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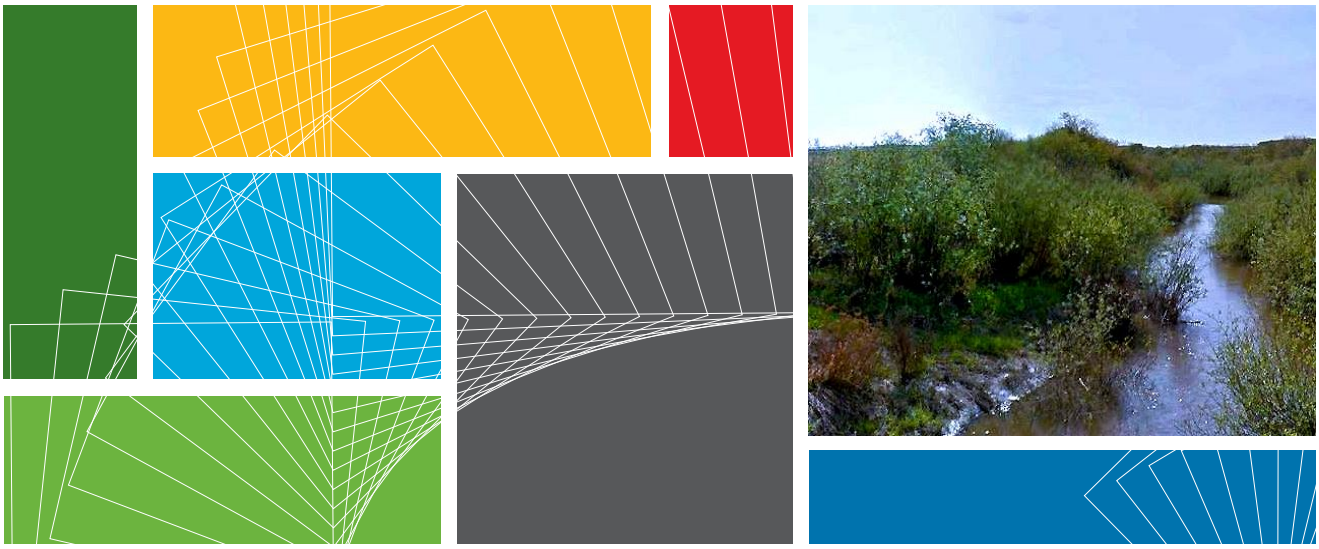


City of Grande Prairie

Final Report

Bear Creek North Area Structure Plan Background Report

December 2017

ISL Engineering and Land Services

ISL Engineering and Land Services Ltd. is an award-winning full-service consulting firm dedicated to working with all levels of government and the private sector to deliver planning and design solutions for transportation, water, and land projects.

Table of Contents

TABLES

FIGURES

MAPS

Following Page

1.0 Introduction

The purpose of this report is to inform the preparation of the Bear Creek North Area Structure Plan (BCNASP) for the City of Grande Prairie. The report provides a detailed scan of relevant City documents, provincial plans and legislation, and regional requirements to establish the legislative context and design parameters to be considered in the development of the BCNASP.

1.1 What is an Area Structure Plan?

Section 633 of the Municipal Government Act (MGA) sets out a framework (Figure 1) for the subsequent subdivision and development of an area of land through a planning document called an Area Structure Plan (ASP). An ASP designates proposed land uses, lays out transportation networks and the general location of public utilities, assigns population densities and identifies the proposed sequence of development for the subject area. Municipalities can identify any other matters they deem necessary to include in the ASP and then adopt the ASP by bylaw.

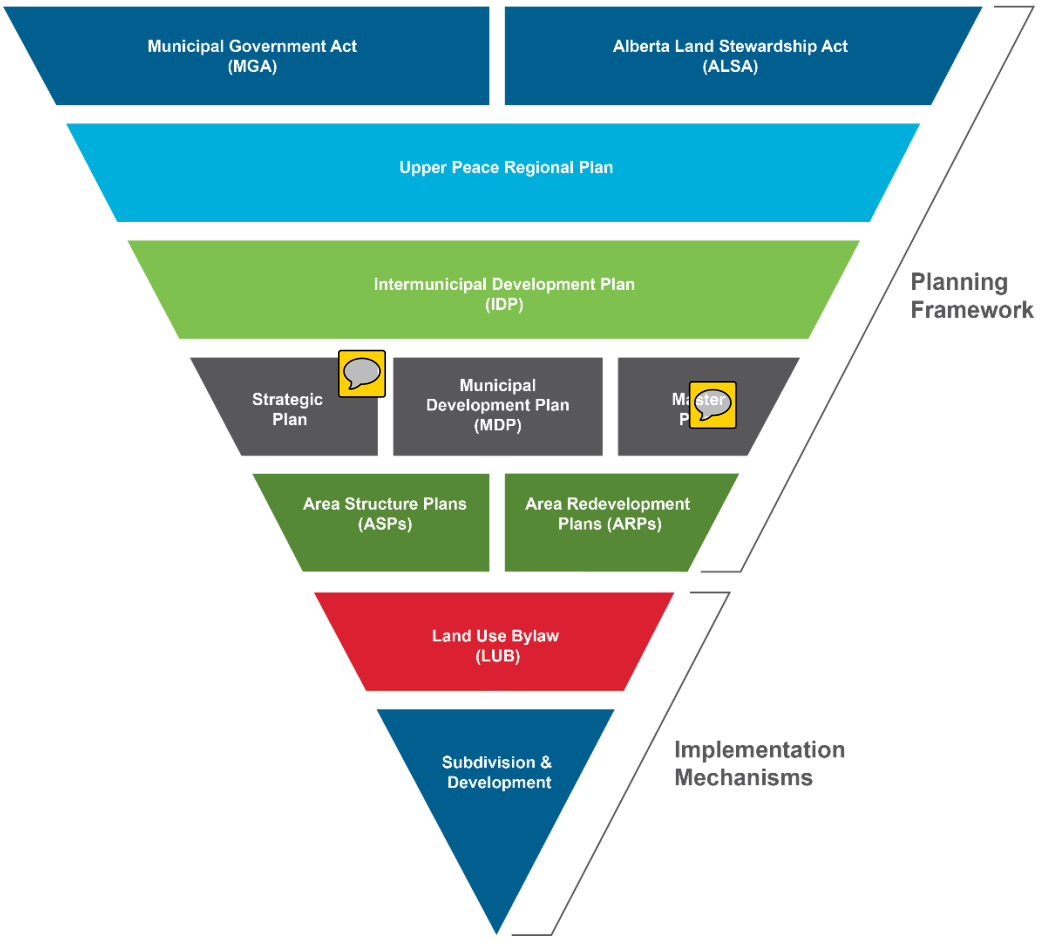


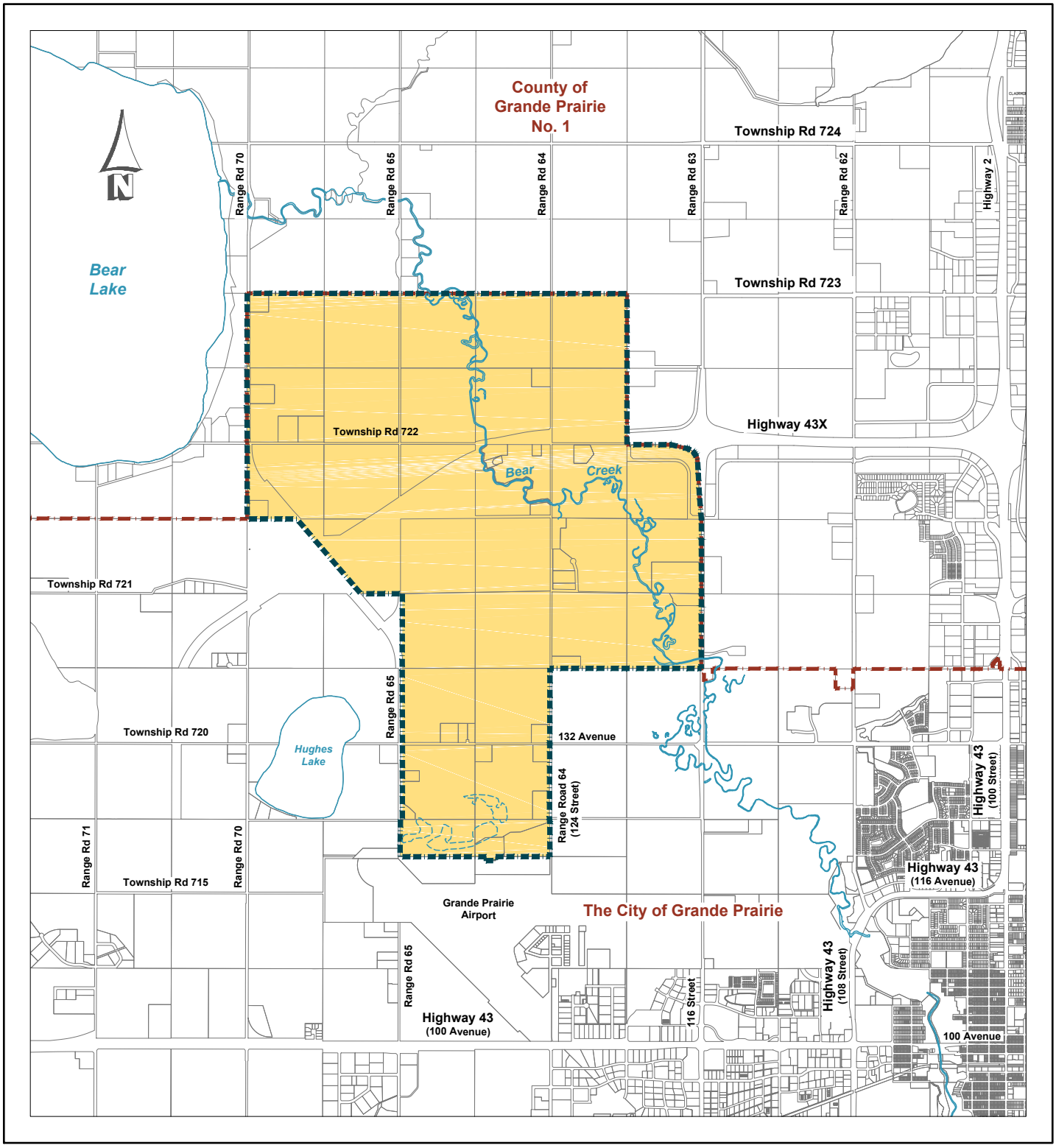
Figure 1: Planning Policy Framework

1.2 Plan Area and Location

The BCNASP study area is located in the western portion of the City and encompasses approximately 1,950 hectares of titled land as summarized in Table 1 below. The plan area is bounded by Range Roads 65 and 70 to the west, 116th Street (Range Road 63) to the east, the Grande Prairie Airport to the south, and the City of Grande Prairie limits to the north as illustrated in Map 1.

Table 1: Plan Area Summary

Legal Description	Area (ha)	Legal Description	Area (ha)
NW 18-72-6-W6M	60.2	B1, L2, Plan 1623362	17.8
B1, L1, Plan 1423797	4.1	SW 9-72-6-W6M	49.1
NE 18-72-6-W6M	64.7	L1A, 9620262	3.7
SW 18-72-6-W6M	44.5	B1, L2A, Plan 0226903	4.3
B1, L1, Plan 0940595	8.0	B1, L3, Plan 0226903	3.3
B1, L2, Plan 0940595	6.1	B1, L4, Plan 0226903	1.6
B1, L2, Plan 1221850	5.4	NW 5-72-6-W6M	65.1
SE 18-72-6-W6M	65.2	NE 5-72-6-W6M	66.8
NW 17-72-6-W6M	65.2	SE 5-72-6-W6M	61.2
NE 17-72-6-W6M	65.2	B1, L1, Plan 1122518	4.0
SW 17-72-6-W6M	65.2	SW 5-72-6-W6M	56.5
SE 17-72-6-W6M	54.3	B1, L1, Plan 0321163	4.1
B1, L1, Plan 1624249	4.1	B1, L2, Plan 0325582	1.6
NW 16-72-6-W6M	65.2	B1, L2A, Plan 1124460	1.6
SW 16-72-6-W6M	65.2	NW 4-72-6-W6M	61.9
NW 7-72-6-W6M	46.9	PT NW 4-72-6-W6M	4.1
L1, Plan 9720247	4.1	NE 4-72-6-W6M	61.1
NE 7-72-6-W6M	61.1	B1, Plan 8421382	4.0
SE 7-72-6-W6M	5.7	NW 32-71-6-W6M	59.9
NW 8-72-6-W6M	24.2	B1, L1, Plan 0940541	2.4
NE 8-72-6-W6M	25.8	B1, L2, Plan 1124120	2.1
B1, L1, Plan 1224325	24.3	NE 32-71-6-W6M	52.5
L4, Plan 9724437	1.2	L1, Plan 0020612	3.4
L5, Plan 9823959	3.6	L2, Plan 0020613	3.4
L6, Plan 9823959	2.7	B1, L3, Plan 0325264	5.9
B1, L8, Plan 1721905	0.7	SW 32-71-6-W6M	31.4
SW 8-72-6-W6M	65.2	B1, L1, Plan 0941363	14.6
SE 8-72-6-W6M	63.9	B1, L2, Plan 0941363	6.6
NW 9-72-6-W6M	61.5	Environmental Reserve	12.7
B1, L1, Plan 0722222	3.7	Municipal Roads/Road Allowances	48.7
NE 9-72-6-W6M	56.6	Provincial Highways/Roads	138.3
SE 9-72-6-W6M	47.0	**Total**	**1957.5**



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LEGEND

- Plan Area
- ASP Boundary
- City Boundary

PLAN AREA

BEAR CREEK NORTH
AREA STRUCTURE PLAN

Map 1

Scale - 1:60,000

0 0.50 1.00 1.50 2.00(km)

December 2017

2.0 Federal Legislation

2.1 Species at Risk Act (SARA)

The Species at Risk Act is administered by Environment and Climate Change Canada. The Act identifies measures to protect listed wildlife (this includes vegetation) species through recovery strategies, protection of critical habitat, management of species of concern, agreements and permits, as well as Project reviews. Species identified cannot be killed, harmed, harassed or captured and their residence (e.g. nest, burrow) and habitat cannot be destroyed or moved under the Act (Government of Canada 2017).

2.2 Fisheries Act

The Fisheries Act is administered by the Department of Fisheries and Oceans (DFO). The Act prohibits work, undertaking, or activity that results in 'serious harm' to fish that are part of a commercial, recreational or Aboriginal fishery, or to fish that support such a fishery. Serious harm includes the death of fish or permanent alteration to, or destruction of, fish habitat (Section 35) (DFO 2013). The Act also prohibits the deposition of deleterious substances into waters used by fish; ensures the safe passage of fish, requires flow of water and passage of fish, and requires water intakes and diversions to have fish guards or screens. The DFO has introduced a self-assessment tool to facilitate the Act. A DFO Self-Assessment is required for works within a waterbody. It is a tool that outlines a number of activities and criteria that do not require a DFO Review. A Self-Assessment should be conducted prior to submission to the DFO for Review. If serious harm to fish and fish habitat is unavoidable then the Project should be submitted to DFO. Any work that may impact Bear Creek should have a DFO Self-Assessment completed by a Qualified Aquatic Environment Specialist.

2.3 Navigation Protection Act

The Federal Navigation Protection Act includes a List of Scheduled Waters under which Transport Canada regulates works and activities that have the potential to affect navigation. Non-scheduled waterways also may be covered under the Act, if the works pose a risk to public navigation. Bear Creek is not considered a Scheduled Waterbody.

2.4 Migratory Birds Convention Act

The Migratory Birds Convention Act (MBCA) is administered by Environment and Climate Change Canada (EC) to ensure protection of migratory birds, their nest, and their eggs. Birds protected by the MBCA include waterfowl (such as ducks, geese and swans), insectivorous birds (such as wrens, robins, shrikes and woodpeckers), and some nongame birds (such as herons and gulls) (EC 2017a). To protect migratory birds, EC provides general nesting periods based on geographic location (EC 2017b). The general nesting period covers the majority of species covered under the MBCA, however, it may not be accurate for species that can breed at any time during optimal conditions (e.g., Crossbill species), or species that may nest earlier or later (EC 2017b). It is important to note that this period may not include those nesting periods for species not covered under the MBCA but are covered under Alberta's Wildlife Act. During the nesting period, construction activities require a pre-construction nest-sweep to avoid disturbance and nest sweeps every 2-6 days where habitat occurs. If there is no habitat on the Project, but adjacent to the footprint, nest sweeps are also required as some species have large setbacks. In the event that nesting migratory birds are identified during the nest sweep, a setback may be identified through consultation with EC where feasible, or a permit would be required to remove the nest.

3.0 Provincial Legislation

3.1 Alberta Land Stewardship Act and Land-use Framework

The Alberta Land Stewardship Act (ALSA) is the enabling legislation that supports the Land-use Framework (LUF). Pursuant to 638(1), Part 17 of the Municipal Government Act, all statutory plans must comply with the ALSA; regional plans enacted under ALSA will prevail over any statutory plan to the extent of any conflict or inconsistency.

The LUF sets out an approach to manage public and private lands and natural resources to ensure Alberta's long-term economic, environmental and social goals are achieved. As well, it provides a basis for land use management and decision-making that addresses Alberta's growth pressures. Seven regions and two (metropolitan) sub-regions were created through the LUF. The seven regions are generally congruent with the Province's major watersheds and aligned with municipal boundaries.

The City of Grande Prairie falls within the boundaries of the Upper Peace Regional Plan. At the time of this report, the Government of Alberta has not commenced any work on the Upper Peace Regional Plan so there is no regional plan policy to influence or consider in the development of the BCNASP. The existing land-use policies under the MGA (i.e. those established in 1996) continue to remain in effect in regions that do not have a regional plan in place.

3.2 Environmental Protection and Enhancement Act

Alberta Environment and Parks (AEP) administers Alberta's Environmental Protection and Enhancement Act (EPEA), and regulates EPEA for all activities not related to hydrocarbon resources. The EPEA manages the province's air, land, and water resources, and its accompanying regulations set out in detail which activities require approvals and the requirements for obtaining them. An EPEA application to AEP for approval may be required for activities as waste management, substance release, potable water, water wells, and conservation and reclamation as part of future subdivision and development applications in the BCNASP area following its approval. Stormwater management facilities may also require EPEA applications. The Alberta Energy Regulator regulates EPEA for all applications related to the operation and development of hydrocarbon resources.

3.3 Municipal Government Act

The BCNASP will be prepared in accordance with the MGA. The Act enables municipalities to adopt ASPs that meet all of the requirements of Section 633. Additionally, the MGA stipulates that an ASP must:

- Conform to a municipality's Municipal Development Plan;
- Have given opportunity to property owners, businesses, interested members of the community, and school boards to provide their input in the planning process for the ASP; and
- Be adopted by bylaw, which requires a public hearing to be held on the proposed plan.

The MGA was amended by three bills over a period of three years: Municipal Government Amendment Act (2015), Modernized Municipal Government Act (2016) and An Act to Strengthen Municipal Government (2017). Most of the changes contained in the three MGA Review amending bills and their associated regulations came into force on October 26, 2017.

Remaining amendments and associated regulations will come into force in phases, with some becoming effective on January 1, 2018 and in April 2018. The policy changes impacting the BCNASP will focus on the policies in Table 2 below:

Table 2: Relevant MGA Amendments

Amendments	Effective Date
Hierarchy and Relationship of Plans	October 26, 2017
Listing and Publishing of Policies	October 26, 2017; must be published by January 1, 2019
Conservation Reserve	October 26, 2017
Environmental Reserve	October 26, 2017
Land-Use Policies	October 26, 2017
Municipal Development Plans	April 1, 2018; if no MDP in place must adopt by April 1, 2021

This initial set of amendments proclaimed on October 26, 2017 do not alter, remove or impact the current process and requirements for the preparation of the BCNASP; however, amendments of significance would include the hierarchy and relationship of plans, and amendments for conservation and environmental reserve.

3.3.1 Hierarchy and Relationship of Plans

The MGA identifies the following statutory plans: intermunicipal development plan (IDP), a municipal development plan (MDP), an area structure plan (ASP) and an area redevelopment plan (ARP). The MGA provides that statutory plans adopted by a municipality must be consistent with one another. Statutory Plans must also be consistent with regional plans adopted under the Alberta Land Stewardship Act (ALSA) and a Growth Management Plan adopted by a Growth Management Board provided they are within the area defined by those plans. While the MGA states that ALSA and Growth Management plans prevail if there is an inconsistency, it gives no direction regarding which municipal level statutory plan prevails when provisions in one statutory plan are inconsistent with provisions in another statutory plan.

Amendments to the MGA will require municipalities to have the same types of statutory plans and continue to align their statutory plans with ALSA and/or growth management plans that apply to them. The MGA identifies the hierarchy and relationship of statutory plans, so that each plan will be consistent with the plans above it and, in the event of an inconsistency, which provisions in what plan will prevail. Key amendments to Section 633(3) of the MGA specify that an ASP must be consistent with any IDP and MDP in effect for the lands identified in the plans. The BCNASP will need to be consistent with the City of Grande Prairie Municipal Development Plan (Bylaw C-1237) and the City of Grande Prairie & County of Grande Prairie Intermunicipal Development Plan (Bylaw C-1248; Bylaw 2896).

3.3.2 Conservation Reserve and Environmental Reserve

Prior to the recent amendments to the MGA, the legislation did not provide municipalities with the ability to conserve environmentally significant lands, other than lands that met the criteria under Environmental Reserve (ER). ER lands are those that are undevelopable and may or may not have key environmental features a municipality wishes to preserve. The amended MGA now enables municipalities to designate land for a new type of reserve, called Conservation Reserve (CR), in order to protect environmentally significant features such as wildlife corridors, significant tree stands, or other environmentally significant features a municipality chooses to conserve. The amended MGA includes provisions relating to a municipality's designation of CR, including:

- compensation from the municipality to the developer for the CR lands taken;
- the need for CR dedication;
- bylaw authority;
- the disposal of CR by a municipality;
- an appeal mechanism for landowners regarding the compensation for land set aside for CR; and
- a requirement that a municipality must ensure land designated CR maintain in a natural state.

For the BCNASP, the City of Grande Prairie is allowed to include policies addressing conservation reserve in the municipal development plan and area structure plans as per the amended s.632 and s.633 of the MGA. Conservation and environmental reserve may be applicable to the Bear Creek corridor and Environmentally Significant Areas within the plan area.

3.4 Public Lands Act

Under the Public Lands Act, AEP is responsible for administering lands owned by the Crown. This Act requires that a surface disposition be issued for the use of all public lands in Alberta. Under Section 3, public lands include the bed and shore of all permanent and naturally occurring waterbodies (i.e., watercourses and wetlands) unless the title has been granted to a private landowner.

Bed and shore of watercourses are owned by the Crown and all permanent wetlands must be submitted to the Water Boundary group for determination of Crown ownership. Determination of Crown ownership can take 6 to 12 months. For work on a Crown waterbody (i.e., all watercourses and Crown claimed wetlands) a Temporary Field Authorization (TFA) or Department License of Occupation (DLO) is required. A TFA is a short-term deposition issued for a year or less. A DLO is a long-term disposition for multi-year projects or long-term/permanent occupation of public land. A DLO application must include a letter from the applicant describing the need, an application form, a detailed sketch plan, and application fees. These can take six (6) or more months to issue, so it is allowable in some cases to have a TFA before a DLO is issued to allow for early entry onto public land.

Any future work undertaken on the bed and shore of Crown-owned waterbodies within the area will need to satisfy the requirements of a TFA or DLO prior to the work being initiated on public land. The BCNASP will identify existing Crown-owned land, including permanent wetlands, which would be subject to the requirements of the Public Lands Act.

3.5 Water Act

The Water Act manages Alberta's water resources and governs activities affecting waterbodies, including construction, water diversions and infilling of wetlands. Through AEP, Water Act Approval is required to alter the flow of water; change the location of water; change the direction of water flow, cause the siltation of water; cause erosion of bed or shore of any waterbody; or any effect on the aquatic environment. Water Act Licenses are issued for the consumptive use of water.

AEP has developed Restricted Activity Period (RAPs) for waterbodies based on stream classification applied to all watercourses in the province. Activities within a specified RAP are considered to be at high risk to cause damage to fish and habitat. The intent on timing restriction for instream activities is to protect sensitive life history stages of fish, such as spawning, embryo incubation and fry emergence.

Any activity that will disturb a wetland or other type of waterbody (i.e., streams, rivers, lakes) requires Water Act approval, other than those activities that are regulated under the Codes of Practice (COP). COP may occur for: temporary diversion of water for hydrostatic testing; pipelines and telecommunication lines crossing a water body; watercourse crossings; and outfall structures on waterbodies. For activities that are not regulated under a COP, a Water Act approval is required.

At the time of subdivision and development, any activity that is in proximity to the Bear Creek corridor or any other wetland or waterbody in the BCNASP area will be required to obtain a Water Act approval. Obtaining Water Act approval can take 6 to 8 months.

3.6 Alberta Wetland Policy

The goal of the Government of Alberta Wetland Policy, administered by Alberta Environment and Parks, is to conserve, restore, protect and manage Alberta's wetlands in accordance with the following objectives:

- wetlands of the highest value will be protected long-term;
- wetlands will be conserved in areas where loss has been high;
- wetlands will be managed by avoiding, minimizing and replacing lost wetland value; and
- wetland management will be considered at a regional context.

Under the authority of the Water Act, wetlands must be classified using the Alberta Wetland Classification System and assigned an ecological wetland value using the Alberta Wetland Rapid Evaluation Tool – Actual (ABWRET-A). This standardized method must be performed by a qualified professional to ensure that wetland replacement, when required, considers both specific wetland function and loss of area.

Water Act regulated activities require compensation for wetland loss under the Wetland Policy for all wetlands, except for ephemeral wetlands (i.e., Class I [Stewart and Kantrud 1971]). Ephemeral wetlands have borderline hydric soils and typically lack hydrophytic vegetation. While they do not require compensation for Water Act regulated activities (i.e., no AB-WRET-A assessment), they are regulated under the Water Act and may require a Water Act approval, depending on the proposed activity.

Proposed development activity in proximity to wetland areas will be the subject of wetland assessments in advance of subdivision. The BCNASP will include the identification of permanent wetlands in the area and establish strategies respecting their integration with future urban development.

3.7 Wildlife Act

AEP administers the Wildlife Act, which influences and controls human activities that may have adverse effects on wildlife or wildlife habitat on both Crown and privately owned land. Section 36(1) of the Wildlife Act states that houses, nests or dens of prescribed wildlife or beaver dams in prescribed areas and prescribed times shall not be affected. This applies to nests and dens of endangered wildlife, migratory birds, snakes, bats and prairie rattle snake hibernacula. As a result, the Wildlife Act provides setbacks and requires Restricted Activity Dates (RADs) for important species. Setback distances are based on thresholds where human disturbance will adversely affect key wildlife areas or sites, and RADs are based on knowledge of species-specific seasonal life history traits.

Development activity in proximity to Bear Lake, Bear Creek corridor, and wetlands within the plan area will be subject to setbacks. Hughes Lake and the wetland north of the Grande Prairie Airport will be subject to setbacks due to its role as trumpeter swan habitat. The BCNASP will address setbacks in general terms, but implementation of matters relating to the Wildlife Act will be addressed during subsequent and more detailed planning stages.

4.0 Municipal Plans and Policies

4.1 Intermunicipal Development Plan

The Intermunicipal Development Plan (IDP), City Bylaw C-1248/County Bylaw 2896, for the County of Grande Prairie and the City of Grande Prairie, was adopted in 2010. The purpose of the IDP is to provide a coordinated framework for managing the use and development of lands over which the City and County have a joint interest. The IDP provides policy direction in regards to future annexation, future land use, recreation and parkland, transportation and utilities. The Generalized Future Land Use Map of the IDP (See Figure 2) designates the future land uses in the BCNASP area as predominately residential/ public uses with industrial/commercial within the southwest portions of the Plan area, and environmental/open space/recreation areas surrounding the wetland in the south and along the Bear Creek corridor.

Figure 2: Intermunicipal Development Plan Future Land Use Concept

The annexation of the BCNASP lands into the City in 2016 was undertaken in accordance with the IDP. The Provincial Government issued the Order in Council during December 2015 (O.C. 296/2015) reflecting Cabinet's approval of the City's annexation application, which included the City acquiring 6,316 hectares from the County of Grande Prairie, effective Jan. 1, 2016. The IDP is currently being revised to reflect the new City boundary.

4.2 Municipal Development Plan

The Municipal Development Plan (MDP), Bylaw C-1237, as amended, is the primary policy document for use at the municipal level and provides a framework for the ongoing development of the City. The MDP guides future development by describing the City's overall development vision, goals, objectives and policies to implement the vision.

All of the lands incorporated into the City as part of the 2016 annexation, including the BCNASP area, have been identified as "Rural Service Area" in the MDP, and the generalized future land uses identified in the IDP have been incorporated into the MDP as illustrated in (See Figure 3). The MDP also includes a generalized arterial road network concept (See Figure 4) that will be used as a basis for ASP preparation.

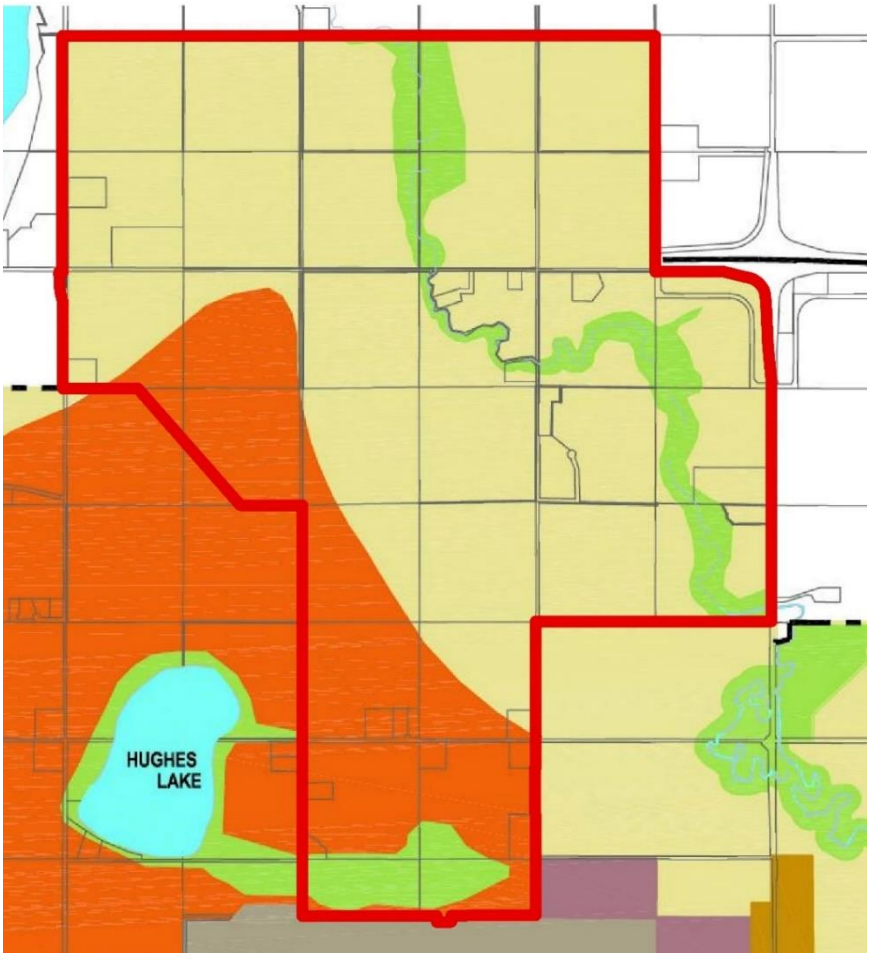

Figure 3: Municipal Development Plan Future Land Use Concept

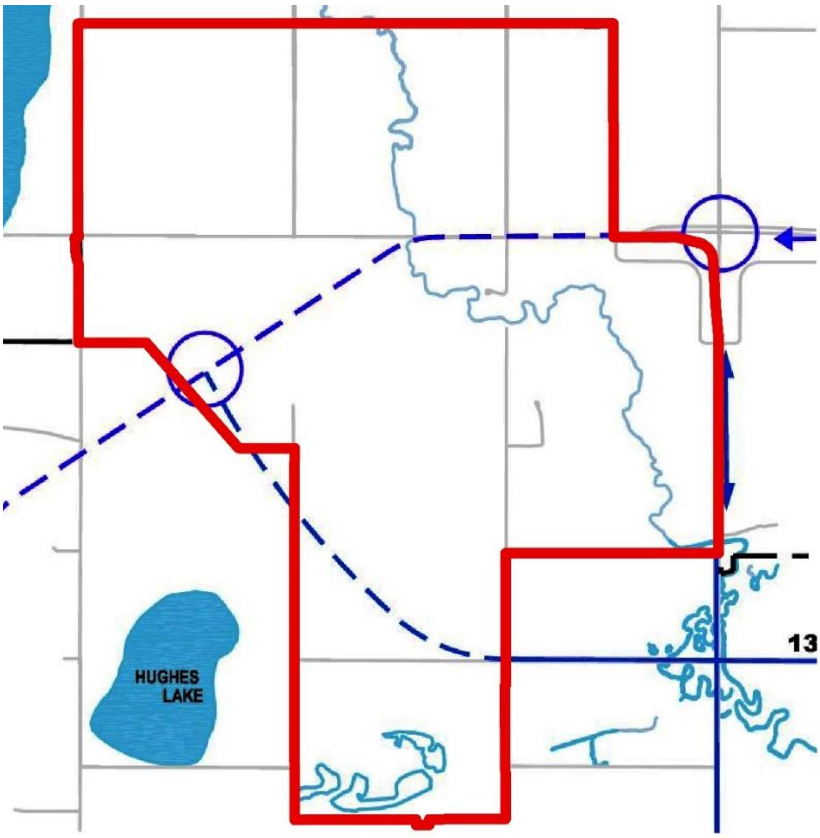

Figure 4: Municipal Development Plan Road Network Concept

Applicable guiding principles from the MDP include the following:

- Promote energy efficiency, water conservation and reduction of solid waste and other environmental initiatives;
- Incorporate sustainable community principles that will ensure a high quality of life;
- Use best management approaches in considering new growth and development initiatives;
- Apply a triple bottom line approach to sustainability in considering new growth;
- Manage new growth and infrastructure to support residential, commercial and industrial uses;
- Pursue the development and enhancement of natural areas including aquatic ecosystems and riparian areas in Bear Creek and around wetlands and lakes;
- Provide for a connected parks and open space system that links neighbourhoods and Muskoseepi Park; and
- Plan for a comprehensive and efficient transportation system.

Generalized MDP policy references that apply to the preparation of the BCNASP are as follows:

- Encourage the application of Smart Growth Neighbourhood Design Guidelines in preparing new residential Area Structure Plans (5.2);
- Develop and promote the application of Crime Prevention through Environmental Design (CPTED) principles in all ASPs, ARPs, and OPs (5.4);
- Area Structure Plans required for all new industrial growth areas (9.1);
- Rural cross-section road standard in new industrial subdivisions to reduce costs and attract users (9.4);

- May support eco-industrial business park development through incentives such as reduced levies or taxes (9.7);
- May require municipal reserve in new industrial subdivisions in the form of land instead of cash-in-lieu (9.8);
- All ASPs required to consider and rationalize park facilities in accordance with the Recreation Master Plan (10.1);
- Municipal reserve required as land for all ASPs including industrial plan areas (10.4);
- Municipal reserve shall be developed as useable park space in new neighbourhoods including sites designated for schools by an ASP (10.10);
- Preserve and protect the Bear Creek Valley in accordance with the Muskoseepi Park Master Plan (11.1);
- Promote conservation and use of existing wetlands for natural stormwater management (11.12);
- In consultation with Alberta Environment, City to work with landowners and developers to establish workable development setbacks from waterbodies at the time of subdivision (11.18);
- As part of an ASP, Environmental Reserve setback shall be required from either top of the Bear Creek Valley, tributary watercourses and valleys, or the high water mark of a Crown-owned body of water (11.30);
- Promote a cohesive network of bicycle and pedestrian trail networks (12.1);
- Road classification and network recommendations of the Transportation Master Plan shall be applied to all future ASPs (13.13);
- Explore alternative urban water and sanitary servicing methods in the Rural Service Area (13.18);
- Statutory plans to include a statement addressing compliance with the MDP (15.3); and
- New ASPs shall have consideration for the ASP requirements (15.6).

4.3 Area Structure Plans

There are no existing ASPs within the Plan area. Existing ASPs are in place for lands to the immediate southeast (Bear Creek Highlands ASP and Arbour Hills ASP), south (Northwest ASP), and southwest (proposed Hughes Lake ASP) of the BCNASP area as shown in Map 2. These ASPs all have land use and development concepts that identify future lands that are predominantly business park or industrial uses to the southwest of the BCNASP area, and residential uses to the southeast.

4.4 Land Use Bylaw

The purpose of the City of Grande Prairie Land Use Bylaw C-1260 (LUB), as amended, is to regulate the use and development of land and buildings within the City, and implement the policies of statutory plans, such as the MDP or an ASP.

As a result of the annexation, the land use districts from the County of Grande Prairie LUB for the subject lands continue to apply until such time as development activity warrants rezoning to applicable City LUB districts. Lands within the BCNASP boundary are currently zoned Agricultural (AG), Country Residential (CR-2, CR-4 and CR-5), and Intensive Recreation (IR) as illustrated in Map 2.

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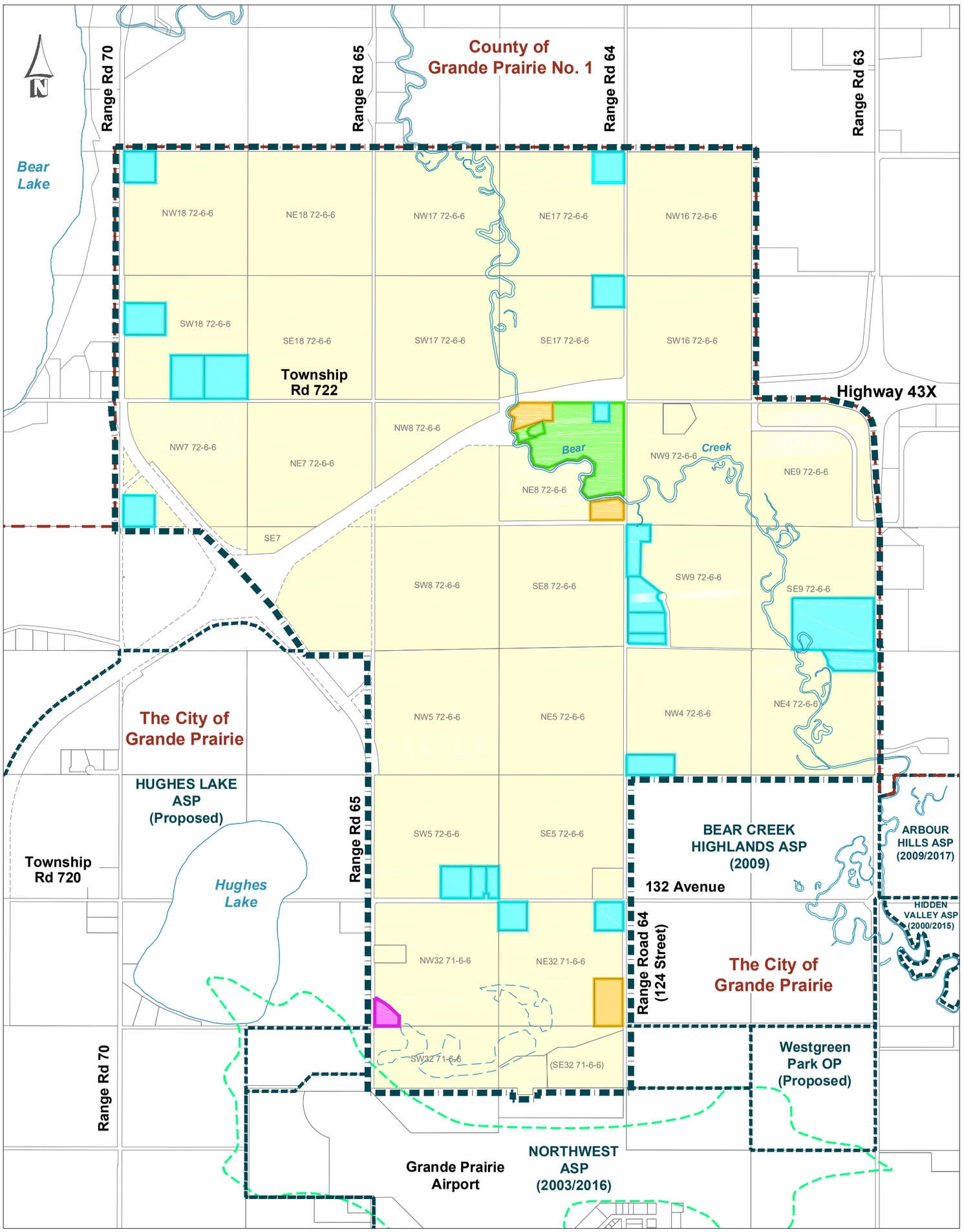

PLANNING AND ZONING CONTEXT

BEAR CREEK NORTH AREA STRUCTURE PLAN

Map 2

LEGEND

- **AG** - Agricultural
- **CR2** - Country Residential
- **CR4** - Country Residential
- **CR5** - Country Residential
- **IR** - Institutional and Recreation

LEGEND

- Plan Area
- City Boundary
- Area Structure Plan (ASP) Area
- 25 NEF Contour*

* *2032 Noise Exposure Forecast, Grande Prairie Airport Development Plan*

Scale - 1:25,000

0 0.25 0.50 0.75 1.00 (km)

December 2017

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4.5 Master Plans

4.5.1 Storm Drainage Master Plan

The Grande Prairie Storm Drainage Master Plan (Focus, 2014) identifies an ultimate stormwater servicing concept for the BCNASP area which includes a total of 20 stormwater Management Facilities (SWMFs) servicing various catchments in the drainage basin as illustrated in Figure 5. The City of Grande Prairie lies within the Bear Creek Drainage Basin, and the majority of the City discharges directly into Bear Creek. SWMFs within the Plan area include:

- Two SWMFs (NW3, NW4) in the north draining into Bear Lake;
- Fifteen SWMFs in the northeast and southeast portions of land draining into the Bear Creek corridor (Bear Creek);
- One SWMF (NW26) to the southwest which will discharge into Hughes Lake; and
- Two SWMFs (NW31, NW32) to the east of Hughes Lake which will discharge to a large wetland located north of the airport.

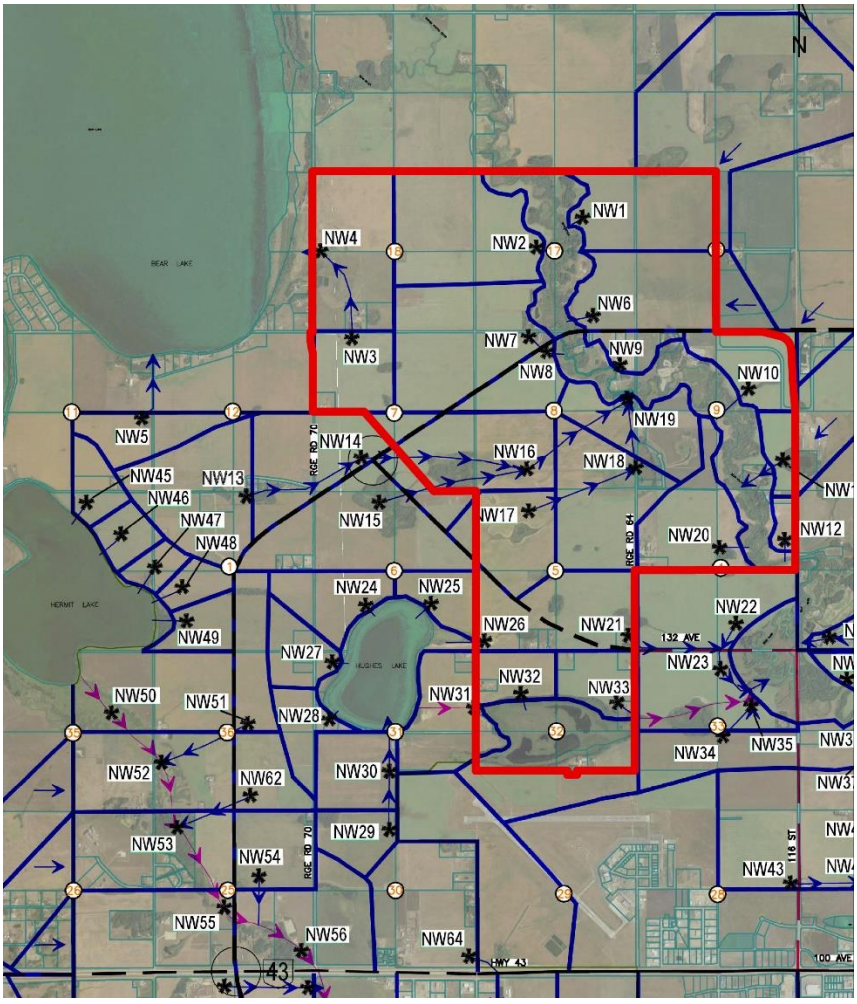

Figure 5: Storm Management Master Plan

In two cases, the SWMF discharge is reliant upon future offsite storm systems outside of the BCNASP area, the majority of lands are proposed to drain to SWMFs located inside the BCNASP area along the Bear Creek corridor. The Storm Drainage Master Plan does not indicate interim servicing schemes that can assist development in the affected areas in advance of downstream development. The majority of future development will construct new storm trunks and outfalls that will discharge to the Bear Creek corridor, lakes, drainage courses and new drainage parkways.

As part of the storm servicing concept there will be a review of the Storm Drainage Master Plan and catchment boundaries to avoid, where possible, fragmentation of the BCNASP area into offsite storm basins, and to determine options for interim SWMF discharge conveyance if development proceeds ahead of downstream storm systems. Opportunities to consolidate basins in order to reduce the number of SWMFs will also be explored.

Hughes Lake, Bear Lake, and the Bear Creek corridor have been identified as Priority Environmentally Significant Areas (ESAs) within the West and Northwest Annexation Areas (O2 Planning + Design, 2012). Hughes Lake and Bear Lake are significant habitats for Trumpeter Swan species, and as such must be protected. This may impact the location of SWMFs immediately upstream of the lakes and permanent wetland north of the airport. The Bear Creek corridor traverses the BCNASP area from the northeast to the southeast and maintaining the quantity and quality of water in the Bear Creek corridor and its tributaries should be the primary goal for any water policies within the plan area. Furthermore, stormwater quality treatment, which is always important, is particularly critical for discharges to Hughes Lake and the marsh wetland located north of the airport in order to maintain and enhance the local ecosystem health. The City should aim for no net loss of wetlands, including avoiding wetlands, mitigating impacts to wetlands where unavoidable, and compensating for unavoidable impacts, while recognizing site-specific needs. Further discussion on environmental requirements will be necessary.

The BCNASP area is located north of the Grande Prairie Airport, which brings with it more stringent stormwater management requirements to minimize the risk of aircraft bird strikes. The Storm Drainage Master Plan identifies the following requirements:

- use of dry ponds only within 3 km of the end of the runways at the airport;
- open water in dry ponds must drain within 48 hours of the end of the 1:100-year rainfall event,
- dry pond design to minimize the growth of cover vegetation for birds;
- side slopes should be as steep as possible to discourage birds, a slope of 4:1 is advised; and
- other measures can include underground storage, bird balls and netting/wires, and secondary uses for the dry pond, such as an off-leash dog park and open space, to discourage waterfowl.

It has been ISL's experience with developments near CFB Edmonton that naturalized wetlands with significant emergent vegetation and limited open water area to discourage waterfowl from landing may also be acceptable. The Master Plan recommended collaboration between the City and the Airport Authority to establish specific requirements and guidelines for SWMFs prior to development in the BCNASP area. It should also be noted that Hughes Lake and the large existing wetland area to the north of the airport are both impacted by the 3 km buffer from the end of the runways at the airport.

Although dry ponds are recommended in the vicinity of the airport, they provide only minimal water quality treatment, and as such other methods such as oil/grit separators and low impact development (LID) measures such as bioswales will be required to meet water quality guidelines. For the SWMFs immediately adjacent to the large wetland north of the airport, there may be potential for relaxation of the dry pond requirement given the presence of Hughes Lake and the wetland are a much more significant, present risk, and the presumed need for high quality stormwater treatment prior to discharge to the Trumpeter Swan habitat (as can be provided by naturalized wetlands). With the development of the annexation areas, a number of new outfalls to the Bear Creek corridor will be required as well as a number of SWMFs and other drainage courses. The Drainage Master plan attempts to reduce the number of outfalls required in the BCNASP area as much as practical to limit development in the Bear Creek valley.

4.5.2 Water Distribution and Wastewater Collection Master Plan

Water Distribution

The draft Water Distribution and Wastewater Collection Master Plan (Morrison Hershfield, 2016), prepared for Aquatera Utilities has most of the BCNASP area being serviced as part of a new zone G-1D due to higher elevations as illustrated in Figure 6. The land east of Bear Creek is proposed to be serviced from the east as parts of Zone G-3 and Zone C-3 (Clairmont system). The very south part of the plan area (mostly containing the ESA natural wetland area) has been included as part of Zone G-1A although most of this land will likely remain undeveloped and the rest could be serviced by Zone G-1D. The BCNASP will evaluate the most logical pressure zone boundaries and reservoir/pump house location(s) for the plan area based on the apparent flexibility in zone boundaries. One future pump house & reservoir location is identified in the 2013 Water Distribution & Wastewater Collection Master Plan for the BCNASP area.

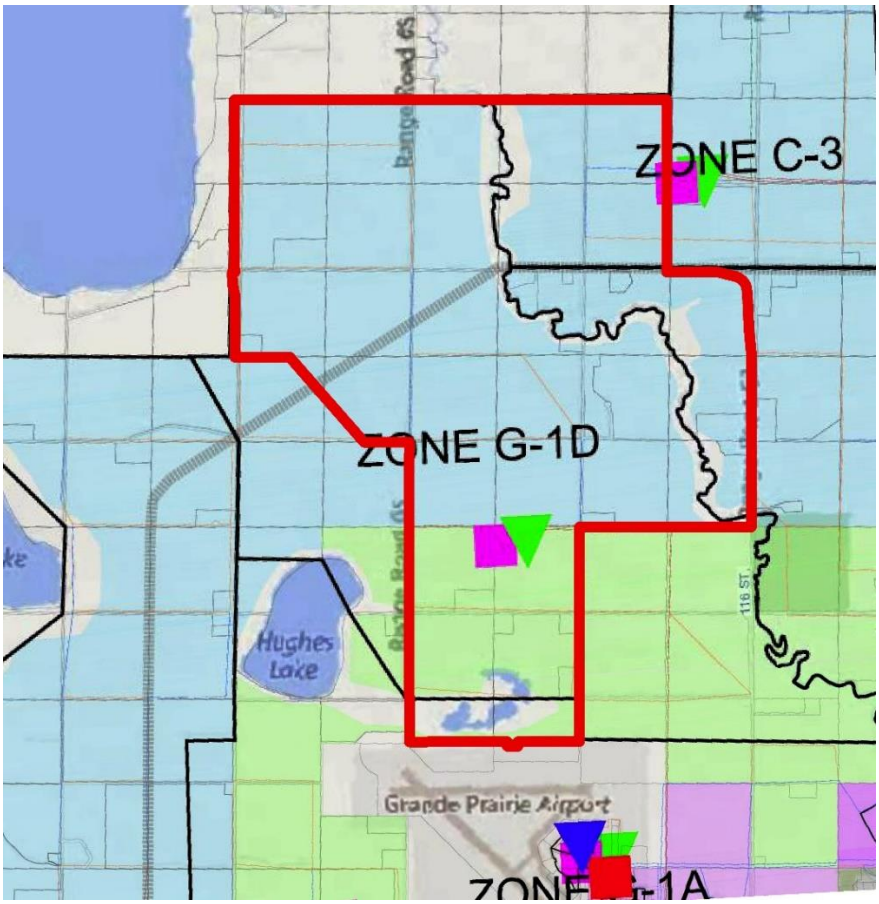

Figure 6: Water Distribution Master Plan

The Master Plan does not discuss interim servicing options to accommodate leap-frogging development as may occur in the BCNASP as a result of the construction of Highway 43X. Consequently, the BCNASP will propose an interim pressure zone strategy to minimize infrastructure requirements until such time as areas north, west and east of the area develop and the ultimate pressure zones can be implemented. As discussed in the Grande Prairie Annexation Area Infrastructure Planning Study in Section 3.5.3, interim servicing options/concepts that would reduce the initial servicing costs include a combination of the following:

- A trickle feed system to a private on-site potable water reservoir;

- Utilization of the future dedicated transmission mains as part of the interim distribution system piping;
- Providing fire protection through the use of non-potable water such as stormwater management ponds/fire ponds; or
- Reducing the fire flow requirements through amendments to the City servicing standards, and utilizing other methods of fire protection (e.g. fire ponds, mechanical sprinkler systems) or restrict the types of activities and structures than are allowed and accept a lower level of fire protection.

It is noted that development servicing within the City limits using reduced standards or on-lot servicing will require an amendment to Aquatera's water and wastewater servicing standards. Based on existing system capacity information to be provided by Aquatera, a high level evaluation will be made of the potential for the Airport water reservoir and pump house to provide interim servicing to the BCNASP area. A 450 mm transmission line from the intersection of 100th Avenue and 124th Street a branch of the transmission line from the water treatment plant that also supplies the zone G-1A reservoirs will fill the reservoir in zone G-1D. The major distribution grid of the zone will consist mostly of 250 mm and 300 mm pipes.

Wastewater Collection

The BCNASP area is to ultimately be serviced by the Future West Trunk Service Areas 6 and 18 as illustrated in Figure 7:

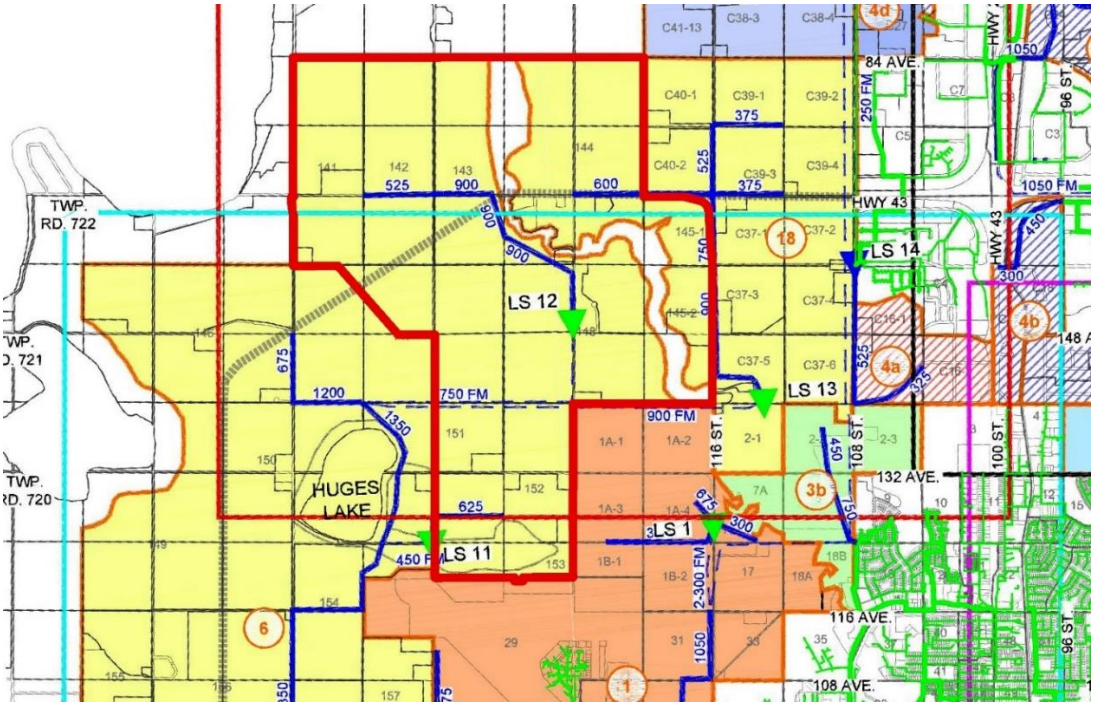

Figure 7: Wastewater Collection Master Plan

- Servicing land to the west of the City will require a significant amount of new infrastructure. A new sanitary trunk main is required from the wastewater treatment plant, extending to the west along the north edge of Flyingshot Lake, and north towards Hughes Lake and into the BCNASP area; the majority of the BCNASP area will require pumping to discharge to the new wastewater trunk. Local gravity trunks will discharge to the lift stations. Three forcemains and lift stations (LS 11, LS 12 and LS 13) are required to service the area that is north and east of Hughes Lake, including the land east of Bear Creek. The lift station that services the land east of Bear Creek in Service Area 18 will service off-site areas;

- The remaining areas nearest to the West Trunk may be serviced by gravity. Further, depending on the depth of the future West Trunk, lift station LS 11 may be eliminated.

The BCNASP area is located at the upstream end of a proposed new sanitary trunk that is not likely to be extended to the area in the near term. As a result, interim servicing schemes are critical to enabling development within the foreseeable future as the Master Plan does not provide any details as to how this area may be developed in advance of trunk construction. Potential interim urban servicing might be possible by utilizing the 116th Street trunk until such time as that trunk's sewershed is fully built out. Lift stations would be required to convey the flows from the BCNASP area to the 116th Street Trunk. Based on existing system capacity information to be provided by the City, a high level evaluation will be made of the potential for the 116th Street Wastewater Trunk to provide interim servicing to the Plan area.

On-lot servicing or reduced servicing standards may also be a possibility for some land uses such as large lot industrial however this will require a change in the City/Aquatera development standards to accommodate a lower level of servicing. Because of the significant interim servicing costs, we recommend carrying both options in the BCNASP (full standards with interim servicing and on-lot servicing).

4.5.3 Parks and Open Space Master Plan

The Parks and Open Space Master Plan (Sandalack + Associates, 2012) provides Grande Prairie with a framework for developing a comprehensive open space system, with typologies ranging from natural to manicured, passive recreation to active and local to regional scale. The City's main recreational and ecological corridor, Muskoseepi Park, follows the Bear Creek corridor, which flows north into our study area. All parks and trails proposed in the BCNASP will seamlessly connect to this existing corridor, while providing a mix of open spaces in keeping with the Master Plan's typologies and guidelines.

Some specific guidelines from the Master Plan include:

- Prioritizing protection and reclamation of natural features, wetlands and watercourses during future ASP processes;
- Ensuring trail connectivity and walkability through grid or modified grid development; and
- Providing a wide range of recreational opportunities for all seasons and demographics.

Section 10.13 of the Master Plan provides the following recommendations for future open space with respect to annexed lands:

- Maintain the environmental integrity and waterbody/watercourse connectivity;
- Use Environmental Reserve as a tool to preserve these natural features;
- Prevent the intentional drainage of natural wetlands and drainage channels; and
- Identify opportunities for Regional Parks adjacent to future Environmental Reserve.

These recommendations will be considered in the preparation of the future land use concept for the BCNASP lands.

4.5.4 Muskoseepi Park Master Plan

The Muskoseepi Park Master Plan provides some direction for the development of the corridor as it extends north into our study area. The plan suggests:

- Visual and ecological respect for the creek corridor;
- Open access, non-privatization and visibility from adjoining neighbourhoods; and
- Preservation of the creek corridor in perpetuity whether as a bird sanctuary, ecological preserve or other protected landscape.

The plan also proposes logical connections to adjoining neighbourhoods and destinations beyond, looping trails and a strong trail hierarchy, and a balance of recreational opportunities within the park corridor.

4.5.5 Transportation Master Plan

The Transportation Master Plan (TMP) provides recommendations for roadway enhancements and improvements to support future anticipated growth in the City. The TMP was developed to the City's 2009 boundaries. As such the entire BCNASP area is outside of this boundary. However, the TMP's recommended long-term road network did contemplate general road alignments beyond these boundaries, including the provincial Bypass Highway alignment.

The Highway 43X alignment, which will bisect the Plan area is identified in the TMP as providing key regional connections for both the City and the County. 116th Street, which runs along the east boundary of the plan area is designated as a Truck Route and Dangerous Goods Route.

In addition, the TMP identifies preliminary opportunities to provide and enhance connections for alternative modes of transportation, including walking, cycling and public transit. The TMP recommends supporting alternative modes to help reduce congestion, reduce socio-economic barriers related to owning personal vehicles and to improve health benefits.

The TMP is currently being reviewed by the City, and will be updated to include the BCNASP area and all other annexed lands.

4.5.6 Moving Forward – A Strategy for Active Transportation

The purpose of the 2014 Active Transportation Strategy is to provide a variety of active transportation and public transit options so that they become the preferred mobility choice for residents. A key consideration for the Strategy is that all policies and action items recognize that Grande Prairie is a winter city and provide for accommodation of active modes in all seasons. The Strategy focuses on six key areas to increase the range of mobility options for residents:

- Walking for Recreation and Leisure;
- Walking for the Commute;
- Walking to School;
- Cycling;
- Transit; and
- The Built Environment.

Action items for the six key areas that are relevant to the BCNASP policies will be incorporated, where possible, throughout the ASP.

4.5.7 Joint Recreation Master Plan

The Joint Recreation Master Plan for the County and the City was approved in 2016. The purpose of the plan is to provide guidance related to the implementation of recreation facilities and programs that will serve the region. The plan includes short, mid and long-term recommendations for service delivery of indoor infrastructure and outdoor infrastructure. One of the more immediate recommendations relevant to the BCNASP is the development of a Regional Trails Master Plan. As part of the preparation of the land use concept, opportunities for regional trails will be considered to ensure the BCNASP aligns with the future vision and goals identified in the Joint Recreation Master Plan.

4.5.8 Grande Prairie Airport Development Plan

The Grande Prairie Airport Development Plan (WSP, 2014) outlines the airport's long-term plans for facility development. As a result of its proximity to the BCNASP area, height and noise exposure forecast (NEF) restrictions apply to those lands that are in line with the two airport runways as illustrated in Figure 8. These restrictions are also enforced through caveats registered by Transport Canada on the affected lands.

Given that the BCNASP area is currently proposed for industrial use within the southwest portions of the plan area as per the City's MDP, the NEF contours are not of concern. Building height restrictions would be addressed more specifically at the time of development, but will have an impact on built form in the southern portions of the BCNASP area, including all land use and building types.

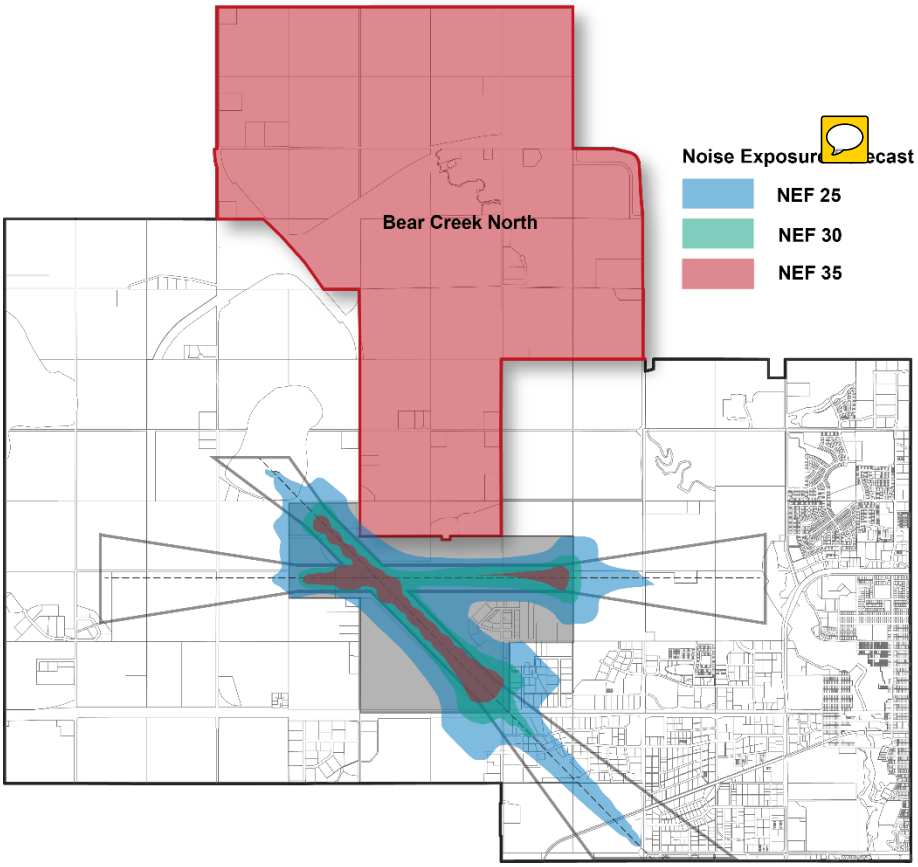

Figure 8: Airport Development Plan

4.6 Other Studies

4.6.1 Mapping of Environmental Reserve and Science-based Setbacks for Environmental Reserve

The City of Grande Prairie Mapping of Environmental Reserve (ER) and Science-based Setbacks for ER (O2 Planning + Design, 2012) was prepared to map riparian areas, wetlands and other important natural features within the City, including the recently annexed areas, and identify Priority Environmentally Significant Areas (ESAs). The report outlines best management practices for riparian zones, including the preservation of naturally occurring forested buffers and setbacks including ridges and escarpments. It also recommends protecting natural vegetation through ER dedication as well as strategic MR placement and suggests naturalized landscaping where mown grass is not strictly required.

The report also includes a new Riparian Area Setback Matrix Model intended to establish site-specific development setbacks in proximity to these features. The report identifies the BCNASP as being located within the Environmental Sensitive Area 556 – Boreal - Important Bird Area. Hughes Lake and a wetland area in the southerly portion of the BCNASP are identified as Priority ESAs. The BCNASP will employ the baseline data contained in this report to inform broad ER and other environmental protection strategies for the area. Setback and development guidelines in these ESAs offer great opportunities to extend the Bear Creek corridor trail network within the BCNASP area.

4.6.2 Bear Creek Corridor Geohazard Slope Stability and Erosion Assessment

Numerous active and historical landslides have occurred within the Bear Creek corridor within the City of Grande Prairie. Based on the level of risk associated with top-of-bank developments and the historical problems associated with slopes along Bear Creek, guidelines for the evaluation of slope stability studies within the City were developed by Parkland Geotechnical Ltd. Recommendations for top-of-bank development and guidelines for the evaluation of slope stability studies will be considered in the BCNASP.

4.6.3 Annexation Area Infrastructure Planning Study

The Grande Prairie Annexation Area Infrastructure Planning Study (ISL Engineering and Land Services, 2012) identifies long-term infrastructure network needs (transportation, water, wastewater and stormwater management) for all of the City's newly annexed lands, which includes the BCNASP area.

Stormwater Management

Preliminary locations for stormwater management facilities within the BCNASP area are identified with Hughes Lake, Bear Lake, Bear Creek corridor, and a wetland located north of the Grande Prairie airport serving as drainage discharge points for the area. The stormwater management concept contained in the study is consistent with the City's Storm Drainage Master Plan.

Wastewater and Water Servicing Systems

The overall wastewater and water servicing concepts proposed for the area are mostly consistent with those contained in the Draft Aquatera Water Distribution and Wastewater Collection Master Plan.

Long-term sanitary servicing of the BCNASP area is dependent on the construction of a new wastewater trunk, which would connect to the existing wastewater treatment plant and extend northwest through the west annexation lands. Most of the north portion of the BCNASP area requires a lift station to discharge to the new trunk. Servicing of the area east of the Bear Creek corridor could be accomplished as part of the Clairmont 116 Street Service Area to avoid crossing Bear Creek.

Initial water servicing strategies would include ultimate build-out into three separate distribution pressure zones:

- Northwest of Hughes lake towards Hermit Lake, lands with an elevation of 675 m and above would have water distributed through a minimum 300 mm diameter loop from a proposed Reservoir and Pump Station located west of the BCNASP area. Only a very small portion of the BCNASP area falls within this zone and with the adjustment of the zone boundaries it could be excluded to be consistent with the Water Distribution Master Plan;
- Lands east of Bear Creek could be serviced by the Clairmont Water Distribution System to avoid a crossing; and
- The remainder of the area would be part of the existing Zone G-1A (formerly Zone 1B), although two new reservoirs and pump houses were proposed for this zone (the current reservoir and pump house is located at the airport). This differs from the Water Distribution Master Plan that proposes a new Zone G-1D to service most of the BCNASP and neighbouring areas.

Transportation Network

The Infrastructure Planning Study identifies a hierarchy of roads (highway, arterial and collector) throughout the BCNASP area to provide connectivity and access for the lands. The proposed Highway 43X alignment bisects the plan area, and identifies approximate future arterial roadway alignments as well as a supporting collector road network as illustrated in Figure 9. The arterial and collector network contained in the study is conceptual as the BCNASP area is not addressed in the City's current Transportation Master Plan.

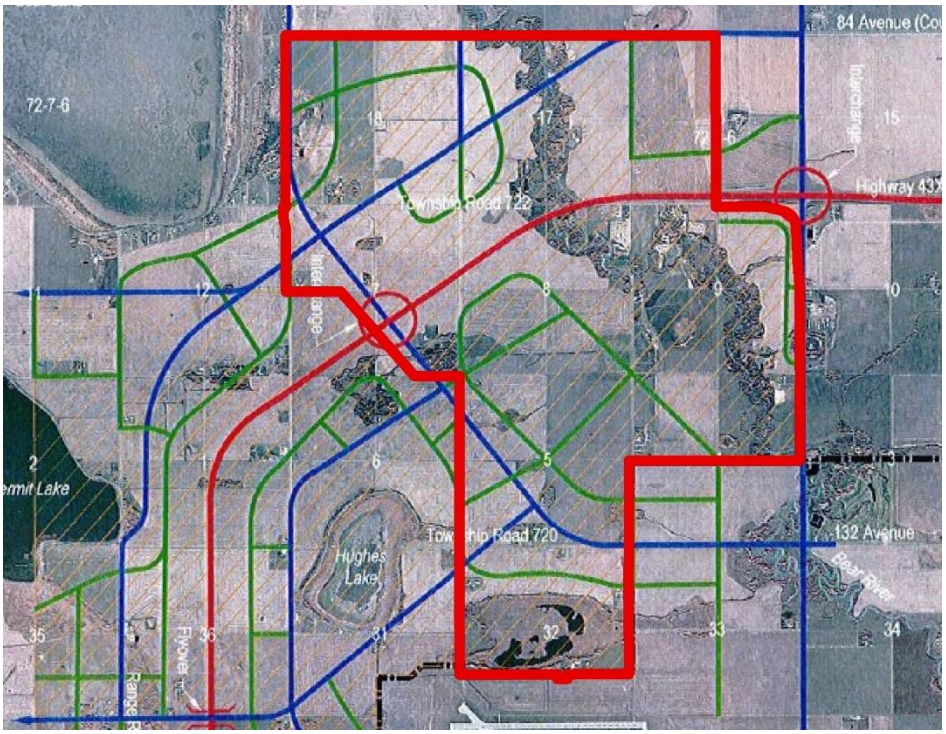

Figure 9: Annexation Study Transportation Concept

5.0 Physical Characteristics

5.1 Hydrology

A review of hydrologic features located in the BCNASP area identified some key locations and ESAs that have some moderate to high water resource values for the lands (The City of Grande Prairie Mapping of Environmental Reserve (ER) and Science Based Setbacks for ER (O2 Planning + Design, 2012) as illustrated in Map 3). The Bear Creek corridor that runs from northeast to the southeast has a moderate to high water resource value and Hughes Lake and other water features north of the Grande Prairie Airport in the plan area have some or moderate water resource value. Currently, much of the land in the BCNASP area is undeveloped and provides for opportunities for future growth. However, there are many small to medium water features with water resource value that could limit development in particular locations and will need to be considered in the preparation of the future land use concept for the BCNASP.

5.2 Topography

The plan area is relatively flat with topographic relief along the Bear Creek corridor and wetlands, as shown in Map 4. The elevations range from lowest points of 657 m in the northeast to southeast portions along the Bear Creek corridor to the highest points ranging between 670 m to 680 m in the northwest and southwest portions of the plan area. The largest differences in elevation are located along the Bear Creek corridor. Based on topography and a review of the Grande Prairie Storm Drainage Master Plan (Focus, 2012), marsh wetlands and low lands have been identified in the BCNASP area with an additional open water wetland along the south boundary. Based on topography and a review of the Grande Prairie Storm Drainage Master Plan (Focus, 2012) stormwater run-off generally moves from Hermit Lake through the Plan area to discharge into the Bear Creek corridor, which has the potential to impact development in SW8 72-6-6 and SE8 72-6-6, and there is also the potential for some stormwater run-off from Hughes Lake and the open water wetland to the south inside the plan area. Additional stormwater run-off from the northeast portions of land in the plan area may impact development discharging into the Bear Creek corridor.

5.3 Soil

The potential for the presence of alluvial soils have been identified in the City as well as in some of the recently annexed lands (The City of Grande Prairie Mapping of Environmental Reserve (ER) and Science-based Setbacks for ER, O2 Planning + Design, 2012). The presence of those soil types could limit future development in the BCNASP area as they are susceptible to contamination.

5.4 Vegetation

According to The City of Grande Prairie Mapping of Environmental Reserve (ER) and Science-based Setbacks for ER (O2 Planning + Design, 2012) a majority of the land within the plan area is annual cropland with limited portions of perennial cropland or pasture. There are remnant forested areas and wetlands throughout the BCNASP with larger clusters of remnant forested areas northeast of Hughes Lake, in the south surrounding an open water wetland, and in the northwest plan area around Bear Lake. There are also small clusters of shrub coverage across the BCNASP lands mostly concentrated around the Bear Creek corridor, existing wetlands and low areas. Where possible, existing vegetation including shrub coverage will be considered at the time of more detailed site planning to help maintain pre-development hydrology in the area.

5.5 Wildlife Sensitivity

Hughes Lake, Bear Lake and an open water wetland north of the Grande Prairie Airport have been identified as nesting habitat for Trumpeter Swans, a species that is classified as “At Risk” in the General Status of Alberta Wild Species Report. Environmental Assessments have been completed for the Highway 43: From the Junction of Highway 43 & 2 to Highway 43 West of Grande Prairie, a Functional Planning Study (Earth Tech, 2004) and Resources Road Functional Planning Study (ISL, 2010). These reports identified the following mitigation requirements to protect the long-term integrity and productivity of the Trumpeter Swan breeding habitat; prevent industrial disturbance to Trumpeter Swans during nesting and brood rearing periods; and minimizing human access near swan lakes to reduce disturbance from recreational activities (See Figure 10):

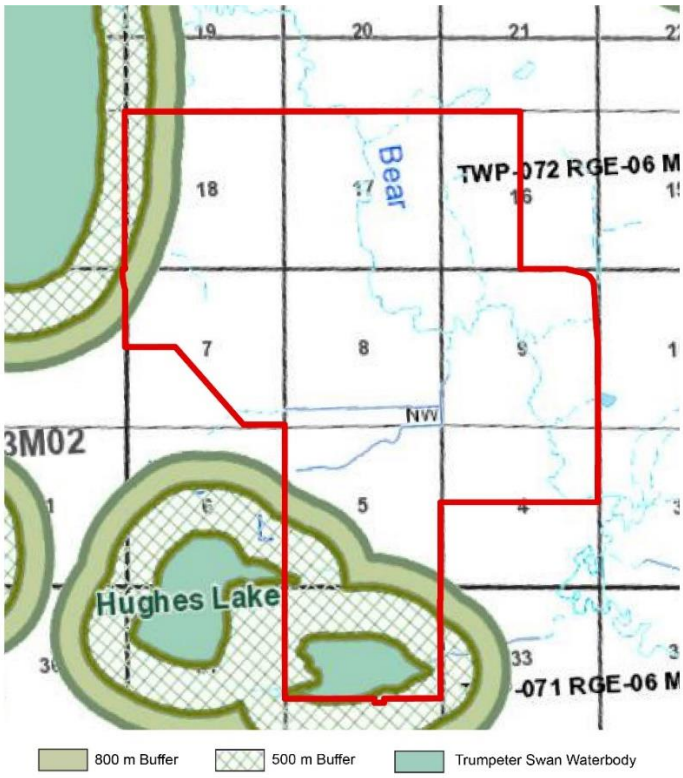

Figure 10: Trumpeter Swan Mitigation Requirements

- No activity within 800 m of the high water mark of identified lakes or bodies of water between April 1 to September 30; and
- No long-term development (roads, wells, pipelines, etc.) within 500 m of the high water mark of identified lakes or bodies of water.

These setbacks will be used to inform the development of the future land use concept for the BCNASP, in the context of the specific development that may be proposed, other municipal planning policy, and landowner needs. Reduced setback requirements may be determined at the time of ASP preparation in consultation with Alberta Environment and Parks.

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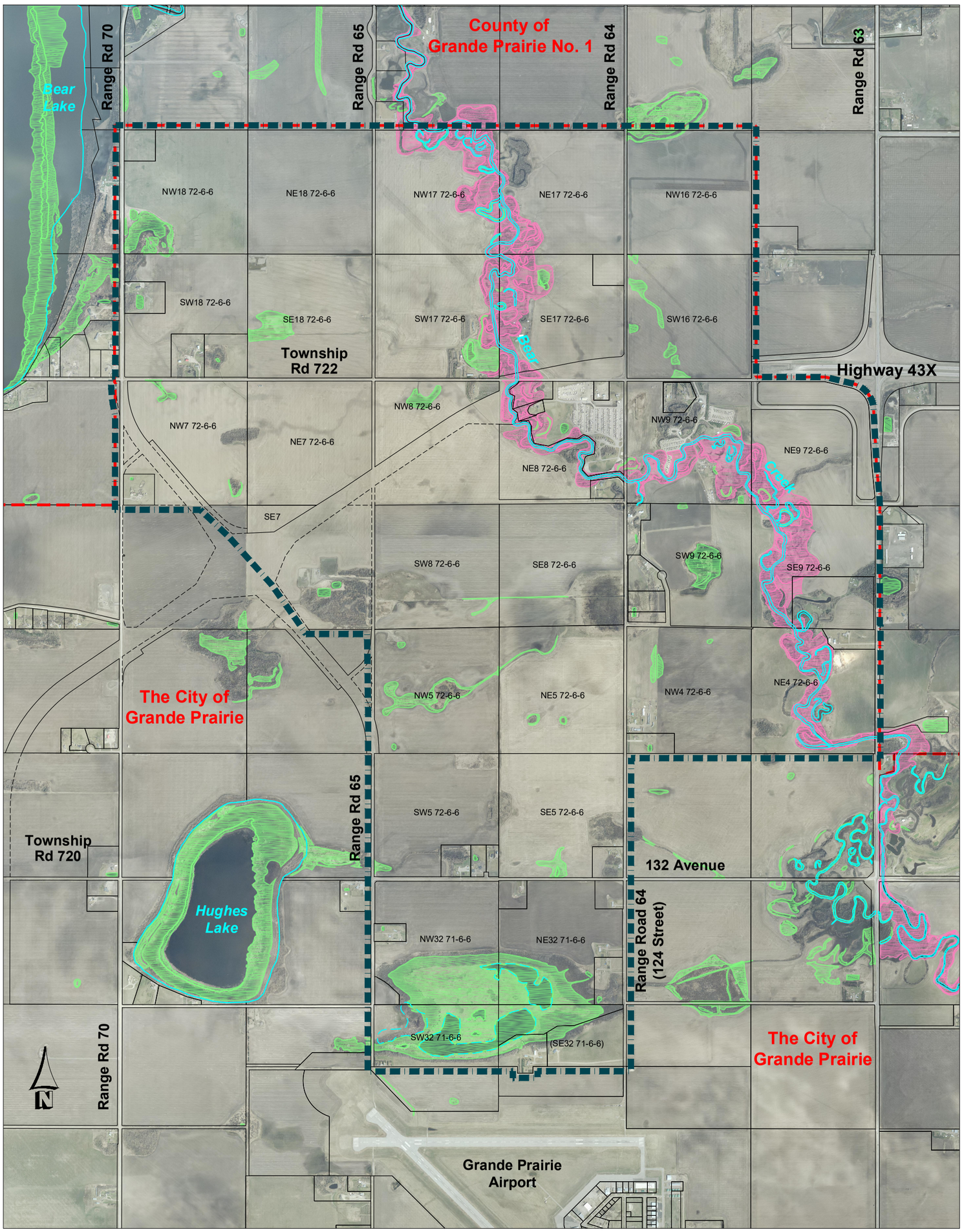

NATURAL FEATURES

BEAR CREEK NORTH
AREA STRUCTURE PLAN

Map 3

LEGEND

- Plan Area
- City Boundary
- Bear River Corridor - NW Annexation Area
- West Annexation Lakes and Wetlands Environmentally Significant Area (ESA)

ESA data from September 2012 City of Grande Prairie Mapping of Environmental Reserve (ER) and Science Based Setbacks for ER, O2 Planning and Design

Scale - 1:25,000

0 0.25 0.50 0.75 1.00 (km)

December 2017

GRANDE prairie ALBERTA

ISL Engineering and Land Services

MVH Urban Planning & Design Inc.

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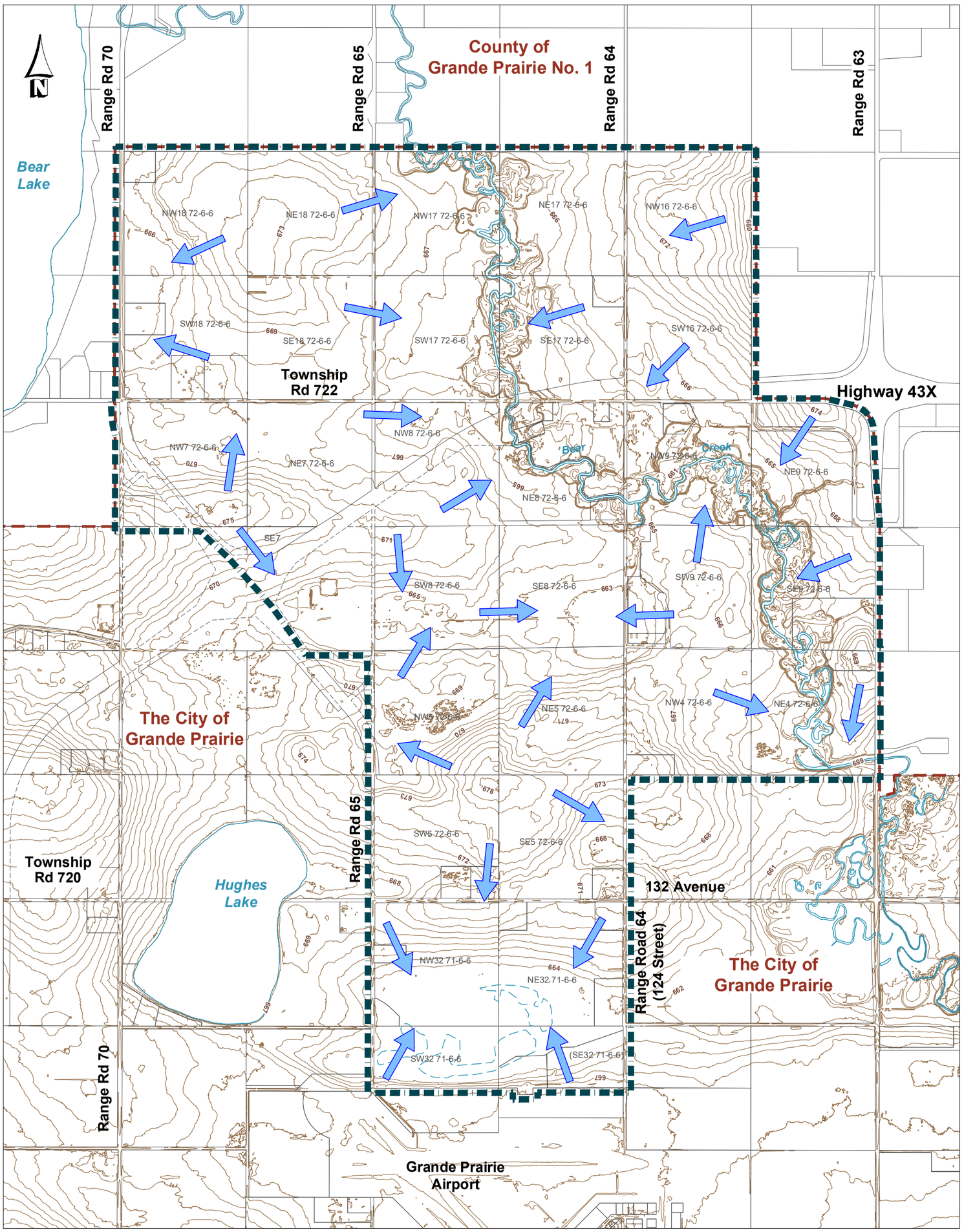

TOPOGRAPHY

BEAR CREEK NORTH
AREA STRUCTURE PLAN

Map 4

LEGEND

- Plan Area
- City Boundary
- Contour (1m Interval) *
- Direction of Flow

* Note: All contour values are oriented in an uphill direction of slope. Contour isolines are shown in 1.0 metre intervals.

Scale - 1:25,000

0 0.25 0.50 0.75 1.00 (km)

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6.0 Land Use, Transportation and Infrastructure

6.1 Existing Land Use

The plan area currently contains a mix of agricultural, country residential, and recreational land uses, as per the County of Grande Prairie Land Use Bylaw, and existing development as shown on Map 5 and identified in the following table.

Table 3: Land Use District Statistics

Land Use	Land Use District	Area (ha)	Percent (%)
Agriculture	Agricultural AG	1641.1	83.8
Country Residential	Country Residential 2	2.1	0.1
	Country Residential 4	11.8	0.6
	Country Residential 5	89.6	4.6
Recreation	Institutional and Recreation	25.9	1.3
	Sub-Total	**1770.5**	**90.4**
	Roads	**187.0**	**9.6**
	Total Plan Area	**1,957.5**	**100.0**

Agricultural land uses currently account for a majority of the BCNASP area. There are concentrations of small country residential land uses throughout the area, including subdivisions located along Range Road 64, 132 Avenue and Township Road 722. Intensive recreational land uses are located predominantly at the junction of Township Road 722 and Range Road 64. The plan area contains an RV Park, campground and cabin business located in the plan area along Township Road 722 adjacent to Bear Creek. Roads and infrastructure rights-of-way covers approximately 3 quarter sections of land and there is wetlands located in the plan area, with an environmentally significant open water wetland located north of the Grande Prairie Airport within the southern portions of the BCNASP area.

The lands located within the BCNASP area are owned by approximately 35 private landowners.

6.2 Transportation Network

The existing roadway network for the BCNASP area is illustrated on Map 6 and consists of Highway 43X, and City Township and Range Roads. Highway 43X (the Grande Prairie Bypass) is currently under construction through the centre of the plan area. The new highway will connect Highway 43 at 116th Street (Range Road 63), curving to the southwest and connecting to Highway 43/100th Avenue west of the Grande Prairie airport.

In the short-term the BCNASP will connect to the bypass at the following locations:

- 116th Street (roundabout); and
- An at-grade intersection at the west end of the area that connects to Range Road 70 (to the north) and Range Road 65 to the south. Range Road 65 provides a connection to 132th Avenue.

In the long term the BCNASP will connect to these same locations via interchanges. At-grade intersections will close after these interchanges begin service.

The 2004 Functional Planning study projected an AAD 6,500 vpd on the bypass in 2022.

6.3 Energy Infrastructure

Based on information from the Alberta Energy Regulator (AER), the BCNASP area contains a mix of pipelines, wells and power lines, as illustrated on Map 7.

There are 2 natural gas pipelines in vicinity of the BCNASP boundary that must be considered during the development of the ASP. No H2S is present within the pipelines and offset requirements and emergency preparedness zones will not be required in the planning and design of the ASP Land Use Concept.

There is 1 active well site and 7 abandoned well sites in the vicinity of the BCNASP. None of the well sites have recorded the presence of H2S, and will not require the identification of emergency preparedness zones in addition to the incorporation of standard offset requirements.

Table 4: Total Wells by Type

Well Type	Count
Abandoned	7
Flowing Gas	1
Flowing Oil	0
Miscellaneous	0
Suspended Gas	0
Suspended Oil	0
Water	0
Licensed	0
Total	8

The development setback requirements from existing and future planned energy infrastructure located within the BCNASP area is shown in the following table.

Table 5: Development Setbacks from Oil and Gas Facilities

Facility	Setback
Power Lines	Power Line Right-of-Way and in accordance with the Alberta Electrical Utility Code
Pipelines (not sour)	Pipeline Right-of-Way
Active Wells (not sour)	100 m radius around the well (AER Directive 056)
Abandoned Wells	5 m radius around the well (AER Directive 056)

In addition, ATCO Electric is preparing to construct a new electrical substation on the NE 7-72-6-6 as illustrated on Map 7 to boost the electrical capacity in the general area.

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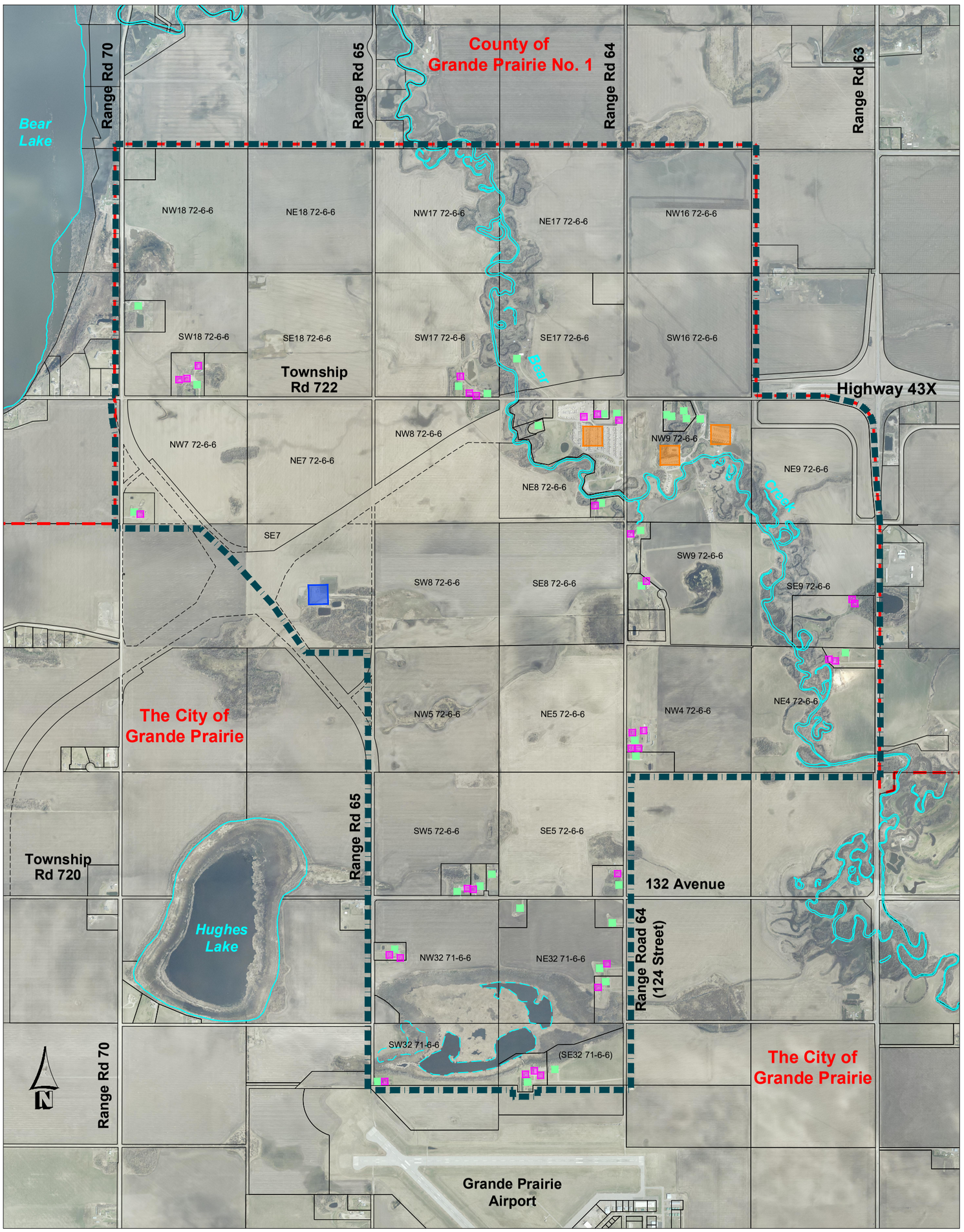

LEGEND

- Plan Area
- City Boundary
- House
- Shop / Out Building
- Recreation (Golf / Park)
- Well Site

EXISTING LAND USE

BEAR CREEK NORTH
AREA STRUCTURE PLAN

Map 5

Scale - 1:25,000

0 0.25 0.50 0.75 1.00 (km)

December 2017

GRANDE prairie ALBERTA

ISL Engineering and Land Services

MVH Urban Planning & Design Inc.

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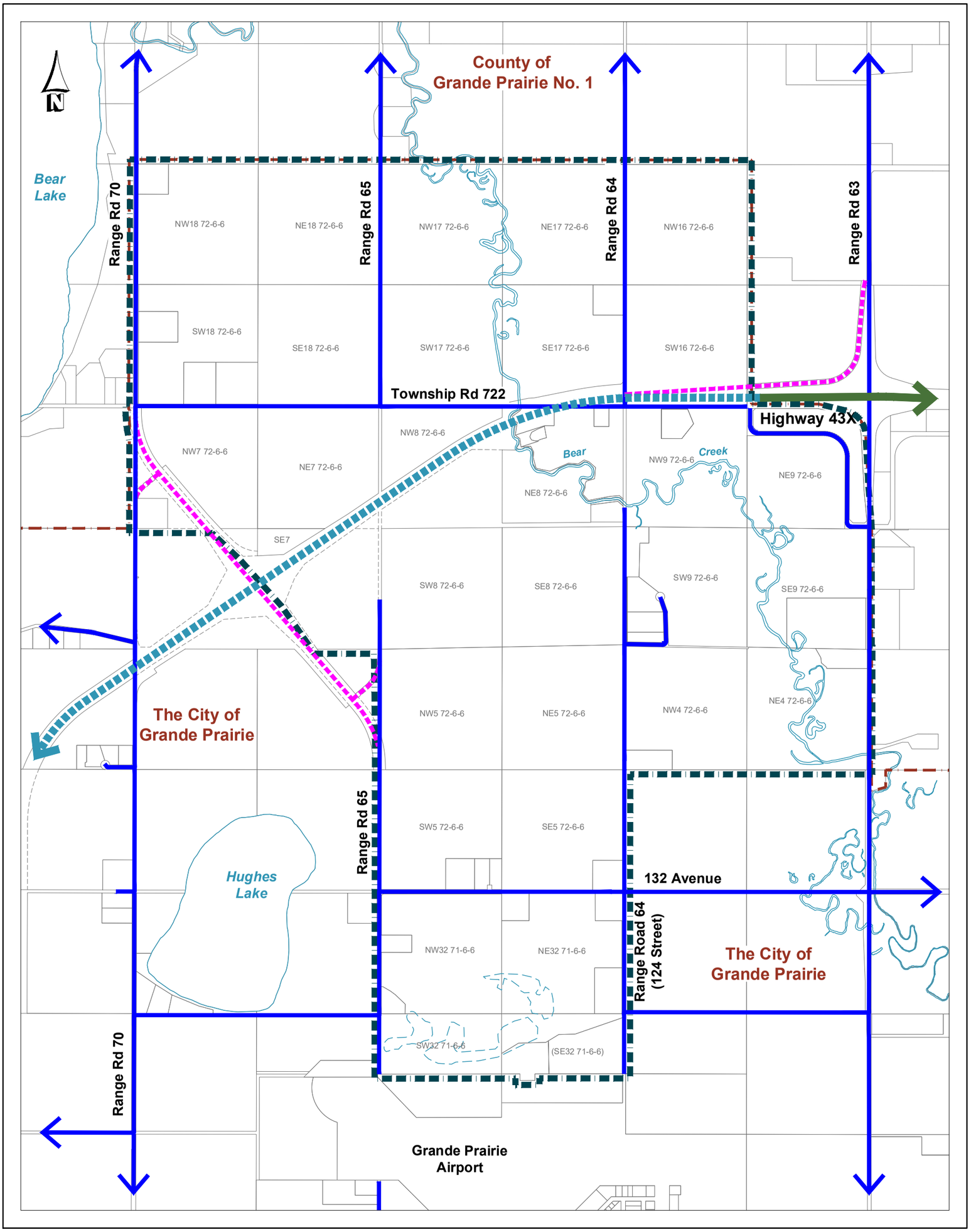

LEGEND

- Plan Area
- City Boundary
- Highway 43
- Highways 43X (Proposed)
- Municipal Road
- Municipal Road (Proposed)

TRANSPORTATION

BEAR CREEK NORTH
AREA STRUCTURE PLAN

Map 6

Scale - 1:25,000

0 0.25 0.50 0.75 1.00 (km)

December 2017

GRANDE prairie ALBERTA

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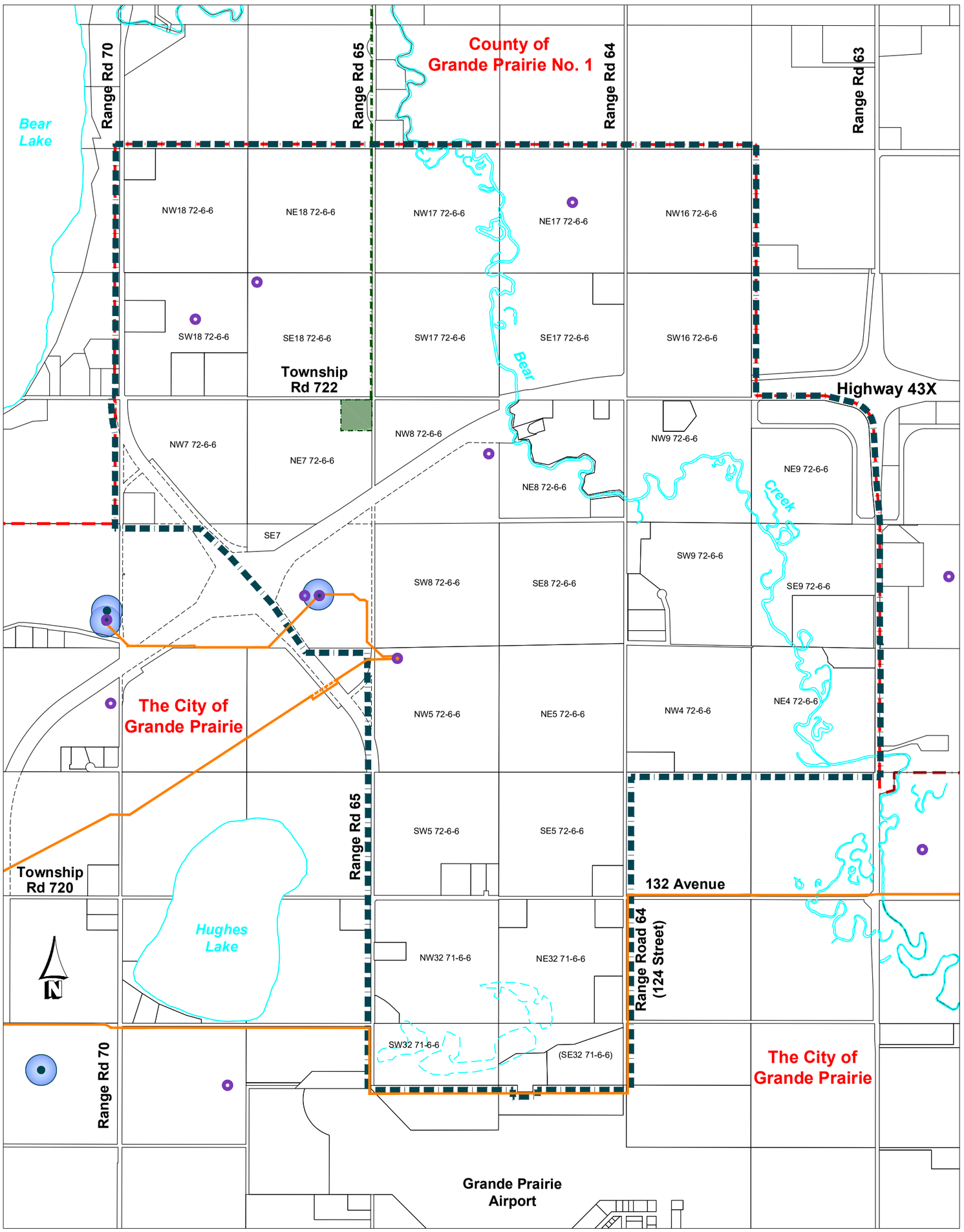

LEGEND

- Plan Area
- City Boundary
- Natural Gas Pipeline (Operational)
- Natural Gas Pipeline (Abandoned)
- Well Site (Operational) with 100m Setback
- Well Site (Suspended, Drilled and Capped or Abandoned)
- Proposed Power Line
- Proposed Power Transformer Site

ENERGY INFRASTRUCTURE

BEAR CREEK NORTH
AREA STRUCTURE PLAN

Map 7

Scale - 1:25,000

0 0.25 0.50 0.75 1.00 (km)

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6.4 Land Ownership

The BCNASP area currently contains a mix of private and municipally-owned land as shown on Map 8 and Table 6. The lands within the Plan area are primarily privately owned. The Crown owns 7.1% of the lands within the area, all of which are dedicated to the Highway 43X right-of-way. The remainder of the area (3%) consists of City-owned lands (consisting of ER parcels and road rights-of-way).

Table 6: Land Ownership

Ownership Type	Area (ha)	Percent (%)
Private	1,757.8	89.8
Province of Alberta	138.3	7.1
City of Grande Prairie	61.4	3.1
Total	**1,957.5**	**100.0**

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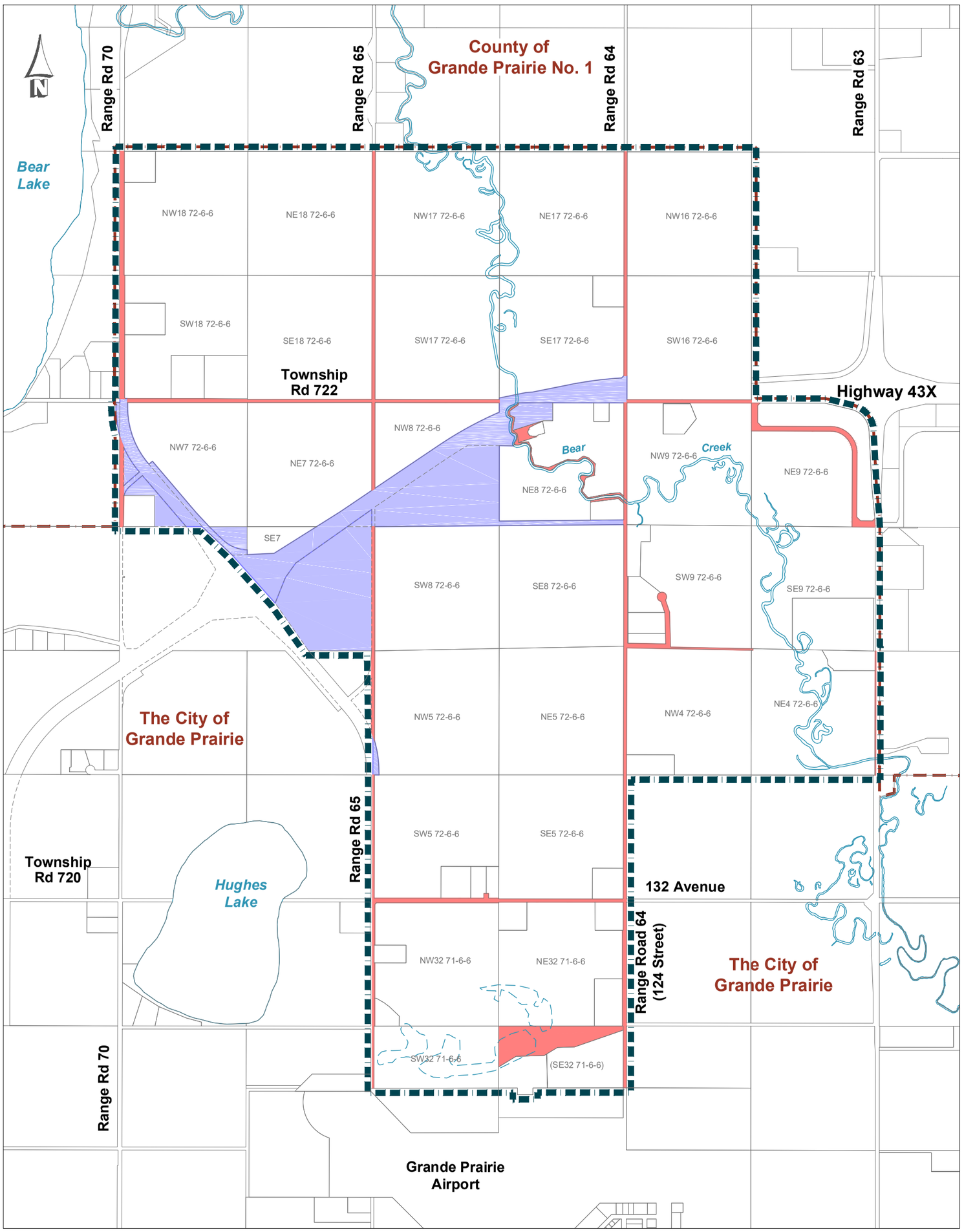

LAND OWNERSHIP

LEGEND

- Plan Area
- City Boundary
- Private
- City
- Crown

BEAR CREEK NORTH
AREA STRUCTURE PLAN

Map 8

Scale - 1:25,000

0 0.25 0.50 0.75 1.00 (km)

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