Blackfalds Servicing Master Plan

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1.0 Introduction

1.1 PURPOSE

The purpose of this report for the Town of Blackfalds is to provide engineering and planning information that will assist the Town, as well as private and public stakeholders, to make decisions regarding cost effective future growth and development directions. The study area, as shown in Map 1, includes approximately six quarter sections on the north, west, south and east sides of the Town.

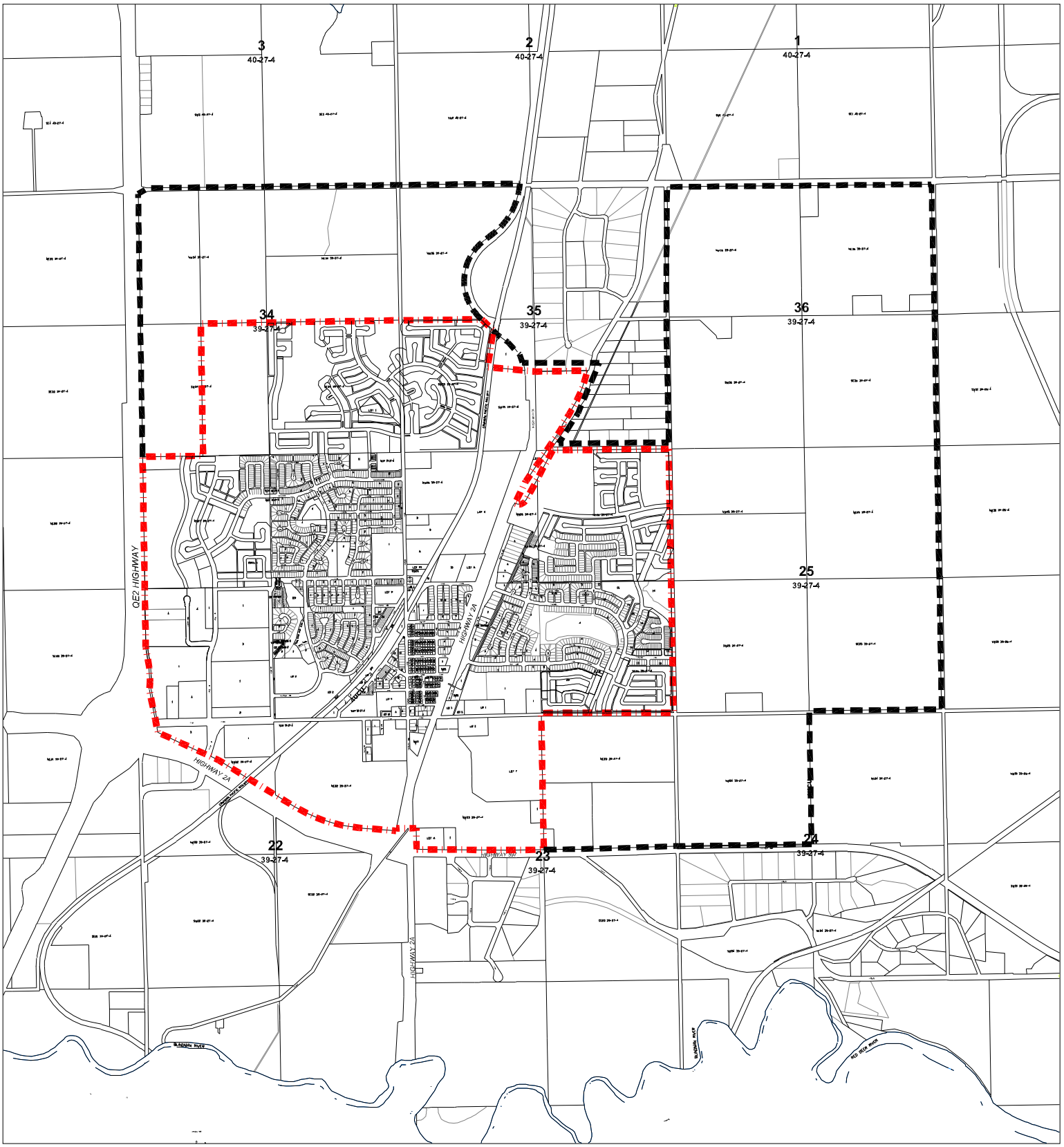
The main objectives include the following.

Master Plan - Growth Management

- Identify the sequential development of residential, commercial and industrial lands based on economy and ease of servicing.
- Provide recommendations for the best locations for future residential, commercial and industrial development while considering transportation issues, expansion of park systems and protection of natural areas.
- Consider the size of the existing downtown business core and determine if its needs to be adjusted.
- Perform a preliminary analysis of the Town's existing assessment and tax base regarding the split between residential and non-residential sources of taxation and provide comments on its appropriateness.
- Identify horizons and development scenarios for the development, including what servicing is necessary for each stage of the population projections. The Town identified both a ten year horizon to address long range delivery standards and to prepare a growth plan scenario that show development to a population of 11,600 to 20,500 into the future and an indication of the direction and extent of growth for the next population of 20,500 to 31,800 people.

Master Plan - Infrastructure

- Upon review the existing infrastructure information and reports available, determine the extent of servicing capabilities of existing municipal systems.
- Conduct a preliminary review of existing municipal systems in relation to their capacity for new developments tying into the systems



TOWN OF

BLACKFALDS

2007 Proposed Annexation

MAP 1

Proposed Annexation Areas

EXISTING TOWN BOUNDARY

PROPOSED ANNEXATION BOUNDARY

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PARKLAND COMMUNITY PLANNING SERVICES

- Create conceptual drawings showing preliminary alignment and sizing of trunk watermains and sanitary sewers as well as schematic locations of required storm detention ponds and stormwater outfalls for the subject areas.

- Create a plan showing major collector and arterial roadways and indicate locations of different land use (residential, industrial and commercial) and identify areas for preservation of unique natural features, if any.

1.2 REVIEW OF PREVIOUS STUDIES AND REPORTS

Over the past 20 years the Town has completed various planning and engineering studies and reports outlining the potential growth areas in and around Blackfalds and the required infrastructure to service these growth areas.

A complete listing of all previous reports and information that were provided by the Town of Blackfalds and other sources reviewed for the preparation of this Master Plan – Growth and Infrastructure are referenced at the end of this report.

1.3 STUDY AREA

Map 1 illustrates the study area requested by the Town and advised by the consulting team. Included in the study area are the lands west of the current Town boundary to Highway 2, south to Secondary Highway 597, north to Lakeside Sargent Road (one quarter section north of the existing Town boundary) and the two quarter sections east of the Town boundary. These are lands that Lacombe County has generally agreed for annexation to the Town.

Residential sector boundaries have been numbered in notations signifying North, South, East and West followed by a number (i.e. Area W2). The letter T is in front of areas that are currently within the Town boundaries (i.e. Area TW2). This format was used to be able to easily identify the subject areas. Previous reports have used a numbering system.

For the industrial and commercial areas, the letters I and C have been used followed by a number (i.e. Area I2 or Area C1). This number indicates an area only for ease of referencing in this report and is not a phased system.

1.4 ACKNOWLEDGEMENTS

Stantec Consulting Ltd. would like to thank the following Town of Blackfalds Personnel for their help in the preparation of this report.

Ray Kerber, Director of Operations & Engineering Services

Terry Topolnitsky, Planning & Development Manager

Chris Ulmer, Parkland Community Planning Services

2.0 Background To Land Use And Future Development

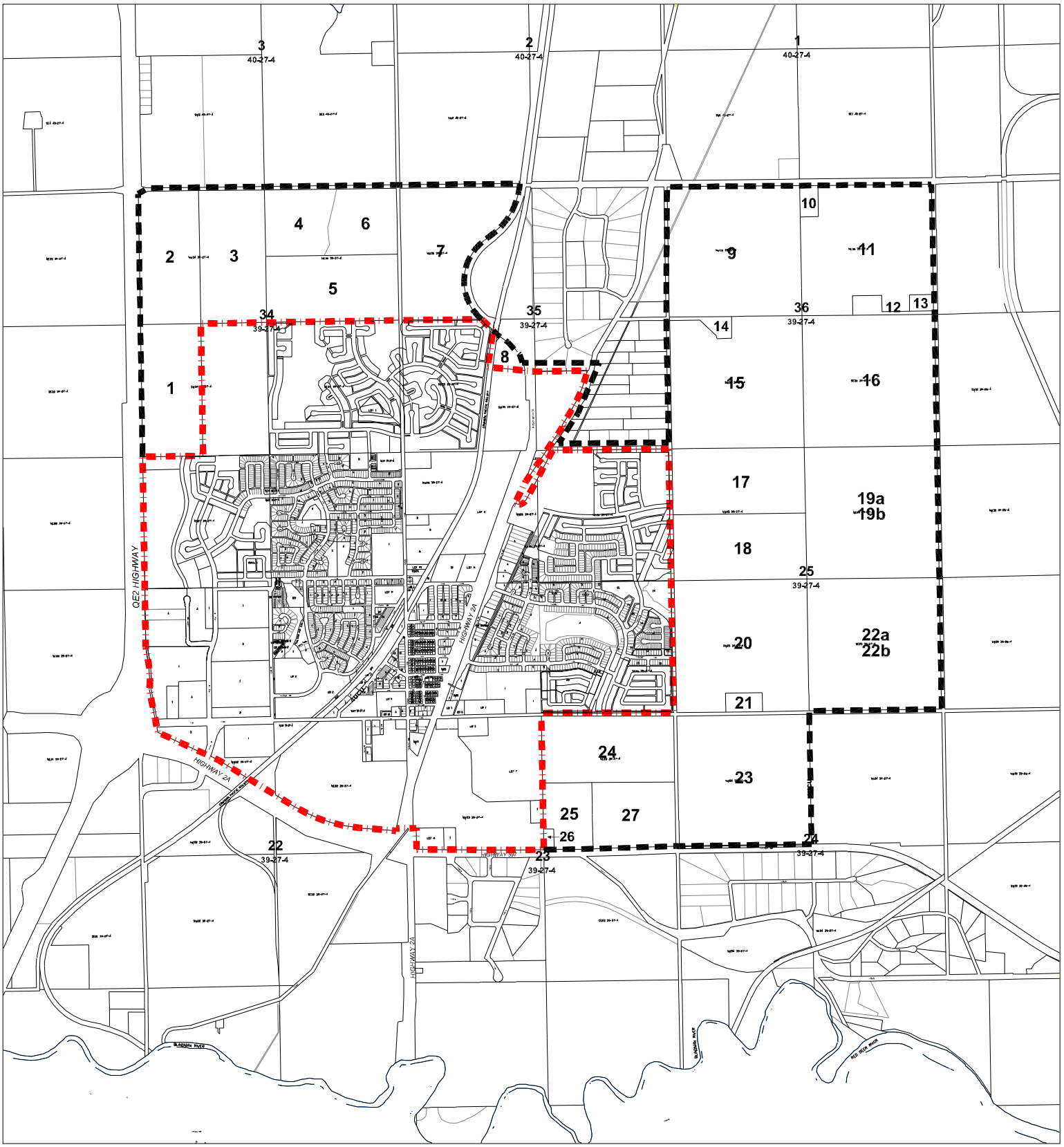
2.1 SIGNIFICANT FEATURES AND CONSTRAINTS

The growth and development of a town is shaped, in part, by a number of natural and 'built' (man-made) features around the community. Blackfalds is no exception. Figure 2 shows the significant features in and around Blackfalds that have helped to shape and will continue to influence Blackfalds' land use pattern and its form of urban growth.

Among the most influential of features are the major roads, two of which are primary provincial highways. Highway 2, Alberta's major north-south road connecting Edmonton and Calgary, forms the west boundary of the study area. Linking Blackfalds with Red Deer to the south and Lacombe to the north, Highway 2A is about 1.5 miles to the east of Highway 2, cutting the Town diagonally. Secondary Highway 597 is the south boundary of the study area. This important secondary highway provides access to the major petrochemical developments to the east, at Prentiss and Joffre. While all of these major roads are obstacles to urban growth, they are not barriers, as recently shown by the extension of municipal services east of Highway 2A to provide for commercial and residential development in the east part of Blackfalds. More importantly, these major roads provide significant and convenient access to Blackfalds, both for residents and businesses.

The Canadian Pacific Railway (CPR) through the heart of the community is typical of towns that settled around the railroad. As a significant and busy carrier of north-south rail freight, the limited number of rail crossings (two at present) serves to limit road network options in Blackfalds. As well, land in the vicinity of the railway has been seen as less desirable for residential development, although more recently this 'stigma' appears to be disappearing. While the Union Carbide Loading Terminal was located in Blackfalds to provide the company with access to its markets via CP Rail, generally demand for industrial land with rail access has been limited, not only in Blackfalds, but in other Central Alberta communities, including Red Deer. Therefore, for the most part the existence of the rail has not been a significant benefit to local economic development.

Other 'linear' facilities that influence growth and land use patterns are pipelines and transmission lines. The ATCO Utilities pipeline has been located immediately east of Highway 2A and served to influence land use patterns and design in this Blackfalds growth sector, with the right-of-way forming the boundary between commercial and residential land uses. The pipeline is in the process of being relocated along the South Street corridor, extending north along Range Road 27-0, which forms the eastern boundary of the annexation area. An overhead electric transmission line within the southeast portion of the annexation area will be a land use design factor in the future. As illustrated in Map 3: Built Constraints there are oil and gas wells and pipelines located within the annexation area, largely in the southeastern sections. Each of the wells carries with it a 100-metre setback.



2007 Proposed Annexation

EXISTING TOWN BOUNDARY

PROPOSED ANNEXATION BOUNDARY

AFFECTED PARCELS

TOWN OF BLACKFALDS

MAP 2

AFFECTED PARCELS

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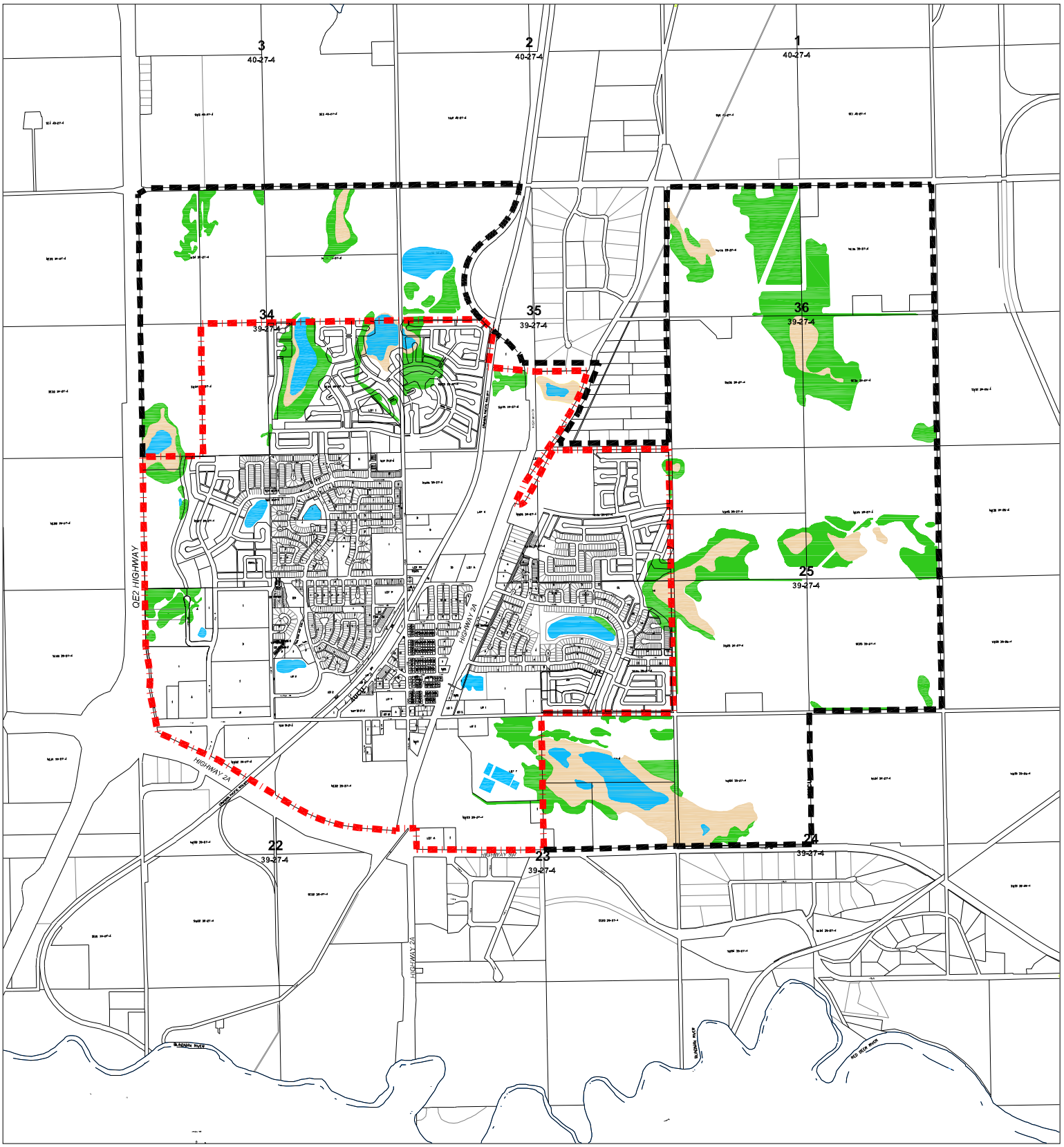

TOWN OF BLACKFALDS

MAP 2

ENVIRONMENTAL CONSTRAINTS

2007 Proposed Annexation

- EXISTING TOWN BOUNDARY
- PROPOSED ANNEXATION BOUNDARY
- WATER BODY
- SLOUGH / WETLAND
- TREED AREA

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PARKLAND COMMUNITY PLANNING SERVICES

Another significant 'built' feature is the old County landfill site, lying in the northeast corner of the annexation area in NE ¼-section 36-39-27-4. Provincial regulations, as depicted on Map 3: Built Constraints, dictate a minimum 300-metre setback from the facilities for residences, schools, hospitals and eating establishments. Additionally, a 100-metre setback is illustrated based on the potential for Alberta Environment to reduce the required setback upon further evaluation of the site. Prior to any development in this area adequate reclamation will be required to a standard enforced by Alberta Environment in order to reduce the development setback.

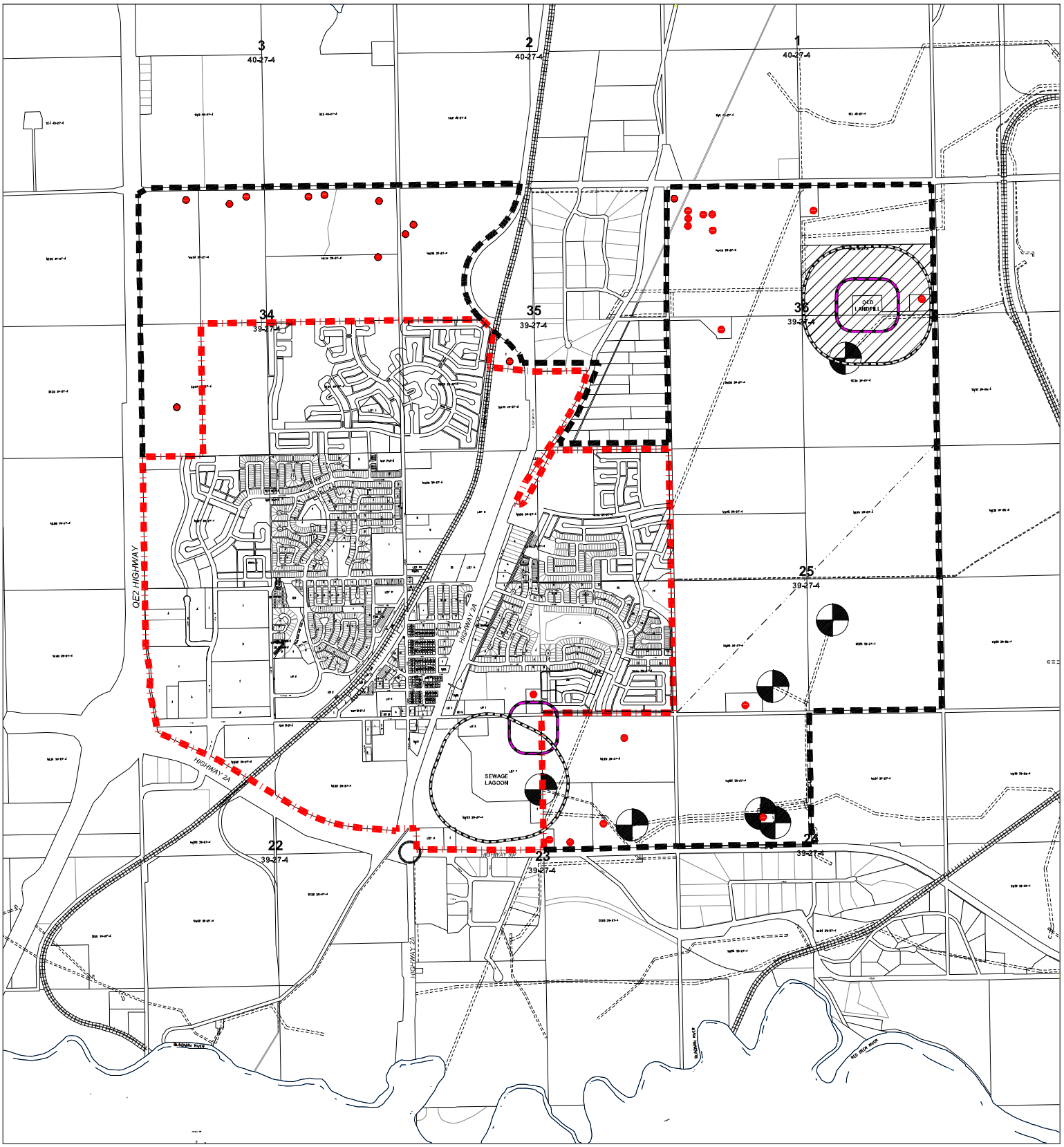
The natural features that impact Blackfalds' growth and development are its general topography, the various small, yet often steep escarpments and the scattered lowlands and sloughs. The developed portion of Blackfalds is located essentially on a localized 'crown of land'. To the north and south, and eventually to the east, the land falls away thus providing challenges to urban servicing, as discussed later in this report. The series of sloughs and low wetlands provide varied and interesting landscape amenities, as well as various challenges to the provision of municipal services or as opportunities for stormwater management and open space. Localized steep escarpments provide constraints to subdivision design.

2.2 LAND USE

The initial settlement of Blackfalds occurred shortly after 1900 with the earliest lots registered in Ottawa in 1902 and 1903. The initial surveyed area was between the railway and the C & E Trail (now Highway 2A), generally one block east and west of Broadway Avenue, but to Highway 2A along South, Minto and Indiana Streets. The only area surveyed west of the railway was the residential area bounded by Stanley, Lansdowne and Westwood streets. Significant further residential development west of the railway essentially did not occur until the 1970s.

Presently, commercial development lies in the downtown area, west of Highway 2A between Park and South streets, and within a highway commercial strip along the East Side of Highway 2A. Within the Town, industrial development has occurred along the CP Rail as well as the northeast corner of the junction of Highway 2 and Secondary Highway 597. Rural industrial development has spread along the south side of Secondary Highway 597 from Highway 2 to east of Highway 2A.

Residential areas generally predominate. All large tracts of land within the existing Town boundary have either been developed or have an adopted or proposed Area Structure Plan in place, as illustrated in Map 4: Area Structure Plan Locations, which identify the type and intensity of development. Major community facilities and buildings include the schools, arena and skate park, sport park, community hall, fire hall, Town office and cemetery. These are identified on Map 2: Future Land Use as Public/Institutional. Various green areas (open spaces) are scattered throughout the residential areas and are identified on Map 2: Future Land Use as Open Space.



2007 Proposed Annexation

- EXISTING TOWN BOUNDARY
- PROPOSED ANNEXATION BOUNDARY
- OIL / GAS / GLYCOL PIPELINE R-of-W
- RAILWAY
- OVERHEAD POWER LINE
- 300m SETBACK
- 100m SETBACK
- BUILDING
- OIL / GAS WELL (100m setback)

TOWN OF BLACKFALDS

MAP 3
BUILT CONSTRAINTS

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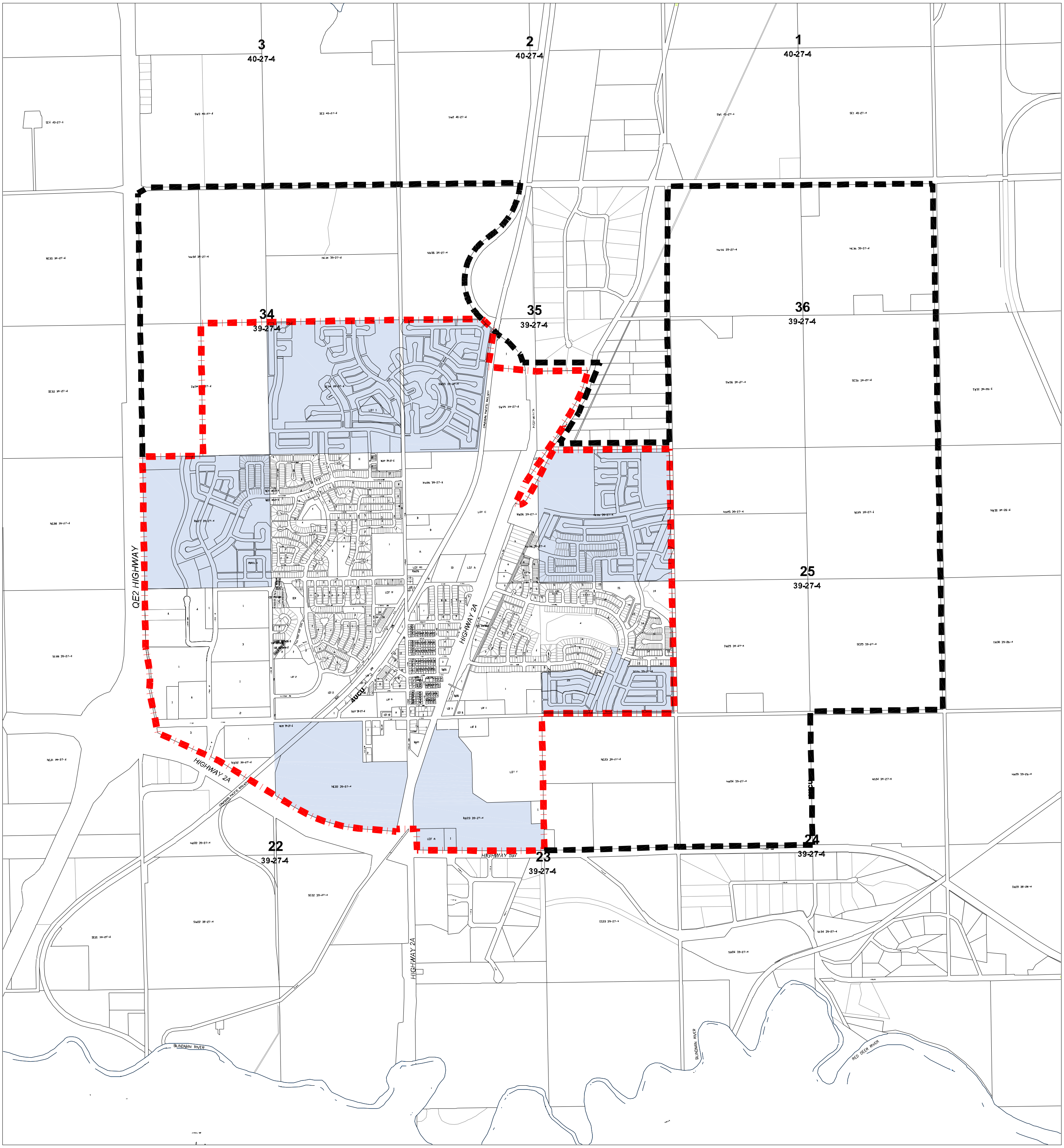

2007 Proposed Annexation

TOWN OF
BLACKFALDS

MAP 4
AREA STRUCTURE PLAN LOCATIONS

- EXISTING TOWN BOUNDARY
- PROPOSED ANNEXATION BOUNDARY
- EXISTING AREA STRUCTURE PLAN
- NO AREA STRUCTURE PLAN

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Within the annexation area the majority of the land is still farmed, although it does contain two businesses along the northern edge. Red Deer Exhaust is located along Township Road 40-0 and Central Alberta Greenhouse is located east of Highway 2A along Lakeside Sargent Road.

2.3 POPULATION GROWTH AND PROJECTIONS

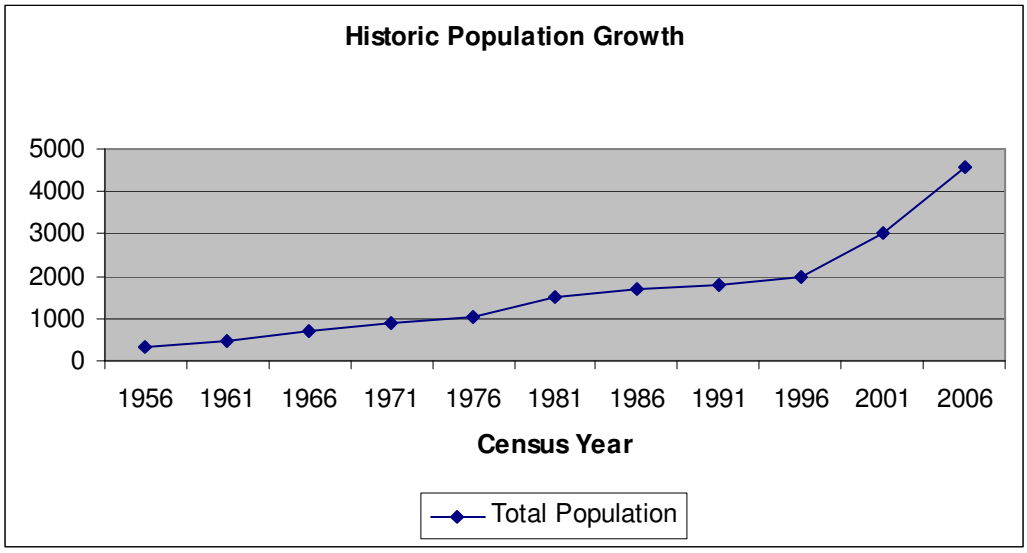
With a population of only 1,024 in 1976, during its first 75 years Blackfalds' growth can be described as slow and unspectacular. However, given the current population of 4,571 (based on the 2006 Census) the population of Blackfalds has more than quadrupled over the last thirty years (see Table 1 and Figure 1).

Table 1
Historic Population Comparisons: 1956-2006 Federal Census Figures

Year	Blackfalds	A.G.R.	Lacombe Co.	A.G.R.	Alberta	A.G.R.
1956	340	17.16%	13,819	0.87%	1,123,116	3.63%
1961	477	7.01%	14,898	-1.49%	1,331,944	3.47%
1966	729	8.50%	14,839	-0.08%	1,463,203	1.90%
1971	904	4.40%	14,959	0.16%	1,627,874	2.16%
1976	1,024	2.52%	16,173	1.57%	1,838,037	2.46%
1981	1,488	7.76%	19,431	3.74%	2,237,724	4.01%
1986	1,688	2.55%	20,223	0.80%	2,375,278	1.20%
1991	1,769	0.94%	21,697	1.42%	2,545,553	1.39%
1996	2,001	2.50%	24,147	2.16%	2,696,826	1.16%
2001	3,042	8.74%	26,918	2.20%	2,974,807	1.98%
2006	4,571	8.49%	29,709	1.99%	3,290,350	2.04%
50-Year		5.33%		1.54%		2.17%
10-Year		8.61%		2.09%		2.01%

NOTES:
1. The Lacombe Co. population represents a compilation of all growth, both urban and rural, within the County.
2. A.G.R. refers to Annual Growth Rate

Figure 1: Blackfalds Historic Population: 1956-2006



Growth slowed in the early 1990's but has increased rapidly, well above Lacombe County and Alberta rates, since 1996 as reflected in the annual growth rates (A.G.R.) shown in Table 1. The Town began compiling municipal census data in 2001 and the annual growth rates remained consistently high each year, as reflected in Table 2.

Table 2: Blackfalds Municipal Census Totals and Annual Growth Rates

Year	Population	Annual Growth Rate
2001	3,042	-
2002	3,540	16.4%
2003	3,812	7.7%
2004	3,955	3.8%
2005	4,373	10.6%
2006	4,741	8.4%

No doubt, growth rates will fluctuate greatly from year to year or from one short time period to another. It is plausible that the current growth rates could be sustained in Blackfalds in the near future, however other periods of little to no growth may be felt with various swings in the economy.

For the purposes of planning for future land uses and the provision of municipal utilities, three different growth scenarios were used to estimate the future population. Table 3 shows the

projected 2036 population of Blackfalds at the three rates of growth. With an estimated base population of 4,700 in the year 2006, the three projections in Table 3 indicate a very wide population range in the year 2036.

Table 3: Blackfalds Projected Population Growth

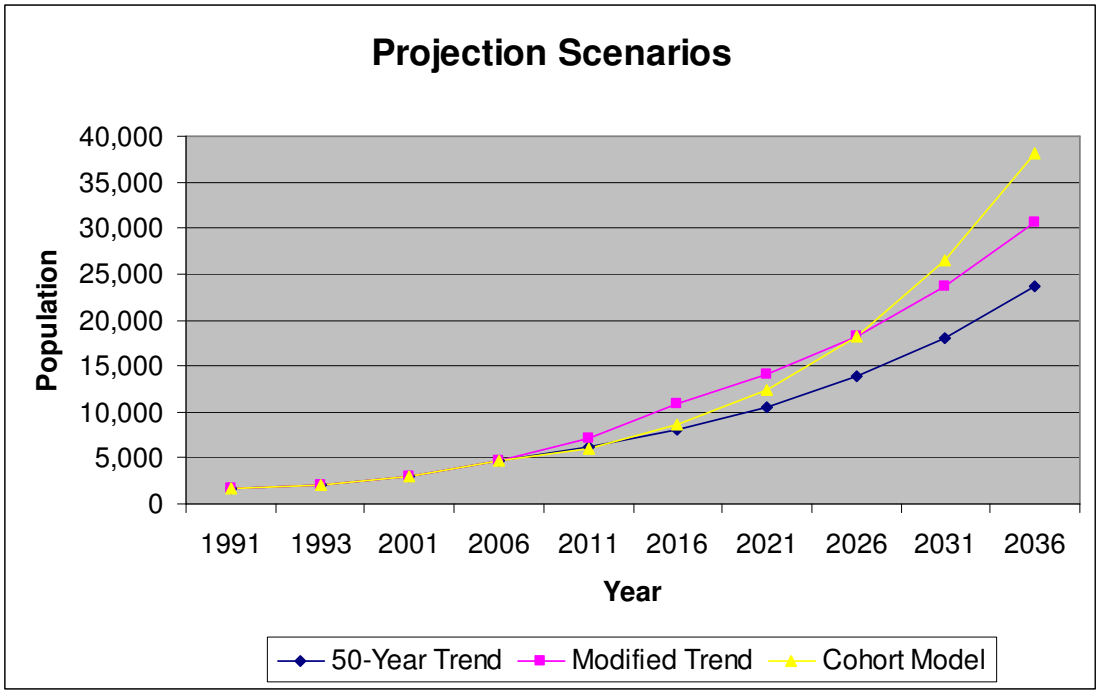
Year	50-Year	New Pop	Modified	New Pop	Cohort	New Pop
2006	4,741	-	4,741	-	4,723	-
2011	6,185	1,444	7,162	2,421	6,076	1,353
2016	8,083	1,898	10,819	3,657	8,666	2,590
2021	10,564	2,481	14,026	3,207	12,485	3,819
2026	13,807	3,243	18,184	4,158	18,239	5,754
2031	18,045	4,238	23,575	5,391	26,543	8,304
2036	23,584	5,539	30,564	6,989	38,040	11,497
Total	**-**	**18,843**	**-**	**25,823**	**-**	**33,317**

The Low estimate is the result of simply applying the constant 50-year annual growth rate (5.33%) discussed in Table 1 resulting in a 2036 population of 23,495. The Moderate projection extrapolates the recent 10-year annual growth rate (8.6%) to 2016 indicating a continued short-term growth trend in the Town. After 2016 the 50-year annual growth rate is used indicating a decrease in pace of the expected long-term growth. The High estimate uses a cohort-component projection model that attempts to measure the impacts of fertility, mortality and immigration on the population.

The Moderate projection was believed to be the most plausible future population and was utilized to project the corresponding land consumption ratios for future development. The Low projection was not chosen because it was felt that it did not adequately account for the expected short-term continuation of rapid population growth. The High projection was not chosen because it was felt that it placed too much emphasis on the most recent growth trends and over-emphasized the migration component.

For planning purposes the Town is expecting to approach a population of approximately 30,000 over the next thirty years. Figure 2 graphically illustrates a comparison of the three population projection scenarios.

Figure 2: Blackfalds Population Projection Scenarios: 2006-2036



2.4 RESIDENTIAL LAND REQUIREMENTS

To forecast future land requirements for residential development, two variables need to be considered. The first is the density of dwelling units (average number of units per area of land) and the second is the number of persons (occupancy) per unit.

The Town's Municipal Development Plan contains a policy directive in Section 5: Residential Development specifically aimed at residential density. Policy 5.3 states: "The design density for neighbourhoods should average between 10 residential units per gross developable hectare (4 per gross developable acre) and 12.5 residential units per gross developable hectare (5 per gross developable acre). Variations may be permitted if accommodated in an Area Structure Plan or Outline Plan approved by Council."

Three recent Area Structure Plans in Blackfalds have been reviewed to determine recent trends in residential densities. The residential densities in the plans ranged from 10.4 to 11.6 dwelling units per gross developable hectare, for an average of approximately 11 dwelling units per gross developable hectare, well within the defined range as stated in the Municipal Development Plan.

With regard to dwelling occupancy, the 1991 Census of Canada reported the average household size in Blackfalds was 2.84 persons per unit. The Town of Blackfalds 2006 Municipal Census reported an average household size of 2.89. This represents an uncommon

demographic trend. Recent history has a decrease in average household sizes as families have been getting smaller and the number of single-parent and childless households have increased.

The key indicator for experiencing an increasing average household size trend is the relative stability of the under-65 age cohorts, which implies that the Town is getting younger. This is typical of a high-growth community experiencing a high rate of in-migration. In Blackfalds the in-migration appears to be largely young (aged 26-40 years old) family households with children.

Figures 3 and 4 illustrate the similarities between the 1991 and 2006 population distribution by both age and sex. The shapes of the pyramids are very similar and indicate that the actual composition of the population has changed very little over the past 15 years, which helps to explain the increasing average household size trend.

Figure 3: Blackfalds Population Composition: 1991

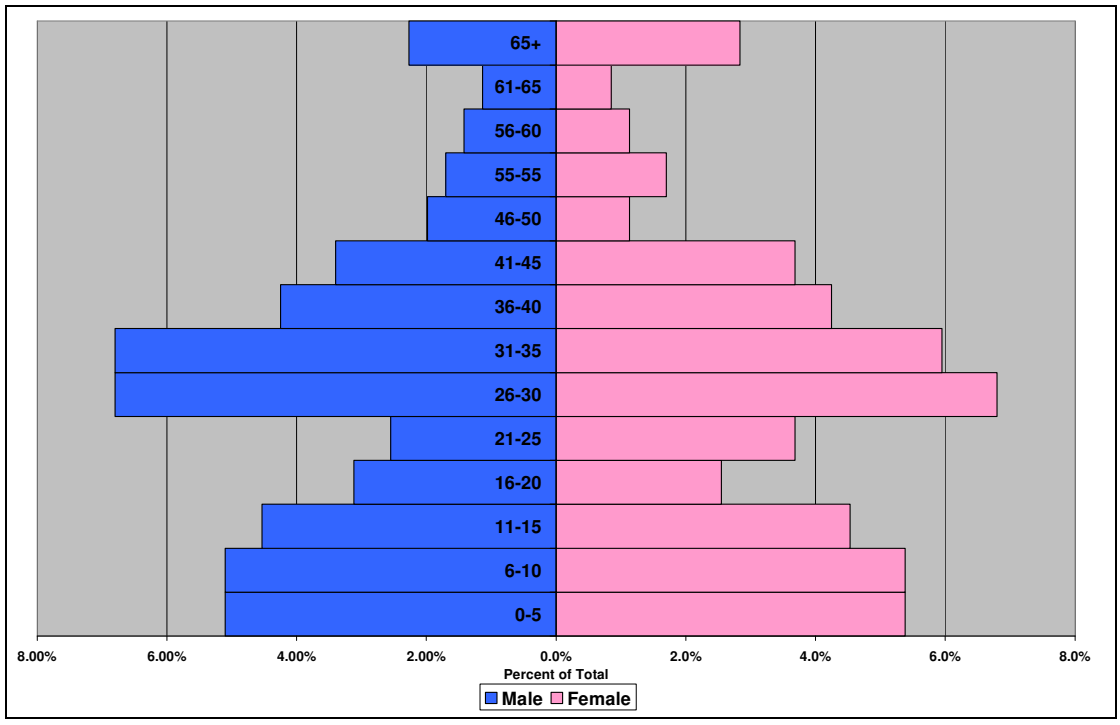
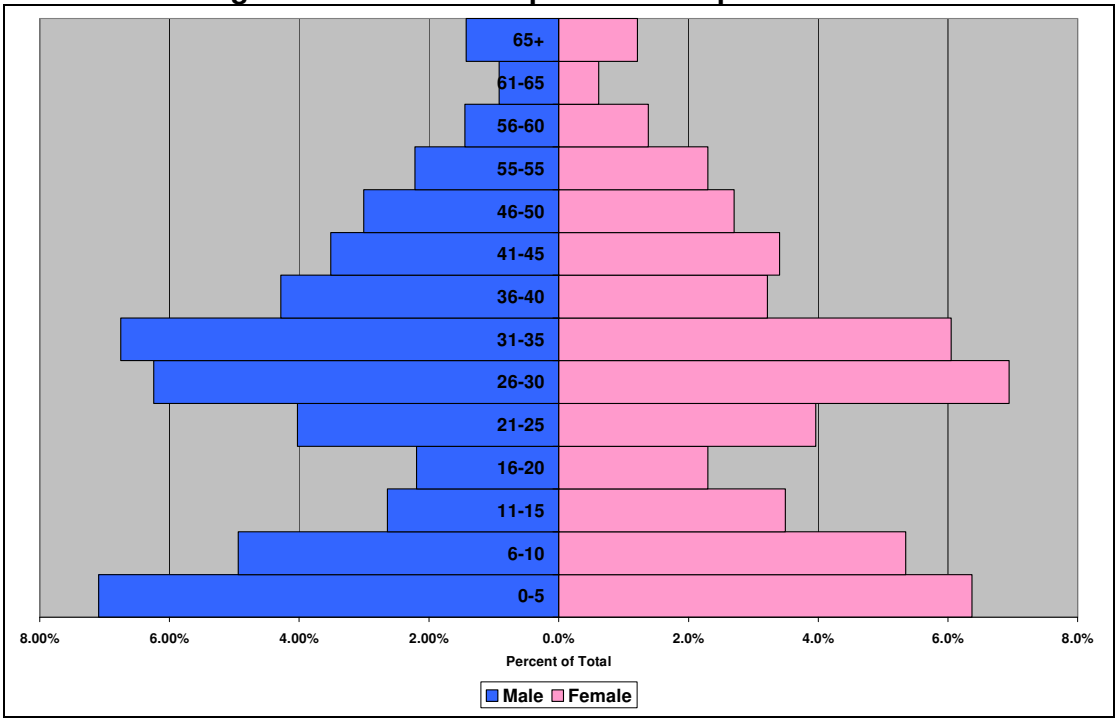


Figure 4: Blackfalds Population Composition: 2006



To project residential land requirements for Blackfalds the population projection must be converted into an anticipated demand for new housing units. To project the total number of new housing units the projected average household size must be applied to the projected population. Forecasting average household sizes is difficult. The type and size of households within a community is largely determined by the locational advantages within that community for various household needs. For example, elderly households typically migrate toward areas with low-maintenance housing options within close proximity to health care facilities.

As illustrated, historic and current trends have indicated the increased presence of young, married-couple households with children in Blackfalds due to the proximity to employment opportunities in Red Deer, an increasing mix of housing choice, relative affordability, and the small-town character suitable for raising children.

Table 4 illustrates the projected need for new housing units based on the Moderate population growth scenario retaining the average household size of 2.89 as a constant throughout the 30-year planning horizon.

Table 4: Projected Household Needs

Year	Population	New Residents	Average Household Size	Dwelling Units	New Dwelling Units
2006	4,741	-		1,638	-
2,011	7,162	2,421	2.89	2,476	838
2,016	10,819	3,657	2.89	3,741	1,265
2,021	14,026	3,207	2.89	4,851	1,110
2,026	18,184	4,158	2.89	6,290	1,439
2,031	23,575	5,391	2.89	8,155	1,865
2,036	30,564	6,989	2.89	10,573	2,418
Total	**-**	**25,823**	**-**	-	**8,935**

The New Residents column represents the expected new population for each five-year interval. Dividing the New Residents by the Average Household Size indicates the total number of New Dwelling Units necessary to accommodate the increase in population. Based on this projection the Town will require an additional 8,556 housing units to accommodate the new population over the next thirty years.

Land consumption is directly attributable to the total number of expected housing starts based on the projected population, average household size, and the intensity of development. As previously discussed, the current Blackfalds policy (Municipal Development Plan Policy 5.3) states the desired community density should be within the range of 10.0 to 12.5 dwelling units per gross developable hectare. Table 5 illustrates the range of land consumption needs based on the projected number of housing units and the Municipal Development Plan desired density range.

Table 5: Residential Land Consumption Needs

Year	Dwelling Units	New Dwelling Units	12.5 d.u/ha	10 d.u/ha
2006	1,638	-	-	-
2,011	2,476	838	67	84
2,016	3,741	1,265	101	127
2,021	4,851	1,110	89	111
2,026	6,290	1,439	115	144
2,031	8,155	1,865	149	187
2,036	10,573	2,418	193	242
Total	-	**8,935**	**715**	**894**

Total consumption for residential development also reflects the necessary land for municipal reserve dedications as well as the necessary land for transportation facilities. Table 5 indicates that between 684 ha and 856 ha of land will be necessary to accommodate the projected population growth.

Recent Area Structure Plans have increased the variety of housing choice and introduced a greater percentage of attached and multi-family dwelling units within the overall design. Municipal Development Plan Policy 5.6 requires a minimum of 70% of units within a new development to be single-family detached a 10% maximum of new units to be duplex, and a maximum of 20% of new units to be townhouse, or apartment-style housing. As this mix continues to be followed overall densities appear to be rising towards the higher end of the density range.

2.5 COMMERCIAL AND INDUSTRIAL LAND REQUIREMENTS

The current supply of commercial and industrial lands and is based on area calculations of parcels containing existing uses and does not include vacant land designated for future development. The total commercial space currently used within the Town is approximately 5.56 ha, which is approximately 1.2 ha per 1,000 residents. The Town contains approximately 31.33 ha, or 6.6 ha per 1,000 residents, of developed Industrial lands.

The existing supply of commercial and industrial lands is relatively low and a reflection of the rapid population growth that has occurred in the last five years, indicating that residential growth has outpaced commercial and industrial development.

Additionally, the Town's proximity to shopping and employment opportunities in Red Deer has a direct impact on the supply of commercial and industrial land uses. Based on the 2006 Federal Census the Town had a Labour Force of approximately 2,780. According to place of work statistics only 10.6% of the local labour force was employed in Blackfalds, which illustrates a very large percentage of local employees commuting to jobs outside of the community.

The City of Red Deer's trade area captures the Town of Blackfalds and the proximity increases the gravitation of Blackfalds consumers towards the Red Deer retail and service industry markets reducing the demand for local commercial activity. However, as the local population grows it is expected that retail and service sector activity will increase accordingly to reflect the higher demand.

The reduced level of commercial and industrial development within the Town has a direct impact on the local tax base and creates an imbalance between residential and non-residential (specifically commercial and industrial) assessment.

Based on the October 30, 2006 Equalized Assessment Report from Alberta Municipal Affairs, Blackfalds' ratio of residential to non-residential tax assessment was 90.7% Residential and 9.3% Non-Residential. The intent is to develop an increasing amount of commercial and

industrial lands to generate a greater balance in the Town's tax base. This is specifically important for Blackfalds as the balance has shifted greatly to the residential side as population growth has increased rapidly during the past decade. The December 1, 1997 ratio of residential to non-residential assessment values was 86.7% to 13.3%.

Table 6 illustrates a comparison between similarly sized Towns in the region.

Table 6: Regional Comparison of Assessment Ratios

Municipality	2006 Population	Residential	Non-Residential
Blackfalds	**4,741**	**90.7%**	**9.3%**
Three Hills	3,089	82.6%	17.4%
Didsbury	4,275	90.1%	9.9%
Ponoka	6,576	80.7%	19.3%
Rocky Mountain House	6,874	72.6%	27.4%
Olds	7,248	80.7%	19.3%
Innisfail	7,316	78.6%	21.4%

In order to increase the balance between residential to non-residential assessment values the non-residential component must increase. To achieve a target of doubling the existing non-residential assessment of 9.3% to 18.6% requires approximately 0.65 ha of commercial and industrial lands for every hectare of residential land. This specific example would generate a requirement for approximately 488 ha of commercial and industrial land based on current typical assessment rates for residential, commercial and industrial properties.

3.0 Related Growth Issues

3.1 COMMERCIAL DEVELOPMENT AND THE DOWNTOWN

As shown on Map 5: Future Land Use and Roadways, Blackfalds has a 'downtown' commercial core, albeit limited in extent and in the variety of goods and services offered. Historically, the community's general development plans have 'protected' the commercial core by limiting the amount of land allocated for commercial purposes elsewhere in the community with the hope that the downtown area would grow in size and vibrancy. While there has been commercial development in the downtown core, interest in downtown locations for new commercial enterprises appears to remain weak.

Currently, just over one-third of the properties that are allocated for downtown commercial uses are used for commercial purposes, while the remainder are used for other residential and institutional purposes. Given the amount of parcels still available for commercial development, it is concluded that the present size of the 'designated downtown' is sufficiently large, to accommodate future commercial interests that may seek a 'downtown' location.

Retail location trends call for sites with high visibility from major arterials (like Highway 2A), good access and convenient parking. In Blackfalds, like most small towns, the downtown generally does not offer these key attributes. This is evident by the high degree of interest in the commercial parcels created along the east side of Highway 2A.

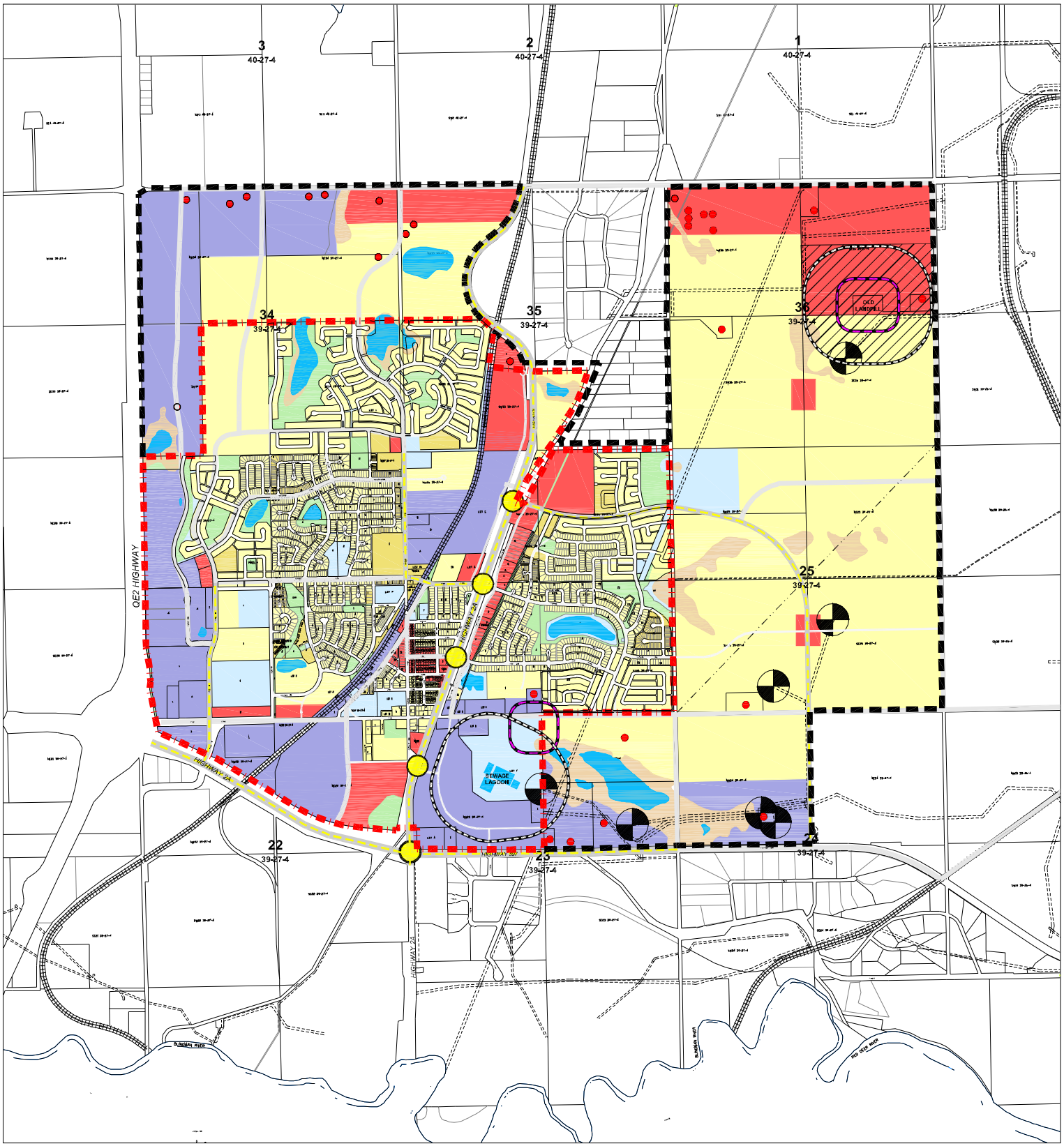
Consequently, the challenge for downtown Blackfalds is not its size. In the short to medium term, with the likely concentration of commercial development along Highway 2A, the real challenge facing the downtown is its continued vitality and vibrancy. It will be important keep the number of vacancies to a minimum, in order to maintain the feel of 'vitality' and to provide choices and continuity for shoppers.

Some ideas to consider for the downtown area are:

- capitalize on social, cultural and commercial history – create a distinctive shopping area integrated with personal services, new specialty shops, coffee houses, etc. that make the downtown a 'social' and gathering place as well

- pedestrian friendly – pedestrians should have equal or greater rights than vehicles – dedicated pedestrian crossings, etc.

- reinvest in the downtown – provide identity, marketing initiatives, improved aesthetics – tree planting, brick sidewalks, attractive street furniture signage, gateways and intersection corner features, improved and coordinated store fronts, parking areas, including off-street (likely both the Town and business sector will need to partner)



2007 Proposed Annexation

- EXISTING TOWN BOUNDARY
- PROPOSED ANNEXATION BOUNDARY
- ARTERIAL ROADWAY
- COLLECTOR ROADWAY
- LOCAL ROADWAY
- SIGNALIZED INTERSECTION
- COMMERCIAL
- OPEN SPACE
- INDUSTRIAL
- PUBLIC / INSTITUTIONAL
- RESIDENTIAL
- RESIDENTIAL MULTI-FAMILY
- WATER BODY
- SLOUGH / WETLAND
- SPECIAL STUDY AREA
- OVERHEAD POWER LINE
- 300m SETBACK
- 100m SETBACK
- BUILDING
- OIL / GAS WELL (100m setback)
- OIL / GAS / GLYCOL PIPELINE R-of-W
- RAILWAY

TOWN OF
BLACKFALDS

MAP 5
FUTURE LAND USE & ROADWAYS

OCTOBER 2007

PARKLAND COMMUNITY PLANNING SERVICES

- retail compression – shops and services on both sides of street to 'double loop' for pedestrians.

3.2 CONSERVATION AREAS AND TRAILS

Open space areas, and especially 'natural' open spaces, can significantly add to the aesthetics of a community and the quality of life of its residents. As discussed in Section 2.1 and shown on Map 2: Environmental Constraints, there are a number of features in and around Blackfalds that do and can serve as 'conservation' areas and therefore contribute greatly to the range and variety of open space available in Blackfalds far into the future.

The most significant 'conservation' features include sloughs, wetlands, escarpments and wooded areas. Future plans for growth and development should serve to accommodate the conservation of these areas.

The conservation areas and other open spaces should be integrated by a trail system that also links residential areas with community recreation and education facilities. The trail system would utilize existing features and facilities, wide sidewalks along new collectors and municipal and utility parcels in future subdivision areas that could be strategically located to promote trail continuity.

3.3 PLANNING DOCUMENTS – TOWN OF BLACKFALDS

The Town of Blackfalds has three significant planning documents that guide and regulate future growth and development, these being the, the Municipal Development Plan, Inter-Municipal Development Plan, and the Land Use Bylaw.

The Municipal Development Plan (MDP) was adopted in 2002. It serves "as a common guide for Council, subdivision and development authorities, municipal residents and businesses, and the development community respecting Blackfalds' land use and development and by doing so promotes orderly growth which appropriate, sustainable and efficient, thus enhancing opportunities for business and the quality of life of residents" (Purpose – page 1).

The two municipalities adopted a Joint General Municipal Plan in 1988. Since that time, provincial planning legislation has changed, defining new requirements for inter-municipal planning, particularly related to the establishment of dispute resolution mechanisms. A new Inter-municipal Development Plan was adopted by both Councils in 2003 and updated in December 2006 to respond to the substantial growth that occurred in the Town and the continuing development pressures both within the Town and surrounding area.

The purpose of this Inter-municipal Development Plan is to outline a co-operative framework for the resolution of planning, economic development, utility servicing, and transportation issues that are of joint interest to the Town of Blackfalds and Lacombe County. Strong growth has

continued with the result that the Town and County decided to update the Inter-municipal Plan to reflect their future development interests and needs.

The MDP states the Town together with Lacombe County will seek to update the Blackfalds Joint General Municipal Plan. As discussed in Section 3.5, this update has not yet occurred.

As new development has occurred the Town has adopted a number of Area Structure Plans, which are a more detailed policy guide to land use development. The future land use patterns in each of the Area Structure Plans have been incorporated into Map 5: Future Land Use and Roadways.

The Land Use Bylaw regulates land use development through the use of a series of land use districts which generally reflect the desired distribution of land uses as guided by the MDP.

3.4 PLANNING DOCUMENTS – LACOMBE COUNTY

Lacombe County has four planning documents that relate to the 'fringe' area around Blackfalds. These are the Municipal Development Plan, the Inter-Municipal Development Plan, the Land Use Bylaw, and the Lacombe/Blackfalds Rural Fringe Area Structure Plan.

Section 10 of the Lacombe County Municipal Development Plan recognizes the importance of co-operating with urban neighbors by encouraging coordinated and complementary land use and development activities. The County recognizes fringe areas adjacent to urban centres require special planning attention and therefore special planning initiatives with urban communities are supported.

The Joint Lacombe County/Blackfalds Inter-Municipal Development Plan identifies the Town's long-term growth area, which is represented in this study by the annexation area. This joint planning initiative was developed to ensure that both the Town and County's long-term development needs could be met in a mutually beneficial manner.

The County Land Use Bylaw designates land around Blackfalds for agricultural, industrial and country residential purposes. These reflect existing land uses in the fringe area and help to shape the future urban growth pattern.

The Lacombe/Blackfalds Rural Fringe Area Structure Plan was approved in December of 2007. The purpose of the Lacombe / Blackfalds Rural Fringe Area Structure Plan (ASP) is to identify lands where multi-lot housing, industry / business or other types of development may be considered. The ASP is meant to provide a policy framework indicating the preferred land uses, general development standards, road access improvements and servicing requirements to ensure orderly planning in the area and to respond to future subdivision and development proposals. The plan area is considered to be south and east of the annexation area and extending north to the Town of Lacombe.

The Town and County are also currently working on another joint planning initiative that includes the Town of Lacombe as well. Upon completion this will form the Highway 2A Urban Corridor Area Structure Plan and will incorporate lands north of the Town of Blackfalds' annexation area located between Highway 2, the western edge of the Lacombe/Blackfalds Rural Fringe Area Structure Plan, and the Town of Lacombe.

4.0 Future Development Concept and Sequential Development

4.1 DEVELOPMENT HORIZONS

As an integral part of this Growth and Infrastructure Study, it was determined that planning for future growth would be based on the following population horizons:

- Short-Term Growth: Defined as largely within the existing Town boundary and designed to accommodate a population horizon of approximately 11,600.
- Medium-Term Growth: Defined as the logical initial development of the annexation area and designed to accommodate a population horizon of approximately 20,500.
- Long-Term Growth: Defined as the development of the remaining lands within the annexation area and designed to accommodate a population horizon of approximately 31,800.

4.2 DEVELOPMENT AREAS

The 2006 Inter-Municipal Development Plan has provided the Town of Blackfalds with its preferred long range growth and land use pattern. With the Town's proposed annexation of portions of 14 quarter sections, development phasing and sequencing has to be looked at in more detail.

This report builds on past planning initiatives and studies to provide the Town with an updated sequential development scheme. This sequential development plan considers the revised population and density growth patterns for the Town and ease of servicing.

The Proposed Phasing and Population Horizons map illustrates the build-out population of the existing Town boundary as well as a logical phased expansion of the boundary based on the ability to feasibly extend servicing.

4.1.1 Existing Capacity

Six major Area Structure Plans have been submitted to the Town for future development within the existing boundary. Additionally there have been subdivision submittals for additional residential development on individual parcels. The new proposed development in conjunction with the existing MDP Land Use Concept, and proposed amendments to the MDP, will accommodate an approximately 3,000 additional residential units. The residential build-out of the Town represents an approximate increase in total population of 8,600 based on the average household size of 2.89. The population projections in Section 2.3 indicate this is likely to occur over the next 15 years.

The Town does have existing land available for both commercial and industrial development. Lands on either side of Highway 2A at the southern entrance to the Town are planned to accommodate some industrial development as well as lands adjacent the Highway 2 corridor along the Town's western boundary. The Town has lands designate for commercial use within its downtown area as well as lands between the rail and Highway 2A along the northern boundary. Lands within the existing boundary are capable of accommodating an additional 46.9 hectares of commercial space and 103.9 hectares of industrial lands.

4.1.2 Annexation Area

The proposed annexation lands are shown on Map 1: Proposed Annexation Areas and consist of four major areas:

- Northwest: Comprising lands north of the existing boundary between Highways 2 and 2A and south of Lakeside/Sargent Road.
- Northeast: Comprising lands contained in Section 36-39-27-4 bound to the north by Lakeside/Sargent Road, to the west by Range Road 27-0, and to the east by the existing country residential development;
- East: Comprising lands contained within Section 25-39-27-4 and bound to the west by Range Road 27-0, to the east by the Town boundary, and to the south by Township Road 39-4; and
- Southeast: Comprising the NE 23-39-27-4 and NW 24-39-24-4 bound to the north by Township Road 39-4, to the east by the Town boundary, and to the south by Highway 597.

The total area within the proposed annexation area is approximately equal to 983.69 ha with the total developable area approximately equal to 783.52 ha. This total developable area excludes lands that are within utility right-of-ways, setbacks, or considered environmentally sensitive.

4.2 FUTURE LAND USE PLAN

Map 5: Future Land Use and Roadways expands on the Future Land Use Concept within the Town's Municipal Development Plan and refines the Inter-Municipal Development Plan's concept. The creation of the Future Land Use Concept in the Town annexation area was based largely on the following:

- The analysis of land use requirements based on the projected population and the resulting need for commercial and industrial expansion;
- Consideration of optional land uses for each development sector in relation to major infrastructure (such as highways and secondary highways);

- Potential planned adjacent or nearby land uses;
- The phasing and costing of utility infrastructure as discussed in the following sections.

The annexation of the lands to the north between Highways 2 and 2A will provide a logical expansion of planned residential development within the existing boundary and economic development potential along the Highway 2 corridor. Existing and future major roadways define the area and the long-term concept seeks to take advantage of potential economic development opportunities along Lakeside/Sargent Road and Township Road 40-0) as transportation improvements are developed.

The lands directly east of the existing boundary (in Section 25) form a logical planning unit of residential neighborhoods transitioning from large-scale existing and planned developments within the Town's boundary. The area provides the opportunity to create a relatively central location for public facilities (school and recreation sites) that are accessible to the entire population. Long-term efficient access to this area requires the coordination of an internal collector road network extending from the existing developed neighborhoods along the eastern edge of the Town's boundary.

The northeast area (Section 36) contains unique challenges. The area is bound by the country residential estates located in the County, which impedes internal connectivity. The residential areas are an extension north of the proposed neighborhoods within Section 25. The area illustrates commercial opportunity adjacent to Lakeside/Sargent Road, which includes an existing greenhouse business located in the northwest corner of NW 36. NE 36 contains an old landfill site, which is accompanied by a 300-metre setback for the location of residential developments, which will impact the siting of houses within the illustrated setback boundary. As development extends into this quarter-section Alberta Environment will be consulted to determine the potential to reduce the 300-metre setback. The commercial designation illustrates the potential to develop an employment node to balance the availability of jobs within the Town and to take advantage of future residential growth north of the annexation boundary.

The presence of the old County landfill creates some uncertainty on the ultimate development capacity of areas 8 and 10 (as illustrated on the Proposed Phasing and Population Horizons map) because of the potential to reduce the development setback with further reclamation of the site. Currently area 10 is designated for commercial development, which would not significantly impact the overall capacity. However, area 8 is designated as residential and the maximum development capacity would be significantly impacted by the size of the development setback surrounding the landfill site.

The southernmost lands within the proposed annexation boundary along Highway 597 have two distinct functions. The northern areas illustrate an expansion of residential neighborhoods while the southern areas along Highway 597 represent an expansion of industrial development taking advantage of direct access to the Highway and proximity to the Highway 2 and 2A intersections.

Since municipalities are dynamic entities and land use needs may change with evolving economic and social factors, over time this land use plan will need to be reviewed. As development occurs more detailed Area Structure Plans will be prepared refining the overall Future Land Use plan.

4.3 CARRYING CAPACITY

Tables 7 through 10 outline the carrying capacity of each of the designated quarter-sections within the proposed annexation area for each of the identified land uses on the preliminary concept map. Each quarter-section is defined in accordance with the proposed phase of development as described on the Proposed Phasing and Population Horizons map.

4.3.1 Residential Development

Table 7 illustrates the projected carrying capacity of the annexation area for residential development in total number of dwelling units. The carrying capacity is based on achieving the maximum allowable density in accordance with the Town's Municipal Development Policy of 12.5 dwelling units per gross developable hectare.

Area 8 is discussed under three different scenarios. The first being the ability to achieve the maximum capacity based on the entire developable area. The second illustrates the capacity based on the existence of a 300-metre development setback surrounding the landfill site and the third scenario illustrates the impact on the capacity through reducing the development setback to 100-metres.

Table 7: Residential Development Carrying Capacity

Proposed Phase	Legal Description	Area (ha)	Potential Dwelling Units
1	SW 25-39-27-4	60.79	760
	NE 34-39-27-4	38.85	486
2	NW 25-39-27-4	43.73	547
3	NE 23-39-27-4	19.43	241
	NW 34-39-27-4	16.38	205
4	NW 24-39-27-4	32.78	406
	NW 35-39-27-4	22.36	280
5	SE 25-39-27-4	63.83	815
6	NE 25-39-27-4	62.57	782
7	SW 36-39-27-4	61.26	766
8	SE 36-39-27-4	60.55	756
	300-m Scenario	***41.84***	***523***
	100-m Scenario	***57.12***	***714***
9	NW 36-39-27-4	38.56	481
	Totals	**521.09**	**6,523**
	300-m Scenario	***502.38***	***6,290***
	100-m Scenario	***517.66***	***6,481***

Map 5: Future Land Use and Roadways illustrates a Public/Institutional land use designation, which has been discussed as a potential school or multiple use recreation complex. The size of the area is approximately 16 hectares and is included as part of Phase 2 in the Proposed Phasing and Population Horizons map. Based on the potential Municipal Reserve dedications within the residential areas it is anticipated that the majority of parks, open spaces, and public/institutional facilities will be included in new residential development.

The carrying capacity for the residential component of the annexation area illustrates the potential to accommodate approximately between 6,290 and 6,523 new residential units. In Section 2.4 Table 4 illustrates the need to develop approximately 9,000 new residential units to accommodate the long-term population horizon, which exceeds 30,000 (an estimate 25,800 new residents). As discussed in Section 4.2 the current Town boundary has the ability to accommodate an approximate 3,000 additional residential units, indicating the need to accommodate approximately 6,000 new residential units in the annexation area. As Table 7 indicates the annexation area is sufficiently sized to accommodate the projected population and resulting residential demands.

4.3.2 Commercial and Industrial

Tables 8 and 9 illustrate the projected carrying capacity of the annexation area for both commercial and industrial lands based on the future land use concept illustrated in Map 5:

Future Land Use and Roadways. Each quarter-section is defined in accordance with the proposed phase of development as described on the Proposed Phasing and Population Horizons map.

Table 8: Commercial Development Carrying Capacity

Proposed Phase	Legal Description	Area (ha)
Short-Term	SW 35-39-27-4	2.61
1	SW 25-39-27-4	1.36
	NE 34-39-27-4	6.66
4	NW 35-39-27-4	14.76
5	SE 25-39-27-4	1.36
7	SW 36-39-27-4	1.97
	SE 36-39-27-4	1.95
9	NW 36-39-27-4	23.58
10	NE 36-39-27-4	64
	Totals	**118.25**

Table 9: Industrial Development Carrying Capacity

Proposed Phase	Legal Description	Area
1	NE 34-39-27-4	17.6
2	SW 34-39-27-4	25.64
3	NE 23-39-27-4	18.56
	NW 34-39-27-4	46.37
4	NW 24-39-27-4	22.59
	Totals	**130.76**

The commercial and industrial land needs were addressed in the annexation area as a reflection of the increased service levels and shopping needs of a population in excess of 30,000 as well as the goal to provide an increased number of local employment opportunities to an expanding local labour force. Another specific goal identified by the Town was to balance the community tax base by increasing the percentage of the assessment revenue derived from non-residential sources. As an initial goal the annexation sought to achieve a doubling of the current non-residential assessment proportion of 9.3% (as illustrated in Table 6 in Section 2.5). Although this increases the total assessment value of non-residential lands to approximately 16.5% it falls short of the target to double the existing ratio to 18.6%.

As a mechanism to help offset the residential-to-non-residential assessment imbalance the Town has recently reached an agreement with Lacombe County on the implementation of a joint

economic development agreement that addressed the opportunity to share in future tax revenues generated from commercial and industrial development in a defined area west of Highway 2. The agreement is based on a cooperative arrangement that provides an increased proportion of tax revenue to the Town based on the level of urban services that they provide to the commercial and industrial sites. As development occurs within the joint economic development area the Town will acquire additional revenues to address the current imbalance.

Table 10 summarizes the carrying capacity of the annexation area in its entirety illustrating the proposed amount of development for each of the proposed phases as described on the Proposed Phasing and Population Horizons map.

Table 10: Annexation Area Carrying Capacity

Proposed Phase	Legal Description	Residential		Commercial	Industrial	Public/Institutional
		Area (ha)	Dwelling Units	Area (ha)	Area (ha)	Area (ha)
Short-Term Growth	SW 35-39-27-4	-	-	2.61	-	-
1	SW 25-39-27-4	60.79	760	1.36	-	-
	NE 34-39-27-4	38.85	486	6.66	17.6	-
2	NW 25-39-27-4	43.73	547	-	-	16.03
	SW 34-39-27-4	-	-	-	25.64	-
3	NE 23-39-27-4	19.43	241	-	18.56	-
	NW 34-39-27-4	16.38	205	-	46.37	-
4	NW 24-39-27-4	32.78	406	-	22.59	-
	NW 35-39-27-4	22.36	280	14.76	-	-
5	SE 25-39-27-4	63.83	815	1.36	-	-
6	NE 25-39-27-4	62.57	782	-	-	-
7	SW 36-39-27-4	61.26	766	1.97	-	-
8	SE 36-39-27-4	60.55	756	1.95	-	-
	300-m Scenario	***41.84***	***523***	-	-	-
	100-m Scenario	***57.12***	***714***	-	-	-
9	NW 36-39-27-4	38.56	481	23.58	-	-
10	NE 36-39-27-4	-	-	64	-	-
Totals		**521.09**	**6,523**	**118.25**	**130.76**	**16.03**
300-m Scenario		***502.38***	***6,290***			
100-m Scenario		***517.66***	***6,481***			

5.0 Review of Infrastructure

5.1 GENERAL BACKGROUND & INTRODUCTION

The Town completed an analysis of their infrastructure in December 1996 by Tagish Engineering. This report assessed the existing infrastructure and addressed the long term needs of the Town to the year 2020 or a 25 year growth. In 2000, Stantec completed the original Town of Blackfalds Master Plan which estimated the population for the year 2020 between 3,566 and 5,957 people with an estimated long term growth rate of 3.45% to the year 2020 of 4,729 people. Based on the 2007 Census completed by the Town, the previous population estimates for 2020 were exceeded in 2007, as the Town's existing population reached 4,843 people. For the purpose of this Master Plan, the population projections, as discussed in Section 2.0are based on a 2005 population of 4,373 with a growth rate of 8.60% experienced until 2015 and followed by a growth rate of 6.15% until 2035.

The 2000 report set target populations for when additional infrastructure would be required as discussed in Section 4.1. The population targets for this study have been set as follows and the corresponding area is shown in Figure 5.1:

- 11,600 people = Phase 1: Existing Town boundary build-out – Year 2017
- 20,500 people = Phase 2: Annexation Stage 1 - Year 2027
- 31,800 people = Phase 3: Annexation Stage 2 - Year 2035

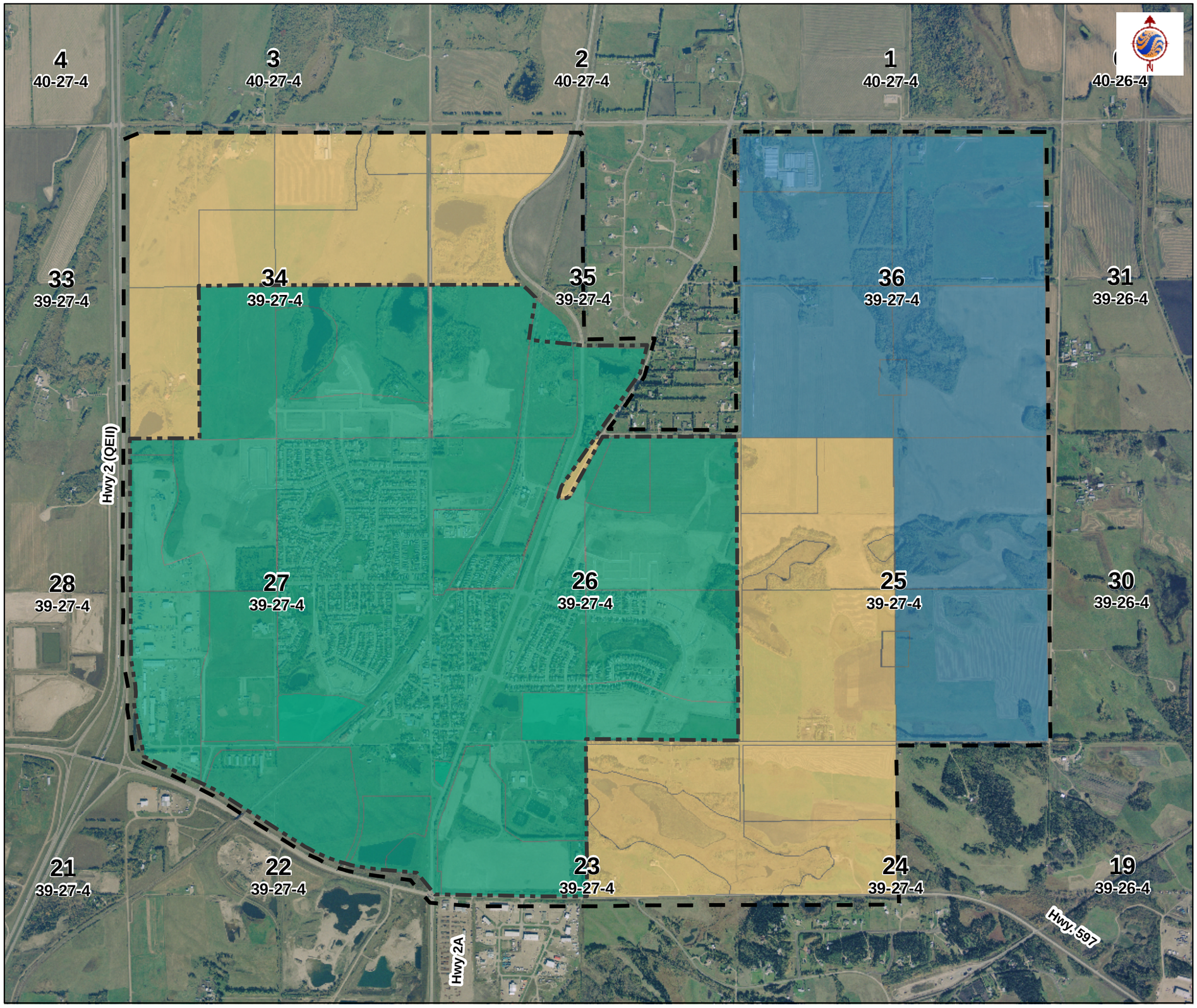
Please note that development mat influence the sequence of the proposed infrastructure extensions and upgrades described in the following sections, which may not be as per the population scenarios noted above.

The infrastructure review and analysis presented below provided a guideline for the planning of required future upgrading of the Town's infrastructure and facilities to the population horizons noted above. Please refer to Figure 5.2 which outlines the future development areas that are referred to in Section 5.0.

5.2 ROADS

5.2.1 Background

A Transportation Study was completed for the Town by Swanson Transportation Consultants and UMA Engineering in 1991. This study provided a street network plan to a population target of 6,000 people. This population only considered residential development west of Highway 2A with less than a quarter section of industrial land on the east side of Highway 2A. The study addressed a number of issues including; the location of an arterial route around the outer edge



Stantec Consulting Ltd.
600, 4808 Ross Street
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Fax. 403-342-0969

Stantec

Legend

- Short Term Growth (11,600 Pop. Horizon)
- Medium Term Growth (20,500 Pop. Horizon)
- Long Term Growth (31,800 Pop. Horizon)
- Annexation Boundary
- Existing Town Boundary

Client/Project

TOWN OF BLACKFALDS
2007 MASTER PLAN

Title

Proposed Phasing and Population Horizons

Project No.
113927050

Drawing No.
5.1

Scale:
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Meters

Date:
Apr. 22, 2008

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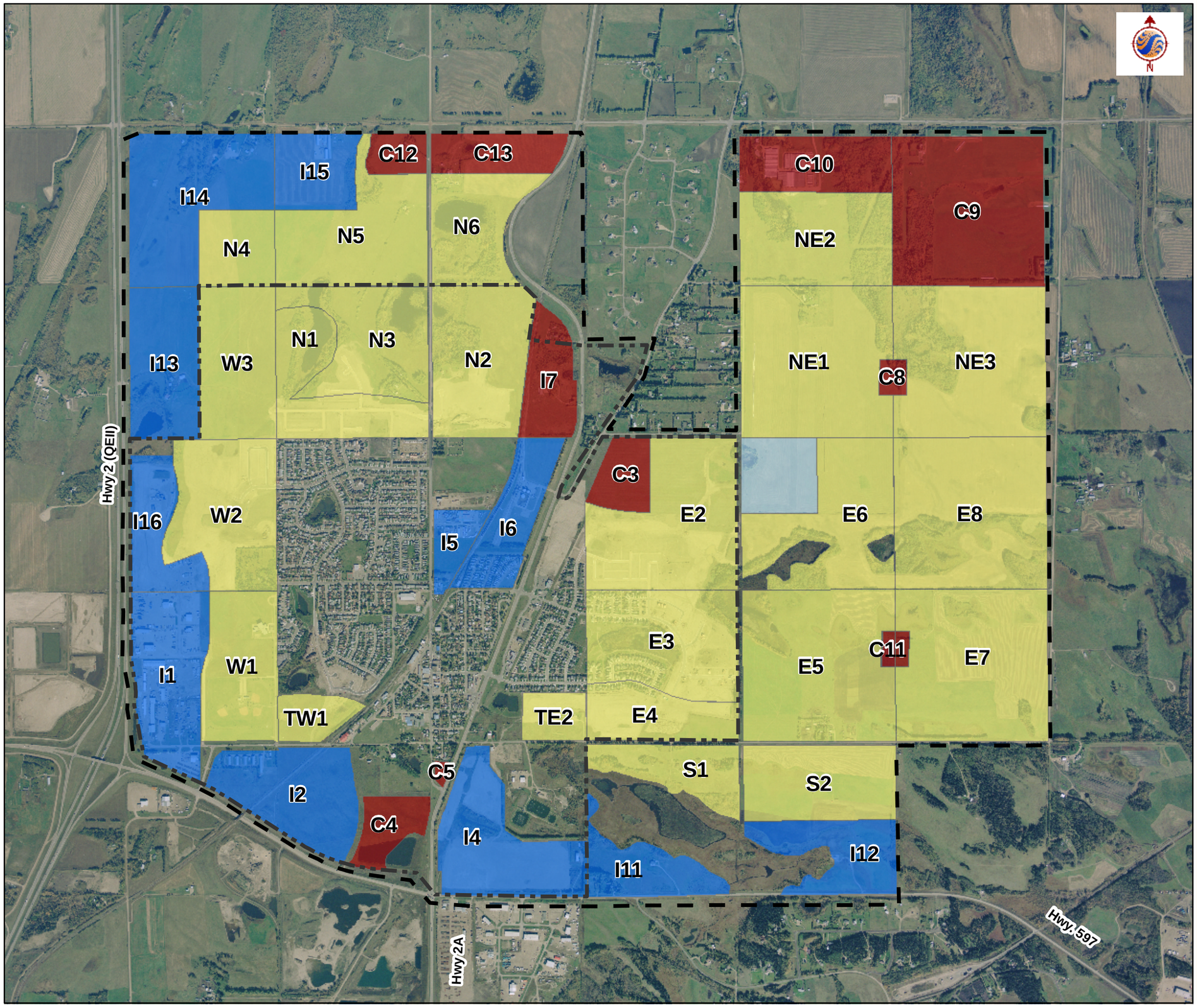

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Legend

- Residential
- Commercial
- Industrial
- Institutional
- Annexation Boundary
- Existing Town Boundary

Client/Project

TOWN OF BLACKFALDS
2007 MASTER PLAN

Title

Proposed Development Areas

Project No.
113927050

Drawing No.
5.2

Scale:
0 125 250 500 750
Meters

Date:
Apr. 22, 2008

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of town, the extension of Womacks Road, the number and location of railway crossings and access to Highway 2A and Secondary Highway 597. The Future Land Use Concept at that time did not include any areas north of the cemetery. Adding these areas increases the population within these boundaries to potentially well over 7,500 people. UMA also proposed roadway standards for residential, collector, arterial and industrial roads that have been adopted by the Town. No changes to these standards are proposed.

The General Municipal Plan Analysis of Infrastructure completed by Tagish Engineering in 1996 proposed a number or variations to the 1991 UMA Transportation Study. These changes were to try to utilize existing road networks, upgrading them to a higher standard when required and placing a good portion of the road network through development areas. The developer would have to build them as part of their development cost. The other significant change in this report was to reduce the road standards to more collectors and eliminate the North Highway 2A access across the CP Rail crossing due to its potential high cost.

In 1998, a Traffic Impact Study was completed by Reid Crowther for Waghorn Developments Inc. on the East Side of Highway 2A addressing the development of approximately 24.2 Ha (60 acres) of land for both commercial and residential development. The previous land use had this area designated commercial and industrial. The report recommended that the widening of Highway 2A between Gregg and Park Streets would be required by Year 2003 to accommodate background and site generated traffic and it assumed that Highway 2A would be twinned by the year 2013.

In 2000, Stantec completed the original Master Plan, which addressed the roads based on short, medium and long term population horizons up to a population of 12,000 people. There was a greater focus on short and medium range horizons in this report so the Town completed a Transportation Study in 2003 to enhance and confirm the recommendations of the Master Plan, particularly in terms of the long-range recommended road network. Based on this study the following short and medium range upgrades were identified:

1. West Arterial Construction & Womacks Road Extension
2. Gregg Street Realignment, Broadway Avenue Alignment & New Rail Crossing
3. Park Street / Highway 2A Improvements, Parkwood Road Construction and Signalization of Park Street / Highway 2A and Gregg Street / Highway 2A
4. Twin Highway 2A to be completed by Alberta Infrastructure & Transportation
5. Extend West Arterial Road to Westbrooke Road, Widen South Street to 4 Lanes and Reconstruct West Arterial Access to Highway 597.
6. Construct Stage 1 of East Collector and Realign C&E Trail

7. Construct Industrial Collector from Parkwood Road to Highway 597

8. Construct Collector from South Street to Industrial Collector (Item 7)

Based on the review of the previous studies, consideration of the proposed land uses and direction of growth as the Town grows; we present the following Proposed Transportation Network as presented in Figure 5.3.

This proposed road network is designed to serve the needs of the Town's future growth to the 20,500 population horizon. Further, more detailed road network analysis would have to be completed to provide a road network for 32,000 people

5.2.2 Community Expectations of Acceptable Traffic Conditions

An important consideration in the development of roadway networks is the expectations of a community with respect to acceptable traffic conditions. As a general rule, the larger the community the higher level of tolerance residents will have for daily traffic volumes and delay. In smaller communities, such as Blackfalds, the tolerance for delay is relatively low and community expectations are for minimal delays, therefore smaller daily volumes. In many communities these expectations have been tempered somewhat by the realization of residents that they cannot afford to provide roadway infrastructure required to maintain the traffic conditions to which they are accustomed. With this realization, residents in both large (such as Edmonton and Calgary) and medium sized (such as Red Deer) communities have consciously accepted transportation plans that call for increased overall delays and higher daily volumes by delaying or in some cases eliminating them from long-term plans selected roadway network improvements.

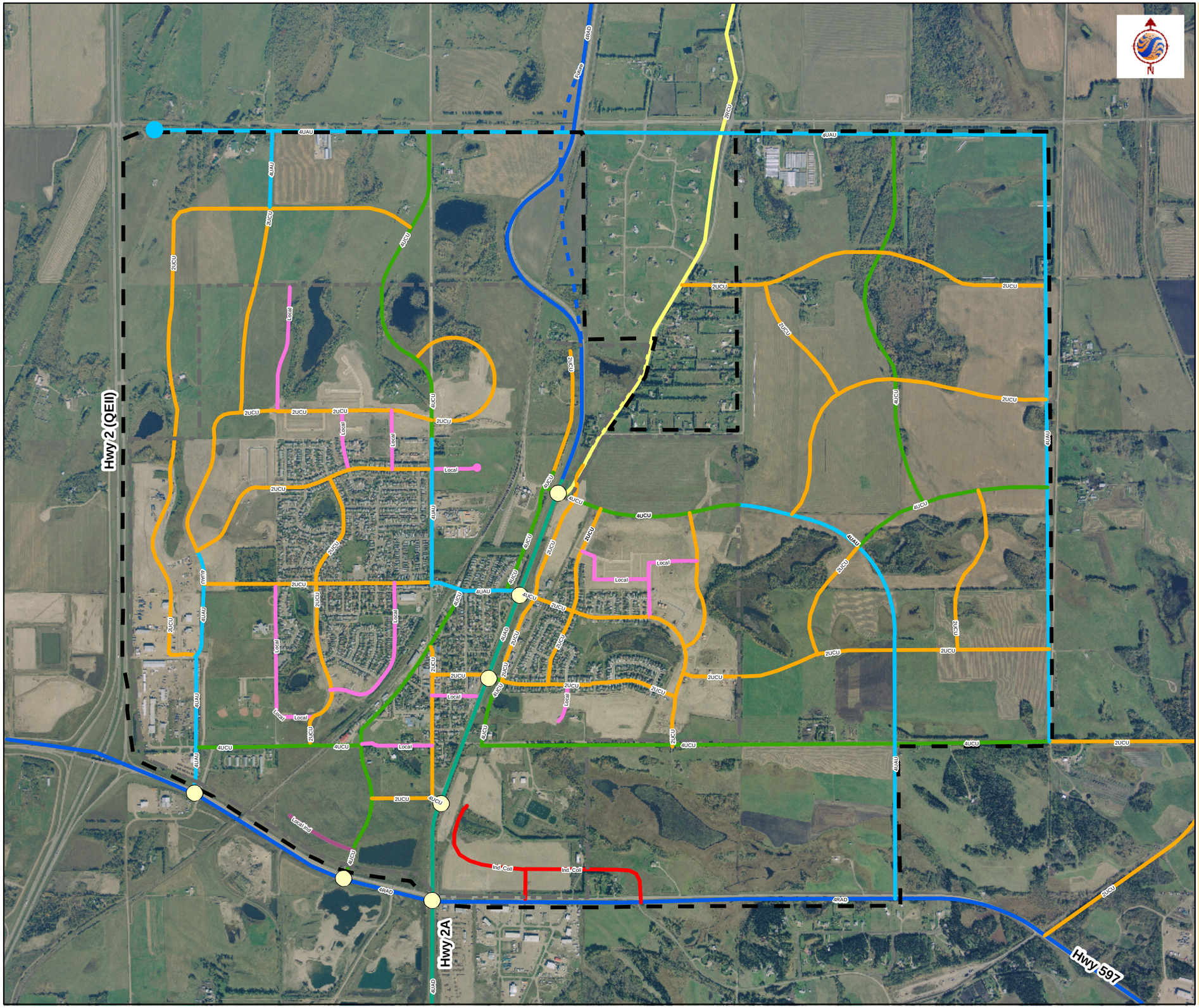
Based on previous studies, the estimate of expected level of traffic volumes on various roadway standards are as follows:

- Local/residential roads : <1000 vpd
- Collector roads : 1000 – 5000 vpd
- Arterial roads : > 5000 vpd

5.2.3 Vista Trail

Vista Trail, previously known as the West Arterial/Collector Road, is the north-south arterial roadway located parallel to and 0.4 km west of Leung Road and looping east to connect to Broadway Avenue. An arterial standard of roadway is recommended from Highway 597 to the collector intersection north of the Womacks Road extension. The road should then transition down to a two lane undivided urban collector standard.

The configuration where the road loops from north/south to east/west should compliment the residential road development in that area.



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Tel. 403-341-3320
Fax. 403-342-0969

Legend

- Signalized Intersection

Proposed Road Network

- 2RCU = 2 Lane Rural Collector Undivided
- 2UCU = 2 Lane Urban Collector Undivided
- 4RAD = 4 Lane Rural Arterial Divided
- 4UAU = 4 Lane Urban Arterial Undivided
- 4UCU = 4 Lane Urban Collector Undivided
- Ind. Coll = Industrial Collector
- Local Ind = Local Industrial
- Local
- Future Highway 2A Alignment
- Annexation Boundary
- Existing Town Boundary

Client/Project

TOWN OF BLACKFALDS
2007 MASTER PLAN

Title

Proposed Road Network

Project No.
113927050

Drawing No.
5.3

Scale:
0 125 250 500 750
Meters

Date:
Apr. 25, 2008

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Comparing this Vista Trail concept to the Tagish Engineering concept of using Leung Road as an arterial reveals the following advantages for the Vista Trail concept:

- direct access to Secondary Highway 597 as an arterial standard roadway;
- allows staging of the road development as growth occurs; and
- re-building or improving of Leung Road not required.

The Proposed Transportation Network also includes the re-alignment of Vista Trail south of South Street.

5.2.4 South Street

South Street is a east-west Collector Road which is separated by Highway 2A. The west portion does not intersect Highway 2A and is recommended to be upgraded to a four lane urban collector between Vista Trail and Railway Avenue. The east portion which currently intersects Highway 2A is proposed to be realigned near this existing intersection to turn north and tie into Parkwood Road. A four lane undivided urban collector is recommended for he entire east portion of South Street.

5.2.5 Future Development

The following describes how this Proposed Transportation Network is intended to address the future growth development and special issues identified by the Town of Blackfalds.

The transportation network was analyzed with the following future development:

- Short-Term Growth: Defined as largely within the existing Town boundary and designed to accommodate a population horizon of approximately 11,600.
- Medium-Term Growth: Defined as the logical initial development of the annexation area and designed to accommodate a population horizon of approximately 20,500.
- Long-Term Growth: Defined as the development of the remaining lands within the annexation area and designed to accommodate a population horizon of approximately 31,800.

The in-fill residential development will use existing network roadways with no anticipated problems.

5.2.6 Staging of Proposed Transportation Network

The staging of the Proposed Transportation Network is based on the broad analysis of this project. An updated detailed Transportation Study would assist for a better staging list.

5.2.6.1 5,000 to 11,600 Population Horizon (Phase 1)

As the areas within the existing Town boundary develop, the following roadway improvements are suggested:

- Area east of Highway 2A: Park wood Road should be constructed from Park Street to South Street. South Street should be upgrade to an urban collector roadway and tie into Parkwood Road allowing the existing South Street / Highway 2A intersection to be closed. South Street will likely be constructed as a two lane collector initially with the opportunity to upgrade to a four lane collector as required. The industrial area in the south will contain only an internal roadway system and connect to Highway 597 in line with the existing approach to the south of Highway 597.

- Area west of Highway 2A and south of South Street: East Railway Avenue will be upgraded to a four lane collector roadway and be extended south through area I2 from South Street to Highway 597. Vista Trail will be upgrades to a four lane arterial roadway and re-aligned from South Street to Highway 597 to correct the match the alignment north of South Street.

- Area west of Highway 2A and north of South Street: Vista Trail will be constructed to a four lane arterial roadway from South Street into area W3 (Valley Ridge). Major traffic movements should be confined to Vista Trail while minor traffic increases in existing residential roadways (Womacks Road, Westridge Drive, Leung Road and South Street). Also, an industrial collector roadway will parallel Vista Trail to provide a separate route for industrial traffic.

- Broadway Avenue will be extended through areas N2/N3 (Aspen Lakes) as a four lane undivided collector roadway as development occurs.

5.2.6.2 11,600 to 20,500 Population Horizon (Phase 2)

As residential development grows in the northwest and southeast portions of the annexation area, the following road improvements are suggested.

- The west Industrial collector will be extended north to area I14 then curve east along the boundary between I14 and N4, intersecting with Vista Trail. Vista Trail will be extended north of area W3 as a collector roadway until the intersection with the west Industrial collector where it will increase to a four lane arterial roadway and tie into Lakeside Sargent Road. .Lakeside Sargent Road will ultimately be upgraded to an arterial roadway from the intersection with Vista Trail to Highway 2A.

- The four lane collector road through area E2 (Cottonwood Meadows) will be extend east into area E6 and curve south , intersect with South Street on the east side of area E5 and continue south to Highway 597. The section of this road from area E2 to Highway 597 will be constructed to an arterial roadway. South Street will also be extended.

5.2.6.3 20,500 to 31,800 Population Horizon (Phase 3)

As the remainder of the annexation areas in the northeast corner develop, the flowing road improvements are suggested:

- Arterial roadways will ultimately be constructed along the east and north boundaries.
- Major collector roadway links should be constructed east/west from t he arterial roadway in area E6 and north/south from area E8 to the north arterial roadway (Lakeside Sargent Road).

5.3 WATER SYSTEM

5.3.1 Water Supply

The Town's water comes from City of Red Deer via the North Red Deer Water Services Commission (NRDWSC) regional supply line. One 250 mm line supplies water to the existing pump station which is routed through the Town from the south. Another 250 mm supply line connects to the regional line at the northeast corner of quarter section NE 26-39-27-4, which is also the northeast corner of the existing town limits. It extends west across Highway 2A and the existing railway then to the Broadway Avenue Reservoir and Pumphouse. These two supply lines can provide enough water to meet the existing and future water demands for the town.

Water treatment is no longer required at the Town's existing supply comes from the NRDWSC.

5.3.2 Water Storage

The recommendations in the "2000 Town of Blackfalds Master Plan" stated that a new reservoir and pump station would be required by the time the town reached a population of 4,800 people. Also, the changes to the FCC fire flow standards mean that additional storage is now required. The calculation of the required water storage is based on the Alberta Environment Standards and Guidelines and the FCC requirements.

$$S = A + B + C$$

Where:

S = Total Storage Requirements

A = 230 L/s for 3 hours (Fire Storage Requirements)

B = 25% MDD (Equalization Storage)

C = 15% ADD (Emergency Storage)

The NRDWSC is a long regional water supply line that currently extends from the City of Red Deer to the Town of Ponoka. As a contingency for water supply, additional storage defined as (D) for the town and should be added to account for unlikely supply interruptions. A common criterion for this additional required storage is 1.25 times ADD. Given this criterion, the total storage calculation is as follows:

$$S = A + B + C + D$$

In the Broadway Avenue Pre-design Report, it was determined from these calculations that the deficient storage volume in the year 2031 will be approximately 10,000 m^3. The proposed option is to initially construct a 6,800 m^3 reservoir followed by a 4000 – 6800 m^3 second

adjoining reservoir after approximately 10 - 12 years. It should be noted that these requirements were based on the population projections used to design the regional water line which estimate Blackfalds population to be approximately 17,700 by the year 2036.

To service the future development to the east, it is anticipated that another reservoir and pumphouse will be required. Conceptually this facility is located in area E6. The design and location of this will need to be evaluated further in a separate pre-design report.

5.3.3 Pumping Facilities

Water distribution for the Town is currently pumped from the Water Treatment Facility/Water Reservoir and Pumphouse located on Railway Avenue north of South Street and from the Broadway Avenue Reservoir and Pumphouse located immediately north of the cemetery on Broadway Avenue.

The existing pumping facility currently houses 4 pumps, one constant speed jockey booster pump, two variable speed booster pumps and one fire pump. The pump capacities are as follows in Table 5.4.

Table 5.1: Pump Data

	Pump	Flow
1	7.5 Hp Jockey Pump	14.6 L/s (232 US gpm)
2	25 Hp Variable Speed pump	31.5 L/s (500 US gpm)
3	25 Hp Variable Speed pump	31.5 L/s (500 US gpm)
4	75 Hp Diesel Powered Right-Angle Drive Fire Pump	88.3 L/s (1,400 US gpm)

The pumping facility is designed to provide water demands for a population of 5,000 people (Tagish, 1996). The fire pump can also provide fire flow demands for a population of 5,000 people. The diesel unit also provides stand-by power during emergencies at the facility. If additional flow is required from the facility, a larger variable speed pump can be installed.

As this pumping facility upgrading requirements match the existing reservoir sizing, both can be upgraded at the same time.

The Broadway Avenue Reservoir & Pump Station, in conjunction with the existing pump station, will supply water to the Town's distribution system. The two facilities will have enough standby capacity to provide ample flow during emergencies.

The modeling analysis from the "2004 Water Distribution Analysis Report" determined that the minimum hydraulic grade line (HGL) supply from the Broadway Avenue Reservoir & Pump Station should not be less than 917.5m. This will ensure that the future PHD flows can be

provided to all locations in the town at a minimum pressure of 40 psi. When considering the future water supply to the west development area and the revised population projections used in the Broadway Avenue Reservoir Pre-design Report, the pumps will be required to provide a minimum pressure to hydraulic grade of approximately 920m at the new pump station for the ultimate PHD scenario. The updated modeling confirmed that in this scenario the existing pump station with one duty pump (one standby) and one jockey pump operation can supply 50 L/s. Therefore, the ultimate total capacity requirements of the future distribution pumps in the Broadway pump station are calculated to be 285 L/s – 50 L/s = 235 L/s. Table 5.2 shows approximate pumping capacity requirements for different pumping scenarios and design years.

Table 5.2: Future Pumping Capacity Requirement

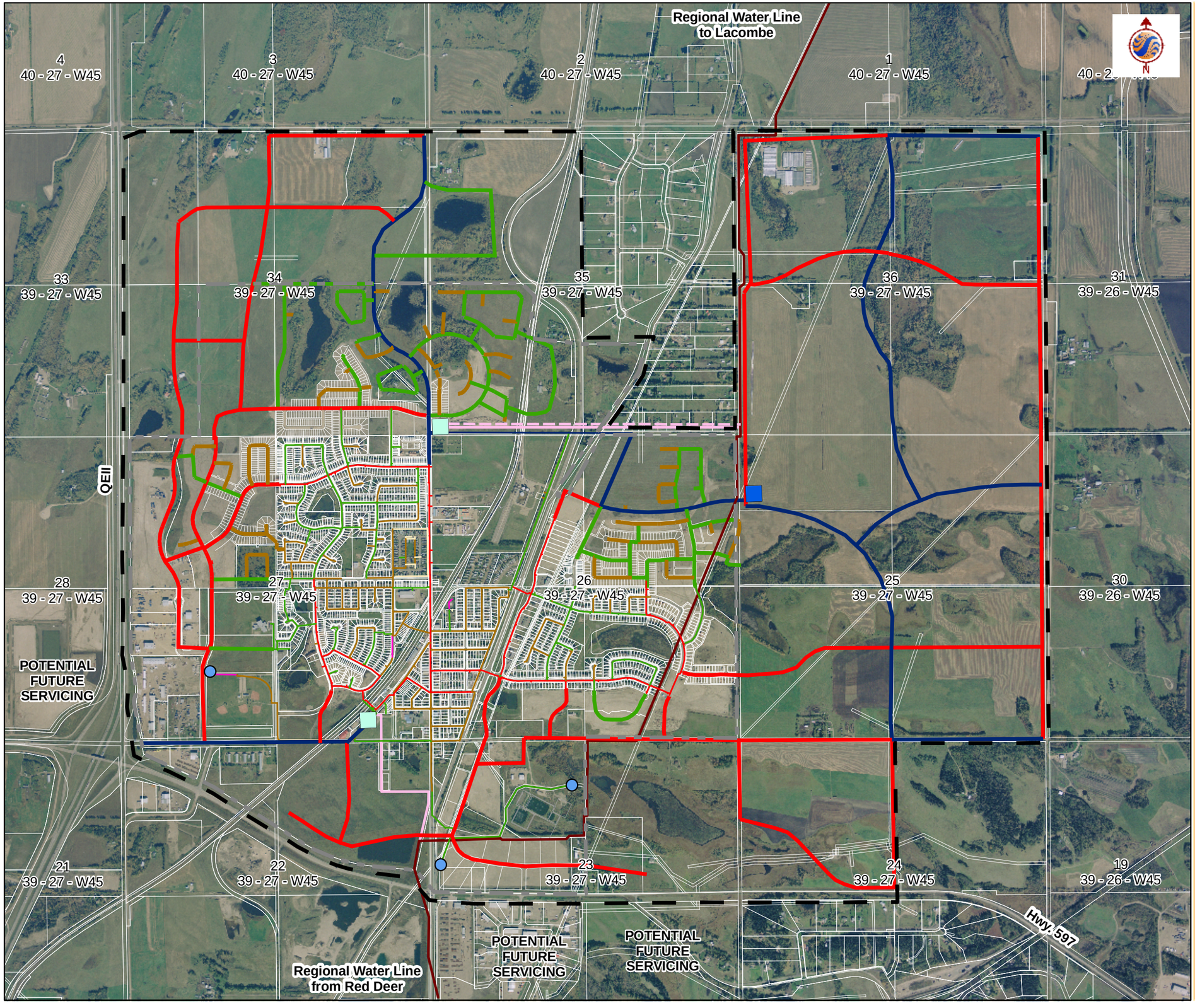
Year	Population Horizon	MDD (L/S)	PHD (L/s)	Existing Pump Station Capacity (L/s)	Proposed New Pump Station Capacity Requirements (L/s)
2006	4,800	36.6	89	50	39
2009	6000	58.2	139	50	89
2013	8,000	75.0	177	50	127
2024	12,000	104.5	235	50	185
2033	16,000	131.5	285	50	235

During the design of the future water supply system, fire flow requirements were carefully examined. Through the analysis of the water model, it was determined that the operation of the existing fire pump and the operation of the Broadway pump station distribution pumps will be sufficient to meet the fire flow demands. Therefore, the installation of new fire pumps in the Broadway pump station will not be necessary.

For the Broadway Avenue Reservoir, the follow tables outline the interim and ultimate pumping scenarios.

Table 5.3: Interim Pumping Scenario

	Pump	Flow
1	40 Hp Variable Speed pump	40.0 L/s (634 US gpm)
2	40 Hp Variable Speed pump	40.0 L/s (634 US gpm)
3	75 Hp Variable Speed pump	80.0 L/s (1268 US gpm)
4	75 Hp Variable Speed pump	80.0 L/s (1,268 US gpm)



Stantec Consulting Ltd.
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Legend

Existing Water Lines

- 50 mm
- 100 mm
- 150 mm
- 200 mm
- 250 mm
- 300 mm

Future Water Lines

- 150 mm
- 200 mm
- 250 mm
- 300 mm

Water Reservoir

- Existing
- Future
- Existing Water Well (Not in Use)
- 750 mm Main
- 250 mm (Future Twinning)
- 250 mm Reservoir Supply
- Annexation Boundary
- Existing Town Boundary

Client/Project

TOWN OF BLACKFALDS
2007 MASTER PLAN

Title

Proposed Water Servicing

Project No.
113927050

Drawing No.
5.4

Scale:
0 125 250 500 750
Meters

Date:
Apr. 25, 2008

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Table 5.4: Ultimate Pumping Scenario

	Pump	Flow
1	75 Hp Variable Speed pump	80.0 L/s (1268 US gpm)
2	75 Hp Variable Speed pump	80.0 L/s (1268 US gpm)
3	75 Hp Variable Speed pump	80.0 L/s (1268 US gpm)
4	75 Hp Variable Speed pump	80.0 L/s (1,268 US gpm)
5	75 Hp Variable Speed pump	80.0 L/s (1268 US gpm)

Please note that the system curves determined during the detailed design of the Reservoir and Pumphouse should be referenced in order to determine the actual total pumping capacity of the system.

5.3.4 Water Distribution System

The Town's water distribution system requires upgrading to accommodate the increasing population growth and water consumption demands. Figure 5.4 shows the proposed water servicing requirements with the proposed land uses. The following system upgrades are required as follows and as shown on Figure 5.4.

5.3.4.1 5,000 to 11,600 Population Horizon (Phase 1)

Upgrades to accommodate the recommended 11,600 population horizon, which assumes all existing infill areas with the Town's current boundary are developed, are as follows. Note that all internal local looping within each development area also is to be completed by the developer as part of their development cost:

- Upgrade the existing main from the existing the old Water Treatment Plant reservoir to a 300 mm main and extend this west along South Street.
- Extend three 250mm water mains from Park Street to South Street along Parkwood Road, through area TE2 (Meadowglen) and along Panorama Drive.
- Construct a 250mm loop from South Street through areas I4, C4 and I2 to connect to the proposed 300mm main along South Street south of the old Water Treatment Plant reservoir.
- Extend a 300mm main through area E2 from the existing 250mm Broadway Avenue reservoir's east distribution main and complete a 250mm water loop from the north end of Parkwood Road to area E2.

- Install a 250mm watermain along Vista Trail from South Street north through areas W1, W2 and W3.

- Connect a 250mm watermain from Vista Trail and extend this along the west Industrial collector roadway north through areas I1 and I2.

- Extend the 300mm watermain from the Broadway Avenue reservoir north along Broadway Avenue through Areas N2/N3.

5.3.4.2 11,600 to 20,500 Population Horizon (Phase 2)

Upgrades to accommodate the 20,500 population horizon, which assumes the development of the northwest and south east annexation areas, are as follows. Note that all internal local looping within each development area also is to be completed by the developer as part of their development cost.

The northwest area improvements are as follows:

- Extend the 250mm watermain along the west industrial roadway north through areas I13 and I14 and then east to connect to Vista Trail and continue east where it will connect to the proposed 300mm watermain along Broadway Avenue

- Extend the 250mm watermain along Vista Trail north through area N4, I14 and I15 to Lakeside Sargent Road.

- Extend the 300mm watermain along Broadway Avenue north to Lakeside Sargent Road.

- Install a 250mm water main along Lakeside Sargent Road to complete the loop from Vista Trail to Broadway Avenue

The southeast area improvements are as follows:

- Construct a new reservoir to service the east side of Blackfalds. Timing to be determined as per a future pre-design.

- Extend a 250mm watermain along South Street between areas E5 and S2.

- Extend a 250mm watermain east from area E3 (Panorama Estates) through area E5.

- Extend the 300mm watermain from area E2 east through area E6 then south along the east boundary of E5 to complete the loop to South Street.

- Complete a 350mm water loop though areas S2 and I12.

5.3.4.3 20,500 to 31,800 Population Horizon (Phase 3)

Upgrades to accommodate the 31,800 population horizon, which includes the remaining annexation areas in the northeast corner, are as follows. Note that all internal local looping within each development area is to be completed by the developer as part of their development cost.

- Install a 250mm watermain from the future reservoir north through areas NE1, NE2 and C10 to Lakeside Sargent Road.
- Extend a 300mm watermain from Area E6 east through area E8 to the east annexation boundary.
- Extend the watermain along South Street as a 300mm watermain to the east annexation boundary.
- Install a 300mm watermain north from Areas E6 and E8 to the Lakeside Sargent Road to service areas NE1, C8, NE3, NE2, C9 and C10.
- Install a 250mm watermain along the north boundary of area C10 to complete the water loop for this area.
- Install a 300mm watermain along Lakeside Sargent Road and a 250mm water main along the east annexation boundary to complete the water loops for all areas on the east side of Town.
- Construction of a new Booster Station/Water Reservoir at the north end of Town. The preferred location has been identified at the high point (Elev. 881) on the East Side of Broadway Avenue just south of the existing Cemetery. This location takes advantage of the high elevation and proximity to future development in and around this area.

5.4 SANITARY SEWER SYSTEM

5.4.1 Sewage Treatment Facility

Stantec has conducted an extensive study on the sewage treatment facility for the Town of Blackfalds in 2005. The Town is currently using an aerated lagoon system for its wastewater treatment. The aerated lagoon system consists of one completely mixed aerated cell, two partially mixed aerated cells and a polishing cell. Basing on an average wastewater generation rate of 285 L/capita/d, the capacities of the existing aerated lagoon cells can be presented in the Table 5.3.

Table 5.3 Existing lagoon system capacity

	Required Hydraulic & Detention Time (Days)	Existing Capacity (m^3)	Estimated Service Population
Completely Mixed Aerated Cell	2	5,000	8,772
Partially Mixed Aerated Cells	28	36,900	4,624
Polishing Cell	5	2,420	1,698

Although the effluent quality from the lagoon system still meets the Alberta Environment (AENV) requirements, the polishing cell and the partially mixed aerated cells have reached their capacities. BOD may exceed the AENV standard if the lagoon system is not upgraded in year 2008 since the population has outgrown the Partially Mixed Aerated cells' capacities. Before the Town joins the Central Alberta Regional Wastewater (CARWW) treatment plant, interim expansion of the existing lagoon system is needed. Basing on the moderate growth rate, the population of the town will reach 7,791 in Year 2013. After the interim expansion, the lagoon system should have the capacity to serve the population. The required lagoon system capacities for the growing population are presented in Table 5.4. In Table 5.4 the wastewater generation per capita per day has a growth rate of 1% per year to account for the possible increases in commercial, industrial and I/I contributions. Capacity projections in Year 2016 and 2018 are also presented in Table 5.2 to show the capacity requirements in case CARWW project is not fulfilled.

Table 5.4: Lagoon system capacity requirements

	Existing (2003 data)	Required Capacity			
		2008	2013	2016	2018
Population	3,812	5,401	7,791	9,979	11,244
Per Capita Flow (L/day)	285	300	315	324	331
Completely mixed aerated cell (m^3)	5,800	3,236	4,906	6,466	7,433
Partially Mixed Aerated Cells (m^3)	36,900	45,302	68,678	90,529	104,058
Polishing Cell (m^3)	2,420	8,090	12,264	16,166	18,582
Treated Effluent Pumping (L/s)		25.7	38.9	51.3	58.9

As seen in Table 5.2, the Town needs to expand the volumes of partially mixed aerated cells and polishing cell for the interim upgrades.

As an alternative, Stantec and Neilson Environmental Inc. developed an enhanced aeration lagoon design to increase the lagoon capacity without increasing the volumes of the cells. This alternative should give the lagoon system enough capacity to service the Town into year 2013 (7,791 population). This design has been approved by AENV and has been implemented.

For the interim plan, a new pump with a capacity of 42 L/s should be installed in the effluent pump station as suggested in the 2005 study report. The gravity outlet pipe discharging the effluent to the Red Deer River has maximum capacity of 48.3 L/s, so there is not need to upgrade this section to meet the interim plan. However, damaged sections of the outlet pipe will be identified and replaced in 2008.

5.4.2 Lift Stations

Currently, there are four lift stations operating in the sanitary system. The North West Lift Station (NWLS) pumps wastewater from the Town's northwest corner south to MH109 which flows to the Lift Station #3 (LS#3) and east to MH143 on Broadway Avenue which flows south to the Stanley Street Lift Station (SSLS). All sewage wastewater generated in areas to the west of the CN railway ends up in SSLS and LS#3. The two stations then convey the flow to the gravity system which flows to the existing siphon which feeds the lagoons. In Panorama Estates, a recently constructed lift station located on Panorama Drive (PDLS) services both the Panorama Estates and Cottonwood Meadows neighborhoods, which are located on the east side of the existing town boundary. This lift station currently pumps wastewater to the existing gravity system in Panorama Estates which ultimately flows the existing siphon as well.

All lift stations are currently running within their designed capacities. As new developments are constructed and tie in to the sanitary sewer system, upgrades to these lift stations or construction of new lift stations are expected.

The locations of new lift station are conceptually shown on Figure 5.5. Delineations of the drainage basins are based on current topographic characteristics of the new development areas and the lift stations are located in the lowest points of the basins. In reviewing and calculating the lift stations capacities, a wastewater generation rate for existing development areas of 230 L/cp/d was used, based on historical data analysis. For new development areas, an average flow rate 320 L/c/d was used as per the *Town of Blackfalds Minimum Design Standards for Development*. In residential areas, peak dry weather flow rates are the products of the average flow rate and the Harmon Peaking factor. In Industrial, Commercial or Institutional (ICI) areas, an average flow rate for preliminary planning of 18 m^3/ha/day (0.208 l/s/ha) is used along with the peaking factor noted in the *Alberta Environment Standards & Guidelines for Municipal Waterworks, Wastewater & Storm Drainage Systems*. Inflow and infiltration (I/I) flows are included according to the Town's minimum standard of 0.07 m^3/ha/day. For new developments, the population residing in a given area is determined by the values noted in the available Area Structure Plan (ASP) or is assumed to be 37.5 people/ha, which is based on 12.5 dwelling units/ha multiplied by 3 people/dwelling unit.

The order of lift station upgrades and construction of new lift stations is based on the assumed development/phasing schedule.

5.4.2.1 5,000 to 11,600 Population Horizon (Phase 1)

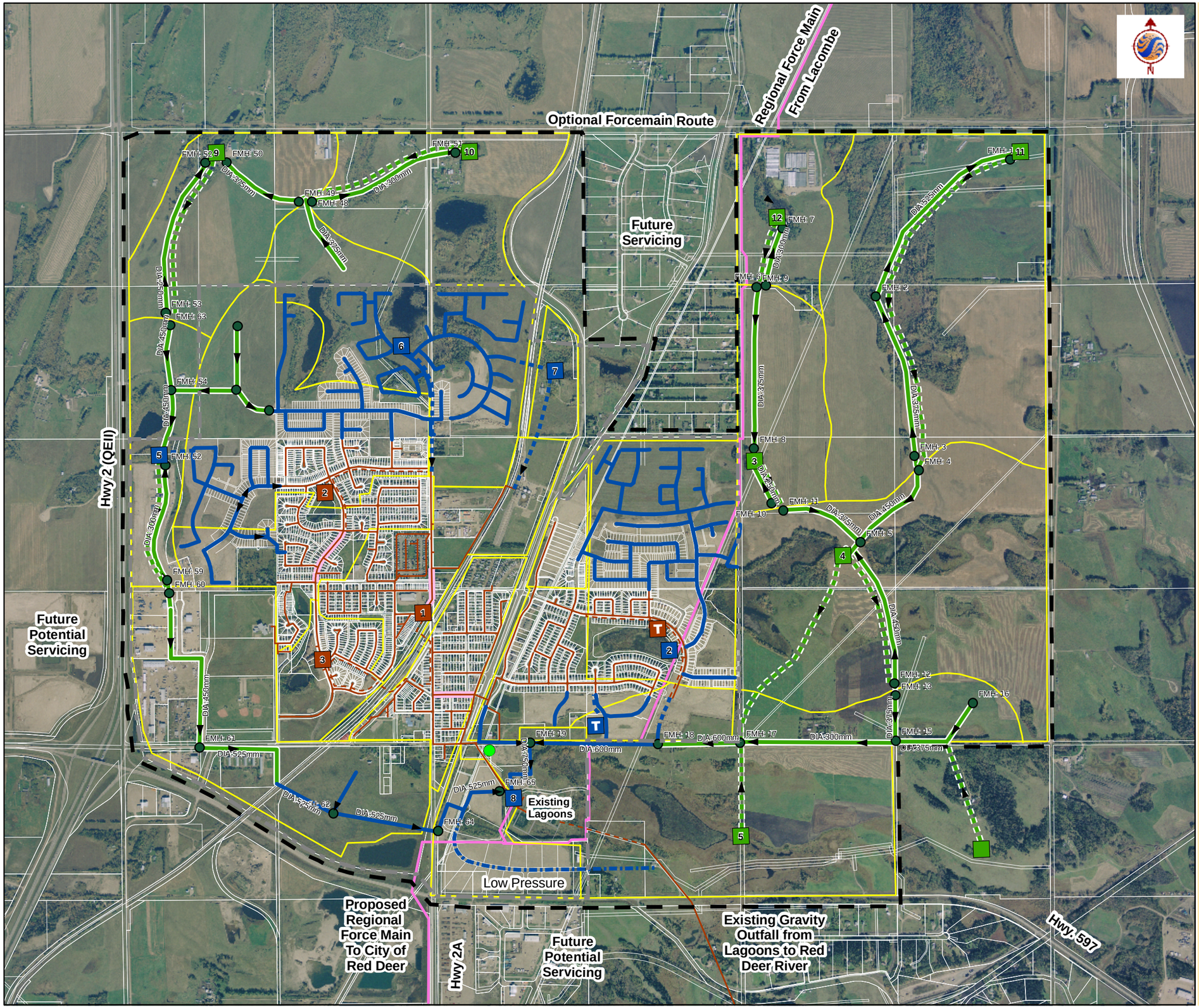
Infill of the undeveloped areas within the current Town boundary will allow the Town's population to reach 11,600 people, which equates to year 2018 based on the Town's projected growth rates. The infill areas include: N1, N2, N3 (Aspen Lakes), W3 (MacLab Development), W2 (Valley Ridge), I1, W1, I2, C4, I6, I7 and I4 on the west side of town and C3, E2 (Cotton Meadows) on the east.

Existing Lift Stations

Northwest Area Lift Station (NWLS)

NWLS is shown in sanitary map as lift station #2.

In the 2000 Master Plan, NWLS was proposed as the TW2 Lift Station. This lift station was designed to service the residential areas of TW2, N1, and W3 (2918 people). The peak flow rate for the proposed TW2 was 48.4 L/s. The lift station was built in 2000 and the maximum peak capacity is 49 L/s. In this phase, the contributing population will be adjusted to 3200 people. In order to keep the peak flow within the lift station's capacity, wastewater from the Valley Ridge (W2) industrial area is proposed to be diverted south to the proposed new sanitary trunk. The sizing of the NWLS is presented in Table 5.5a.



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Legend

Proposed Sanitary Lines

- Force Main
- Gravity Main
- Low Pressure Force Main

Future Sanitary Lines

- Force Main
- Gravity Main
- Future Sanitary Man Holes

Existing Sanitary Lines

- Force Main
- Gravity Main
- Proposed Regional Sanitary Line
- Existing Sanitary Lines to be Upgraded
- Annexation Boundary
- Existing Town Boundary

Client/Project

TOWN OF BLACKFALDS
2007 MASTER PLAN

Title

Proposed Sanitary Servicing

Project No. 113927050

Drawing No. 5.5

Scale: 0 125 250 500 750 Meters

Date: Apr.7, 2008

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Table 5.5a: Sizing of Northwest Area Lift Station (NWLS)

Contributing area	Design area (ha)	Design population	Design population to this LS	Area(ha) for design Res. area to this LS	Design ICI area (ha) to this LS	Total design peak flow (l/s)	Cumulative peak flow (l/s)
Existing	27.12	1017	1017	27.12	0.00	12.2	12.2
W3	32.38	1214	1214	32.38	0.00	19.1	31.3
N1	13.5	471	471	13.5	0.00	7.9	39.2
W2 north	13.4	503	503	13.4	0.00	8.3	47.5

Lift Station #3

Lift Station #3 was built in 1998 and is currently collecting wastewater from the Westridge Drive sanitary gravity main and pumping it to the Indiana Street sanitary main. The current peak capacity of the LS#3 is 35 L/s. In the 2000 Master Plan, the peak capacity of LS#3 was proposed up to 82 L/s. The NWLS is currently pumping a maximum peak flow of 12 L/s to LS#3. Since LS#3 has higher peak capacity than the SSLS, more wastewater will be diverted to LS#3. The peak flow that can be diverted to LS#3 will be set at 38 l/s. Additional flow from the south portion of Valley Ridge (W2) will enter LS#3 through the Westridge Drive sanitary main. The sizing of the Lift Station #3 is presented as Table 5.5b.

Table 5.5b: Sizing of Lift Station #3 (LS#3)

Contributing area	Design area (ha)	Design population	Design population to this LS	Area(ha) for design res. Area to this LS	Design ICI area (ha) to this LS	Total design peak flow (l/s)	Cumulative peak flow (l/s)
Existing	46.32	1737	1737	46.32	0	20.0	20.0
from LS#2						38.0	58.0
W2 south	11.10	387	387	11.1	1.6	8.3	66.4

Stanley Street Lift Station (SSLS)

SSLS is shown in Figure 5.5 as lift station #1.

Besides the peak wet weather flow rate of 9.6 L/s from the surrounding area, SSLS will accept new flows from a portion of N2, N3 (Aspen Lakes) and from the Northwest Area Lift Station (NWLS). Since the current peak capacity of SSLS is 49 L/s, an upgrade to this lift station is required. In the 2000 Master Plan, it was noted that the capacity of the SSLS can be increased to 75 L/s by upgrading the existing 150 mm force main to 250 mm. The sizing of the SSLS is presented in Table 5.5c.

Table 5.5c: Sizing of Stanley Street Lift Station (SSLS)

Contributing area	Design area (ha)	Design population	Design population to this LS	Area(ha) for design res. Area to this LS	Design ICI area (ha) to this LS	Total design peak flow (l/s)	Cumulative peak flow (l/s)
Existing	20.96	786	786	20.96	0	9.6	9.6
N2,N3 (from LS#6)	42.00	1465	1465	42.00	0	22.9	32.5
from LS#2						9.5	42.0
I7, I6	28.8	0	0	0	28.80	31.6	73.6

Panorama Estates Lift Station (LS#4)

The Panorama Estates Lift Station is shown in Figure 5.5 as lift station #4 (LS#4).

LS#4 was recently constructed along Panorama Drive in 2007. In Phase 1, continued development of areas E2, C3 (Cottonwood Meadows) will provide additional flows into LS#4. The peak design capacity of LS#4 is 60 L/s. Sizing of LS#4 is presented in Table 5.5d.

Table 5.5d: Sizing of Lift Station #4

Contributing area	Design area (ha)	Design population	Design population to this LS	Area(ha) for design res. Area to this LS	Design ICI area (ha) to this LS	Total design peak flow (l/s)	Cumulative peak flow (l/s)
Existing	15.04	564	564	15.04	0	9.3	9.3
E2	29.20	1671	1671	29.20	0.00	24.6	33.9
C3	12.62	0	0	0	12.62	14.0	47.9

New Lift Stations in Phase 1

Proposed new lift stations in phase 1 development are listed below.

Lift Station #5

Lift Station #5 (LS#5) is shown in area I16 (Valley Ridge Industrial). This station will service the new annexation areas in the north and northwest and will ultimately pump into the future west sanitary trunk. In Phase 1, LS#5 will pump wastewater from I16 to the proposed sanitary system in W2 which ties into MH174 in the existing system. However, the wastewater flow can be pumped south once the future west sanitary trunk is installed in the southwest areas (I1, W1, I2, C4, I4). LS#5 should be designed to the final required capacity. Contributing areas from other drainage basins are noted along with the lift station which is responsible for pumping the wastewater to LS#5. The sizing of capacity of the LS#5 is presented in Table 5.5e

Table 5.5e: Sizing of the Lift Station #5 (LS#5)

Contributing area	Design area (ha)	Design population	Design population to this LS	Area(ha) for design res. Area to this LS	Design ICI area (ha) to this LS	Total design peak flow (l/s)	Cumulative peak flow (l/s)
C13 (from LS#9)	14.76	0	0	0	14.76	16.4	16.4
C12 (from LS#9)	4.16	0	0	0	4.16	4.6	21.0
I15 (from LS#9)	16.17	0	0	0	16.17	18.0	39.0
N6 (from LS#9)	22.4	840	840	22.4	0	13.5	52.5
N5 (from LS#9)	42.72	1602	1602	42.72	0	24.7	77.2
I14 (from LS#9)	46.36	0	0	0	46.36	47.2	124.4
N4 (from LS#9)	16.4	615	615	16.4	0	10.1	134.5
I13 (partially from LS#9)	25.64	0	0	0	25.64	28.5	163.0
W2 industrial	17.8	0	0	0	17.80	19.8	182.8
Total	206.41	3057	3057	81.52	124.89	153.6	

Note that the "Total" row in Table 5.5e shows that if all the contributing areas are considered as one drainage basin for LS#5, the total flow rate will be lower than the sum of peak flow rate from each contributing area. This is because smaller drainage basins lead to higher peaking factors. Cumulative peak flow means that flows from all contributing area reach LS#5 at the same time and hence equate to a more conservative flow rate. This is the upper limit of the flow rate entering LS#5. On the other hand, the larger drainage basin assumption equates to a smaller peaking factor and is the lower limit of the flow rate. The real peak flow rate should be a value between the upper and lower limit, depending on the flow velocity in the upstream forcemains and the real time control on the upstream lift stations. In sizing LS#5, the conservative number 182.8 L/s will be used. Similar methods and tables will be used for sizing other lift stations in this report. The detail design and construction of this lift station should be able to accommodate the cumulative peak flow. However, the installation of the pumps and other equipments can be staged.

In Phase 1, LS#5 needs to serve area I16 (or W2 industrial); hence 19.8 L/s will be the required peak capacity for Phase 1.

Lift Station #6

Lift Station #6 (LS#6) is shown in Aspen Lakes, mainly pumping wastewater from N2, and N3 areas. This lift station was proposed in the Aspen Lakes' approved ASP. Table 5.5f shows the details in N2 and N3 area.

Table 5.5f: Sizing of Lift Station #6

Contributing area	Design area (ha)	Design population	Design population to this LS	Area(ha) for design res. Area to this LS	Design ICI area (ha) to this LS	Total design peak flow (l/s)	Cumulative peak flow (l/s)
N2, N3	42.00	1465	1465	42.00	0.00	22.9	22.9

LS#6 will be constructed in Phase 1.

Lift Station #7

Lift Station #7 (LS#7) will service area I7.

Table 5.5g: Sizing of Lift Station #7

Contributing area	Design area (ha)	Design population	Design population to this LS	Area(ha) for design res. Area to this LS	Design ICI area (ha) to this LS	Total design peak flow (l/s)	Cumulative peak flow (l/s)
I7	14.00	0	0	0.00	14.00	15.6	15.6

LS#7 will be constructed in Phase 1.

Lift Station #8 (Future Regional Lift Station)

Lift Station #8 (LS#8) is the proposed regional lift station to transmit the wastewater from the Town south to the future Regional Treatment Plant in Red Deer. The LS#8 is located at the end of the sanitary system adjacent to the existing lagoon facilities. Table 5.5h shows the peak capacities of LS#8 in different phases.

Table 5.5h: Sizing of Lift Station #8

Contributing area	Design area (ha)	Design population	Design population to this LS	Area(ha) for design res. Area to this LS	Design ICI area (ha) to this LS	Total design peak flow (l/s)	Cumulative peak flow (l/s)
Existing	185.00	6213	6213	185.00	0	65.2	65.2
Phase 1 areas	370.90	7495	7495	179.46	191.44	254.4	319.5
Phase 1 total	555.90	13708	13708	364.46	191.44	324.9	
phase 2 areas	403.89	8919	8919	257.22	146.67	242.1	561.6
Phase 2 total	959.79	22627	22627	621.68	338.11	514.5	
Phase 3 areas	379.63	11295	11295	300.33	79.3	216.7	778.2
Phase 3 total	1339.42	33922	33922	922.01	417.41	681.3	

In Table 5.5h, the existing contributing area refers to the existing areas within the Town boundary. Notice that the population is higher than the census data due to the assumptions and simplifications used in the sanitary model. Note that the ICI areas are modeled with equivalent population concept. These assumptions can be justified by the fact that the peak flow rate is very close to the full capacity of the siphon section (62 L/s).

At the end of the Phase 1, the required peak capacity for LS#8 is 320 L/s.

It may not be economic to build a regional lift station with such a large required peak capacity. Further analysis will be conducted in the detail design stage.

It is strongly suggested that LS#8 and the proposed west and east sanitary trunks connecting the new development areas are designed and constructed as soon as possible. By completing LS#8 and these new trunks, the sanitary system will be ready to service all of the future annexation areas and connect to the Regional wastewater treatment plant causing the proposed upgrades on the lagoon facilities to be avoided. The existing siphon and flushing station will be decommissioned once the LS#8 and the new trunks are in place.

5.4.2.2 11,600 to 20,500 population horizon (Phase 2)

Based on the project populations, the population in Town will grow to 20,500 by 2018. Phase 2 includes areas E5, C11, E6, S1, I11, S2 and I12 in the southeast, and N5, I15, C12, I13, I14, N4, N6 and C13 in the northwest. New lift stations will be built and upgrades on Phase 1 lift stations will be completed to serve the new Phase 2 developments. These new lift stations and upgrade requirements are described below.

West Area

Lift stations LS#10 and LS#9 should be built to serve the developments in NW34, NE34 and NW35 quarter sections (areas I13, N 4, I14, N5, I15, C12, N6, C13).

Lift Station #10

Lift Station #10 (LS#10) is conceptually located in area C13. It will serve the drainage basin consists of C13, N6, C12 and portions of N5 and I15. Wastewater collected by trunk FMH49 to FMH51 will be conveyed to LS#9. The sizing of LS#10 is presented in Table 5.5i.

Table 5.5i: Sizing of Lift Station #10

Contributing area	Design area (ha)	Design population	Design population to this LS	Area(ha) for design res. Area to this LS	Design ICI area (ha) to this LS	Total design peak flow (l/s)	Cumulative peak flow (l/s)
C13	14.76	0	0	0	14.76	16.4	16.4
C12	4.16	0	0	0	4.16	4.6	21.0
I15	16.17	0	0	0	5.34	5.9	27.0
N6	22.4	840	840	22.4	0	13.5	40.5
N5	42.72	1602	801	21.36	0	12.9	53.4
Total	100.21	2442	1641	43.76	24.26	52.6	

In Phase 2, LS#10 will be constructed to its full peak flow capacity of 54 L/s.

Lift Station #9

Lift Station #9 (LS#9) is shown in the northwest corner of the new annexation area in area I14. Sizing of LS#9 is present in Table 5.5j.

Table 5.5j: Sizing of Lift Station #9

Contributing area	Design area (ha)	Design population	Design population to this LS	Area(ha) for design res. Area to this LS	Design ICI area (ha) to this LS	Total design peak flow (l/s)	Cumulative peak flow (l/s)
C13 (from LS#10)	14.76	0	0	0	14.76	16.4	16.4
C12 (from LS#12)	4.16	0	0	0	4.16	4.6	21.0
I15 (partially from LS#10)	16.17	0	0	0	16.17	18.0	39.0
N6 (from LS# 10)	22.4	840	840	22.4	0	13.5	52.5
N5 (partially from LS#10)	42.72	1602	1602	42.72	0	24.7	77.2
I14	46.36	0	0	0	46.36	47.2	124.4
N4	16.4	615	615	16.4	0	10.1	134.5
I13	25.64	0	0	0	5.13	5.7	140.2
Total	188.61	3057	3057	81.52	86.58	124.5	

Lift Station #5

In Phase 2, LS#5 should be upgraded to pump the additional flows collected LS#9 to the west sanitary trunk. LS#5 will reach its full capacity of 183 L/s as noted in Table 5.5e.

East Area

In Phase 2, LS #14 should be constructed to service areas E5 and E6. Developments in S1, S2, I11 and I12 will be serviced by Lift Station #15. The design peak flow rates of these two lift stations are tabulated below. Also, LS#13 is needed to service the institutional area shown in the northwest corner of E6.

Lift Station #13

Table 5.5k shows the ultimate flows to Lift Station #13 (LS#13)

Table 5.5k: Sizing of the Lift Station #13

Contributing area	Design area (ha)	Design population	Design population to this LS	Area(ha) for design res. Area to this LS	Design ICI area (ha) to this LS	Total design peak flow (l/s)	Cumulative peak flow (l/s)
NE2 (from LS#12	50.8	1905	1143	30.48	0	18.06	18.1
C10 (from LS#12	11.2	0	0	0	8.96	10.0	28.0
NE1	61.87	2310	1155	30.94	0	18.24	46.3
E6	59.76	0	0	0	16	17.8	64.1
Total	123.87	4215	2298	61.415	24.96	62.4	

However, in Phase 2, LS#13 will service only the institutional area E6. Hence LS#13 need to have a peak capacity of 18 L/s.

Lift Station #14

Table 5.5l: Sizing of the Lift Station #14

Contributing area	Design area (ha)	Design population	Design population to this LS	Area(ha) for design res. Area to this LS	Design ICI area (ha) to this LS	Total design peak flow (l/s)	Cumulative peak flow (l/s)
C9 (from LS#11)	64	0	0	0	64	61.9	61.9
C10 (from LS#11&13)	11.2	0	0	0	11.2	12.5	74.4
NE2 (from LS#11&13)	50.8	1905	1905	50.8	0	29.0	103.4
NE1 (from LS#13)	61.87	2310	2310	61.87	0	34.6	137.9
C8 (from LS#11)	2.72	0	0	0	2.72	3.0	141.0
NE3 (from LS#11)	61.04	2289	2289	61.04	0	34.3	175.2
E6	59.76	1641	1641	43.76	16	43.0	218.3
E8	62.56	2346	2346	62.6	0	35.1	253.3
C11	2.72	0	0	0	2.72	3.0	256.4
E5	60.8	2280	1830	48.8	0	27.9	284.3
E7	65.2	2445	1673	44.6	0	25.7	310.0
Total	502.67	15216	13994	373.43	96.64	259.4	

The design peak capacity of LS#14 in Phase 2 is the sum of areas E5, E6 and C11 peak flow rates which equates to 74 L/s.

In order to avoid oversizing the east sanitary trunk in this phase, the forcemain from LS#4 to FMH13 should be sized for the flow rate 54.7 L/s. By doing this, the size of gravity trunk from FMH15 to FMH17 can be reduced as shown on Figure 5.5. Another force main connecting LS#4 to FMH17 should be designed for the additional flow rate anticipated in Phase 3 development.

Lift Station #15

Because of the low elevations in the NE23 and NW24 quarter sections, wastewater from these areas will be pumped by LS#15 to the east sanitary trunk. Sizing of the LS#15 is tabulated below.

Table 5.5m: Sizing of the Lift Station #15

Contributing area	Design area (ha)	Design population	Design population to this LS	Area(ha) for design res. Area to this LS	Design ICI area (ha) to this LS	Total design peak flow (l/s)	Cumulative peak flow (l/s)
I11	15.29	0	0	0	15.29	17.0	17.0
I12	22.93	0	0	0	22.93	25.5	42.5
S2	32.48	1218	1218	32.48	0	19.2	61.6
S1	19.28	723	723	19.28	0	11.8	73.4
Total	89.98	1941	1941	51.76	38.22	69.6	

LS#15 will be built to it full peak flow rate at 74 L/S in Phase 2.

Lift station #8

At the end of the Phase 2, the required peak capacity for LS#8 is 562 L/s as noted in Table 5.2h.

5.4.2.3 20,500 to 31,800 population horizon (Phase 3)

The long term development (Phase 3) will take place from 2028 to 2035. In this phase, E7, E8, NE3, C8, NE1, NE2, C10, C9 will be developed. The future lift stations and upgrades are described as follows.

Lift Station #11

Lift Station #11 (LS#11) is conceptually located in the northeast corner of the proposed annexation area. It will service the large drainage basin consisting of areas C9, NE3, C8 and portions of C10, NE1, NE2, E6 and E8.

Table 5.5n Sizing of the Lift Station #11

Contributing area	Design area (ha)	Design population	Design population to this LS	Area(ha) for design res. Area to this LS	Design ICI area (ha) to this LS	Total design peak flow (l/s)	Cumulative peak flow (l/s)
C9	64.00	0	0	0	64	61.9	61.9
C10	11.20	0	0	0	2.24	2.5	64.4
NE2	50.80	1905	762	20.32	0	12.35	76.8
NE1	61.87	2310	1155	30.94	0	18.24	95.0
C8	2.72	0	0	0	2.72	3.02	98.1
NE3	61.04	2289	2289	61.04	0	34.28	132.3
E6	59.76	1641	542	14.94	0	8.98	141.3
E8	62.56	2346	235	6.3	0	4.02	145.3
Total	373.95	10491	4982	133.5	68.96	135.22	

LS#11 will be built to it full peak flow rate at 145 L/S in Phase 2.

Lift station #12

Lift Station #12 (LS#12) is conceptually located in the northwest corner of the proposed annexation area located east of Highway 2A. LS#12 will service portions of areas NE2 and C10.

Table 5.5o Sizing of the Lift Station #12

Contributing area	Design area (ha)	Design population	Design population to this LS	Area(ha) for design res. Area to this LS	Design ICI area (ha) to this LS	Total design peak flow (l/s)	Cumulative peak flow (l/s)
NE2	50.8	1905	1143	30.48	0	18.06	18.1
C10	11.2	0	0	0	8.96	10.0	28.0

LS#12 will be built to it full peak flow rate at 28 L/S in Phase 2.

Lift Station #13

In Phase 3, the capacity of LS#13 will reach 65 L/s as shown in Table 5.2k.

Lift Station #8

In Phase 3, the required peak capacity for LS#8 is 780 L/s as shown in Table 5.2h.

5.4.3 Sewage Trunks

The sewage trunks of the Town of Blackfalds have been upgraded in the past 8 years basically according to the 2000 Master Plan. More upgrades are expected in coming years in order to service the infill areas within the current boundary. New trunks (east and west) will be constructed to service the new annexation areas. The existing pipeline system and the new trunks system service the east and west areas in current boundary and new annexation areas independently until they are connected north of LS#8. The upgrades and new trunks sizing in this master plan are based on the results from the sanitary model which was also used in the 2000 Blackfalds Master Plan.

5.4.3.1 Conditions of the existing sewage collection system

Based on a wastewater generation rate 230 L/capita/day from historical data (2000-2006) analysis, the current sanitary network capacity was evaluated unless the sanitary model. Results from the model show that the sanitary system is capable of dealing with the current population and I/I levels except for the section between MH199 to MH123 and the existing siphon. This modeling result agrees to the following on-site observations:

- the Siphon is running under its full capacity
- the flushing station seems to be operating more like a lift station.

Hence, upgrades on the most downstream sanitary mains of the sanitary system are becoming urgent. Upgrades to these sections can be referenced to the suggestions made in 5,000 to 11,600 population horizon.

The same design criteria in sizing of the lift stations was used to size the gravity sanitary sewer mains.

5.4.3.2 5,000 to 11,600 population horizon

The population of the Town was projected to reach 11,600 people by 2018. During this period, the infill areas of W3, Aspen Lakes, Valley Ridge, Cottonwood Meadows and E4, TE2 and the southwest quarter sections will be fully developed according to their ASPs. In the approved ASPs, the wastewater generated from the residential, ICI and I/I will be collected by the sanitary systems in these areas. These new systems will be connected to the existing sanitary system. There are many upgrade options that can be made to upgrade the capacity of the existing system to accommodate the new flows from the new developments. The options described here are the minimum option. Upgrades that need to be carried out for these developments are described as follows. These upgrades are highlighted in the Figure 5.5.

Development of W3, Aspen Lakes and Valley Ridge

- Pipelines from MH109 to MH65 need to be upgraded to 300 mm diameter. This upgrade can accommodate the flows higher than 19 L/s pumped from NWLS to LS#3.
- Pipelines from MH139 to MH46 need to be upgraded to 375 mm. This section is the inlet pipe for the SSLS.
- Pipes from MH103 to MH23 along Indiana Street have to be upgraded to 375 mm.

Development of Cottonwood Meadows

Two Alternatives are available for the sanitary upgrades to accommodate the sewage flows from Cotton Meadows.

1. Alternative 1. According to the approved ASP, the development of the Cottonwood Meadows will bring additional sewage flows to the sanitary mains located in Panorama Drive. Sewage flows going into LS#4 will be divided north to MH 212 and south to MH197 in the intersection of Pondside Crescent and Park Street. The flow rates will be 35L/s to the south and 7L/s to the north. Pipelines from MH181 to MH207 in Park Street can be upgraded to 350 mm. Or, a 200 m force main that connects the Panorama drive lift station and MH207 can be installed to avoid the gravity pipeline upgrades. Upgrades from MH207 to MH198 in Panorama Drive and pipe linking MH198 to MH199 parallel to Highway 2A is inevitable in this alternative. The pipelines have to be upgraded to 375 mm diameter pipes.
2. Alternative 2. The additional flows from the Cottonwood Meadows can be pumped into FMH 18 by LS #4 if the future trunk linking FMH18 to FMH19 is in its place.

It is suggested that the future trunk from FMH18 to FMH19 be installed to avoid the upgrades in Alternative 1.

Development of E4, TE2

E4 and TE2 are planned for residential developments only. The designed flow rate from the two areas is 16.8 L/s. The flows from E4 and TE2 areas will ultimately flow to the east trunk.

Gravity Sanitary Main Upgrades

An overhaul on the gravity main sections will be carried out in order to convey the all the sewage flows from the areas within the current boundary to LS#8. It is suggested that the Town begin to carry out the upgrade on the gravity sections as soon as possible.

1. Pipeline from MH199 to MH3, which locate at the most downstream section of the existing system, does not have the capacity to handle the additional sewage flows from the new developments. The total flow rates after the new development are 3 times larger the existing gravity trunk main capacity. A new trunk with 525 mm should be installed to link the existing MH 199 to MH3. The 300 mm pipe linking MH3 to MH203 will be abandoned. A new 525 mm trunk will be installed to link MH 3 and MH203 to reverse the current flow direction.

2. The pipeline from MH3 to MH123 and the existing siphon section will be decommissioned. New 525 mm gravity mains linking the MH203 to FMH19 and 750mm pipes linking FMH19 to FMH65 will be installed. The sewage flows will be discharged to the proposed regional lift station (LS#8) wet well and be pumped to the proposed regional wastewater forcemain once the regionalization plan is fulfilled.

Note that in Figure 5.5, the above upgrades were designed according to the development phasing. The sanitary systems in the infill areas are connected to the existing sanitary network. Assuming that developments in the Phase 2 go before the Phase 1 areas and the new trunks are installed, the flows from Aspen Lakes, Valley Ridge and W3 can be diverted to the new west sanitary trunk. By diverting a portion or all of the flows from these three areas, some upgrades listed above can be avoided.

Development of the Southwest Quarter Sections

The infill areas coded with I1, W1, I2, C4, C5 and I4 will have fully developed by 2018. New trunks along with new lift stations will be built to convey the flows from these areas to the lagoon facilities or to the new regional sewer forcemain.

- Pipelines from FMH60 to FMH65 have to be constructed as noted on Figure 5.5.

5.4.3.3 11,600 to 20,500 Population Horizon

In 2028, the population in Town will grow to 20,500. Areas of E5, C11, E6, S1, I11, S2 and I12 in the southeast and areas N5, I15, C12, I13, I14, N4, N6 and C13 in the northwest will be fully developed. Basically, the new sanitary trunks will follow the collector roads in the new development areas as shown in Figures 5.2 and 5.3. Preliminary sizing of the sanitary trunks and the lift stations are shown in Figure 5.5 are listed as following:

1. FMH15 to FMH19 and to FMH65 will be constructed before the developments at the Southeast areas as these trunks are the most downstream sanitary pipelines servicing the new Southeast areas.

2. Sanitary gravity mains from FMH4 to FMH5 within the quarter section NW 25-39-27-4, main from FMH11 to FMH5, main from FMH13 to FMH15, main from FMH8 to FMH10 and from FMH12 to FMH5 will be constructed and/or upgraded

5.4.3.4 20,500 to 31,800 Population Horizon

The long term development (Phase 3) will take place from 2028 to 2035. In this phase, E7, E8, NE3, C8, NE1, NE2, C10, C9 will be developed. The sanitary trunks will be constructed as shown in Figure 5.5.

5.4.4 Central Alberta Regional Wastewater System

Long term wastewater treatment plans for the Town of Blackfalds include joining a regional wastewater servicing initiative that will see wastewater centrally treated at a treatment facility located at or near to the City of Red Deer. The wastewater initiative has been named the Central Alberta Regional Wastewater System and consists of three Transmission Legs which are referred to as the South Leg, the West Leg, and the North Leg as they relate to the City of Red Deer. The Central Alberta Regional Wastewater System will reduce communities' dependence on aging wastewater treatment infrastructure and will improve the quality of wastewater effluent that is discharged into the Red Deer River to ensure a safe drinking water supply in the future.

Current plans show the Town of Blackfalds to be a part of the North Leg of the System which will extend from Lacombe through Blackfalds to the City of Red Deer. The Central Alberta Regional Wastewater Overall Concept Summary / Master Plan (2008) outlines the regional initiative including a proposed timeline for the design and construction of each leg of the System. The North Leg of the Central Alberta Regional Wastewater System is planned to be constructed by 2012 in accordance with the plans shown in the Central Alberta Regional Wastewater Overall Concept Summary / Master Plan.

As noted above in Section 5.4.2, Lift Station #8 (LS#8) is the proposed regional lift station to transmit the wastewater from the Town south to the future Regional Treatment Plant in Red Deer. LS#8 will receive all wastewater flows from the Town which presents the opportunity to coincide with plans for the future Central Alberta Regional Wastewater System. Designing and constructing LS#8 with the ability to become a regional lift station may present cost savings, time savings, and prevent redundancy of infrastructure over the long term.

Regional lift stations for the Central Alberta Regional Wastewater System will be built to the same standards for the entire System to simplify operations and maintenance. Considerations should be made to design LS#8 to the same standards as lift stations for the Central Alberta Regional Wastewater System.

5.5 STORM WATER MANAGEMENT

5.5.1 Existing Drainage Basins

The Town's Storm Sewer System has been reviewed in a good level of detail in past reports, in particular the 1996 Analysis of Infrastructure Report prepared by Tagish Engineering. In general terms, the Town is in a good position regarding storm drainage. They currently require a limited amount of piped storm sewer to drain their runoff to low areas and/or drainage basins. Figure 5.6 shows the Proposed Stormwater Servicing plan.

Currently the existing surface drainage splits into three basins.

1. Southwest – The existing Town bounded by the north edge of section 27-39-27-W5, QEII to the west, Highway 597 to the south, Highway 2A to the east including the area south of Park Street east of Highway 2A ultimately flow south to the Blindman River (areas west of Highway 2A) and the Red Deer River (areas east of Highway 2A).

2. Northwest – Areas north of section 27-39-27-W5 bounded by QEII on the west and Highway 2A on the east. Currently there is not a clearly defined outlet to the north although this drainage will ultimately make its way to Lacombe Lake.

3. East – Areas north of Park Street and east of Highway 2A drain to a series of low areas that will ultimately be connected to a gravity trunk main that flows to Blackfalds Lake.

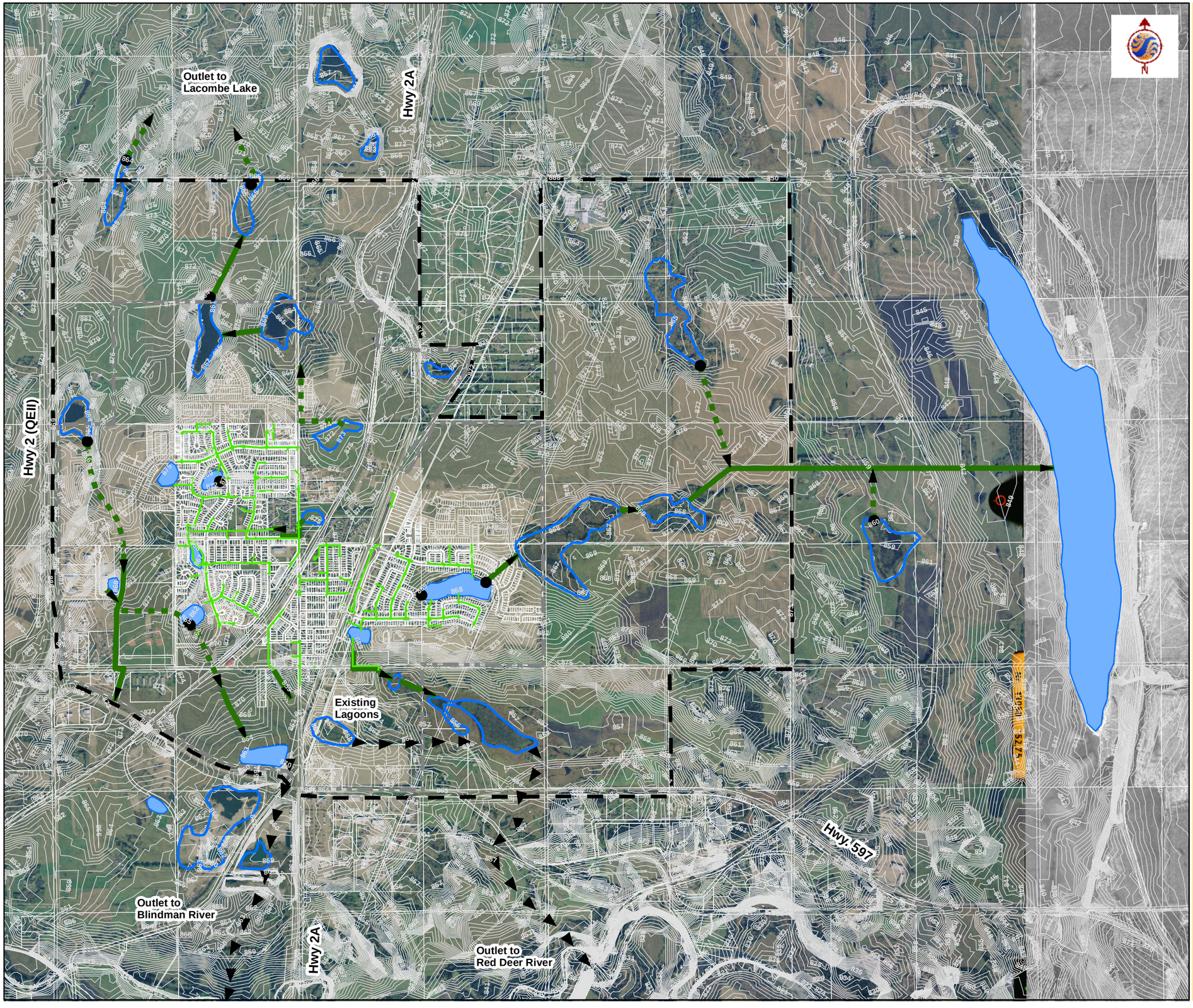
5.5.2 Storm System Requirements for Development Areas

Figure 5.6 shows the storm sewer requirements for the future development areas.

1. Southwest –This basin includes the existing west side of Town and areas W1, W2, I16, I5, I6, I1, I2, C4, and C5 which ultimately flows south to the Blindman River (areas west of Highway 2A) and the existing Town east of Highway 2A and south of Park Street as well as areas TE2, E4, I4, I11, I12, S1and S2 which ultimately flow south to the Red Deer River (areas east of Highway 2A).

2. Northwest – This basin includes areas N1, N2, N3, N4, N5, N6, I13, I14, 15, C13 and C14. Currently there is not a clearly defined outlet to the north although this drainage will ultimately make its way to Lacombe Lake

3. East – This basin includes existing Town east of Highway 2A and north of Park Street as well as areas E3, E2, C3, E5, E6, C11, E7, E8, NE1, NE2, NE3, C8, C9 and C10 drain to a series of low areas that will be interconnected and ultimately flow to a gravity trunk main that drains east to Blackfalds Lake.



Stantec Consulting Ltd.
600, 4808 Ross Street
Red Deer, AB Canada
T4N 1X5
Tel. 403-341-3320
Fax. 403-342-0969

Legend

- Overland Drainage Route
- Proposed Stormwater Force Main
- Proposed Stormwater Gravity Main
- Existing Storm Sewer
- Existing Storm Denention Pond
- Proposed Storm Denention Pond
- Proposed Storm Lift Station
- Annexation Boundary
- Existing Town Boundary

Client/Project

TOWN OF BLACKFALDS
2007 MASTER PLAN

Title

Proposed Storm Servicing

Project No.
113927050

Drawing No.
5.6

Scale:
0 250 500 750 1,000
Meters

Date:
April 25, 2008

V:\1139\active\113927050\05a\Arcview\PDF

These proposed upgrades should be reviewed with consideration to the other required upgrades required for the storm water system to deal with the future growth and development of Blackfalds. It is recommended that the Town complete a Stormwater Master Plan / Implementation Plan for the west and east areas in order to establish a detailed development plan for the ultimate stormwater system.

5.6 SHALLOW UTILITIES

Shallow utilities will be required for all new developments within the Town. These utilities include; power (Trans-Alta), telephone (Telus), cable (Shaw) and gas (ATCO). These services will be extended with all future developments within the existing and expanding town boundaries.

The Town should ensure that each utility is aware of all proposed developments and anticipated growth within Blackfalds to ensure that they systematically upgrade their utilities in a timely and cost effective manner.

5.7 OTHER

The Town has to consider that this Master Plan for Growth and Infrastructure is a planning tool for both orderly population growth and development and upgrading of infrastructure to maintain required standards.

Proposed changes to this plan should be documented and added as an appendix item as issues arise that affect it. This will serve as a check to ensure that if there are deviations from this plan that the reasons and history are documented. This will allow for improved decision making processes for future planning and infrastructure upgrades.

6.0 Planning and Servicing Strategy for Growth

6.1 ANNEXATION

The Town of Blackfalds is proceeding with the annexation of land from Lacombe County. This process is anticipated to be completed by the end of 2008.

6.2 MUNICIPAL DEVELOPMENT PLAN

The Town of Blackfalds will need to update the Municipal Development Plan following annexation of land from Lacombe County. A detailed series of plan amendments, both text and maps, will be required to provide statutory Town planning directions for the newly annexed lands, as well as to reflect the various land use and road changes as recommended by the study and as accepted by the Town.

6.3 FRINGE LANDS – PLANNING COOPERATION WITH LACOMBE COUNTY

The Town and County are strongly encouraged to prepare and adopt an intermunicipal development plan for the lands around Blackfalds, as advised in both municipalities' municipal development plans. As a part of this plan, Blackfalds needs to clearly identify future long term growth directions and seek cooperation from the County to avoid the sterilization of these growth directions.

6.4 INDUSTRIAL DEVELOPMENT

The Town should review its role in the provision of industrial land, especially serviced industrial land which will bring greater assessment levels than large privately serviced parcels used primarily for pipe or equipment storage. To promote industrial development, most communities in the Central Alberta area find it necessary to be proactive in the supply of industrial land. In the recent past the Town has been willing to promote residential development through the provision of key infrastructure, and thus contribute to the increasing portion of residential assessment. If the private sector is not willing to establish serviced industrial land, then the Town should at least explore partnerships in doing so if the market indicates opportunities for returns on investment in a reasonable period of time.

6.5 FRONT END SERVICING

Many Cities and Towns in Central Alberta are or have begun developing industrial land for sale as private developers have not shown interest in this type of development due to better opportunities developing residential and commercial lands. The Town should review this option and also consider pursuing joint ventures with the County to encourage more industrial development in the area.

As well, to stimulate growth of Industrial land in Blackfalds, the Town can investigate other options with industry to front end service various levels of industrial development within Blackfalds.

6.6 DEFERRED SERVICING AGREEMENTS

When developing industrial property to less that a fully serviced standard, the Town should consider entering in to a Deferred Servicing Agreement with the developer of the property depending on the proposed level of servicing for that property. This agreement would allow the Town in the future to have the option to have the developer service the land when trunk mains or pumping facilities are extended to these development areas making it cost effective to do so.

7.0 References

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- Town of Blackfalds Offsite Levies Report, Tagish Engineering, 1999
- Town of Blackfalds Municipal Development Plan, 1998
- Town of Blackfalds traffic Impact Study, WNM Engineering Ltd., 1998
- Town of Blackfalds Draft Technical Report, Southwest Area Servicing Study, B.M. Potter Consultants Ltd., 1998
- Town of Blackfalds East Area Storm Water Management, Tagish Engineering, 1998
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- Town of Blackfalds Joint General Municipal Plan, 1988
- Town of Blackfalds 1986 Groundwater Program Water Well No. 8, 1986
- Lacombe County Municipal Development Plan
- Lacombe County Land Use Bylaw
- Lacombe County Burbank Area Local Plan
- Lacombe County Lacombe/Blackfalds Area Outline Plan
- Personal Communication – Bob Wilson (Re/Max – Lacombe)
- Personal Communication – Ralph Salomons (Re/Max – Red Deer)
- Personal Communication – Allan Williams (Lacombe County)
- City of Red Deer Population Projections (Nichols Applied Management)
- City of Red Deer Growth Study (UMA)
- Alberta Health Population Projections for Alberta and its Health Regions: 1996-2016