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DATE: Feb 04/04
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 REVIEW BOARD

Please contact (867) 669-4736 if this facsimile is not complete.



Environment Canada / Environnement Canada

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February 04, 2004

File No. 4781 003

Kimberley Cliffe-Phillips
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Mackenzie Valley Environmental Impact Review Board
P.O. Box 938, 5102-50th Avenue
Yellowknife, NT X1A 2N7

By facsimile: 867-766-7074

**Re: Technical Report for the Environmental Assessment – Paramount Resources
Cameron Hills Extension Project**

Please find attached Environment Canada's Technical Report for the Paramount Resources Cameron Hills Extension Project. Environment Canada representatives will be in attendance at the public hearing scheduled for February 18-19, 2004 in Hay River, but will not be making a formal presentation. They will, however, be available to respond to any questions which the Board members, applicant, or the public may have concerning the issues raised by Environment Canada in the technical report.

Should you wish clarification on any aspect of the submission prior to the public hearing please contact Wade Romanko by telephone at (867) 669-4736 or by e-mail at wade.romanko@ec.gc.ca.

Sincerely,

for

Laura Johnston
Manager, Northern Division
Environmental Protection Branch
Prairie and Northern Region
Environment Canada
Yellowknife

cc: Peter Blackall (Director, Environmental Protection, Environment Canada, Edmonton)
Stephen Harbicht (Head, Assessment and Monitoring, EPB Yellowknife)

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Canada

Environment Canada

Technical Report

Paramount Resources Ltd. Cameron Hills Extension Project

February 04, 2004

INTRODUCTION

Paramount Resources Ltd. has applied for an extension to the Cameron Hills Drilling Project, Gathering System and Pipeline Development. Environment Canada (EC) has reviewed the information provided by the proponent on the proposed extension and has participated in the information request (IR) process associated with this project. During this review Environment Canada has, and is, providing expert advice as a Responsible Minister acting in the role of a Directly Affected Party as defined by the Mackenzie Valley Environmental Impact Review Board.

Environment Canada

The general mandate of Environment Canada (EC) is defined by the *Department of the Environment Act*. This Act provides the Department with a general responsibility for environmental management and protection in terms of the need to foster harmony between society and the environment for the economic, social, and cultural benefit of present and future generations of Canadians. The Department shares this responsibility with the provinces and territories. Environment Canada is also responsible for providing specialist or expert information and knowledge to federal government agencies and for the preservation and enhancement of environmental quality.

The operations of the Cameron Hills Extension Project are subject to the following statutes administered by Environment Canada: Section 36(3) of the *Fisheries Act*, the *Canadian Environmental Protection Act (CEPA)*, the *Migratory Birds Convention Act*, the *Canada Wildlife Act*, and the *Species at Risk Act*.

The air emissions issues presented in the following Technical Analysis Report reflect the concerns and recommendations developed through the collaboration of EC and Government of the Northwest Territories (GNWT-RWED) Air Quality Sections.

Issue #1 Mitigation of SO₂ Air Emissions

EC identified concerns regarding potential air quality degradation due to SO₂ emissions from the Paramount Cameron hills oil and gas facilities. Using best available technology (BAT), the proponent can reduce SO₂ emissions to negligible levels.

Reference: DAR section 7.2 and Appendix III, Paramount response to I.R. 1.2.131 and I.R. 1.2.134

Developer's Conclusions

In their response to I.R. 1.2.134, Paramount concludes that since the "worst case" modelling predictions for ground-level SO₂ are below the NWT ambient air quality standards, mitigation measures are not necessary.

Environment Canada's Conclusion

EC has concerns regarding the modelling approach used by Paramount to predict ground-level SO₂ and is not convinced that the predictions represent a "worst case" scenario. Given that Paramount is predicting that SO₂ levels will be more than 98% of the NWT ambient air quality standards, mitigation measures should be implemented to reduce SO₂ emissions to ensure the ambient standards are not exceeded.

Environment Canada's Rationale/Evidence

As part of the Canada-wide Standards for PM and Ozone, the Government of Canada and the Government of the Northwest Territories have recognized that polluting "up to a limit" is not acceptable and that the best strategy to avoid future problems is Keeping Clean Areas Clean (KCAC). The KCAC strategy encourages the pollution prevention approach (e.g. the use of best management practices and best available technology) to minimize emissions and environmental impacts.

The foot notes attached to tables of stack heights for line heaters and pumpjacks, Tables III-8, -10, -24 and -26, state:

"A standard line heater stack height of 6.1m was assumed. Stack heights associated with concentrations in excess of the NT standards were increased to comply with NT standards."

and

"A standard pumpjack stack height of 3m was assumed. Stack heights associated with concentrations in excess of the NT standards were increased to comply with NT standards."

The proposed stack heights for line heaters ranged from 6.1m to 19m and stack heights for pumpjacks ranged from 3m to 8.5m. It appears that there were many exceedances predicted under the original stack configurations. Subsequently, the proponent ran multiple iterations of the model with increased stack heights until all concentrations were under the ambient standards. Even with this extreme modelling and configuration exercise, the maximum predicted 1-hour SO₂ concentrations are still within 98% of ambient standards for each emission scenario.

We are concerned that the proponent is configuring stack heights so that model predictions meet ambient guidelines rather than trying to mitigate emissions. This approach essentially results in a polluting "up to a limit" scenario and is contrary to the approach advocated under the Canada-wide Standards process and KCAC strategy. It should be noted that Tables III-8 and -10 (the Baseline Case) indicate that potential exceedances of the NWT SO₂ standards could be occurring now under the current stack configurations for the existing line heaters and pumpjacks. Clearly there is a sulphur issue that needs to be addressed.

In the Baseline Case and Application Case, maximum SO₂ concentrations are predicted to occur very close to the central battery facility. In the Planned Development Case, the proponent introduces an amine sweetening unit which reduces the central battery SO₂ emissions estimates to 7% of the Baseline and Application Cases. Although the predicted SO₂ concentrations near the central battery are greatly reduced in the Planned Development Case, SO₂ levels in other areas are still within 99% of ambient standards. Further benefits could be achieved by using the sweetened fuel for all combustion engines such as the line heaters and pumpjacks. Paramount states that if "sweet fuel were used at all sites, as suggested by the reviewer, SO₂ emissions would be too small to measure" (response to I.R. 1.2.134).

The H₂S percentage of the gas used as fuel in combustion engines and heating is essential to estimating SO₂ emissions at the Cameron Hills facility. It is, therefore, vital that the H₂S percentages not be underestimated and that the modelling represents 'worst case' emission scenarios. Concerns were expressed in I.R. 1.2.131 that the H₂S estimates were based on a single sample. Paramount responded that the "gas compositions used in the dispersion modeling are based on single samples that provide the best representative analysis, based on stabilized well flow, and equipment stabilization". Without data from multiple samples it is not possible to assess the confidence level of the H₂S estimates. It is noted that in a recent submission of their Emergency Response Plan for the Cameron Hills facility (revised July 2003), Paramount estimates the H₂S percentages for all existing gas and oil wells at 3% (Table 3.4) – a figure in excess of any of the estimates used in the DAR.

Recommendation

Environment Canada recommends that Paramount mitigate SO₂ emissions from the Cameron Hills facility. Accelerating the installation of the amine sweetening unit, proposed by the Proponent in the Planned Development Case, and using the sweetened fuel in all combustible engines and heaters, would eliminate all SO₂ air quality concerns.

Issue #2 Ambient Air Quality Monitoring

EC identified concerns regarding potential air quality degradation due to emissions from the Paramount Cameron hills oil and gas facilities. Air quality monitors are required to ensure NWT ambient air quality standards are not exceeded.

Reference: DAR section 7.2, I.R. 1.2.135, Paramount's response to I.R. 1.2.135

Developer's Conclusions

In the response to I.R. 1.2.135, Paramount agrees to "monitor air quality to assure that acceptable air quality is achieved". Paramount has installed two sulfation stations to measure long-term air quality.

Environment Canada's Conclusion

The monitoring program proposed by Paramount is insufficient since the sulfation stations will not provide information on ambient SO₂ concentrations in a form or averaging period that would allow comparison to the NWT ambient air quality standards. The monitoring program should include continuous ambient SO₂ monitors and a meteorological monitoring site.

Environment Canada's Rationale/Evidence

Model predictions provided by Paramount in the DAR, indicate that 1-hour SO₂ concentrations will be more than 98% of the NWT ambient air quality standards for Baseline Case, Application Case and Planned Development Case. To ensure that ambient standards are not exceeded, continuous ambient SO₂ monitors should be installed in locations predicted to have the highest concentrations. A meteorological monitoring site should also be installed at the facility to allow analysis of elevated episodes and to provide on-site data for future modelling.

The original modelling did not use on-site meteorological data so the locations of the peak values may not be accurate. After sufficient on-site meteorological data is collected

it should be used to redo the dispersion modelling to reassess the locations of the air quality monitoring sites.

Recommendation

EC recommends that Paramount develop an air quality monitoring program through consultation with air quality specialists at EC and GNWT.

Issue #3 Waste Management – Drilling Fluid and Waste Disposal

The proponent has referred to regulatory parameters or guidelines for waste management.

Reference: DAR section 3.4.2 & 4.1.1

Developer's Conclusions

Paramount is proposing to dispose of drill cuttings in remote pits, drill cuttings are to be sampled and analyzed to ensure the cuttings do not exceed regulatory parameters or guidelines (the Indian and Northern Affairs Canada's *Environmental Operating Guidelines: Hydrocarbon Well-sites in Northern Canada* (1986) and the Alberta Energy and Utilities Board *Guide 50: Drilling Waste Management* (1996)).

Environment Canada's Conclusion

1. These guidelines were developed to communicate the best operating practices to protect the environment, and reduce the overall extent of the land surface disturbance. The proponent is advised to adhere closely to the requirements of these guidelines, as well as to be cognizant of and adhere to any industry best practices that are developed subsequent to these guidelines. Notwithstanding this, waste management and operating guidelines are subordinate to all existing acts, regulations, and terms and conditions of permits.
2. Environment Canada believes it is critical for all parties involved to develop coordinated reporting methods that advance scientific knowledge and are meaningful for environmental management purposes (e.g.: cumulative impacts and environmental risk assessment).

Environment Canada's Rationale/Evidence

Due to the limited amount of northern research, Environment Canada has concerns with the cumulative and long-term impacts with the use of in-ground sumps and/or the mix/bury/cover approach in the Northern regions. An informal review of current and historic northern sump sampling techniques, monitoring methods, reporting formats and archiving systems have demonstrated that information collected regarding in-ground sumps is significantly varied, disjointed and difficult to collate.

Recommendation

The Board should ensure that a comprehensive monitoring program is established so that the information gathered is useful in assessing the performance of in-ground waste disposal facilities.