South Exshaw Area Structure Plan

Municipal District of Bighorn No. 8

Being Schedule "A" of By-law No. 15/97
adopted the 9 th day of September 1997.

South Exshaw
Area Structure Plan

1.0 Introduction

1.1.0 Setting

The Hamlet of Exshaw is located in the Bow River Corridor, adjacent to Highway 1A, approximately 14 kilometres east of the Town of Canmore. The Hamlet is bounded by the Bow River to the south, Jura Creek to the east, mountain terrain to the north and the Lafarge Canada Inc. quarry and cement plant to the west.

1.2.0 Background

The M.D. of Bighorn No. 8 (MD), adopted a new General Municipal Plan (GMP) in 1992 that addressed planning and development matters in the municipality. More specifically, policies were adopted within the GMP regarding planning and development matters in the Hamlet of Exshaw. The GMP indicated that where subdivision is proposed within an area identified as the South Exshaw Planning Area, an area structure plan (ASP) would have to be prepared prior to consideration of the proposed subdivision. The South Exshaw Planning Area generally included that portion of the South Half of Section 23-24-9 West of the Fifth Meridian, located north of the Bow River, and east of Exshaw Creek. A proposal for the subdivision and development of private lands located within South Exshaw Planning Area was received by the MD prompting the need for preparation of the ASP.

The area contained within the A.S.P. boundaries, as shown on Map 1, includes not only the South Exshaw Planning Area as identified within the GMP, but includes all land located within the Hamlet of Exshaw located north of the Bow River, south of the Canadian Pacific Railway and east of Exshaw Creek. The area included within the plan was expanded in order to address subdivision and development matters, especially with respect to servicing, in a comprehensive manner.

1.3.0 Policy Context

This Plan conforms with Section 633 of the Municipal Government Act, and provides a framework and guideline for subdivision and development within the Plan area. This area

structure plan describes the sequence of development, the land uses proposed for the area, the density of population and the general location of transportation routes.

In accordance with Section 638 of the Municipal Government Act, this Plan conforms with the MD of Bighorn No. 8 Municipal Development Plan (i.e. General Municipal Plan 1992).

Preparation of the plan included notification and discussion with all landowners and leaseholders located within the plan area regarding development matters addressed within this Plan. A public hearing was held and the South Exshaw Area Structure Plan was adopted in accordance with the provisions of the Municipal Government Act.

1.4.0 Goals and Objectives

1.4.1 To provide for the development of industrial and recreational land uses within the plan area, compatible with adjacent land uses.

1.4.2 To identify concerns and constraints to subdivision and development within the plan area.

1.4.3 To provide for the development of private and public lands located within the plan area.

1.4.4 To identify the sequence of development within the plan area.

1.4.5 To provide for the orderly development of land.

1.4.6 To protect the natural environment.

1.4.7 To ensure the efficient servicing of land located within the plan area.

2.0 Plan Policies

This section of the Plan provides the detailed policies to which all subdivision and development must comply. The policies have been divided into seven subsections: general policies, industrial development, recreation development, environment , transportation and utility servicing.

2.1.0 General Policies

2.1.1 All subdivision and development shall conform to the MD of Bighorn No. 8 Municipal Development Plan and Land Use By-law.

2.1.2 For purposes of this plan, the policies of this plan shall be applied to the existing municipal lease lots as if they were titled fee simple lot.

2.1.3 The MD shall give consideration to the subdivision of existing municipal leased lots located within the plan area.

2.1.4 The MD, may, as a condition of subdivision or development, require the developer to enter into a development agreement to address the following matters:

a) development within the floodplain;
b) site access / road development;
c) utility servicing;
d) grading plans / site drainage;
e) building restrictions; and
f) any other matters deemed appropriate by the subdivision or development approving authority.

2.1.5 Existing mature tree stands and understorey shrubbery shall be retained as much as is possible or shall be replaced upon completion of construction of a site, to the satisfaction of the MD, in order to provide a buffer to the prevailing west winds, reduce the potential impact of wind erosion and provide visual screening between developments.

2.1.6 Fencing within the Plan area shall be kept to a minimum so as not to provide barriers to the movement of wildlife. Preferably, fences will have a solid top railing, less than one metre above the ground, with the bottom at least 45 cm off the ground. Fences may be erected for security purposes provided that they are a minimum 1.8 metres in height, designed so as not to entangle animals, and placed in such location that animals can move around the fenced areas within the Plan area.

2.1.7 Development proposals within the Plan area shall include provisions for adequate fire protection given the proposed use, and be prepared in consultation with the MD.

2.1.8 Dwelling units shall not be permitted within the Plan area.

2.2.0 Industrial Development

2.2.1 Lands identified on Map 1 as industrial shall be utilized for industrial land uses consistent with the provisions of the Hamlet Industrial District of the M.D. of Bighorn Land Use By-law (LUB).

2.2.2. Development of multi-tenant industrial facilities shall be permitted within the plan area subject to the following considerations:

a) the existence of appropriate sewage treatment facilities;
b) the provision of satisfactory access to the site;
c) the provision of adequate on-site parking and loading spaces; and
d) the requirement for a minimum of utility services.

2.2.3 Industrial land uses shall be restricted to those uses requiring limited utility services.

2.2.4. The minimum parcel size for industrial lots shall be 0.5 acres (0.202 hectares). The minimum parcel size may be reduced, allowing for the further subdivision or development, upon the installation of an appropriate sewage collection system and provision of an adequate water supply.

2.2.5 The subdivision of industrial lots pursuant to the above policy will require the submission of a concept plan, acceptable to the MD, which indicates proposed lot layout and internal roadway(s) required to provide access to the new lots.

2.2.6 Redevelopment of lands for industrial purposes will be considered within Area B, subject to the relocation of the existing sewage treatment facility to lands located within Area E, or elsewhere, and the reclamation of the subject property to the satisfaction of Alberta Environmental Protection.

2.3.0 Recreation Development

2.3.1 Lands identified on Map 1 as recreation shall be utilized for recreational land uses consistent with the provisions of the Conservation Forestry District of the M.D. of Bighorn Land Use By-law (LUB).

2.3.2 The development of permanent buildings and structures shall be in accordance with subsection 2.5 of this part.

2.3.3 Notwithstanding the requirements of subsection 2.5.0 regarding development of permanent buildings or structures within the floodplain, recreational uses such as a ball diamond, campground or other similar non-intensive uses are considered to be appropriate developments within the 1:100 year floodplain.

2.3.4 The development of trails and walkway system utilizing the setback areas adjacent to the Bow River and Exshaw Creek or any recreational area shall be encouraged.

2.3.5 The linkage of trails or walkways developed within the plan area to other Hamlet trails or walkways, or trail systems developed within the Bow Corridor, are encouraged.

2.4.0 Reserve Lands

2.4.1 The Subdivision Approving Authority shall normally require all lands located adjacent to the Bow River and contained within the floodway to be dedicated as environmental reserve at the time of subdivision. An exception shall be made for Lot 1, Plan 8910818 where in evaluating any future subdivision application the Authority shall consider the potential to use some of the land located in the floodway for temporary vehicle parking. The Authority's evaluation shall weigh the benefits of the economical and effective use of land for such parking against any possible adverse impact on the operation of the floodway, and any granting of parking area shall be subject to the land owner entering into a subdivision agreement to guarantee the floodway's preservation.

2.4.2 Where land has been dedicated as environmental reserve as a condition of subdivision approval, consideration shall be given by the Subdivision Authority to waiving the requirement for the further dedication of municipal reserve lands or payment of cash in lieu of land dedication.

2.5.0 Environment

2.5.1 All development shall be designed and constructed in an environmentally sensitive manner.

2.5.2 The development or placement of permanent buildings or structures, other than for river bank stabilization, shall not be permitted on any lands lying within the floodway as generally shown on Map 2. Development or placement of permanent buildings or structures may be permitted on land lying within the flood fringe provided the development site has been floodproofed to the satisfaction of the MD.

2.5.3 For buildings or developments within the flood fringe, development permit and building permit applications shall be accompanied by building plans signed by an architect or engineer indicating that the building or structure will be adequately flood proofed.

2.5.4 Only those land uses as may be identified within Section 12.5.0 of the Land Use By-law shall be located within the floodway of the Bow River.
Lands located within the flood fringe may be considered for development provided that:

a) the development site, including storage areas, has been floodproofed with the use of fill to an elevation determined in consultation with the MD; and

b) the developer submits a grading plan, acceptable to the MD, which addresses site drainage.

2.5.5 A minimum setback of 30 metres from the top of the bank shall be required for any building proposed adjacent to the Bow River or Exshaw Creek with the exception of buildings associated with a public utility.

2.5.6 Subdivision and development within the Plan area shall be designed so as not to impact the drainage of waters from Jura Creek.

2.5.7 The existing road profile for Diamond Drive should be retained in order to accommodate drainage from Jura Creek through the existing culverts under Highway 1A and the CP Railway.

2.5.8 Due to the proximity of the Bow River, industrial developments utilizing or producing hazardous materials shall not normally be permitted to locate within the Plan area, except where the developer provides information that details product safety and specific handling procedures satisfactory to the MD.

2.6.0 Transportation

2.6.1 Diamond Drive will continue to provide primary access to the Plan area, and shall continue to be maintained as a rural profile, as determined by the Public Works Department.

2.6.2 The subdivision of Lot 1, Plan 8910818 shall require the provision of a public right of way as shown on Map 1, and it shall be constructed in accordance with MD road standards. An access easement agreement, providing access to Lot 1, Plan 8910818 may be considered by the MD, for a single use development only if said development will generate a minimum volume of traffic.

2.6.3 Roadways providing access to development sites shall be constructed in accordance with floodproofing measures satisfactory to the MD.

2.6.4 On-site parking and loading spaces shall be provided for all new development and the redevelopment of existing sites in accordance with the provisions of the Land Use By-law.

2.7.0 Utility Servicing

2.7.1 Any utility to be provided shall be installed in accordance with accepted engineering standards and practices, and to the satisfaction of the MD.

2.7.2 Any cost incurred by the MD for the provision of any utility shall be apportioned to the benefiting lands or developments and may be recovered through off-site levies, acreage assessments, or other cost recovery methods deemed appropriate by the MD.

2.7.3 All lots located within the plan area shall be served by a sewage disposal system acceptable to the MD and viable options include the following:

a) a portable sewage system;
b) a pump-out holding tank in accordance with an agreement entered into with the MD with respect to the disposal of sewage effluent; or
c) connection to a low pressure sanitary sewer system with grinder pump lift station.

2.7.4 The MD, in consultation with lot owners and leasees, shall consider the servicing of the plan area with a low pressure sanitary sewer system. Appendix A provides preliminary information regarding the development of a low pressure sanitary sewer system.

2.7.5 Lot owners or leasees proposing the use of pump-out holding tanks shall enter into an agreement with the MD, as a condition of development approval, regarding the regular maintenance and disposal of sewage effluent with respect to the proposed development.

2.7.6 Lands located immediately adjacent to the existing sewage lagoon site (Area B) shall be reserved in the event that additional lands are required for the expansion or improvement of the existing sewage treatment facility.

2.7.7 Lands located in the eastern portion of the plan area, north of the existing ball diamond, may be considered for the future relocation of sewage treatment facilities in accordance with requirements as may be identified by the MD.

2.7.8 Development of new sewage treatment facilities within the eastern portion of the plan area shall be buffered and / or screened from adjacent recreational land uses as deemed appropriate by the MD.

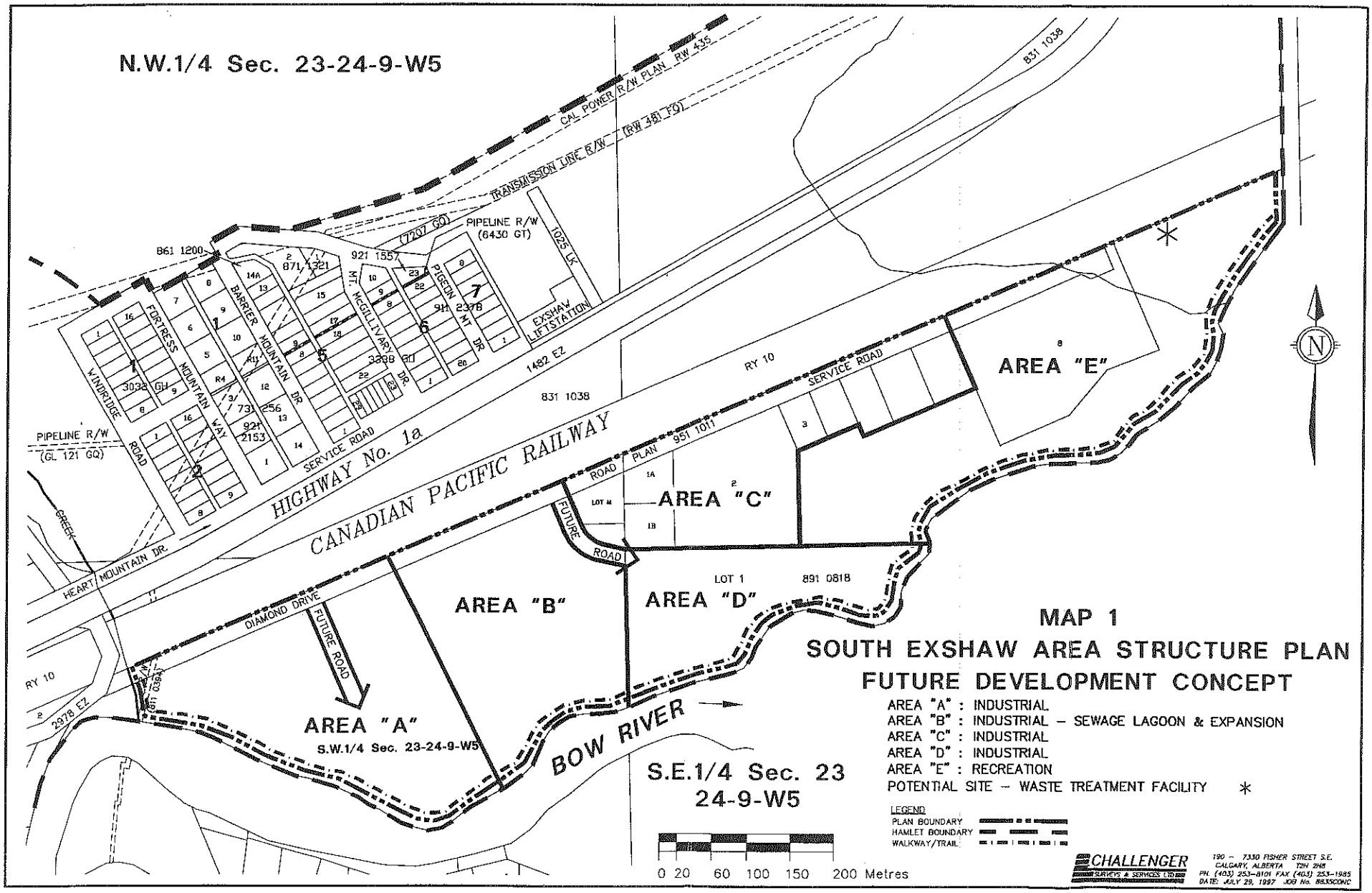
2.7.9 Lots located within the plan area may be serviced by private water wells. However, groundwater obtained within 300 metres of the sewage facility shall mot be used for potable purposes.

2.7.10 When development requires the provision, installation or upgrading of any utility, the developer shall be responsible for all costs regarding installation, including the costs of any testing and / or studies necessary as may be determined by the MD.

3.0 Implementation

This Plan provides a guideline and framework for future subdivision and development within the Plan area. Council shall review the provisions of this Plan as required in order to ensure that the policies this Plan continue to meet the requirements of landowners and leaseholders, and of the MD of Bighorn.

Section 692, of the Municipal Government Act requires that Council hold a public hearing with respect to any amendments to this Plan, thus ensuring that the views of the landowners, leaseholders and the public are considered prior to adoption.



MAP 1

SOUTH EXSHAW AREA STRUCTURE PLAN

FUTURE DEVELOPMENT CONCEPT

AREA "A" : INDUSTRIAL
AREA "B" : INDUSTRIAL – SEWAGE LAGOON & EXPANSION
AREA "C" : INDUSTRIAL
AREA "D" : INDUSTRIAL
AREA "E" : RECREATION
POTENTIAL SITE – WASTE TREATMENT FACILITY *

LEGEND
PLAN BOUNDARY
HAMLET BOUNDARY
WALKWAY/TRAIL

CHALLENGER SURVEYS & SERVICES LTD.
190 – 7330 FISHER STREET S.E.
CALGARY, ALBERTA T2H 2H8
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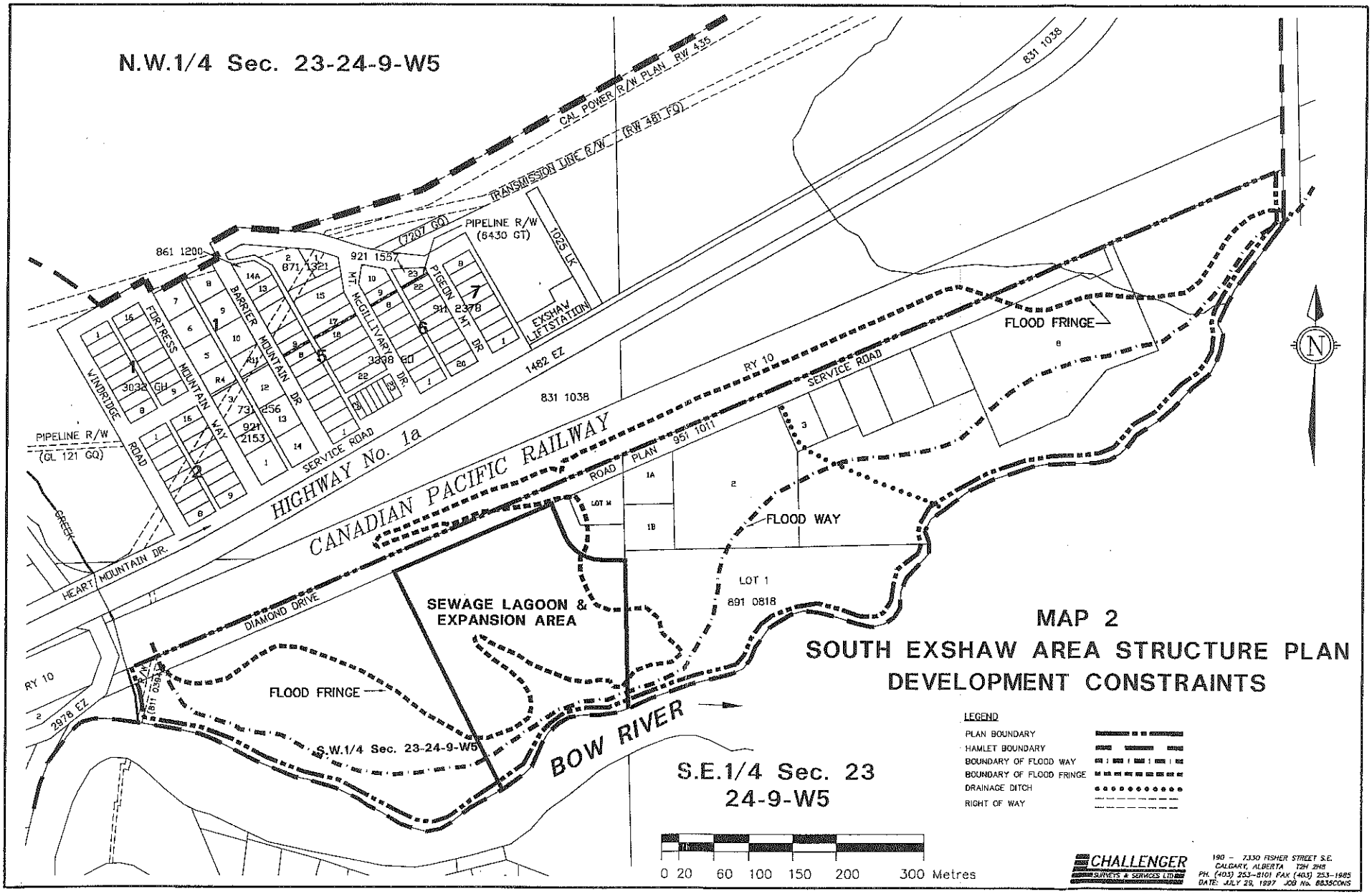
DATE: JULY 29, 1997 JOB No. 86X5CONC

Base Map provided by Provincial Mapping, Environmental Protection


N.W.1/4 Sec. 23-24-9-W5
CAL POWER R/W PLAN RW 435
TRANSMISSION LINE R/W (RW 481 FQ)
861 1200
921 1557
(7207 GQ)
PIPELINE R/W (6430 GT)
1025 LK
831 1038
EXSHAW LIFTSTATION
FLOOD FRINGE
RY 10
SERVICE ROAD
1462 EZ
831 1038
HIGHWAY No. 1a
CANADIAN PACIFIC RAILWAY
PIPELINE R/W (GL 121 GQ)
ROAD PLAN 951 1011
FLOOD WAY
LOT 1 891 0818
SEWAGE LAGOON & EXPANSION AREA
DIAMOND DRIVE
HEART MOUNTAIN DR.
FLOOD FRINGE
S.W.1/4 Sec. 23-24-9-W5
BOW RIVER
S.E.1/4 Sec. 23 24-9-W5
0 20 60 100 150 200 300 Metres
MAP 2
SOUTH EXSHAW AREA STRUCTURE PLAN
DEVELOPMENT CONSTRAINTS
LEGEND
PLAN BOUNDARY
HAMLET BOUNDARY
BOUNDARY OF FLOOD WAY
BOUNDARY OF FLOOD FRINGE
DRAINAGE DITCH
RIGHT OF WAY
CHALLENGER SURVEYS & SERVICES LTD.
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DATE: JULY 29, 1997 JOB No. 8835CONS
Base Map provided by Provincial Mapping, Environmental Protection

Appendix A:

Sanitary Servicing

EXSHAW INDUSTRIAL PARK
SEWER SERVICES

I. GENERAL

In an attempt to understand the costs of servicing the light industrial park in Exshaw with a sanitary sewage collection system, the MD of Bighorn commissioned a study to undertake a review. The study, in general terms, undertook a review of the following:

a) a low pressure sanitary sewer system (LPS) with grinder pump lift stations (Option I);
b) a conventional gravity sewage collection system complete with lift station at the east end (Option II);
c) a conventional gravity sewage system with a new sewage treatment plant (STP) at the east end (Option III);

II. BACKGROUND INFORMATION ON SERVICING

The Exshaw light industrial park has the following considerations which will affect servicing costs:

a) The subdivision is linear in length on the south side of Diamond Drive with no potential for development on the north side due to the CPR main line and, in addition, further subdivision to the south of the present development is restricted by the Bow River. Therefore the servicing costs are typically double due to servicing only one side of the development.

b) The Bow River influences the level of the groundwater in the area and water levels can be high from early June to the end of July due to spring runoff.

c) The existing lagoons, located in the northeast corner of SW ¼ 23-24-9 W5M are elevated in height and therefore sewage discharge to these facilities is not possible without pumping.

d) The future of the existing lagoons is questionable and either upgrading and/or a new treatment plant will be required in the near future. For this study, only discharge to the existing lagoons has been considered and no acreage assessment recovery costs for sewage treatment have been included in the costing analyses.

e) The MD of Bighorn has indicated that sewage flows are anticipated to be for sanitary facilities for workers primarily, with little or no wastewater flows being generated by light industrial process operations.

f) If larger LPS grinder pump systems are required for process flows, the present electrical servicing on Diamond Drive is reported to be with 208

volt 3 phase power, thereby allowing for larger pumps. (Larger pumps are more efficient with 3 phase power rather than single phase.) (The costing analyses do not consider recovery of the capital expenditure by the MD for the existing 3 phase power supply.)

III. LOW PRESSURE SANITARY SEWAGE SYSTEM

A. SITE IMPLICATIONS

Due to adverse site conditions (a possible high groundwater table), the LPS system was considered as an alternative to a conventional gravity sewer system. A LPS system is basically a small, on-site lift station which discharges a waste slurry into a small diameter flexible sewer line that would flow to the sewage lagoon.

Therefore, due to the high water table in the area, as well as the lower elevation of the industrial park lands in comparison with the lagoons, the LPS is ideally suited for this type of application.

B. GRINDER PUMP STATIONS

A grinder pump station can be generally described as a small lift station installed within the subject developable lot.

An oil-cooled motor (for cooling as well as keeping moisture out of the motor for longer life) drives a non-clogging dual cutter pump. The cutter blades handle items which are found in sewage such as disposable diapers, sanitary products, bone, wash rags, pantyhose, plastic, wood sticks, mop strings, etc.

The ground particles can be discharged into small 35mm (1 ½") service connection lines and ultimately into forcemain collection lines of 50mm (2") to 75mm (3"). The forcemains are not required to be installed at a required gradient (such as a conventional sewer system) due to the pumping by each development (lot).

C. GRINDER PUMP STATION TYPES

For this application, the study has identified three types of stations which may suit this development. The three stations reviewed are a simplex (single pump), a duplex (light industrial-dual pumps) suited for minor industrial waste flows, and a larger duplex station which has higher rated horsepower pumps (requiring three phase power), complete with larger tankage than the light duplex system. The following Table I outlines the features.

COMPARISON OF GRINDER PUMP STATIONS - TABLE I

Description	Application	Pump	Tankage	Shipping Wt + Control Panel	Main Features	Budget* Price
Simplex System	- residential type - could handle 3-4 workers and little or no process wastes	- 1-2 HP pump - 230 V/1Ø/60	0.6m dia x 2.1m deep (2' x 7')		- high level alarm (light and horn)	$ 4,606 + GST
Duplex-Industrial System (Light Duty)	- commercial or light industrial - could handle 5-15 persons and some minor industrial flows (subject to analysis)	- 2 - 2 HP pumps - 230 V/1Ø/60 - 12.5cm (5.0") dia impellers	1.2m dia x 3.7m deep (4' x 12') (example only - 6' x 8' may be better)	636 kg + 55 kg (1400# + 120#)	- 2 pump reliability - high level alarm (light and horn) - heavy duty pump seals ($400 each pump)	$ 14,835 + GST
Indusrial (Heavy Duty Duplex. System)	- industrial application - could handle 15-30 persons + industrial flows (subject to analysis)	- 2 - 5 HP pumps - 230 V/3Ø/60 - 14cm (5.75") dia impellers	1.5m dia x 4.9m deep (5' x 16') (example only - 8' x 10' tank may be better)	1090 kg + 82 kg (2400# + 180#)	- 2 heavy-duty pumps - high level alarm (light and horn) - manual reset heat sensors -lightning suppression - anti-condensation heater - seal failure indicator - price includes site delivery, installation and setup	$ 23,303 +GST

* As quoted by Western Pump (July 3/97) for budget purposes.

D. LOW PRESSURE SANITARY SEWER SYSTEM (LPS) ESTIMATED COSTS

The west end of the industrial park appears to be suited to a LPS system as an existing 100mm (4") line from Exshaw lift station No. 2 to the existing lagoons fronts the development. Therefore a new LPS forcemain would not be required. (This benefit is applicable to Block 1 and Block 2 Lots 1-7 SW ¼ 23-24-9 W5M.)

Lots 1B and 1 are best suited for servicing from the west side of each lot for a direct tie to the lagoon (or a proposed forcemain trunk from other lots).

Lots M,1A,2-9 (east of the existing lagoons) are proposed to be serviced from the forcemain proposed to be installed in the industrial park road right-of-way.

For the analysis the following assumptions were made:

a) for Blks 1&2 it was assumed that the existing forcemain from Exshaw lift station #2 has sufficient capacity

b) for lots 1-7 in Blk 2 frontages were estimated at 1/3 the distance from the front of each lot

c) for lot 3 (NE1/4) the frontage was adjusted from 30m to 20m to allow for a drainage right-of-way

d) lot 8 (NE1/4) was included in the analysis and the frontage was estimated at 220 metres

e) servicing was assumed to be terminated 20 metres into lot 9 (ballpark)

f) servicing costs were calculated at $70/m for forcemains plus 40% for appurtenances such as valving, bedding, and manholes for a total of approximately $100/m (confirmed by Raywalt Construction for budget purposes); no allowance has been made for road repairs or rebuilding.

IV. GRAVITY SANITARY COLLECTION SYSTEM

A. GENERAL DESCRIPTION

Upon review of the water table elevations encountered during the new Exshaw lift station and associated forcemain installation in the spring of 1997, it appears possible that a gravity sanitary main could be installed. In early June of 1997, the water table was at an elevation of 1284.5 on the south side of the CPR tracks. Based on an approximate ground elevation of 1293 at the west end and 1287 at the east end of the industrial park, a

conventional system could possibly be installed. The two possible options for a gravity system would be as follows:

a) A gravity sewage collection line could be installed from the west limits of the industrial park to the east end, with a new lift station (or grinder station) at the east end. Collected sewage would then be discharged into the existing lagoon system.
b) As an option to discharging to the existing lagoons, a new sewage treatment facility could be considered for the east end of the industrial park. This would allow for reclamation of the lagoon site and a more esthetic setting for the industrial lots adjacent to the lagoons.

B. NEW EAST END INDUSTRIAL PARK LIFT STATION - OPTION II

If consideration was given to a gravity system with a new east end lift station, the total overall costs are estimated to be more than a LPS system with simplex units (20 @ $5,000 each) but less than a duplex industrial system (20 @ $15,000 each).

Benefits of Option II over Option I

- with Option I each industrial lot would require a grinder station ranging from $5,000, $15,000 or $24,000 in capital costs. Based on 20 lots for an example, this could range from $100,000 minimum up to $400,000 excluding the associated forcemains. At a price of about $150,000 a new lift station at the east end could be built. This option would also reduce the operating costs of each lot for maintenance and operation of their individual grinder stations. A further consideration about Option I is that if an individual lot had a simplex system and then required a duplex system (light duty) based on growth (increased sewage flows) then a new purchase (or retrofit) would be required, which may negate the potential for industrial growth.

C. NEW STP AT THE EAST END - OPTION III

If a new sewage treatment plant were built at the east end of the Exshaw industrial park, then the overall benefits that could be realized would be as follows:

Benefits of Option III over Option II

- Option III (conventional gravity and new STP) would not require a lift station and associated forcemain (as would Option II)
- Option III opens up valuable industrial land which is out of the Bow River floodplain (the lagoons are presently situated on valuable land and impact industrial lots due to esthetic concerns)
- the potential for additional land would allow for more lots, which would reduce thereby reduce the overall frontage assessment charges to the existing industrial lots