

**REQUEST FOR PROPOSAL**

**ATMOSPHERIC DISPERSION MODELLING  
IN THE YELLOWKNIFE AREA**

**August 1994**

**Reference # S-9403**

## **SECTION I**

### **TERMS OF REFERENCE**

#### **ATMOSPHERIC DISPERSION MODELLING**

The Department of Renewable Resources and Royal Oak Mines Inc. require plume dispersion modelling of sulphur dioxide and arsenic trioxide emitted from Royal Oak's Giant Yellowknife Mine roaster stack using US EPA computer dispersion models. Also required is an assessment of the effectiveness of emission control options which could be taken at the mine to provide a reduction in ambient concentrations of the pollutants.

Meteorological and topographical input files suitable for US EPA dispersion models are required. The model calculations should then be compared with observed air quality to document the performance of the model. Following this a meeting between the Contractor and Contract Managers will be scheduled to discuss preliminary results and provide further direction to prepare a sensitivity analysis to assess possible control options.

The Giant Yellowknife Mine roaster stack is the primary source of sulphur dioxide and arsenic trioxide in the Yellowknife area. Roaster exhaust gas is cooled and scrubbed to remove arsenic by Cottrell precipitators and a baghouse prior to release. There are no controls to remove sulphur dioxide. The exhaust stack is 45.7 metres tall and 2.7 metres in diameter. Exhaust gas temperature is about 90° C.

Control options to be assessed include increasing dispersion through raising roaster exhaust gas temperature, velocity or stack height. Contaminant removal before roaster gases are exhausted is another option to be assessed.

The presence of Great Slave Lake to the south of the roaster stack is known to influence plume dispersion and the modelling for this study should account for lake influences. Data collected by Environment Canada's Atmospheric Environment Service at the Yellowknife airport is suitable for meteorological input files.

#### **Report and Other Deliverables:**

Input files and an assessment of model predictions with observed air quality should be completed by November 18, 1994. The meeting between the Contractor and Contract Manager shall be scheduled at a time convenient to all parties after the contract is awarded in early October and again during the week of November 21, 1994. The contractor shall submit five copies of a draft report and electronic copies of model input files by December 21, 1994. Following review and comment by the Contract Managers, the Contractor will submit five bound copies of the final report and one unbound copy by January 16, 1995.

Upon satisfactory completion of the final report, the Contractor shall invoice the Government of the Northwest Territories for 50% and Royal Oak for 50% of the contract price. Payment shall be made in accordance with GNWT payment directives and Royal Oak payment [practices].

#### **Contract Managers:**

The Contract Managers shall be James Sparling, Air Quality Specialist, Environmental Protection Division, Department of Renewable Resources and David Anthony, Manager, Environmental Services, Royal Oak Mines Inc.