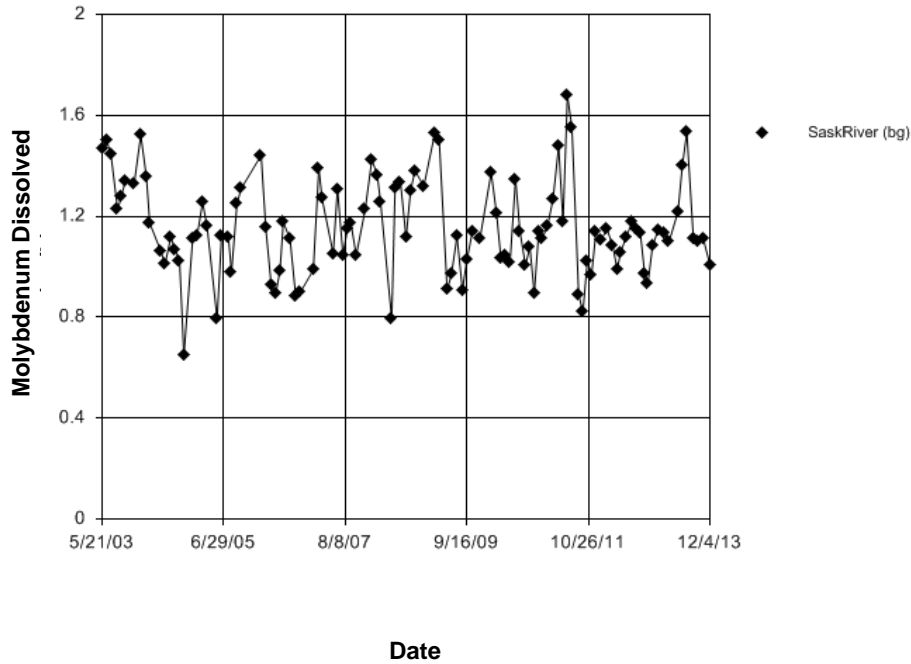


Figure E1393 Saskatchewan River: Molybdenum Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 5.412  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 6 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H<sub>adj</sub>) was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 5.412  
 Adjusted Kruskal-Wallis statistic (H<sub>adj</sub>) = 5.412

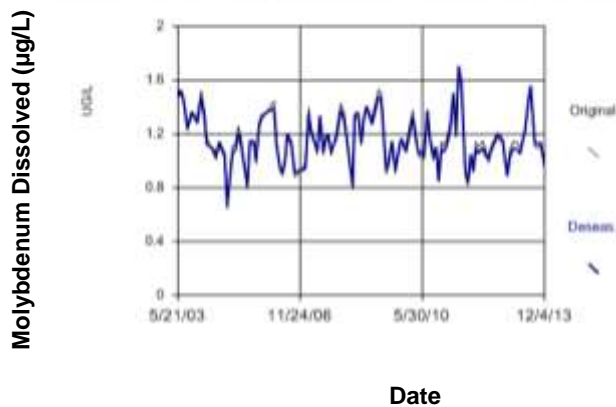


Figure E1394 Saskatchewan River: Molybdenum Dissolved

### Seasonal Kendall

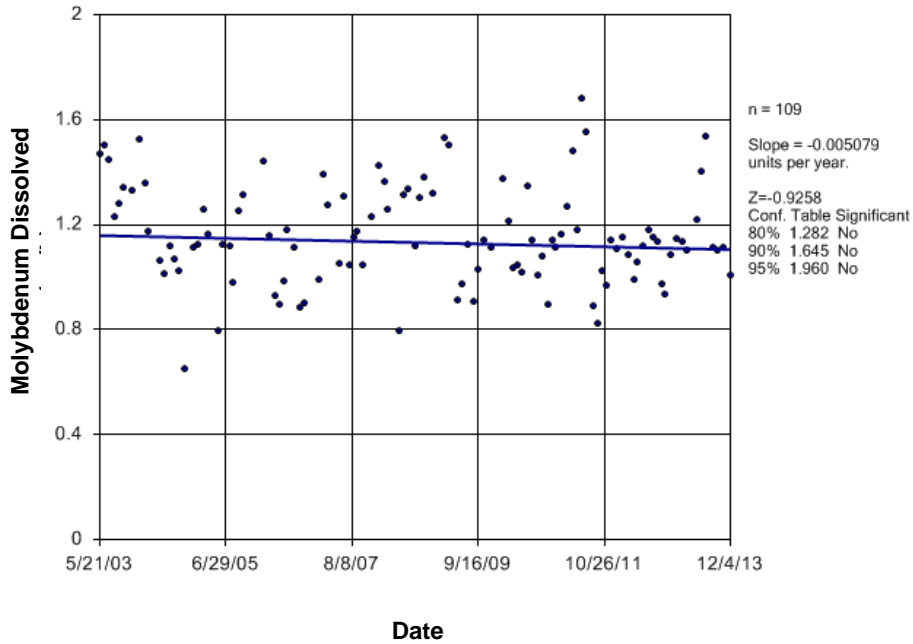


Figure E1395 Saskatchewan River: Molybdenum Dissolved

### Time Series

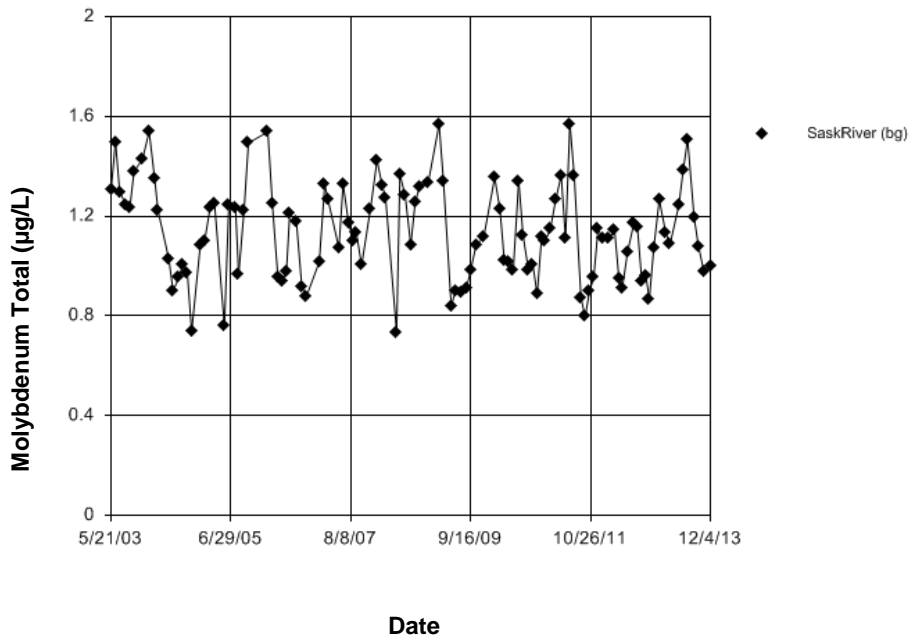
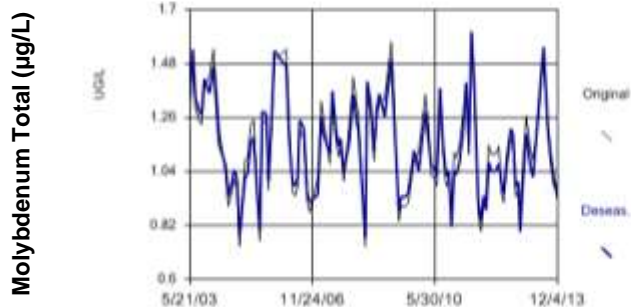


Figure E1396 Saskatchewan River: Molybdenum Total

## Seasonality

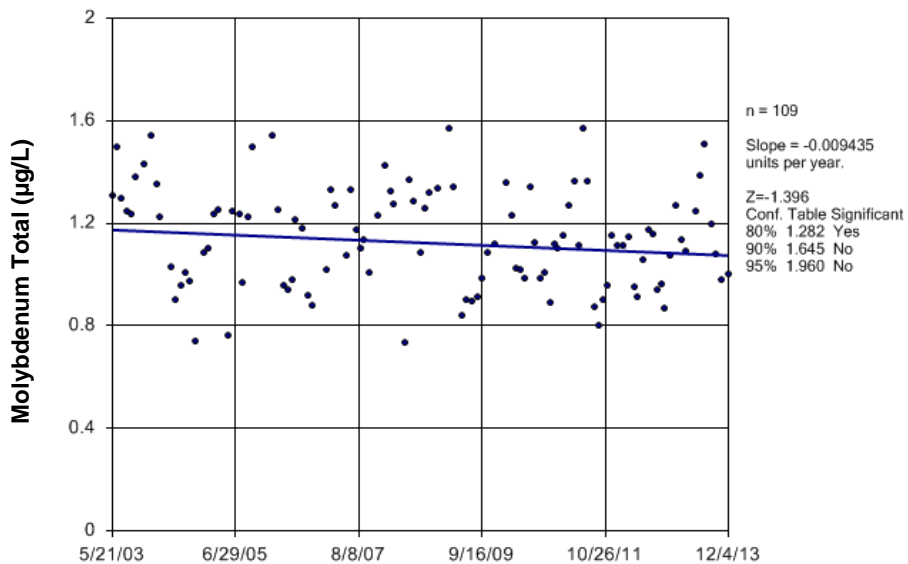
For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 5.401  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 6 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 5.4  
 Adjusted Kruskal-Wallis statistic (H') = 3.401



Date

Figure E1397 Saskatchewan River: Molybdenum Total

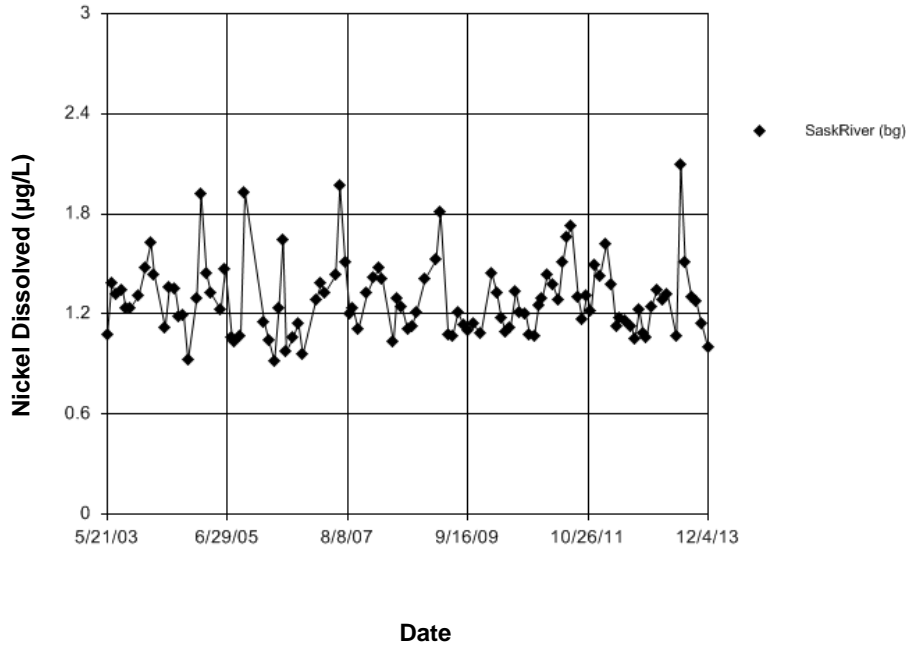
## Seasonal Kendall



Date

Figure E1398 Saskatchewan River: Molybdenum Total

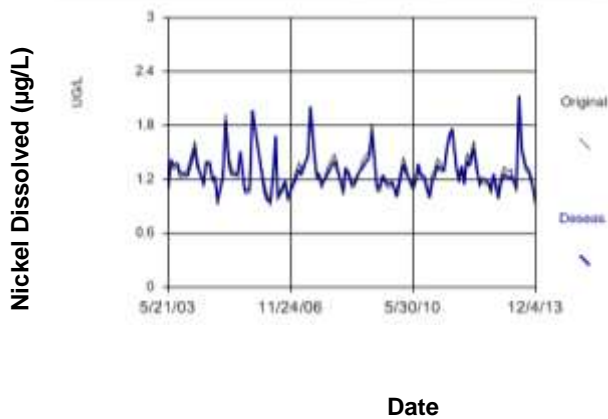
### Time Series



**Figure E1399 Saskatchewan River: Nickel Dissolved**

### Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 13.4  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 6 groups of data in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H<sub>adj</sub>) was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 13.4  
 Adjusted Kruskal-Wallis statistic (H<sub>adj</sub>) = 13.4



**Figure E1400 Saskatchewan River: Nickel Dissolved**

### Seasonal Kendall

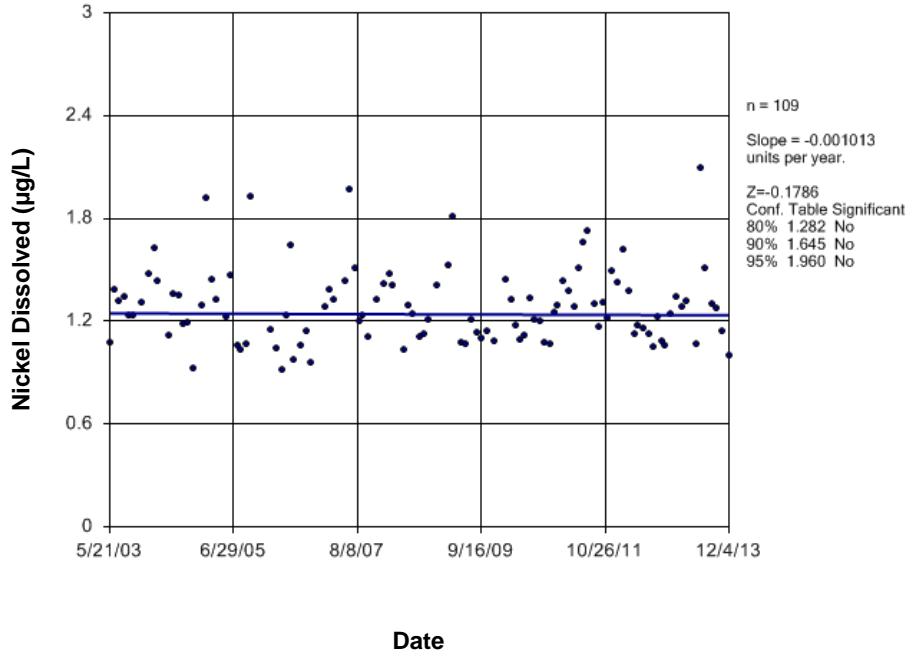


Figure E1401 Saskatchewan River: Nickel Dissolved

### Time Series

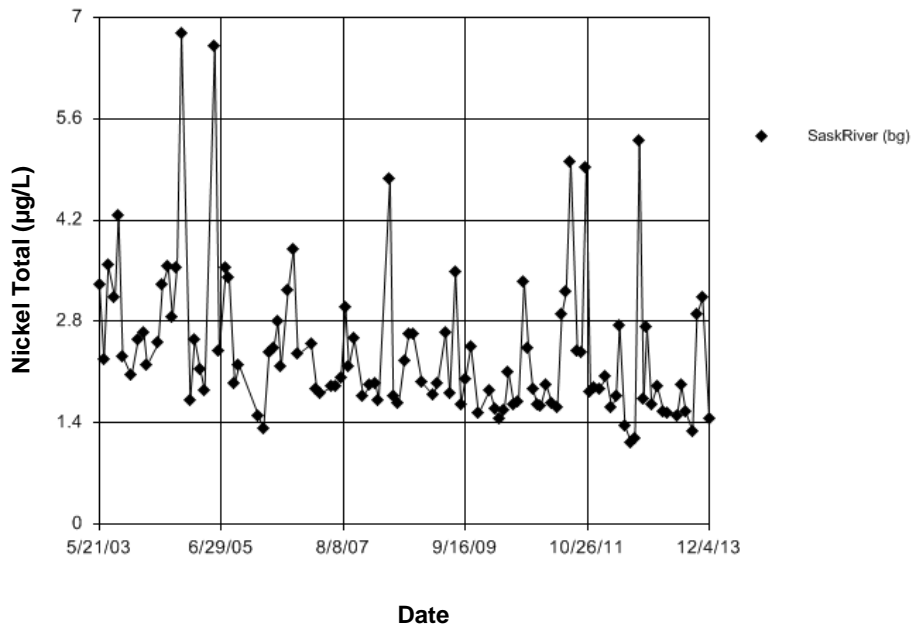
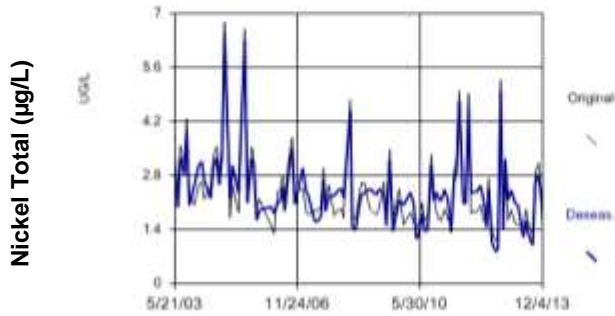


Figure E1402 Saskatchewan River: Nickel Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 17.38  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of two in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 17.38  
 Adjusted Kruskal-Wallis statistic (H') = 17.38



Date

Figure E1403 Saskatchewan River: Nickel Total

## Seasonal Kendall

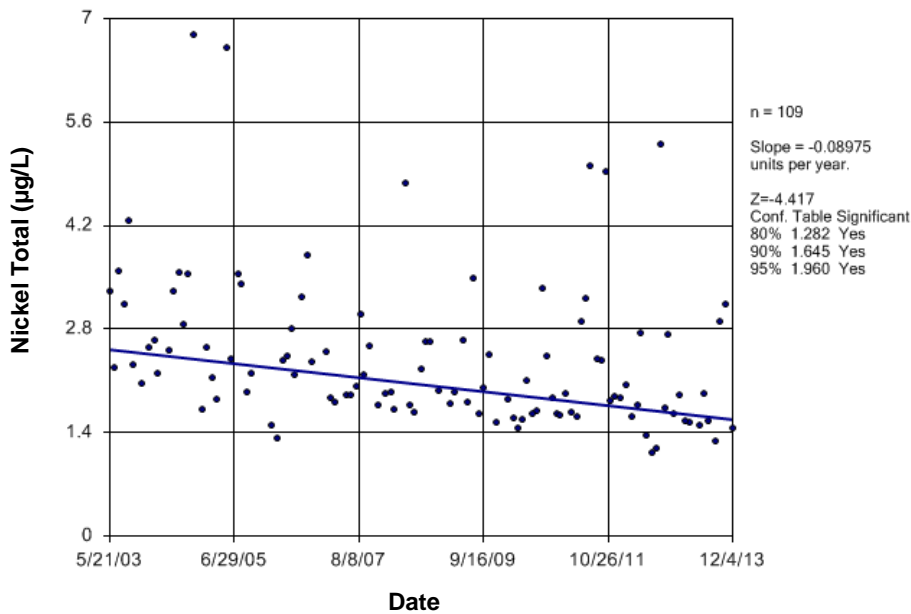


Figure E1404 Saskatchewan River: Nickel Total

## Time Series

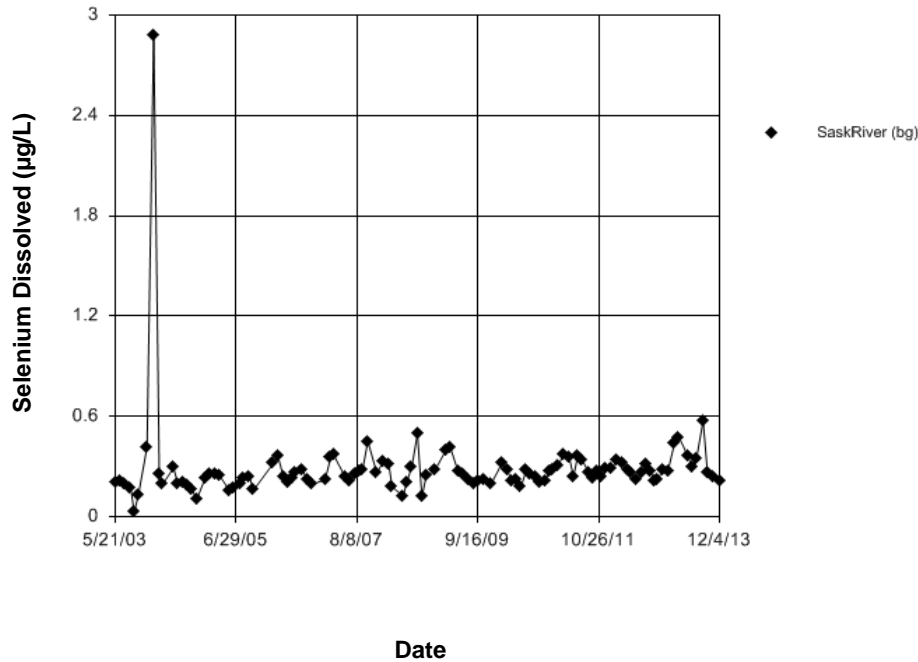


Figure E1405 Saskatchewan River: Selenium Dissolved

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 13.81  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 13.81  
 Adjusted Kruskal-Wallis statistic (H') = 18.81

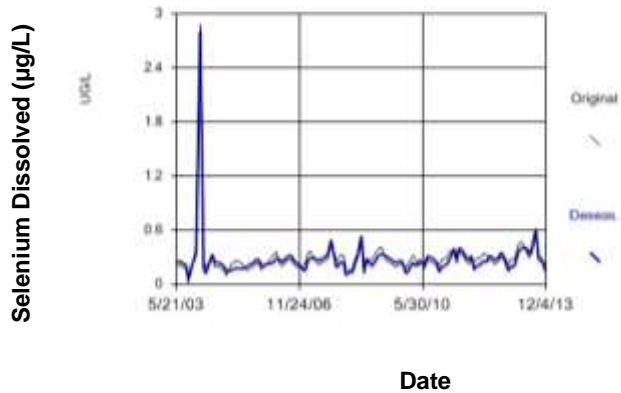


Figure E1406 Saskatchewan River: Selenium Dissolved

### Seasonal Kendall

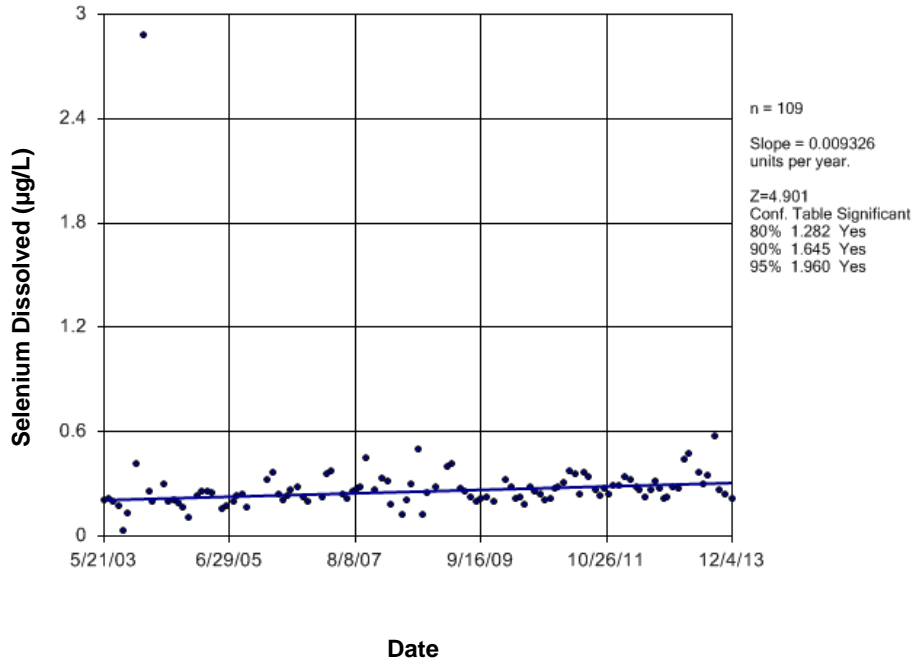


Figure E1407 Saskatchewan River: Selenium Dissolved

### Time Series

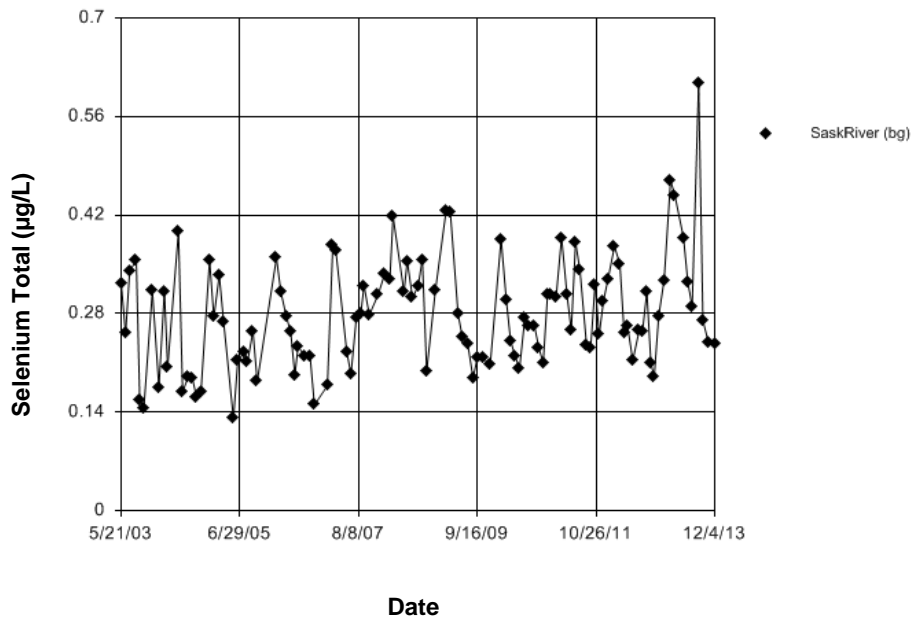
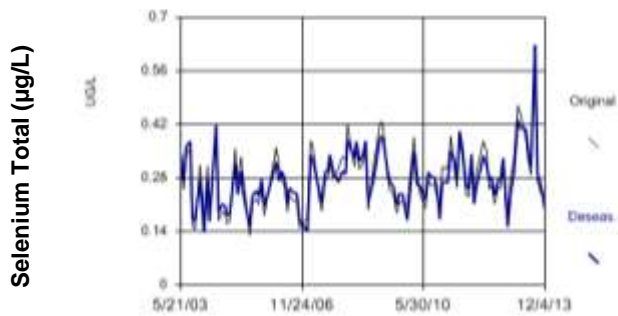


Figure E1408 Saskatchewan River: Selenium Total



## Seasonality

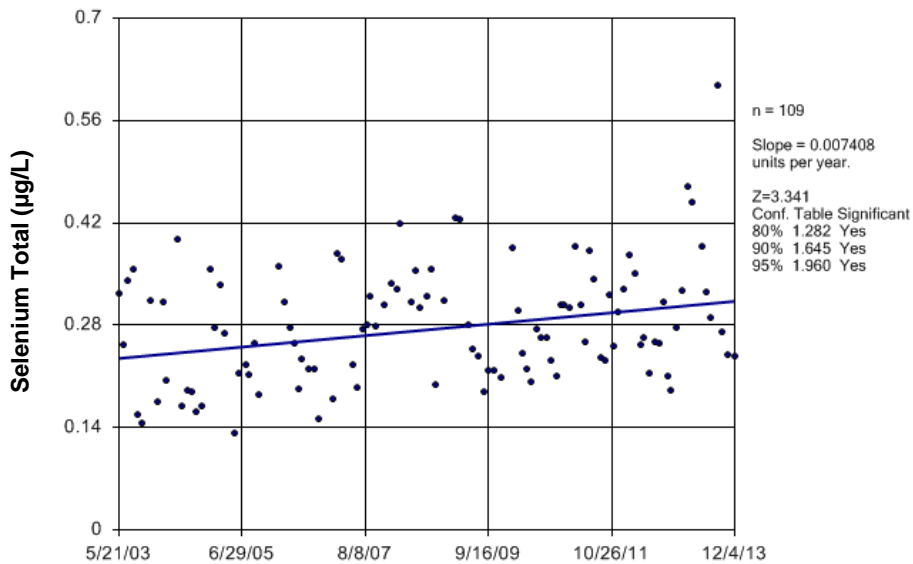
For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 15.61  
Tabulated Chi-Squared value = 5.991 with 1 degree of freedom at the 5% significance level.  
They were 4 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
Kruskal-Wallis statistic (H) = 15.61  
Adjusted Kruskal-Wallis statistic (H') = 13.61



Date

Figure E1409 Saskatchewan River: Selenium Total

## Seasonal Kendall



Date

Figure E1410 Saskatchewan River: Selenium Total

### Time Series

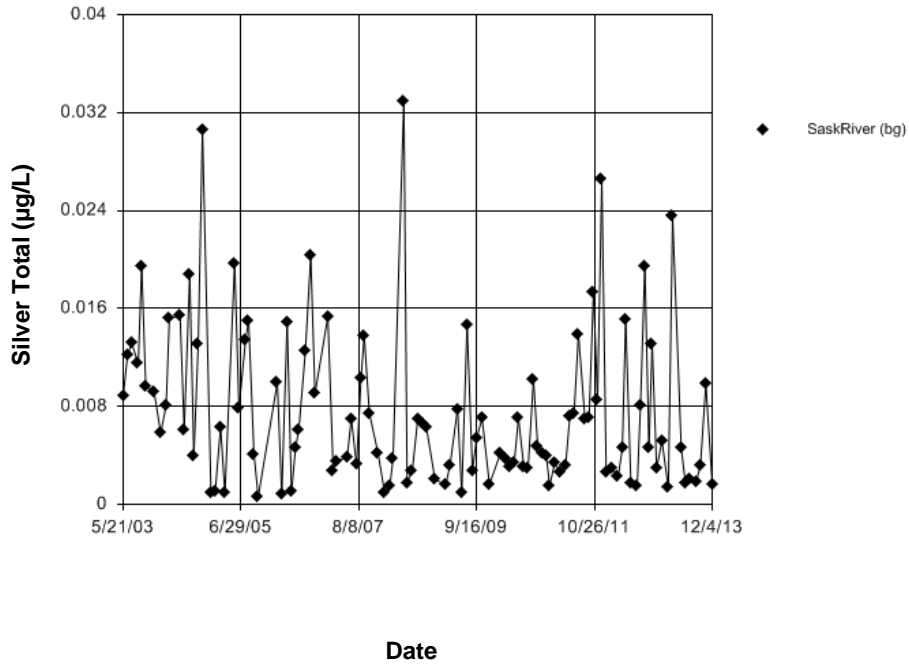


Figure E1411 Saskatchewan River: Silver Total

### Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 11.18. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 0 groups of ties in the data, so an adjustment to the Kruskal-Wallis statistic (0) was necessary.

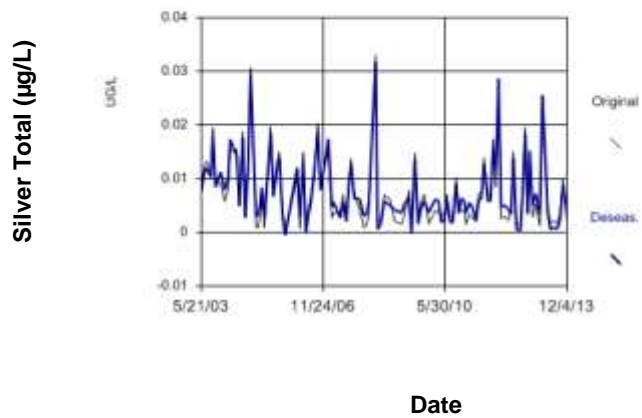


Figure E1412 Saskatchewan River: Silver Total

### Seasonal Kendall

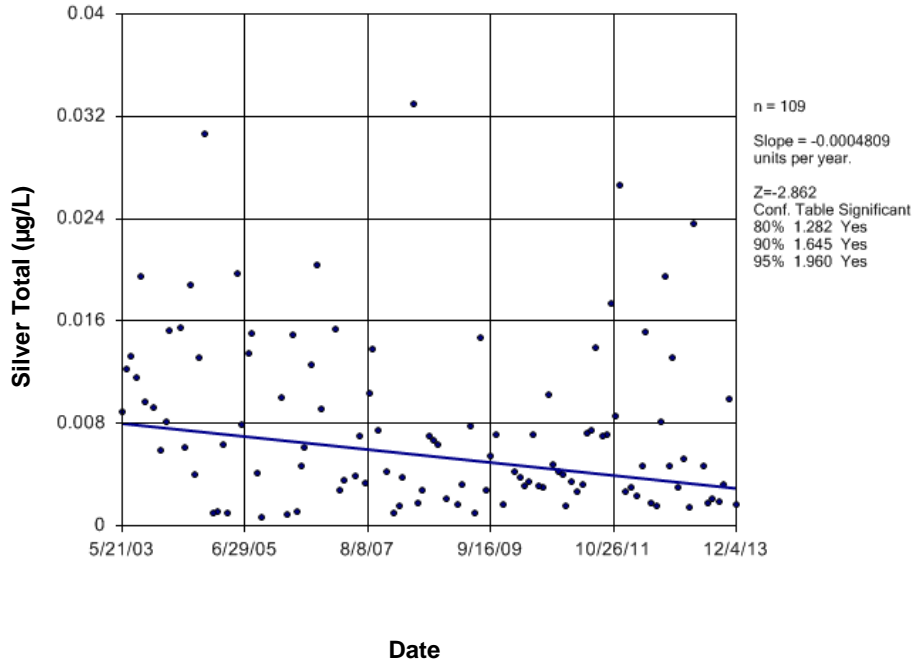


Figure E1413 Saskatchewan River: Silver Total

### Time Series

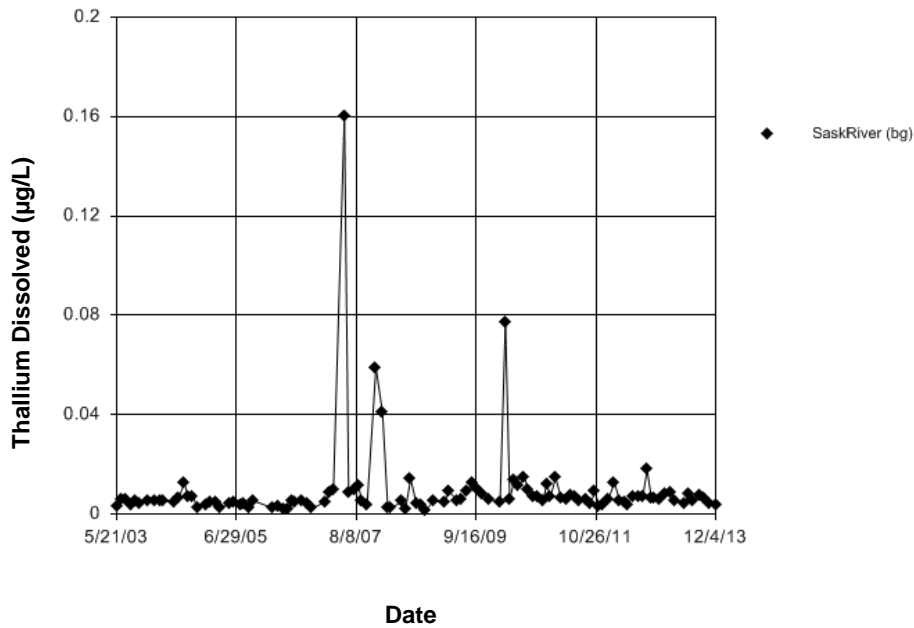
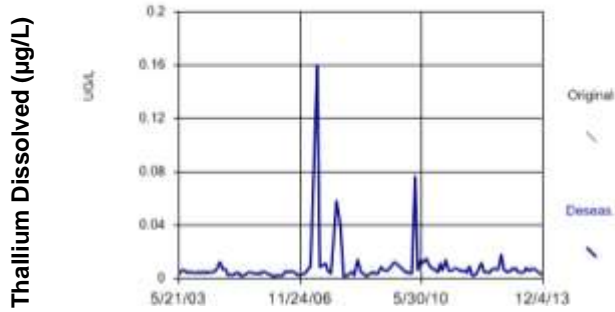


Figure E1414 Saskatchewan River: Thallium Dissolved

# Seasonality

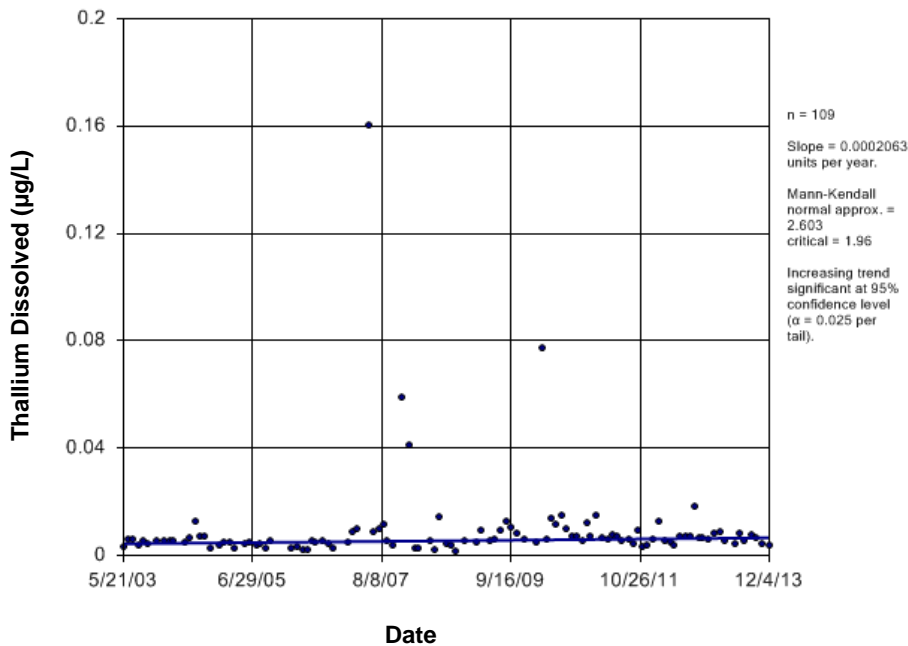
For the data shown, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 0.01155.  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 0.01155  
 Adjusted Kruskal-Wallis statistic (H') = 0.01155



Date

Figure E1415 Saskatchewan River: Thallium Dissolved

# Sen's Slope Estimator



Date

Figure E1416 Saskatchewan River: Thallium Dissolved

### Time Series

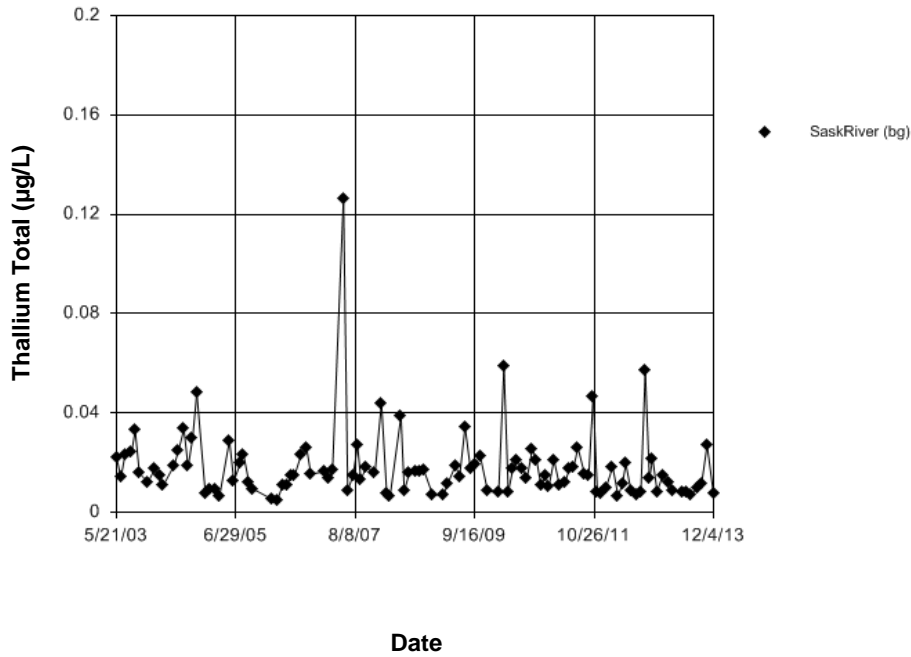


Figure E1417 Saskatchewan River: Thallium Total

### Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 20.29  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 4 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 20.29  
 Adjusted Kruskal-Wallis statistic (H') = 20.29

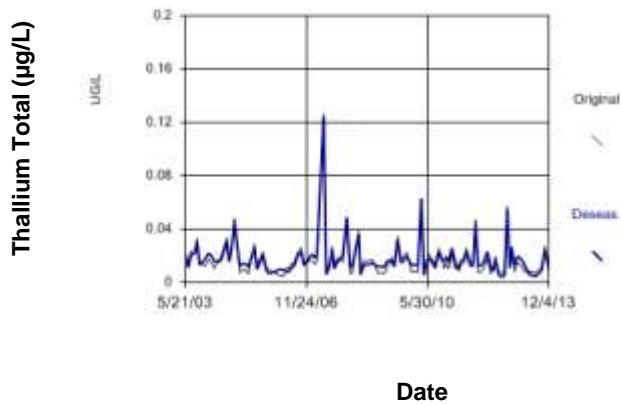


Figure E1418 Saskatchewan River: Thallium Total

### Seasonal Kendall

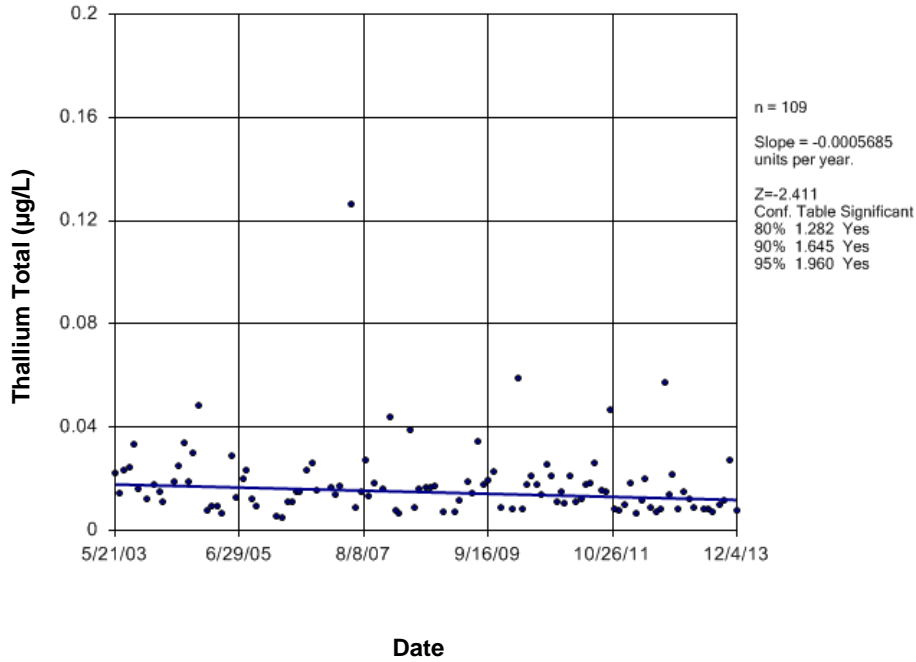


Figure E1419 Saskatchewan River: Thallium Total

### Time Series

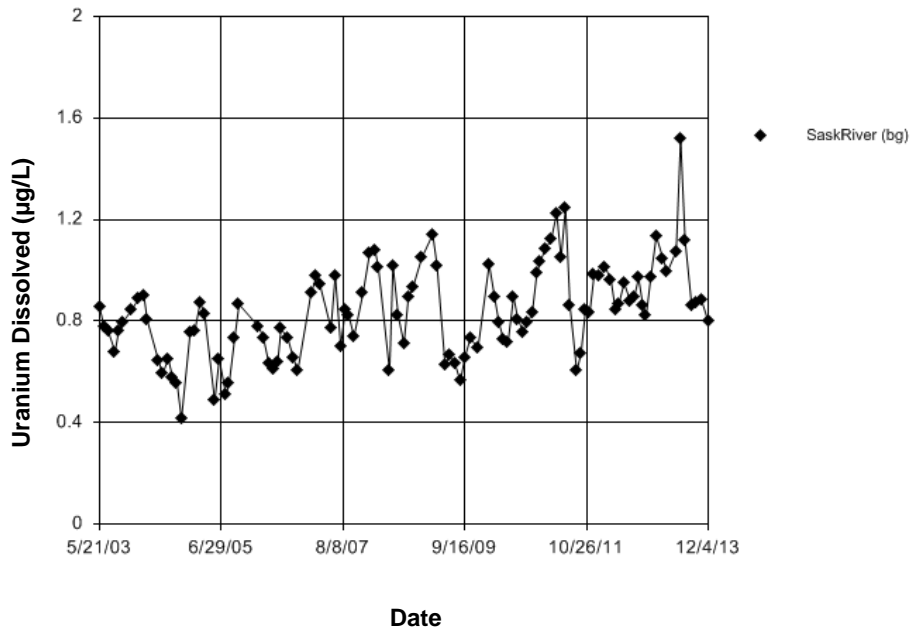
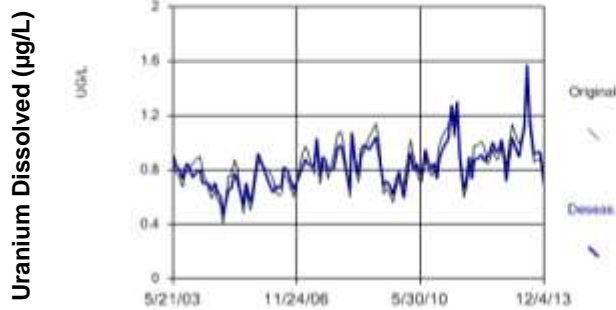


Figure E1420 Saskatchewan River: Uranium Dissolved

## Seasonality

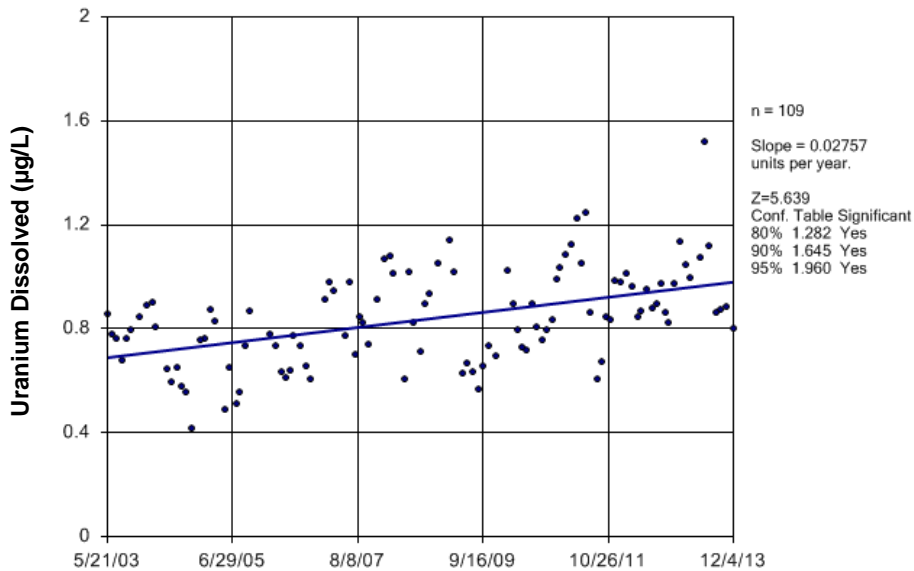
For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-Squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 24.28  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 24.28  
 Adjusted Kruskal-Wallis statistic (H') = 24.28



Date

Figure E1421 Saskatchewan River: Uranium Dissolved

## Seasonal Kendall



Date

Figure E1422 Saskatchewan River: Uranium Dissolved

### Time Series

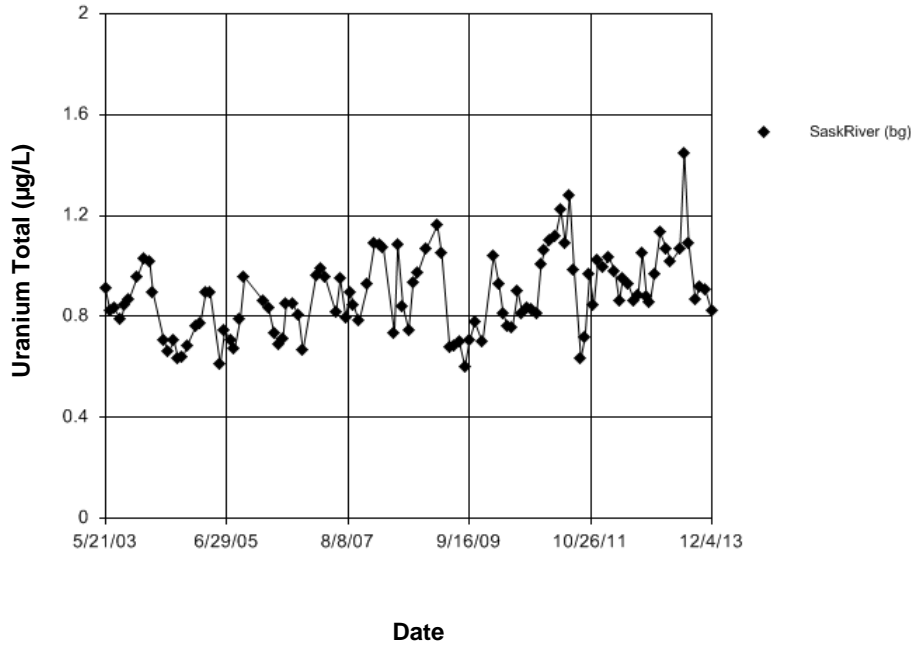


Figure E1423 Saskatchewan River: Uranium Total

### Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 22.66  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 4 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 22.66  
 Adjusted Kruskal-Wallis statistic (H') = 22.66

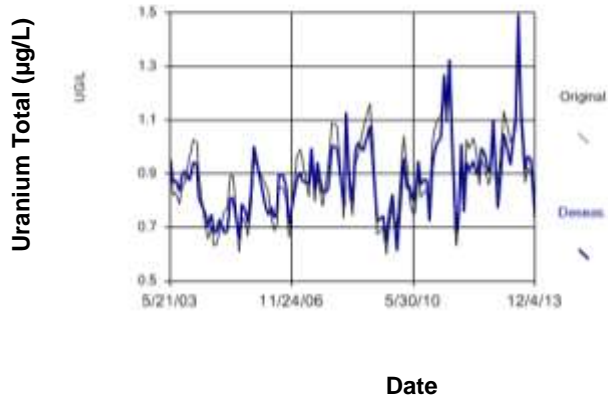


Figure E1424 Saskatchewan River: Uranium Total



### Seasonal Kendall

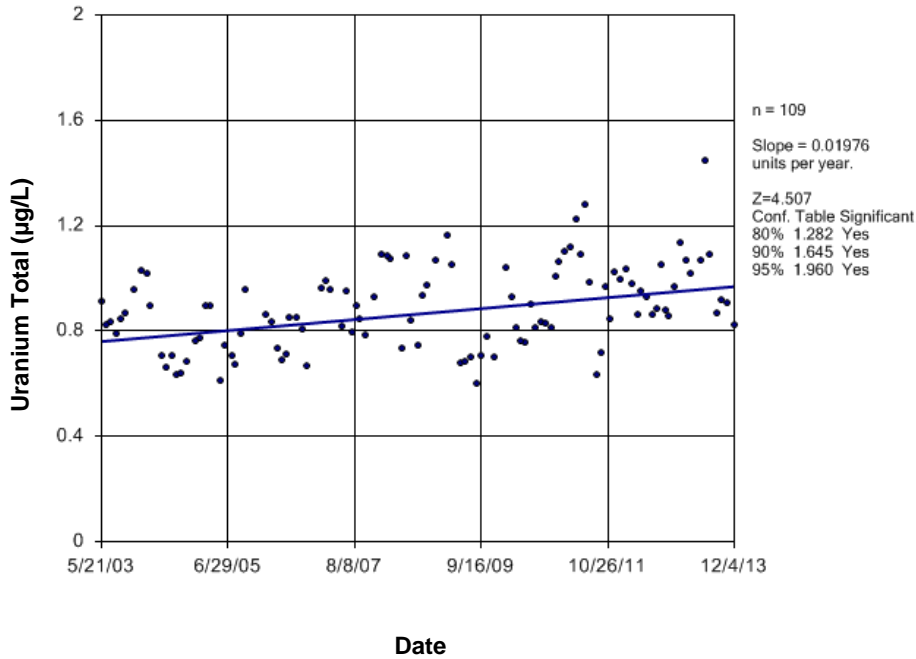


Figure E1425 Saskatchewan River: Uranium Total

### Time Series

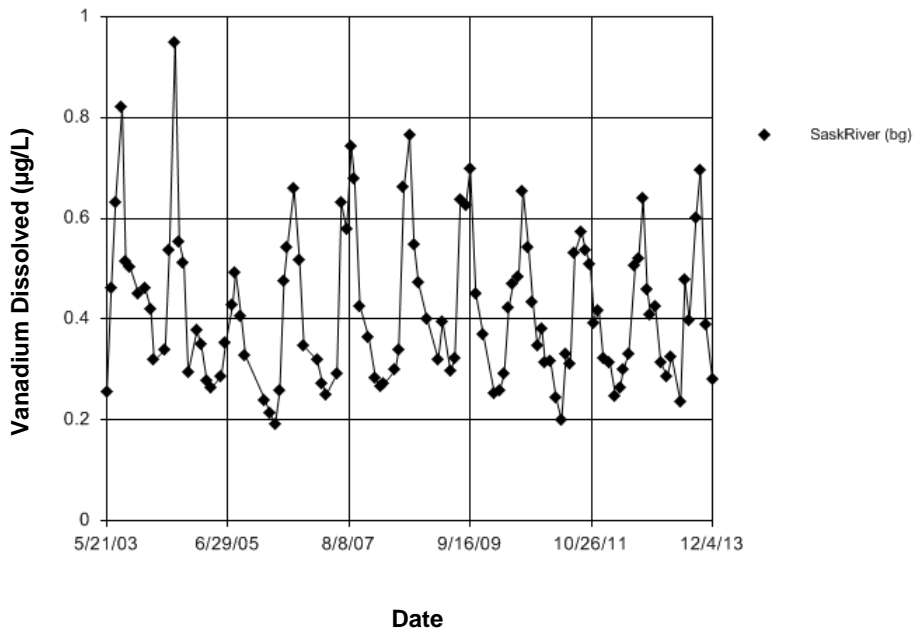
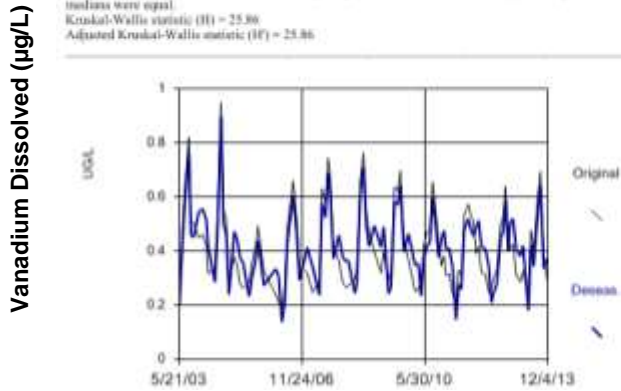


Figure E1426 Saskatchewan River: Vanadium Dissolved

## Seasonality

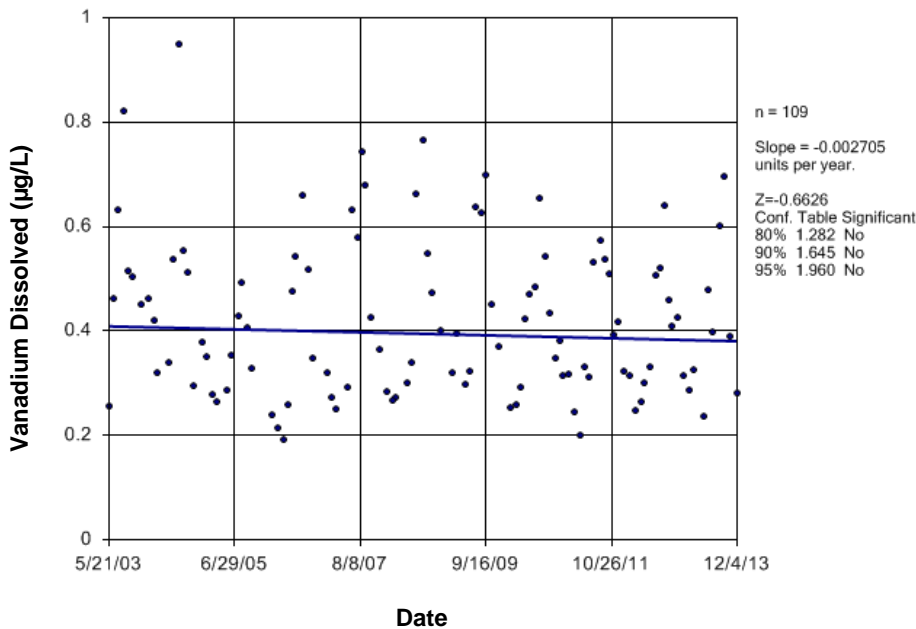
For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 25.86  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 25.86  
 Adjusted Kruskal-Wallis statistic (H') = 25.86



Date

Figure E1427 Saskatchewan River: Vanadium Dissolved

## Seasonal Kendall



Date

Figure E1428 Saskatchewan River: Vanadium Dissolved

## Time Series

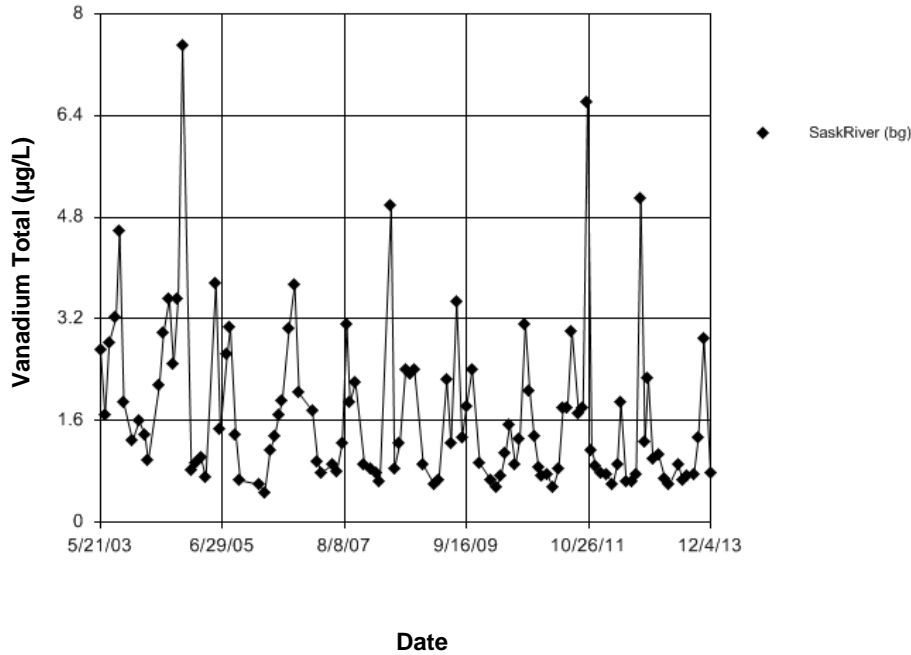


Figure E1429 Saskatchewan River: Vanadium Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 35.12. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal. Kruskal-Wallis statistic (H) = 35.12. Adjusted Kruskal-Wallis statistic (H') = 35.12

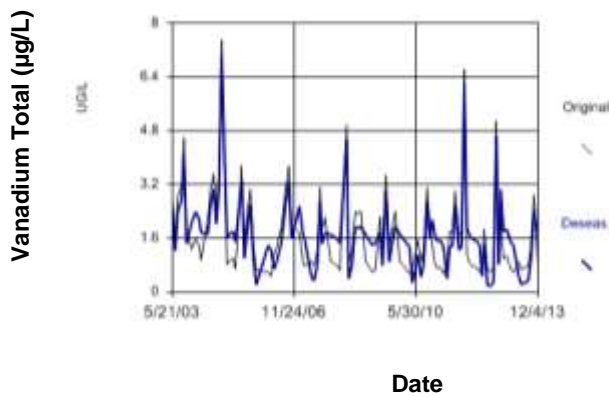


Figure E1430 Saskatchewan River: Vanadium Total

### Seasonal Kendall

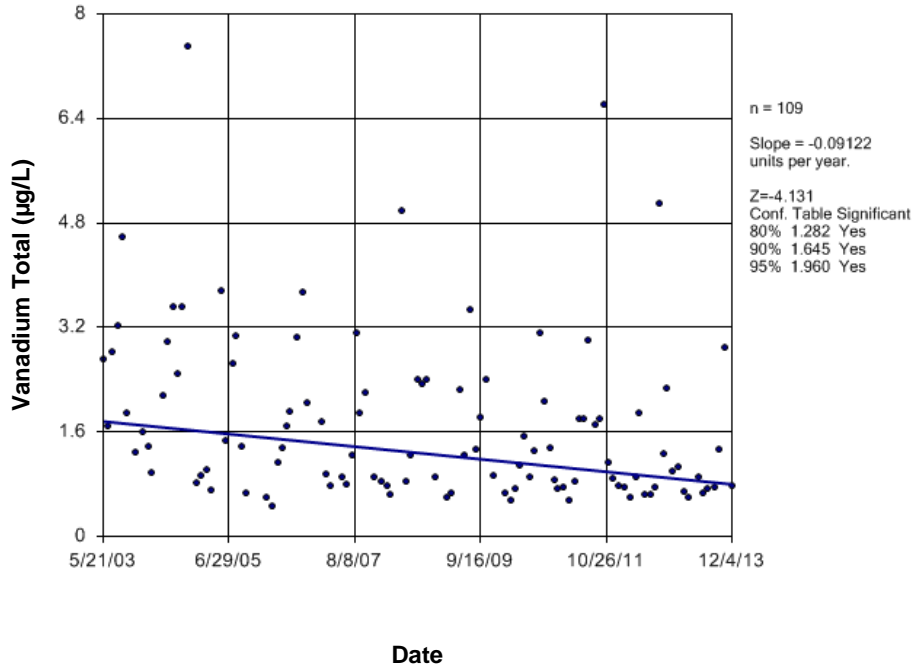


Figure E1431 Saskatchewan River: Vanadium Total

### Time Series

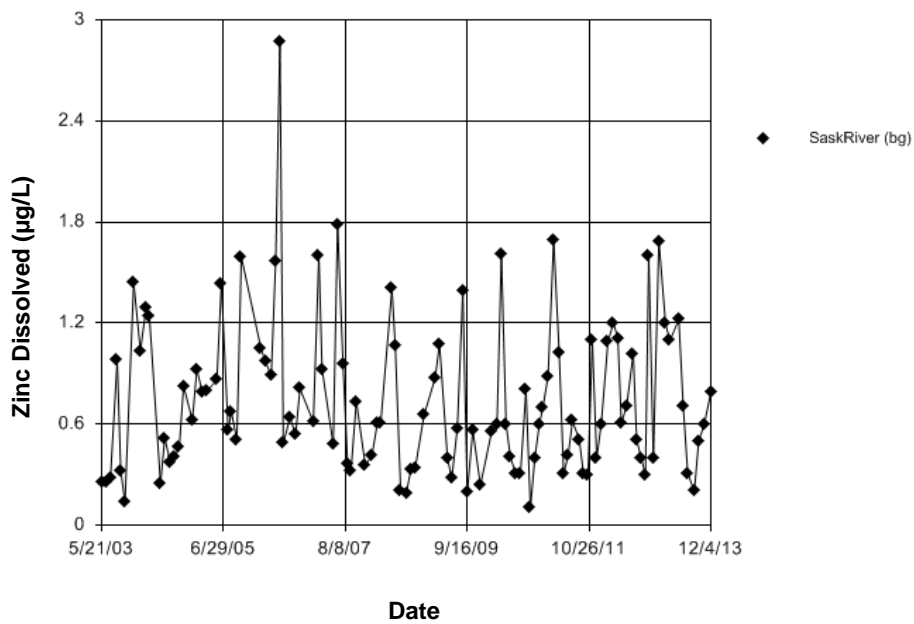
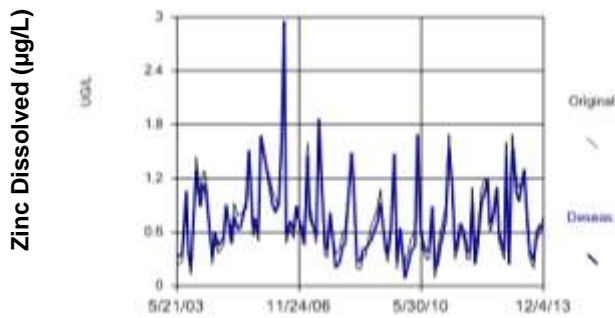


Figure E1432 Saskatchewan River: Zinc Dissolved

## Seasonality

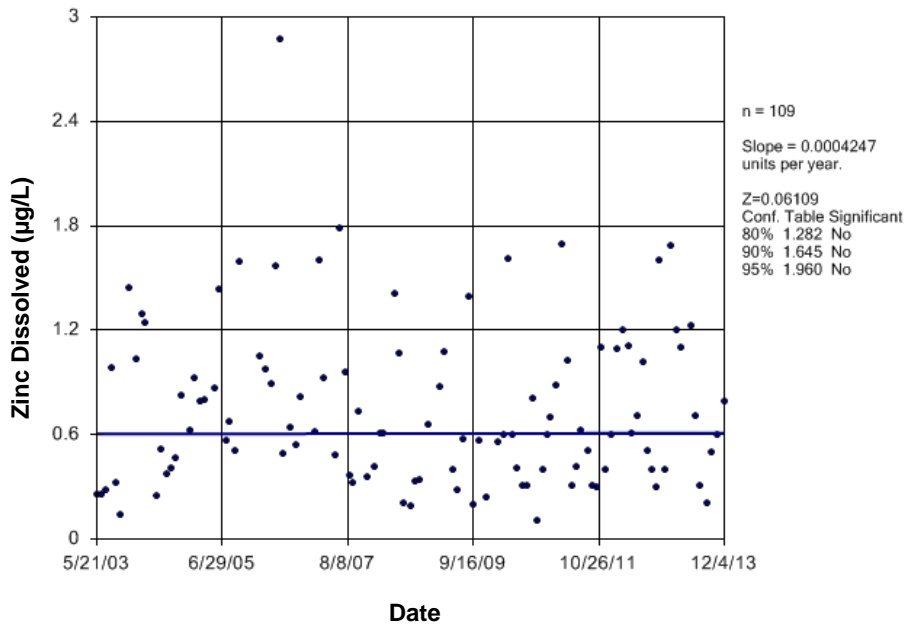
For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 9% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 12.49  
 Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.  
 There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.  
 Kruskal-Wallis statistic (H) = 12.49  
 Adjusted Kruskal-Wallis statistic (H') = 12.49



Date

Figure E1433 Saskatchewan River: Zinc Dissolved

## Seasonal Kendall



Date

Figure E1434 Saskatchewan River: Zinc Dissolved

## Time Series

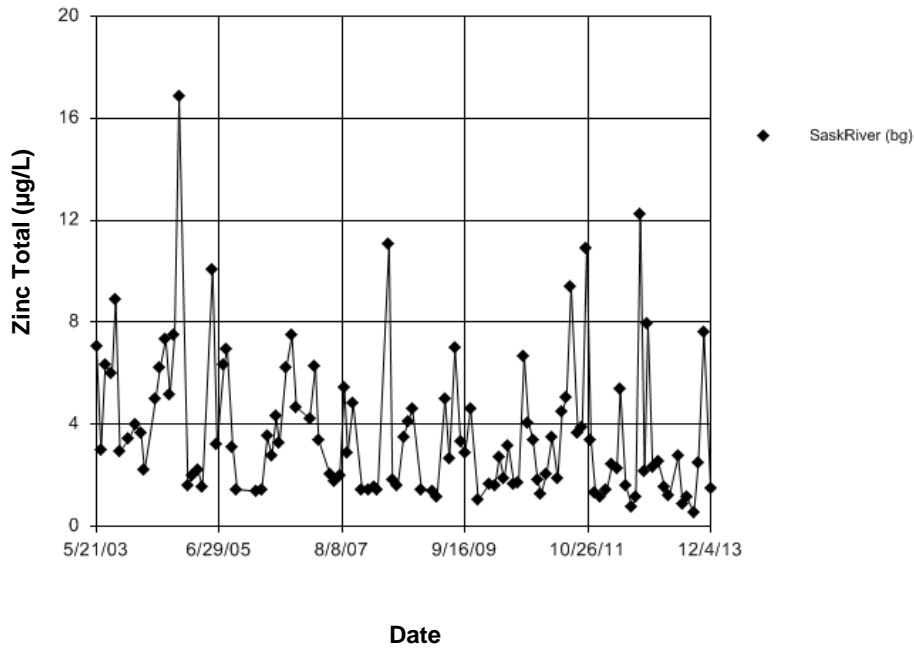


Figure E1435 Saskatchewan River: Zinc Total

## Seasonality

For the data shown, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season. Calculated Kruskal-Wallis statistic = 21.65. Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level. There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

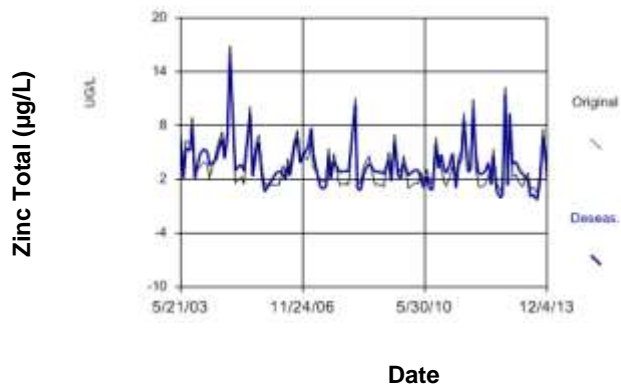


Figure E1436 Saskatchewan River: Zinc Total

# Seasonal Kendall

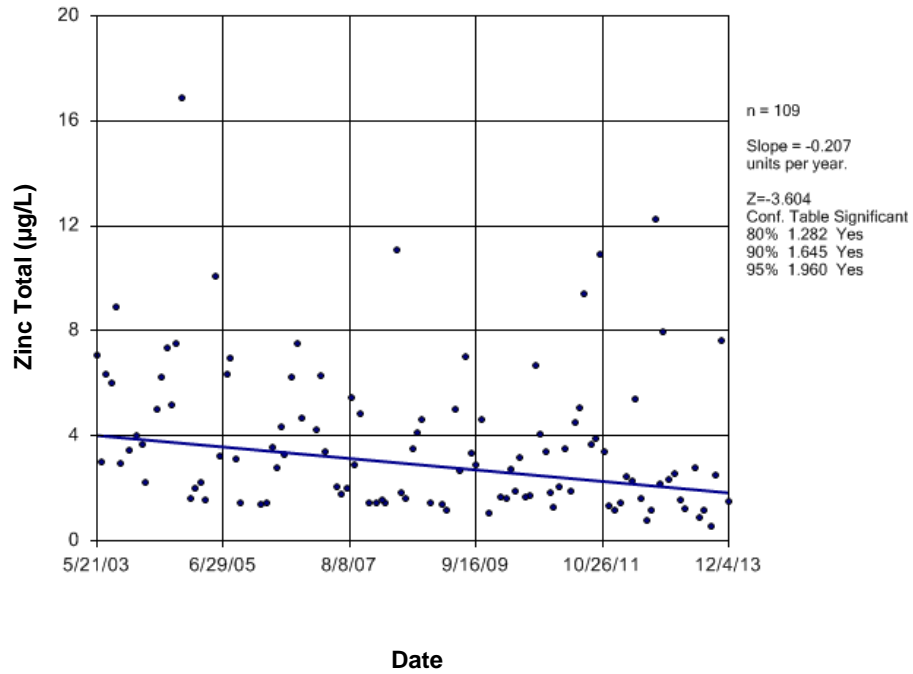


Figure E1437 Saskatchewan River: Zinc Total









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