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July 9, 2002

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MAIL ROOM
SALLE DE COURIER
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NEB / ONE

Dear Mr. Davies:

Re: GSX Canada Pipeline Project - Hearing Order GH-4-2001
The Environmental Effects of the Combustion of Gas at the Proposed Duke Point Generation Facility
Environment Canada Information Request #2

Please find Information Request #2 of Environment Canada attached to this letter.

Yours very truly,

John Clark,
Counsel
Department of Justice

c. Dave Carter
Catherine Badke
Bill Henwood
Brian O'Donnell
Judy Tanguay
Michel Mantha
GSX Intervenors

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Canada

National Energy Board
GSX Canada Pipeline Project - Hearing Order GH-4-2001

Environmental Effects of the Combustion of Gas at Proposed Duke Point Generation Facility
Environment Canada Information Request #2

2.1 Preamble

As a result of experience with other reviews, Environment Canada has developed a number of general information requirements which apply to any assessment of air emissions from thermal generating facilities such as that proposed for Duke Point. Provision of this information as a minimum is extremely helpful in ensuring consistency of review criteria. These general information requirements may be summarised as follows:

a) A summary of air emissions expected to result from the facility on an annual basis broken out into the full range of key criteria and toxic pollutants as well as greenhouse gas components.

b) A summary of any offsetting air emissions reductions, if any, which will be achieved either on-site or off-site at the facility, including any proposed mitigation of carbon dioxide and other GHG emissions.

c) A summary of net emissions based on a and b above.

d) A comparison of project emissions to inventoried emissions of the Georgia-Coast-Cascade basin airshed.

e) Persuasive information on the transportation patterns for the airborne pollutants originating from the facility with emphasis on the extent to which the ambient air concentrations will change, both in the Canadian and American portions of the airshed.

f) A comparison of pre- and post-project peak ambient air quality parameter concentrations with Canadian maximum desirable and acceptable objectives and the Canada-wide Standards for Particulate Matter and Ozone.

g) Information on the potential human health impacts of any change in air quality emissions and the resultant change in ambient air quality, together with the geographic extent of any such impacts.

h) Information on the change in atmospheric deposition of contaminants, including comparison with available criteria for ecosystem sensitivity.

i) Information on impacts of the change in air emissions on agricultural crops in the region.

j) A comparison of the proposed emissions control technologies with Canadian standards and guidelines for similar technologies.

k) A comparison of pre- and post-project ambient air quality concentrations in the Georgia-Coast-Cascade air basin between the current proposed site and other alternate sites.

l) Information on the impacts on visibility in the airshed and on a number of specified lines of site.

m) Information on any new or physically modified infrastructure, for example, power lines, pipelines, compressor stations.

n) Information on any operational changes to existing facilities or infrastructure which could have environmental implications.

o) Basic information on the cumulative effects of emissions from this proposal in context with those from other known existing or proposed projects/activities within the airshed.

Based on Environment Canada's review of the Duke Point documentation provided, adequate information appears to be included on items a), f) and g) above. However, there appears to be only partial information in relation to items b), c), d), e), h), j), l) and o). Furthermore, there appears to be little or no information relating to items i), k), m) and n).

Request

The applicant is requested to provide or complete information in relation to all items on the above list with the exception of items a), f) and g) set out in the preamble to this question. The following points are specifically noted:

- The documentation provided relies in large part on an analysis of emissions from the nearby Harmac plant and a comparison of anticipated project emissions to those from Harmac. However, the applicant did not use actual data from Harmac but instead based their analysis on an estimate of what the data should likely be. The credibility of this approach should be better established or first-hand data should be obtained from Harmac.

- Information relating to Item b) was generally confined to greenhouse gases. It may be that there are no offsets for the other emissions, in which case items b) and c) are complete. However, this should be formally confirmed for the record.

- Information relating to item l) did not include an analysis of lines of sight. This should be rectified.

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The applicant's responses to the following more detailed project-specific technical questions may assist in providing some of the outstanding information from the above list.

2.2 Reference: Vancouver Island Generation Project, Application for Project Approval Certificate (Sections 10.1 Air Pollution Emissions Prevention and Control, 10.5 Risks from Aqueous Ammonia and 15.4.2 Air Pollutant Profiles)

Preamble

The Applicant proposes to employ a Dry Low NOx (DLN) combustion system designed for 9 ppm engine exhaust concentration, followed by a Selective Catalytic Reduction (SCR) technology resulting in a 3 ppm stack emission. Efficient gas turbine plants which use DLN represent a very small amount of total air pollution (NOx, SO_2, PM, mercury and air toxics) compared to even the very cleanest type of oil or coal based system. The DLN system itself represents a 95% reduction in uncontrolled NOx emissions (from about 200 ppm) on such a high efficiency engine, and the 1992 Canadian CCME Guidelines (0.5 kg/MWhr) and BC provincial guidelines (9 ppm) are thus met without SCR additions.

Request

The Applicant is requested to:

(1) assess whether SCR is the most appropriate technology to apply in this situation, balancing the environmental impacts of using an ammonia-based backend control with the benefits of incremental NOx reduction. This should include consideration of the following points:

a) evaluation of 5 ppm ammonia slip rate, in the context of a 6 ppm NOx reduction
b) intermittent merchant plant operation, and its impacts on NH_3 slip
c) fine particulate emissions resulting from the SCR system (ammonium bisulphate from NH_3 reacting with trace sulphur in the gas fuel)
d) additional costs of SCR, potential catalyst disposal and system efficiency losses
e) potential environmental implications of spills, accidents or leaks during ammonia transportation, handling and storage
f) pollution prevention and energy conservation measures as alternatives to end-of-pipe controls
g) the recent US EPA reviews of the overall need for SCR systems when reliable DLN systems are employed.

(2) prepare a table comparing the total emissions from a DLN only system, to that of a DLN plus SCR system, quantifying daily and annual emissions of NOx, PM, ammonia, relevant VOCs and plant CO_2 .

(3) if the above responses confirm the environmental benefits of applying SCR to this project, describe how the ammonia slip rate will be optimized to ensure the overall emissions of ammonia and NOx are minimized.

2.3 Reference: Vancouver Island Generation Project, Application for Project Approval Certificate (Sections 10.6 Greenhouse Gas Emissions and 3.2.1 General Plant Description)

Preamble

The proposed plant will emit about 0.9 Mt of greenhouse gases annually. GHG prevention is dependent on fuel and energy choice, and overall efficiency for power and heat. This concept of efficiency and promoting cogeneration is captured in the 1992 CCME guideline for gas turbines. GHG (and air pollution) emissions can be minimized and prevented through a variety of choices such as:

1. energy conservation and demand side management
2. renewable energy from wind turbines, solar and geothermal energy
3. clean use of woodwaste
4. landfill/waste gases, industrial waste heat recovery
5. gas combined heat and power, cogeneration systems
6. gas combined cycles

For natural gas combined cycle plants, CO_2 emissions are about 50 kg/GJ x 7.2 GJ/MWhr = 360 kg/MWhr (compared to 900 to 1000 kg/MWhr at coal plants, and 500 kg/MWhr from gas boilers). In offsetting other industrial or municipal boiler fuel use, and summer cooling loads involving electricity and CFCs, smaller cogeneration projects close to thermal loads can have a 20-40% further GHG reductions to the 250 kg/MWhr level. Other forms of energy indicated above have little or no GHG emissions.

Request

The Applicant is requested to indicate how the proposed facility fits within a sustainable energy framework for the region of Vancouver Island where it is situated, by undertaking the following analyses:

(1) provide an estimate of how much of the region's electrical and thermal energy demand could be met over the relevant time period, by a balanced mixture of the above energy options

(2) indicate the approximate size of winter and summer thermal loads (in MWth) of communities in this region of Vancouver Island

(3) quantify the amount of thermal energy discharged from the condenser cooling tower

(4) provide an assessment of the electrical (MWe) and thermal (MWth) cogeneration potential for communities and industries in this area

(5) assess the GHG prevention possibilities from alternative energy systems described in parts (a) and (d)

(6) evaluate the capture of low grade waste heat (from the heat recovery/ condenser cycle or steam turbine extraction) which could be sent to energy applications in nearby commercial/industrial loads, in a district energy scheme to offset other boiler fuel use.

(7) quantify GHG emission offsets specifically connected with the proposed Duke Point generation facility.

2.4 Reference: (1) Vancouver Island Generation Project, Application for Project Approval Certificate (Section 10.6 Greenhouse Gas Emissions); (2) Application to the NEB for the Georgia Strait Crossing Project

Preamble

In addition to the emissions from the proposed plant, operation will consist of about 50 mmcfd of additional gas production and delivery throughout the Westcoast and connecting pipeline system. This will typically result in additional full fuel cycle emissions, such as a 10-20 % addition to plant GHGs from upstream facilities, as well as increased air pollution in terms of SO_2 and NOx. These emissions have been quantified in recent annual environmental reports of Duke Energy for the Westcoast system.

Request

The Applicant is requested to provide an estimate of the total additional CO_2, methane, SO_2 and NOx generated, stated as an approximate percentage of gas throughput to serve the plant, assuming a general average of gas supply locations.

2.5 Reference: (1) Vancouver Island Generation Project, Application for Project Approval Certificate, (2) Application to the NEB for the Georgia Strait Crossing Project

Request

Vancouver Island is presently served by an existing Westcoast Energy pipeline crossing built in 1991. Please provide basic information on the capacity of that line, including:

(1) a description of pipeline and compression facilities
(2) contracted capacity and actual average day flows for 2001
(3) maximum flow capacity after possible future compression upgrade.

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2.6 Reference: Vancouver Island Generation Project, Application for Project Approval Certificate (Section 10.3.2 Emissions)

Preamble

Under Article V of the Canada/U.S. Air Quality Agreement, Canada is obligated to notify the U.S. of any proposed projects which, if carried out, would be likely to cause transboundary air pollution. A notification form needs to be completed for any new air pollution source located within 100 km of the Canada/U.S. border that is expected to emit greater than 90 tonnes per year of any one of the common air pollutants (SO_2, NOx, CO, total suspended particulates and volatile organic compounds) or greater than 1 tonne per year of any one hazardous air pollutant in the National Pollutant Release Inventory.

Request re: Transboundary Air Notification Request

Because the proposed power plant is located within 100 km of the Canada/U.S. border and it appears the emissions of CO and NOx will exceed 90 tonnes per year, the Applicant is requested to complete the transboundary air notification form in accordance with the requirements detailed on Environment Canada's web site at http://www.ec.gc.ca/pdb/can_us/canus_trans_e.cfm.