MARTIN GEOMATIC CONSULTANTS LTD.

LEGACY RIDGE
STAGE 2

APPENDICES

AVONLEA LAND CORP. LTD.

PROJECT #6893-CE-0476
APRIL 2006

ALBERTA REGISTRIES

LAND TITLE CERTIFICATE

S

LINC	SHORT LEGAL	TITLE NUMBER
0023 936 040	4;21;9;18;;9,10	041 374 684

LEGAL DESCRIPTION

MERIDIAN 4 RANGE 21 TOWNSHIP 9
SECTION 18
FIRST:
THAT PORTION OF LEGAL SUBDIVISION 9 IN THE NORTH EAST QUARTER
WHICH LIES TO THE SOUTH OF THE GEORGETOWN SUBDIVISION
ON PLAN LETHBRIDGE 7751AQ, CONTAINING 13.88 HECTARES
(34.20 ACRES) MORE OR LESS
EXCEPTING THEREOUT:

PLAN	NUMBER	HECTARES	ACRES
SUBDIVISION	2181JK	2.45	6.06
SUBDIVISION	9212212	0.390	0.96

EXCEPTING THEREOUT ALL MINES AND MINERALS AND THE RIGHT TO WORK THE SAME
SECONDLY:
THE EAST 721.5 FEET OF THE SOUTH 850 FEET OF LEGAL SUBDIVISION 10
IN THE SAID NORTH EAST QUARTER, CONTAINING 5.70 HECTARES
(14.08 ACRES) MORE OR LESS
EXCEPTING THEREOUT ALL MINES AND MINERALS
AND THE RIGHT TO WORK THE SAME

ESTATE: FEE SIMPLE

MUNICIPALITY: CITY OF LETHBRIDGE

REFERENCE NUMBER: 921 278 705

REGISTERED OWNER(S)

REGISTRATION	DATE(DMY)	DOCUMENT TYPE	VALUE	CONSIDERATION
041 374 684	30/09/2004	TRANSFER OF LAND	$1,012,375	$1,012,375

OWNERS

AVONLEA LAND CORP. LTD..
OF 1111 3RD AVE SOUTH
LETHBRIDGE
ALBERTA T1J 0J5

(CONTINUED)

ENCUMBRANCES, LIENS & INTERESTS

REGISTRATION NUMBER	DATE (D/M/Y)	PARTICULARS
831 025 913	14/02/1983	UTILITY RIGHT OF WAY GRANTEE - THE CITY OF LETHBRIDGE. AS TO PORTION OR PLAN:8211477
041 453 719	29/11/2004	MORTGAGE MORTGAGEE - KEVIN KIRK MORTGAGEE - BRADLEY KIRK BOTH OF: 238 22 ST NORTH LETHBRIDGE ALBERTA T1H3R7 ORIGINAL PRINCIPAL AMOUNT: $5,500,000

TOTAL INSTRUMENTS: 002

THE REGISTRAR OF TITLES CERTIFIES THIS TO BE AN ACCURATE REPRODUCTION OF THE CERTIFICATE OF TITLE REPRESENTED HEREIN THIS 23 DAY OF FEBRUARY, 2006 AT 02:39 P.M.

ORDER NUMBER:4669781

CUSTOMER FILE NUMBER:

END OF CERTIFICATE

February 27, 2006 EBA File: 4401110

Martin Geomatic Consultants Ltd.
255 – 31 Street North
Lethbridge AB T1H 3Z4

Attention: Mr. Ed Martin, P.Eng.

Dear Sir:

Subject: Top of Bank Geotechnical Review
Legacy Subdivision, Stage 2
Lethbridge, Alberta

As requested, EBA Engineering Consultants Ltd. (Ltd) completed a review of the Top of Bank along the southwest corner of the proposed Legacy Subdivision, Stage 2 development, in Lethbridge, Alberta. The reviews were completed on February 6 and 15, 2006 by EBA geotechnical engineers. Figure 1 presents a site plan of the proposed development as well as the contours of the top portion of the adjacent slope. For reporting purposes, 'Top of Bank" is defined under the City of Lethbridge River Valley Area Redevelopment Plan (RVARP) which is incorporated in City of Lethbridge Bylaw 5277.

For this specific property area, based on EBA's observations, the natural ground forms a shallow tributary drainage channel at the southwest corner of the development, which extends approximately 125 m to the west. At this point, the channel has been partially infilled by an access roadway. A culvert has also been constructed to allow surface drainage to flow along the tributary channel beneath the roadway. From a geotechnical perspective, it is EBA's opinion that this 125 m section of drainage channel need not be considered as part of the "Oldman River Valley Slope", but as a small tributary. The stability of this short section has no significant influence on the stability of the river valley slope. A new, revised, top of bank line was staked by EBA and surveyed, with the new line shown on the attached Figure 1 (field survey February 6, 2006).

It is considered acceptable that the new line shown be incorporated as the Top of Bank Line for this area of the Legacy Subdivision, Stage 2. A development setback distance of 10 m is recommended from this new line section. Otherwise, the development setback distances and the development restrictions required under the RVARP are applicable for this development.

It is further noted that these recommendations would allow the construction of a new street section, (depicted on Figure 1), as this would require only nominal regrading of the edge of the tributary channel. No works would be completed within the revised development restricted areas.

EBA Engineering Consultants Ltd.
p. 403.329.9009 • f. 403.328.8817
442 - 10 Street N • Lethbridge, Alberta T1H 2C7 • CANADA

We trust the information provided satisfies your present requirements. Should you have any questions, please contact our office at your convenience.

Respectfully submitted,
EBA Engineering Consultants Ltd.

J.A. (Jim) Ryan, P.Eng.
Project Director

/cld

Attachment Site Plan

LEGEND

BOREHOLE LOCATION

0 50 100m

1: 2500

EBA Engineering Consultants Ltd.	CLIENT: MARTIN GEOMATIC CONSULTANTS LTD.	PROJECT: GEOTECHNICAL EVALUATION LEGACY SUBDIVISION STAGE 2, LETHBRIDGE, AB	
DWN. LCH / CHKD. MJS		TITLE: SITE PLAN AND BOREHOLE LOCATIONS	
EBA JOB NO. 4401110	FILE: 4401110s01.dwg	REVISION NO. 1	DATE: February 2006 / FIGURE 1

Arrow
Archaeology
Limited

HISTORICAL RESOURCES OVERVIEW

LEGACY RIDGE STAGE 2 SUBDIVISION
LETHBRIDGE, ALBERTA

Prepared for:
Martin Geomatic Consultants Ltd.
Lethbridge, Alberta

Prepared by:
Neil Mirau
February, 2006

COMMUNITYDEVELOPMENT
Cultural Facilities and Historical Resources
Heritage Resource Management

Historical Resources Overview

File Opened			
Prepared By	Neil Mirau Arrow Archaeology Ltd. 2315 – 20 Street, Coaldale, Alberta T1M 1G5 arrowarchaeology.com	Archaeological Permit No.	N/A
Project Name or Identifier	Legacy Ridge Stage 2		
Disposition Type and Number			

Applicant Corporate Name	Avonlea Land Corp. Ltd.
Contact Person	not available
Address	1111 – 3 Ave. S. Lethbridge, Alberta T1J 0J5
Telephone	403 320 1989
Fax	403 327 1987
Email	info@avonlea-homes.com

Agent's Corporate Name	Martin Geomatic Consultants Ltd.
Contact Person	Ed Martin
Address	255 – 31 Street N Lethbridge, Alberta T1H 3Z4
Telephone	403 329 0050
Fax	403 329 6594
Email	ursulab@mgcl.net

Key Contact	Arrow Archaeology Limited
Contact Person	Neil Mirau
Address	2315-20 Street Coaldale, Alberta
Telephone	403 345 2812
Fax	403 345 2817
Email	neil@arrowarchaeology.com

Nature of Activity	Residential Subdivision within the City of Lethbridge
Project Size	approximately 12 ha.
Nearest Towns	Lethbridge
NTS Mapsheets	82H/10 Lethbridge
Lands Affected, Ownership and HRV information	W4 R 21 T9 S18 L 9,10 HRV 0 Freehold
Existing Surface Disturbance	The eastern part of the subdivision area has been cultivated at some time in the past, however it has been allowed to return to grassland. Approximately the western third of the subdivision area is native grassland. Both areas have probably most recently been used as pasture areas, although the last active use of the area appears to have been several years ago. Urban development, i.e. the community of Hardieville is located directly north of the development. Other City of Lethbridge urban development is located a short distance south and southeast. Land immediately south of the subdivision area is under active cultivation. A major north-south running power transmission line is located west of the subdivision. The area west of the subdivision is primarily native grassland, although roads, trails and other disturbances are impacting that area.
Landscape Information	The subdivision is within the City of Lethbridge and is located on level prairie upland. The western border of the proposed subdivision is approximately 200 to 500 m east of the break of slope to the Oldman River Valley. There is, however, a long (ca. 1600 m) coulee that extends east from the valley bottom and whose head is less than 100 m west of the western edge of the subdivision. The subdivision is within the Mixed Grass Prairie ecoregion of southern Alberta. Native vegetation observed in the area included *Bouteloua gracilis* and *Agropyron* sp. Vegetation in the eastern part of the area is primarily *Agropyron cristatum.* Surface and near surface sediments are primarily glaciolacustrine with some relatively recent aeolian sediments overlying the glaciolacustrine silts and clays which in turn overly glacial ground moraine/till deposits. Soil in the area is typically Brown Chernozemic. Very few lithic clasts were observed at the surface in the subdivision area. Till and glaciolacustrine sediments area exposed in the coulee walls a short distance the west of the area. Fossiliferous Cretaceous bedrock underlies the subdivision, but based on exposures of bedrock in coulee and valley walls to the west, this bedrock is more than 8 to 10 m below the modern prairie-level surface. The subdivision surface is approximately 900 masl and is about 70 m above the modern level of the Oldman River.
Borden Block and Site Numbers	DkPe 59 sites DkPf 108 sites (The eastern boundary of Borden Block DkPf is just west of proposed subdivision and therefore site data from this block is included herein)

Known Archaeological Sites in Vicinity	DkPe 16, 17, 18 DkPf 18, 19, 21 Shown on the topo map sheet with yellow triangle symbols
Known Archaeological Sites Impacted	none
Known Historic Sites in Vicinity	Galt (CPR) No. 3 Coal Mine remains Hardieville house foundations (coal miner residences?) Shown on the topo map sheet with red triangle symbols as A and B respectively
Historic Sites Impacted	None
Previous Archaeological Permits in Vicinity	78-112, 79-002, 80-043, 84-032, 89-051, 96-037
Previous Permits in Impact Zone	79-002, 80-043, 89-051
Palaeontological Sensitivity	The subdivision is located entirely on glacial, glaciolacustrine and postglacial, mostly aeolian, sediments and there is no exposed bedrock in or near the area. The subdivision is therefore considered to have low palaeontological potential and sensitivity.

Evaluation	The quarter section/legal subdivisions in which this proposed development is located are classified as Historical Resource Value 0 according to the *Listing of Significant Historical Sites and Areas* (Fifth edition). Although the subdivision area is within several hundred metres of the break of slope into the Oldman River Valley and has some native grassland, a previous HRIA conducted under permit 80-043 covered the proposed subdivision area and surrounding area and no historical resources were found within the proposed area to be impacted by this development. Work conducted under 80-043 by Lifeways of Canada was in advance of urban development in the area, but not specifically the subdivision area examined herein, although again, this area was within that HRIA's survey area. The previous historical resource assessment work done under 80-043 included a pedestrian survey and subsurface testing of the general area including the subdivision. No sites were recorded within the Legacy Ridge subdivision area as a result of that HRIA. Our examination of the area suggests that there is low potential for the project to intersect or impact historical resources. There is no probability that the project will impact any fossiliferous bedrock.

Recommendation	An HRIA is not required for the subdivision area however, pursuant to Section 31 of the *Historical Resources Act,* should historic resources be discovered during construction the HRMB is to be contacted immediately.
Attachments	-Section of 1:50000 NTS sheet 82 H/10 showing subdivision area and nearby historical resources -Satellite image showing subdivision area -Master List for DkPf and DkPe -Subdivision Plans supplied by proponent -Section of 1:50000 NTS sheet 82/10 showing limits of previous HRIA
Signature	 Date: February 2, 2006

Government Use Only			
HSAS		Date	
Approved		Date	
	Regional Archaeologist		
Approved		Date	
	Head, Archaeological Survey		

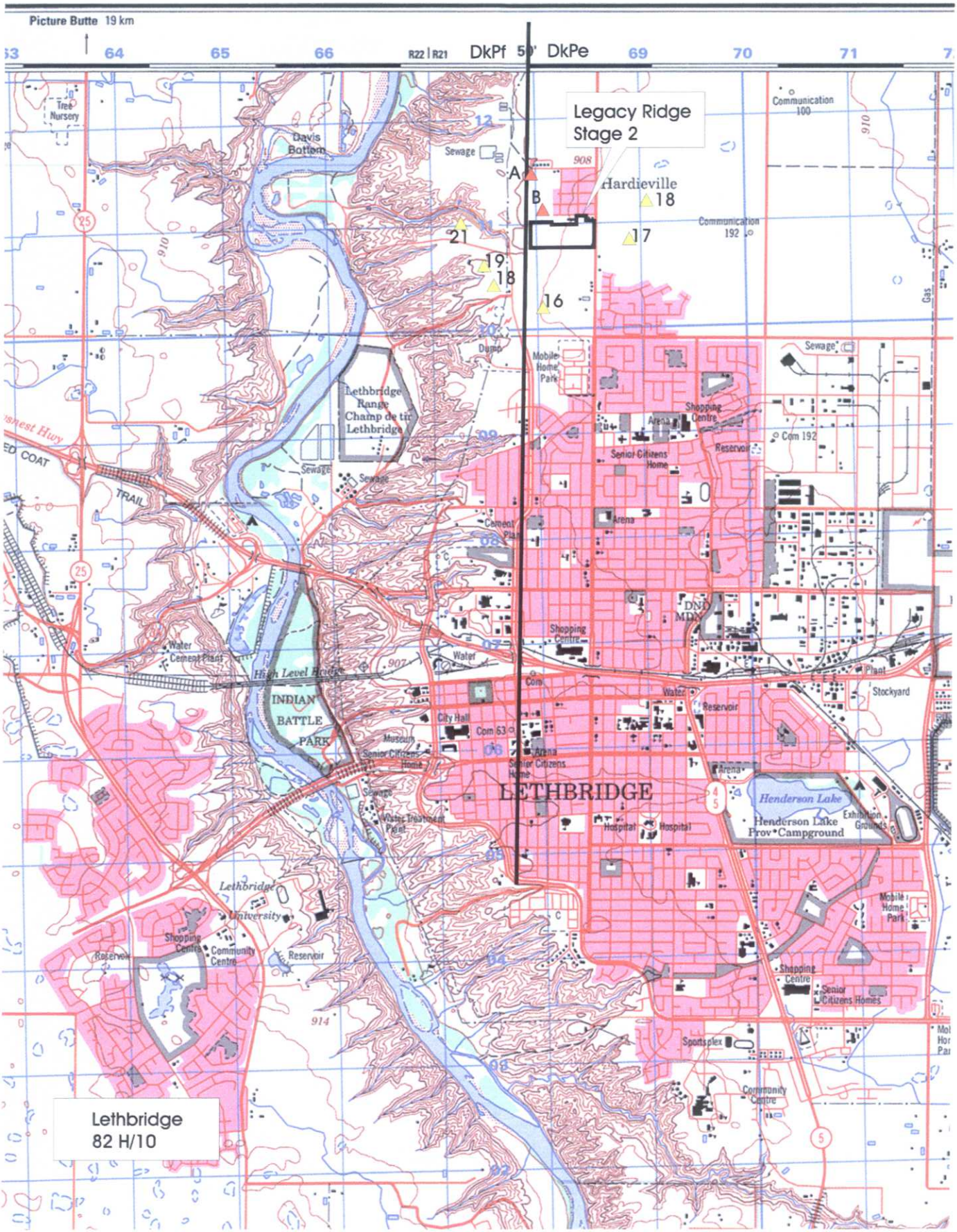

Figure 1. Subdivision area and nearby archaeological sites.

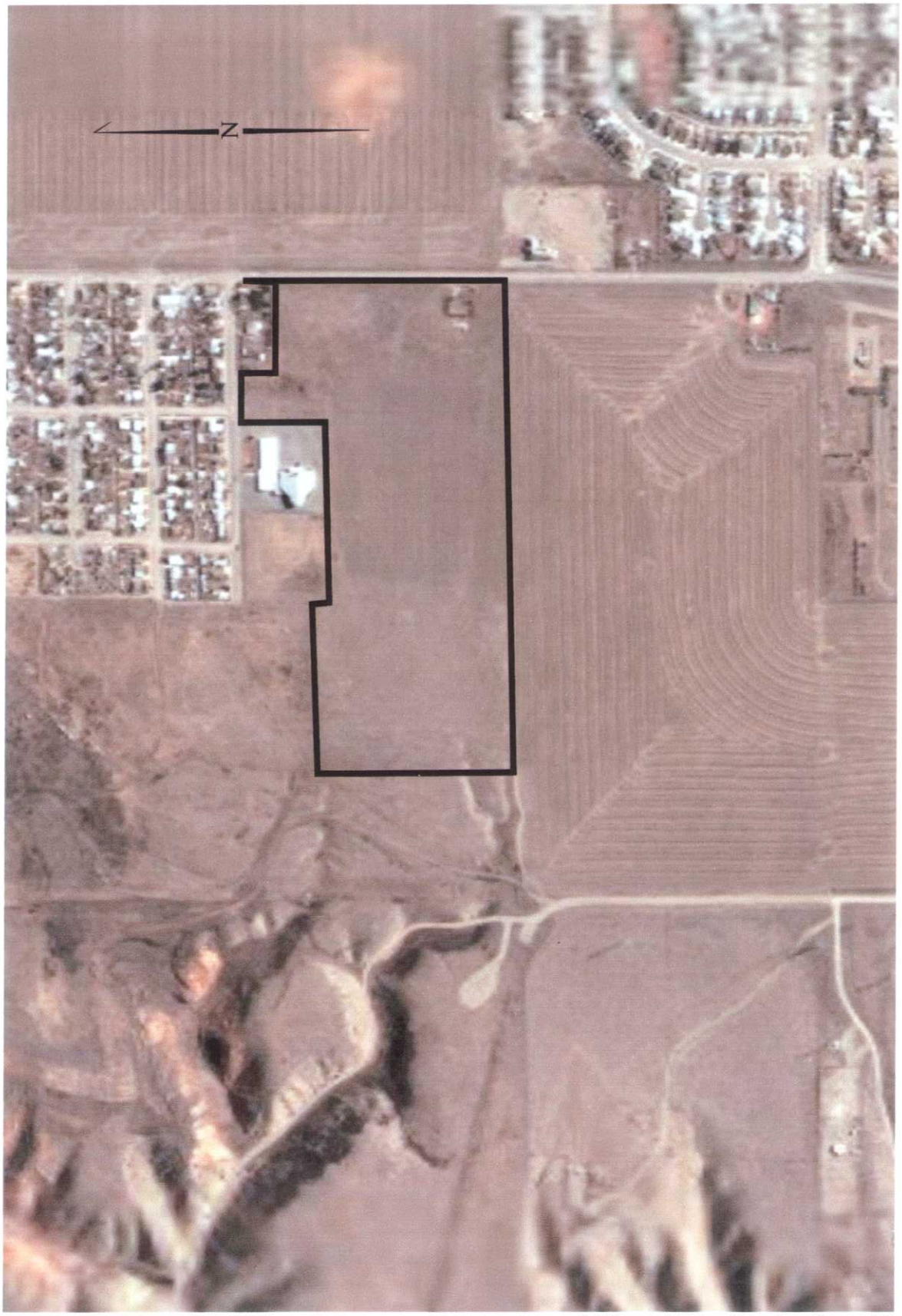

Figure 2. Satellite image with subdivision outlined in black.

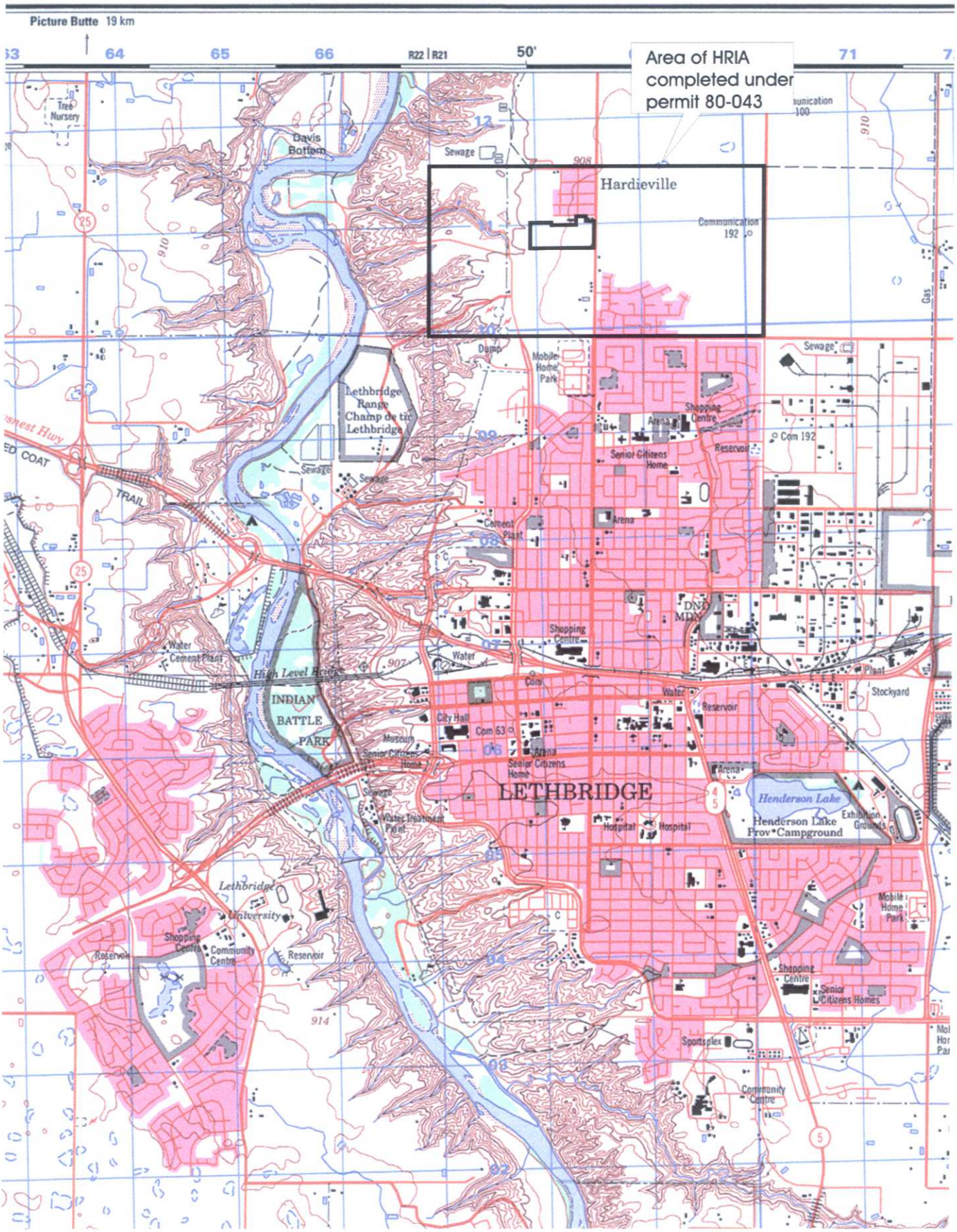

Figure 4. Previous HRIA permit area

ALBERTA MASTER LIST OF BORDEN NUMBERS

May 27, 2005

Borden No.	Site Name	Site Type	Feature	HRV	Permit No. Reference
DkPf-1	Many Spotted Horses Medicine Wheel	stone feature; ceremonial	stone circle; cairn; medicine wheel; hearth; depression; debris	N/A	Glenbow 1957; Archaeological Society of Alberta 1968; ASA 76 -035; ASA 84-065; ASA CRM 078; ASA CRM 090; Wood, B.P. 2001
DkPf-2	Conrad Trading Post; Get Wood's Bottom; Whiskey Trader's Bottom	scatter, campsite, stone feature, trading post; burial	foundation; mound (chimney); fireplace; grave	N/A	Glenbow 1957; ASA 79-A; ASA 83 -070; ASA 83-088; ASA CRM 056; ASA CRM 072; Wood, B.P. 2001
DkPf-3		campsite		HRV 4	Glenbow 1958
DkPf-4	Raceway	campsite		HRV 4	U of C
DkPf-5	Blackfoot - Cree Indian Battle; Last Great Indian Battle	military	battleground	HRV 1	Byrne, W.J. 1975
DkPf-6		scatter; campsite		HRV 0	ASA 75-045
DkPf-7		scatter; campsite		HRV 0	ASA 75-045
DkPf-8		stone feature	stone circle; cairn	HRV 4	ASA 75-045
DkPf-9		stone feature	stone circle	HRV 4	ASA 75-045
DkPf-10		stone feature	cairn	HRV 4	ASA 75-045
DkPf-11		stone feature	cairn	HRV 4	ASA 75-045
DkPf-12		stone feature	stone circle; cairn	HRV 4	ASA 75-045
DkPf-13		stone feature	stone circle; cairn	HRV 4	ASA 78-026; ASA 82-092
DkPf-14		campsite; stone feature	stone circle; cairn	HRV 4	ASA 78-026; ASA 82-092
DkPf-15		campsite; military; mine	stone circle; cairn; hearth; battleground; depression; air vent; shaft	HRV 4	ASA 78-026; ASA 82-092; ASA 87 -005
DkPf-16		stone feature	cairn	HRV 4	ASA 80-043; ASA 80-061
DkPf-17		stone feature	stone circle	HRV 4	ASA 80-043

ALBERTA MASTER LIST OF BORDEN NUMBERS

May 27, 2005

Borden No.	Site Name	Site Type	Feature	HRV	Permit No. Reference
DkPf-18		stone feature	stone circle; cairn	HRV 4	ASA 80-043
DkPf-19		stone feature	stone circle; cairn	HRV 4	ASA 80-043
DkPf-20		stone feature	stone circle	HRV 4	ASA 80-043
DkPf-21		stone feature	stone circle; cairn	HRV 4	ASA 80-043
DkPf-22		stone feature	stone circle	HRV 4	ASA 80-043
DkPf-23		campsite; stone feature	cairn	HRV 4	ASA 80-043; ASA 84-032
DkPf-24		scatter; campsite		HRV 4	ASA 81-082
DkPf-25		stone feature	stone circle	HRV 4	ASA 80-043
DkPf-26		campsite		HRV 4	ASA 82-092
DkPf-27		scatter (lithic)		HRV 0	ASA 82-092; ASA 96-037
DkPf-28		palaeontological ?		HRV 0	ASA 82-092
DkPf-29		scatter (lithic)		HRV 4	ASA 82-092
DkPf-30		isolated find		HRV 0	ASA 82-092
DkPf-31		isolated find		HRV 0	ASA 82-092
DkPf-32		isolated find		HRV 0	ASA 82-092
DkPf-33		stone feature	cairn	HRV 4	ASA 82-092
DkPf-34		stone feature	cairn	HRV 4	ASA 82-092
DkPf-35		stone feature	cairn	HRV 4	ASA 82-092
DkPf-36	1926 - 1949 Shacks, 1938 - 1949 Shacks, 1883 Sheran's Ferry Landing	settlement (townsite); mine (coal); commercial; scatter	foundation (cement); depression; debris; house; structure (log)	HRV 4	ASA 82-092; ASA 99-098

ALBERTA MASTER LIST OF BORDEN NUMBERS

May 27, 2005

Borden No.	Site Name	Site Type	Feature	HRV	Permit No. Reference
DkPf-37		burial	cemetery; grave	HRV 4	ASA 82-092
DkPf-38		stone feature	stone circle	HRV 4	ASA 82-092
DkPf-39		structure remains		HRV 4	ASA 82-092
DkPf-40	Drift Mines 8, 9, 10, J.K. Hamilton and City Mine	mine		HRV 4	ASA 82-092; ASA 99-098
DkPf-41		mine		HRV 4	ASA 82-092
DkPf-42	Jack Rawlingson Mine	mine		HRV 4	ASA 82-092
DkPf-43	Sheran Mine	mine		HRV 4	ASA 82-092; ASA 99-098
DkPf-44		historic feature	shoring (bank)	HRV 4	ASA 82-092
DkPf-45		scatter (lithic)		HRV 4	ASA 82-092
DkPf-46		stone feature	stone circle	HRV 4	ASA 82-092; ASA 99-078
DkPf-47		stone feature	cairn	HRV 4	ASA 82-092
DkPf-48		scatter; workshop		HRV 4	ASA 82-092
DkPf-49		campsite; stone feature	stone circle	HRV 4	ASA 82-092
DkPf-50					see HSS - CPR High Level Bridge
DkPf-51		scatter, campsite; stone feature	cairn, stone line	N/A	ASA 83-070; ASA CRM 072; Wood B.P. 2001
DkPf-52		scatter (artifact)		HRV 0	ASA 83-070
DkPf-53		campsite		HRV 4	ASA 83-070
DkPf-54	Captain Jack's Bottom - Unidentified Post; Captain Jack's Bottom - Unidentified	trading post (whiskey)	depression; foundation; chimney	HRV 4	ASA 84-032 reserved; ASA CRM 056

ALBERTA MASTER LIST OF BORDEN NUMBERS

May 27, 2005

Borden No.	Site Name	Site Type	Feature	HRV	Permit No. Reference
DkPf-55		stone feature; settlement	stone circle; cairn; hearth; dump	HRV 4	ASA 84-032
DkPf-56		campsite		HRV 4	ASA 84-032
DkPf-57		stone feature	cairn	HRV 4	ASA 84-032
DkPf-58		isolated find		HRV 0	ASA 84-032
DkPf-59		isolated find		HRV 0	ASA 84-032
DkPf-60		campsite		HRV 4	ASA 84-032
DkPf-61		homestead ?		HRV 4	ASA 84-032
DkPf-62		homestead ?		HRV 4	ASA 84-032
DkPf-63		homestead ?	pit	HRV 4	ASA 84-032
DkPf-64		homestead ?	garbage	HRV 4	ASA 84-032
DkPf-65		scatter (lithic)		HRV 4	ASA 84-032
DkPf-66		stone feature	stone circle	HRV 4	ASA 84-032
DkPf-67		isolated find		HRV 0	ASA 84-032
DkPf-68		stone feature	cairn; line (cairn)	HRV 4	ASA 84-032
DkPf-69		stone feature	stone circle	HRV 4	ASA 84-032
DkPf-70		isolated find		HRV 0	ASA 84-032
DkPf-71		stone feature	cairn	HRV 4	ASA 84-032
DkPf-72		stone feature	cairn	HRV 4	ASA 84-032
DkPf-73		campsite		HRV 4	ASA 84-032
DkPf-74		isolated find		HRV 0	ASA 84-032

ALBERTA MASTER LIST OF BORDEN NUMBERS

May 27, 2005

Borden No.	Site Name	Site Type	Feature	HRV	Permit No. Reference
DkPf-75		campsite		HRV 0	ASA 84-032
DkPf-76		homestead		HRV 4	ASA 84-032
DkPf-77					Reeves, B.O.K. 1984 reserved
DkPf-78					Reeves, B.O.K. 1984 reserved
DkPf-79					Reeves, B.O.K. 1984 reserved
DkPf-80					Reeves, B.O.K. 1984 reserved
DkPf-81					Reeves, B.O.K. 1984 reserved
DkPf-82		stone feature	stone circle; alignment (stone)	N/A	ASA 84-065
DkPf-83		stone feature	stone circle	N/A	ASA 84-065
DkPf-84		scatter (lithic)		N/A	ASA 84-065
DkPf-85		stone feature	stone circle; cairn	N/A	ASA 84-065
DkPf-86		stone feature	cairn	N/A	ASA 84-065
DkPf-87		stone feature	stone circle	N/A	ASA 84-065
DkPf-88		stone feature; burial	cairn; arc; grave; pavement (cobble)	N/A	ASA 84-065
DkPf-89		settlement	depression	N/A	ASA 84-065
DkPf-90		burial	grave; pile (stone); pit	N/A	ASA 84-065
DkPf-91		stone feature	stone circle	N/A	ASA 84-065
DkPf-92		stone feature	stone circle	N/A	ASA 84-065
DkPf-93		stone feature	stone circle; cairn	N/A	ASA 84-065
DkPf-94		stone feature	stone circle	N/A	ASA 84-065

ALBERTA MASTER LIST OF BORDEN NUMBERS

May 27, 2005

Borden No.	Site Name	Site Type	Feature	HRV	Permit No. Reference
DkPf-95		stone feature	cairn	N/A	ASA 84-065
DkPf-96		stone feature	stone circle; cairn	N/A	ASA 84-065
DkPf-97		stone feature	stone circle	N/A	ASA 84-065
DkPf-98		stone feature	stone circle; cairn	N/A	ASA 84-065
DkPf-99		stone feature	stone circle; cairn; alignment	N/A	ASA 84-065
DkPf-100		stone feature	stone circle	N/A	ASA 84-065
DkPf-101		stone feature	cairn; stone circle; alignment; effigy ?	N/A	ASA 84-065
DkPf-102		scatter		N/A	ASA 84-065
DkPf-103		scatter (lithic)		HRV 4	ASA 85-005
DkPf-104		scatter		HRV 0	ASA 85-065
DkPf-105	Burial Tree	scatter <10; campsite; stone feature	stone circle, stone arc	N/A	Wood, B.P. 2001
DkPf-106		scatter <10; stone feature	stone arc	N/A	Wood, B.P. 2001

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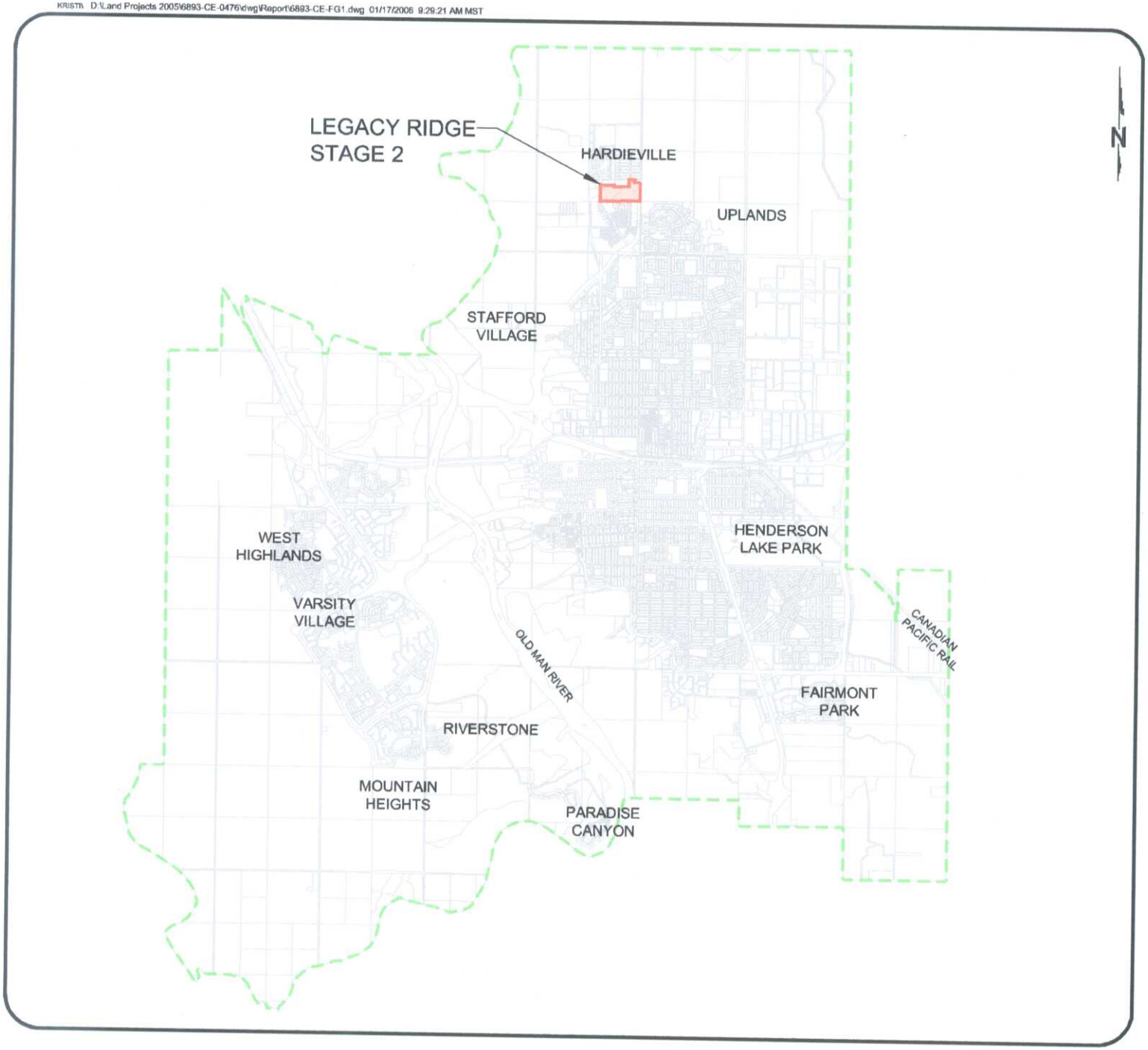


LEGACY RIDGE STAGE 2

LEGEND:

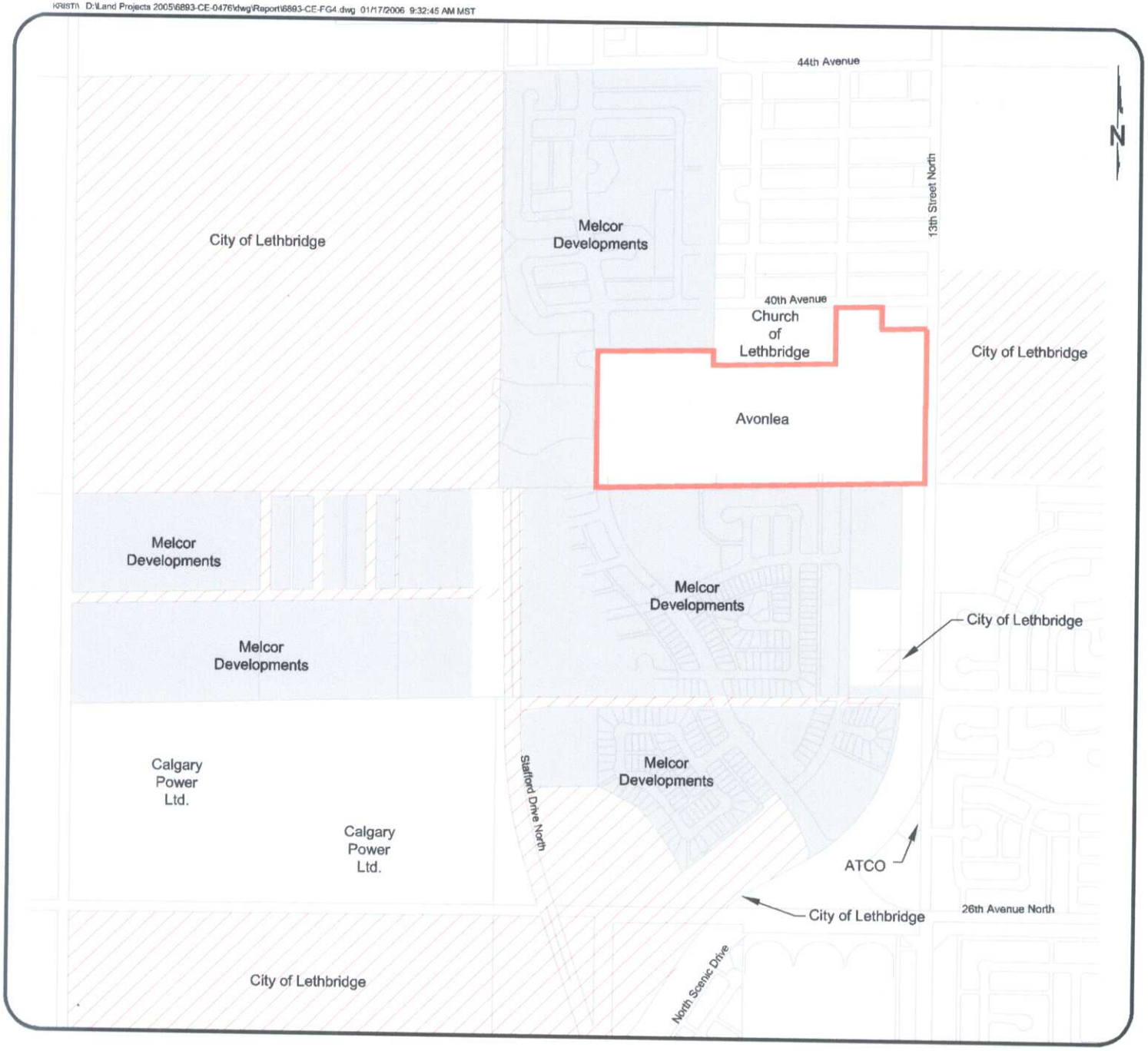
- Legacy Ridge Stage 2 Boundary
- City of Lethbridge Limits

Location Plan

Scale NTS Figure No: 1

Avonlea Land Corp. Ltd.
1111 3rd Avenue South Lethbridge, Alberta
Ph: (403) 3201989 Fax: (403) 327-1987
www.avonlea-homes.com

MARTIN GEOMATIC CONSULTANTS LTD.
Consulting Engineers, Planners, and Land Surveyors



LEGACY RIDGE STAGE 2

LEGEND:

- Legacy Ridge Stage 2 Boundary
- City of Lethbridge
- Melcor Developments Ltd.
- Others

Land Ownership

Scale 1:10000 Figure No: 4

Avonlea Land Corp. Ltd.
1111 3rd Avenue South Lethbridge, Alberta
Ph: (403) 3201989 Fax: (403) 327-1987
www.avonlea-homes.com

MARTIN GEOMATIC CONSULTANTS LTD.
Consulting Engineers, Planners, and Land Surveyors

Final Report

PETA Lands
Traffic Impact Assessment

Prepared for:
Avonlea Land Development Corp.
1111 - 3 Avenue S.
Lethbridge, Alberta T1J 0J5

Prepared by:
Earth Tech (Canada) Inc.
Atrium VII, Suite 300
340 Midpark Way S.E.
Calgary, Alberta T2X 1P1

February 23, 2006

Project No. 88713-03

EarthTech
A Tyco International Ltd. Company

300 Atrium VII
340 Midpark Way S.E.
Calgary, Alberta
T2X 1P1 Canada

P 403.254.3301
F 403.254.3333
earthtech.com

February 23, 2006

Refer to File: 88713-03
Licences & Permits: Permit No. P07502
L:\Work\88000\88713\03-Report\PUBLISHED\20060223 Final Report_FINAL-covlet.doc

Avonlea Land Development Corp.
c/o Martin Geomatics
255 – 31 Street North
Lethbridge, AB T1H 3Z4

Attention: Mr. Ed Martin

Dear Sir:

Re: **PETA Lands Traffic Impact Assessment**
Final Report

Earth Tech (Canada) Inc. is pleased to submit three (3) bound copies and one (1) electronic copy (CD) of the PETA Lands Traffic Impact Assessment final report.

The road network assessed in this Traffic Impact Assessment includes nine intersections and identifies the impact of traffic generated by the development in and around Legacy Ridge.

We appreciate and have enjoyed the opportunity to participate in this most interesting project.

Please contact me at 403.254.3336 if you have any questions or concerns.

EARTH TECH (CANADA) INC.
Per:

Peter A. Truch, P.Eng.
Project Manager

/sm

Encl.

Table of Contents

APPENDICES

1.0 PROJECT BACKGROUND

Avonlea Land Ltd. plans to develop the PETA Lands, located in Legacy Ridge in North Lethbridge into a residential community. This proposed development is expected to have 205 single-family dwelling units and will be fully developed by the 2013 time horizon.

Earth Tech was retained by Avonlea Land Ltd. through Martin Geomatic Consultants Ltd. to complete a traffic impact assessment (TIA) to identify the impacts of traffic generated by the development in and around Legacy Ridge.

The development site is bounded by 40 Avenue North to the north, 13 Street North (Scenic Drive North) to the east, the 35 Avenue North right of way to the south, and Marie van Haarlem Boulevard to the west. The location of the proposed development is shown in **Figure 1.1.**

The development will access the greater road network via full turn accesses to 40 Avenue North, 13 Street North, and Marie Van Haarlem Boulevard. The road network assessed in this TIA includes nine intersections as indicated on Figure 1.1.

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LEGEND

SCALE: Not to Scale

Figure 1.1

Proposed Development Location

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2.0 TRAFFIC VOLUMES

Earth Tech completed an extensive process to determine base and site traffic volumes. Morning and afternoon peak hour volumes were considered for the 2013 and 2031 time horizons.

2.1 BASE TRAFFIC VOLUMES

Determination of the base traffic volumes for both 2013 and 2031 followed the same methodology, incorporating information from the City of Lethbridge (City) EMME/2 traffic forecasting model plus knowledge of the expected developments in the area listed below.

- Legacy Ridge;
- Uplands;
- Melcor lands; and,
- Hardieville.

Traffic counts for three intersections were available from the Legacy Ridge report and are included in **Figure 2.1**. These counts were then balanced with results shown on **Figure 2.2.**

Figures 2.3 and 2.4 respectively show the 2013 and 2031 horizon base traffic volumes.

In determining base traffic volumes, Earth Tech assumed that the 35 Avenue connector is already in place. If it did not exist prior to the development of Legacy Ridge Lands, an additional 70 (46) vehicles would traverse through intersections #3 and #4 in the morning and afternoon peak hours. These volumes have an insignificant impact on the intersections.

Sections 2.1.1 through 2.1.5 document how each of the elements listed above contributed to the determination of the overall base traffic volumes for the 2013 and 2031 horizons. To find the total base traffic volumes for each of the four study horizons, Earth Tech superimposed (summed) traffic volumes described in the following sections. It was assumed for the sections described below that the vast majority of trips will be via private vehicle; that the inbound distribution/assignment would be the same for the outbound distribution/assignment, and that vehicles traversing the network will typically take the most direct between their origin and destination.

2.1.1 EMME/2 Traffic Forecasting Model

Existing intersection turning movement counts were obtained from the Legacy Ridge Stage I Transportation Impact Assessment dated June 25, 2004 (Legacy Ridge TIA) for the intersections of Scenic Drive at Stafford Drive and at 26 Avenue North. One additional count at 13 Street North and Uplands Drive was provided by the City. Intersection turning movements were back-calculated to determine existing traffic volumes on a link-by-link (two-way road segment) basis.

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LEGEND

AM (PM) Traffic Volumes →

SCALE: Not to Scale

Figure 2.1

Existing Traffic Counts

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LEGEND

AM (PM) Traffic Volumes →

SCALE: Not to Scale

Figure 2.2

Balanced Traffic Counts

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LEGEND

AM (PM) Traffic Volumes

SCALE: Not to Scale

Figure 2.3

2013 Base Volumes

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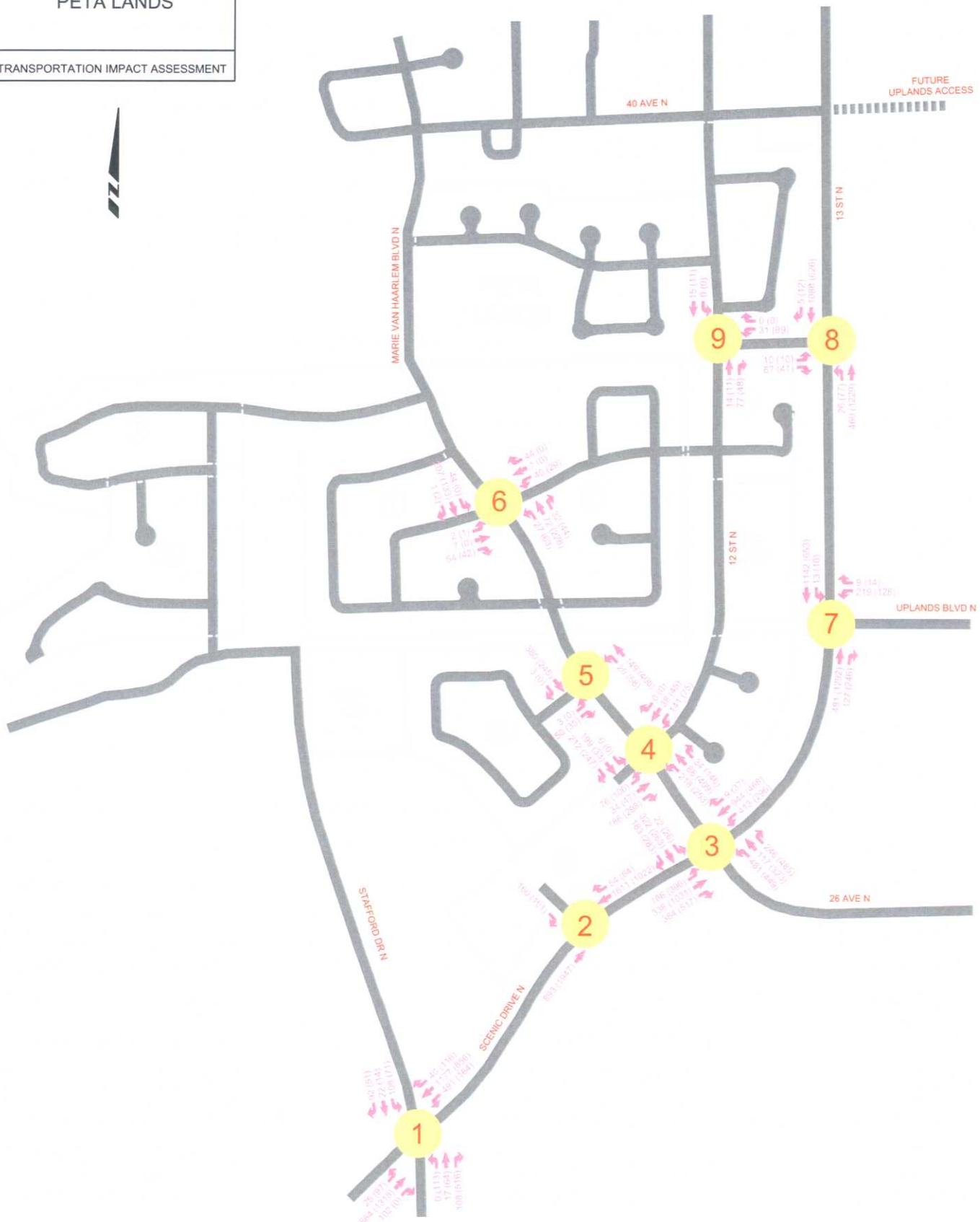

LEGEND

AM (PM) Traffic Volumes →

SCALE: Not to Scale

Figure 2.4

2031 Base Volumes

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The City also provided Earth Tech with afternoon peak hour 2013 and 2031 forecasts on a link-by-link level of refinement; these forecasts are included in **Appendix 'A'**. Two alterations were made to the forecasts. First, the forecasts assumed some development to occur at Legacy Ridge. As Legacy Ridge was dealt with separately (discussed in the next section), the assumed traffic from Legacy Ridge was factored out of the link-by-link forecasts.

Second, morning traffic volumes were assumed to be the converse movement of the afternoon peak hour, reduced by ten percent.

Using the existing link-by-link volumes and the future traffic forecasts, Earth Tech worked out growth percentages for each link to the 2013 and 2031 horizons. These percentages were applied to the existing intersection turning movement counts to create turning movement forecasts for each time horizon. The intersection forecasts were then balanced, resulting in the traffic volumes for the 2013 and 2031 horizons shown in **Figures 2.5 and 2.6** respectively.

2.1.2 Legacy Ridge

The Legacy Ridge TIA identified the necessary intersection configurations, intersection control, and ultimate road classifications for the Legacy Ridge road network. This analysis assumed all access to Legacy Ridge were via connections to Scenic Drive at Stafford Drive and at Marie van Haarlem Boulevard (26 Avenue North). Since the publication of the Legacy Ridge TIA, another access point to the community at 35 Avenue North was granted. As a result, the work completed for the Legacy Ridge TIA required further analysis.

The Legacy Ridge TIA analysis was based on a nine zone system, as shown on **Figure 2.7**. Each zone's land use was identified, and converted to vehicle trip generation using the ITE Trip Generation Handbook, 7th Edition, 2003. These trips were then distributed and assigned to the road network.

As a result of the new access, Earth Tech found that changes were required to zones 2, 3, 5, and 9. However, it was necessary for Earth Tech to re-examine the entire nine zone system, devising a new distribution and assignment for each zone, because that information was not available.

The distribution shown on **Figure 2.8** was generally assumed to take place. The high percentage of vehicles destined to/from 26 Avenue North reflects the expected significant development in North Lethbridge (e.g. Sherring Park). Vehicle trips that were assumed to take one route in the morning peak hour were assumed to take the same route in the afternoon peak hour in the reverse direction. In summary, the distribution is as follows:

- 40 % of trips were destined to/from the south/west via Scenic Drive North;
- 10% of trips were destined to/from the south via Stafford Drive North;
- 45% of trips were destined to/from the east via 26 Avenue North; and,
- 5% of trips were destined to/from the north via 13 Street North (Scenic Drive North).

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LEGEND

AM (PM) Traffic Volumes

AM (PM) 2-Way Traffic Volumes

SCALE: Not to Scale

Figure 2.5

2013
EMME/2 Balanced
Traffic Forecasts

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Dwn. BV	Ckd. PAT	Date Sept 05	Project 88713	Dwg.SK021	Rev. 01

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LEGEND

AM (PM) Traffic Volumes

AM (PM) 2-Way Traffic Volumes

SCALE: Not to Scale

Figure 2.6

2031
EMME/2 Balanced
Traffic Forecasts

EarthTech
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Dwn. BV	Ckd. PAT	Date Sept 05	Project 88713	Dwg.SK022	Rev. 01

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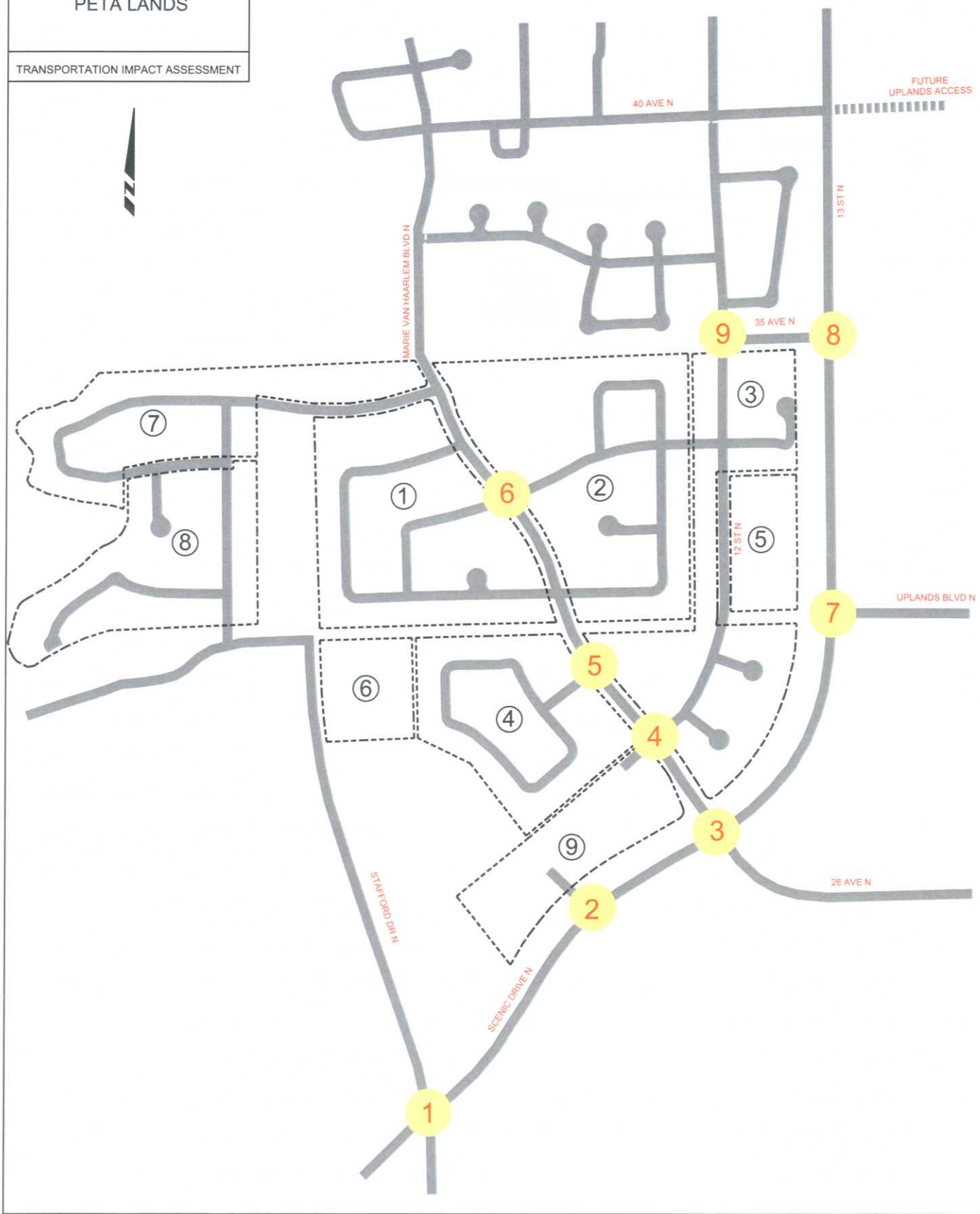

LEGEND

SCALE: Not to Scale

Figure 2.7

Legacy Ridge
Zone System

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Dwn. BV	Ckd. PAT	Date Sept 05	Project 88713	Dwg.SK029	Rev. 00

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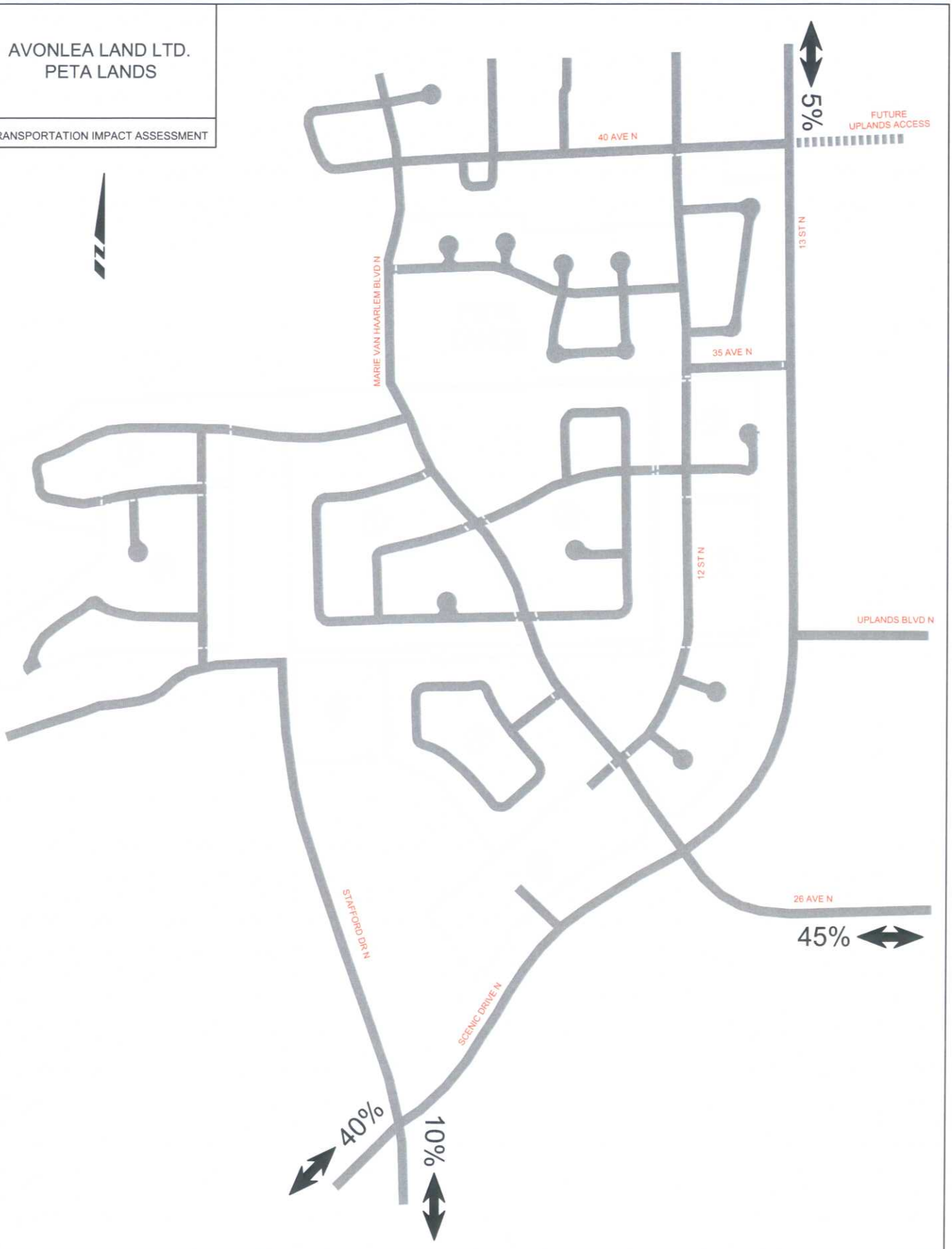

LEGEND

SCALE: Not to Scale

Figure 2.8

Forecasted Distributions

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Dwn. BV	Ckd. PAT	Date Sept 05	Project 88713	Dwg.SK020	Rev. 00

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The general distribution was applied to each zone, and percentage assignment for each zone determined. **Appendix 'B'** contains the percentage assignment assumptions for each zone.

Assumptions of note include those for zone 9 and for the elementary school. For zone 9 (commercial land use), it was assumed 50% of the traffic generated by the site was a by-pass trip (i.e. a trip already on the road system). Of the other 50% (i.e. new trips generated), Earth Tech assumed that 20% came from within Legacy Ridge, and 30% came from locations outside Legacy Ridge. For the elementary school, two distinct types of trips were assumed to occur, those by staff working at the school, and those by parents dropping their children off. Staff trips were only assumed to be inbound to the school in the morning peak hour, whilst parent trips comprised both inbound and outbound trips. Elementary school trips in the afternoon peak hour were assumed to occur before the typical afternoon peak period (i.e. before 16:00) and were excluded from afternoon peak hour analysis.

Earth Tech applied the trip generation rates used in the Legacy Ridge TIA, unless Fitted Curve Equations[1] for the appropriate land use indicated higher vehicle trips; in this case, the fitted curve equations were used. **Table 2.1** shows the Fitted Curve Equation used to determine trips generated in the morning and afternoon peak hours. The resulting total trip generation for both 2013 and 2031 morning and afternoon peak hours is included in **Appendix 'C'**. The trips generated for each zone within Legacy Ridge were applied to the percentage assignment for the corresponding zone to determine total number of trips. All zones were combined to determine the total number of trips generated by Legacy Ridge.

Table 2.1: Fitted Curve Equation

	AM	PM
Single Family	$T = 0.70 (X) + 12.05$	$L_n (T) = 0.89 L_n (X) + 0.61$
Multi Family	$L_n (T) = 0.90 L_n (X) - 0.07$	$L_n (T) = 0.89 L_n (X) - 0.07$
Convenience Store	$T = [291.69 \times (X)] - 662.1$	$T = [175.88 \times (X)] - 358.94$
Retail	$L_n (T) = 0.6 L_n (X) + 2.29$	$L_n (T) = 0.66 L_n (X) + 3.4$

X = number of dwelling units

2.1.3 Uplands

In a method similar to that used to determine each zone in Legacy Ridge, Earth Tech calculated future Uplands traffic. Note that existing Uplands traffic was captured with the existing traffic counts and traffic forecast model traffic projections described in Section 2.1.1.

Using the trip generation rates included in Appendix 'C' and the percentage assignment included in **Appendix 'D'**, total future Uplands traffic volumes were calculated. Assumptions of note for future Uplands traffic included:

- The majority of future trips access Uplands via a new connection to 13 Street North (Scenic Drive North) aligning with 40 Avenue North;

[1] Institute of Transportation Engineers, Trip Generation, 7th Edition, 2003.

- A small amount of the future trips access Uplands via existing access points (i.e. Uplands Boulevard and Erminedale Boulevard); and,
- The majority of trips to/from the east were assumed to use Kodiak Gate and 28 Street North accesses, thereby not entering into the analysis area.

2.1.4 Melcor Lands

Again, using similar methodology, Earth Tech determined future trips to the Melcor lands located to the west and north of Hardieville. Appendix 'D' contains the percentage assignment assumptions for Melcor lands.

2.1.5 Hardieville

Vehicle trips related to future expansion in Hardieville were established using the methodology as described above. Appendix 'D' also contains percentage assignment assumptions for Hardieville. Note that existing Hardieville traffic was captured with the existing traffic counts and traffic forecast model traffic projections described in Section 2.1.1.

2.2 SITE TRAFFIC VOLUMES

Akin to the methodology described in Section 2.1, Earth Tech calculated PETA Lands (site) traffic volumes for the 2013/2031 morning and afternoon peak hour horizons using trip generation rates and percentage assignment (included in Appendices 'C' and 'D' respectively).

Calculations showed that average rates versus fitted curve equations resulted in virtually identical trip generation rates. The resulting number of trips generated by PETA lands is shown in **Table 2.2**.

Table 2.2: PETA Lands Trip Generation

	Inbound (veh/hr)	Outbound (veh/hr)	TOTAL (veh/hr)
Morning Peak Hour	41	117	158
Afternoon Peak Hour	134	76	210

Figure 2.9 shows the morning and afternoon peak hour site traffic volumes. Figure 2.9 applies to both 2013 and 2031 time horizons as build out of the PETA Lands is expected prior to 2013.

2.3 TOTAL TRAFFIC VOLUMES

Figures 2.10 and 2.11 respectively show the total (base + site) traffic volumes for 2013 and 2031 horizons.

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LEGEND
AM (PM) Outbound Traffic Volumes
AM (PM) Inbound Traffic Volumes

SCALE: Not to Scale

Figure 2.9
PETA Lands
Traffic Volumes

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LEGEND

AM (PM) Traffic Volumes

SCALE: Not to Scale

Figure 2.10

2013 Combined Volumes

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Dwn. BV	Ckd. PAT	Date Feb 06	Project 88713	Dwg.SK037	Rev. 00

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LEGEND

AM (PM) Traffic Volumes

SCALE: Not to Scale

Figure 2.11

2031 Combined Volumes

EarthTech
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Dwn. BV	Ckd. PAT	Date Feb 06	Project 88713	Dwg.SK028	Rev. 00

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3.0 CAPACITY ANALYSIS

3.1 METHODOLOGY

Upon determination of the volume data for base and comprehensive scenarios (combined base and site generated traffic), Earth Tech completed signalized and unsignalized intersection capacity analysis using Synchro 6 software, and roundabout analysis using aaSidra 2.0 software. Both programs predominantly use methodology outlined in the Highway Capacity Manual (HCM) – 2000 Edition as described in the following sections. If specific input information was unknown, the default parameters for analysis followed City of Lethbridge accepted parameters, attached in **Appendix 'E'**.

3.1.1 Level of Service

The level of service grading scale for intersection analysis is based on average control delay per vehicle. LOS ranges from 'A' to 'F' where LOS 'A' reflects ideal free flow conditions with little or no delay, and LOS 'F' indicates general failure of the movement. Grading criteria are different for signalized vs. unsignalized intersections. The primary reason for this difference is that drivers expect that signalized intersections are designed to carry higher traffic volumes than unsignalized intersections, thus a higher level of control delay is acceptable. **Table 3.1** shows LOS criteria for signalized intersections.

Table 3.1: LOS Criteria for Signalized Intersections

Level of Service	Average Control Delay per Vehicle (s/veh)
A	10.0 or less
B	10.1 – 20.0
C	20.1 – 35.0
D	35.1 – 55.0
E	55.1 – 80.0
F	Greater than 80.0

As mentioned above, unsignalized intersections, i.e. all-way stop controlled or two-way stop controlled, follow a different grading scale than those of signalized intersections. For unsignalized intersections, the LOS is defined as a function of the total elapsed time from when a vehicle stops at the end of a queue until the vehicle departs from the stop line. This time includes the time required for the vehicle to travel from the last-in-queue to the front-of-queue position. **Table 3.2** shows the LOS criteria for unsignalized intersections.

Table 3.2: LOS Criteria for Unsignalized Intersections

Level of Service	Average Control Delay per Vehicle (s/veh)
A	10.0 or less
B	10.1 – 15.0
C	15.1 – 25.0
D	25.1 – 35.0
E	35.1 – 50.0
F	Greater than 50.0

For both signalized and unsignalized intersections in Lethbridge, accepted overall intersection LOS is 'D', with individual movements requiring upgrading at the 'D' to 'E' threshold.

3.1.2 Volume to Capacity Ratios

Another important measure of effectiveness of an at-grade intersection movement that Synchro 6 calculates is the volume to capacity (v/c) ratio. This is an indication of relative utilization of available capacity for a movement. The v/c ratio has a theoretical maximum of 1.00; in Lethbridge 0.80 is the accepted general maximum used as a basis for intersection design.

3.1.3 Queue Lengths

Earth Tech also uses estimated queue lengths for individual movements at at-grade intersections as another important measure of effectiveness. Estimated 95th percentile queue lengths are presented on a movement-by-movement basis in meters. Queuing calculations are used to design appropriate turn bay storage lengths, and tonsure that spillback into adjacent intersections is not a problem.

3.2 FINDINGS

Earth Tech made use of the Legacy Ridge TIA recommended laning for the 2013 time horizon as a starting point in the capacity analysis performed but made the following modifications:

At Intersection #1 (Scenic Drive North and Stafford Drive North):

- The westbound left storage length was increased from 75m to 85m, and
- The northbound right turn was modified from a yield condition to a merge condition.

Intersection #3 (Scenic Drive North and 26 Avenue North/Marie van Haarlem Boulevard):

- Eastbound and westbound left turn lane storage lengths increased from 75m to 90m,
- The protected-prohibited westbound dual left was replaced in favour of a single left turn with protected-permissive phasing, and
- The northbound left turn storage length was increased from 75m to 85m.

The analysis in the study area assumed that the Legacy Ridge School will serve the communities located on the west side of 13 Street North only, thus creating the worst case scenario for traffic in the study area.

3.2.1 2013 Time Horizon

Figure 3.1 shows the analyzed configuration with base traffic volumes, along with corresponding measures of effectiveness for the 2013 morning and afternoon peak hours. Given the configurations tested, essentially every movement at every intersection falls within City of Lethbridge acceptable tolerances, except:

- EBL at Intersection #3 with a level of service 'E' in the morning peak hour;
- WBL at Intersection #7 with a LOS 'E' in the morning peak hour; and, the
- EBL at Intersection #8 with a LOS 'F' in the afternoon peak hour.

In the cases of Intersections #3 and #7, the v/c ratios for these movements are below 0.80, and are therefore not expected to be of concern. Forecasted traffic volumes for the EBL at Intersection #8 are expected to be less than 10 vehicles in the peak hour, and therefore, despite a LOS 'F', the intersection will likely not require modifications or signalization to operate at acceptable levels.

Superimposing PETA Lands volumes with base traffic volumes for the 2013 horizon, it becomes apparent that the PETA Lands traffic has very little impact on the assumed base network (shown in Figure 3.1). **Figure 3.2** shows the analyzed configuration with total traffic volumes (i.e. base plus PETA Lands traffic) for the 2013 morning and afternoon peak hour horizons. The maximum v/c ratio slightly exceeds the 0.80 City standard, increasing to 0.83 when the development traffic is added to the network and coordination is maintained between Intersection #1 (Scenic Drive North/ Stafford Drive), #3 and #7.

The improvements attributed directly to PETA Lands would be the following:

- lengthen of the westbound left turn bay at Intersection #3 (Scenic Drive North/26 Avenue North/Marie van Haarlem Boulevard) from 90 to 105 m
- lengthen the north west left turn bay storage bay at Intersection #3 from 85m to 95m
- lengthen the southwest left storage bay from 85m to 95 m at Intersection #1 (Scenic Drive North/Stafford Drive).

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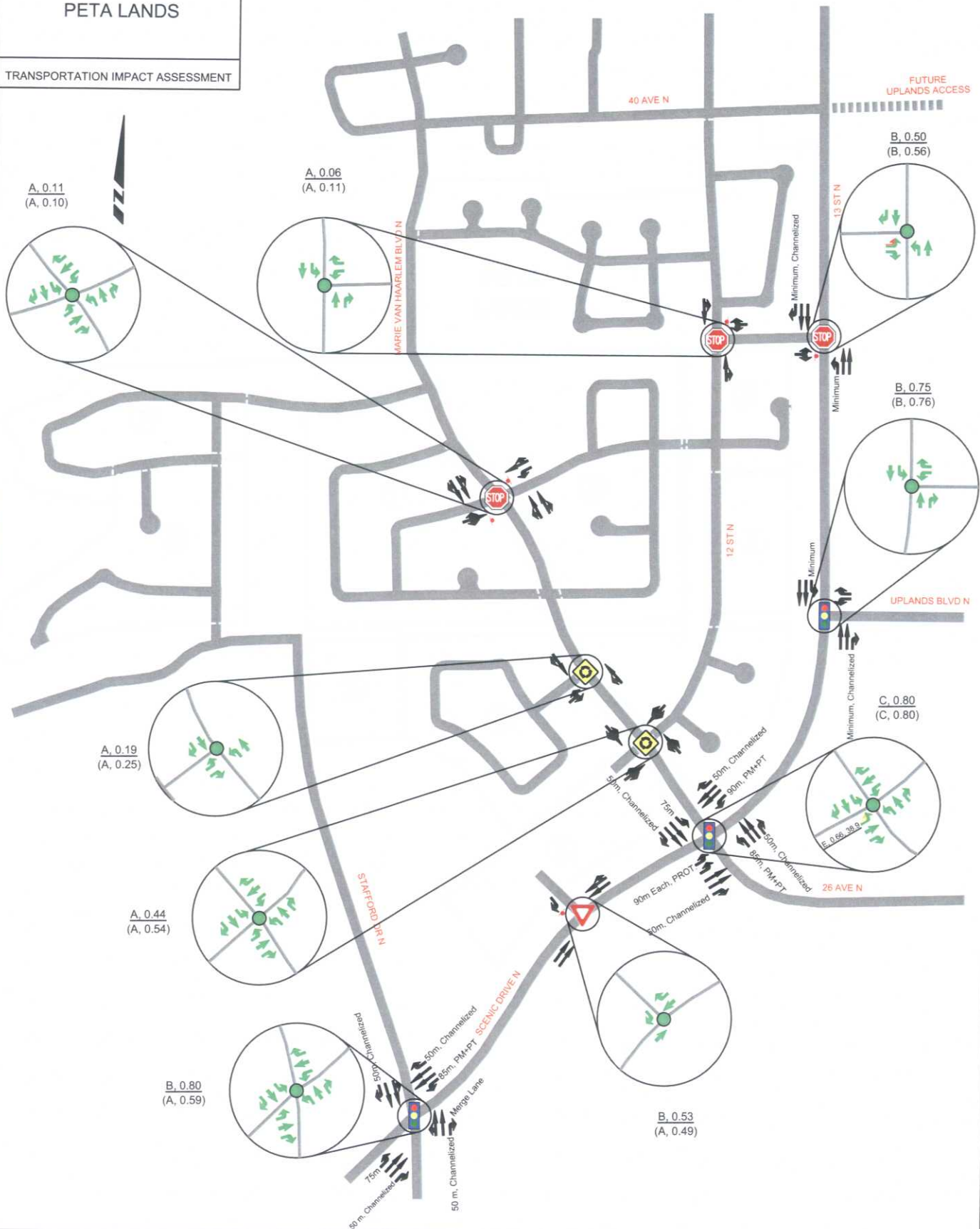

LEGEND

A, 0.29, 10.1 (am MOE)
(A, 0.29, 10.1) (pm MOE)

If green, Overall I/S LOS C or better.
Individual Movements C or better.
V/C = or less than 0.80, Queues reasonable.

SCALE: Not to Scale

Figure 3.1

Intersection Configurations and Measures of Effectiveness (2013 Base Traffic)

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Dwn. BV	Ckd. PAT	Date Sept 05	Project 88713	Dwg.SK031	Rev. 01

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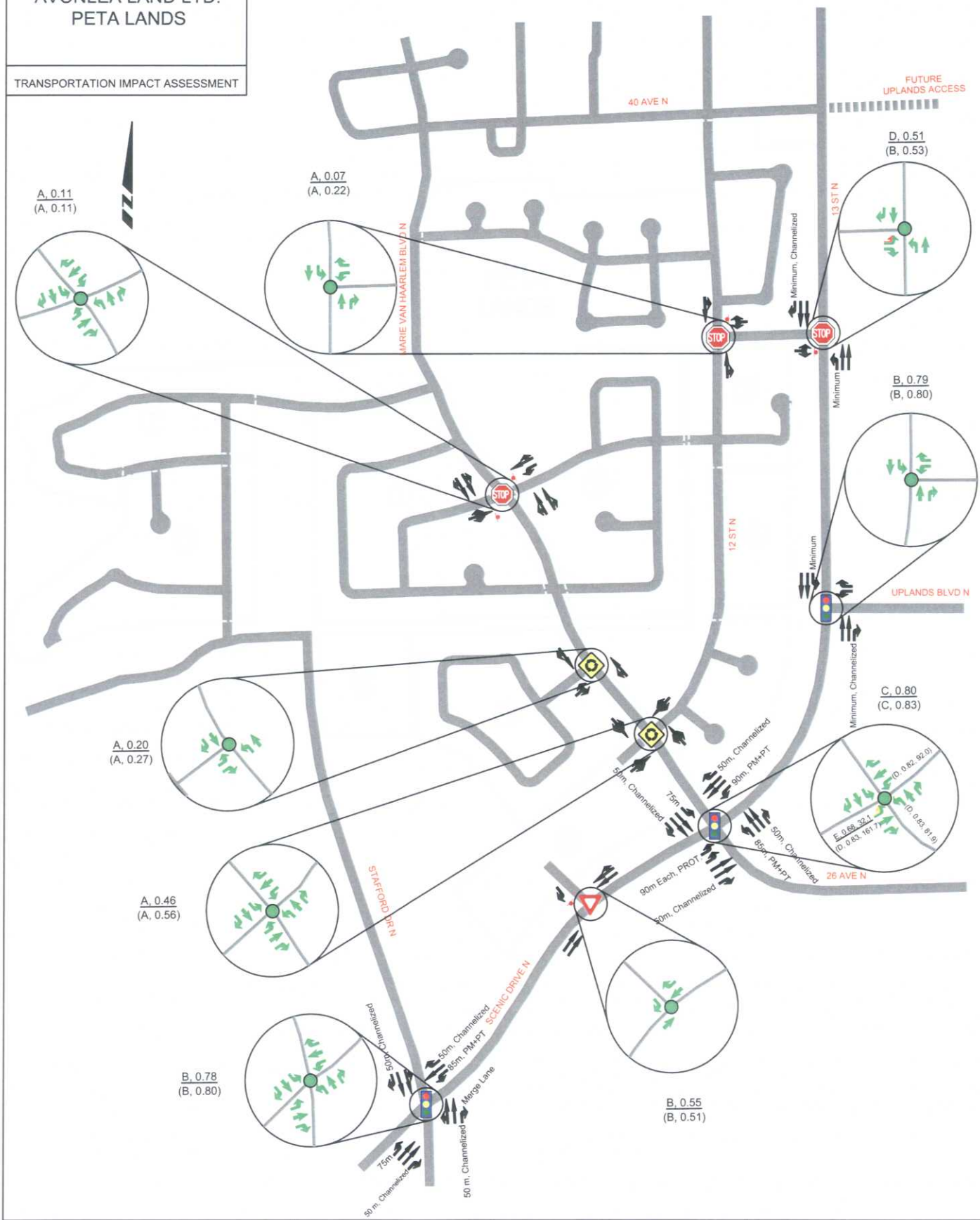

LEGEND

A, 0.29, 10.1 (am MOE)
(A, 0.29, 10.1) (pm MOE)

If green, Overall I/S LOS C or better.
Individual Movements C or better.
V/C = or less than 0.80, Queues reasonable.

SCALE: Not to Scale

Figure 3.2

Intersection Configurations and Measures of Effectiveness (2013 Combined Traffic)

EarthTech
A tyco International Ltd. Company

Dwn. BV	Ckd. PAT	Date Sept 05	Project 88713	Dwg.SK032	Rev. 01

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At the 2013 time horizon, Earth Tech believes that none of the intersections in the study area will be of operational concern with base traffic conditions or total traffic conditions, despite the issues identified above.

3.2.2 2031 Time Horizon

The base 2031 network reflects some alterations to the assumed 2013 network. All three major intersections in the study area: Intersections #1 (Scenic Drive North and Stafford Drive North), #3 (Scenic Drive North and 26 Avenue North/Marie van Haarlem Boulevard) and #7 (Uplands Boulevard/13 Street North) will require improvements to accommodate 2031 base traffic volumes. These improvements are as follows:

Intersection #1:

- Lengthen the westbound left turn lane storage bay to 135m.

Intersection #3 is somewhat more of a concern. The following upgrades and changes are recommended:

- Install northbound dual left turn lanes of 95m storage length (per lane). Revise phasing for the turn to protected-prohibited;
- Increase the northbound right turn storage bay length to 75m;
- Increase the westbound left turn storage bay length to 155m;
- Increase the eastbound right turn storage bay length to 50m; and,
- Close the south E/W crosswalk to accommodate forecasted traffic volumes.

Intersection #7:

- Construct an additional lane each direction on 13 Street North to accommodate forecasted traffic. A single through lane will not accommodate north/south traffic on 13 Street North in the afternoon peak hour and will cause failure of the WBL movement at Intersection #7 (Uplands Boulevard/13 Street North).

The analysis indicate that four lane roadway might not be required at Intersection #8 (13 Street North/35 Avenue), two lanes on 13 Street North will accommodate base traffic, but the EBL movement is still failing. As noted above, this is a very low traffic and is not of concern. An additional northbound left storage lane is required for capacity reasons at the intersection to accommodate the base traffic at this intersection.

As noted on **Figure 3.3**, the configuration shown accommodates 2031 base volumes to accepted levels, except at Intersection #3. Several movements exceed the acceptable City standards and the analysis shows a congested intersection that will be fully utilized.

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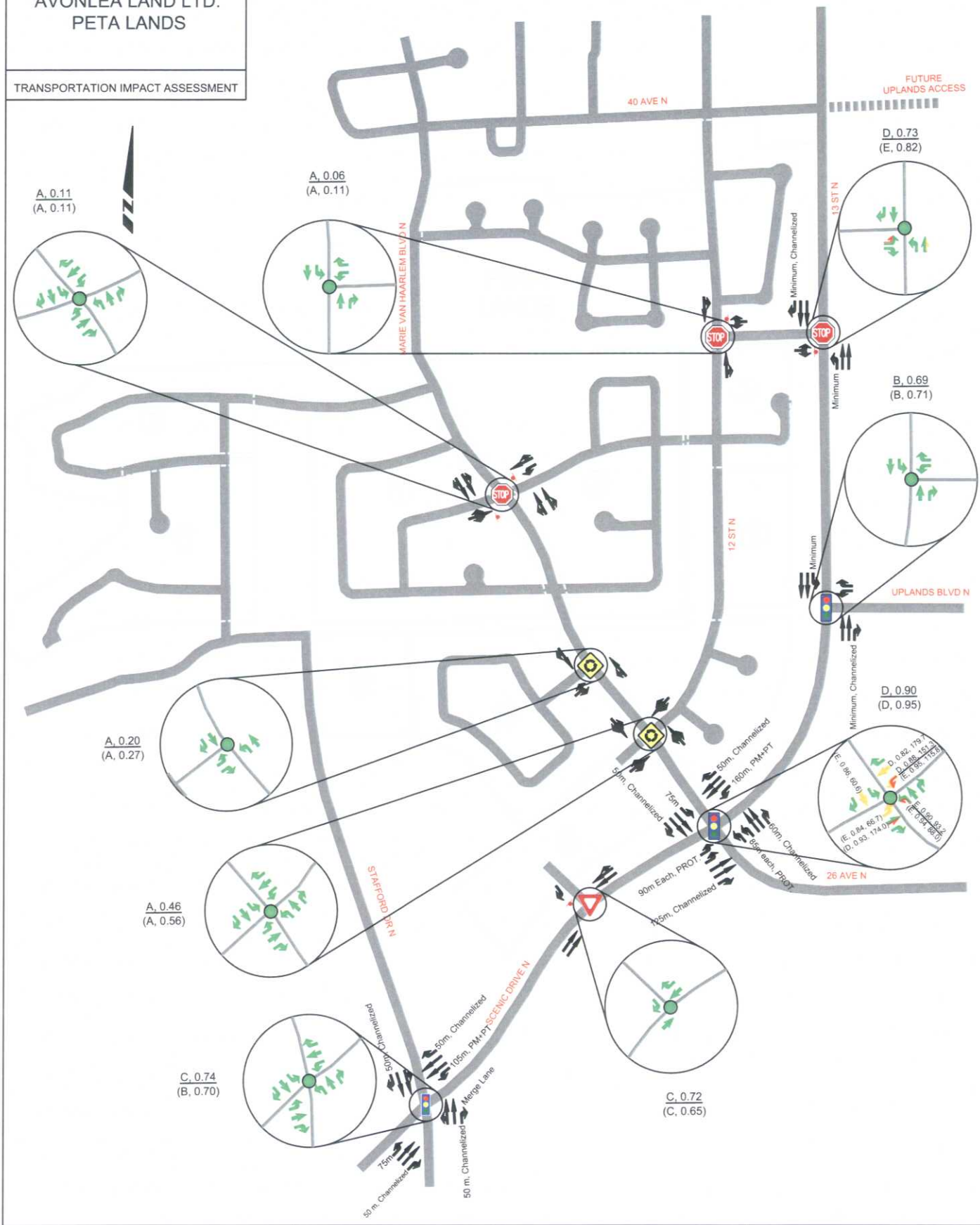

LEGEND

A, 0.29, 10.1 (am MOE)
(A, 0.29, 10.1) (pm MOE)

If green, Overall I/S LOS C or better.
Individual Movements C or better.
V/C = or less than 0.80, Queues reasonable.

SCALE: Not to Scale

Figure 3.3

Intersection Configurations and Measures of Effectiveness (2031 Base Traffic)

EarthTech
A tyco International Ltd. Company

Dwn. BV	Ckd. PAT	Date Sept 05	Project 88713	Dwg.SK033	Rev. 01

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An improvement that would ameliorate intersection operations, but would still be below acceptable standards would be to install three through lanes on Scenic Drive North through the intersection (i.e. three eastbound and westbound through lanes). Although this would be desirable to improve intersection operations at this specific location, it is the only intersection along the corridor in the study area that would have three lanes; space is constrained in the area, and use of the third lane would be suspect if only introduced prior to the intersection and dropped shortly after. Although operations on some movements exceed City of Lethbridge standards, it is not recommended that three through lanes are added on Scenic Drive North.

Figure 3.4 shows the 2031 total traffic volumes (i.e. base plus PETA Lands traffic) and measures of effectiveness. The most significant change is found at Intersection #3 where the maximum v/c ratio value increases from 0.95 to 1.00 for afternoon peak hour traffic volumes. As with base traffic conditions in 2031, a third through lane each direction along Scenic Drive North would help to improve operations at the intersection, but for reasons previously described, is not recommended.

As a result, the addition of PETA Lands traffic will extend the queues at the intersections and would bring the following changes to the base traffic:

- Lengthen Intersection #1 WBL storage bay from 135m to 145m;
- Lengthen the NBR storage bay from 75 m to 100m, the WBL from 155m to 180m and the EBR storage bay from 50m to 60m at Intersection #3; and,
- Add a right turn island and merge lane to accommodate morning peak hour traffic at Intersection #8.

Despite some movements showing operations exceeding City of Lethbridge standards, operations with PETA Lands traffic are not significantly different from those of the 2031 base conditions.

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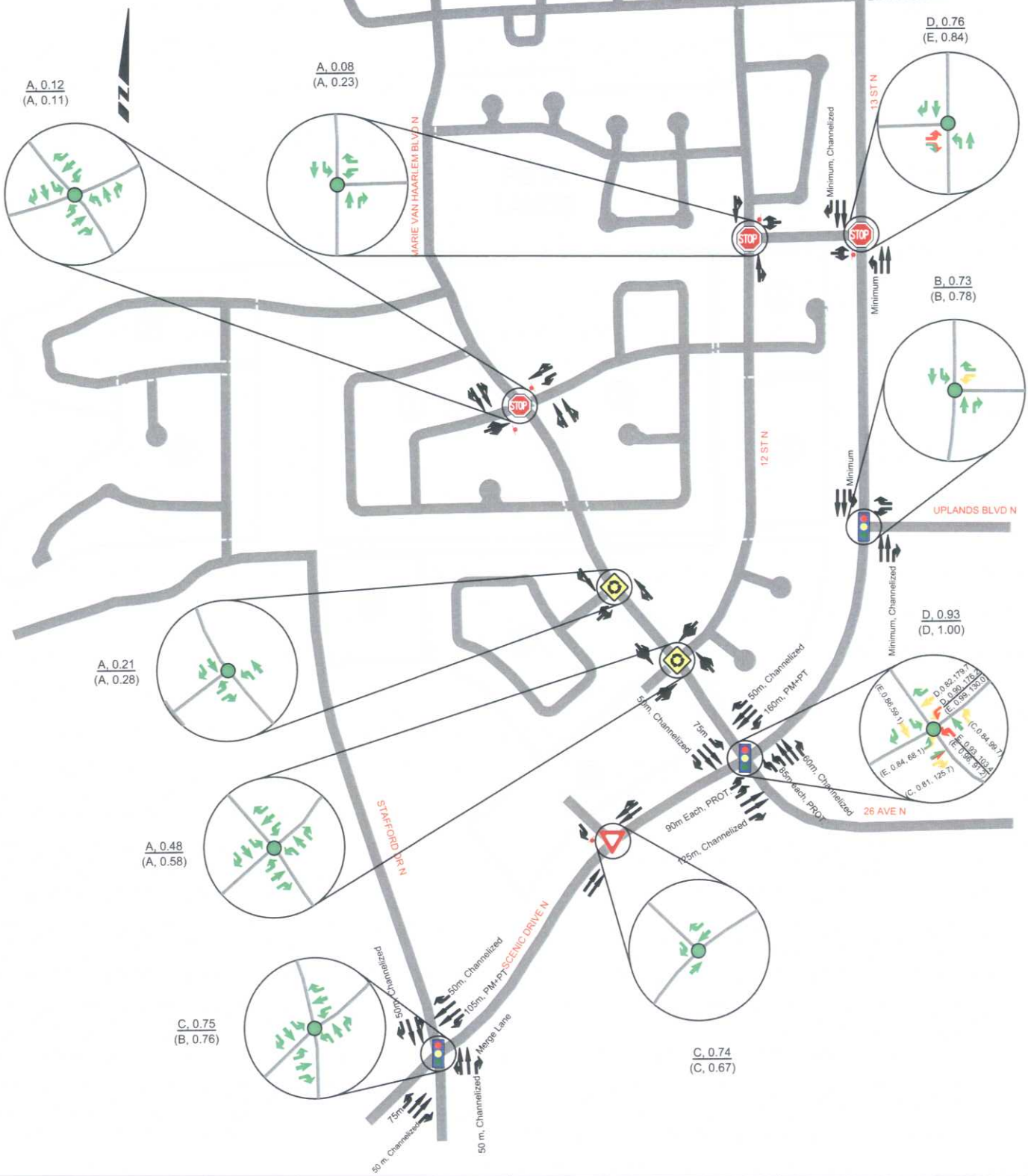
PETA LANDS

TRANSPORTATION IMPACT ASSESSMENT



LEGEND

A, 0.29, 10.1 (am MOE)
(A, 0.29, 10.1) (pm MOE)

If green, Overall I/S LOS C or better.
Individual Movements C or better.
V/C = or less than 0.80, Queues reasonable.

SCALE: Not to Scale

Figure 3.4

Intersection Configurations and Measures of Effectiveness (2031 Combined Traffic)

EarthTech
A tyco International Ltd. Company

Dwn. BV	Ckd. PAT	Date Sept 05	Project 88713	Dwg.SK034	Rev. 01

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4.0 CONCLUSIONS AND RECOMMENDATIONS

Summarizing the results from the Synchro analysis, it is noted that all the intersections will operate well at the 2013 time horizon, slightly exceeding the maximum v/c ratio of 0.80 at the intersection of Scenic Drive North intersection with 26 Avenue North/Marie van Haarlem Boulevard, when PETA Lands traffic is superimposed. Coordination of three intersections in the study area: #1(Stafford Drive North/Scenic Drive North), #3(Scenic Drive North/26 Avenue North/Marie van Haarlem Boulevard) and #7(Uplands Drive/Scenic Drive North) is maintained to improve traffic operation on the network.

The improvements attributed directly to PETA Lands at the 2013 time horizon would be:

- Lengthen of the westbound left turn bay at Intersection #3 (Scenic Drive North/26 Avenue North/Marie van Haarlem Boulevard) from 90 to 105 m;
- Lengthen the north west left turn bay storage bay at Intersection #3 from 85m to 95m; and,
- Lengthen the southwest left storage bay from 85m to 95 m at Intersection #1 (Scenic Drive North/Stafford Drive).

At the 2031 time horizon additional the improvements attributed to the development are as follows:

- Lengthen Intersection #1 WBL storage bay from 135m to 145m;
- Lengthen the NBR storage bay from 75 m to 100m, the WBL from 155m to 180m and the EBR storage bay from 50m to 60m at Intersection #3; and,
- Add a right turn island and merge lane to accommodate morning peak hour traffic at Intersection #8.

Expected Average Annual Daily Traffic (AADT) volumes on the 35 Avenue North connection between Lettice Perry Road and 13 Street North (Scenic Drive North) are in the order of 2,250 vehicles/day, indicating that the connection should be constructed to a Minor Collector classification. All other roads in the PETA Lands development should be built to local classification standards. Given classification, all roadways will adequately serve traffic without additional turn bays and/or parking restrictions (i.e uncontrolled two lane roadways). As a result of this TIA, no other changes are expected to the road classification recommendations of the Legacy Ridge TIA.

It is not believed that shortcutting and calming measures are needed in the development as the majority of traffic will use Marie van Haarlem Blvd. or 13 Street North to access adjacent developments.

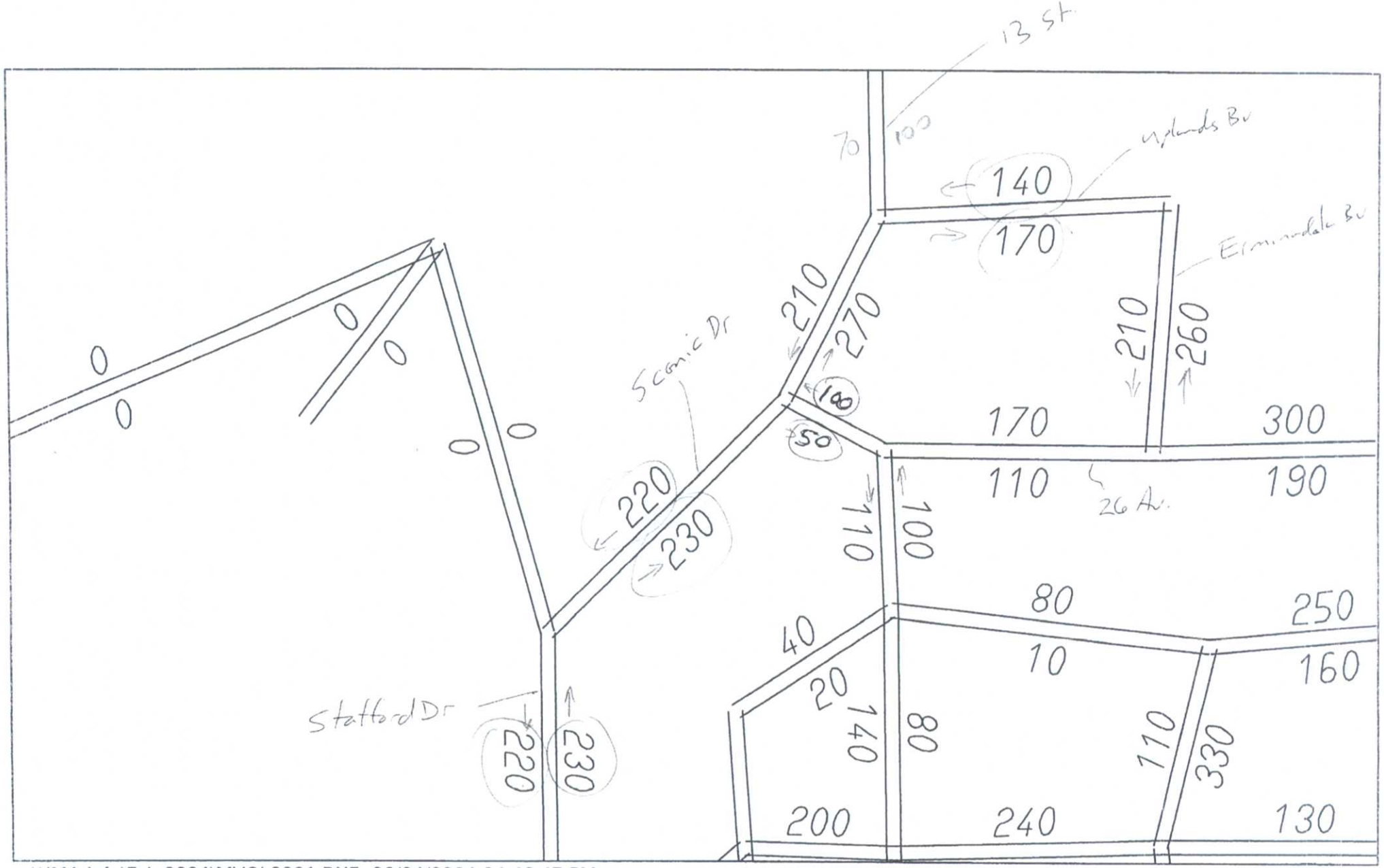
With the 2031 forecasted volumes in place, Intersection #3 will operate at its maximum capacity with movements that will not meet accepted City standards with 2031 base traffic

volumes. The widening of Scenic Drive North to three through lanes through the intersection is an option to improve operations that the City could consider, but the fit into the greater network should be respected.

Considering the 2013 and 2031 resulting measures of effectiveness, and the relatively small volume of traffic generated by the PETA Lands development, Earth Tech believes that the PETA Lands development will have a small impact on operations at the Scenic Drive North and 26 Avenue North/Marie van Haarlem intersection and will bring no significant changes in the overall operations for the greater road network in the 2013 and 2031 time horizons.

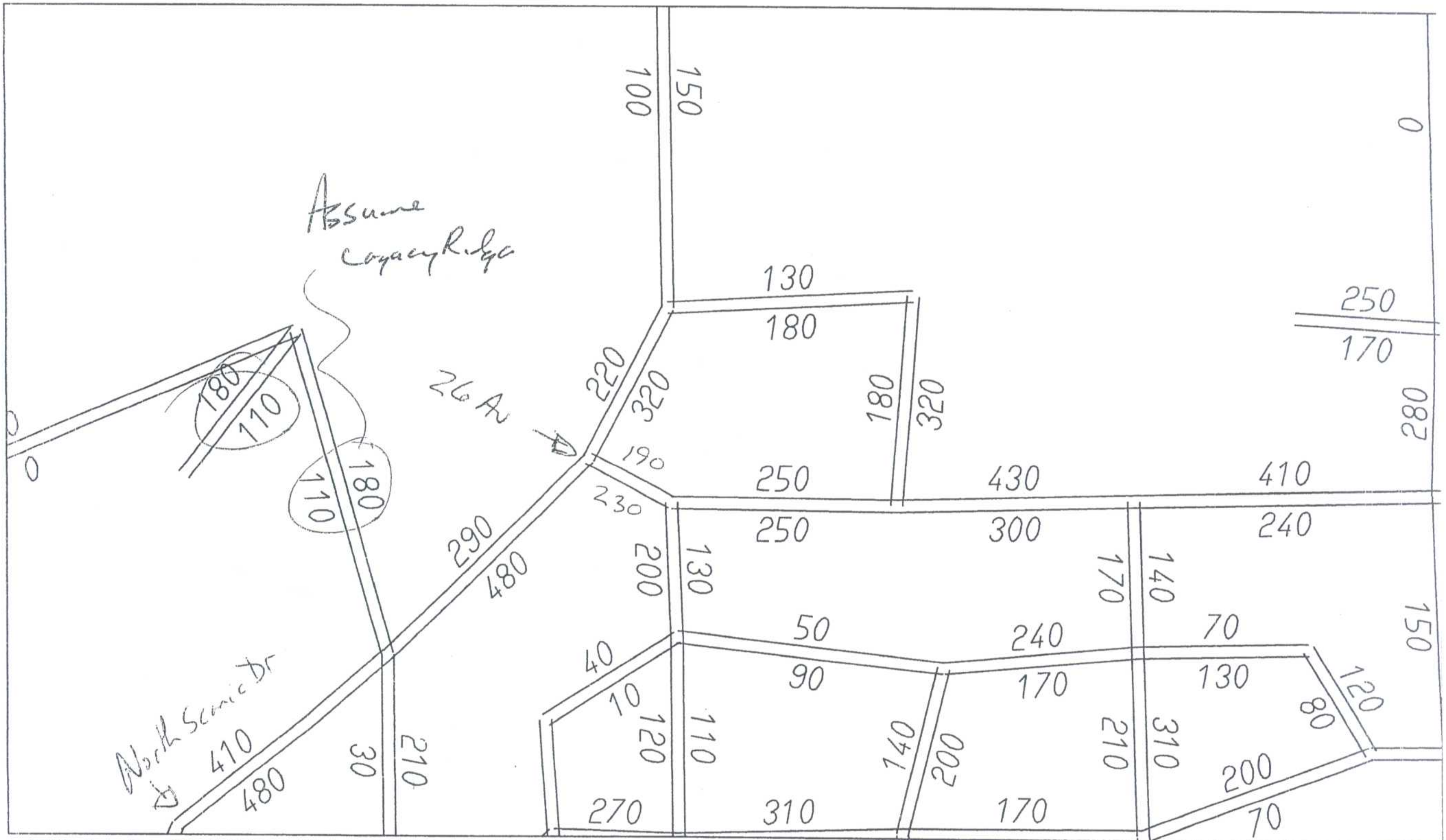
Appendix A

2013 and 2031 EMME/2 Traffic Model Forecasts



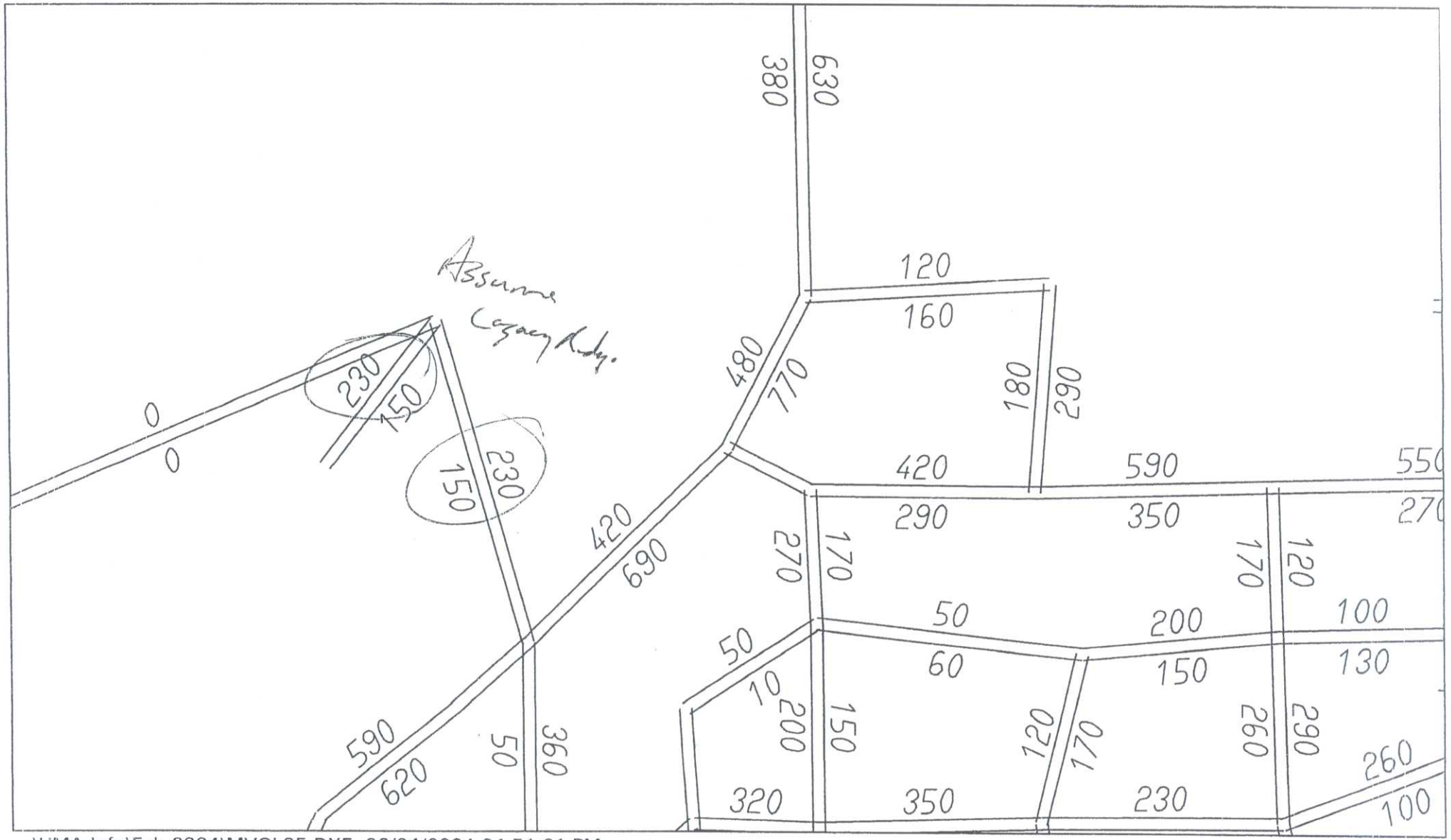
...\UMA Info\Feb 2004\MVOL2001.DXF 06/04/2004 04:46:47 PM

Existing (2001) PM



...\UMA Info\Feb 2004\MV832.DXF 06/04/2004 04:50:28 PM

2013 PM


380
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320
350
230
100
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Assume Legacy Rdy.
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2031 PM

Appendix B

Legacy Ridge
Percentage Assignments

AVONLEA LAND LTD.
PETA LANDS

TRANSPORTATION IMPACT ASSESSMENT

LEGEND
Outbound Traffic %
Inbound Traffic %

SCALE: Not to Scale

Figure B.1

Zone 1 Distribution

EarthTech
A tyco International Ltd. Company

Dwn. BV	Ckd. PAT	Date Sept 05	Project 88713	Dwg.SK002	Rev. 01

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AVONLEA LAND LTD.
PETA LANDS

TRANSPORTATION IMPACT ASSESSMENT

LEGEND
Outbound Traffic %
Inbound Traffic %

SCALE: Not to Scale

Figure B.2

Zone 2 Distribution

EarthTech
A tyco International Ltd. Company

Dwn. BV	Ckd. PAT	Date Sept 05	Project 88713	Dwg.SK003	Rev. 01

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AVONLEA LAND LTD.
PETA LANDS

TRANSPORTATION IMPACT ASSESSMENT

LEGEND
Outbound Traffic %
Inbound Traffic %

SCALE: Not to Scale

Figure B.3

Zone 3 Distribution

EarthTech
A tyco International Ltd. Company

Dwn. BV	Ckd. PAT	Date Sept 05	Project 88713	Dwg.SK004	Rev. 01

L:\Work\88000\88713\02a-CAD\GFI\TRA\PUBLISHED\05.10.17\Figure B.03, SK004 - Zone 3.dwg

AVONLEA LAND LTD.
PETA LANDS

TRANSPORTATION IMPACT ASSESSMENT

LEGEND
Outbound Traffic %
Inbound Traffic %

SCALE: Not to Scale

Figure B.4

Zone 4 Distribution

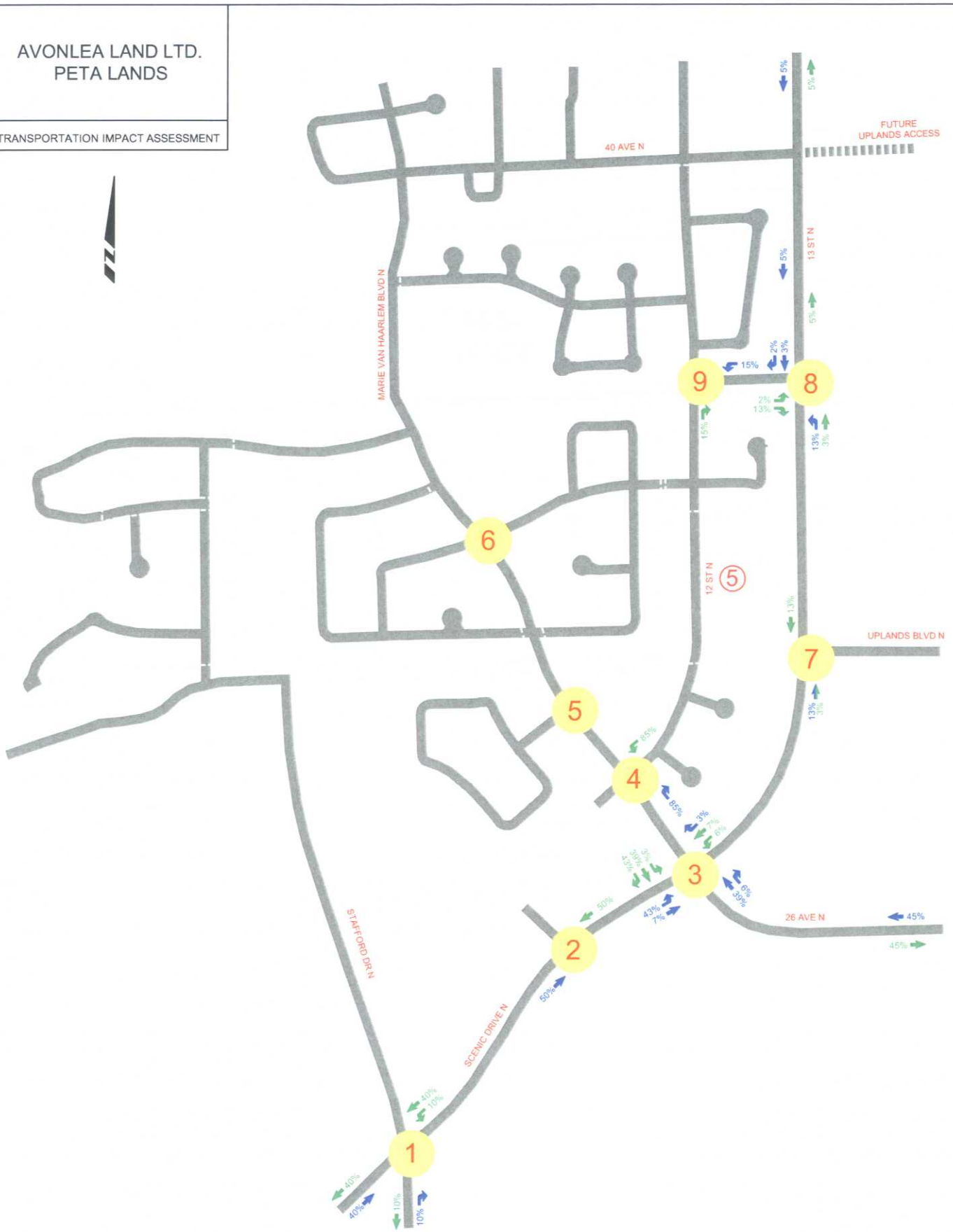
EarthTech
A tyco International Ltd. Company

Dwn. BV	Ckd. PAT	Date Sept 05	Project 88713	Dwg.SK005	Rev. 01

L:\Work\88000\88713\02a-CAD\GFI\TRA\PUBLISHED\05.10.17\Figure B.04, SK005 - Zone 4.dwg

AVONLEA LAND LTD.
PETA LANDS

TRANSPORTATION IMPACT ASSESSMENT



LEGEND
Outbound Traffic %
Inbound Traffic %

SCALE: Not to Scale

Figure B.5

Zone 5 Distribution

Dwn. BV	Ckd. PAT	Date Sept 05	Project 88713	Dwg.SK006	Rev. 01

EarthTech
A tyco International Ltd. Company

L:\Work\88000\88713\02a-CAD\GFI\TRA\PUBLISHED\05.10.17\Figure B.05, SK006 - Zone 5.dwg

AVONLEA LAND LTD.
PETA LANDS

TRANSPORTATION IMPACT ASSESSMENT

LEGEND
Outbound Traffic %
Inbound Traffic %

SCALE: Not to Scale

Figure B.6

Zone 6 Distribution

EarthTech
A tyco International Ltd. Company

Dwn. BV	Ckd. PAT	Date Sept 05	Project 88713	Dwg.SK007	Rev. 01

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AVONLEA LAND LTD.
PETA LANDS

TRANSPORTATION IMPACT ASSESSMENT

LEGEND
Outbound Traffic %
Inbound Traffic %

SCALE: Not to Scale

Figure B.7

Zone 7 Distribution

EarthTech
A tyco International Ltd. Company

Dwn. BV	Ckd. PAT	Date Sept 05	Project 88713	Dwg.SK008	Rev. 01

L:\Work\88000\88713\02a-CAD\GFI\TRA\PUBLISHED\05.10.17\Figure B.07, SK008 - Zone 7.dwg

AVONLEA LAND LTD.
PETA LANDS

TRANSPORTATION IMPACT ASSESSMENT

LEGEND
Outbound Traffic %
Inbound Traffic %

SCALE: Not to Scale

Figure B.8

Zone 8 Distribution

EarthTech
A tyco International Ltd. Company

Dwn. BV	Ckd. PAT	Date Sept 05	Project 88713	Dwg.SK009	Rev. 01

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AVONLEA LAND LTD.
PETA LANDS

TRANSPORTATION IMPACT ASSESSMENT

LEGEND
Outbound Traffic %
Inbound Traffic %

SCALE: Not to Scale

Figure B.9
Zone 9 Distribution
Non-Passby 30% External

EarthTech
A tyco International Ltd. Company

Dwn.	Ckd.	Date	Project	Dwg.	Rev.
BV	PAT	Sept 05	88713	SK010	01

L:\Work\88000\88713\02a-CAD\GFI\TRA\PUBLISHED\05.10.17\Figure B.09, SK010 - Zone 9 NPB 30% Ext.dwg

AVONLEA LAND LTD.
PETA LANDS

TRANSPORTATION IMPACT ASSESSMENT

LEGEND
Outbound Traffic %
Inbound Traffic %

SCALE: Not to Scale

Figure B.10
Zone 9 Distribution
Non-Passby 20% Internal

EarthTech
A tyco International Ltd. Company

Dwn. BV	Ckd. PAT	Date Sept 05	Project 88713	Dwg.SK023	Rev. 00

L:\Work\88000\88713\02a-CAD\GFI\TRA\PUBLISHED\05.10.17\Figure B.10, SK023 - Zone 9 NPB 20% Int.dwg

AVONLEA LAND LTD.
PETA LANDS

TRANSPORTATION IMPACT ASSESSMENT

LEGEND
Outbound Traffic %
Inbound Traffic %

SCALE: Not to Scale

Figure B.11
Zone 9 Distribution
Passby 10% Inbound

EarthTech
A tyco International Ltd. Company

Dwn.	Ckd.	Date	Project	Dwg.	Rev.
BV	PAT	Sept 05	88713	SK011	01

L:\Work\88000\88713\02a-CAD\GFI\TRA\PUBLISHED\05.10.17\Figure B.11, SK011 - Zone 9 PB 10% IB.dwg

AVONLEA LAND LTD.
PETA LANDS

TRANSPORTATION IMPACT ASSESSMENT

LEGEND

Outbound Traffic %

Inbound Traffic %

SCALE: Not to Scale

Figure B.12

Zone 9 Distribution
Passby 40% Outbound

EarthTech
A tyco International Ltd. Company

Dwn. BV	Ckd. PAT	Date Sept 05	Project 88713	Dwg.SK012	Rev. 01

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AVONLEA LAND LTD.
PETA LANDS

TRANSPORTATION IMPACT ASSESSMENT

LEGEND

Inbound Traffic % →

SCALE: Not to Scale

Figure B.13

Elementary School Distribution (Staff)

EarthTech
A tyco International Ltd. Company

Dwn.	Ckd.	Date	Project	Dwg.	Rev.
BV	PAT	Sept 05	88713	SK024	00

L:\Work\88000\88713\02a-CAD\GFI\TRA\PUBLISHED\05.10.17\Figure B.13, SK024 - School Distribution Staff.dwg

AVONLEA LAND LTD.
PETA LANDS

TRANSPORTATION IMPACT ASSESSMENT

LEGEND
Outbound Traffic %
Inbound Traffic %

SCALE: Not to Scale

Figure B.14
Elementary School Distribution (Parents)

EarthTech
A tyco International Ltd. Company

Dwn. BV	Ckd. PAT	Date Sept 05	Project 88713	Dwg.SK025	Rev. 00

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Appendix C

2013 and 2031
Trip Generation

2013 Morning Peak Hour Traffic Generation

Zone	Size	Type	Units	Trips/DU	Average Trip Rate	Fitted Equation	Higher?	AM Trip Rate (veh/hr)		
								Inbound	Outbound	Total
1	156	Single Family	DU	0.77	120	121	Fitted	32	90	121
2	169	Single Family	DU	0.77	130	130	Fitted	34	96	130
3	112	Single Family	DU	0.77	86	90	Fitted	24	67	90
4	67	Single Family	DU	0.77	52	59	Fitted	15	44	59
5	189	Multi Family	DU	0.75	142	104	Average	23	119	142
6	192	Multi Family	DU	0.75	144	106	Average	23	121	144
7	0	Single Family	DU	0.77	0	0	Average	0	0	0
8	0	Single Family	DU	0.77	0	0	Average	0	0	0
9	8	Gas w/ Store	Pumps	10.06	80	N/A	Average	40	40	80
	6	Fast Food w/ DT	1000 ft^2 GFA	53.11	319	N/A	Average	163	156	319
	3	Convenience Store	1000 ft^2 GFA	65.39	196	213	Fitted	106	106	213
	135	Retail	1000 ft^2 GFA	1.03	139	187	Fitted	114	73	187
	425	Elem. School	Students	0.42	179	147	Average	98	80	179
UPLANDS	831	Single Family	DU	0.77	640	594	Average	166	474	640
MELCOR	267	Single Family	DU	0.77	206	199	Average	53	152	206
	183	Multi Family	DU	0.75	137	101	Average	22	115	137
HARDIEV.	168	Single Family	DU	0.77	129	130	Fitted	34	96	130
PETA	205	Single Family	DU	0.77	158	156	Average	41	117	158

Total Legacy Ridge	672	993	1,665
Total Base	947	1,830	2,777
Total PETA	41	117	158
GRAND TOTAL	**988**	**1,947**	**2,935**

2013 Afternoon Peak Hour Traffic Generation

Zone	Size	Type	Units	Trips/DU	Average Trip Rate	Fitted Equation	Higher?	PM Trip Rate (veh/hr)		
								Inbound	Outbound	Total
1	156	Single Family	DU	1.02	159	165	Fitted	105	59	165
2	169	Single Family	DU	1.02	172	177	Fitted	113	64	177
3	112	Single Family	DU	1.02	114	123	Fitted	79	44	123
4	67	Single Family	DU	1.02	68	78	Fitted	50	28	78
5	189	Multi Family	DU	0.92	174	99	Average	116	57	174
6	192	Multi Family	DU	0.92	177	100	Average	118	58	177
7	0	Single Family	DU	1.02	0	0	Average	0	0	0
8	0	Single Family	DU	1.02	0	0	Average	0	0	0
9	8	Gas w/ Store	Pumps	13.38	107	N/A	Average	54	54	107
	6	Fast Food w/ DT	1000 ft^2 GFA	34.64	208	N/A	Average	108	100	208
	3	Convenience Store	1000 ft^2 GFA	53.73	161	169	Fitted	83	86	169
	135	Retail	1000 ft^2 GFA	3.75	506	763	Fitted	366	397	763
UPLANDS	831	Single Family	DU	1.02	848	730	Average	542	305	848
MELCOR	267	Single Family	DU	1.02	272	266	Average	174	98	272
	183	Multi Family	DU	0.92	168	96	Average	113	56	168
HARDIEV.	168	Single Family	DU	1.02	171	176	Fitted	113	63	176
PETA	205	Single Family	DU	1.02	209	210	Fitted	134	76	210

Total Legacy Ridge	1,192	947	2,139
Total Base	2,134	1,469	3,604
Total PETA	134	76	210
GRAND TOTAL	**2,269**	**1,545**	**3,814**

2031 Morning Peak Hour Traffic Generation

Zone	Size	Type	Units	Trips/DU	Average Trip Rate	Fitted Equation	Higher?	AM Trip Rate (veh/hr)		
								Inbound	Outbound	Total
1	156	Single Family	DU	0.77	120	121	Fitted	32	90	121
2	169	Single Family	DU	0.77	130	130	Fitted	34	96	130
3	112	Single Family	DU	0.77	86	90	Fitted	24	67	90
4	67	Single Family	DU	0.77	52	59	Fitted	15	44	59
5	189	Multi Family	DU	0.75	142	104	Average	23	119	142
6	192	Multi Family	DU	0.75	144	106	Average	23	121	144
7	86	Single Family	DU	0.77	66	72	Fitted	19	53	72
8	88	Single Family	DU	0.77	68	74	Fitted	19	55	74
9	8	Gas w/ Store	Pumps	10.06	80	N/A	Average	40	40	80
	6	Fast Food w/ DT	1000 ft^2 GFA	53.11	319	N/A	Average	163	156	319
	3	Convenience Store	1000 ft^2 GFA	65.39	196	213	Fitted	106	106	213
	135	Retail	1000 ft^2 GFA	1.03	139	187	Fitted	114	73	187
	425	Elem. School	Students	0.42	179	147	Average	98	80	179
UPLANDS	831	Single Family	DU	0.77	640	594	Average	166	474	640
MELCOR	267	Single Family	DU	0.77	206	199	Average	53	152	206
	183	Multi Family	DU	0.75	137	101	Average	22	115	137
HARDIEV.	168	Single Family	DU	0.77	129	130	Fitted	34	96	130
PETA	205	Single Family	DU	0.77	158	156	Average	41	117	158

Total Legacy Ridge	710	1,101	1,811
Total Base	985	1,938	2,923
Total PETA	41	117	158
GRAND TOTAL	**1,026**	**2,055**	**3,081**

2031 Afternoon Peak Hour Traffic Generation

Zone	Size	Type	Units	Trips/DU	Average Trip Rate	Fitted Equation	Higher?	PM Trip Rate (veh/hr)		
								Inbound	Outbound	Total
1	156	Single Family	DU	1.02	159	165	Fitted	105	59	165
2	169	Single Family	DU	1.02	172	177	Fitted	113	64	177
3	112	Single Family	DU	1.02	114	123	Fitted	79	44	123
4	67	Single Family	DU	1.02	68	78	Fitted	50	28	78
5	189	Multi Family	DU	0.92	174	99	Average	116	57	174
6	192	Multi Family	DU	0.92	177	100	Average	118	58	177
7	86	Single Family	DU	1.02	88	97	Fitted	62	35	97
8	88	Single Family	DU	1.02	90	99	Fitted	63	36	99
9	8	Gas w/ Store	Pumps	13.38	107	N/A	Average	54	54	107
	6	Fast Food w/ DT	1000 ft^2 GFA	34.64	208	N/A	Average	108	100	208
	3	Convenience Store	1000 ft^2 GFA	53.73	161	169	Fitted	83	86	169
	135	Retail	1000 ft^2 GFA	3.75	506	763	Fitted	366	397	763
UPLANDS	831	Single Family	DU	1.02	848	730	Average	542	305	848
MELCOR	267	Single Family	DU	1.02	272	266	Average	174	98	272
	183	Multi Family	DU	0.92	168	96	Average	113	56	168
HARDIEV.	168	Single Family	DU	1.02	171	176	Fitted	113	63	176
PETA	205	Single Family	DU	1.02	209	210	Fitted	134	76	210

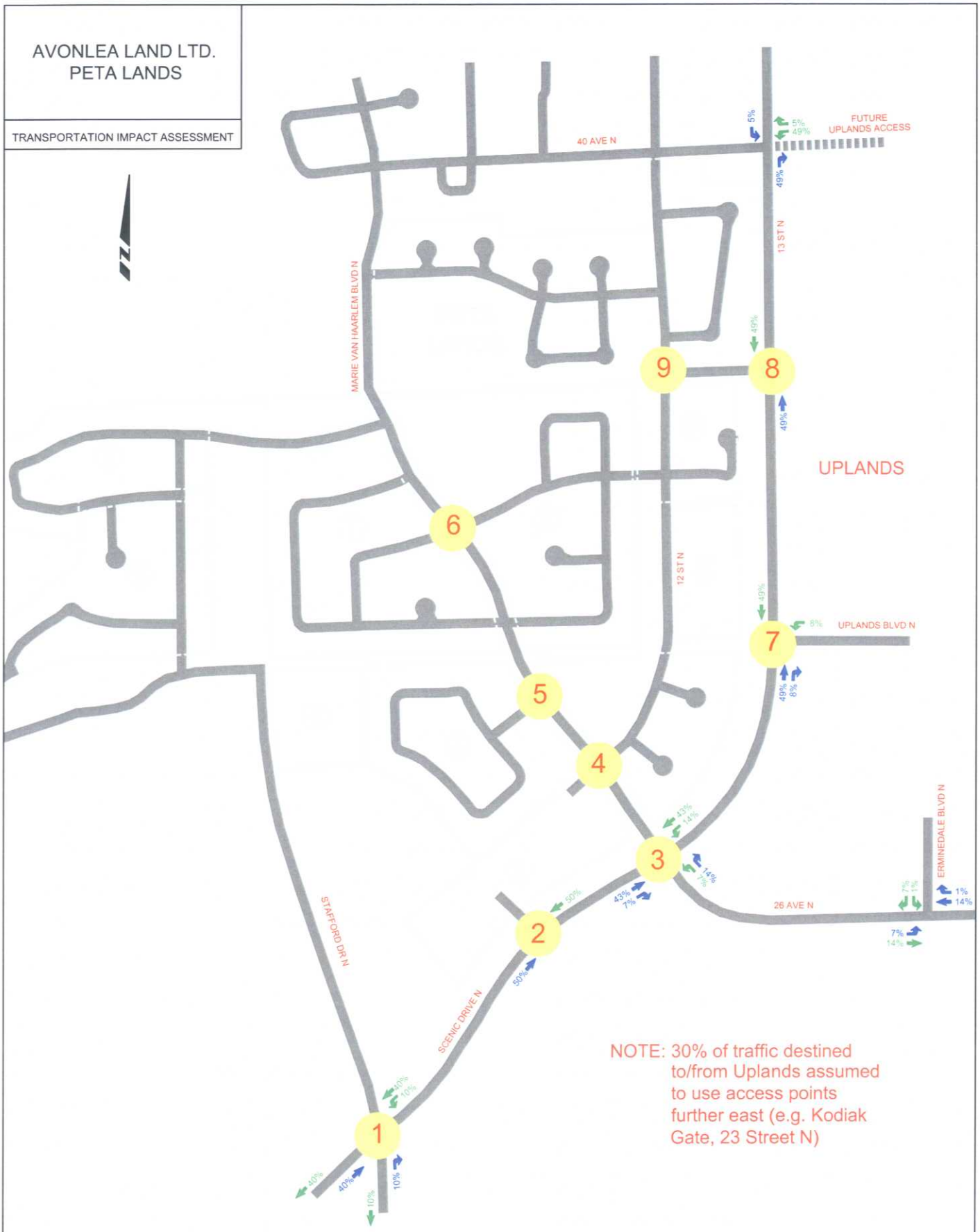
Total Legacy Ridge	1,318	1,017	2,335
Total Base	2,260	1,540	3,799
Total PETA	134	76	210
GRAND TOTAL	**2,394**	**1,615**	**4,010**

Appendix D

Surrounding Land Percentage Assignments

AVONLEA LAND LTD.
PETA LANDS

TRANSPORTATION IMPACT ASSESSMENT



LEGEND
Outbound Traffic %
Inbound Traffic %

SCALE: Not to Scale

Figure D.1
Uplands Distribution
(Additional Traffic)

EarthTech
A tyco International Ltd. Company

Dwn. EB	Ckd. PAT	Date Sept 05	Project 88713	Dwg.SK018	Rev. 01

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AVONLEA LAND LTD.
PETA LANDS

TRANSPORTATION IMPACT ASSESSMENT

LEGEND
Outbound Traffic %
Inbound Traffic %

SCALE: Not to Scale

Figure D.2

Melcor Distribution

EarthTech
A tyco International Ltd. Company

Dwn. EB	Ckd. PAT	Date Sept 05	Project 88713	Dwg.SK017	Rev. 01

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AVONLEA LAND LTD.
PETA LANDS

TRANSPORTATION IMPACT ASSESSMENT

LEGEND
Outbound Traffic %
Inbound Traffic %

SCALE: Not to Scale

Figure D.3

Hardieville Distribution

EarthTech
A tyco International Ltd. Company

Dwn. EB	Ckd. PAT	Date Sept 05	Project 88713	Dwg.SK016	Rev. 01

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AVONLEA LAND LTD.
PETA LANDS

TRANSPORTATION IMPACT ASSESSMENT

LEGEND
Outbound Traffic %
Inbound Traffic %

SCALE: Not to Scale

Figure D.4

PETA Lands Distribution

EarthTech
A tyco International Ltd. Company

Dwn. BV	Ckd. PAT	Date Sept 05	Project 88713	Dwg.SK013	Rev. 01

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Appendix E

City of Lethbridge
Synchro Standards

City of Lethbridge Synchro Factors

The following factors and methodologies are to be used for in Synchro analyses submitted to the City of Lethbridge with Traffic Impact Assessments.

Lane Window

- Ideal Sat. Flow = 1750 for all movements
- Use DEFAULT for remaining categories in Lane window.

Volume Window

- Conflicting peds = apply data where available. Future horizons should consider potential pedestrian movements
- Conflicting bikes = apply where available
- Peak Hour Factor = 0.88 or actual (0.88 is recommended by Trafficware for areas with uniform flow and a recognizable peak, ie small cities) **NOTE:** *If analysis is completed with 15 minute data a PHF =1.0 is required.*
- Growth Factor = 1.0
- Heavy Vehicles = Enter if known. Otherwise non-industrial areas use 5% on main street and 2% on side street. Use 10% for all roads in Industrial areas.
- Bus blockages = applicable where available
- Traffic from midblock = apply where available
- Link OD Volumes = any alterations must be documented in detail
- Lane Group Flow = Default
- Vehicle clearances and existing signal timing – Contact Traffic Operations

Timing Window (Signals)

- Minimum Initial Main Street = 20 seconds or pedestrian time (sum of walk and ped clearance), whichever is greater.
- Minimum Initial Sidestreet = 10 seconds or pedestrian time (sum of walk and ped clearance), whichever is greater.
- Minimum Initial Arrows = 5 seconds
- A recall (pedestrian or minimum) should be placed on the main street unless the intersection operates in a fixed time (pretimed) mode.
- A recall should NOT be placed on the minor street or turns.

Phasing Window

- Pedestrian Walk Time = minimum of 6 seconds
- Pedestrian Clearance Time = minimum use actual crossing distance and 1.2 m/s. In areas with high senior citizen crossing volumes the walking speed will be reduced to 1.0 m/s.
- Pedestrian Calls = approximate from counts where available

- Minimum Splits for Arrows = 10 seconds plus clearance. In extreme cases 8 seconds plus clearance for protected/permitted arrows, 9 seconds plus clearance for protected only arrows.
- Dual Entry = Yes
- All other factors to be default/calculated values.

General Comments

- If an arrow is required in one peak hour it should be included in the analysis of all peak hours.
- Summaries must include V/C ratios, LOS values and queue lengths.

Alberta
ENVIRONMENT

APPROVAL

PURSUANT TO THE PROVISIONS OF THE *WATER ACT*

APPROVAL No. 00223835-00-00

FILE No. 00223835

Avonlea Land Corporation
1225 Great Lake Place South
Lethbridge, AB
T1K 6R6

is authorized to construct stormwater management structures adjacent to an unnamed water body subject to the attached conditions.

DECEMBER 23, 2030
Expiry Date

Dave McGee
Designated Director under the Act

DEC 2 3 2005
Dated

Approval No. 00221701-00-00
File No. 00223835

CONDITIONS

ACTIVITY

1. This approval is appurtenant to NE 18-009-21-W4.

2. The approval holder shall undertake the activity in accordance with the plans and/or reports filed in the following Departmental records:

NUMBER	TITLE
00223835-P001	Location Plan
00223835-P002	Drainage Systems

3. The approval holder shall confine the activity to the work area designated on the plans or to areas as prescribed in the approval.

4. The approval holder shall not deposit any substance that will adversely affect the water body.

5. The approval holder shall prevent siltation and erosion of the water body resulting from the activity.

GENERAL

6. The approval holder shall retain a copy of this approval at the site of the activity.

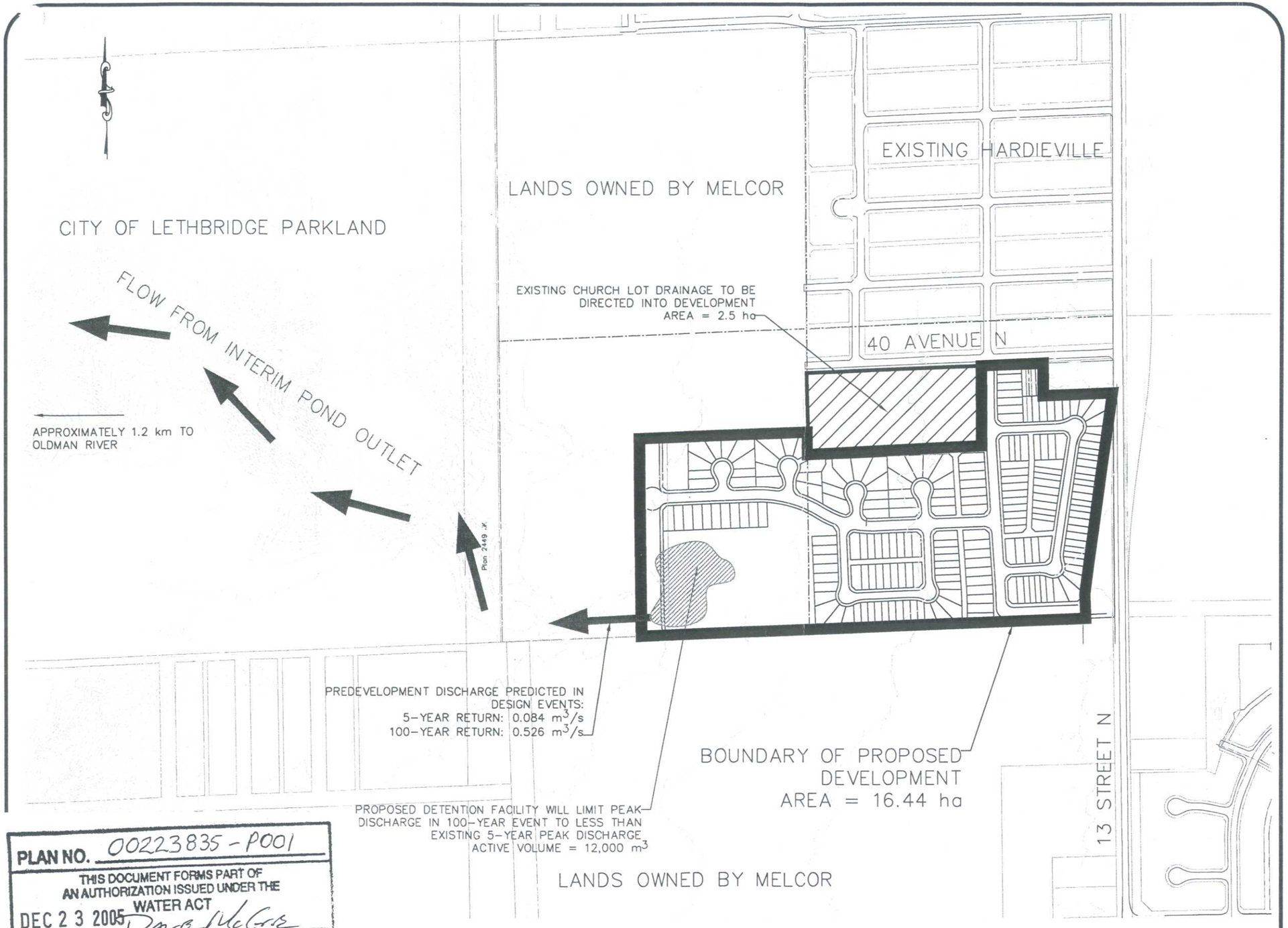
7. On completion, partial completion of the activity, or when requested by the Director, the approval holder shall submit to the Director a certificate of completion which includes:

   (a) a statement that the activity or that part of the activity has been completed in accordance with the approval, and

   (b) any other information required by the Director.

Designated Director under the Act

DEC 2 3 2005
Dated



PLAN NO. 00223835-P001
THIS DOCUMENT FORMS PART OF AN AUTHORIZATION ISSUED UNDER THE WATER ACT
DEC 2 3 2005
DATE
DESIGNATED DIRECTOR UNDER THE ACT

Legacy Ridge Development

CONTOURS ARE AT 2.5-m INTERVALS BASED ON CITY OF LETHBRIDGE AERIAL SURVEY

Scale: 1:5,000

MARTIN GEOMATIC CONSULTANTS LTD.
Consulting Engineers, Planners, and Land Surveyors

Fig. SK-1

LOCATION PLAN & OFFSITE DRAINAGE (INTERIM)

PLAN NO. 00223835-P001
THIS DOCUMENT FORMS PART OF AN AUTHORIZATION ISSUED UNDER THE WATER ACT
DEC 23 2005 (DATE) David McGee (DESIGNATED DIRECTOR UNDER THE ACT)

MELCOR LANDS
(FUTURE DEVELOPMENT)

40 AVENUE N

FUTURE DRAINAGE TO BE ROUTED TO NORTH TO TIE TO FUTURE PERMANANET STORMWATER MANAGEMENT FACILITY

REQUIRE 12,000 m^3 DETENTION STORAGE

CONTROL FLOW TO 0.084 m^3/s

FUTURE NORTH SCENIC DR

13 STREET N

MELCOR LANDS
(FUTURE DEVELOPMENT)

Legacy Ridge Development

PROPOSED STORM SEWER

PROPOSED OVERLAND FLOW ROUTE

PROPOSED STORMWATER MANAGEMENT

PROPOSED FLOW CONTROL STRUCTURE

CONTOURS ARE AT 0.5-m INTERVALS BASED ON CITY OF LETHBRIDGE AERIAL SURVEY

Scale: 1:2,000

MARTIN GEOMATIC CONSULTANTS LTD.
Consulting Engineers, Planners, and Land Surveyors

Fig. SK-2

PROPOSED ONSITE MAJOR & MINOR DRAINAGE SYSTEMS

Legacy Ridge-Residential Subdivision
SANITARY DESIGN

6893-CE-0476

						(.60-3.1m/s)			28-Feb-06			
From	From	Ref.	Added area	Size	Slope	Capacity	Velocity	Length	Street Elevation		M.H. Invert	
M.H.	M.H.		(Hectares)	mm	%	m^3/sec.	m/sec.	m	upper	lower	upper	lower
214	202			200	0.80	0.029	0.934	74.840	911.650	911.427	908.650	908.051
200	201			200	0.60	0.025	0.809	94.663	912.187	911.657	909.287	908.719
201	202			200	0.60	0.025	0.809	110.403	911.657	911.427	908.659	907.997
202	203			200	0.60	0.025	0.809	119.587	911.427	910.394	907.937	907.219
200	210			200	0.80	0.029	0.934	93.546	912.187	911.880	909.287	908.539
210	211			200	0.90	0.031	0.990	72.427	911.880	910.762	908.479	907.827
212	211			200	0.67	0.027	0.854	54.515	911.091	910.762	908.191	907.826
211	203			200	0.83	0.030	0.951	66.266	910.762	910.394	907.766	907.216
203	204			200	1.00	0.033	1.044	91.040	910.394	909.471	907.156	906.245
221	204			200	1.40	0.039	1.235	91.050	910.520	909.471	907.520	906.245
230	204			200	1.84	0.044	1.416	53.800	910.435	909.471	907.235	906.245
204	205			200	1.20	0.036	1.144	91.870	909.471	908.461	906.185	905.083
240	205			200	1.75	0.043	1.381	51.040	909.180	908.461	905.980	905.087
221	222			200	1.20	0.036	1.144	110.030	910.520	909.302	907.520	906.200
222	223			200	1.07	0.034	1.080	44.737	909.302	908.801	906.140	905.661
223	205			200	1.05	0.034	1.070	51.700	908.801	908.461	905.631	905.088
205	206			200	1.20	0.036	1.144	50.123	908.461	907.541	905.023	904.421
206	207			200	1.00	0.033	1.044	45.590	907.541	907.445	904.361	903.906
251	207			200	1.60	0.041	1.320	46.212	907.746	907.445	904.646	903.907
207	224			200	1.05	0.034	1.070	46.186	907.445	906.532	903.846	903.361
224	208			200	1.05	0.034	1.070	41.867	906.532	906.000	903.331	902.891
261	208			200	1.27	0.037	1.176	42.403	906.552	906.000	903.432	902.893
208	209			200	1.40	0.039	1.235	97.016	906.000	905.022	902.831	901.473
215	209			200	0.40	0.021	0.660	75.351	904.450	905.022	901.750	901.449
209	216			250	0.40	0.038	0.768	90.100	905.0220	905.0950	901.399	901.0382
216	217			250	0.40	0.038	0.768	70.549	905.0950	905.0400	901.0082	900.7260

APPENDIX

APPENDIX I ~ LAND USE STATISTICS AND STUDENT GENERATION

Appendix I

Land Use Allocation Statistics

Use	Hectares	%	Units	%	Population	%
Gross Area	**16.383**					
Residential						
Single Family Lots	12.369	75.50%	159	76.00%	445	76.00%
Duplex Lots	1.223	7.46%	50	24.00%	140	24.00%
Subtotal Residential	**13.592**	**82.96%**	**209**	**100.00%**	**585**	**100.00%**
Parks and Open Space						
School Site	2.791	17.04%				
Subtotal Parks and Open Space	**2.791**	**17.04%**				
TOTAL	**16.383**	**100.00%**	**209**	**100.00%**	**585**	**100.00%**

Assumptions

1. Household Densities
   ** Low Density - 2.8 persons per unit

Density per gross hectare = 35.7 persons/ha

Density per gross hectare (excluding park) = 43.0 persons/ha

Student Generation

School	Students Per Dwelling Unit	No. of Students (209) Units
Public Elementary (ECS to 5)	0.17	36
Public Middle (6 to 8)	0.085	17
Public Senior	0.113	23
Holy Spirit Elementary	0.08	17
Holy Spirit Middle	0.04	8
Holy Spirit High	0.04	8
TOTAL		**109**

APPENDIX

APPENDIX J ~ WATER DISTRIBUTION ANALYSIS

Scenario: Base
Fire Flow Analysis
Junction Report (Max Day)

Elevation (m)	Label	Zone	Type	Base Flow (l/s)	Pattern	Demand (Calculated) (l/s)	Calculated Hydraulic Grade (m)	Pressure (kPa)
904.50	FH 1	Zone	Demand	1.130	Fixed	1.130	951.19	456.95
905.20	FH 2	Zone	Demand	1.130	Fixed	1.130	951.19	450.11
906.10	FH 3	Zone	Demand	1.130	Fixed	1.130	951.19	441.33
906.60	FH 4	Zone	Demand	1.130	Fixed	1.130	951.19	436.44
907.60	FH 5	Zone	Demand	1.130	Fixed	1.130	951.21	426.80
907.80	FH 6	Zone	Demand	1.130	Fixed	1.130	951.21	424.81
908.80	FH 7	Zone	Demand	1.130	Fixed	1.130	951.24	415.31
909.80	FH 8	Zone	Demand	1.130	Fixed	1.130	951.23	405.50
909.50	FH 9	Zone	Demand	1.130	Fixed	1.130	951.27	408.75
910.80	FH 10	Zone	Demand	1.130	Fixed	1.130	951.25	395.91
909.90	FH 11	Zone	Demand	1.130	Fixed	1.130	951.24	404.59
910.90	FH 12	Zone	Demand	1.130	Fixed	1.130	951.40	396.40
911.80	FH 13	Zone	Demand	1.130	Fixed	1.130	951.37	387.25
912.00	FH 14	Zone	Demand	1.130	Fixed	1.130	951.34	385.05
910.80	FH 15	Zone	Demand	1.130	Fixed	1.130	951.33	396.71
911.60	FH 16	Zone	Demand	1.130	Fixed	1.130	951.34	388.89
905.00	J-1	Zone	Demand	0.000	Fixed	0.000	951.19	452.07
906.10	J-2	Zone	Demand	0.000	Fixed	0.000	951.20	441.34
907.20	J-3	Zone	Demand	0.000	Fixed	0.000	951.21	430.69
908.80	J-4	Zone	Demand	0.000	Fixed	0.000	951.23	415.29
909.50	J-6	Zone	Demand	0.000	Fixed	0.000	951.25	408.65
910.40	J-7	Zone	Demand	0.000	Fixed	0.000	951.33	400.62
910.80	J-8	Zone	Demand	0.000	Fixed	0.000	951.39	397.22
911.50	J-9	Zone	Demand	0.000	Fixed	0.000	951.37	390.24
911.80	J-10	Zone	Demand	0.000	Fixed	0.000	951.35	387.03
911.60	J-11	Zone	Demand	0.000	Fixed	0.000	951.34	388.90
911.70	J-12	Zone	Demand	0.000	Fixed	0.000	951.34	387.92
911.10	J-13	Zone	Demand	0.000	Fixed	0.000	951.47	395.07
913.00	J-14	Zone	Demand	0.000	Fixed	0.000	951.75	379.20
909.80	J-15	Zone	Demand	0.000	Fixed	0.000	951.23	405.50
910.80	J-17	Zone	Demand	0.000	Fixed	0.000	951.25	395.92
910.60	J-18	Zone	Demand	0.000	Fixed	0.000	951.25	397.80
909.50	J-19	Zone	Demand	0.000	Fixed	0.000	951.24	408.49
906.60	J-20	Zone	Demand	0.000	Fixed	0.000	951.19	436.44
907.80	J-21	Zone	Demand	0.000	Fixed	0.000	951.21	424.81
904.50	J-22	Zone	Demand	0.000	Fixed	0.000	951.19	456.96
904.50	J-23	Zone	Demand	0.000	Fixed	0.000	951.19	456.96
911.60	J-24	Zone	Demand	0.000	Fixed	0.000	951.34	388.90
910.80	J-25	Zone	Demand	0.000	Fixed	0.000	951.34	396.71
910.90	J-26	Zone	Demand	0.000	Fixed	0.000	951.40	396.40
906.10	J-28	Zone	Demand	0.000	Fixed	0.000	951.19	441.33
907.60	J-30	Zone	Demand	0.000	Fixed	0.000	951.21	426.80
909.90	J-43	Zone	Demand	0.000	Fixed	0.000	951.24	404.59
908.80	J-45	Zone	Demand	0.000	Fixed	0.000	951.24	415.31
904.00	J-46	Zone	Demand	0.000	Fixed	0.000	951.19	461.85
909.50	J-48	Zone	Demand	0.000	Fixed	0.000	951.27	408.75
912.00	J-50	Zone	Demand	0.000	Fixed	0.000	951.34	385.05
911.20	J-52	Zone	Demand	0.000	Fixed	0.000	951.47	394.10
911.80	J-53	Zone	Demand	0.000	Fixed	0.000	951.37	387.26
905.20	J-55	Zone	Demand	0.000	Fixed	0.000	951.19	450.11

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Scenario: Base
Steady State Analysis
Junction Report (Max Hour)

Elevation (m)	Label	Zone	Type	Base Flow (l/s)	Pattern	Demand (Calculated) (l/s)	Calculated Hydraulic Grade (m)	Pressure (kPa)
904.50	FH 1	Zone	Demand	2.830	Fixed	2.830	948.69	432.46
905.20	FH 2	Zone	Demand	2.830	Fixed	2.830	948.69	425.62
906.10	FH 3	Zone	Demand	2.830	Fixed	2.830	948.71	416.98
906.60	FH 4	Zone	Demand	2.830	Fixed	2.830	948.71	412.11
907.60	FH 5	Zone	Demand	2.830	Fixed	2.830	948.79	403.12
907.80	FH 6	Zone	Demand	2.830	Fixed	2.830	948.77	400.99
908.80	FH 7	Zone	Demand	2.830	Fixed	2.830	948.93	392.77
909.80	FH 8	Zone	Demand	2.830	Fixed	2.830	948.92	382.86
909.50	FH 9	Zone	Demand	2.830	Fixed	2.830	949.10	387.53
910.80	FH 10	Zone	Demand	2.830	Fixed	2.830	949.03	374.17
909.90	FH 11	Zone	Demand	2.830	Fixed	2.830	948.96	382.26
910.90	FH 12	Zone	Demand	2.830	Fixed	2.830	949.85	381.20
911.80	FH 13	Zone	Demand	2.830	Fixed	2.830	949.66	370.56
912.00	FH 14	Zone	Demand	2.830	Fixed	2.830	949.53	367.27
910.80	FH 15	Zone	Demand	2.830	Fixed	2.830	949.48	378.53
911.60	FH 16	Zone	Demand	2.830	Fixed	2.830	949.48	370.77
905.00	J-1	Zone	Demand	0.000	Fixed	0.000	948.69	427.60
906.10	J-2	Zone	Demand	0.000	Fixed	0.000	948.71	417.04
907.20	J-3	Zone	Demand	0.000	Fixed	0.000	948.78	406.90
908.80	J-4	Zone	Demand	0.000	Fixed	0.000	948.92	392.69
909.50	J-6	Zone	Demand	0.000	Fixed	0.000	949.04	386.95
910.40	J-7	Zone	Demand	0.000	Fixed	0.000	949.48	382.44
910.80	J-8	Zone	Demand	0.000	Fixed	0.000	949.77	381.35
911.50	J-9	Zone	Demand	0.000	Fixed	0.000	949.69	373.78
911.80	J-10	Zone	Demand	0.000	Fixed	0.000	949.54	369.33
911.60	J-11	Zone	Demand	0.000	Fixed	0.000	949.49	370.83
911.70	J-12	Zone	Demand	0.000	Fixed	0.000	949.49	369.81
911.10	J-13	Zone	Demand	0.000	Fixed	0.000	950.21	382.72
913.00	J-14	Zone	Demand	0.000	Fixed	0.000	951.73	379.04
909.80	J-15	Zone	Demand	0.000	Fixed	0.000	948.92	382.88
910.80	J-17	Zone	Demand	0.000	Fixed	0.000	949.04	374.20
910.60	J-18	Zone	Demand	0.000	Fixed	0.000	948.99	375.74
909.50	J-19	Zone	Demand	0.000	Fixed	0.000	948.95	386.09
906.60	J-20	Zone	Demand	0.000	Fixed	0.000	948.71	412.12
907.80	J-21	Zone	Demand	0.000	Fixed	0.000	948.77	401.00
904.50	J-22	Zone	Demand	0.000	Fixed	0.000	948.69	432.49
904.50	J-23	Zone	Demand	0.000	Fixed	0.000	948.69	432.48
911.60	J-24	Zone	Demand	0.000	Fixed	0.000	949.49	370.79
910.80	J-25	Zone	Demand	0.000	Fixed	0.000	949.48	378.55
910.90	J-26	Zone	Demand	0.000	Fixed	0.000	949.85	381.21
906.10	J-28	Zone	Demand	0.000	Fixed	0.000	948.71	417.00
907.60	J-30	Zone	Demand	0.000	Fixed	0.000	948.79	403.14
909.90	J-43	Zone	Demand	0.000	Fixed	0.000	948.96	382.28
908.80	J-45	Zone	Demand	0.000	Fixed	0.000	948.93	392.79
904.00	J-46	Zone	Demand	0.000	Fixed	0.000	948.69	437.38
909.50	J-48	Zone	Demand	0.000	Fixed	0.000	949.10	387.54
912.00	J-50	Zone	Demand	0.000	Fixed	0.000	949.53	367.27
911.20	J-52	Zone	Demand	0.000	Fixed	0.000	950.21	381.75
911.80	J-53	Zone	Demand	0.000	Fixed	0.000	949.66	370.57
905.20	J-55	Zone	Demand	0.000	Fixed	0.000	948.69	425.64

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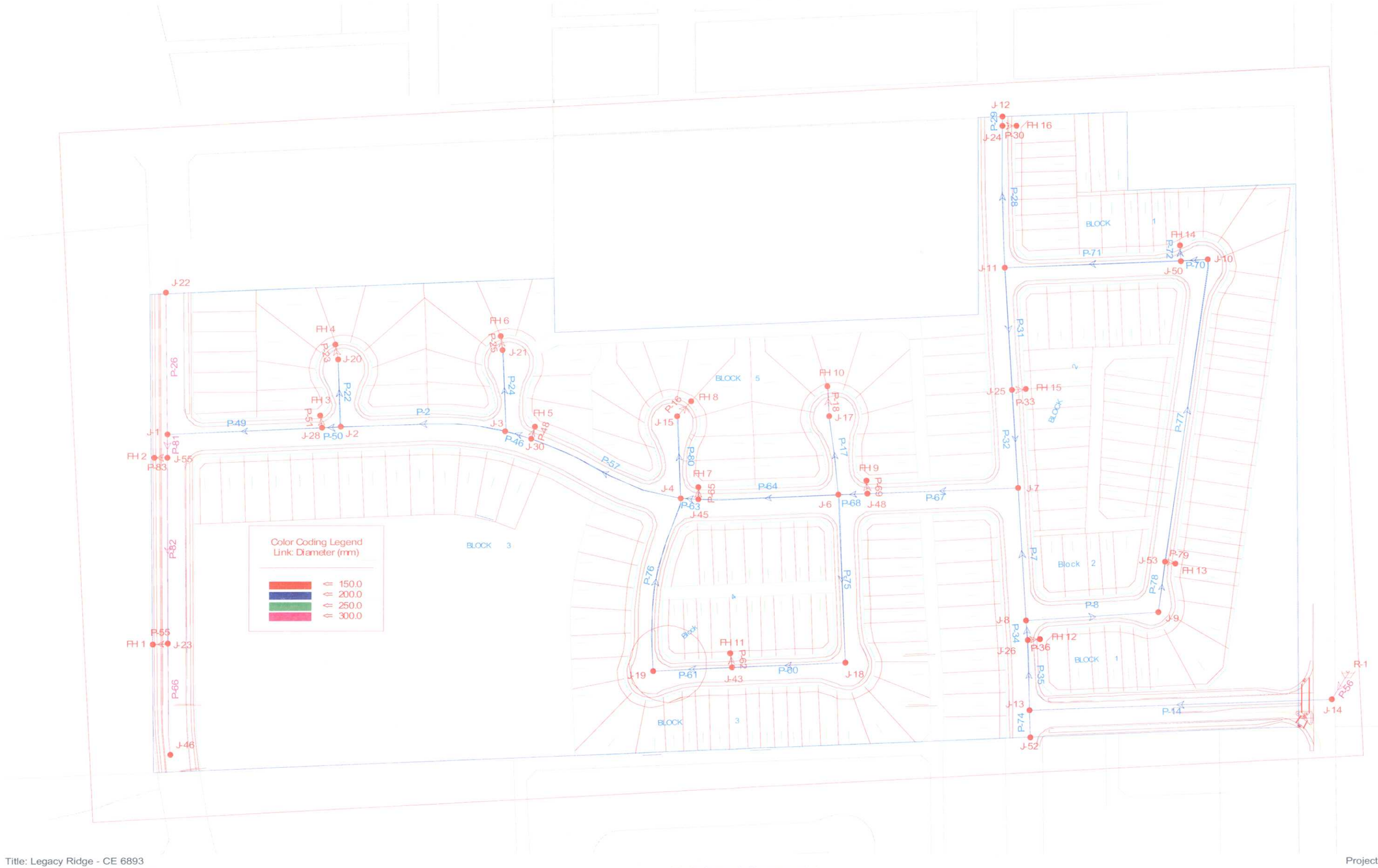
Water Distribution Analysis
Schematic Diagram

Label	Zone	Fire Flow Iterations	Fire Flow Balanced?	Satisfies Fire Flow Constraints?	Needed Fire Flow (l/s)	Available Fire Flow (l/s)	Total Flow Needed (l/s)	Total Flow Available (l/s)	Residual Pressure (kPa)	Calculated Residual Pressure (kPa)	Minimum Zone Pressure (kPa)	Calculated Minimum Zone Pressure (kPa)	Minimum Zone Junction	Minimum System Pressure (kPa)	Calculated Minimum System Pressure (kPa)	Minimum System Junction
FH 1	Zone	14	true	true	75.000	94.180	76.130	95.310	150.00	150.00	150.00	160.29	FH 2	N/A	160.29	FH 2
FH 2	Zone	14	true	true	75.000	94.180	76.130	95.310	150.00	150.01	150.00	160.30	J-55	N/A	160.30	J-55
FH 3	Zone	14	true	true	75.000	99.002	76.130	100.132	150.00	150.02	150.00	160.06	FH 4	N/A	160.06	FH 4
FH 4	Zone	15	true	true	75.000	95.622	76.130	96.752	150.00	150.02	150.00	161.98	J-20	N/A	161.98	J-20
FH 5	Zone	15	true	true	75.000	106.944	76.130	108.074	150.00	150.02	150.00	160.45	FH 6	N/A	160.45	FH 6
FH 6	Zone	14	true	true	75.000	100.375	76.130	101.505	150.00	150.02	150.00	162.58	J-21	N/A	162.58	J-21
FH 7	Zone	14	true	true	75.000	116.183	76.130	117.313	150.00	150.03	150.00	154.51	FH 8	N/A	154.51	FH 8
FH 8	Zone	15	true	true	75.000	105.678	76.130	106.808	150.00	150.03	150.00	169.36	J-15	N/A	169.36	J-15
FH 9	Zone	15	true	true	75.000	123.058	76.130	124.188	150.00	150.00	150.00	153.96	FH 10	N/A	153.96	FH 10
FH 10	Zone	15	true	true	75.000	106.013	76.130	107.143	150.00	150.00	150.00	179.45	J-17	N/A	179.45	J-17
FH 11	Zone	11	true	true	75.000	111.011	76.130	112.141	150.00	150.00	150.00	165.72	J-43	N/A	165.72	J-43
FH 12	Zone	14	true	true	75.000	155.978	76.130	157.108	150.00	150.01	150.00	163.50	FH 14	N/A	163.50	FH 14
FH 13	Zone	15	true	true	75.000	135.371	76.130	136.501	150.00	150.02	150.00	165.68	J-53	N/A	165.68	J-53
FH 14	Zone	10	true	true	75.000	130.420	76.130	131.550	150.00	150.01	150.00	155.42	J-50	N/A	155.42	J-50
FH 15	Zone	13	true	true	75.000	133.624	76.130	134.754	150.00	150.01	150.00	168.58	J-12	N/A	168.58	J-12
FH 16	Zone	14	true	true	75.000	114.841	76.130	115.971	150.00	150.01	150.00	165.76	J-12	N/A	165.76	J-12
J-1	Zone	N/A	false	nil	75.000	N/A	N/A	N/A	150.00	N/A	150.00	N/A	N/A	N/A	N/A	N/A
J-2	Zone	N/A	false	nil	75.000	N/A	N/A	N/A	150.00	N/A	150.00	N/A	N/A	N/A	N/A	N/A
J-3	Zone	N/A	false	nil	75.000	N/A	N/A	N/A	150.00	N/A	150.00	N/A	N/A	N/A	N/A	N/A
J-4	Zone	N/A	false	nil	75.000	N/A	N/A	N/A	150.00	N/A	150.00	N/A	N/A	N/A	N/A	N/A
J-6	Zone	N/A	false	nil	75.000	N/A	N/A	N/A	150.00	N/A	150.00	N/A	N/A	N/A	N/A	N/A
J-7	Zone	N/A	false	nil	75.000	N/A	N/A	N/A	150.00	N/A	150.00	N/A	N/A	N/A	N/A	N/A
J-8	Zone	N/A	false	nil	75.000	N/A	N/A	N/A	150.00	N/A	150.00	N/A	N/A	N/A	N/A	N/A
J-9	Zone	N/A	false	nil	75.000	N/A	N/A	N/A	150.00	N/A	150.00	N/A	N/A	N/A	N/A	N/A
J-10	Zone	N/A	false	nil	75.000	N/A	N/A	N/A	150.00	N/A	150.00	N/A	N/A	N/A	N/A	N/A
J-11	Zone	N/A	false	nil	75.000	N/A	N/A	N/A	150.00	N/A	150.00	N/A	N/A	N/A	N/A	N/A
J-12	Zone	N/A	false	nil	75.000	N/A	N/A	N/A	150.00	N/A	150.00	N/A	N/A	N/A	N/A	N/A
J-13	Zone	N/A	false	nil	75.000	N/A	N/A	N/A	150.00	N/A	150.00	N/A	N/A	N/A	N/A	N/A
J-14	Zone	N/A	false	nil	75.000	N/A	N/A	N/A	150.00	N/A	150.00	N/A	N/A	N/A	N/A	N/A
J-15	Zone	N/A	false	nil	75.000	N/A	N/A	N/A	150.00	N/A	150.00	N/A	N/A	N/A	N/A	N/A
J-17	Zone	N/A	false	nil	75.000	N/A	N/A	N/A	150.00	N/A	150.00	N/A	N/A	N/A	N/A	N/A
J-18	Zone	N/A	false	nil	75.000	N/A	N/A	N/A	150.00	N/A	150.00	N/A	N/A	N/A	N/A	N/A
J-19	Zone	N/A	false	nil	75.000	N/A	N/A	N/A	150.00	N/A	150.00	N/A	N/A	N/A	N/A	N/A
J-20	Zone	N/A	false	nil	75.000	N/A	N/A	N/A	150.00	N/A	150.00	N/A	N/A	N/A	N/A	N/A
J-21	Zone	N/A	false	nil	75.000	N/A	N/A	N/A	150.00	N/A	150.00	N/A	N/A	N/A	N/A	N/A
J-22	Zone	N/A	false	nil	75.000	N/A	N/A	N/A	150.00	N/A	150.00	N/A	N/A	N/A	N/A	N/A
J-23	Zone	N/A	false	nil	75.000	N/A	N/A	N/A	150.00	N/A	150.00	N/A	N/A	N/A	N/A	N/A
J-24	Zone	N/A	false	nil	75.000	N/A	N/A	N/A	150.00	N/A	150.00	N/A	N/A	N/A	N/A	N/A
J-25	Zone	N/A	false	nil	75.000	N/A	N/A	N/A	150.00	N/A	150.00	N/A	N/A	N/A	N/A	N/A
J-26	Zone	N/A	false	nil	75.000	N/A	N/A	N/A	150.00	N/A	150.00	N/A	N/A	N/A	N/A	N/A
J-28	Zone	N/A	false	nil	75.000	N/A	N/A	N/A	150.00	N/A	150.00	N/A	N/A	N/A	N/A	N/A
J-30	Zone	N/A	false	nil	75.000	N/A	N/A	N/A	150.00	N/A	150.00	N/A	N/A	N/A	N/A	N/A
J-43	Zone	N/A	false	nil	75.000	N/A	N/A	N/A	150.00	N/A	150.00	N/A	N/A	N/A	N/A	N/A
J-45	Zone	N/A	false	nil	75.000	N/A	N/A	N/A	150.00	N/A	150.00	N/A	N/A	N/A	N/A	N/A
J-46	Zone	N/A	false	nil	75.000	N/A	N/A	N/A	150.00	N/A	150.00	N/A	N/A	N/A	N/A	N/A
J-48	Zone	N/A	false	nil	75.000	N/A	N/A	N/A	150.00	N/A	150.00	N/A	N/A	N/A	N/A	N/A
J-50	Zone	N/A	false	nil	75.000	N/A	N/A	N/A	150.00	N/A	150.00	N/A	N/A	N/A	N/A	N/A
J-52	Zone	N/A	false	nil	75.000	N/A	N/A	N/A	150.00	N/A	150.00	N/A	N/A	N/A	N/A	N/A
J-53	Zone	N/A	false	nil	75.000	N/A	N/A	N/A	150.00	N/A	150.00	N/A	N/A	N/A	N/A	N/A
J-55	Zone	N/A	false	nil	75.000	N/A	N/A	N/A	150.00	N/A	150.00	N/A	N/A	N/A	N/A	N/A

Scenario: Base
Fire Flow Analysis
Fire Flow Report + Max Day



APPENDIX

APPENDIX L ~ HISTORICAL RESOURCES ACT REQUIREMENTS AND CLEARANCE

Alberta Community Development
Heritage Resource Management

Old St. Stephen's College
8820 - 112 Street
Edmonton, Alberta, Canada T6G 2P8
Telephone 780/431-2300 Fax 780/427-5598
www.cd.gov.ab.ca/hrm

March 24, 2006

Project File: 4835-06-033

Mr. Ed Martin
Martin Geomatic Consultants Ltd.
255 – 31 Street N
Lethbridge, Alberta
T1H 3Z4

Dear Mr. Martin:

SUBJECT: AVONLEA LAND CORP. LTD.
AGENT BEING MARTIN GEOMATIC CONSULTANTS LTD.
LEGACY RIDGE STAGE 2
RESIDENTIAL SUBDIVISION DEVELOPMENT - LETHBRIDGE
SECTION 18, TOWNSHIP 9, RANGE 21, W4M
***HISTORICAL RESOURCES ACT* REQUIREMENTS**

Arrow Archaeology Limited has provided the Cultural Facilities and Historical Resources Division (CFHRD) of Alberta Community Development with a "Historical Resources Overview" describing the Avonlea Land Corp Ltd's development plans with the **LEGACY RIDGE STAGE 2** residential subdivision development. **A Historical Resources Impact Assessment is not required.** Therefore, the Avonlea Land Corp. Ltd. has *Historical Resources Act* clearance for the **LEGACY RIDGE STAGE 2** residential subdivision development as described within the "Historical Resources Overview". Should you require additional information regarding the CFHRD's review of this project to impact historical resources, please contact the undersigned.

HISTORICAL RESOURCES ACT REQUIREMENTS

Reporting the discovery of historical resources

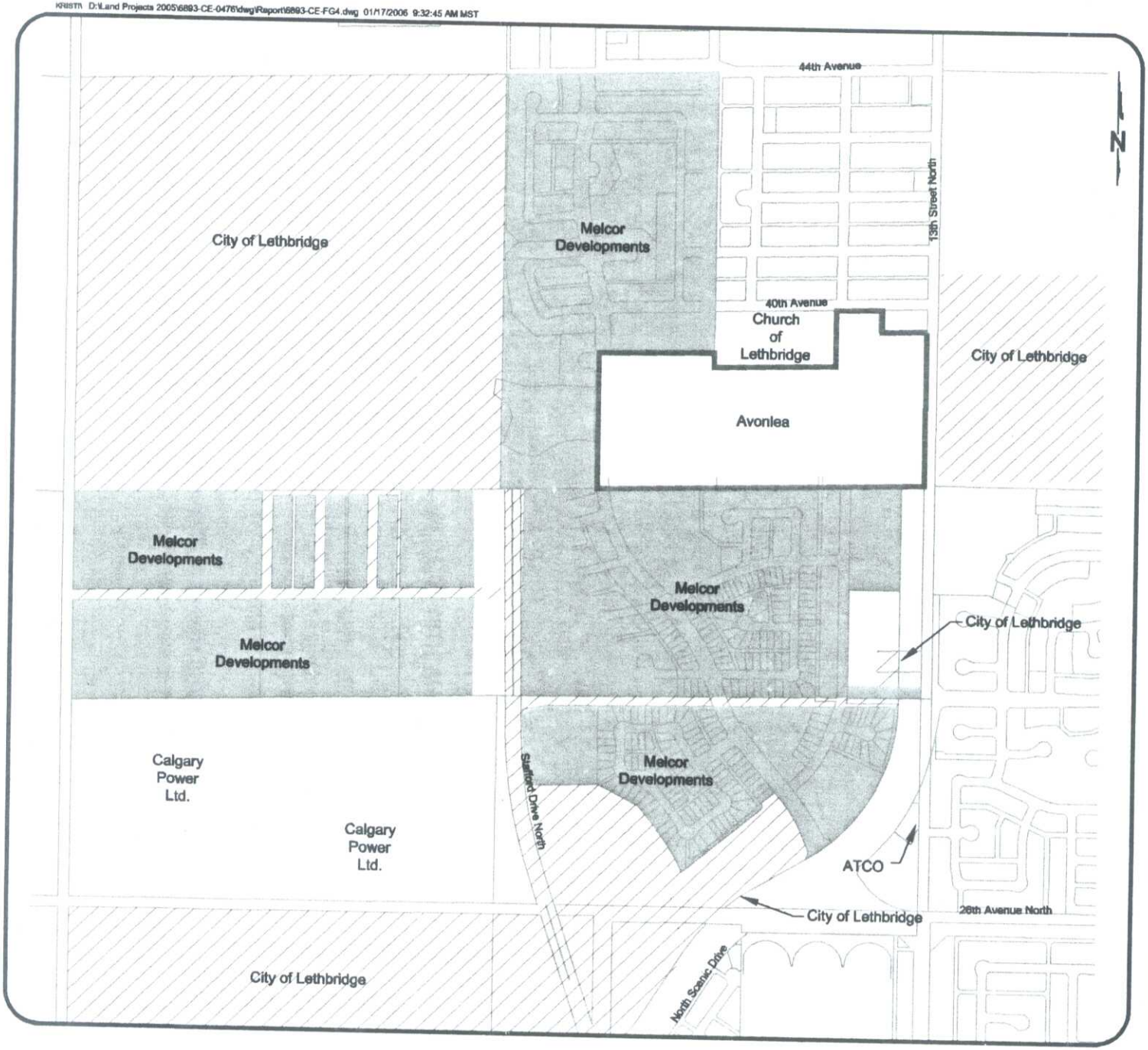
Please be aware, pursuant to Section 31 of the *Historical Resources Act*, should any historic resources be encountered during subdivision development activities, please contact George Chalut at (780) 431-2329, (Resource Management Planner, Protection & Stewardship Section, Heritage Resource Management Branch, Cultural Facilities and Historical Resources Division, Alberta Community Development, 8820 - 112 Street, Edmonton, Alberta, T6G 2P8), or fax (780) 427-3956. It will then be necessary for the CFHRD to issue further instructions regarding the documentation of these resources. On behalf of the Cultural Facilities and Historical Resources Division, I would like to thank the Avonlea Land Corp. Ltd., Martin Geomatic Consultants Ltd. and Arrow Archaeology Limited for their continued cooperation in our endeavour to conserve Alberta's past.

Sincerely,

George Chalut
Southeast Region, Resource Management Planner
Protection & Stewardship Section

Cc: Avonlea Land Corp. Ltd.
Neil Mirau, Arrow Archaeology Limited

KRISTA D:\Land Projects 2005\6893-CE-0476\dwg\Raport\6893-CE-FG4.dwg 01/17/2006 9:32:45 AM MST



LEGACY RIDGE STAGE 2

LEGEND:

- Legacy Ridge Stage 2 Boundary
- City of Lethbridge
- Melcor Developments Ltd.
- Others

Land Ownership

Scale 1:10000 Figure No: 4

Avonlea Land Corp. Ltd.

1111 3rd Avenue South Lethbridge, Alberta
Ph: (403) 3201988 Fax: (403) 327-1987
www.avonlea-homes.com

MARTIN GEOMATIC CONSULTANTS LTD.
Consulting Engineers, Planners, and Land Surveyors