EAST PASKAPOO SLOPES
Area Structure Plan
(ASPEN VILLAGE)

THE CITY OF CALGARY
LAND USE AND MOBILITY
PLANNING AND TRANSPORTATION POLICY

The Blue Pages in this document contain supporting information and do not form part of the bylaw.

For the purposes of electronic publications The Blue Pages are identified by the footer "Supporting Information to the East Paskapoo Slopes Area Structure Plan".

Office Consolidation
2006 November,
2008 November,
2013 July

EAST PASKAPOO SLOPES
Area Structure Plan

THE CITY OF CALGARY
LAND USE & MOBILITY
PLANNING AND TRANSPORTATION POLICY

Note: This office consolidation includes the following amending Bylaws:

Amendment	Bylaw	Date	Description
1	2P2005	2005 June 13	Map 1 – Replace
			Map 2 – Replace
			Section 1.0 – Subsection 1.1 – delete paragraph two
			Section 2.3 – under "Open Space" – delete sentence
			Section 2.3 – under "Land Use" – delete sentences
2	25P2007	2008 November	Map 2 – Replace
			Section 2.2–under "Plan Formulation" delete & replace sentence
			Section 2.3 –under "The Concept" delete and renumber paragraphs
			Section 2.4 –under "General Policies" delete & renumber paragraphs
			Section 2.10 –under "Role of the Approving Authority with Respect to the Development Plans and Architectural Controls" delete & replace text
3	31P2013	2013 July 29	Replace Map 2
			Section 2.3 under the subheading “Land Use”, replace text
			Section 2.5 entitled “Residential”, under paragraph “a)”, replace text

Amended portions of the text are printed in italics and the specific amending Bylaw is noted.

Persons making use of this consolidation are reminded that it has no legislative sanction, and that amendments have been embodied for ease of reference only. The official Bylaw and amendments thereto are available from the City Clerk and should be consulted when interpreting and applying this Bylaw.

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East Paskapoo Slopes Area Structure Plan

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PREFACE

The East Paskapoo Slopes Area Structure Plan and Supporting Information is a planning document prepared for adoption by City Council under provisions of the Municipal Government Act, 1996, c.M26.1, as amended. The document consists of two parts; the first is the ASP, pages 2 to 23, to be adopted by City Council by bylaw. The ASP establishes the conceptual framework for the more detailed planning to follow. The second part is the Supporting Information section, printed on the blue pages, which provides the background to the plan.

Upon its adoption by City Council, the East Paskapoo Slopes Area Structure Plan replaces the Winter Heights Area Structure Plan, June 1987, and all policies and provisions related to the Special Development Area, Paskapoo Slopes in the East Springbank Area Structure Plan, September 1997.

1.0 INTRODUCTION

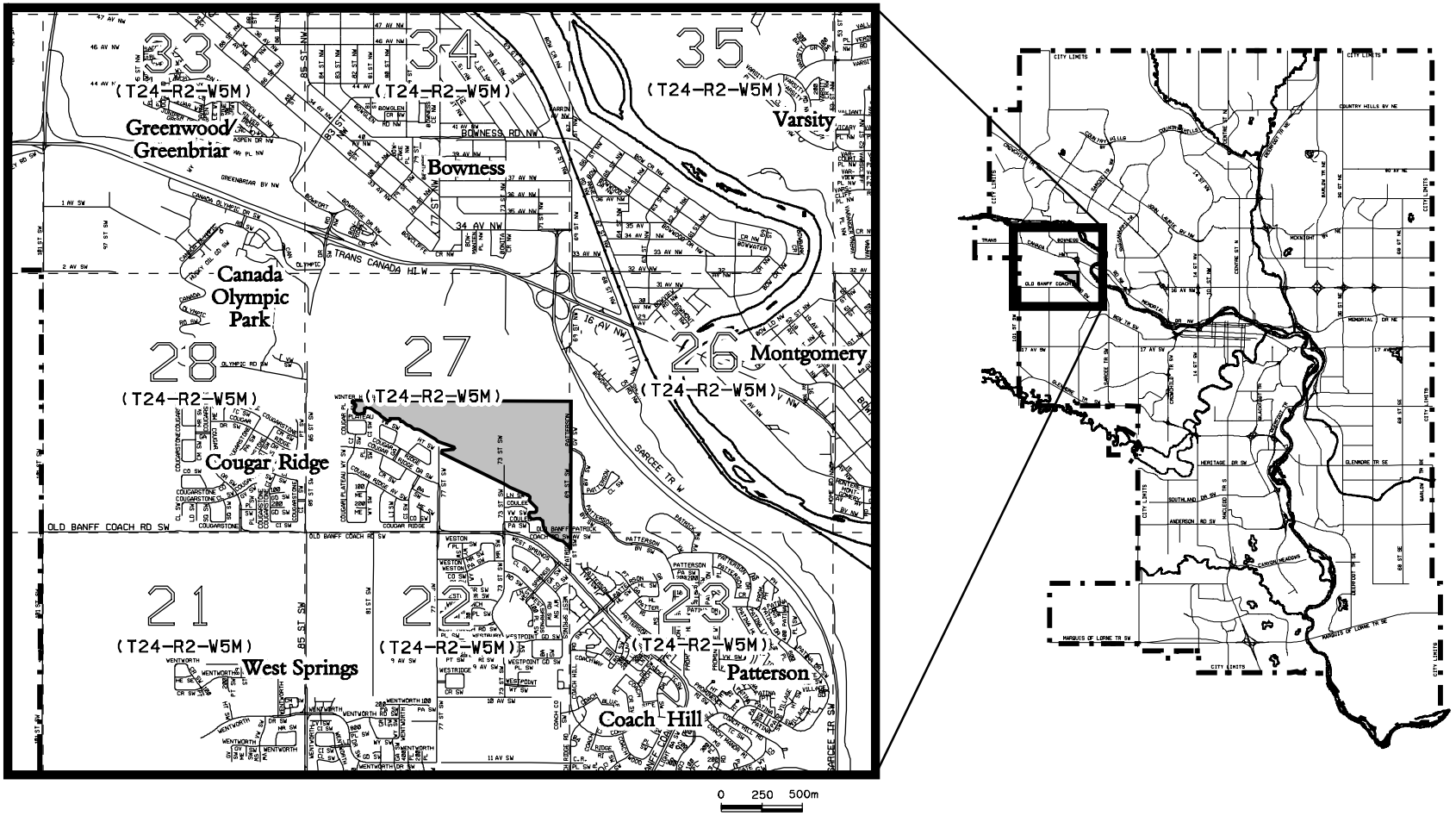
1.1 Location

East Paskapoo Slopes is located in the northwest sector of the city to the south of the Trans Canada Highway and west of Sarcee Trail. To the east is the northern tip of Patterson Heights and Wilson Gardens, to the north is the community of Bowness, to the west is Canada Olympic Park, and to the south and southwest is the East Springbank III planning area.

paragraph deleted **2P2005**

SPECIAL NOTE:

This Plan contains many proposals related to the extension of utility systems, open space provision, roads, pathways/bikeways and other municipal services. It is important to note in this regard that the Area Structure Plan does not commit The City to provide these services and facilities at any particular point in time. These decisions will be made through the normal development process and the annual capital budget process.



Planning Area

Approved:
2000 Dec. 23P2000
Amended:
2005 Jun. 2P2005

Draw No.
PIN: rep_loc
Plot Date: 27-JAN-2005

MAP 1
EAST PASKAPOO SLOPES
Area Structure Plan

LOCATION

THE CITY OF CALGARY
LAND USE PLANNING & POLICY

DATE PLOTTED: 27-JAN-2005
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1.2 Paskapoo Slopes

Paskapoo Slopes is an imposing escarpment dissected by a number of ravines, extending along the south side of Trans Canada Highway for roughly 4 kilometres. This visually prominent hill rises 155 metres above the Trans Canada Highway to the upland plateau. Aspen forest and Balsam Poplar woodlands cover much of the escarpment and add to its visual prominence. The forested hill is a magnificent sight - a landmark on the city's gateway from the west, similar in significance to Nose Hill Park in ecological quality and visual prominence.

Large portions of Paskapoo Slopes are considered environmentally significant, and has been extensively studied since 1991 by Park Development and Operations. The escarpment is characterised by an abundance of natural features including steep ravines and gullies, streams and springs, unique stands of Aspen and Balsam Poplar, dense dogwood, Riverine Tall Shrub communities, and a large glacial erratic (in the south- central portion of the ASP area). The slopes are also known to be habitat for deer, small mammals, and a large variety of migratory and breeding birds.

The planning area is situated on the eastern end of Paskapoo Slopes. The escarpment in this area grades steeply into a mix of large and active ravines, coulees, drainage channels, and benchlands. This combination of natural features has produced a variety of vegetation communities ranging from high quality stream habitat, forested slopes, to productive fescue prairie.

In prehistoric times, First Nation peoples used the area extensively. The escarpment ridge offered unobstructed views of the Bow River Valley as well as vast expanses of prairie lands. For pre-contact First Nations, conditions for bison hunting were ideal, considering the steepness of the cliff below and suitability of the riverbanks for winter camps.

A Historical Resources Inventory and Assessment of both the East Springbank III and East Paskapoo Slopes planning areas was commissioned by The City of Calgary in the summer of 1998. The study identified a significant number of archeological sites which are considered to be the northern extension of the Porcupine Hills/Oldman River basin pattern of bison driving, trapping and processing. The pattern, dating back over the past five thousand years or more, is characterized by the use of escarpments, slopes, benches and ravines for trapping and processing bison. The bison were gathered from the grazing lands in the uplands to the south and west and moved by a system of drive lanes to preferred killing and processing locales along Paskapoo Slopes. This pattern of bison hunting is unique, and is similar in complexity to Head-Smashed-In Buffalo Jump site at Fort MacLeod.

Because of its prehistoric context, Paskapoo Slopes could be of provincial significance.* The Slopes are also rooted in Native archeological heritage. According to the Historical Inventory referred to above, the archeological sites on record vary from local to high regional significance. Conservation of the regionally significant sites by inclusion in the open space system or implementation of mitigation measures is recommended in the study.

The **Historical Resources Inventory and Assessment Paskapoo Slopes (Permit 98-038)** is currently on file with Alberta Community Development.

1.3 Planning Considerations

The planning area, excluding COP lands, amounts roughly to 164.5 acres. Development within this area is constrained in a number of ways:

a) Because of the steepness of the escarpment, and the presence of numerous deep ravines and gullies, the developable lands are fragmented into several isolated cells with separate access routes. The access requirements of these cells, and the integration of development into adjacent lands are important considerations.

b) A continuous open space system along the face of the escarpment is required for long-term viability of wildlife habitat in this area. Provisions of the Municipal Government Act may not adequately satisfy this requirement. In addition, a diversity of interdependent vegetation communities, including clearings of native fescue grass, must be protected in large blocks to provide an effective cover for wildlife.

c) Soil stability is another concern, given the topographical variations of the site, and the presence of numerous springs, water streams and underground aquifers. The Preliminary Geotechnical Terrain Analysis, 1998, undertaken by an independent consultant, identified significant concerns in developing portions of the site, especially where the slopes are in excess of 33 percent. The study recommended that further investigation of the subsurface hydrological conditions, and the undertaking of engineering measures to ensure proper subsurface drainage and minimize sub-soil instability risks.

Map 7 identifies three categories of slopes, 0 to 15 percent, 15 to 33 percent, and 33 percent or greater.

* At its Regular Meeting of July 03, 2000, City Council adopted the recommendation of S.P.C. on Community and Protective Services, requesting the Province to make a determination of the archeological significance of the sites in the study area in accordance with the Provincial criteria established for this purpose.

d) The snow-making operations of Canada Olympic Park is another concern. Noise and snow drifting might conflict with future residential development on the slopes. Also, allowing residential development prior to COP establishing its future needs will limit the land use options to be considered on COP land.

   Adequate separation from current and any future COP facilities should be addressed prior to approving residential uses on the escarpment. Prospective buyers of residential units should be made aware of the possibility that COP may expand its facilities.

e) The significant archeological sites in Paskapoo Slopes represent a valuable cultural and educational resource (see Map 8). There are 49 sites in the planning area, 19 of which are in the area under active planning (outside COP property). Protecting as much as possible of these sites as open space, connecting the protected sites with interpretative trails and marking them with signs can bring a historical perspective to Paskapoo Slopes, and add interesting highlights to the trail system.

2.0 THE PLAN

2.1 Plan Objectives

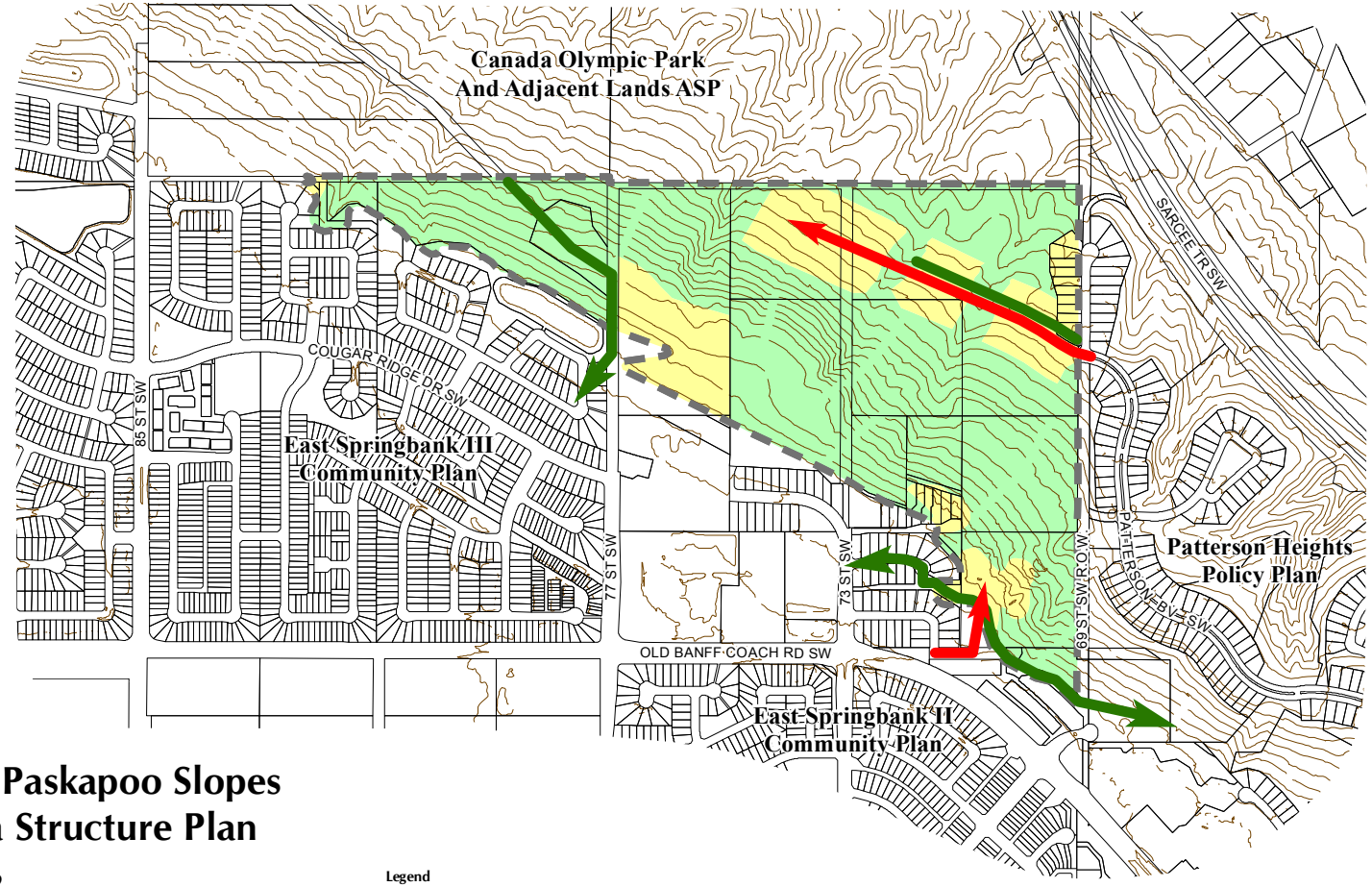
A number of Council-approved documents provide the broad policy direction for the East Paskapoo Slopes plan, including: the **Calgary Transportation Plan**, the **Sustainable Suburbs Study**, **The City of Calgary Environmental Policy**, the **Natural Area Management Plan**, the **Calgary Urban Park Master Plan**, the **Calgary River Valleys Plan, Improving Calgary's Entranceways**, and the **Transit Friendly Design Guide** (for more details, see Supporting Information). The specific objectives related to this Plan are:

- Protect large and continuous blocks of land in the Environmentally Significant Areas as open space through Environmental Reserve, Municipal Reserve, voluntary placement of Conservation Easement, density transfer and other means approved by City Council.

- Allow for a form of development sensitive to the natural setting.

- Ensure that development in sloped areas is slope-adaptive; the steeper and more visible the slope, the greater the requirement for slope-adaptive design.

- Ensure that the visual impact of development on sloped areas and ridge lines is minimized.



East Paskapoo Slopes Area Structure Plan

Map 2

Concept Plan

(Land Use, Open Space & Roads)

Legend

- Study Area Boundary
- Low Density Residential
- Open Space (Approximate)
- Pathway
- Access

0 100 200 300 400 500

Metres

THE CITY OF CALGARY
LAND USE PLANNING & POLICY

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This map is conceptual only. No measurements of distances or areas should be taken from this map.

Approved: 23P2000
Amended: 31P2013

- Ensure that the servicing and transportation infrastructure alignments chosen are sensitive to the natural integrity of this area, avoiding, where possible, significant archeological sites.

- Consolidate as much as possible of the development on lands peripheral to the main escarpment, and protect the significant archeological sites as part of the open space system.

2.2 Plan Formulation

The basic steps undertaken in formulating this Plan can be summarized as follows:

a) *Lands which may qualify as Environmental Reserve under provisions of the Municipal Government Act were delineated.* These lands, in addition to Municipal Reserve, were considered open space. The balance was considered developable, subject to access and servicing constraints. **25P2007**

b) The next step was determining a uniform density for all potentially developable lands on the main escarpment, having regard to the ecological quality of this area, and the anticipated, cumulative impact of development. Country residential, at a density of 2.5 units per hectare (one unit per acre), is generally considered appropriate in the context of this natural setting.

c) Incentives to protect more of the escarpment lands have been introduced as a refinement to the basic development option (country residential at one unit per acre). Since maintaining a large block of wildlife habitat undisturbed in the central portion of the escarpment is considered an important planning consideration, the Plan allows for density transfer, with an increase in the density range offered as incentive.

d) Density can also be increased in accordance with the policies and guidelines established in this Plan to encourage a sensitive form of development.

e) Access to developable lands on various portions of the escarpment was selected on the basis of visual and environmental impacts and consideration for safety.

2.3 The Concept

Open Space

The open space system in East Paskapoo Slopes consists mainly of steep escarpment lands and natural drainage courses. Steep slopes are the predominant geographic feature on the upper elevations along the southern boundary, from Patterson Heights to the COP current site. Seven ravines dissect the main escarpment, running in north-easterly direction, and

terminate at the bottom of the escarpment south of the Trans Canada Highway. Much of the escarpment is covered with healthy stands of Aspen and tall shrubs, notwithstanding a recent disturbance to the natural vegetation in the area west of Patterson Heights.

To maintain the viability of wildlife on this major escarpment, the significant natural features, such as ravines and gullies, are protected as open space in this Plan. Also included in the open space system are the steep lands which, if developed, would pose unacceptable soil stability risk. *Sentence deleted* **2P2005**

Land Use

Since one of the key objectives of this Plan is to protect the integrity of wildlife habitat on the main escarpment, the land use concept provides for a low-density form of residential development, 2.5 units per hectare (one unit per acre), possibly on all the developable lands.* At this density, a sensitive form of development will not compromise or significantly impact wildlife habitat.

To improve the overall quality of development on the escarpment, provisions are made for density transfers to protect vegetation on more escarpment lands. This additional protection is encouraged in the central portion of the escarpment. Density can be transferred to the fringe areas defined in Map 6, with an additional 1.25 units per hectare (0.5 unit per acre) increase in density as incentive, provided that native vegetation in the central portion will be protected.

Independent of density transfer, the Plan provides for incentives to encourage high quality design and sensitivity to the natural setting. *Density can be increased an additional 1.25 units per hectare in accordance with the criteria established in the policies, development guidelines and architectural controls stated in this Plan.* **31P2013**

deleted first three sentences **2P2005**

Development on the higher elevations along the ridge of the escarpment is to be incorporated into the detailed planning and development of East Springbank III, while development on the intermediate elevations (Patterson Woods and possibly the Quance properties) is likely to be incorporated into Coach Hill/Patterson Heights.**

* ER lands are excluded from density calculation.

** For locations of the Patterson woods and Quance property, see Map 4.

Access

Given the topographical complexity and environmental sensitivity of the site, access routes to the various development cells on the escarpment are as follows:

a) Development cells in the eastern portion of the site (Patterson Woods) will be accessible from Patterson Boulevard. The various cells within this site can be serviced internally by a private road.

b) Other cells along the escarpment ridge will be accessible from the roadway network in the East Springbank III planning area. **25P2007**

2.4 General Policies

a) The land use, open space, and road concept is illustrated in Map 2. This overall concept plan shall serve as the basis for more detailed land use and subdivision plans. Boundaries of the developable lands and open space shown on this map may be modified at the outline plan stage.

b) To address the concerns of the Coach Hill / Patterson Heights community and other groups involved in the preparation of this Plan, it is proposed here that a joint advisory committee be formed and given the following mandate:

- The main function of the committee is to establish a platform for informed discussions involving representatives from appropriate business units in the Administration, community groups and the landowners. The committee should attempt to arrive at a consensus regarding the safeguards needed to protect existing housing, the natural and visual surroundings, and ensure a sensitive form of development in conformity with the Plan policies.

- The committee will have access to the professional expertise and resources available within the Administration.

- The committee will be given the opportunity to review, comment, and make submissions to the Approving Authority at the land use redesignation, outline plan approval, and development permit approval stage.

- The terms of reference for the committee shall be subject to Council approval. Also, the outcome of the process shall be reported to Council and any further approval shall be subject to the regular approval process.

c) On the basis of the information provided in the Preliminary Terrain Analysis, all lands with slope of 33 percent or greater are considered, for the purposes of this Plan, undevelopable—to be taken as Environmental Reserve at the outline plan stage. Should more detailed hydrological assessment and sub-soil testing indicate otherwise, an amendment to this Plan would be required to allow for development on the subject lands. As a condition, however, Urban Development, Land Use and Mobility must be satisfied that site development will not pose unacceptable risk with regard to soil stability.

d) Where development is permitted, slope stability and hydro-geological impact studies prepared by a qualified professional engineer shall be provided in support of any land use or outline plan subdivision application, and shall be subject to review by Urban Development, as per the current practice in dealing with such applications. The cumulative impact of development on soil stability shall be taken into consideration. A peer review by an independent consultant shall also be undertaken.

e) A biophysical impact assessment will be required in conjunction with any servicing schemes to be submitted in support of land use redesignation or outline plan application. Servicing and utility alignments will be selected so as to minimize the impact on environmentally significant sites and archeological sites. Where possible, directional drilling or other methods of construction which minimize this impact shall be used.

f) Design for stormwater management facilities for the planning area must satisfy the Provincial standards for stormwater quality, introduced in 1998, as well as City of Calgary standards.*

g) A Site Contamination Statement and a Phase 1 Environmental Site Assessment will be required as part of any outline plan/land use amendment application. Additional Environmental Site Assessment report(s) and a site action plan may also be required, as determined from the review of the Site Contamination Statement, Phase 1 Environmental Site Assessment and civic databases. If required, the site action plan will be provided to the satisfaction of Alberta Environment, Calgary Regional Health Authority and Environmental Management.

h) Paskapoo Slopes is considered an area of high archaeological sensitivity. Therefore, the developer is required to submit an archaeological study of the subject site to Alberta Community Development, and carry out any mitigation measures required by the Province.

* The Stormwater Management & Design Manual, currently being prepared by Wastewater & Drainage, will establish the detailed engineering requirements necessary to meet Provincial and City of Calgary standards.

i) Environmental Reserve and Municipal Reserve will be used to protect natural features or archeological sites, and, therefore, construction encroachment will not be considered.

j) The Development Guidelines, Concept Plan, and Architectural Controls described in Sections 2.7, 2.8, and 2.9, shall be taken into consideration by the Approval Authority in reviewing outline plans of subdivision, land use redesignations and development permit applications within the planning area.

k) The existing retreat and guest lodging facility located on 85 Street SW may continue its current operations. Compatible expansion of the existing uses as well as on-going maintenance and upgrades to the facilities and grounds are permitted without a land use amendment to this Plan if they remain sensitive to the natural setting and character of the site. Any major change in the intensity of the development or use of the site will require a land use redesignation application in accordance with the policies and guidelines established in this Plan. **25P2007**

2.5 Residential

a) Considering the extent of developable land in East Paskapoo Slopes, a basic residential density of 2.5 units per hectare (one unit per acre) is considered appropriate in the Environmentally Significant Area, as defined on Map 3. *A development proposal demonstrating exceptional sensitivity to the environment may be granted an additional density of 1.25 units per hectare (0.5 unit per acre).* **31P2013**

b) Density transfer is encouraged from the central portion of the escarpment to the fringe areas, roughly as defined on Map 6, also with an increase of 1.25 units per hectare (0.5 unit per acre).

c) Canada Olympic Park shall be advised of any proposed residential development within the planning area, and given the opportunity to comment on the proposed development in the context of their expansion plans. In turn, the Approving Authority must be satisfied that the proposed use, in the context of the information available will not set the stage for a future land use conflict.

d) The developers and builders in the planning area shall be responsible for providing an information package, to be approved by the Approving Authority, to advise prospective owners of residential units regarding the possibility of Canada Olympic Park expanding its' facilities, and the impact of snow drift and noise generated by the snow making equipment at their current and possible future locations.

2.6 Natural Areas, Pedestrian/Cyclist Pathways and Archeological Sites

It is intended that the open space be located, sized and configured to meet the needs of a regional natural environment park, and will meet these goals:

a) Park Development & Operations will protect and maintain representative and viable natural habitat types as an integral component of the parks and open space system.

b) Park Development & Operations will manage designated natural park lands in a manner which will, by intent, maintain the natural character and integrity of these sites.

c) Park Development & Operations will encourage and welcome informed public, corporate and community participation, stewardship and partnerships in the acquisition, management, research and protection of appropriate natural environments.

d) Year round enjoyment and use by all Calgarians will be encouraged with appropriate sensitivity to environmental impact and safety. Where recreational use and the long-term survival of significant habitats conflict, protection of the resource will take precedence. Recreational facilities will be designed and managed to minimize negative impact on natural areas.

e) The City of Calgary will work with adjacent municipalities to cooperatively protect contiguous natural habitat.

f) The City will work cooperatively with COP to establish future recreational uses for their properties within the planning area, recognizing the environmental significance of the site.

g) Generally, natural areas may be protected through:

- dedication as Environmental Reserve;
- dedication as credit or non-credit Municipal Reserve;
- density transfer to other sites;
- voluntary placement of conservation easement;
- corporate and individual donations.

h) A mixture of vegetation communities are required to be protected.

i) No re-grading shall be allowed to encroach into the ravines and escarpment shown as open space in Map 2. Furthermore, natural vegetation in these areas shall not be disturbed, except for the construction of pathways or installation of utilities, for which rehabilitation measures shall be undertaken to the satisfaction of Park Development & Operations, and Utilities and Environmental Management. Under no conditions will stormwater or sanitary trunks be constructed along the bottom of a ravine.

j) Corporate and individual donations, use of environmental reserve easement and conservation easement shall be encouraged to protect additional lands beyond the open space system to be acquired in accordance with the Municipal Government Act at locations to be determined by Park Development & Operations.

k) A continuous open space system is to be protected from development as conceptually shown on the Land Use Concept (Map 2). The open space system is to be protected in its natural state through the following approaches:

   i) Lands that qualify as Environmental Reserve (ER) to be dedicated as required under the Municipal Government Act. Exact limits of ER shall be determined at the Outline Plan stage.

   ii) To the extent possible, Municipal Reserve shall be used to protect additional environmentally significant lands and regionally significant archeological sites.

   iii) If development is to take place in the central portion of the escarpment, as defined on Map 6, the building footprint shall be limited to 20 percent of the parcel area.

l) To maintain the ecological quality of this part of Paskapoo Slopes, any changes to the drainage pattern or ground-water levels within the planning area should not impact the ecological quality of the remaining natural areas shown as open space on Map 2, or any natural areas in the vicinity. Site specific geotechnical and hydrological studies shall consider this requirement and shall be reviewed by the Approving Authority when land use and development proposals are considered.

m) Crossings of ravines by roads and utilities will be minimized and shall be subject to approval by Park Development & Operations, and Utilities and Environmental Management. A full Biophysical Impact Assessment, with public consultation, is required for any ravine crossing, and will include mitigation strategies. Continuity of the water flow, whether permanent or intermittent, shall be maintained. Bridges or retaining walls will be required. Archeological sites, springs and sites of rare plants shall be avoided.

n) Any environmental damage which occurs during or prior to development shall be rehabilitated by the developer/builder in all areas to be retained in a natural state. The use of native grass and plant species shall be required, and will be carried out to the satisfaction of Park Development & Operations.

o) Outline plans for areas of particular environmental sensitivity should be reviewed by Park Development & Operations staff, who shall provide advice to the Approving Authority to help ensure that any adverse impacts are minimized.

p) The natural features to be protected as open space will be generally managed as a major natural environment park, and in accordance with the Natural Area Management Plan.

q) Fire truck access shall be maintained to all natural areas for fire fighting purposes.

r) Housing shall be separated from natural areas by fences. Setbacks from natural areas shall be required.

s) Signage for natural environment parks may be standardized.

Pathways and Trail System:

t) The pathway and trail system for East Paskapoo Slopes is shown conceptually in Map 2. This system will provide access to the natural amenities of the site. The ecological sensitivity of the surrounding lands shall be a major factor in determining the design standard and choice of construction materials and methods, providing access to the appropriate user groups.

u) Where appropriate, a joint effort by Park Development & Operations, Alberta Community Development, interest groups (e.g. Paskapoo Slopes Preservation Society, Edworthy Park Heritage Society, Society of Bowness Residents etc.) and the developers may be undertaken in developing an interpretative trail system.

v) The pathway system should incorporate seating areas at significant viewpoints within the planning area to the satisfaction of the Approving Authority.

x) Any portion of the pathway to be located along a road should be constructed as a separate pathway, as opposed to being accommodated on the road pavement.

2.7 Development Guidelines

East Paskapoo Slopes is prominently located along a major entranceway to the city, the Trans Canada Highway. The site is also highly visible from the surrounding communities as well as from communities across the Bow River to the north. For these reasons, the following development guidelines are proposed to assist the Approving Authority in reviewing land use, subdivision, and development applications for the East Paskapoo Slopes area. These guidelines will help ensure that development is of a high architectural and landscaping standard in keeping with the area's prominent location and environmental sensitivity.

a) **Sensitivity to the Natural Topography**

Topographical variations offer not only a challenge to development but also opportunities to create visually interesting physical surroundings. Skillful design capitalizes on topographic variations. Some of the design approaches to be employed in the design task are:

- street layout to minimize re-grading requirements;
- building mass to conform to the land contours;

- multi-level housing design to utilize grade variations (slope-adaptive housing); and

- maintaining view vistas, as appropriate, from the streets at intervals for public access to views from the higher elevations.

b) **Minimizing the Visual Impact**

Development proposals shall address the visual impact through the extensive use of the following design tools:

- screening of portions of the development by intensive landscaping shall ensure that the natural elements in the physical surroundings of the development remain prominent;

- blending of the development into the slopes may require special design solutions, such as lower residential density or extensive tree planting/landscaping, to sensitively handle the interface with heavily treed areas;

- careful control of building height and form to ensure that the development will not be visually overwhelming in the natural setting of the planning area. Likewise, appropriate choices of building materials and colours will ensure compatibility with the natural surroundings;

- development edge is another concern that can be addressed in the layout, building and landscaping of the subdivision. Rear of houses to be seen from Trans Canada Highway or Sarcee Trail, with a long solid fence, may have a negative visual impact. These problems can be avoided through sensitive subdivision layout. Also, a chain link fence is visually less intrusive compared with a solid fence. Rows of trees at appropriate locations can soften the visual impact along the edge of development and, therefore, increased landscaping in the area is encouraged; and

- special attention should be given to addressing visual impacts of retaining walls and the edge of development as seen from the Trans Canada Highway and Sarcee Trail. The visual impacts of retaining walls can be reduced by skillful design that make use of smaller scale, stepped-up structures, attractive natural materials on the exterior wall, intensive planting of trees and shrubs, etc.

c) **Quality of Residential Development**

- Cluster housing is encouraged in this Plan. The physical layout of this form of housing utilizes the land more efficiently, thus a larger area can be allocated to open space, public or private. Continuity of the open space system is also better maintained, and the opportunity for a consistent architectural treatment and landscaping is enhanced.

- Slope-adaptive housing is also encouraged. This form of housing will reduce the visual impact, and result in less disturbance to the subsoil hydrology.

- Careful treatment of the interface with Patterson Heights must be addressed in any proposed development to the west. The character of houses fronting on Patterson Boulevard shall be taken into consideration to ensure compatibility with existing development.

2.8 The Concept Plan

In addition, to the development guideline stated in Section 2.7, two steps have been added to the normal approval process. The first is a concept plan, which deals with the land uses and physical layout of the overall development. The second is the architectural controls, discussed in Section 2.9, which deal with specific requirements for each building site.

A concept plan, to be prepared by the developer, will be required to provide the following information, in conjunction with the outline plan(s), to assist the Approving Authority in reviewing the proposed development and assessing its merit:

a) A plan indicating the physical layout of the proposed development in terms of building mass and envelope relative to the topography of the site and its surroundings. This plan must cover a sufficient area (beyond the site boundaries) to ensure compatibility with planning for the surrounding lands. The plan must also conform to the overall land use/transportation concept described in Map 2 and the development policies set out in Section 2.7.

b) Computer-generated perspectives, based upon accurate information regarding site topography and its natural features, physical layout of the proposed development and likely architectural massing of buildings will be needed to demonstrate what the development would like from important travel corridors and vantage points.

c) Top of the escarpments and slope stability lines, as per the geotechnical and hydrological studies conducted for the site.

d) Preliminary grading plan, including cuts, fills, and road grades, indicating any significant modifications to the natural topography to accommodate the proposed development. Any potential problems with steep roads can be identified and dealt with at this stage.

e) Location of all retaining walls higher than 1.2 metres (4 feet).

f) A landscaping plan indicating existing vegetation, areas to be disturbed and proposed natural vegetation area. The plan must also indicate

species, sizes and number of trees to be planted and any other landscaping features, such as fountains, seating areas, etc.

g) Cross-sections, architectural massing, perspectives, schematics, and any other drawings and illustrations as may be required to assist the Approving Authority in reviewing the proposed development.

2.9 Architectural Controls

The purpose of the architectural controls is to ensure that development on the sloping lands is visually compatible with the natural surroundings and is sensitive to the environment.

a) The architectural controls are to be formulated by a qualified consultant, to be retained by the developer, in order to achieve the guidelines stated in Section 2.7. All the necessary requirements to achieve those principles shall be established and will be subject to the review by the Approving Authority prior to the issuing of any development permit.

b) The architectural controls shall be formulated for a single parcel, on a block by block basis or any other basis acceptable to the Approval Authority.

c) The architectural controls shall be based upon the following guiding principles:

Architectural Theme

- An architectural theme is required to unify the streetscape and give the development a distinctive character. More than one theme may be selected, assuming that the themes are visually compatible.

  In selecting the architectural theme(s), the use of natural building materials such as wood, stone, etc., shall be encouraged.

Siting and Building Orientation

- Due consideration should be given to topography and on-site drainage in the subdivision layout, and in siting each individual building within the lot to minimize disturbance to the natural vegetation.

Building Mass and Height

- To ensure harmony of the physical surroundings, the apparent mass of different buildings on the same street should be consistent.

- Height transition is also important; for example from a two-storey house to a bungalow beside it. One way of achieving transition on sloping terrain is by reducing the difference in eave elevation (from one building to its neighbouring building).

- Stepping back the building mass on the higher floors will contribute to more open surroundings on the street level. Stepped massing may be appropriate in the design of houses on sloping terrain, as is the case with slope adaptive housing.

- Sloped roofs and stepped-back building mass can be appropriate design features to break up the visible mass of downhill buildings and reduce their visual impact.

- Careful consideration should be given to the design of three storey houses (i.e., houses with a walkout basement) which may have a significant visual impact. A stepped-back building mass is one way of reducing this impact.

Site Grading

- The finished grade should follow as closely as possible the natural contours of the site.

- Site slopes should be absorbed within the building massing, as is the case with slope-adaptive housing, for example, and through the use of retaining walls outside the building envelope.

- All grading requirements of the site, including loam stock pile locations, drainage swales and retaining walls, shall be provided within the site boundaries.

- Excavation or construction shall not be allowed to undermine the slope stability of any roadway base, underground utility or adjacent retaining walls.

- Due to sloped topography, precautions shall be taken during construction such as erosion control and silt fencing to ensure that ground and surface runoff will not be directed to escarpments, ravines, water streams and springs.

- Careful consideration should be given to the treatment of front stairs and access to buildings on up-sloping sites. The ground floor entrance should be no more than 1.2 metres (4 feet) above the finished grade.

Retaining Walls

- Retaining walls shall be engineered and of uniform design and construction to ensure consistency of appearance within the subdivision.

- Retaining walls shall be designed to ensure a balance between the retention of natural vegetation and the appearance of the retaining wall.

- Exposed large stacked boulders or rip-rap rocks are unacceptable for building retaining walls above 2 metres.

- Retaining walls shall be entirely on private property.

- Highly visible retaining walls shall be finished with attractive natural stones or textured concrete. Use of wooden retaining walls shall be limited to the rear and side yards, and behind the required front yard setback lines of private property.

Driveways

- On sloping sites, driveways should be constructed with a smooth vertical curve at the top and bottom, rather than a straight ramp. The maximum grade of the driveway shall not exceed 12%.

- Driveways should be constructed of concrete, exposed aggregate, unit pavers, stamped concrete, or asphalt.

Roof Materials

- Roofing materials should be of subdued earth tone to minimize the visual impact from surrounding lands, and be of a fire retardant material.

Exterior Finishes

- Use of natural materials, such as bricks, stone, wood, etc., in quiet complementary colours should be encouraged.

- Houses on corner lots should be treated architecturally as having two front elevations. The aesthetics of both elevations are to be addressed in the design.

- Large, blank building surfaces or solid walls, for example, along the side of a house, are to be avoided in high visibility locations. If necessary, ornamental features such as arches, pillars and trim boards may be used to break up the mass.

- Where the rear elevations of houses are highly visible, consideration should be given to their appearance from important travel corridors and vantage points. Screening by landscaping may be an acceptable alternative.

- No more than .46 metres (1.5 feet) of exposed unfinished concrete foundation wall shall be permitted.

Colours

- Colour coordination is required to maintain harmony in the overall appearance of the development, without unduly restricting the need to express the individual character of each house or building.

- The dominant colours should be in subdued earth tones; contrasting colours can be used on window frames, trim boards, facia boards and other small building surfaces.

Landscaping and Fencing

- Landscaping is encouraged to protect, maintain and enhance the appearance of the site, unify the streetscape and promote the compatibility of the development within its natural surroundings, provided that native trees and shrubs will remain the predominant species in this natural area.

- Balance should be maintained between protection and retention of existing vegetation and the need for tree planting and landscaping. Retention of existing trees outside the building envelope and driveway surface is generally encouraged, having regard to the safety of nearby buildings.

- All fencing in highly visible locations should be coordinated in both design and detail.

- A woven mesh fence, rail, split rail fence or low, ornamental iron fence may be constructed to separate private properties from adjacent ravines, escarpments or other natural elements of the open space system, and be located on or within private property line.

Design Variation

- Design variations for residential buildings should be encouraged along the same street as opposed to repeating the same design within a short distance. Setback variations are also encouraged, provided that adequate separation between houses is maintained.

2.10 Role of the Approving Authority with Respect to the Development Plans and Architectural Controls

a) In conjunction with the outline plan(s), the developer is required to submit a Concept Plan for the proposed development, as described in Section 2.8 for review and approval by the Approving Authority.

b) The Approving Authority shall assess the merit of any proposal for residential development with respect to increasing the density in accordance with Subsections 2.5 a) and 2.5 b).

c) All comprehensive development sites shall be designated Direct Control District. Furthermore, the architectural controls referred to in Section 2.9 shall be included in the amending bylaw.

d) Subdivision plan and landscape concept plan are required for any comprehensive development proposal. **25P2007**

2.11 Development Phasing

Various portions of the planning area with different access corridors or utility servicing schemes are likely to develop independently.

The development cells along the ridge of the escarpment are likely to proceed as a part of developing the lands on top of the escarpment. The eastern cells on the intermediate elevations (Patterson Woods) is readily accessible from Patterson Boulevard, and is currently serviceable up to 20 hectares (50 acres) of developable lands, with the balance being dependent upon availability of storm and sanitary capacity.

Supporting Information

PART 2: SUPPORTING INFORMATION

3.0 EXISTING CONDITIONS AND NATURAL FEATURES

3.1 Existing Uses and Conditions

On-going and past activities had a considerable impact on the condition of the natural vegetation in the planning area. For a number of years, a tree farm operated southwest of the Sarcee Trail interchange, and gravel mining also took place in this vicinity. To the west, the deep gullies and ravines adjacent to Canada Olympic Park have attracted heavy use by all-terrain recreational vehicles, scarring the terrain and causing soil erosion. Further up the escarpment on the east side, some fifty acres of wooded lands have been cleared (Patterson Woods) and is now being cultivated. A lama farm is also operating on the slope higher up on a five-acre parcel.

A number of tourist-oriented businesses operate on sites adjacent to Canada Olympic Park, with access from 85 Street. Several country residential acreages are scattered along the ridge of the escarpment, taking advantage of the dense vegetation and the magnificent view of the Bow Valley from the high elevations.

Three ice ponds are located at the bottom of ravines south of Trans Canada Highway. Their purpose is to dam stormwater runoff and water flow from spring seepage before reaching the road, causing ground heaving, specially in freezing temperatures.

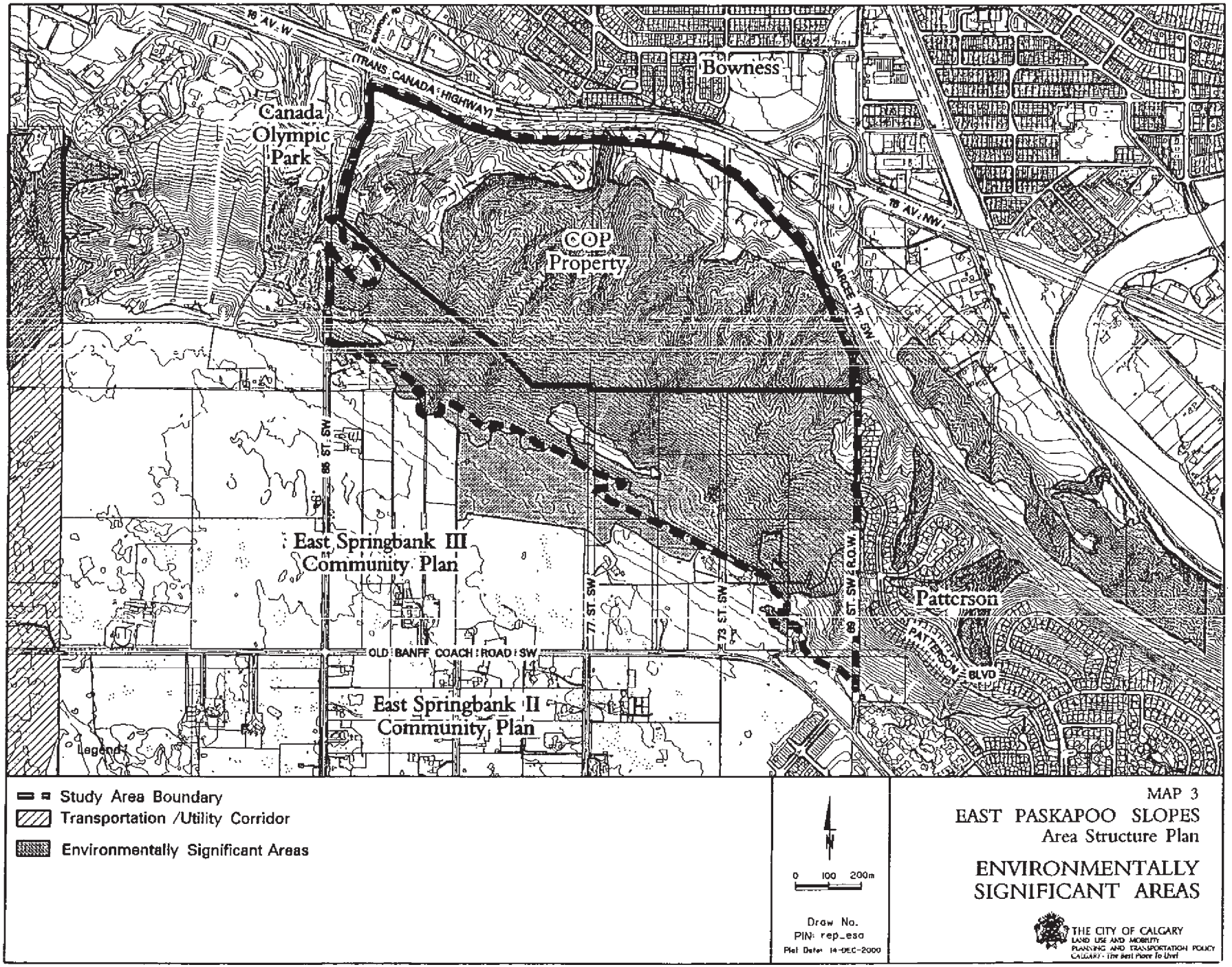
3.2 Topography

The planning areas is located on the eastern portion of the north facing slopes that form a transition from the Upland Plateau to the bottom of the Bow River valley. Topography is dominated by a sloping escarpment, dissecting ravines, a series of plateaus below the ridge, and a relatively flat area at the bottom (in the northeastern portion of the planning area). Rugged terrain and deeply incised gullies and ravines characterize the intermediate and lower elevations. The highest and lowest elevations are approximately 1,230 metres in the southwest and 1,080 metres in the northeast corner, respectively.

3.3 Environmentally Significant Areas (ESA)

The majority of the site is considered an Environmentally Significant Area, defined by Park Development & Operations on the basis of the following criteria:

- quality of the biotic community: communities of high quality (minimal disturbance) and/or diversity of a specific habitat type;
- ecological function - human: area makes a significant, if not unique, contribution to the community. This includes aesthetic consideration, potential for passive recreation space, etc;
- ecological function - natural: area is important to the healthy maintenance of a natural system beyond its boundaries;
- distinctive and/or unusual land form: presence of distinctive and/or unique land form (geologic or geographic); and
- uniqueness: the habitat or ecosystem has limited representation within the municipality, or the area is a representative habitat for wildlife of recognized importance.


16 AV. W
TRANS CANADA HIGHWAY
Bowness
Canada Olympic Park
COP Property
16 AV. NW
SARCEE TR. SW
85 ST. SW
East Springbank III Community Plan
77 ST. SW
73 ST. SW
69 ST. SW
R.O.W.
Patterson
PATTERSON BLVD
OLD BANFF COACH ROAD SW
East Springbank II Community Plan
Legend
Study Area Boundary
Transportation /Utility Corridor
Environmentally Significant Areas
N
0 100 200m
Draw No.
PIN: rep_esa
Plot Date: 14-DEC-2000
MAP 3
EAST PASKAPOO SLOPES
Area Structure Plan
ENVIRONMENTALLY SIGNIFICANT AREAS
THE CITY OF CALGARY
LAND USE AND MOBILITY
PLANNING AND TRANSPORTATION POLICY
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Habitat Type	Associated Vegetation Community
1. Aspen Forest	Aspen/rose/buckbrush Aspen balsam poplar/dogwood Aspen/saskatoon/rose Aspen/willow Aspen/white spruce
2. Balsam Poplar	Balsam P./water birch/dogwood Balsam P./dogwood Balsam P./silverberry Balsam P./brome (thistle)
3. Upland Tall Shrub	Saskatoon/chokecherry Willow Silverberry
4. Riverine Tall Shrub	Willow Saskatoon Water birch Dogwood
5. Upland Low Shrub	Buckbrush/Rose Shrubby Cinquefoil
6. Native Grassland	Rough Fescue Needle Grass (dominant) Mixed Native Grass (others)
7. Non-native Grassland	Brome-Thistle Other
8 Disturbed	Balsam P./manicured grass Manicured grass Anthropogenic
9. Wetland	Non-native

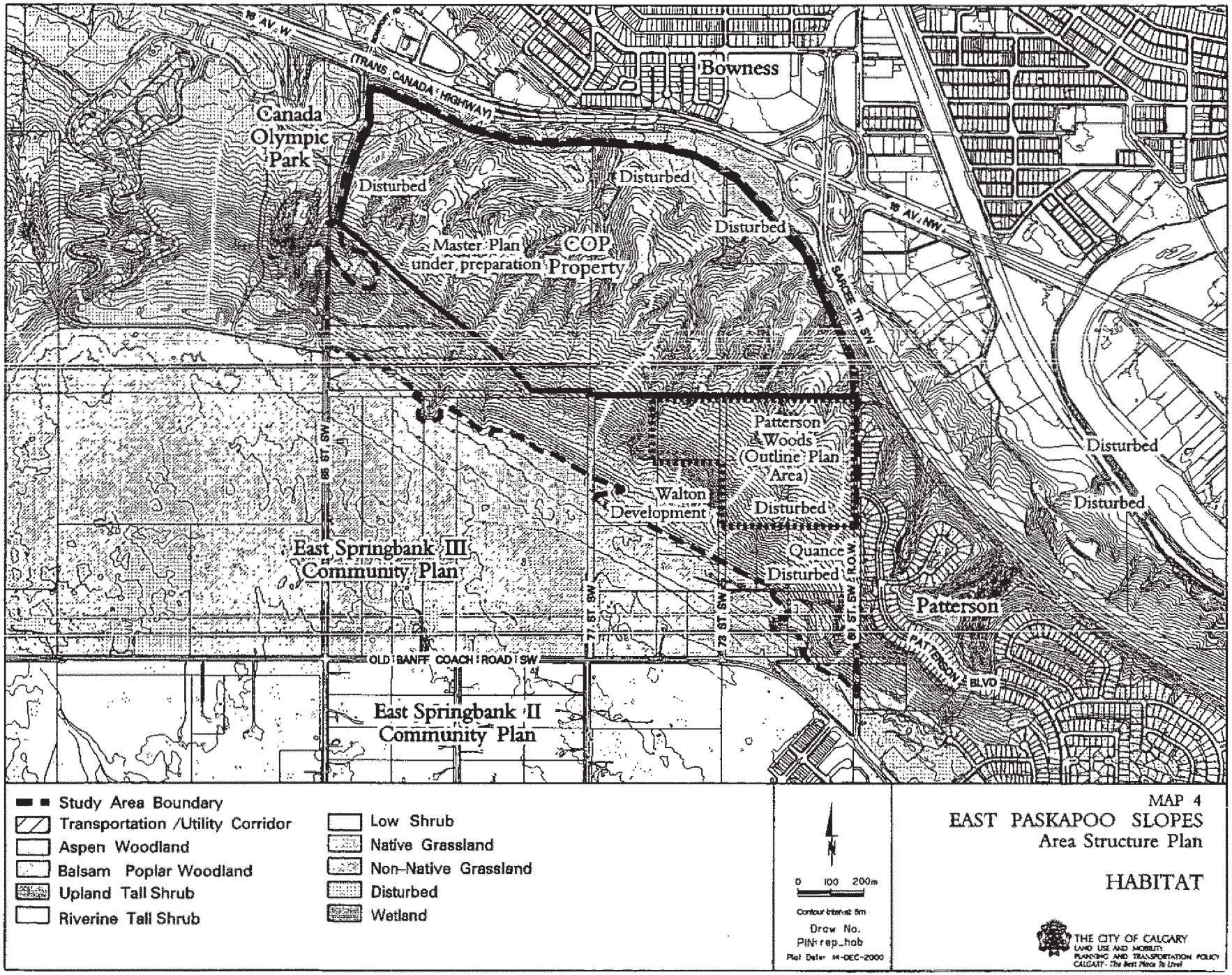
3.4 Biophysical Assessment of the Paskapoo Slopes

Paskapoo Slopes has been extensively studied by Park Development & Operations, as well as by several environmental consultants. In the Calgary context, this escarpment is comparable to a major Natural Park, such as Bowmont, Nose Hill or Edworthy Park. Diversity of wildlife habitat, association of vegetation communities, frequent use by a number of wildlife species, and its role in maintaining viability of habitat beyond its boundaries are remarkable characteristics of the slopes.

Aspen Forest

Trembling aspen (often referred to as quaking aspen) is the most widely distributed tree in North America. Its success can be attributed to its ability to establish in a range of site conditions, and prolific reproduction through asexual suckering. While abundant, aspens have a relatively short lifespan, averaging 65-80 years, and significantly less in unfavourable conditions. In Calgary, large aspen forests are most common on marginal sites where the trees have a relatively fast turnover rate. Trees tend to reach maturity at a relatively young age, occasionally as young as thirty years in exposed, windy sites.

In the planning area, aspen is found commonly in association with other tree species in mixed stands. Mixed deciduous forests of aspen and balsam poplar are found in moist depressions, or ravines. On most


16 AV. W.
TRANS CANADA HIGHWAY
Canada Olympic Park
Bowness
Disturbed
Disturbed
Disturbed
Master Plan under preparation
COP Property
16 AV. NW.
SARCEE TR. SW
Patterson Woods (Outline Plan Area)
Disturbed
Disturbed
Walton Development
Disturbed
Quance
Disturbed
85 ST. SW
77 ST. SW
73 ST. SW
69 ST. SW
East Springbank III Community Plan
Patterson
PATTERSON BLVD
OLD BANFF COACH ROAD SW
East Springbank II Community Plan
Study Area Boundary
Transportation /Utility Corridor
Aspen Woodland
Balsam Poplar Woodland
Upland Tall Shrub
Riverine Tall Shrub
Low Shrub
Native Grassland
Non-Native Grassland
Disturbed
Wetland
N
0 100 200m
Contour Interval 5m
Draw No.
PIN: rep_hab
Plot Date: 14-DEC-2000
MAP 4
EAST PASKAPOO SLOPES
Area Structure Plan
HABITAT
THE CITY OF CALGARY
LAND USE AND MOBILITY
PLANNING AND TRANSPORTATION POLICY
CALGARY - The Best Place To Live!

north-facing escarpments, aspen is interspersed with white spruce. Typically in this area, aspen has an understorey (associated shrub and ground cover) which may be composed of saskatoon, rose, chokecherry, red osier dogwood, willow, buckbrush, and Canada buffaloberry.

In the Calgary area, aspen poplar may be found in both isolated stands or clones or as a component of mixed woods. Aspen copses tend to form in well-drained areas on open plains, and on the moist northern exposures of small hills and ravines. In a grassland setting, aspen stands form small "islands" of woodland, providing additional diversity in the prairies and foothills. Several species of birds and mammals feed in the open grassland, but require the hiding and thermal cover afforded by small tree stands. Many of these species cross Sarcee Trail to Edworthy Park for winter thermal cover. Paskapoo Slopes is dominated by a consistent expanse of aspen. The high quality and variety of ages of aspen are important factors on the slopes.

It is to be noted that aspen forests can tolerate a certain amount of edge encroachment by development but internal fragmentation should be avoided.

Balsam Poplar

The balsam poplar forest is a predominant habitat type in most natural areas along the river edge within Calgary. Riverine forest, in the Calgary context, offers vegetation that is not found in the grassland and aspen woodlands, and are among the most important habitats for wildlife, especially for migratory bird usage in North America. Riparian or riverine woodlands in Calgary typically exist on prominent point bars of the Bow and Elbow rivers. Mature balsam poplar (Populus balsamifera) is the dominant tree species in the riverine forest, establishing on gravelly river floodplain and terraces in moderately well-drained areas. This particular tree requires moist ground with cycles of moisture and drying in order to survive, and may suffer accordingly if water table regimes are altered. Balsam poplar stands may be also found in upland areas, but are usually near a source of water—for example a seep, spring, or drainage course as is found throughout Paskapoo Slopes. The ravine systems on Paskapoo Slopes are inhabited extensively with balsam poplar and are rare in the Calgary area. Of concern should be the altered environmental conditions caused by changed hydrology expected in denser development.

Under ideal conditions, balsam poplar may be accompanied by an understorey of red-osier dogwood, willow, water birch, saskatoon, silverberry, or Canada buffaloberry. Occasionally, white spruce may establish in shady, moist areas but normally do not mature. Mature riparian (associated with water) forests that have been disturbed—through grazing, gravel extraction, or other natural and human processes—often have a rudimentary smooth brome-thistle understorey. There is extensive disturbance in the NW corner of the newly acquired Canada Olympic Park property. For this reason significance has been lessened in this area.

Shrubs

Shrub habitats in Calgary's natural areas have been separated into Riverine Tall Shrub, Upland Tall Shrub, and Low Shrub. The location of shrubs is determined strongly by slope and aspect, as well as by soil moisture, texture, and drainage. In open upland areas, shrubs will be confined generally to areas of high moisture - such as depressions, shallow ravines, or west, east or north-facing slopes. South facing slopes are usually too exposed and dry to support shrubs; in these areas grasses have a competitive advantage. Places where moisture collects on south facing slopes, however, may permit the development of low shrub stands composed of buckbrush, silverberry, or rose.

Riverine Tall Shrubs

Riverine shrubs are found along the floodplain and lower slopes of the major river valleys in Calgary. These shrubs, which commonly include red-osier dogwood, water birch, and a variety of willows, can withstand periodic flooding and are adapted to grow in coarse, unstable soil. In general, riverine shrubland accompanies balsam poplar riverine woodlands, and marks the transition from grassland or wetland into floodplain forest. It is generally assumed that a source of water lies close to the surface in order to maintain such moisture-loving trees. This habitat is rare in large pure units and its highest concentration in the city is at the Weaslehead and the Patterson Woods area (before site clearance) and smaller units on Canada Olympic Park land. This area is particularly important to wildlife and is very sensitive to disturbance and fragmentation.

Upland Tall Shrubs

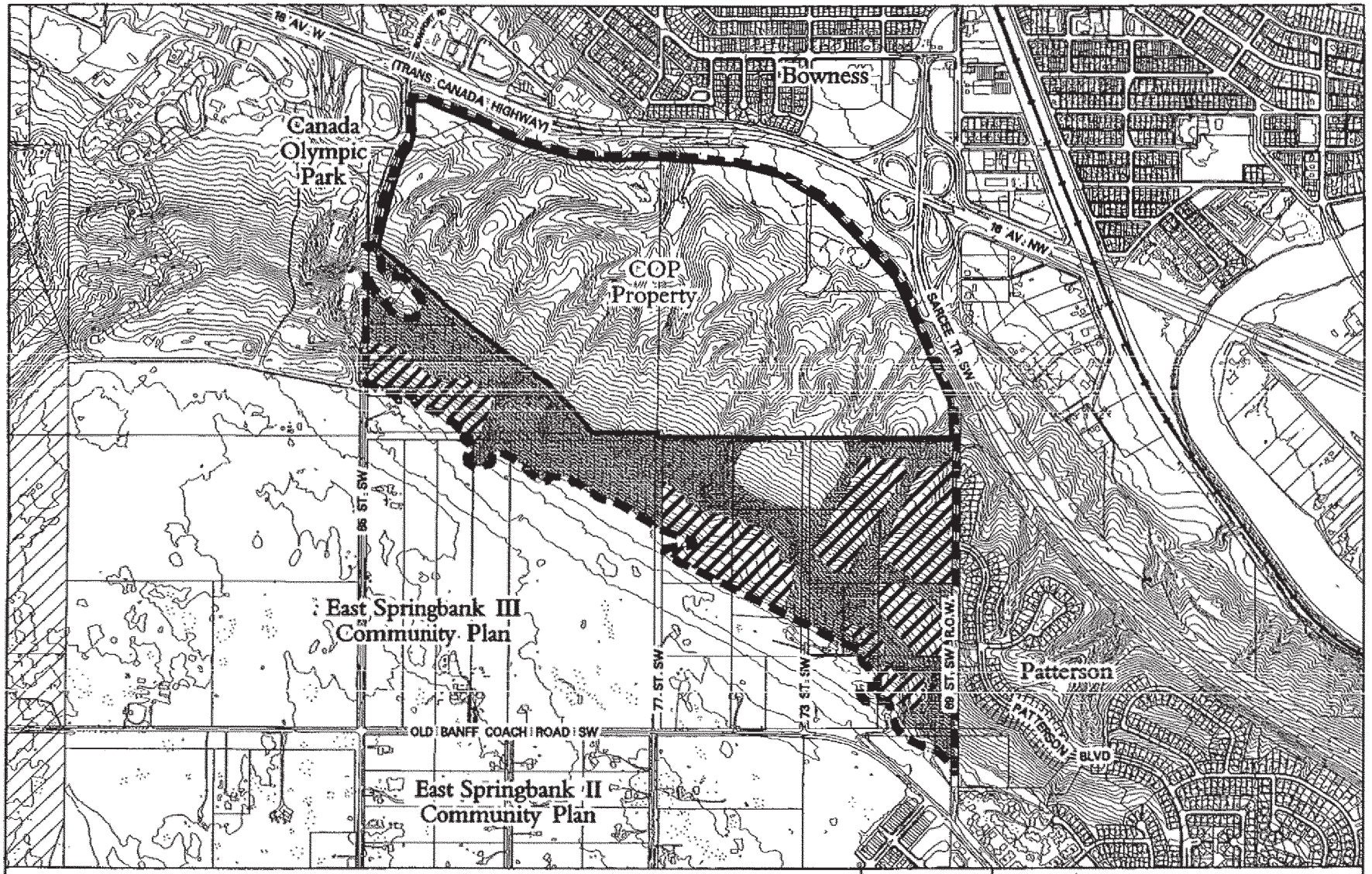
Saskatoon and chokecherry, and sometimes willow can interact to form upland tall shrub communities. In some cases, low shrub species may comprise a secondary layer as well. Saskatoon, chokecherry, and willow usually grow on the lower, more moist portions of a slope, or in protected ravines. Once again, the distribution of these shrubs is largely dictated by moisture availability on Paskapoo Slopes.

Low Shrubs

Low shrub communities may consist of buckbrush, shrubby cinquefoil, rose, or silverberry. Canada buffaloberry and gooseberry may be present, although they form a minor component of these shrub habitat types. Low shrub communities may be found along the dry, upper portions of a slope or in well-drained, open floodplain areas. On Paskapoo Slopes, these areas are often found in edge conditions and in openings in the forest canopy. This habitat type is too closely associated with others to be identified clearly on the map.

Native Grasslands

Most grasses grow in exposed areas where wind and sun prevail; more so than other vegetation species can usually tolerate. Moisture tends to be limiting, especially in steeper hillside situations. In the Paskapoo Slopes area, grasslands are commonly found on south or southwest-facing slopes of ravines and escarpments.


16 AV. W
TRANS CANADA HIGHWAY
Bowness
Canada Olympic Park
COP Property
16 AV. NW
SARCEE TR. SW
85 ST. SW
77 ST. SW
73 ST. SW
69 ST. SW
R.O.W.
East Springbank III Community Plan
East Springbank II Community Plan
OLD BANFF COACH ROAD SW
Patterson
PATTERSON BLVD
Study Area Boundary
Transportation /Utility Corridor
Open Space (approximate)
Potentially Developable Sites
Note: Development potential on lands placed Under Policy Review (see Map 2) is not shown in this map.
N
0 100 200m
Draw No.
PIN: rep_er
Plot Date: 14-DEC-2009
MAP 5
EAST PASKAPOO SLOPES
Area Structure Plan
OPEN SPACE & POTENTIALLY DEVELOPABLE LANDS
THE CITY OF CALGARY
LAND USE AND MOBILITY
PLANNING AND TRANSPORTATION POLICY
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On Paskapoo Slopes, June grass, wheat grasses, and needle grasses grow in mixed communities on the drier hill slope habitats. Large patches of fescue grasslands, while rare in Calgary, still exist on Nose Hill and Paskapoo Slopes and a few other locations. Rough fescue grass communities are often tall and tussocky (hill like) and tend to be found on rough terrain that was unsuitable for the plough. The exception to this rule exists on the plateau above and south of the escarpment. The tufted thick base protects the grass from fire and winter grazing. The composition of these grassland communities is largely dictated by moisture availability. Certain species require a relatively moist, moderate slope, while other grasses may tolerate steep, dry escarpments. Native grasslands also support an abundance of wildflowers. Prairie crocus is a common spring flower, while golden bean, hedysarum, lupine, geranium, fleabane, bedstraw, sage, goldenrod, and aster will follow into fall. The diversity and abundance of available food for animal species are high. Grasslands can vary in condition and diversity based on past and present grazing practices and the availability of a weed source. The abundance of this habitat type can be hidden by grazing practices. On sites that have experienced high grazing and have recovered over the last year or so, fescue prairie is apparent.

Disturbed and Non-Native Grasslands

Disturbance simply refers to areas where the majority of native species have been removed leaving either bare ground or introduced grass. There is little natural growth. Non-native grassland refers to introduced grasses or weeds that have been left to grow naturally. These areas are often assumed to be native grasslands by the untrained eye. The more disturbed a site is the less structure biologically the area usually has and therefore the less likely it is to be utilized heavily by wildlife. In other words, when diversity is low and food sources are poor. One of the most common non-native grassland that is highly invasive and difficult to control is Smooth Brome/Thistle.

A large site, 50 acres, west of Patterson Heights, has been cleared of trees and vegetation during the spring of 1999. If any portion of this site is to be allocated to open space in the future, natural vegetation can be restored through proper natural area management practices.

Summary of Paskapoo Slopes Habitats

Most of the sloping lands that make up Paskapoo Slopes are Aspen Woodland habitat type. This includes the area known as the escarpment. This area of aspen is significant due to the large size and the continuous nature.

The ravines in Calgary West, the TUC and the area known as East Paskapoo Slopes and above are in very good condition and play a significant role in habitat diversity. They are made up of balsam poplar (one of the few upland sites in Calgary), shrubs and grasslands. The diversity of habitats is one reason for the high wildlife use in the area. Split Bison bones

have been found in the running streams as well. Rare species of plants should be expected here due to the unusual conditions.

Paskapoo Slopes is one of the few places in Calgary where intact fescue prairie exists with the rare and threatened Baird's Sparrow having been observed but likely does not provide nesting habitat. Native grasslands are very important to most forest areas as they often play a critical role as food source for most of the inhabitants that nest or migrate through the woodlands. The close associations, and boundaries are all important reasons for the identification of the area as Environmentally Significant. The lower flat land and the upper bench south of Canada Olympic Park are disturbed grassland and do not play a significant role in food supply for wildlife.

The Riverine Tall Shrub community in and south of Canada Olympic Park/East Paskapoo Slopes are very significant and are rare in the city. This is the only place where upland sites of these kind are found in abundance. These areas are important nesting and cover sites for resident animals including birds, and play a significant role as part of the wildlife habitat. This area is susceptible to the impacts of fragmentation.

The landscape features that provide the conditions for the above vegetation groups include glacial/fluvial terraces, ravines and other fluvial erosion features. The north facing slopes extend beyond Canada Olympic Park through Calgary West and Artist View just outside the City limits. It is this cool and moisture retaining hillside aspect that encourages treed vegetation. These slopes then become west facing until they reach the Elbow River Valley. The slopes are equivalent in elevation to Nose Hill and the Edgemont Escarpments. South of Paskapoo Slopes in East Springbank also contain patches of native grasslands and clones of Aspen.

Planning Implications

Open space and environmental policies should take into account a number of inter-related issues: the ecological and geographic association of vegetation communities, age pattern within each community, and their role as wildlife habitat. Wildlife is defined here not as just deer or other large mammals, but is broader in scale, ranging from birds to plants. Connectivity is an important part of maintaining species viability as reproduction, seasonal and daily migration and even food supply relies on maintaining attached links. Where these areas are pinched off, fragmented or removed entirely, many of our urban wildlife problems begin. These include large animal/car collisions, undesirable species in built communities, and other issues such as loss of ecological diversity. With increased disturbance long term operational costs also increase. One of the key factors for the protection of the quality of this area and its inhabitants is the maintenance of the large structure of habitats with as little fragmentation and pinch outs as possible.

Wildlife movement is often concentrated by availability of superior or seasonal habitat. The presence of dense conifer wood along the Douglas fir trail provides excellent wintering areas for many species, most of which move from the Paskapoo Slopes area on a regular basis. Species that have been observed include mule deer, white-tailed deer, moose, Canada lynx, cougar, black bear, red fox, coyote, American badger and porcupine indicating contact with the Elbow River. Many species of birds are also likely to use the movement corridor. When the integrity of the corridor is maintained few wildlife conflicts occur. In other words the larger the contact between major habitat types the more likely the movement will be safely accommodated. As these areas are pinched in (e.g., through development), options for wildlife to escape or move by choice are narrowed and chances of traffic accidents are increased. Lower speed and wide corridor are considered a safer practice.

In summary, to ensure the viability of the various habitats, vegetation communities and the associated wildlife use in East Paskapoo Slopes, the following are encouraged:

a) The maintenance of the large block-like (unfragmented) combination of habitat types that extend throughout the escarpment.

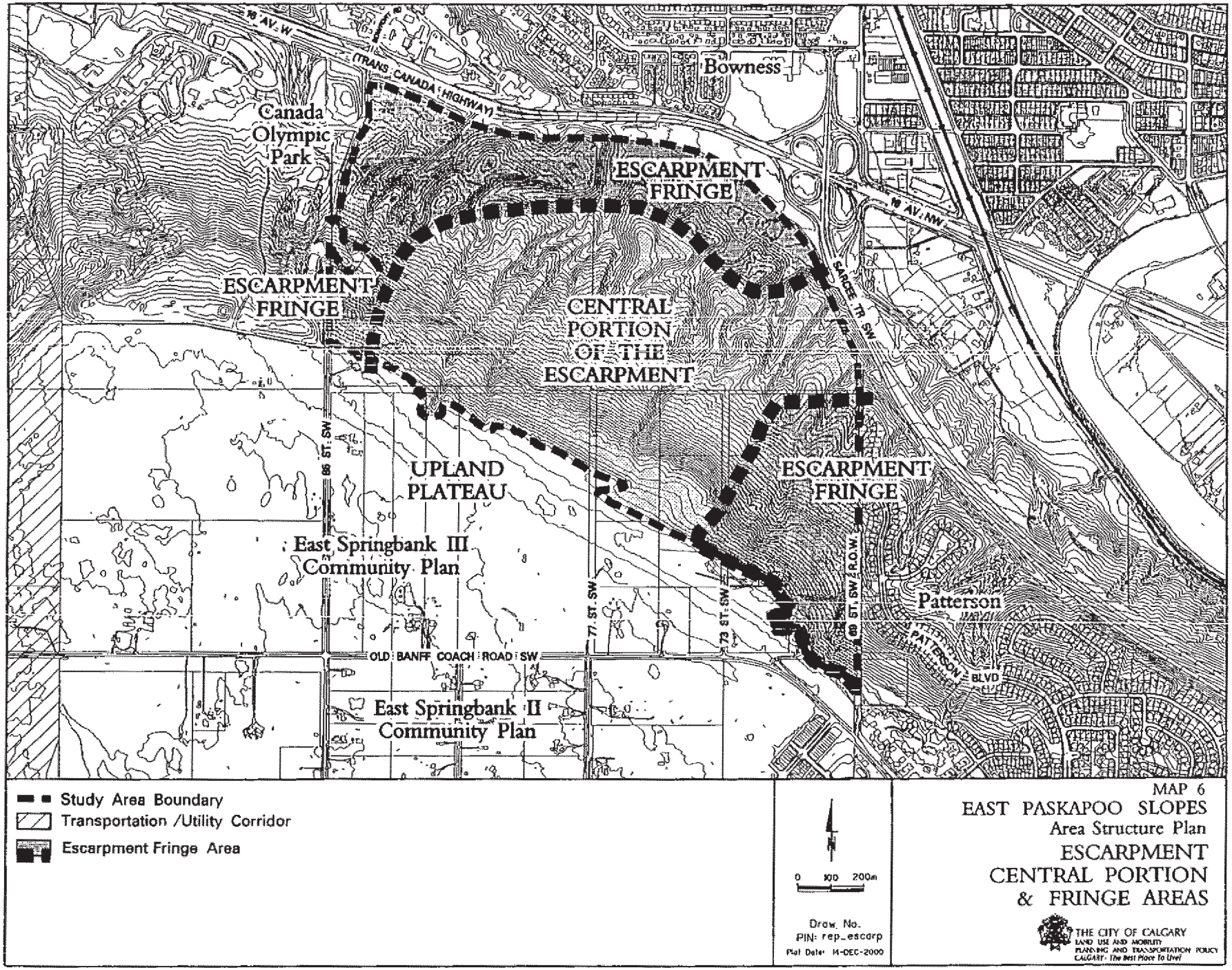
b) The protection of the ravines, aspen woodland and balsam poplar association, including grasslands normally on east facing slopes.

c) The availability and close proximity of diverse vegetation communities such as native grasslands, shrubs and trees.

d) Recognition of the slopes' role as an ecological unit, providing for wildlife movement between the Elbow River and Edworthy Park, the Douglas Fir Trail and Lawrey Gardens. This role is becoming increasingly important, given the extent of development encroachment in the surrounding lands.

e) The protection of the rare Riverine Tall Shrub community.

f) The avoidance of increased fragmentation in significant habitats.


16 AV. W
(TRANS CANADA HIGHWAY)
Bowness
Canada Olympic Park
ESCARPMENT FRINGE
16 AV. NW
SARCEE TR. SW
ESCARPMENT FRINGE
CENTRAL PORTION OF THE ESCARPMENT
85 ST. SW
UPLAND PLATEAU
ESCARPMENT FRINGE
East Springbank III Community Plan
77 ST. SW
73 ST. SW
69 ST. SW R.O.W.
Patterson
PATTERSON BLVD
OLD BANFF COACH ROAD SW
East Springbank II Community Plan
Study Area Boundary
Transportation /Utility Corridor
Escarpment Fringe Area
N
0 100 200m
Draw. No.
PIN: rep_escarp
Plot Date: 14-DEC-2000
MAP 6
EAST PASKAPOO SLOPES
Area Structure Plan
ESCARPMENT
CENTRAL PORTION
& FRINGE AREAS
THE CITY OF CALGARY
LAND USE AND MOBILITY
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3.5 Geotechnical Terrain Analysis*

The East Springbank III/Aspen Village and Patterson Woods Community Plan Report on Geotechnical Terrain Analysis, completed in 1998 November, provides an overview of the geological and drainage conditions within the planning area. Lands within the East Springbank III and East Paskapoo Slopes planning areas were assessed in terms of their development potential from a geotechnical standpoint, based upon the following categories:

Zone A - No significant geotechnical concerns.

- All slopes within this category are flatter than 15 percent (8.5 degrees), and a stability assessment is not required.

Zone B - Potential stability concerns.

- Slope gradients are in the 15 to 33 percent range.
- Possible adverse impact due to cuts and embankments.
- Site specific investigation and stability evaluation of proposed final terrain configuration is required.

Zone C - Significant stability concerns.

- Slopes are steeper than 33 percent (18 degrees).
- Development not recommended without site specific project evaluation and the undertaking of engineering measures to ensure that a soil stability concerns are dealt with.

As illustrated on Map 7, small portions of land are located in **Zone A**, where ground conditions are considered to be good and further geotechnical work is not required. Within **Zone B**, the range of slopes are between 15 and 33 percent. It is recommended that grading of sloping ground be carefully evaluated in consideration of the following aspects:

i. final terrain configuration with respect to drainageways and steep slope segments;

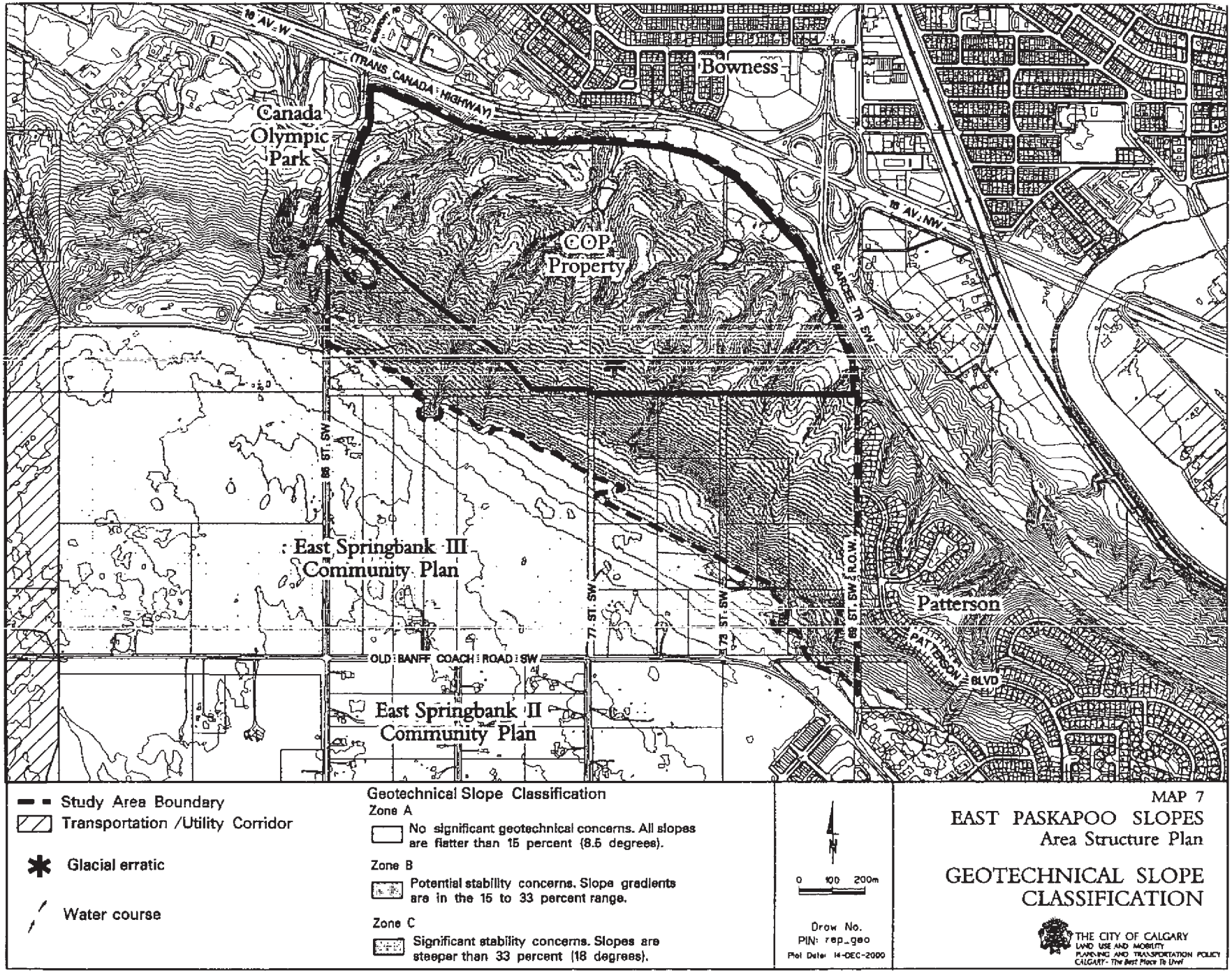
ii. erosion potential; and

iii. increase of groundwater levels because of modified underground water regime.

Additional details regarding Zone B are contained within the report.

The report indicates that development in **Zone C** (drainage ways/ravines and steep escarpment lands) may have significant adverse impacts on terrain and drainage, and recommends that no development take place on slopes exceeding 33 percent gradient and in ravines.

* East Springbank III/Paterson Woods Community Plan, Report on Geotechnical Terrain Analysis, Geo-Engineering (M.S.T.) Ltd., October 1998.


16 AV. W
TRANS CANADA HIGHWAY
Bowness
Canada Olympic Park
COP Property
16 AV. NW
SARCEE TR SW
85 ST. SW
East Springbank III Community Plan
77 ST. SW
73 ST. SW
69 ST. SW
R.O.W.
Patterson
PATTERSON BLVD
OLD BANFF COACH ROAD SW
East Springbank II Community Plan
Study Area Boundary
Transportation /Utility Corridor
Glacial erratic
Water course
Geotechnical Slope Classification
Zone A
No significant geotechnical concerns. All slopes are flatter than 15 percent (8.5 degrees).
Zone B
Potential stability concerns. Slope gradients are in the 15 to 33 percent range.
Zone C
Significant stability concerns. Slopes are steeper than 33 percent (18 degrees).
N
0 100 200m
Drawn No.
PIN: rep_geo
Plot Date: 14-DEC-2000
MAP 7
EAST PASKAPOO SLOPES
Area Structure Plan
GEOTECHNICAL SLOPE CLASSIFICATION
THE CITY OF CALGARY
LAND USE AND MOBILITY
PLANNING AND TRANSPORTATION POLICY
CALGARY - The Best Place To Live!

The report also recommends consideration of the following principles of erosion and sediment control:

Plan the development to the existing terrain and site conditions.

- Design and plan the development of roads, utilities and building sites with as little soil excavation and disturbance as possible.
- Design and plan development for the particular soil conditions and topography of the site.
- Confine construction to least critical areas.

Schedule development to minimize risk of potential erosion.

- Where possible, plan construction activities during dry months of the year to avoid potential rain events and delays.
- Stage development to allow "green-up" or re-establishment of vegetation and minimize erosive areas.
- Halt construction during periods of heavy precipitation and runoff to minimize soil disturbance.
- Restrict vehicular and equipment access or provide working surfaces/pads.

Retain existing vegetation where possible.

- Minimize clearing rights-of-way and stripping of building sites.
- Avoid clearing and grubbing areas with sensitive soils.
- Consider aesthetics and retention of vegetation, including undergrowth.
- Physically mark clearing boundaries on the construction site.

Re-vegetate/protect denuded areas and bare soils.

- Seed or re-vegetate cut and fill slopes, and disturbed natural slopes.
- Cover temporary fills or stockpiles with polyethylene sheeting or tarps.
- Use mulches and other organic stabilizers to minimize erosion until vegetation is established on sensitive soils.
- Plan seeding and planting to allow establishment before end of growing season.

Divert runoff away from denuded areas.

- Minimize flow over bare areas by diverting overland flows away from development areas.
- Isolate cleared areas and building sites with swales to re-direct runoff.
- Avoid steep slopes below rills and gullies.
- Retain natural drainage patterns wherever possible.

Minimize length and steepness of slopes where possible.

- Erosion and soil loss is greater the longer and steeper the slope. Minimize both length and steepness of all slopes at engineering/planning stage.

Minimize runoff velocities and erosive energy.

- Maximize the length and flow paths for precipitation runoff to minimize energy of flow.
- Construct interceptor ditches and channels with low gradients to minimize secondary erosion and transport.
- Line unavoidable steep interceptor or conveyance ditches.

Retain eroded sediments onsite with erosion and sediment control structures.

- Utilize sediment traps and silt fences.
- Provide bed load clean-outs at culverts and ditches.
- Construct and operate sediment control ponds.

Plan, inspect and maintain erosion and sediment control structures.

- Develop and follow a maintenance and inspection schedule as part of the development plan.

3.6 Subsurface Hydro-geological Conditions

According to the Alberta Research Council Bulletin No. 53, "Surficial Geology of the Calgary Urban Area" by S.R. Moran (1986), the soils and landforms in the area of the site are of pre-glacial and glacial origin. These comprise lacustrine sands and silts, pebble loam till, Tertiary pre-glacial gravel, and bedrock of the Porcupine Hills Formation. The till generally consists of a very stiff silty clay containing a trace to some sand and gravel. Groundwater was noted in about half the boreholes, but perched groundwater is predicted to occur in areas of shallow bedrock or clay-rich tills. Furthermore, seepage from the bedrock may occur irregularly.

Published information (Ozoray and Barnes, 1978; Meyboom, 1961) indicate that the groundwater flow in the vicinity of the planning area is directed north-northeast, with recharge (groundwater accumulation) occurring in the Broadcast Hill area and discharge (seeps and springs) occurring in ravines and along the valley slopes. The two western ravines in the planning area have permanent streams, and the other ravine is generally dry. It appears the surface streams largely originate from springs near the top of the escarpment.

3.7 Archeological Resources*

A base line archaeological inventory and assessment was carried out in May and June 1997 of Precontact Native Archaeological Sites in the East Paskapoo Slopes and adjacent areas in Southwest Calgary. Paskapoo Slopes are a set of six Glacial Lake Calgary benches cut by a series of 12 ravines lying below the edge of the Paskapoo Escarpment and the Coach Hill Uplands. Poplar forests, most less than 50 years in age, clothe the higher benches, while Native fescue grasslands characterize the lower benches and the uplands.

Archaeological studies involved both the compilation of known archaeological site data for areas which have been subject to previous archaeological study as well as field reconnaissance. Previous studies include the once proposed Stonebridge Subdivision (Reeves 1992) and the proposed Woods In Patterson Heights (Reeves 1997). Thirty-one sites in total were recorded in these two studies, a number of which were large and regionally significant bison kill/processing campsites. Field studies consisted of foot reconnaissance and shovel prospecting in areas of potential, focusing on areas which had not been previously examined. An additional 18 sites were found along the Slopes from the edge of the existing Patterson Heights Subdivision to Canada Olympic Park. Many are large bison kill/ processing camps of regional significance.

In total, 49 sites are now on record for the Slopes (Table 1, 2; Map 8). A number of other bison kill/ processing camps are predicted to exist in the heavy forested areas along the slopes. With the exception of the remains of five sites located on the edges of Patterson Heights, all of which were heavily impacted in that subdivision's development, most of the other sites are in good-excellent condition.

The sites include a group of small campsites and stone feature sites of local to high local significance, primarily associated with the lower open grassy surfaces of the lower Glacial Lake Calgary benches. Six small surface campsites lacking tipi rings, characterized by small scatters of fire-cracked rock, some butchered bison bones, and an occasional tool were found. One tipi-ring site containing four rings was also found, the only one on record for the area. Stone cairns were found associated with the tipi ring site. An isolated cairn was also found on a hilltop and a sweat pit on another. This pattern of Native occupancy is of local significance as the sites are small and limited in their contents and not particularly significant to interpreting past Native resources harvesting and settlement patterns along the Paskapoo Slopes.

* Historical Resources Inventory and Assessment, Paskapoo Slopes (Permit 98-038), Lifeways of Canada, Limited, July, 1998.

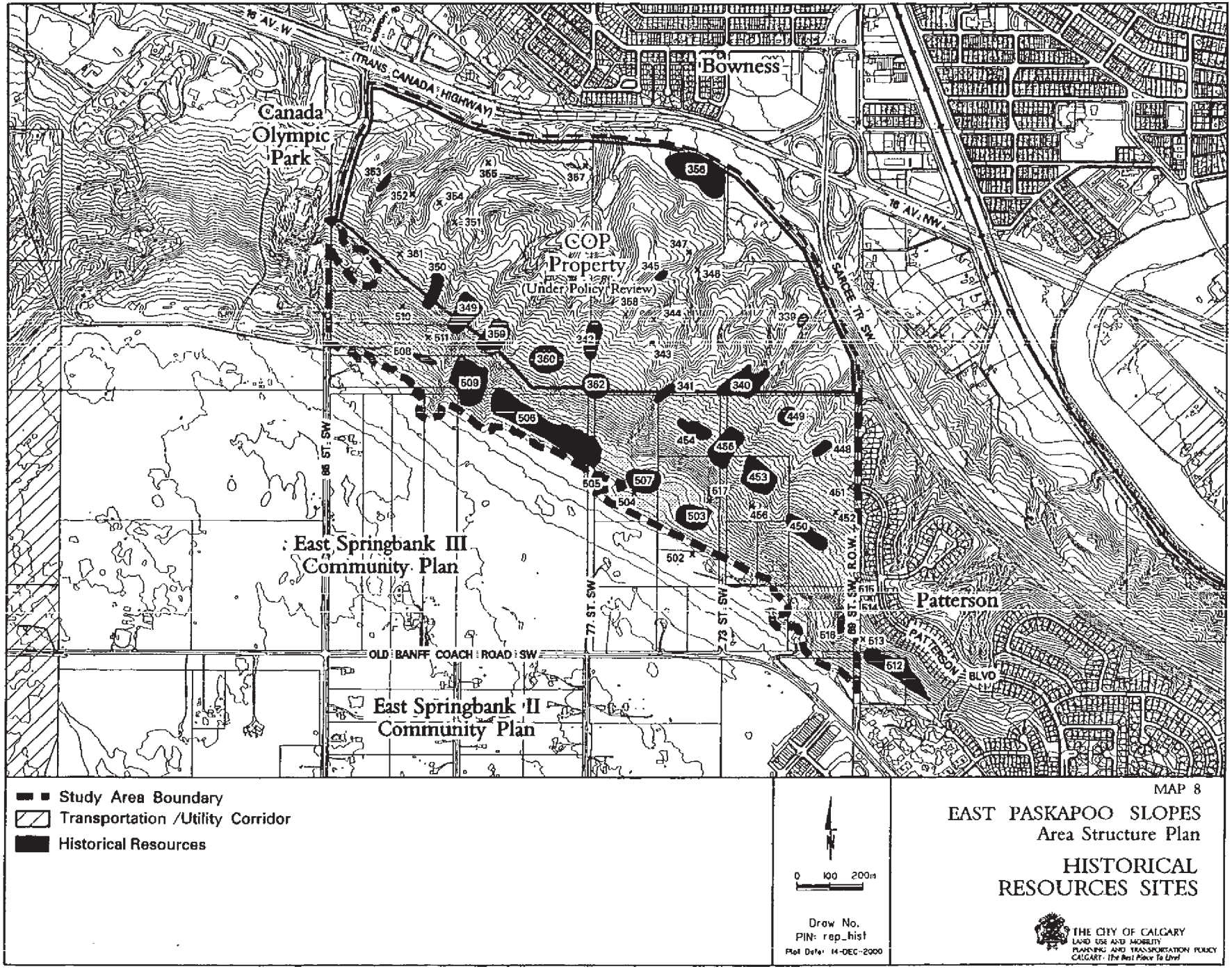
The Paskapoo Slopes bison kill/processing camp pattern is regionally and provincially significant. It is represented by 39 geographically discrete sites which vary in size, complexity and significance. Some sites are very large complex kill and kill/processing camps. They were used a number of times in the past. Others are smaller one-time events. The sites represent a continuum of bison killing and processing activities.

The Paskapoo Slopes pattern is spatially very complex. Bison were not only driven into corrals along the uppermost slopes below the escarpment and processed in camps located on the highest benches of Glacial Lake Calgary; they were also driven and trapped at lower levels along the slopes. In some cases, the herds were moved down from the escarpment across the highest bench and jumped off the steep and often cliffed edge of this bench into corrals constructed on the slope below above the next level of major processing camps. In some places, the bison were driven through areas which were also utilized as kill/processing camps. The result is a series of kills/processing camps extending down the slopes. Similar complexities in moving herds to specific jump-offs have been documented at the Head-Smashed-In Buffalo Jump west of Ft. Macleod.

Two geographic foci for bison killing and processing exist in West Calgary. One focus associates with the Paskapoo Slopes between Broadcast Hill and Canada Olympic Park - the area and sites described in this report. The second focus lies at the northwest end of the Paskapoo Escarpment three km west of COP adjacent to the City Limits as exemplified by bison kills and processing camps located in the Valley Ridge and Crestview Estates subdivision. The great majority of these sites have or will be removed in subdivision development.

The Paskapoo Slopes pattern is similar in kind and intensity to that found associated with large bison kills/processing camps along the Porcupine Hills such as Head-Smashed-In, Boneyard Coulee and Old Women's Buffalo Jumps. Paskapoo Slopes differs from the Porcupine Hills sites primarily in that bison driving and processing is spread out laterally and vertically along the Slopes rather than being focused on one or more specific cliffs and associated processing areas. The Paskapoo Slopes pattern is intensive but spatially dispersed over at least two km of hillside. The results in Paskapoo Slopes are individual and sometimes multiple bone beds up to 50 cm thick and processing camps 10-20 cm thick located at many locales along the Slopes. Stacked together, these layers would no doubt represent the intensity found in the deep bone beds and campsite deposits at jumps and camps such as that of Old Women's Buffalo Jump.

The Paskapoo Slopes pattern is the northern extension of the Porcupine Hills/Oldman River Basin pattern of bison driving, trapping and processing. As such it is collectively of Provincial Significance. Individual sites within it range from local to high regional significance. Paskapoo Slopes is an integral component of our City's Native Archaeological Heritage.


16 AV. W
TRANS CANADA HIGHWAY
Bowness
Canada Olympic Park
COP Property
(Under Policy Review)
16 AV. NW
SARCEE TR SW
85 ST. SW
East Springbank III Community Plan
77 ST. SW
73 ST. SW
OLD BANFF COACH ROAD SW
East Springbank II Community Plan
R.O.W.
Patterson
PATTERSON BLVD
Study Area Boundary
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MAP 8
EAST PASKAPOO SLOPES
Area Structure Plan
HISTORICAL RESOURCES SITES
THE CITY OF CALGARY
LAND USE AND MOBILITY
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The Paskapoo Slopes pattern is a distinctive and provincially significant record of Native harvesting and occupancy, most of which could eventually be lost to development as the growth of the City of Calgary continues. Conservation of those regionally significant components of this pattern which lie within the Slopes through site avoidance where feasible, and mitigative archaeological excavations where avoidance is not feasible, will further the preservation and understanding of the Native history and occupancy of the City of Calgary region.

Table 1 Paskapoo Slopes Precontact Native Archaeological Site Listing

Site No. (EgPn)	Site Type	Size m^2	El (m)	Landform	Significance
339	Tipi Rings/Cairns	4800	1114	Bench	High Local
340	Processing Camp/Cairns	20000	1118	Bench	Regional
341	Ravine/Gully Bone Bed	2000+	1154	Ravine	High Local
342	Kill	4800	1146	Swale	High Regional
343	Scattered Processing Camp/Cairn	40000	1138	Bench/Swale	Local
344	Processing Camp	1000	1125	Swale	Regional
345	Processing Camp	1000	1125	Swale	Regional
346	Ravine/Gully Bone Bed	1000	1094	Ravine	High Local
347	Cairn	1	1100	Bench	Local
348	Small Campsite	100	1115	Bench	Local
349	Kill/Processing Camp	6400	1170	Bench/Slope	High Regional
350	Kill/Processing Camp	3000	1170	Bench/Slope	H. Regional[1]
351	Ravine/Gully Bone Bed	300	1136	Gully	Regional[1]
352	Ravine/Gully Bone Bed	400	1135	Gully	Regional[2]
353	Ravine/Gully Bone Bed	100	1135	Gully	Regional
354	Campsite	1000	1140	Bench	Local
355	Sweat Pit	4	1129	Bench	High Local
356	Small Campsite	70000	1085	R. Terrace	Local
357	Small Campsite	2000	1112	Bench	Local
358	Ravine/Gully Bone Bed	1200	1130	Gully	High Local
359	Scattered Kill/Processing	3600	1155	Slope	High Local
360	Skattered Kill	Unknown	1170	Slope	Unknown
361	Scattered Processing Camp	3000	1155	Slope	Local
362	Kill/Processing Camp	20000+	1161	Slope	Regional

Table 1 Paskapoo Slopes Precontact Native Archaeological Site Listing (cont'd)					
Site No. (EgPn)	**Site Type**	**Size m^2**	**EI (m)**	**Landform**	**Significance**
448	Surface Campsite	1000	1136	Bench	Swale
449	Processing Camp	2000	1130	Swale	Regional
450	Processing Camp	7500	1176	Bench	High Regional
451	Scattered Kill/Processing Camp	200+	1142	Slope	Local[3]
452	Processing Camp	600	1155	Bench	Local
453	Kill/Processing Camp	12000	1160	Bench/Slope	High Regional
454	Scattered Processing Camp	10000+	1160	Slope	Local
455	Kill/Processing Camp	7200+	1160	Bench/Slope	High Regional
456	Processing Camp	200	1182	Bench/Slope	Regional
502	Surface Campsite	100	1228	Bench	Local
503	Kill/Processing Camp	12000	1212	Bench	Regional
504	Isolated Artifact Find	1	1220	Bench	Local
505	Pits	800	1224	Bench	Unknown
506	Kill/Processing Camp	20000+	1210	Bench/Slope	High Regional
507	Processing Camp	2000+	1212	Bench	Regional
508	Kill/Processing Camp	Unknown	1206	Bench/Slope	Regional[4]
509	Kill/Processing Camp	3200	1206	Bench/Slope	Regional
510	Processing Camp?	Unknown	1195	Bench	Unknown[4]
511	Processing Camp?	Unknown	1195	Bench	Unknown[4]
512	Kill/Processing Camp	7200+	1200	Bench/Slope	High Local[3]
513	Processing Camp	400	1170	Bench	High Local[3]
514	Processing Camp	<200	1180	Bench	Local[3]
515	Processing Camp	<200	1187	Bench	Local
516	Kill/Processing Camp	1200	1210	Bench/Slope	Regional
517	Kill? Unknown	1205		Spring Head	Unknown

1. Mazama Ash and buried soil below present - no bone bed associated.
2. Mazama Ash and buried soil below present - bone bed associated.
3. Site heavily impacted by Patterson Heights development. Site not found in Patterson Heights HRIA (Balcolm 1989).
4. Site extends into Anton lands access to which was denied in this study. Site could not therefore be delimited and evaluated.
5. Site presumed to exist at this location on Anton lands as adjacent landforms contain sites.

Table 2 Paskapoo Slopes Precontact Native Archaeological Sites: Types and Significance

	SITE SIGNIFICANCE					
Site Types	**Unknown**	**Local**	**High Local**	**Regional**	**High Regional**	**Total**
Bision Kill/Processing Sites						
Bison Kills	1				1	2
Scattered Kills	1					1
Kill/Processing Camps	1		1	5	5	12
Scattered Kill/Processing Camp		1	1			2
Processing Camps	2	5	1	4[1,3]	1	13
Scattered Processing Camps	2[2]	1				3
Ravine/Gully Bone Beds						6
Stone Feature & Other Sites						
Tipi Rings/Cairns			1			1
Cairns		1				1
Sweat Pits[1,2]			1			1
Small Surface Campsites[3]		6				6
Isolated Finds		1				1
Pits	1[4]					1
Totals	**6**	**16**	**8**	**12**	**7**	**49**

1. EgPn-340 has cairn (probably sweat pits) associated.
2. EgPn-343 has cairn (possibly sweat pit) associated.
3. EgPn-449 Has small campsite associated.
4. EgPn-505 may be of Postcontact Non-Native origin.

4.0 POLICY AND STUDIES AFFECTING THE PLAN

4.1 Provincial Land Use Policies

Pursuant to Section 622 of the Municipal Government Act, The Province of Alberta has established *Land Use Policies* (Order in Council 522/96), November 6, 1996). These policies require that Municipal and Provincial planning efforts be consistent and that a high level of cooperation and coordination is fostered with respect to the areas of mutual concern. All Municipal statutory plans must be consistent with the *Land Use Policies.* Key mutual policy areas that this Plan encourages are: land use patterns that foster sustainable development; protection of the natural environment and minimizing the loss of valued habitat; ensuring negative impacts to water quality, hydrology and soil erosion are minimized; and preservation and enhancement of significant historical resources for the enjoyment of present and future generations.

4.2 Winter Heights Area Structure Plan (1987)

The Winter Heights Area Structure Plan was adopted by City Council in 1987 for the area including Aspen Village. This ASP envisioned a mix of residential, highway frontage commercial and open space uses on the site. All traffic to/from the site was proposed from the Trans Canada Highway.

The Winter Heights ASP is to be rescinded upon approval of this Plan.

4.3 East Springbank Area Structure Plan (1997)

The East Springbank ASP approved by City Council on 1997 June 23, identifies the East Paskapoo Slopes planning area as part of the “Special Development Area”. According to the plan policies, a development proposal must:

i) provide evidence of slope stability to the satisfaction of the Approval Authority;
ii) show how the proposed development would be integrated with planned adjacent land uses and the roadway system, including any proposed building setbacks from the top of the escarpment;
iii) demonstrate how environmentally sensitive features can be maintained or integrated with the proposed development.

4.4 The East Springbank III Community Plan

The East Springbank III Community Plan provides for a residential density range of 4 to 7 units per acre, a commercial use on Old Banff Coach Road, and school/open space sites on the flat lands south of the East Paskapoo Slopes planning area. These uses will have access from Old Banff Coach Road.

4.5 Patterson Woods Proposed ASP, 1997

This plan has been proposed for the properties of Calgary Development Corporation and Quance, immediately west of the northern end of Patterson Heights. The plan was presented to Council in 1997, but Council instructed that the planning boundaries be expanded to include other lands in the Special Development Area. The technical evaluation with regard to accessing these two properties is still relevant, however. The following is a summary of the evaluation, updated to reflect changes in the density proposed.

4.5.1 Feasibility of Alternative Access to Patterson Woods

The Transportation Planning Division has met with the applicant and their consultants to investigate alternative accesses. Following is an assessment of the need and availability of several alternative access routes.

a) Traffic Projections

Construction Traffic

During construction of the residential subdivision the access road will need to accommodate a variety of traffic types. A detailed assessment of the traffic anticipated from the development of Patterson Woods has been prepared by the Calgary Development Corporation in cooperation with their primary contractors. A similar assessment is not available for the Quance property.

CDC has identified that a very intense period of truck traffic will occur during the construction of the neighbourhood's roadways. The large number of truck movements are required to supply concrete and asphalt for the construction of roadways. CDC has estimated this traffic at 60 to 100 truck loads per day for a 13 day period.

The other period of heavy truck traffic will occur early in the construction of the area when the site is graded and underground utilities are installed. Truck movements during this period are projected to be in the order of 5 to 23 movements per day.

Construction of the homes is estimated to take three years. This period will see trips by tradesmen working on the homes and trucks to supply building materials. The estimated traffic volumes are 50 light vehicle and 5 heavy vehicle trips per day.

Long Term Traffic

Development potential in Patterson Woods, as per policies of this Plan, fall in the range of 45 to 50 residential units. Based on data collected in Calgary, these homes can be expected to generate an average total of 10 trips per day. The total traffic would therefore be 500 vehicle trips.

b) Technical Evaluation

Potential Access Routes

All potential temporary and permanent access routes were identified. Each route was visited in the field and studied on available aerial photographs and contour mapping. The potential routes evaluated are as follows:*

i) Patterson Boulevard - connecting to the roadway at the north terminus of the existing road.

ii) Sarcee Trail - connecting an egress and possible access from the southbound lanes of Sarcee Trail at the location of the existing emergency egress.

iii) Aspen Village - connecting a roadway through the lands north of the subject area. Temporary access considered via the existing intersection on Sarcee Trail. Long term access considered via the future road network within the Aspen Village subdivision.

iv) 73 Street SW - connecting to an existing road right of way to the south of the subject lands. This route would tie into Old Banff Coach Road. There is also potential on this route for a separate connection to the 10 Acres referred to as the Quance Property.

v) 77 Street SW - connecting to an existing road right of way to the south of the subject lands. This route would tie into Old Banff Coach Road.

Access Evaluation

- Patterson Boulevard

  Patterson Boulevard currently exists. It is designated in the City's Transportation Bylaw as a collector road. The road is physically constructed as a primary collector road surface with setbacks consistent with a regular collector road. Calgary Transit operates on this road.

  This route has a grade of between 4% to 8% on the hill from Old Banff Coach Road. Frontage along the route includes commercial, multi-family, playground/community hall and 121 single family residences. The adjacent properties have their sole access from Patterson Boulevard. In most cases the residential access is in the form of double or triple front drive garages. The other

* Access to CDC property from the north has been evaluated as well. Since it requires extensive regrading and entail significant environmental impact, this route was not recommended for construction traffic as a long-term access. In any case, this is no longer a feasible option as result of COP purchasing the balance of the northern portion of the planning area for the purpose of recreational uses.

developments each have a single driveway entering Patterson Boulevard. There are six intersections with other residential roads along this length of Patterson Boulevard.

The proposed traffic volumes can be accommodated within the environmental capacity envelope of Patterson Boulevard. Patterson Boulevard has a road surface similar to a primary collector; however, the slope and curvature of the northern portion roadway reduces the road's effective capacity. Based on the approved plans for the area, the Transportation Planning Division considers this road to have an environmental capacity of 5,000 cars per day beyond Patina Drive rather than the 10,000 cars per day of a primary collector.

The use of Patterson Boulevard as a construction access is not inconsistent with development in new residential areas.

- Sarcee Trail

The emergency exit as it currently exists is not an acceptable access or egress. The City has requested modifications and repair of the exit ramp to allow its use as intended which are required regardless of the Patterson Woods access/egress. These upgrades will also improve the use of this ramp for Patterson Woods traffic. The Transportation Planning Division feels that the ramp can be used by heavy and light construction traffic leaving Patterson Woods. Temporary signage and barricades will be required along Sarcee Trail. The egress would not be for the use of area residents.

This egress will require all traffic to travel to the top of the hill on Sarcee Trail and either up Bow Trail to turn around or down Bow Trail to Crowchild Trail. The emergency ramp travels immediately behind three homes on Patterson Grove. The Division has not been in contact with these residents to discuss the concept. The ramp does not encroach on private property.

Use of this route for access to the development area is difficult. Trucks northbound on Sarcee Trail will have to make a 180 degree turn at very slow speed. The applicant's primary contractor advised the Division that 31 metres of width is required for the 180 degree turn. The existing configuration is not wide enough. In order to accommodate the turns the landscaped slope would need to be cut back by 3 to 4 metres.

The slope has been landscaped with grass and new trees located up the slope. Traffic control to protect the curb lane on Sarcee Trail would be required. The Division does not recommend the use of this route beyond the intense period of site road and utility construction. The applicant's primary contractor further advises that concrete trucks may not be safe on this access/egress due to their high centre of gravity which would risk a roll-over.

- 73 Street SW

  Access from the public road right-of-way at the west property line would require a road drop down from the top of the valley edge to the site. In order to achieve acceptable road grades this route would require a great deal of regrading of the hill. This regrading would cut across the Aspen growth. The road would also be very visible from the north. Back sloping into private property would be required.

- 77 Street SW

  Access from the public road right of way one quarter mile west of the site would also require a road drop down from the top of the valley edge to the site. In the case of the 77 Street route the road could travel across the slope to reduce the grade. Back sloping from the road would require a great deal of regrading of the hill. This regrading would cut across the Aspen growth. The road would also be very visible from the north. The route would cross one or more private parcels.

c) Conclusions

Based on the information gathered, Transportation Planning has the following conclusions and recommendations:

i) Access via the 73 Street and 77 Street routes is not feasible for engineering and environmental reasons. Back sloping into private property would be required.

ii) Access via the Aspen Village area is geometrically feasible. It has the most ready truck access. This route would significantly damage one or more ravines and crosses private property.

iii) Access and egress from Sarcee Trail is difficult to operate. Egress from the site should be possible. Transportation Planning does not recommend access from this route except for

a short period of intense truck traffic. However, Transportation Planning does recommend this route be used for egress to reduce construction traffic in the neighbourhood.

iv) Access from Patterson Boulevard is geometrically acceptable and does not require crossing private lands. This route will have the greatest impact on residents. This route is the most logical route for permanent access.

4.5.2 Alternate Access to the Quance Property

The Transportation Planning Division has visited and assessed the Quance property to investigate alternative accesses. Following is an assessment of the availability of alternative construction and permanent access routes.

a) Traffic Projections

Construction Traffic

The Quance property has been estimated to have 7 to 10 single family lots. This will generate possibly up to 100 daily vehicle trips.

Based on the Patterson Woods construction traffic projection, a proportional estimate of the construction traffic has been made. The preliminary construction periods, stripping and grading, would see 1 to 5 heavy truck trips per day. The intense road construction period would see 60 to 100 truck loads per day for 4 or 5 days or a smaller number of daily loads for a longer period. The home construction period may see one to two years of traffic at 25 to 50 light vehicle and 3 to 5 heavy vehicles per day.

b) Technical Evaluation

Potential Access Routes

- Patterson Boulevard

  Provision was made in the Patterson Hills subdivision plan to accommodate access from Patterson Boulevard to the Quance property. This access would be opposite Patterson Close. Development of Patterson Hills has seen this access location landscaped into a park with a small stream running through it.

Construction of the access off of Patterson Boulevard would require extensive regrading of the slope. The rear yards of adjacent homes may be affected unless substantial retaining walls are constructed. The road profile approaching Patterson Boulevard will have to be near acceptable grade limits in order to make the change in elevation required in a fairly short distance.

Traffic on this route will pass behind several homes on the west side of Patterson Boulevard. Noise and dust during construction will be very difficult to mitigate.

Following construction, the residential traffic volumes will be fairly low and can be accommodated within the environmental capacity of Patterson Boulevard. A sidewalk will be required adjacent to the access road and will overlook the near yards of several of the Patterson Boulevard properties.

- 73 Street SW

  An additional access route to the Quance property was investigated from 73 Street SW. This route comes off of Old Banff Coach Road at the existing 73 Street road right of way. The access route comes off of 73 Street heading east and down the slope. This route is currently used as a private driveway and appears to have been used in the past for access to the Quance property. The trees along this route have been cut but further cutting would be required. Grades along the route will be steep but appear to be within acceptable City roadway standards.

  Access to the Quance property via 73 Street will require the agreement of the private land owner and should include discussions with the other adjacent owners. These owners have not been contacted as part of this report.

c) Conclusions

Both proposed access routes are technically feasible. The 73 Street route would appear to require less grading but that grading would occur in fairly undisturbed areas. The Patterson Boulevard route would require regrading of an already disturbed hill side. With respect to impacts on existing residences, the Patterson Boulevard access would be more intrusive passing directly behind several homes.

The Transportation Planning Division would recommend that both routes be kept in consideration. If and when an applicant comes forward to develop the Quance property, they should contact the land owner to discuss the 73 Street access proposal.

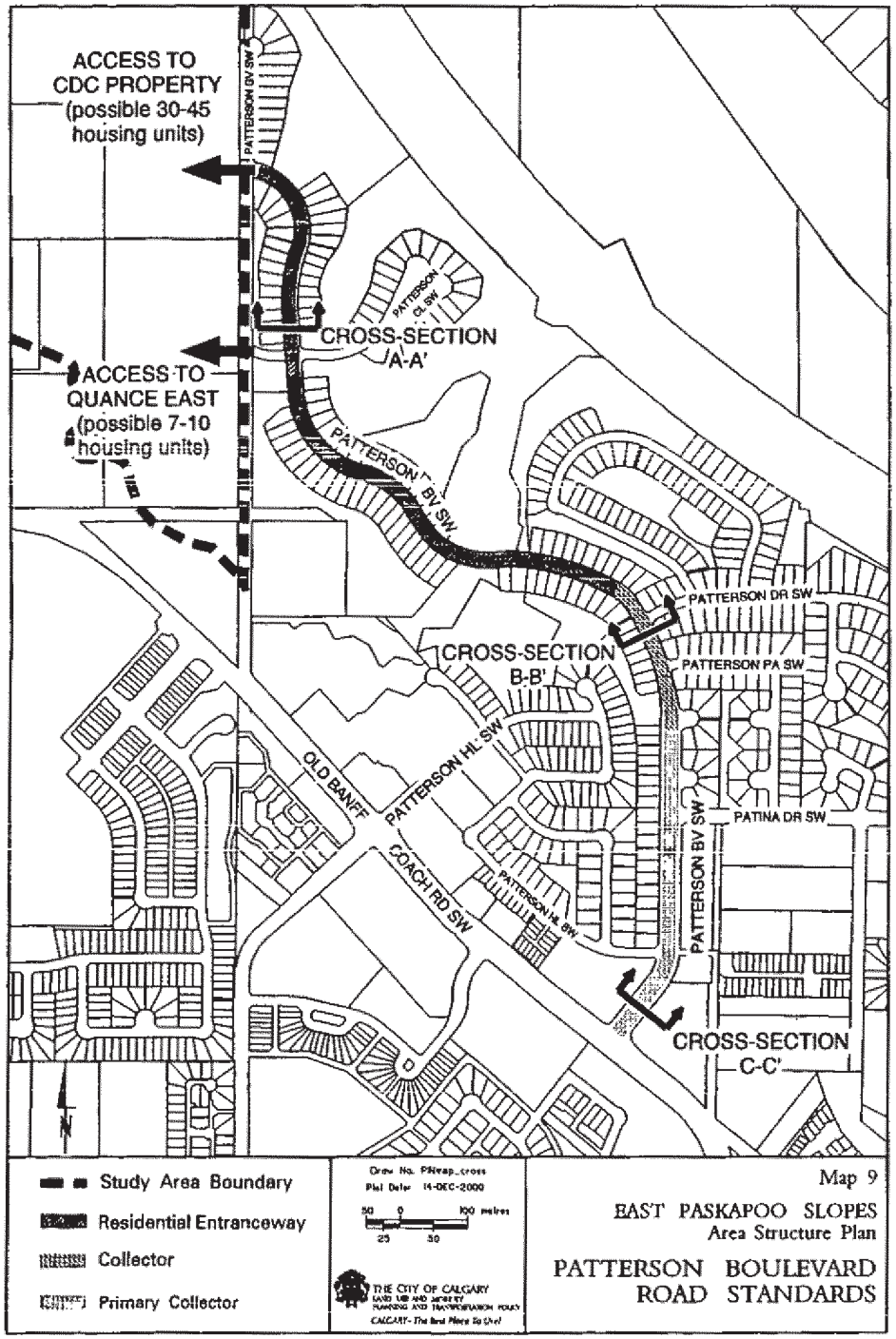
4.6 Environmental Capacity of Patterson Boulevard

During the preparation of the Proposed Patterson Woods and East Springbank III ASPs, as well this Plan, the issue of the Patterson Boulevard capacity has been investigated. It is to be noted here that three road standards have been used in designing various portions of the road:

- Residential Entrance Road - Cross-section A-A:

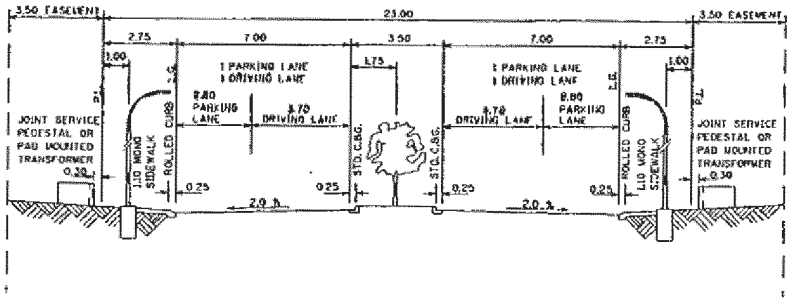
  In this cross-section, the road width, 23 metres, provides for a driving lane, parking lane, and sidewalk on each side, plus a dividing boulevard. This road design is normally used as an entrance feature to new subdivisions (initially with show homes on both sides), to visually enhance entrance to the development area; hence the extra-wide road right-of-way, and the dividing boulevard. This standard is also used on long cul-de-sacs to ensure that emergency vehicles can access and egress the residential street even if one side of the road is obstructed by, for example, a stalled vehicle. The standard was selected for this portion of Patterson Boulevard because it is considered a long cul-de-sac.

  The Road Design Manual used by Calgary Roads does not specify an environmental capacity for this standard since capacity is not normally an issue. However, considering the road width, which is greater than a residential collector (with 5000 vehicles per day environmental capacity), the environmental capacity will not be approached or exceeded as a result of the proposed development (55 units, generating 550 trips per day).



1 - CROSS SECTION 'A-A'

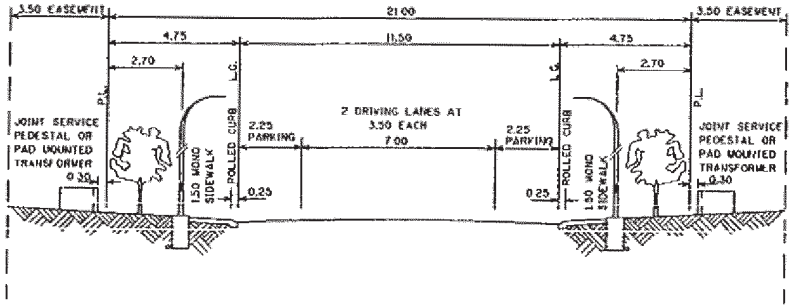
RESIDENTIAL ENTRANCE
ROAD WITH MEDIAN
23.00m R/W, 2x7.00m ROAD



2 - CROSS SECTION 'B-B'

COLLECTOR
PARKING BOTH SIDES
21.00m R/W, 11.5m ROAD

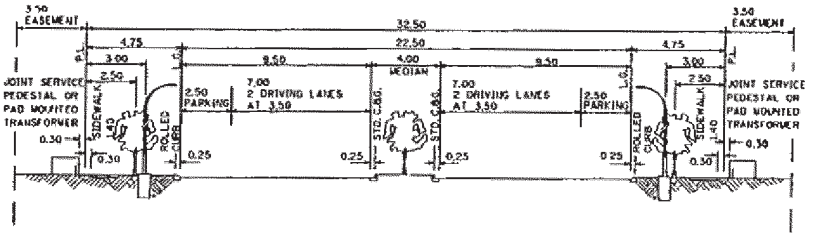
ENVIRONMENTAL GUIDELINE 5,000
VEHICLES PER DAY



3 - CROSS SECTION 'C-C'

PRIMARY COLLECTOR
32.50m R/W, 2x9.50m ROAD

ENVIRONMENTAL GUIDELINE 10,000
VEHICLES PER DAY



- Residential Collector Road - Cross-section B-B:

  This section of the road, extending roughly 900 metres north of 200 Patterson Mount, is built to a residential collector standard - a moving lane, parking lane and walkway on each side, with no diving boulevard. The road width is 21 metres; and its environmental capacity is 5000 vehicles per day. This capacity is adequate for current and future traffic increases to be generated by the proposed development.

- Primary Residential Collector - Cross-section C-C:

  This section of the road extends south of 200 Patterson Mount to Old Banff Coach Road. The road width is 32.5 metres, which includes a moving lane, parking lane, and sidewalk on each side, and a dividing boulevard. The environmental capacity for this design standard is 10,000 vehicle per day. The total daily traffic volumes using the southern end of this road, based upon a 1999 traffic count, is 7000 vehicles per day. This volume is anticipated to increase by 550 vpd, or 7.8 %, as a result of the proposed development.

Conclusion:

An examination of the road design standards used in constructing Patterson Boulevard indicates that road capacity is not an issue in assessing the impact of development proposed in this Plan.

4.7 Municipal Development Plan (1998)

The Calgary Municipal Development Plan was adopted by City Council in July, 1998. The document is the municipal development plan for The City of Calgary, as required by the Municipal Government Act, 1995, and as such, replaces the General Municipal Plan. The plan addresses future land use, development and transportation, relationships with municipal neighbours, provision of municipal services and facilities.

It also includes policies regarding the dedication of reserve land, and provides the basis for actions and decisions regarding the environmental, social and economic health of the city.

The Calgary Municipal Development Plan provides the strategic, city-wide framework for more detailed plans and policies.

4.8 Calgary Transportation Plan

In May, 1995, the Calgary Transportation Plan was adopted by City Council. The plan portrays a vision of Calgary in the year 2024 when the city's population is expected to reach 1.25 million. It sets out a strategy for avoiding expensive and contentious river crossings and road improvements, the problems of air pollution, downstream traffic impacts, and the loss of natural areas experienced by other cities undergoing substantial growth.

It emphasizes the link between transportation and land use planning, and establishes policies to be used in the planning of new residential communities so as to reduce the need for vehicle trips, and encourage transit and other modes of transportation. The study also supports the preservation of environmentally significant areas, historical and archeological sites through effective land use planning (p. 1-11).

4.9 Sustainable Suburbs Study*

In July, 1995, City Council adopted the Sustainable Suburbs Study: Creating More Fiscally, Socially and Environmentally Sustainable Communities. The Study is aimed, not only at implementing the objectives of the Calgary Transportation Plan as they relate to the development of new communities, but seeks to encourage developers, City departments and others to find new ways of designing more sustainable communities. It describes many of the long term fiscal, social and environmental problems facing the City, and sets out a comprehensive package of planning policies, requirements and guidelines that respond to these issues.

4.10 Transit Friendly Design Guide

The Transit Friendly Design Guide was approved by City Council in December, 1995, and describes techniques for improved integration of transit into residential and non-residential areas, to achieve the vision described in the Calgary Transportation Plan. It explains, and gives examples of, the physical requirements necessary to encourage transit use.

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* On June 22, 1998 City Council approved the terms of reference, work program and time table for a review of the Sustainable Suburbs Study and the Transit Friendly Design Guide. An interim policy for the preparation of community plans was also approved (Report E9-20).

4.11 The City of Calgary Environmental Policy, Principles and Goals

The City of Calgary Environmental Policy, Principles & Goals was adopted by City Council in November, 1994, and acts as a guide for City of Calgary Employees to ensure that the environmental stewardship and performance adopted by the City of Calgary is implemented and maintained by staff.

4.12 Natural Area and Parks Planning Context

Two studies provide a background to the natural areas and parks planning for East Paskapoo Slopes.

a) The Urban Park Master Plan, 1994

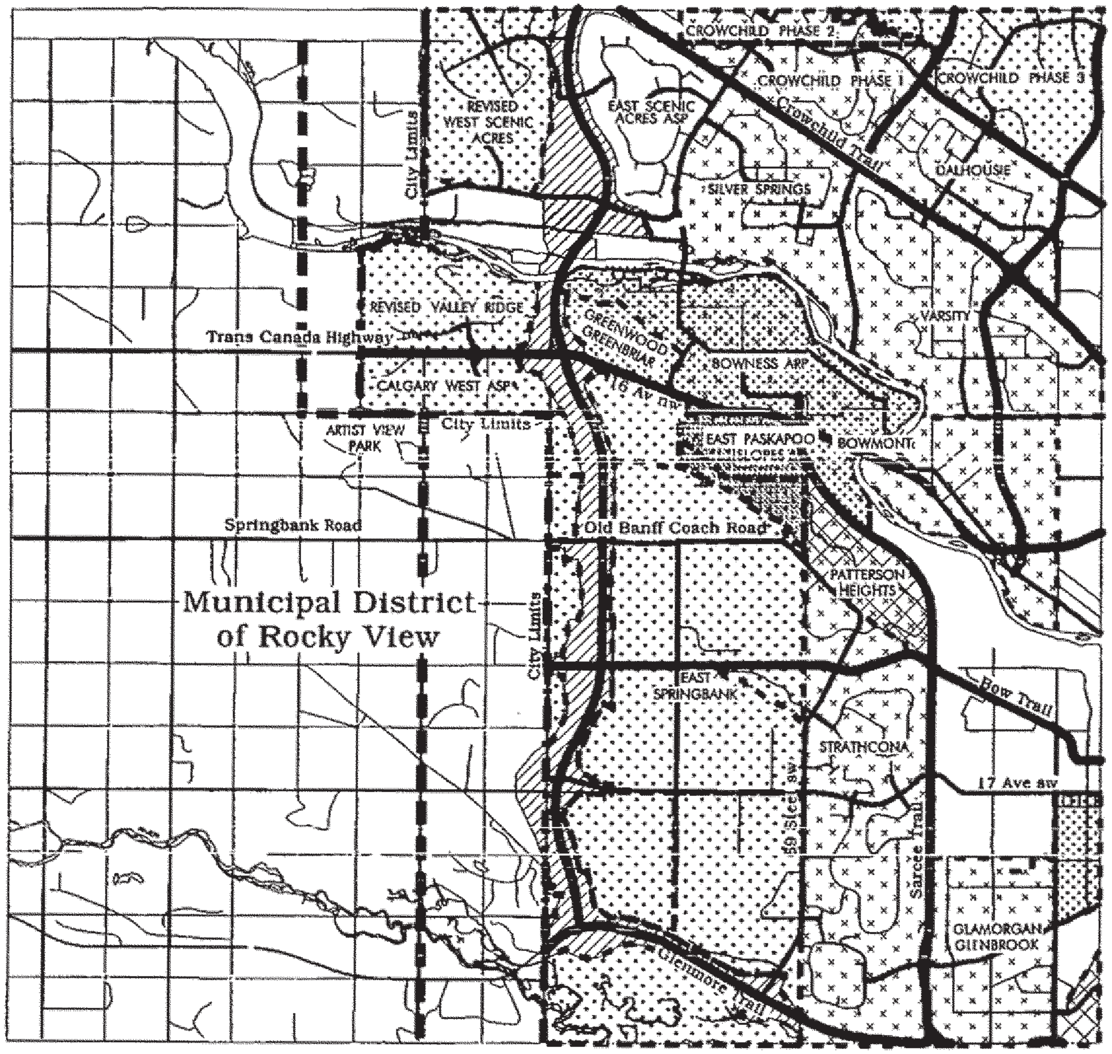
This Plan, approved by Council in September 1994, was prepared in response to a Provincial Government initiative regarding funding of Urban Parks.

The Plan preparation involved extensive consultation with community groups, citizens and stakeholders, volunteer work on the Citizens Planning Advisory Committee, as well as five other subcommittees. The Pulse on Parks Survey, to which 45,000 people responded, was undertaken during the course of the study.

Technical input was provided by a resource team of City staff and consultants. For planning purposes, the river valley was divided into five segments, the Paskapoo Slopes being part of the Bow River West segment. The Bow River West segment is described in the Plan as unique in diversity, abundance and connectivity of natural vegetation and landforms (page 23).

The Urban Parks Master Plan proposed a number of policies, of which the following are relevant to East Paskapoo Slopes:

1. preservation of ecological unit and wildlife movement corridor.



ASP Area Boundary
Planning Area
Plan Boundaries
Area Redevelopment Plan
Area Structure plan
Boundary of the Urban Fringe (In the M.D. of Rockyview)
Design Brief
Policy Plan
Transportation/Utility Corridor

0 50 100m

Crow No.
Pst?rep.planpoll
Plot Date: 14-DEC-2000

MAP 10
EAST PASKAPOO SLOPES
Area Structure Plan

PLANNING POLICY CONTEXT

THE CITY OF CALGARY
LAND USE AND MOBILITY
PLANNING POLICY
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2. development of a regional pathway at the top of the slope.

3. unpaired secondary trails designed for pedestrian use only.

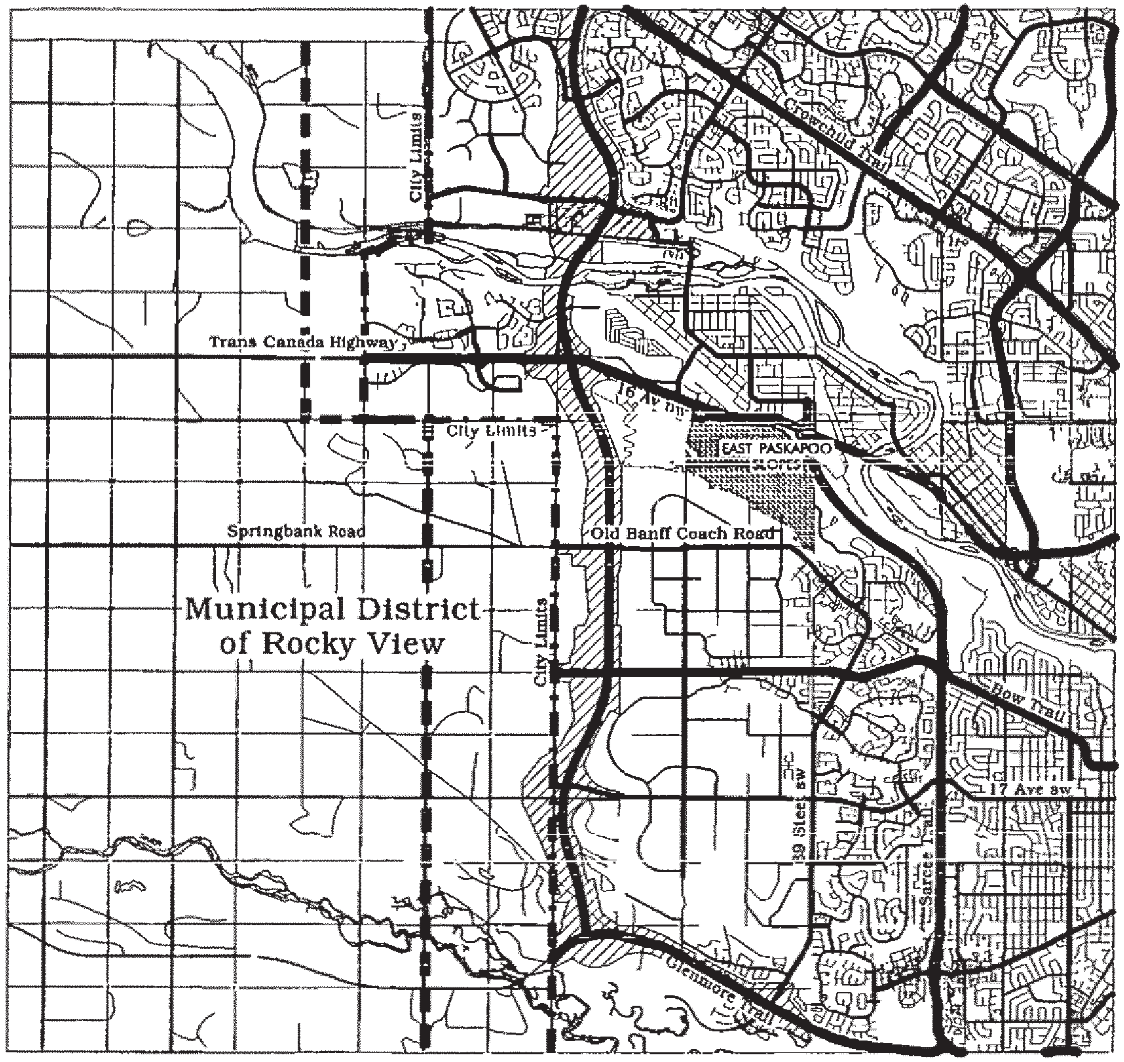
b) The Natural Area Management Plan, 1994

The primary role of this Plan is to ensure the long term viability of Calgary's natural environment, and to support its appropriate use by the public. A new classification is introduced, Natural Environment Park, to facilitate the task of planning and managing these areas.

The Plan highlights the need for a continuous processes of public input, education and interpretation of ecological data, and staff training to provide expert management of natural areas.

Edworthy Park/Paskapoo Slopes is identified in this plan as a major natural system (page 54). The higher elevations are shown as aspen forest, while the lowlands are shown as native grassland (page 43). Six ravines are shown as balsam poplar habitat.

(Note: The Natural Area Management Plan, 1994, dealt with the portion of the area planning in the northend half of Section 27. The balance of the planning area was outside the city limits at that time.)



- - - ASP Area Boundary
Planning Area
Freeway /Expressway
Major Streets
Transportation/Utility Corridor

MAP 11
EAST PASKAPOO SLOPES
Area Structure Plan
REGIONAL TRANSPORTATION SYSTEM

THE CITY OF CALGARY
LAND USE AND MOBILITY
PLANNING POLICY

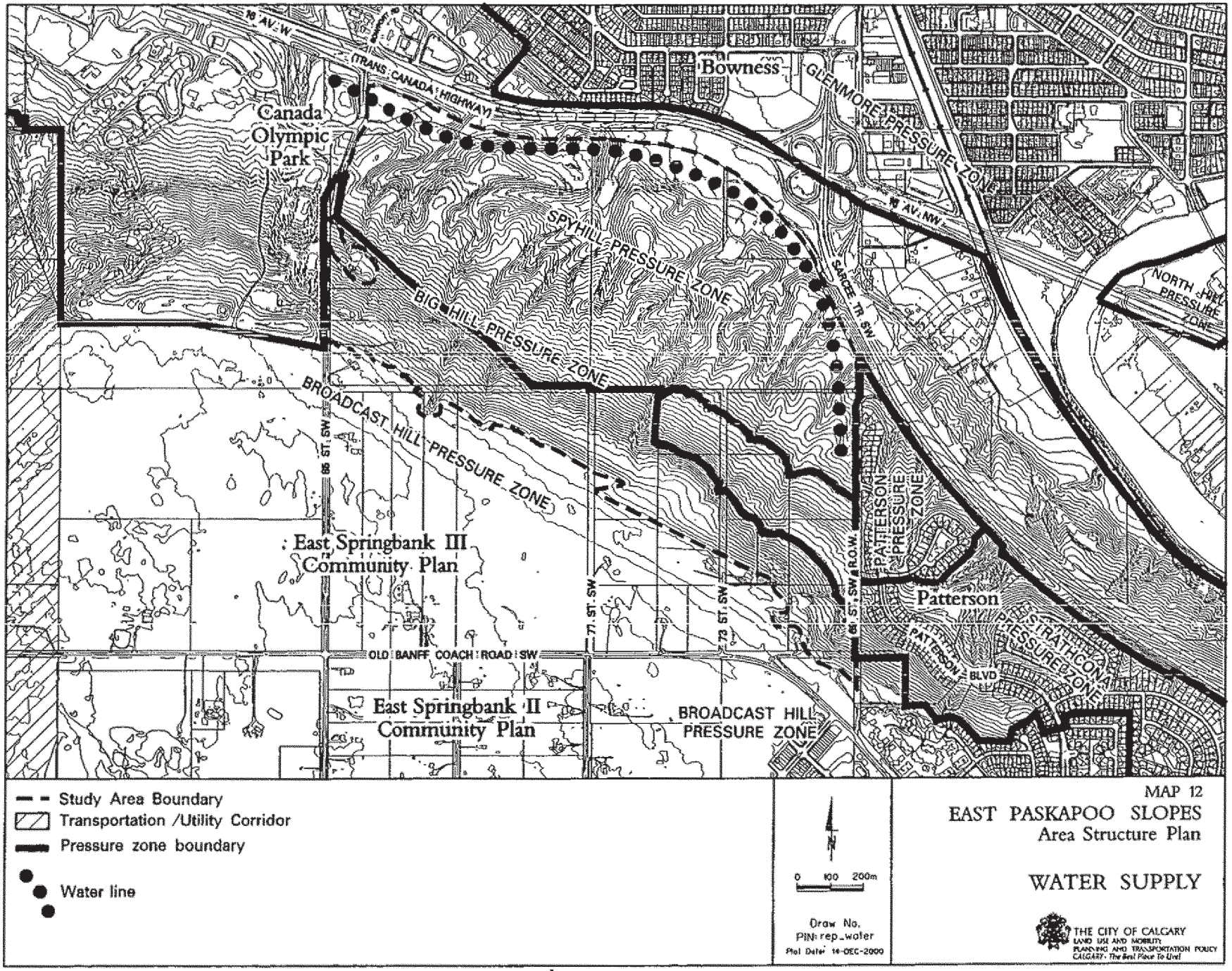
5.0 SERVICING AND UTILITIES

The East Paskapoo Slopes planning area can be serviced by extending utilities from Patterson Heights or the East Springbank III area. Municipal services and utilities to service the planning area can be provided as described below.

5.1 Water Servicing

Development in the eastern portion of the planning area and immediately south of COP property can be serviced by extensions from the Patterson Pressure zone, elevations 1120 metres to 1160 metres (extension from north of the Pressure Reducing Valve on Patterson Boulevard). Development further south and immediately west of Patterson Close can be serviced by extensions from the Strathcona Pressure Zone, elevations 1,169 metres to 1,209 metres (extensions from south of the PRV on Patterson Boulevard).

Remaining development along the south boundary of the planning area can be serviced by extensions from the Broadcast Hill Pressure Zone, elevations 1,208 metres to 1,248 metres.


16 AV. W
TRANS CANADA HIGHWAY
Canada Olympic Park
Bowness
GLENMORE PRESSURE ZONE
16 AV. NW
SPYHILL PRESSURE ZONE
SARCEE TR. SW
NORTH HILL PRESSURE ZONE
BIG HILL PRESSURE ZONE
BROADCAST HILL PRESSURE ZONE
85 ST. SW
East Springbank III Community Plan
77 ST. SW
73 ST. SW
69 ST. SW R.O.W.
PATTERSON PRESSURE ZONE
Patterson
PATTERSON BLVD
STRATHCONA PRESSURE ZONE
OLD BANFF COACH ROAD SW
East Springbank II Community Plan
BROADCAST HILL PRESSURE ZONE
Study Area Boundary
Transportation /Utility Corridor
Pressure zone boundary
Water line
0 100 200m
Draw No.
PIN: rep_water
Plot Date: 14-DEC-2000
MAP 12
EAST PASKAPOO SLOPES
Area Structure Plan
WATER SUPPLY
THE CITY OF CALGARY
LAND USE AND MOBILITY
PLANNING AND TRANSPORTATION POLICY
CALGARY - The Best Place To Live!

5.2 Sanitary Sewers

A secondary trunk is required to service developable lands within the planning area, as well as lands on the upland plateau (in East Springbank). The alignment shown on Map 13, approved by Council on 2000 March 13, is based upon a biophysical impact assessment, and attempts to minimize disturbance to environmentally significant areas and archeological sites.

Roughly 50 acres in the eastern portion of the planning area can be serviced through extensions from Patterson Heights, utilizing the remaining capacity in the sanitary trunks in this subdivision. The balance will be serviced through connections to the secondary trunk shown on Map 13. These additional connections will be subject to biophysical impact assessment, and will be determined at the outline plan stage.

5.3 Storm Sewers

A stormwater management plan has been completed which recognizes development in the planning area.*

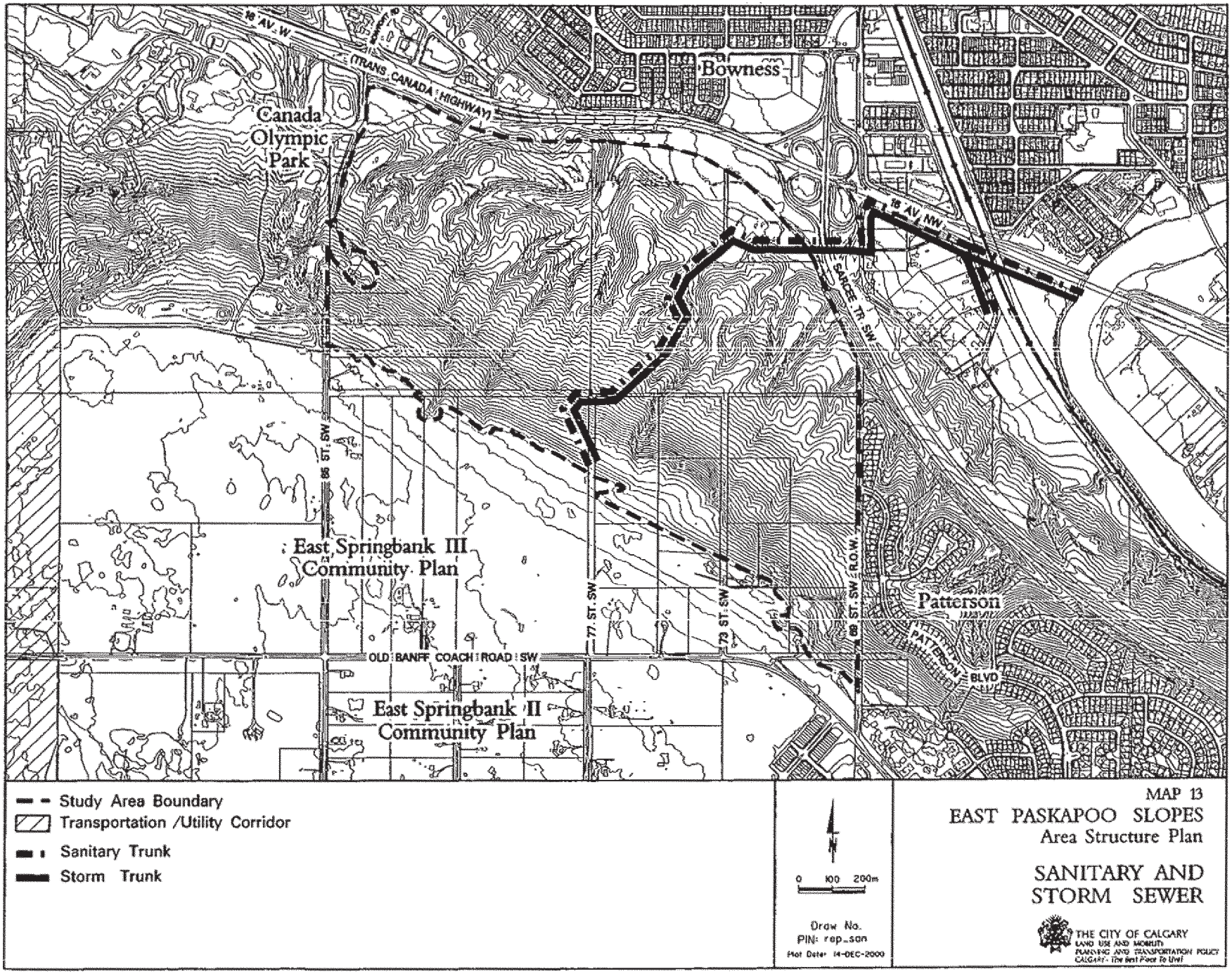
The subject lands fall within the City of Calgary's Patterson Heights Trunk Storm Assessment Area. A secondary trunk facility will be extended from the planning area eastward to Bowdale Crescent N.W., where it will connect to an existing 2400 mm storm stub. This secondary trunk line will be oversized as required to service adjacent developable lands. In addition, an upgrade to the existing outfall will be required.

The 50 acres referred to in Section 5.2 may be serviced using the remaining capacity of the stormwater trunks in Patterson Heights.

5.4 Shallow Utilities

Telephone, electrical, natural gas, and cable television services can be provided by extension of existing facilities from adjacent communities.

* Stormwater Drainage Study Report, Cochrane Engineering Ltd., March 1998.


16 AV. W
TRANS CANADA HIGHWAY
Canada Olympic Park
Bowness
16 AV. NW
SARCEE TR. SW
85 ST. SW
77 ST. SW
73 ST. SW
R.O.W.
88 ST. SW
East Springbank III Community Plan
East Springbank II Community Plan
OLD BANFF COACH ROAD SW
Patterson
PATTERSON BLVD
Study Area Boundary
Transportation /Utility Corridor
Sanitary Trunk
Storm Trunk
N
0 100 200m
Draw No.
PIN: rep_san
Plot Date: 14-DEC-2000
MAP 13
EAST PASKAPOO SLOPES
Area Structure Plan
SANITARY AND STORM SEWER
THE CITY OF CALGARY
LAND USE AND MOBILITY
PLANNING AND TRANSPORTATION POLICY
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6.0 COMMUNITY SERVICES

Community services will be provided as follows:

6.1 Schools

Both the Calgary Board of Education and the Calgary Catholic Board of Education have determined that they do not require a Joint Use Site within the East Paskapoo Slopes planning area. Students will be accommodated in existing schools in neighbouring communities. No playfields are planned for this area, and active recreational opportunities will, therefore, be limited.

6.2 Police Services

Police services for the East Paskapoo Slopes planning area will be provided from the existing District 2 Office, located at 4506 - 17th Avenue S.W.

6.3 Fire Protection and Emergency Medical Services

Fire protection services for the lower portion of the escarpment will be provided from Station No. 15, located in Bowness at 6328 - 35th Avenue N.W., and from Station #29 located at 7027 Coach Hill Road S.W., for the balance of the planning area. Emergency medical services will be provided from Station No. 21, located in Silver Springs at 209 Silvergrove Drive N.W., and Station #8, located at 17th Avenue S.W. and 45 Street.

6.4 Library Services

The East Paskapoo Slopes planning area will be served by the Bowness Branch Library located at 7930 Bowness Road N.W. and the West Hill Branch Library at 5994 Signal Hill Centre S.W.

6.5 Social Services

Social services will be provided from the Bowmont District Office at 5000 Bowness Road N.W., and from the Shaganappi neighbourhood office at 3415 - 8th Avenue SW.

6.6 Public Health Services

Health Services will be made available to the East Paskapoo Slopes planning area through the Calgary Health Service District office located at No. 109, 1829 Ranchlands Drive N.W., and a satellite office located in Bowness at 6328 - 35th Avenue N.W.