APPENDIX 5

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Ref. No. 16987

October 25, 2010

Canadian Zinc Corporation
Suite 1710 - 650 West Georgia Street
Vancouver, BC
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Attention: David Harpley

Via email: david@canadianzinc.com

Re: Regional Streamflow Time Series Trend Analysis

Dear Mr. Harpley:

This letter has been prepared to document a time series trend analysis of long-term streamflow records in the Prairie Creek mine vicinity. A trend analysis of the flow data had been requested by Natural Resources Canada (NRC) staff during technical meetings organized by the Mackenzie Valley Review Board for the Prairie Creek Mine Environmental Assessment.

The objectives of the trend analysis were twofold: (1) to assess if there are any obvious long-term trends in annual peak or mean flows in the region, and (2) to assess the representativeness of flows during the 1975 to 1990 period when the Prairie Creek at Cadillac Mine stream gauge was operated by the Water Survey of Canada (WSC).

A time series trend analysis on annual average flows and annual daily maximum flows was made using WSC flow data for the four gauges listed below. Most of the gauges have short periods of missing record within the period indicated above as having continuous record. For the Liard River gauge, missing flows during the winters of 1981 and 1982 were estimated on the basis of typical winter values to complete the period of record that is coincident with the Prairie Creek gauge.

Name	Gauge #	Basin Area, km^2	Record start	Notes
Prairie Creek at Cadillac Mine	10EC002	495	Oct 1974	Record ends after Dec 1990
Flat River near the Mouth	10EA003	8560	Oct 1960	Continuous records start 1973
South Nahanni River above Virginia Falls	10EB001	14500	Oct 1962	Continuous records start 1972
Liard River at Fort Liard	10ED001	222000	Oct 1943	Continuous records start 1965

To facilitate the assessment of the regional data and also the representativeness of the 1975 to 1990 period, the flow data were normalized using 1975 to 1990 average values. For each gauge, mean annual flows were normalized by dividing by the average of the 1975 to 1990 mean flows. Peak annual flows were normalized by dividing by the average of the 1975 to 1990 peak flow values.

Figure 1 shows a time series plot of normalized annual runoff for each station together with 10-year running average runoff amounts for the Liard and South Nahanni River stations. The ten year running

average is the average over the prior period, for example the 2009 value reflects the mean runoff for years 2000 through 2009. Normalized flows above 1.0 are greater than the average 1975-1990 value; normalized flows less than 1.0 are less than the average 1975-1990 value.

There is no obvious long term trend in the annual mean flows. The 10-year mean values show oscillations that are commonly found in hydrologic records and which are sometimes associated with cyclic variability in the Pacific Decadal Oscillation and other indices.

Figure 1: Normalized Annual Mean Flow

Annual mean flow divided by average flow for 1975-1990 (Prairie Creek period of record)
Liard River missing data for winters 1981 and 1982 estimated to extend continuous record

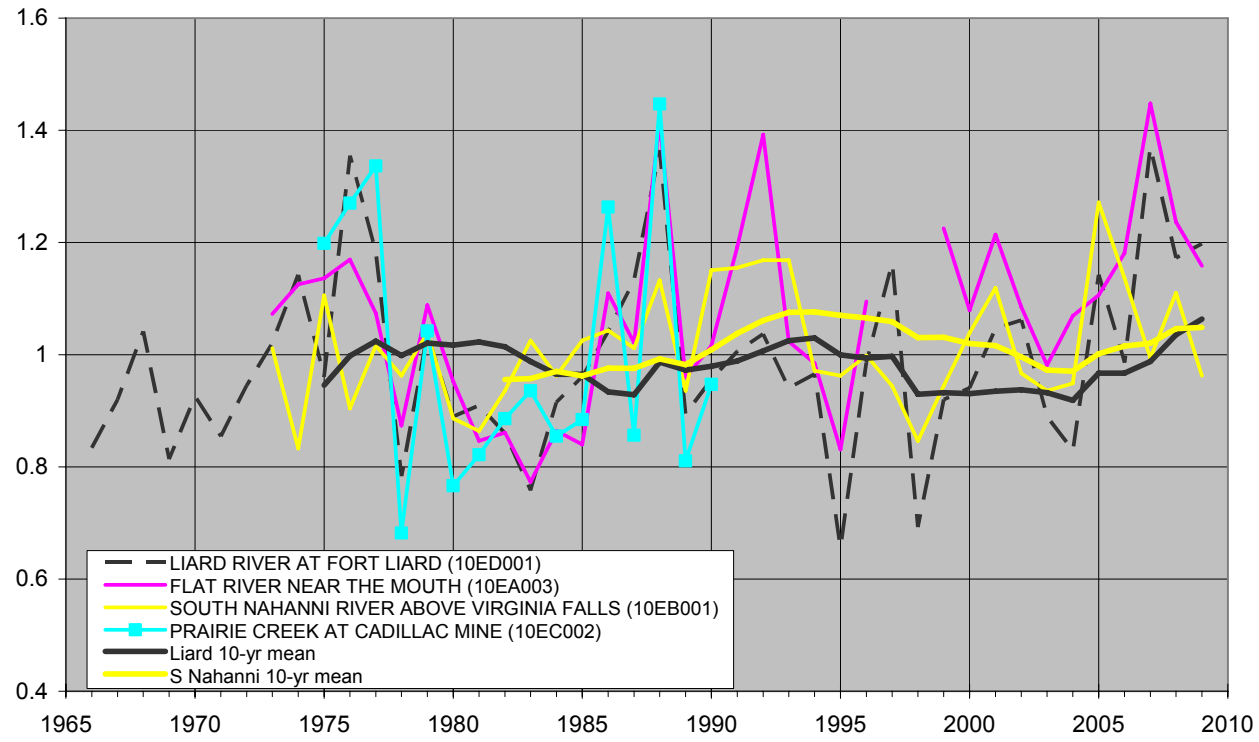
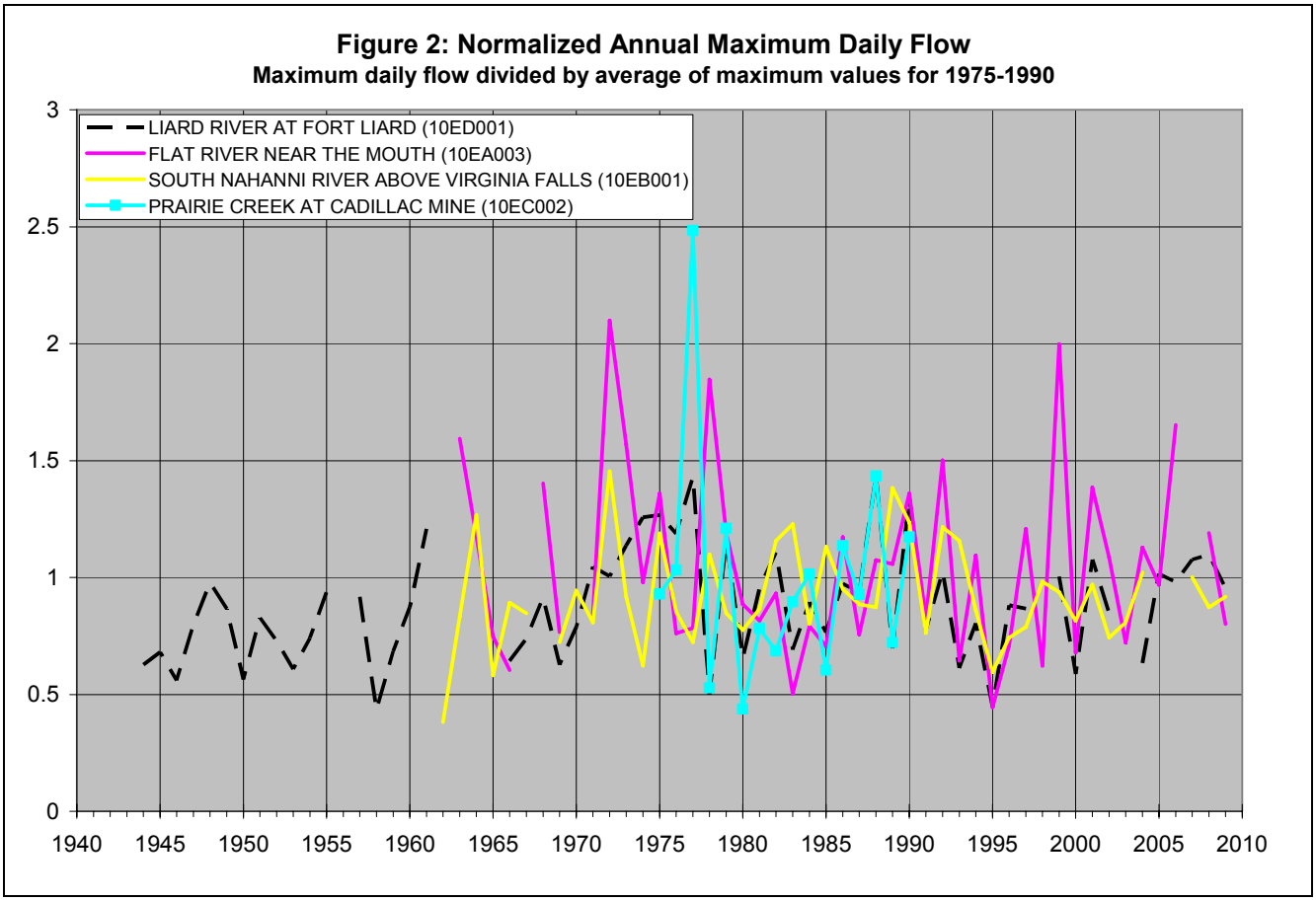


Figure 2 shows a time series plot of normalized annual maximum daily flow for each station. Normalized flows above 1.0 are greater than the average 1975-1990 value; normalized flows less than 1.0 are less than the average 1975-1990 value. The plot does not include 10 year running mean values because of gaps in the post-1997 peak flow records at all of the gauges.

There is no obvious long term trend in the annual peak flows. The normalized Prairie Creek peak flow for 1977 is the highest of all stations for all years of record, but this may be due in part to the relatively small size of the Prairie Creek basin. It is noted that the same year (1977) had the highest flow in the Liard River record but below-average peak flows in the Flat and South Nahanni Rivers.



In conclusion, there are no obvious trends in either the annual mean or annual peak flows at gauged streams in the Prairie Creek region. The 1975 -1990 record for Prairie Creek appears to be reasonably representative of average conditions considering the longer-term flow records at the regional stations. Also, the Prairie Creek record appears to include wet and dry years with runoff near both the upper and lower bounds of the range of variability seen in the other stations.

Respectfully submitted,

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