Mount Klappan Coal Project: March 2006 Update Series

Baseline Studies for Mount Klappan Coal Project: Water Quality

Prepared for

Fortune Coal Limited
Vancouver, British Columbia

Prepared by

Rescan Tahltan Environmental Consultants
Vancouver and Dease Lake, British Columbia

Mount Klappan Coal Project: February 2006 Update Series

Baseline Studies for Mount Klappan Coal Project: Water Quality

As part of the ongoing environmental and socio-economic baseline studies and impact assessment being conducted for the proposed Mount Klappan Coal Project, this document describes the methods and reviews the results of the water quality component carried out in 2004 and 2005. Field sampling began in October 2004 and will continue through 2006. Data collected will form the backbone of the relevant section of the **Environmental Impact Assessment (EIA)** that will be submitted to all levels of government and affected First Nations later this year. This information will also provide an important basis for long-term monitoring of potential impacts of any development.

Water quality has an enormous impact on all aspects of aquatic life and it is therefore imperative when generating an EIA to obtain baseline data on the undisturbed stream, wetland or lake, so that any changes that occur can be monitored.

Water quality can vary considerably throughout the year, and was therefore sampled during different seasons. Sampling took place every second month during winter and every month during summer. In addition, weekly samples were taken at some sites during spring freshet and fall, when snowmelt and heavy rain can lead to changes in water quality.

Overview of Historical Sampling Program

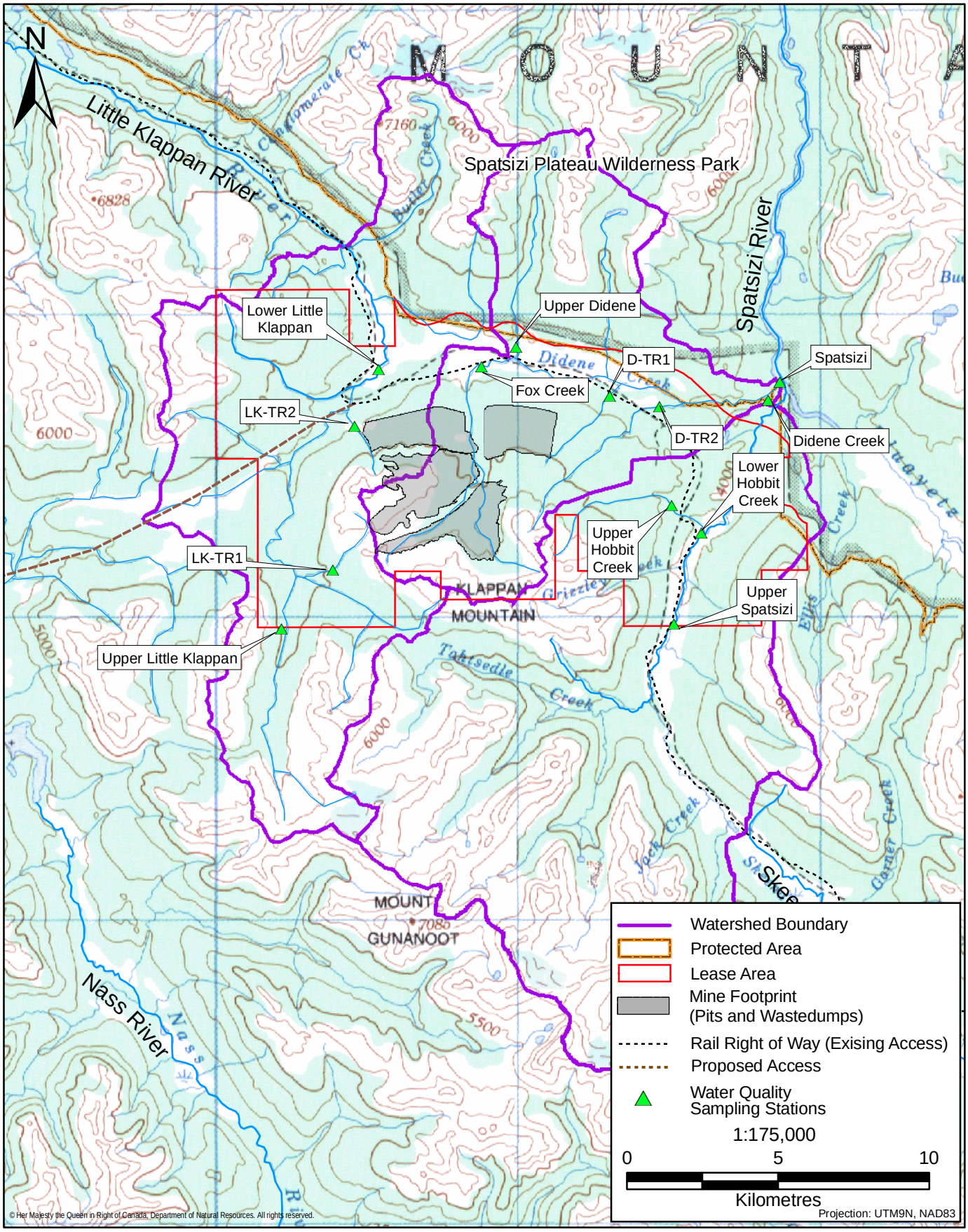
Water quality results from sampling currently being undertaken by RTEC will be compared with data collected by Gulf Canada between 1984 and 1986. The sampling program undertaken in the 1980's collected data on physical parameters (conductivity, pH, total suspended solids, hardness, turbidity, temperature), nutrients (ammonia, nitrogen, phosphate), organics (total organic and inorganic carbon), and 23 total and dissolved metals. The most notable results from the 1980's sampling program are that while the majority of parameters analyzed occurred at or below the analytical detection limits, including selenium, nine of the metals analyzed naturally exceeded guidelines set by the Waste Management Branch of the Ministry of the Environment at the time. These metals were aluminum, copper, iron, lead, manganese, mercury, nickel, silver and zinc.

Sampling Program

In 2004 and 2005, RTEC collected a total of 135 samples at 13 sites near the proposed mine site. The location of these sites is presented in Figure 1. Sites were chosen to include: a) sites downstream of mine development, and b) reference sites that would not be affected by mine development because they were not directly downstream, but were close enough to act as a reference to determine whether any changes in water quality were a result of development or general environmental conditions.

A further 31 samples were collected at 9 stream sites along the proposed new access route that connects the mine and Bell II. All samples were analysed for the following variables:

- Physical parameters (conductivity, pH, total suspended solids, colour, hardness, total dissolved solids, turbidity)
- Nutrients (ammonia, nitrogen, phosphate)



FORTUNE COAL LIMITED

Mount Klappan Coal Project: Mine Site Water Quality Sampling Stations

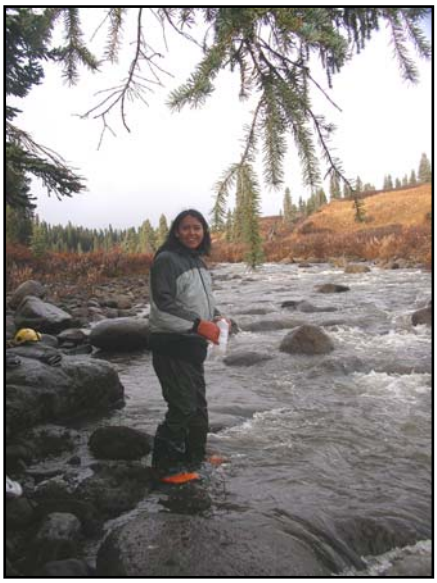
FIGURE 1

Rescan

- Anions (acidity, total alkalinity, bromide, chloride, fluoride, sulphate)
- Organics (total organic carbon)
- Cyanide
- Metals (suite of 32 metals, total and dissolved concentrations)

Analysis of all these variables will allow any potential effect of the mine to be monitored, ranging from increased levels of sediment to increased concentrations of metals. Special emphasis will be placed on selenium which has been demonstrated as an issue in both Southeast and Northeast British Columbia coal developments.

Results



Data analysis is at an early stage, and it is therefore too early to give an overview of all the water quality results. However, as an example of the data that will be produced, aluminum concentrations have been plotted for the freshet and fall sampling periods in 2005, as well as the monthly samples that began in October 2004 (Figure 2). There are several important points that can be made even from this very small fraction of the data that has been collected.

- ***Variability within a site***

  The data show that aluminum concentrations can change dramatically at a site between months and even between weeks.

- ***Variability between sites***

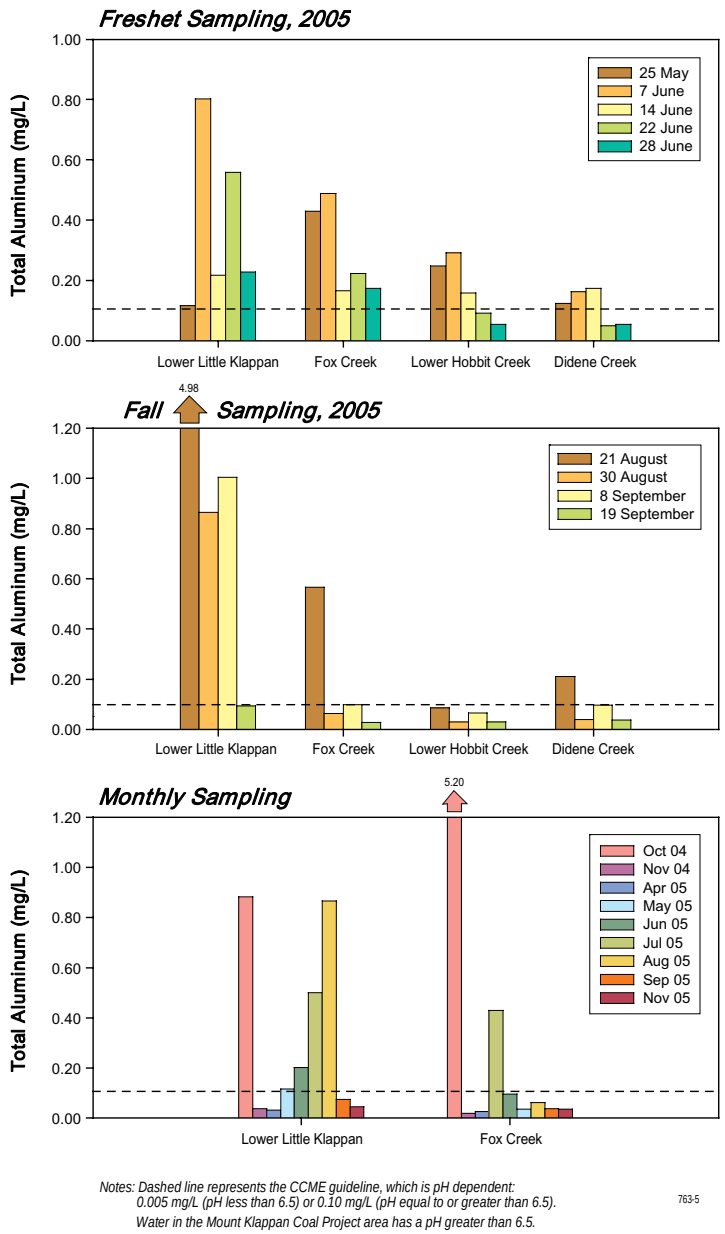
  Comparison of aluminum concentrations in the Lower Little Klappan and Fox Creek shows that two sites that are located fairly close together can have very different concentrations and different patterns of change (e.g., during freshet).

- ***Relationship with existing guideline***

  The **Canadian Council of Ministers of the Environment (CCME)** guideline for aluminum is represented on the graphs as a dashed line, and is exceeded in many instances, particularly during freshet. This demonstrates that there are exceedances even under natural conditions.

These results highlight the importance of collecting baseline data at potentially impacted sites and reference sites, because effects of the mine can only be monitored if natural conditions are known.

The fact that the CCME guideline was exceeded highlights the fact that these are guidelines only, not strict criteria, because certain variables are naturally higher in certain regions of the country. The CCME guidelines were created to provide protection for freshwater and marine life from human effects such as chemical inputs or changes to physical components (*e.g.* pH, temperature, etc.). However, exceedance of a guideline does not necessarily indicate that the variable in question is having a toxic effect on aquatic organisms.



Notes: Dashed line represents the CCME guideline, which is pH dependent:
0.005 mg/L (pH less than 6.5) or 0.10 mg/L (pH equal to or greater than 6.5).
Water in the Mount Klappan Coal Project area has a pH greater than 6.5.

763-5

The CCME guidelines, along with the BC Water Quality Guidelines for the Protection of Aquatic Life, will be used to assess water quality during the lifespan of any proposed development. In addition to these guidelines, the mine will have strict water quality criteria that it must meet as part of its operating permit under the **Waste Management Act (WMA)** and the **Metal Mining Effluent Regulations (MMER)**. While the guidelines can be exceeded even under natural conditions, the criteria set out in the operating permit must be adhered to. Strict penalties up to and including closure of the mine can result if limits are exceeded.

2006 Sampling Program

Water quality monitoring will continue in 2006 with RTEC planning to collect 196 water samples at 12 sites near the proposed mine site. As in 2005, this will include samples being collected every two months in winter, every month in summer, and every week at a smaller number of sites in freshet and fall.

Extensive water sampling will also take place along the proposed road route to Bell II in 2006. RTEC plans to collect 76 water quality samples from 8 wetland sites, 6 lake sites and 5 stream sites.

Summary

Once the 2006 sampling program is complete, two years of data will be available on water quality variability. These results will be compared to water quality data obtained by Gulf in the 1980's, enhanced by the fact that eight of the water quality sites near the proposed mine were also sampled as part of the Gulf field sampling program. Together this information will allow any proposed development to be effectively monitored throughout the life of the mine. Furthermore, as part of the EIA process, baseline data will be used to predict possible impacts of the mine and long term management strategies will be developed to counteract these effects.