Calgary Power Ltd.

Jan. 14/59

1956 - DRAFT MEMORANDUM RE BRAZEAU PROJECT

Our preliminary studies of the Brazeau project show that while at least 800,000 acre-feet of storage can be developed to advantage, much more than was originally expected, its unit cost is disappointingly high, so much so that considered for power alone, the site is of no interest at the present time.

It should be remembered that there are today almost no other places in the world where base load energy can be produced as cheaply as at Wabamun, whether by steam or by hydro, and that to get the cost advantage of hydro for peaking purposes, the undeveloped sites on the Bow are of such size that they can be taken in our stride. The Brazeau project, however, has this redeeming feature that when once the $45,000,000.00 has been spent for the storage and initial unit of 180,000 H.P., other units can be added at the remarkably low cost of $45.00 per H.P. This means that in ten years or so, when the load has grown sufficiently to match up with the peaking possibilities of the site, the project would become economically feasible for power alone.

In the meantime, the Company could make no contribution to the part of the cost attributable to storage of from twenty to twenty-five million dollars, without unduly increasing the cost of service to its own customers, few of whom would share in the collateral benefits of the project. Seven or eight years after the initial installation had been commissioned, the Company could,

. . . 2

10-26

however, reimburse the Province for its capital outlay and thereafter might substantially reduce the interest deficit.

Apart from power, the project would provide a threefold benefit; first in the months that are critical from the pollution standpoint, the flow of the North Saskatchewan through Edmonton would be nearly three times that of the river in its natural state, thus providing additional water for sewage dilution and for industrial use, secondly, its silt load might be reduced as all the silt originating above the dam would be trapped by the reservoir; and thirdly, it would cut the maximum height reached by a flood such as that of 1915, the highest in 70 years or more, by at least five feet. Obviously, these benefits are very great and are of increasing importance as time goes on, but, while the Company would be glad to supply actual data, it would not seem to be the Company's province to evaluate the benefits.

It has has to be recognized that the release of water from the Brazeau plant would be dictated by the consumer's requirements for power, and, in a year when water conditions were at all critical, a peaking plant such as this would only be used at times when the load exceeded the capacity of the steam plants in the system. Consequently, the release of water would vary between wide limits. There would be little or no water discharged during the night and over weekends, and in late March and in April the flow might be small. This could be overcome by allocating a portion of the storage for use at such times, but this would greatly detract from the value of

. . . 3

the project for power purposes.

In a plant with such a low cost per horsepower for extensions, it is obviously desirable to provide the maximum generating capacity that the water supply will support. Four units of 180,000 H.P. each, fully loaded, would discharge 19,000 cfs., but the maximum daily average would be a fraction of this. What the downstream effect of this would be under ice and open water conditions would have to be studied. After two or three units have been installed, it may be necessary to develop the site just above the mouth of the Brazeau to provide some regulation of the wide variations in the discharge from the plant upstream. With upstream storage already provided, this plant might be economically feasible.

There would seem to be three alternatives; first, a preferred programme in which the production facilities would be expanded in the most economical way, having regard only to the cost of service to the Company's customers; secondly, an intermediate one in which the development of peaking capacity on the Brazeau would be given precedence over that on the Bow; and thirdly, a crash programme in which the initial stage of the Brazeau project would be completed with all possible speed, and irrespective of cost.

The preferred programme would best fit the Company's operations, but the Brazeau project would not be required until the Season of 1974-75. With the crash programme, it might be

. . . 4

possible to have the first unit and a part of the storage available for the winter of 1962 - 63, but work on the access road would have to start immediately and the construction would have to proceed without a hitch. Bad weather, or a strike, or even a miscalculation in the construction schedule, would result in a rationing of power. A rush programme is inherently costly and costs would be several million dollars higher as designs would have to be based on inadequate field data and there would be no time to get competitive bids. The timing is wrong as it would be brought in when the Company's need is for base load energy rather than for peaking power, necessitating an overlapping for the season of 1964-65, when it would have to have both the Wabamun 150 M.W. extension and the initial unit at Brazeau, although the Wabamun extension would have sufficed, had it been built first. This would be quite beyond the Company's ability to finance, and to avoid raising the cost of service to the Company's customers, the Province would have to put up the whole cost of the Brazeau project, power and storage, together with the interest charges for two years on the nearly three million dollar expenditure on the Wabamun third unit, now on order. We strongly recommend against attempting such a programme.

The intermediate programme represents a compromise between the preferred and the crash programmes designed to bring the Brazeau project into operation late in 1965, a time when it could be fitted in with the load growth at not too much inconvenience and the collateral benefits would not be too long delayed. By

. . . 5

reason of it being in advance of its time, the Company's production cost would be greatly increased for a period of some seven years after commissioning of the plant. To bring the cost down to something not too much out of line with the preferred programme, it would seem necessary for the Province to advance a sum equivalent to the cost of developing the site for storage alone, including all access roads, and amounting in all to some twenty to twenty-four million dollars. In 1972, when the cost would come down to that of the preferred programme, the Province could be reimbursed for its capital outlay and in succeeding years the deficits in interest could be worked off. In this manner the project could be made self-liquidating.

In the Brazeau project it is a question of load and, if the Cities of Edmonton, Medicine Hat and Lethbridge could be induced to purchase their peaking requirements from the Company, the paying off of the Province could be expedited. The existing income tax discrimination handicaps the Company in selling power to cities. The customers of a power company, in effect, make a contribution of some 15% of their electric bills to the cost of government that those of municipally-owned power utilities escape. Our suggestion is that the Dominion be pressed to rebate the whole of the income tax now collected from the power companies to the provinces instead of the 50% as at present, and that the provinces could in turn rebate this to the municipalities concerned in proportion to the electrical revenue the power companies receive from them.

. . . 6

The foregoing is based on today's prices and a rate of growth of 10% per annum, and on the assumption that the City of Calgary renews its contract for its entire power requirements with the Company. It is assumed that because of the remoteness of the site that neither the reservoir nor the intake pond would have to be cleared. We would also suggest that judging by the other roads we have built, that the access road is a facility that, after construction, will be used mainly by the general public and should therefore not be a charge against the project.

CALGARY POWER COMPANY LIMITED