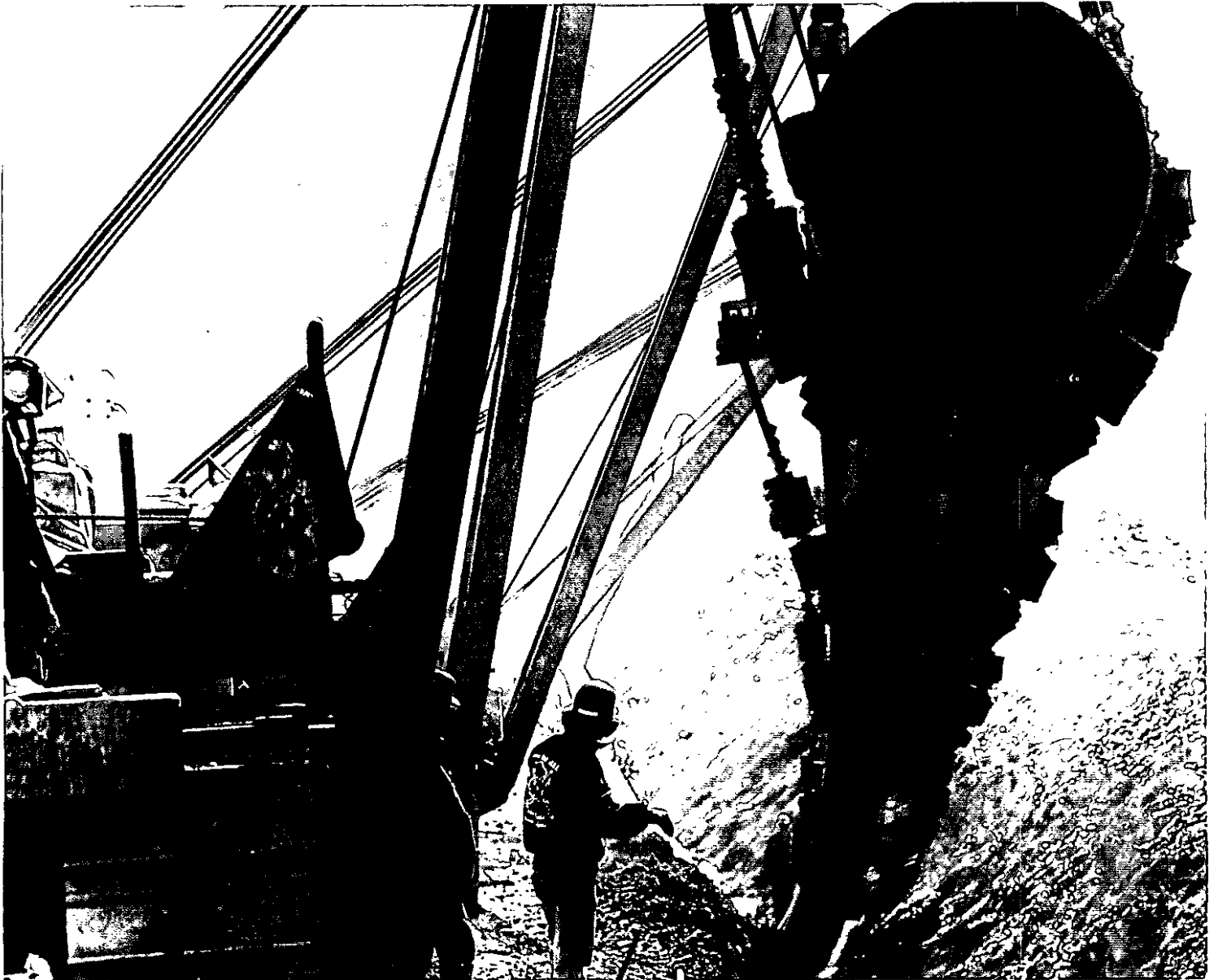


# PART THREE

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# The Project



# 11

## Location, Construction Plan and Scheduling

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### Location

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The first issue I shall address in this discussion of the project is the location of the pipeline right-of-way and its facilities. Throughout the course of the Inquiry, the general routing of the Mackenzie Valley pipeline between the Mackenzie Delta and the Northwest Territories—Alberta border has, for the most part, been taken for granted. But for many people, the proposed locations of the pipeline right-of-way, ancillary facilities and access routes are unacceptable. In particular, the native people have insisted on their right to reserve decision on routing pending settlement of their claims.

Apart from minor differences, the alignments of the mainline, as proposed by Arctic Gas and Foothills, are virtually identical and their potential for impact is, consequently, very similar.

Both pipeline companies have made changes in their original routing and location proposals for a variety of reasons. For example, the first change made by Arctic Gas, which moved the alignment east of Fort Simpson, is an improvement in environmental terms; the fact that the amended route would pass through the proposed Ebbutt Hills International Biological Programme site does not present a major problem. The social concerns, however, are more serious because now there will be a compressor station and a wharf site very close to Fort Simpson. In addition to large-scale amendments, there have been more modest changes. Both companies have modified the locations of river crossings, wharves, stockpile sites, and access roads; and both have introduced the Niglintgak lateral pipeline. Arctic Gas changed the routing of their Parsons Lake lateral pipeline and abandoned many of their communications towers and associated access routes. Foothills have made minor adjustments in pipeline routing north and south of Norman Wells. Most of these changes represent some degree of socio-economic or environmental improvement but much more can obviously be done by further adjustment of the route, the location of facilities and other areas used by the project.

Native people in all of the communities along or near the proposed route have expressed some basic fears about the location of the pipeline and associated facilities in the Mackenzie Valley. These fears are specifically concerned with the location of pipeline lands in relation to the communities themselves, to traditional land use areas and sites of religious importance, and to geographic features of special significance to native people, such as Great Bear River. In response, both pipeline companies have either made changes in location or indicated their willingness to do so. For instance, to avoid the communities of Fort Good Hope, Fort Norman and Wrigley, Arctic Gas proposed to relocate wharves, stockpile sites, access roads and airfields.

To date, such changes have been introduced unilaterally, and there appears to have been no progress towards instituting a review process for resolving conflicts on pipeline routing and location. In fact, there has been little effective communication on this matter between local people, the pipeline companies, government and other interested groups. Nonetheless, the 1972 Pipeline Guidelines state:

... where the pipeline construction is planned to be located in proximity to a settlement — particularly a native settlement or localized area subject to intensive use — then the location of construction camps, associated activities and the detailed siting of the pipeline will be decided by government after consultation with the Applicant, and the settlement council, or local government body, or the native organization. [p. 29]

In terms of minor changes, as opposed to major alterations, there is no convincing evidence that the locations chosen for the pipeline and related facilities are the best, either environmentally or from the point of view of land use. Neither pipeline company has responded to criticisms of specific locations raised by various participants, except to say that the present locations are not final. Nor has there been a commitment to any process of route location refinement in final design that will ensure adequate consideration of environmental and land use concerns. Indeed, during the Inquiry little progress was made on a means to ensure that localities of concern are avoided, and that location refinements will move

the alignment to areas of less rather than more environmental and socio-economic sensitivity.

1. The government should adopt policies that afford maximum protection for wildlife and fish in the vicinity of the pipeline route, and that preserve as much of the nearby land as possible in its natural state. These policies should apply to nearby governmental and industrial activities in the vicinity as well as to the pipeline project.

The Agency should ensure that the location, construction and operation of the project are consistent with these policies, and are acceptable to local people. In particular, the pipeline project should be modified to avoid interfering with local fishing, trapping and hunting patterns, and to satisfy the environmental concerns identified elsewhere in this report.

2. Routing must not be decided simply in terms of engineering and cost. Proposals relating to the location of the right-of-way and facilities should be progressively refined by a process of successive Company proposals and Agency and public responses that takes all environmental and socio-economic factors into account. (See Project Regulation and Review.)

3. Before the final review phase, the Company shall submit to the Agency for approval the rationale behind the location of its route and facilities in terms of potential impact on birds, mammals and fish and on traditional land use by native people. The Company shall also submit proposals for modifying the route and locations to meet environmental concerns. If requested by the Agency, the Company shall include social, environmental, engineering and cost comparisons of alternative right-of-way and facilities locations. The Company should address such matters as the following:

Adjustment of the pipeline route and locations to avoid conflict with areas designated as present or future conservation lands. (See Northern Conservation Areas.)

Adjustment of the location of compressor stations, and the groups of facilities associated with compressor stations, to avoid the valleys and rivers tributary to the Mackenzie River, and the mouths of those tributaries. If a compressor station cannot be moved, then the associated facilities – wharf, stockpile site, airfield, borrow pits, road, camp, and waste facilities – should be kept away from tributary valleys and rivers and river mouths.

Adjustment of the location of wharves and stockpiles along the Mackenzie River to avoid interference with communities and domestic, commercial and sport fishing sites.

Modification of the location of borrow pits to avoid any borrow resource conflicts. (See Terrain Considerations.)

Adjustment of route and locations and established aircraft flight corridors to meet the concerns outlined in the chapters on Wildlife and Aircraft Control.

Adjustment of the pipeline route to minimize the length of pipe on terrain that is potentially susceptible to frost heave,

thaw settlement, slope stability, buoyancy and erosion. (See Geotechnical Considerations.)

A review of the location of the Mackenzie Valley pipeline and associated facilities in terms of their potential for separate or cumulative environmental impact. Any relocations of the pipeline or other corridor developments that could reduce environmental impact should be included.

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## Construction Plan and Scheduling

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In Chapter 3 of Volume One, I described how the pipeline project North of 60 will challenge the engineering and logistics capabilities of designers and builders. The challenge relates not only to the size and complexity of the project but also to its remote setting, to the arctic climate and terrain, and to those components of the project and its design that lack precedent. There are, for example, the fundamental and unresolved design problems associated with frost heave. These problems illustrate the deficiencies in some aspects of the pipeline proposal and the inadequacy of the information that is available to the Inquiry and to the government – information that provides the basis for an assessment of the precedent-setting or innovative engineering aspects of the project.

The innovations and problems are not confined to design: the construction plans and proposed schedules for the pipeline also involve techniques that lack precedent. Volume One outlined the major issues related to winter construction – snow roads and productivity – and focused primarily on the Northern Yukon. Similar problems will face a pipeline in the Mackenzie Delta and Mackenzie Valley. The environmental, social and economic assessments made by the pipeline companies were predicated on the assumption that the project would, in fact, be built as proposed. However, any substantial modification to the schedule or to the methods of construction will obviously alter those assessments. If a schedule cannot be met and plans have to be changed, each party concerned would respond in a way that reflects its own area of interest, and the result could be *ad hoc* solutions, loss of quality control, and an increase in accidents. Despite original intentions, it might become impossible to protect the environment and the local people.

We must be careful to confirm all of our assumptions and contingent evaluations. With regard to any potential impact of pipeline construction on the environment – namely, the direct disturbance of wildlife, fish and whole ecosystems – a schedule limited to the winter months should have the least impact. This does not mean that there will be no impact during winter construction, nor does it mean that the potential impact of modifications to the construction schedule will automatically be unacceptable in the Mackenzie Valley. For reasons set out in Volume One, an extended

summer season or an all-year schedule would be unacceptable in the Northern Yukon; indeed, it was one of the concerns that led to the rejection of the proposed Arctic Gas route across the Northern Yukon. The consequences of a change to summer and winter construction in the Mackenzie Valley would be substantial because, for one thing, an all-weather road would have to be built. In fact, such a change would invalidate nearly all of the planning and assessments presented to this Inquiry.

Although both pipeline companies have indicated their willingness to accommodate delays for environmental reasons, neither company has developed a contingency plan in case of a delay in schedules. No allowance has been made for delays in the delivery of supplies and materials, or for failure in the river transportation system; but most important of all, no allowance has been made for the possibility of any labour problems such as strikes, or even a lack of skilled labour. The most serious potential problems for the northernmost part of the pipeline that could delay the project from the very outset are insufficient snow and a shorter winter season because of a late fall or an early spring (See Terrain Considerations: Snow Roads). At the very least, a contingency plan to counter these events would seem to be an essential part of any construction plan.

Delays in construction activities will involve more than additions to the number of men on the line: each man brought in will require extra food, fuel and equipment and this, in turn, will add to the number of aircraft flights. Extra men will most likely be needed towards spring, which means that any extra flight activity might well take place at a time that is critical for some wildlife activities. As well, extra flights will put more pressure on traffic control programs, on airstrips and community airport facilities, and on local operators. At a glance, we can see the cumulative impact that could result from even this incomplete chain of events following a change in the work schedule.

To resist pressures from the Company to take shortcuts or to change its basic plan in any way, the Agency must identify very early any problems or potential trouble spots. The key factor is to avoid the basic problem in the first place through careful construction, planning and scheduling.

One of the unique features of the Mackenzie Valley pipeline project is the need to consider "extraordinary" or non-project occurrences, such as migrating or staging birds at the site of construction activity. These atypical occurrences will restrict construction activities just as much as any of the

usual and foreseeable difficulties, such as labour problems, delivery failures, and extended periods of bad weather. While these events can be anticipated and alternative plans prepared, some of the environment-related incidents may not be so amenable to planning. Nonetheless, environmental constraints must be seen as equally important, and must be incorporated into project plans from the very beginning. The pipeline companies' studies, which were submitted as background information to their applications, and the information available through the exhaustive hearings process, have emphasized the possibility that fish, mammals and birds will, in the course of their own natural cycles, preclude use of some land or water areas at certain times for construction of the pipeline or related facilities. The land-based activities of the native people may also raise conflicts.

Every aspect of the Company's plan that might lead to pressure to avoid or ignore some environmental or socio-economic restriction must be scrutinized from the point of view of the need for contingency planning and scheduling for potential spillovers.

*4. The Company shall develop a construction schedule that minimizes the adverse impact of the pipeline project on the socio-economic fabric of the region and on the physical and living environment. To this end, the Company shall submit to the Agency for approval a preliminary construction and logistics plan for each spread, and shall demonstrate their technical feasibility and environmental acceptability.*

*5. As part of its final design submission to the Agency, and before commencing any work other than clearing, the Company shall provide the Agency with a sequential activity analysis in a form that is acceptable to the Agency. The analysis shall consider all construction-related activities, as well as all possible environmental and other constraints, together with the courses of action that will be followed if such constraints do occur.*

*6. During construction, the Company shall prepare a monthly progress report for each spread or part thereof, as prescribed by the Agency. The report should detail such matters as the construction progress to date on each spread, keyed to an updated sequential activity program; construction delays and proposed methods for overcoming them, including a revised forecast of project scheduling and activities that show how all physical constraints and all stipulations will be met; the physical condition of snow and ice roads; and the need for any actual or planned additions to the work force that is accommodated in construction and other camps.*