A REVIEW OF DEVELOPMENT PROPOSALS

FOR

SURREY BEND, BRITISH COLUMBIA

May, 1976

ENVIRONMENT CANADA

Environmental Protection Service
Atmospheric Environment Service
Fisheries and Marine Service
Canadian Wildlife Service
Inland Waters Directorate
Lands Directorate

1 INTRODUCTION

During the last century, the lower Fraser Valley has been radically changed by dyking, draining, and clearing of the lowlands for agriculture; by the logging of the upland forests; and by the expansion of urban settlement and commercial or industrial development needs on the basis of water, rail, and road transportation systems. Only some tidal marshes remain in a natural state, mainly because their soil conditions or water levels have so far made them unattractive for human use. Surrey Bend is such an area.

Surrey Bend, approximately 1000 acres in size, is located on the south bank of the Fraser River between Barnston and Douglas islands (Figure 1). It is composed mainly of peat in its central region, with some deltaic deposit on the east bank and alluvial soil on the west bank (Figure 2). It exists as marsh, meadow, woodland, and peat, bordered by an area of hillside forest rising to the high land of northeast Surrey. The upland, like the rest of the Lower Mainland, was logged in the first decades of this century. Some farming has taken place on the meadow areas; but, apart from a small sawmill, the Canadian National Railway tracks, and the log booming on its Fraser River shore, human use has been very limited in recent years. As a result, the Bend has remained "wild", providing a variety of habitat for wildlife, which includes almost all species of animals native to the Fraser Valley (Douglas College, 1974). Surrey Bend is unique in that no other fresh water marsh of this character remains in a fairly natural state on the lower Fraser River.

1.1 Land Status

Surrey Bend is owned by fifteen different groups, with three main groups owning 672 acres. It has been zoned as industrial, allowing most forms of industrial use. However, it has recently been rezoned to the status of industrial "4", which will give Surrey Municipality control over future development. (Greater Vancouver Regional District recently purchased a parcel of 80 acres for a potential sanitary landfill.)

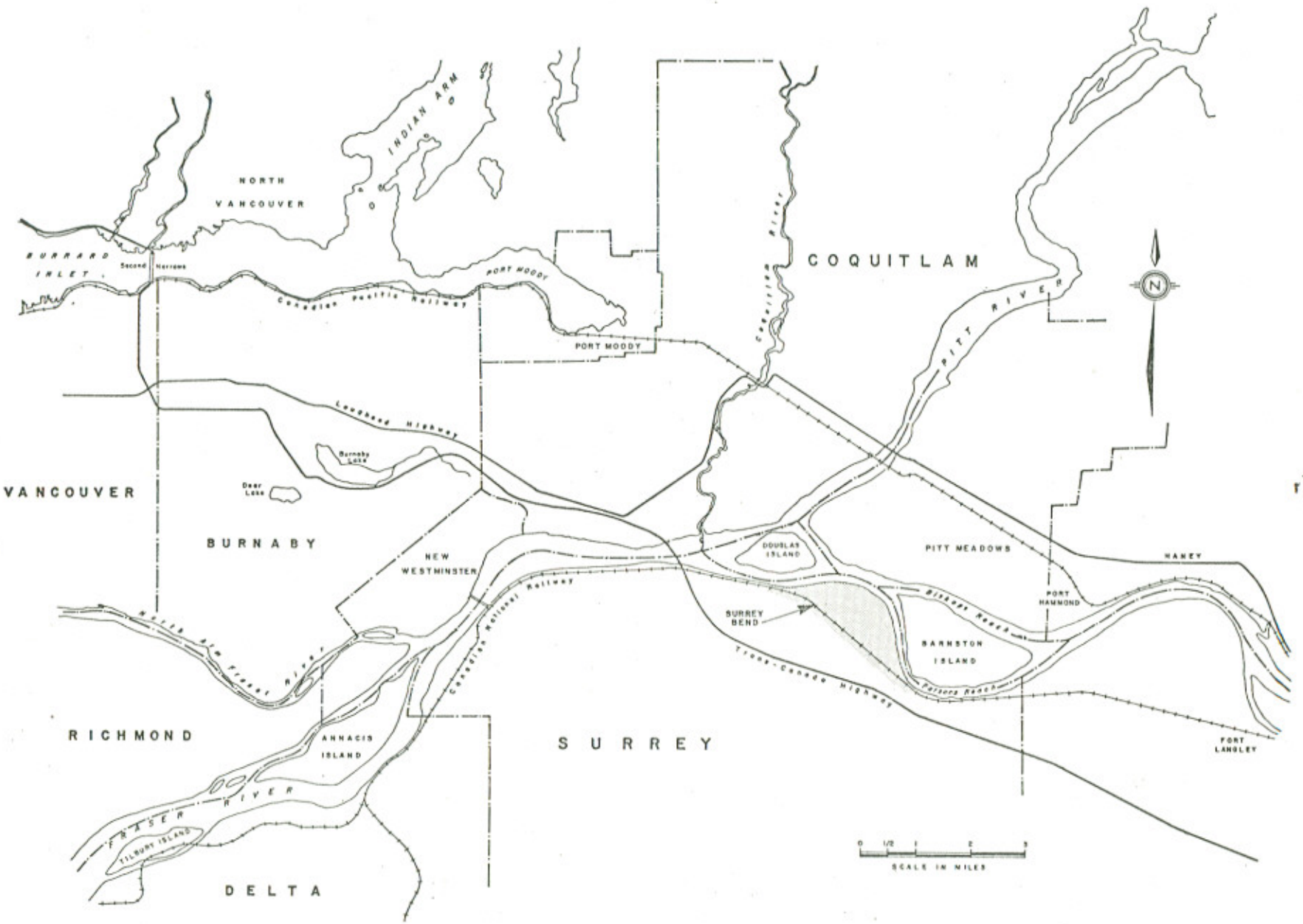

FIGURE I SITE LOCATION MAP

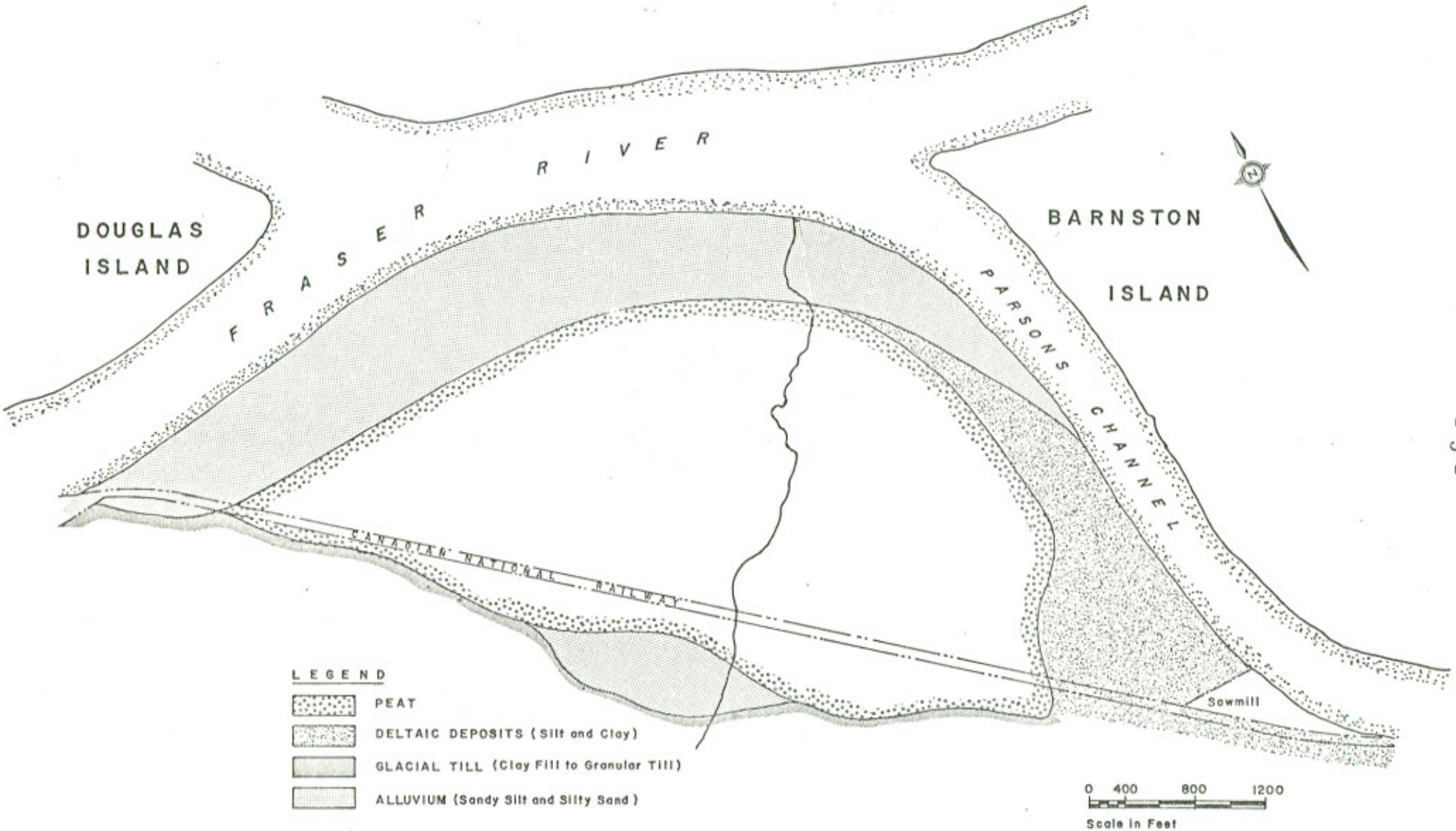

FIGURE 2 SURREY BEND (Surficial Materials)

2 DEVELOPMENT AND PROPOSALS

There are presently three official development proposals for Surrey Bend (Figures 3, 4, and 5).

2.1 Greater Vancouver Regional District

Greater Vancouver Regional District (GVRD) has proposed to utilize a portion of the area, at least 500 acres, as a sanitary landfill (Figure 3). Under the proposal (Unies Report, 1973), the site would have to be dyked to a height of 17 feet above Geological Survey of Canada benchmark in order to control river hydraulics, and would be filled to a possible height of 25 feet. Filling to a height of 40 feet would greatly increase its capacity; however, future industrial development would be hindered because of problems associated with the settling of compact garbage. The site would be screened by buffer zones. A small "T" shaped area would be left untouched. The landfill site may have to be compartmentalized and equipped with pumping stations in order to control leachate (Unies Report, 1973).

2.2 Canadian National Railways

The second proposal, by the Canadian National Railway (Figure 4), is far more extensive and is designed to accommodate a broad industrial base. Within this diversified industrialization, allotment has been made for heavy industry. This would require heavy use of water frontage, as well as other modes of transportation, for daily operations. The plan also calls for a small park, a marina, shopping plaza, and a mixture of light industries with support offices.

2.3 Municipality of Surrey

The Surrey Municipality proposal is designed for multi-use purposes. In this proposal, Surrey Bend would be divided into three zones (Figure 5). Zone 1, adjacent to the Fraser River, consists of approximately 250 acres. This is Surrey's "Island Development Proposal" which will accommodate buildings, roads, and parking areas. River-sand fill will be utilized to raise the land above flooding level. Within

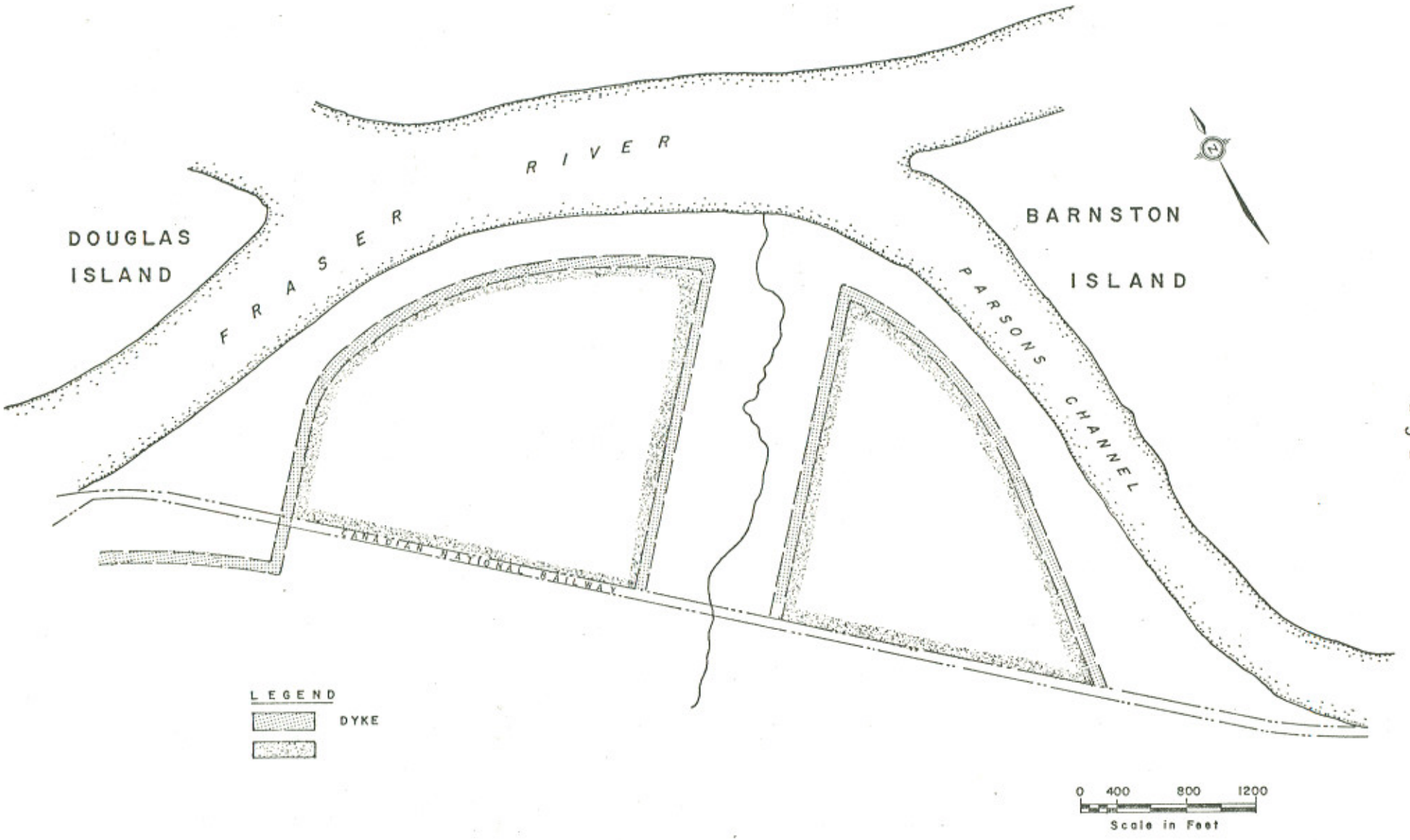

FIGURE 3 GVRD LANDFILL PROPOSAL (UNIES LTD. REPORT)

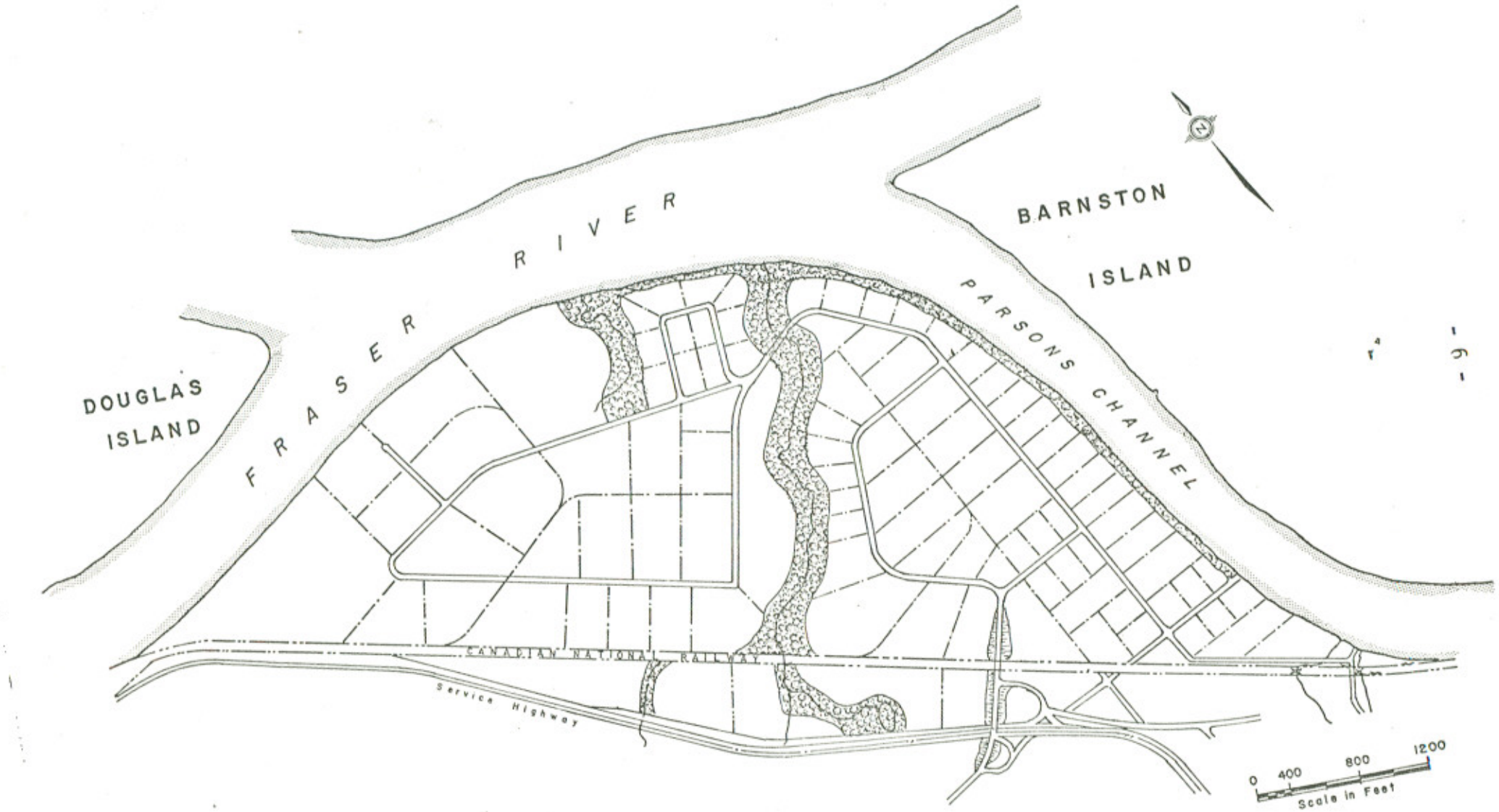

FIGURE 4 C.N.R. PROPOSAL (Ref. C.N.R. Report)

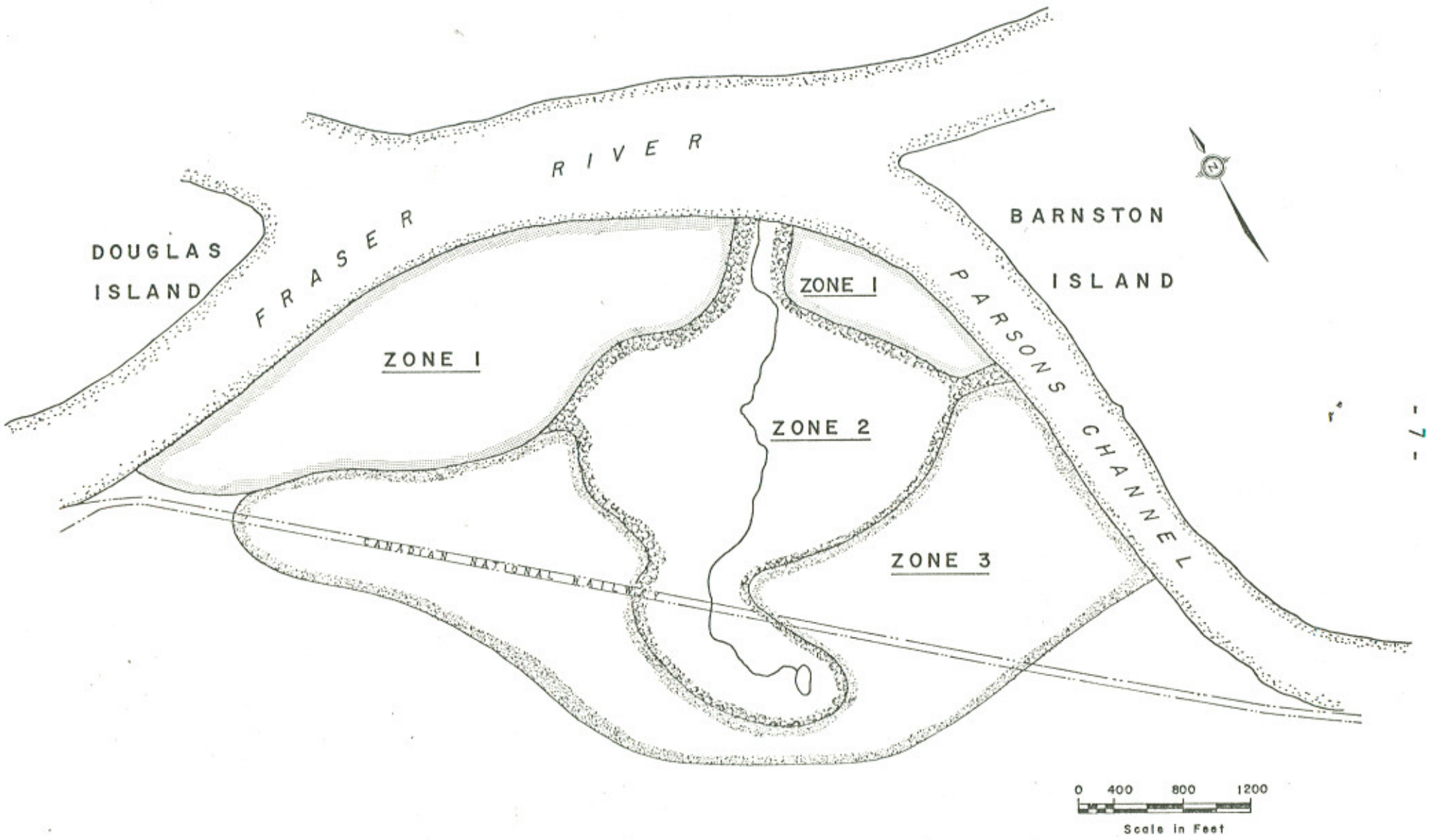

FIGURE 5 SURREY MUNICIPALITY PROPOSAL

Zone 1, the Municipality of Surrey owns 10 acres and the following is a proposal received by the municipality for that parcel of land:

(a) public marina, complete with a lagoon, adjoining four acres of natural park;

(b) boat storage building;

(c) a building accommodating a ships' chandler, a restaurant, and offices;

(d) a float-plane base and maintenance hangar;

(e) a ship-building plant;

(f) two other buildings for marine-oriented industry.

The 270 acres of marsh land in Zone 2 would remain untouched. The "Island Development" of Zone 1 would assist in keeping this area as a floodway and marsh land. The remaining 450 acres of Zone 3 would be set aside solely for industrial use. This area has a mixed surface deposit, ranging from peat (18 to 20 feet deep) to glacial till on the southerly slope (Figure 2). Due to soil conditions and the necessity of landfill, this area would be restricted to light industry. Presently, there is a sawmill situated on the southeasterly corner of Surrey Bend adjacent to Zone 3 (Figure 2).

3 DISCUSSIONS OF PROPOSALS

Local environmentalists have voiced concerns and documented problems related to encroachment upon marsh land and flood plains. Surrey Bend is a remnant marsh land, once common throughout the Fraser Valley. Industrialization is slowly creeping up the Fraser River corridor, thus affecting its foreshore as well as its water quality. Wildlife habitat and species are slowing giving way under the pressure of man trespassing upon their territory. The proposals for future development of Surrey Bend do not really present an in-depth study of the existing flora and fauna of the area. A good example of this is the Unies Report; their total ecological assessment was conducted during the period of April 12 to 20, 1973. These studies indicate a lack of understanding of species distribution, numbers of species, and seasonal uses of the total environmental complex. Such information is vital to evaluate the importance of the site as a wildlife unit within the context of regional land use, and to identify the relative importance of wildlife habitat components within the site so that possible future land-use programs may pose only minimal environmental impact. The sparse information that is available indicates that Surrey Bend supports a well-diversified population of both flora and fauna (Unies Report, 1973). Because of its relatively large size and unusual physical and environmental character, it has spatial and habitat elements attractive to many wildlife species (Unies Report, 1973).

3.1 Specific

The Inland Waters Directorate's Projects and Hydraulics Divisions have reviewed the proposed dyking of Surrey Bend and its effect upon the Fraser River Flood Control Program. If the whole area was to be dyked, the river flood profile would be raised less than six inches above the existing conditions. Due to tidal influence, it is difficult to assess a precise figure of the increase. The increase in flood profile would affect mainly Barnston Island and Pitt Meadows, because their dykes have not been improved up to the design profile. Although the Federal Flood

Damage Protection plan has yet to be implemented in British Columbia, a review of current thinking on the subject might be relevant to federal development activity in the area (e.g., by the Canadian National Railway). In a June 2, 1975, letter to the then Honourable R.A. Williams, Provincial Minister of Lands, Forests, and Water Resources, Mme. Jeanne Sauve, then Minister of Environment, outlined an approach to resolve flood plain damage problems. The program was agreed to by the Cabinet and the following is a portion of the letter:

1. *Construction of federal facilities, federal housing loans, and other grants and loans, should be conditional upon adequate flood-proofing or other damage-reduction measures;*

2. *Once a flood risk is clearly identified, the federal and provincial governments will implement a program to discourage further development in threatened areas.*

Although flood-risk mapping and flood-risk zones have not been designated, Surrey Bend is clearly within the flood plain.

The conclusions drawn in the Unies Report concerning the geology and hydrology were sound, considering the very limited data available to the authors. However, Inland Water Directorate finds, in light of new well records and older well data unavailable to the authors of the Unies Report, the geology and hydrology appear more complex than that described in their report. It now appears that leachate contamination of aquifers is a possibility, and that the subsurface stratigraphy is significantly different than that described in the Unies Report. This has serious ramifications on some conclusions drawn in the report: *"Groundwater in the immediate vicinity of the fill would become polluted by leachate migration from the fill as a consequence of the hydraulic gradients caused by the groundwater mound. The extent of this pollution envelope in the subsurface will depend almost entirely upon the hydrologic properties and distribution of hydrostratigraphic units."* (Unies Report, 1973)

A limited, light-industrial park, as outlined in the Municipality of Surrey proposal, is more desirable than a sanitary landfill (GVRD) or a mixture of heavy and light industry as in the C.N.R. proposal, because less environmental disturbances would occur. There are two statements in the C.N.R. report which are of some concern regarding water quality. They are as follows: "*From a transportation standpoint, it is capable of water, rail and road service.*" This statement takes into account an extensive development of roads, track system, and the foreshore of the Fraser River. Secondly, "*Because of its isolated location, environmental pollution can be controlled*", thus suggesting that isolation is a key instrument to control pollution. Both statements, given as reasons to make industrial development a viable undertaking, show a complete disregard for the environmental implications of this proposal. The continuing development of the foreshore area of the Fraser River is becoming a very great concern and threat to fisheries managers. The implication that Surrey Bend is isolated, thereby making industrial pollution controllable, is an unacceptable approach to protect the Fraser River water quality and the fishery resource.

In addition, air emission problems would arise from heavy industries and from a sanitary landfill operation. The two main sources of pollution resulting from a landfill operation would be particulate emission (e.g., dust generated from the landfill operation) and odour problems. The latter would be the more significant problem, due to the location of the site and prevailing meteorological conditions in the lower Fraser Valley.

With the steady increase in population, there will be an increased need for recreational land, and areas such as Surrey Bend will be in great demand. Since economic conditions often dictate the course of industrial development as well as the location of landfill operations, care must be exercised to evaluate the development of wetlands.

3.2 Ecological

It is the authors' opinion that Surrey Bend should be designated an ecological reserve. Failing that, light industry, with generous buffer zones along the streams and the Fraser River (as proposed by the Municipality of Surrey), could be an acceptable alternative to the sanitary landfill and heavy/light industrial mix proposals. Any development which will generate and discharge effluent or cause physical degradation of the stream and the Fraser River foreshore would be unacceptable. In light of the review of the Unies Report by the Inland Waters Directorate's Projects and Hydraulics Divisions, it is recommended that a drilling program be carried out for the purpose of defining the boundaries of the peat bog, permeability of underlying units, older peat beds, and ground-water flow patterns in the area as a prerequisite to any development activity in the area.

Development of a landfill in this site, such as suggested in the Unies Report, would give rise to considerable concern for the future of migratory birds and aquatic and terrestrial wildlife. In addition to the direct loss of peat bog habitat, there would be the indirect impacts from hydrological change, leachates, dyking, nature of possible industrial development, access, and traffic. A lowering of the intrinsic habitat quality of the remnant "conservation" lands through the crowding of developed areas and the dislocation of the spatial aspects of the existing environmental complex must also be considered.

The need for artificially-created industrial lands in Surrey Municipality has not yet been clearly demonstrated. Furthermore, is there a crisis in solid waste disposal within the Regional District? If there is, what are the alternative methods of waste disposal? The Unies Report is qualified as a preliminary environmental and cultural assessment. This statement is best demonstrated in the accompanying letter with the Unies Report: *"We therefore wish to emphasize that further quantitative and economic analysis of development may indicate*

preference for a plan substantially different than the one assumed for this presentation." Therefore, a more intensive study of ecological, social, industrial, and physical elements is required to establish a sound base to assess alternative developments, or to determine if in fact any development is necessary or desirable.

4 CONCLUSIONS

It is recommended that Surrey Bend be declared an ecological reserve. Failing this conservation measure, the Municipality of Surrey's proposal could be an acceptable alternative.

5 REFERENCES

Canadian National Railway, 1975.
Surrey, B.C., North Peripherial Road and Industrial Development Study.

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A Report on the Impact of Industrial Development on Surrey Bend.

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