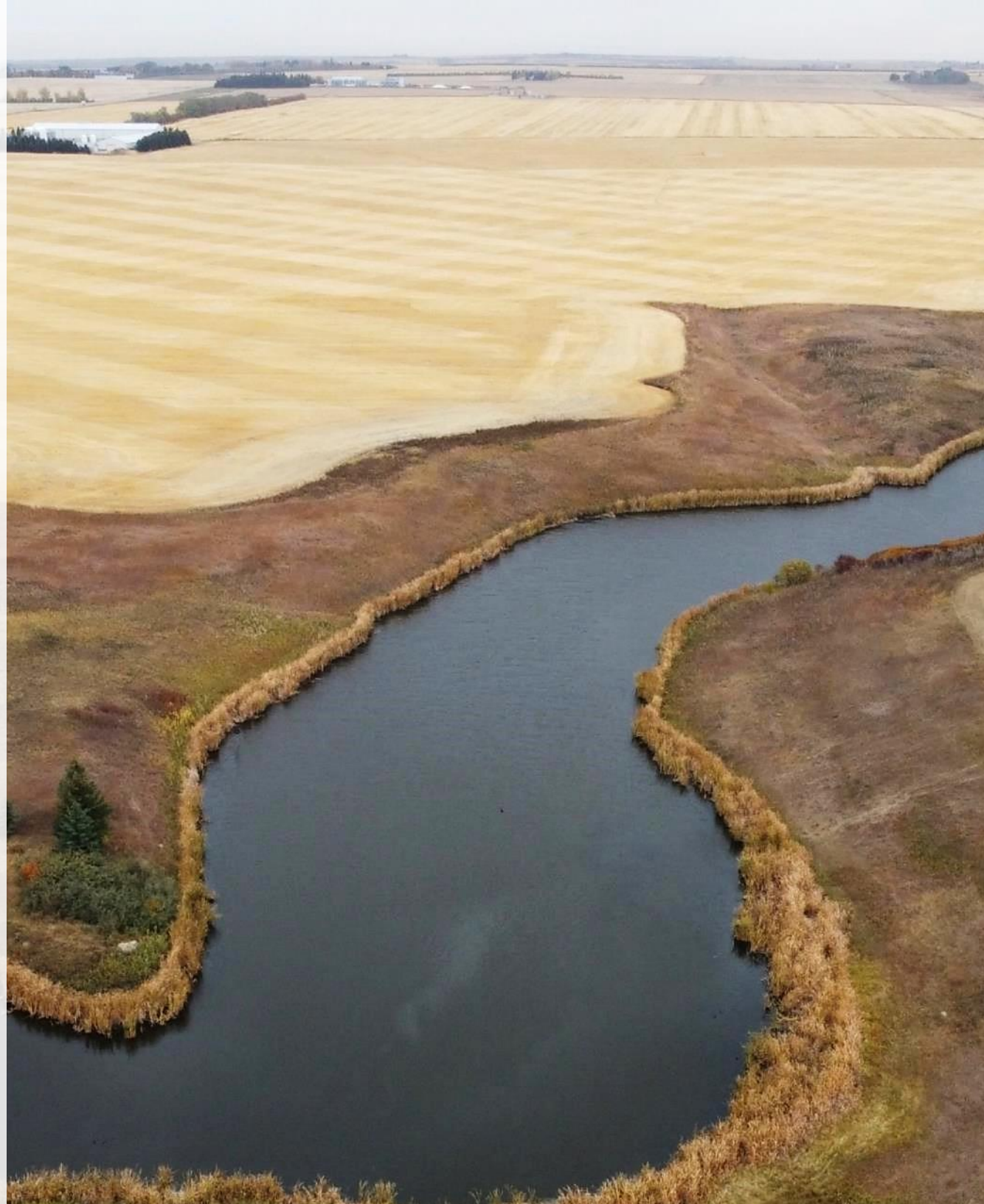


# Linden Northwest

## Area Structure Plan

Bylaw No. xxx-xxxx

Adopted xxxx



## ACKNOWLEDGEMENTS

*Village of Linden Administration and Council*

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## SUPPORTING REPORTS (under separate cover)

Report	Consultant / Author
Traffic Impact Assessment 2024	CIMA+
Conceptual Servicing Memo 2024	CIMA+
Conceptual Storm Pond Analysis 2024	CIMA+
Environmental Overview 2024	CIMA+
Master Infrastructure Plan 2021	CIMA+
Slope Stability Assessment 2019	Geoslope Stability Services

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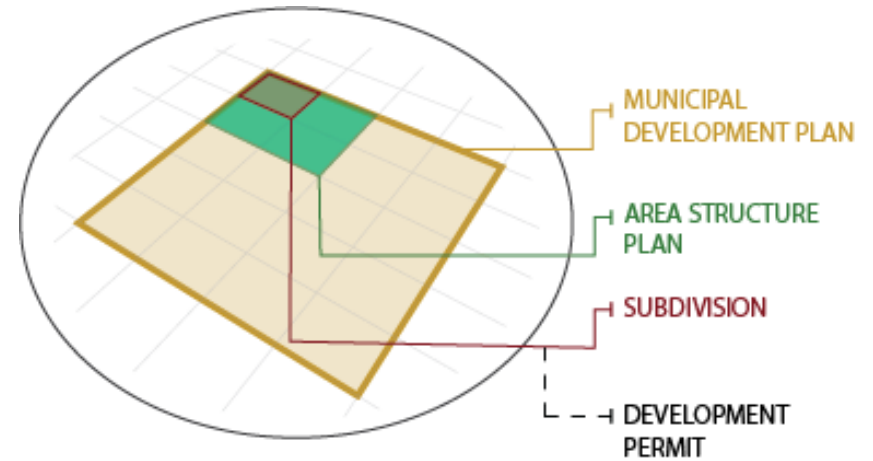
## How to Read this Document

An Area Structure Plan (ASP) is intended to be read holistically and jointly with other applicable statutory plans and bylaws within the municipality. As a statutory plan all subdivision and development applications within the Plan Area must comply with this ASP. The purpose of the ASP is to provide the overall vision and broad policy guidance, while leaving specific details to subsequent subdivision and development approval processes.



### INTERACTIVE LINKS

The digital version of this document has interactive links. The Table of Contents sections, sub-sections and figures can be clicked to jump to the desired section or figure. Similarly figure references, definitions and acronyms are highlighted in bold green text in the document and if clicked on will jump the reader to the applicable figure or Section 8.0 Acronyms.



### **MUNICIPAL DEVELOPMENT PLAN**

Guides overall growth and development for the Village

### **AREA STRUCTURE PLAN**

Provides the vision for the physical development of an area

### **SUBDIVISION**

An area of land divided for development

### **DEVELOPMENT PERMIT**

An area of land that has been approved for a specific use, and associated details of that use

Adopting Bylaw page

# 1 Introduction

## 1.1 PLAN PURPOSE

---

The purpose of the Linden Northwest Area Structure Plan (ASP) is to guide and direct future residential, commercial, industrial and open space subdivision and development within the Plan Area. The ASP will direct growth in a way that fulfills the long-term vision of the Village of Linden.

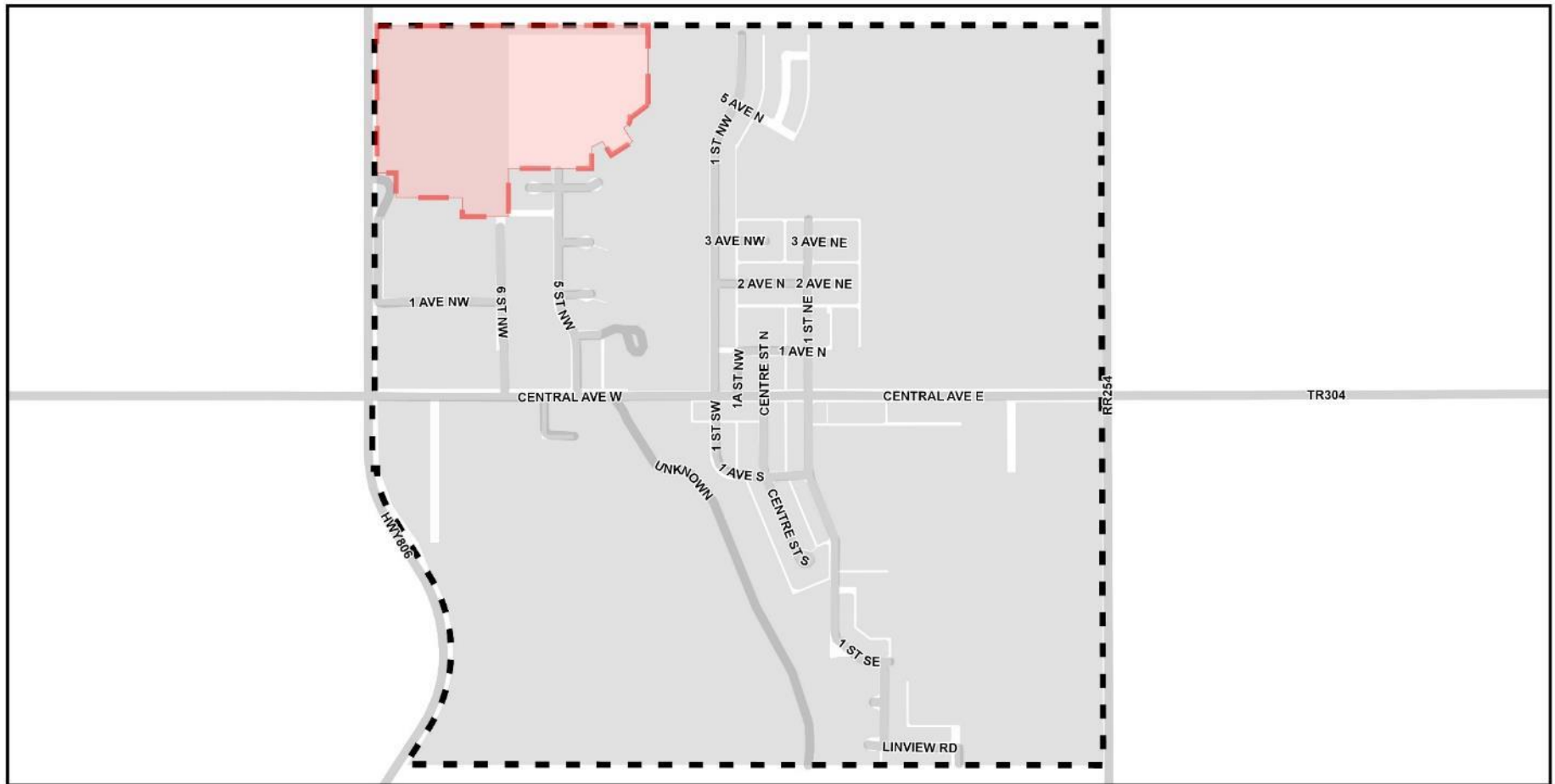
The ASP has been prepared by the Village of Linden in consultation with private landowners within the Plan Area.

An ASP is a statutory document approved by Village Council and adopted by bylaw. An ASP provides citizens, developers, Village staff and Council with a road map when considering applications for land use redesignation, subdivision and development. The ASP is a statutory document and must align with the Village's higher-level plans, including the Municipal Development Plan (MDP) and the Village of Linden and Kneehill County Intermunicipal Development Plan (IDP).


ASPs implement policy statements in the MDP that address future growth, land use patterns and development, transportation, utility servicing, and environmental protection. It describes the proposed land uses, population densities, major transportation routes, utility requirements, and the sequence of development for lands in the ASP area.

The ASP does not predict the rate or pace of development within the plan area. Market forces will determine when and if a parcel of land develops. The purpose of the ASP is to guide the phasing of growth and development in a logical and orderly manner.

**Figure 1 | Context Map** shows the ASP Plan Area in context with the Village of Linden and surrounding lands.



-  ASP Boundary
-  Village Boundary
-  Road

0 250 500 M 

**NORTHWEST ASP CONTEXT MAP**



Figure 1 | Context Map



## 1.2 LEGISLATIVE REQUIREMENTS

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Section 633 of the Municipal Government Act (MGA) dictates the basic requirements and content of an Area Structure Plan.

*“633(1) For the purpose of providing a framework for subsequent subdivision and development of an area of land, a council may by bylaw adopt an area structure plan.*

(2) An ASP

(a) must describe:

- (i) *the sequence of development proposed for the area,*
- (ii) *the land uses proposed for the area, either generally or with respect to specific parts of the area,*
- (iii) *the density of population proposed for the area either generally or with respect to specific parts of the area, and*
- (iv) *the general location of major transportation routes and public utilities, and*

(b) *may contain any other matters the council considers necessary, including matters relating to reserves, as the council considers necessary.*

(3) An area structure plan must be consistent with

- (a) *any intermunicipal development in respect of land that is identified in both the area structure plan and the intermunicipal development plan, and*
- (b) *any municipal development plan.*

## 1.3 INTERPRETATION

---

The Plan policies are written as ‘shall’, ‘should’ or ‘may’ statements. Policy statements utilizing ‘**shall**’ outline mandatory compliance. ‘**Should**’ means the policy is encouraged, but alternatives may be proposed that meet the intent of the policy where the policy statement is not practical or is unreasonable. ‘**May**’ policy statements outline policies to which compliance is supported in principle, but the Council or approving authority has the discretion to determine the level of compliance that is required in each situation.



## 1.4 PLAN AREA

---

The Plan Area is located at the northern municipal boundary of the Village of Linden, bordered by Highway 806 to the west and the coulee to the east. The northern boundary is adjacent to agricultural lands in Kneehill County and Central Avenue to the south.

The Plan Area contains three parcels, two of which are privately-owned and are located adjacent to existing urban industrial and residential development. Parcels 1 and 2 are currently vacant lands. Parcel 3 is a portion of a larger Village-owned legal parcel and was previously subdivided for the purpose of future roads and utilities. The total Plan Area is 20.0 ha (49.5 ac) (**Figure 2 | Plan Area Map**).



-  ASP Boundary
-  Village Boundary

**Parcel Areas**

Parcel 1: 11.20 ha (27.7 ac)  
 Parcel 2: 8.20 ha (20.3 ac)  
 Parcel 3: 0.61 ha (1.50 ac)

Total: 20.01 ha (49.50 ac)

0 100 200 M 

**NORTHWEST ASP PLAN AREA MAP**



Figure 2 | Plan Area Map

# 2 Site Analysis & Infrastructure

## 2.1 SITE ANALYSIS

---

The Plan Area is currently vacant, unserviced land which is used primarily for extensive agricultural purposes. There are a number of existing conditions and site constraints that need to be considered in preparing this ASP (See **Figure 3 | Site Analysis**).

### Highway 806

The Plan Area is located adjacent to Highway 806. As such, development in the Plan Area can only proceed in accordance with approvals from the provincial highway authority. A Traffic Impact Assessment was required by Alberta Transportation and Economic Corridors to be prepared and address impacts of the proposed development on the highway function and design.

### Uplands Drainage

The Plan Area is sloped southerly in the general direction of the coulee to the southeast. In addition to the management of on-site stormwater, upstream lands drain through the Plan Area and need to be addressed in the stormwater design of the Plan Area.

### Wetlands

Two wetlands identified within the Plan Area through the Environmental Overview are classified as temporary marsh. The wetlands are 0.314 ha (0.78 ac) in combined area and are subject to compensation for wetland loss in accordance with the Alberta Wetland Policy.

### Slope Stability

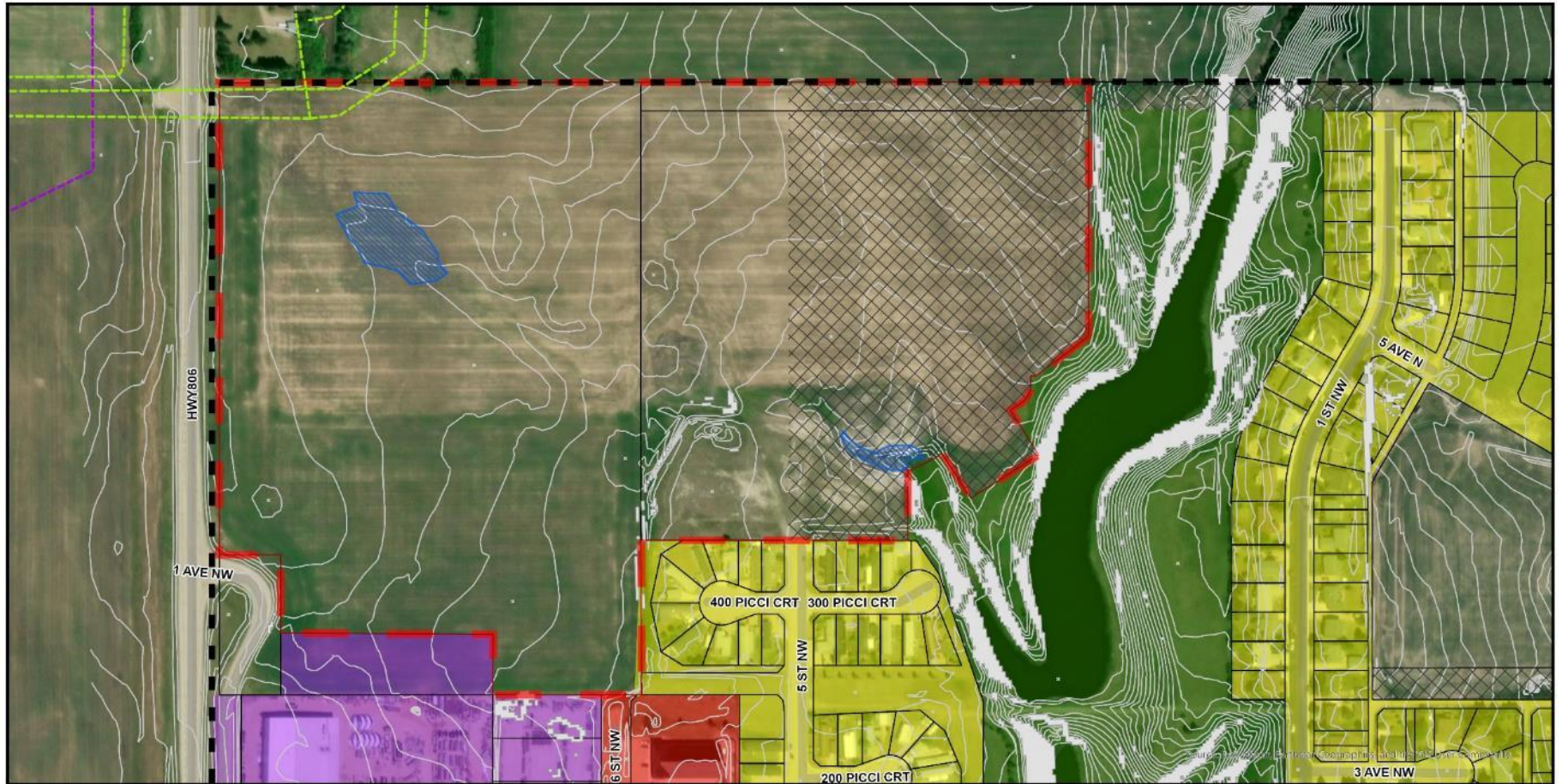
A slope stability report, prepared by **Geoslope Stability Services** for a previous ASP application for Parcel 2 in 2019, shows that adequate setbacks from the steep slopes of the coulee can be achieved and development is not a concern where the recommendations of the report are followed.

### Gas Line Utility

A Kneehill County Gas Co-op low-pressure gas line utility is located in a right-of-way in the northwest corner of the Plan Area. Future development in the utility right-of-way must be in accordance with the terms of the right-of-way agreement.

### Historical Resources

The eastern portion of Parcel 2 is identified to have potential historic value. A Historical Resources Act application was submitted to and approved by Alberta Arts, Culture and Status of Women as part of the preparation of this ASP.



### NORTHWEST ASP SITE ANALYSIS



Figure 3 | Site Analysis

## 2.2 EXISTING CONDITIONS

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The following photos show the site conditions as of September 2022.  
The identified Plan Area boundaries are approximate.



Looking west down Central Avenue. The Plan Area is located in the top right of the photo (northwest).



Looking west at the Plan Area.

## 2.3 EXISTING INFRASTRUCTURE

---

The Village of Linden engaged CIMA+ to prepare an Infrastructure Master Plan (IMP) in 2021. This report reviews the conditions and constraints of Linden’s existing infrastructure as well as required infrastructure for growth areas. The report considers water, wastewater, stormwater and road infrastructure. In 2024, the Village began undertaking capital projects and planning for future capital projects to address required infrastructure improvements identified in the IMP. An additional conceptual serving memo was prepared by CIMA+ in 2024 specific to the preparation of this ASP.



### Water System (Figure 4)

The Village’s potable water is supplied from a regional water system by Aqua 7 (a Regional Services Commission). The water supply line enters the Village along Central Avenue from the east and terminates at the Village’s reservoir. Water is then distributed through the Village’s water distribution system.

The IMP states the reservoir and the existing water system that connects to the Plan Area is generally sufficient and does not require significant upgrades or repairs. However, due to the lack of looping of the system and smaller diameter pipe sizes between 100 mm and 150 mm, the existing fire flows are not adequate, in particular for commercial, industrial and institutional developments.



### Wastewater System (Figure 4)

The Village’s wastewater treatment system is owned and operated by the Village. It consists of a gravity

collection system and sewage lagoons. The IMP indicates the existing gravity collection system in Linden does require some repairs and upgrades. This includes repairing sags (inconsistent slopes in the pipes) which reduced the available capacity to service the Plan Area. In addition to maintenance and repairs to the existing trunk main leading to the lagoon, the trunk main will also require eventual twinning/replacement to accommodate increased development.

The Village’s sewage lagoons are located on lands within Kneehill County, which discharges into Kneehill Creek or is pumped out for use by others. No immediate upgrades are required to the existing lagoon system and the Village is currently only using approximately 2/3 of the available capacity. The Village installed a flow meter in 2024 to better monitor the flow of wastewater from the trunk main into the lagoon as recommended in the IMP.



### Stormwater Management System

The Village of Linden does not currently have a Master Drainage Plan. The CIMA+ Infrastructure Master Plan evaluated the existing drainage patterns and stormwater infrastructure which includes catch basins, outfall structures, manholes, storm sewers, culverts and drainage ditches. Linden appears to lack major overland drainage pathways and designated emergency overland escape routes. However, the system appears to operate adequately for storm events except in a few local areas and during the spring freshet/snowmelt.

The IMP report recommends improvements to overland drainage during large events by constructing drainage channels/swales within drainage easements. It also recommends replacing sections of storm sewer and outfalls that service the Plan Area.



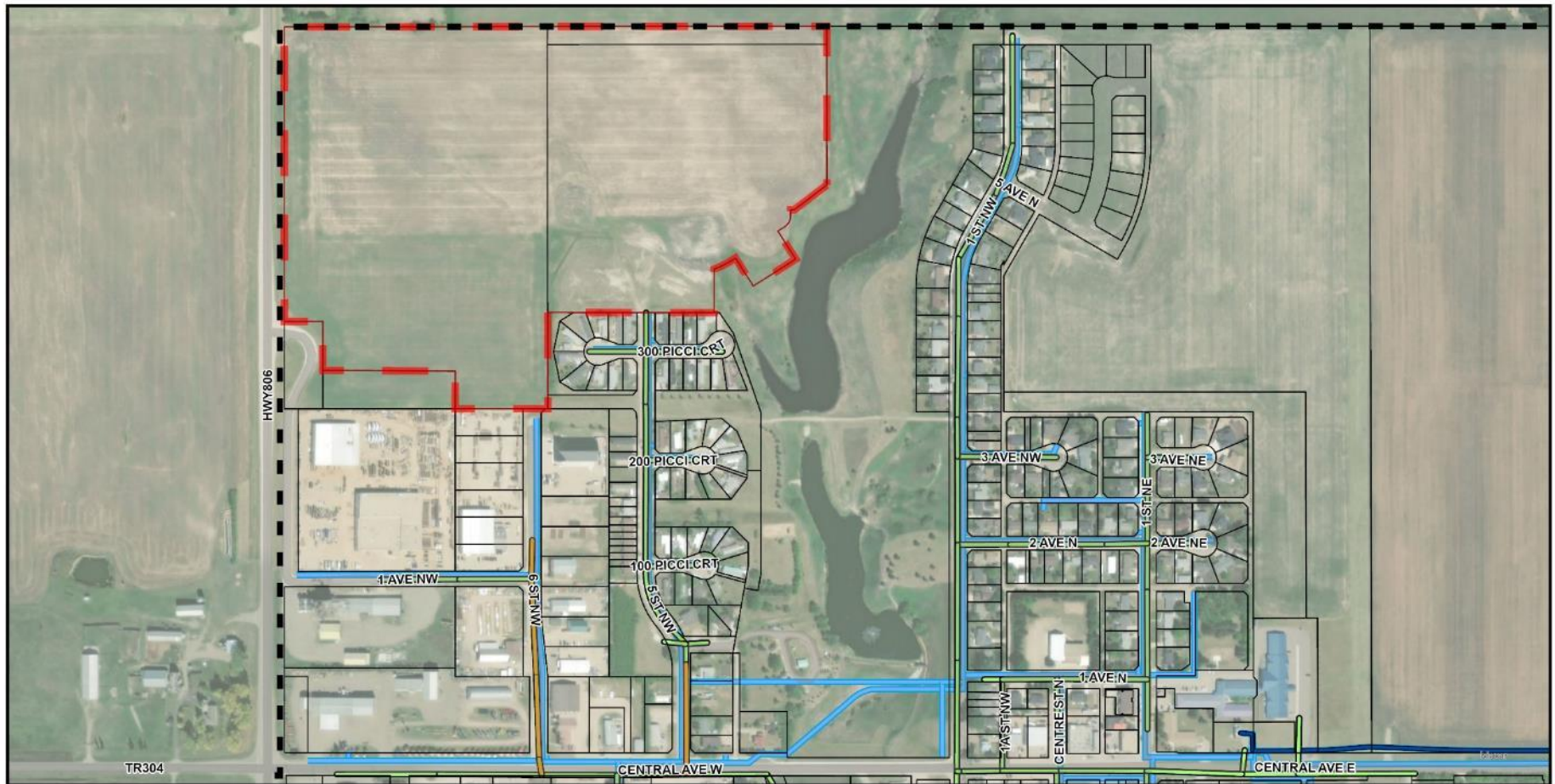
## Roads

The roads in Linden were evaluated by CIMA+ for their condition and to analyze any geometric issues. The report notes that sections of roads will generally require mill and overlay with some spot base repairs and crack repairs. The road condition for roads that provide access to the Plan Area are generally in good to fair condition. Only one section of road along Central Avenue has been identified as a high priority for repair and rehabilitation.

## Summary

The timing and phasing of growth will need to consider these constraints in existing infrastructure, as well as future infrastructure requirements that will be discussed in later sections of this ASP.





 ASP Boundary	 Water Main
 Legal Parcels	 Sanitary Main
 Village Boundary	 Sanitary Main (Requires Replacement)

0    85    170 m

**NORTHWEST ASP**  
**Existing Water & Waste Water Services**




Figure 4 | Existing Water and Wastewater Services

# 3 Vision, Goals and Land Use Concept

## 3.1 VISION STATEMENT

---

**The Plan Area will contribute to and enhance Linden’s village character by providing lands for the expansion of existing industry and the growth of new industries; by supporting a variety of forms and styles of housing for new residents and to accommodate the changing needs of current residents; and by the growth of commercial services to meet the needs of residents and businesses.**

## 3.2 GOALS

---

The following ASP goals were identified during the formation of the Plan.

To establish a policy framework that:

- creates a foundation for the development of multiple privately-owned parcels as a cohesive whole;
- provides clear direction to and articulates expectations of future developers in the Plan Area;
- outlines logical development phasing;
- enables industrial development and minimizes negative impacts with adjacent non-industrial land uses;
- supports a variety of housing styles and types in well connected neighbourhoods;
- provides opportunities for retail and service commercial development to support Linden’s residents and businesses; and
- ensures the efficient design and layout of new infrastructure with a fair and equitable distribution of costs.

### 3.3 LAND USE CONCEPT

The Land Use Concept for the Plan Area is shown on **Figure 5 | Land Use**. It shows the location of proposed land uses and identifies the general location of roads, stormwater management facilities and parks. The land uses are as follows:

#### Industrial/Commercial Flex

The Industrial/Commercial Flex land use area is located at the corners of the intersection at Highway 806. These lands are ideal for commercial or industrial uses that serve the travelling public, and may include gas stations, restaurants and larger retail businesses. As these lands are in a prominent location, they will be required to meet a higher aesthetic design standard than typical industrial uses.

#### Industrial

The industrial land use area will accommodate similar industrial uses that currently exist in Linden, including manufacturing and processing, storage, and development that supports agricultural and oil and gas industries.

#### Residential

The residential lands will accommodate a variety of low and medium density housing types, including detached dwellings, duplexes and multi-unit housing, such as attached housing and low-rise apartments.

#### Parks and Open Spaces

Parks and open spaces will be located to provide a buffer between the industrial and residential land uses, as well as accommodate recreational uses such as trails, parks and off-leash dog parks.

#### Public Facilities

These lands will contain facilities that are required for stormwater management, utilities and road access.

### 3.4 LAND USE STATISTICS

**Table 1 | Land Use Statistics** provides a summary of the approximate areas of land devoted to each land use. Note these land areas are approximate and may change with further detailed engineering design and subdivision approvals.

**Table 1 | Land Use Statistics**

Land Use	Area (ac)	Area (ha)	% of ASP
<b>Commercial/Industrial Flex</b>	4.0	1.6	8
<b>Industrial</b>	11.8	4.8	24
<b>Residential</b>			
Low Density	8.7	3.5	17.5
Medium Density	4.1	1.7	8.5
<b>Parks and Open Spaces</b>	5.1	2.0	10
<b>Subtotal</b>	<b>33.7</b>	<b>13.6</b>	<b>68</b>
<b>Public Facilities</b>			
Storm Pond	4.1	1.7	8.5
Roads	11.7	4.7	23.5
<b>Subtotal</b>	<b>15.8</b>	<b>6.4</b>	<b>32</b>
<b>Total</b>	<b>49.5</b>	<b>20.0</b>	<b>100</b>

\*Note: calculations provided in the table above are approximations based on *Figure 5: Land Use Concept*.



- Proposed Land Uses**
- ASP Boundary
  - Legal Parcels
  - Commercial / Industrial Flex
  - Village Boundary
  - Industrial
  - Roads
  - Right of Way
  - Park
  - Public Infrastructure
  - Residential

0 50 100 m

**NORTHWEST ASP LAND USE CONCEPT**



Figure 5 | Land Use

# 4 Land Use Policy

## 4.1 COMMERCIAL/INDUSTRIAL FLEX



The Commercial/Industrial Flex area is intended to provide flexibility for future subdivision and development of commercial or light industrial uses. The following policies apply in the Commercial/Industrial Flex area.

### Policies

- 4.1.1** Future subdivision of Commercial/Industrial Flex lots shall be guided by **Figure 5 | Land Use** with exact lot lines and lot configurations to be determined at the time of subdivision and rezoning.
- 4.1.2** The area of Commercial/Industrial Flex lots are intended to range in size from approximately 0.2 ha (0.5 ac) up to 1.0 ha (2.5 ac).

**4.1.3** Appropriate land uses in the Commercial/Industrial Flex areas will include a range of commercial uses that support the travelling public and local residents, such as gas stations, restaurants, multi-tenant commercial buildings and larger retail stores. Other commercial and light industrial developments such as vehicle sales and repair shops, and agricultural and building supply centres will also be supported.

**4.1.4** Vehicle access to the Commercial/Industrial Flex lots must be located an adequate distance from the intersection of Highway 806. A minimum distance between 60 m to 100 m from centreline to centreline is recommended.

**4.1.6** Developments in the Commercial/Industrial Flex area must be planned and designed in a way that enhances the prominent location at the highway intersection. The following should be considered in site design and planning:

- (a) buildings should be sited on the lot to address the highway and the local road frontages;
- (b) material and waste storage areas should be located to the rear of properties and adequately screened;
- (c) the use of landscaping to visually enhance the appearance of the development; and
- (d) lighting fixtures on the site and buildings strategically located to visually enhance the development without causing light trespass onto adjacent properties.

## 4.2 INDUSTRIAL

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The Industrial area is intended to accommodate the future growth of new and existing industries in Linden.

### Policies

- 4.2.1** Future subdivision of Industrial lots shall be guided by **Figure 5 | Land Use** with exact lot lines and lot configurations to be determined at the time of subdivision.
- 4.2.2** The area of Industrial lots are intended to be medium to large in size, generally ranging between 1.0 ha (2.5 ac) to 3.0 ha (7.4 ac) in lot area, with larger lots also acceptable.
- 4.2.3** A range of light and heavy industrial uses are encouraged in the Industrial area.
- 4.2.4** Development permit applications in the Industrial area shall be referred to the Village's Fire Department for comment.
- 4.2.5** The Development Authority may request the submission of a hazard/risk assessment or emergency management plan or similar reports for a complete application.
- 4.2.6** The area north of the Industrial area identified as "Right-of-Way" shall be protected for utilities and a potential future secondary road access to Highway 806.

## 4.3 RESIDENTIAL

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The Residential area will accommodate the future development of low and medium-density housing in well-designed neighbourhoods. With an additional 80 - 90 dwelling units added to the housing stock in Linden, it is estimated the population of Linden could grow by 200 persons at full build-out of the Residential Area.

### Policies

- 4.3.1** Residential land uses shall generally be located as shown on **Figure 5 | Land Use**.
- 4.3.2** A mix of low and medium density housing will be accommodated in the Residential area. Housing types may include detached dwellings, duplexes, townhouses and low-rise apartments.
- 4.3.3** Residential density will range between 9 to 20 dwelling units per gross hectare for low density residential development. For medium density residential development, a range of 20 to 37 dwelling units per gross hectare will be accommodated.
- 4.3.4** The Residential area may be developed with a mix of lots with and without lane access, to be determined at detailed subdivision design.

## 4.4 PARKS AND OPEN SPACES

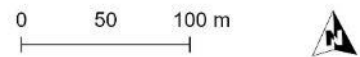
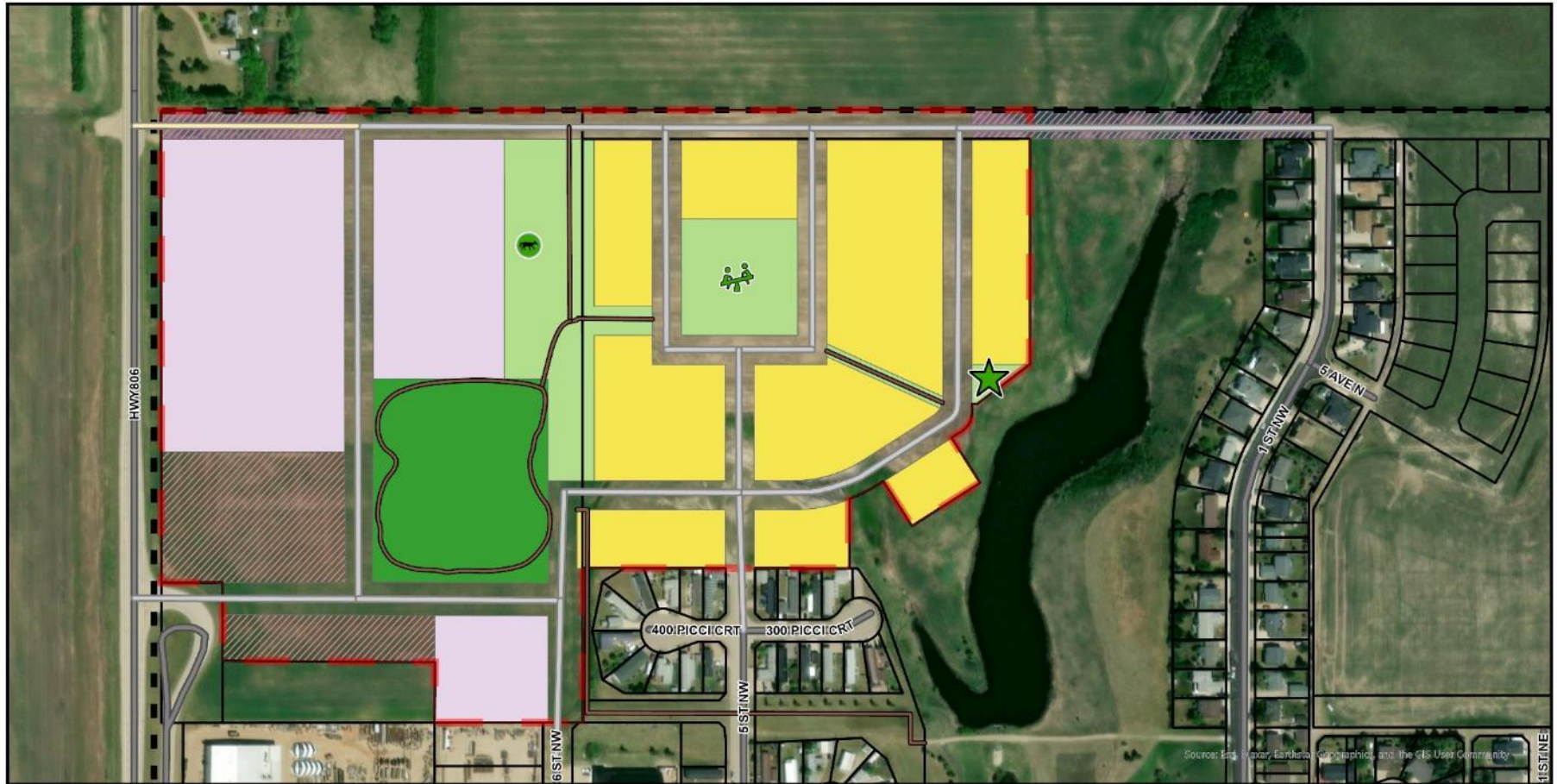


Parks and open spaces will provide recreational amenities for residents and visitors to Linden, as well as buffering between non-compatible land uses.

### Policies

- 4.4.1** Parks and open spaces shall generally be located as shown on **Figure 5 | Land Use** and **Figure 6 | Trails and Parks**.
- 4.4.2** Acceptable park amenities shall include trails, gazebos and benches, playgrounds and an off-leash dog run/park. The Village may determine other acceptable park amenities at the time of subdivision.
- 4.4.3** A trail system in the ASP Plan Area shall connect the park amenities and to the Village-wide trail system.
- 4.4.4** An open space buffer shall be provided to separate the Industrial land use area from the Residential land use area. The width of the open space buffer shall not be less than 30.5 m (100.0 ft) to provide adequate mitigation from nuisances such as noise, dust and visual impacts of industrial development.
- 4.4.5** An off-leash dog run shall be constructed in the open space buffer with the following design:
- entirely enclosed with chain-link fencing and secure gates;
  - dog waste bag dispensers and waste bins provided adjacent to the entrance gates; and
  - a minimum of 0.2 ha (0.5 ac) in area.
- 4.4.6** A playground or similar park amenity shall be installed in a central location of the Residential area.
- 4.4.7** A gazebo or benches, or similar passive park amenities shall be installed in a location overlooking the coulee.





**NORTHWEST ASP Trails and Parks**



Figure 6 | Trails and Parks

# 5 General Policies

## 5.1 NATURAL ENVIRONMENT

---

The Environmental Overview indicates the Plan Area does not contain any areas of native grassland vegetation or Environmentally Significant Areas or rare, threatened plant species at risk. There is however, in addition to two identified wetlands, the potential for sensitive wildlife features. The following policies address the protection of the natural environment in the Plan Area.

### Policies

- 5.1.1** All lands that qualify as environmental reserve should be dedicated as environmental reserve or environmental reserve easement through the subdivision process, as provided for in the *Municipal Government Act*.
- 5.1.2** All subdivision and development applications that may impact a wetland shall provide proof to the subdivision authority or development authority, whichever is applicable, of compliance with the *Alberta Water Act* and *Alberta Wetland Policy*.
- 5.1.4** Mitigation measures outlined in the CIMA+ Environmental Overview, such as erosion and sediment control, weed management, stormwater management and timing of construction activities should be required in all subdivision and development approvals.

## 5.2 MUNICIPAL AND SCHOOL RESERVES

---

The dedication of reserves is the means for the provision of land for parks, open spaces and recreational amenities and the provision of lands for schools. The following policies apply for the dedication of reserves in the Plan Area.

### Policies

- 5.2.1** The provision of municipal reserves will be determined at the time of subdivision in accordance with the *Municipal Government Act* (MGA), the Linden Municipal Development Plan (MDP) and this Bylaw.
- 5.2.2** Municipal reserves owing on a parcel of land shall be provided as municipal reserve, cash-in-lieu or a combination of both. Municipal reserve may only be deferred to future subdivision phases to create larger municipal reserve parcels in accordance with **Figure 6 | Trails and Parks**.
- 5.2.3** The amount, type, location, and shape of municipal reserve land shall be suitable for the desired public use or buffering and in general conformance with **Figure 6 | Trails and Parks**.
- 5.2.4** The Village may accept less than the maximum 10% dedication of municipal reserve only where the Village determines that its municipal reserve requirements have been adequately met for the provision of public parks, trails and open spaces.

- 5.2.5** The Village may accept the dedication of municipal reserve in lieu of a public utility lot (PUL) in the Plan Area where amenities such as a pathway that are part of the Village-wide trail system, are constructed on lands containing municipal utility infrastructure.
- 5.2.6** The stormwater management facilities shall not qualify as municipal reserve lands and shall be dedicated as a PUL.
- 5.2.7** No school reserves are required to be dedicated within the Plan Area.

### **5.3 HISTORICAL RESOURCES**

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An application for *Historical Resources Act* approval was approved by Alberta Arts, Culture and Status of Women for the activities described in this ASP, subject to the following policies.

#### **Policies**

- 5.3.1** A person who discovers an historic resource in the course of making an excavation for a purpose other than for the purpose of seeking historic resources shall forthwith notify the Minister of Alberta Arts, Culture and Status of Women of the discovery, in accordance with the Standard Requirements under the *Historical Resources Act*: Reporting the Discovery of Historic Resources.



# 6 Infrastructure

## 6.1 WATER SERVICING

---

The proposed water servicing strategy for the ASP area aligns with the recommendations of the 2021 Infrastructure Master Plan. The water distribution system in the Plan Area will connect to existing mains along 5<sup>th</sup> and 6<sup>th</sup> Streets NW and looped for redundancy.

The anticipated water demands based on the recommended design parameters in the IMP are as follows:

Commercial/Industrial Areas:

- Average Day Demand (ADD) = 0.68 litres per second (L/s)
- Maximum Day Demand (MDD) = 1.36 L/s
- Peak Hour Demand (PHD) = 2.72 L/s

Residential Areas:

- Average Day Demand (ADD) = 0.42 L/s
- Maximum Day Demand (MDD) = 0.84 L/s
- Peak Hour Demand (PHD) = 1.68 L/s

A few system upgrades are required to accommodate growth in the Plan Area and to ensure an adequate level of service, including the extension of water mains with 200 mm lines outside of the Plan Area, as shown in **Figure 7 | Conceptual Water Servicing**.

It should be noted that even with system upgrades, the available fire flow for the industrial and commercial areas is still not sufficient to meet fire flows for these types of uses which can vary between 200L/s – 300 L/s. This is an unrealistic target for the Village as the current infrastructure was not sized to accommodate these flows. As such, it is recommended that the new commercial and industrial developments include on-site fire protection in their design.

The following policies apply to future water servicing in the ASP area.

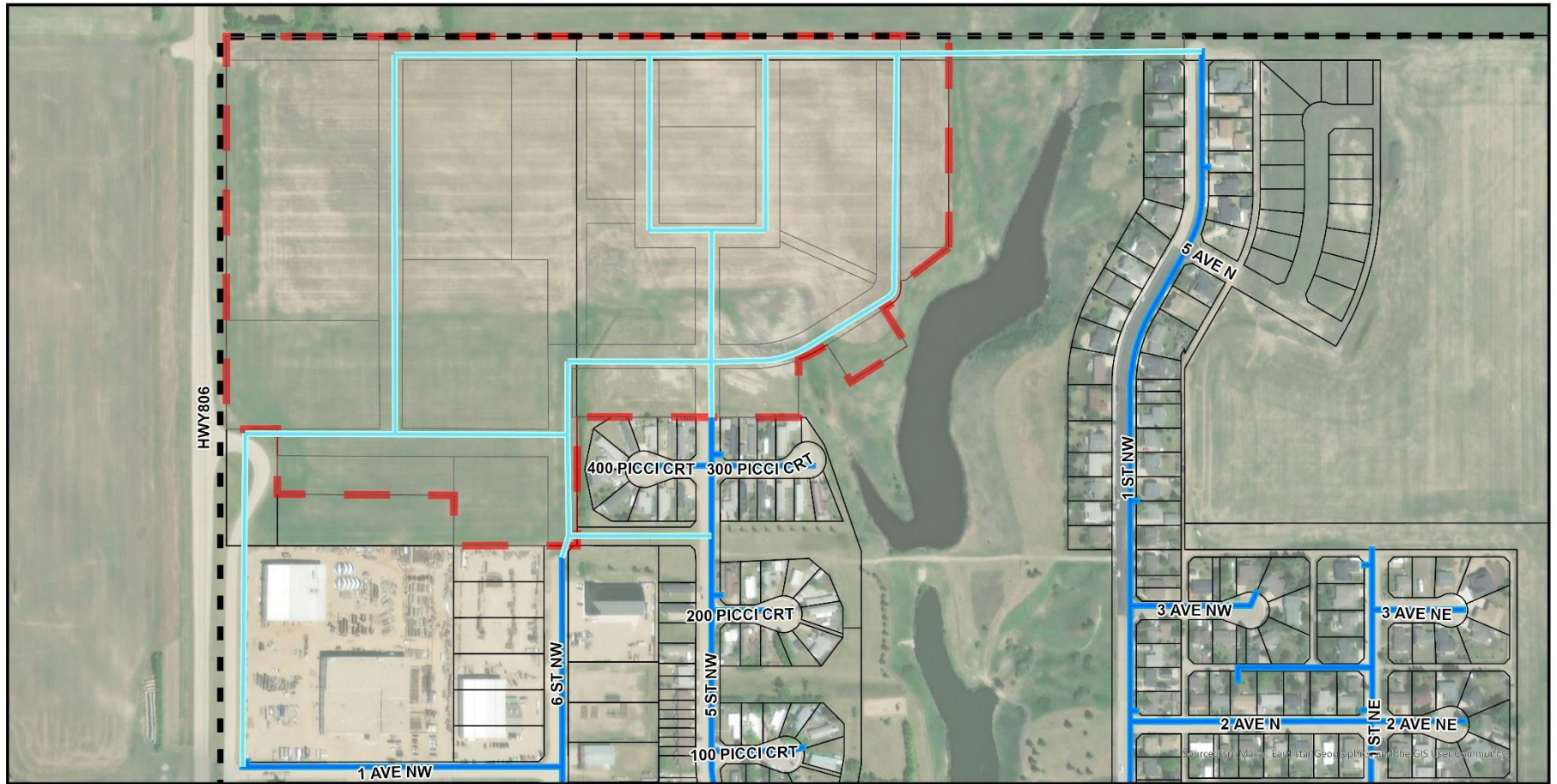
### Policies

- 6.1.1** The water distribution system shall be designed in general accordance with **Figure 7 | Conceptual Water Servicing**, including looping for redundancy and providing improved fire flows. The existing water system shall be extended with 200 mm water mains to the Plan area:
- (a) along the service road from 1<sup>st</sup> Ave NW;
  - (b) along 5<sup>th</sup> and 6<sup>th</sup> St NW;
  - (c) between 5<sup>th</sup> and 6<sup>th</sup> St NW; and
  - (d) along the north boundary of the Plan area connecting to 1<sup>st</sup> St NW.
- 6.1.2** Developers shall be responsible for the construction, installation and oversizing of water systems to service growth in the Plan Area as a condition of subdivision approval.

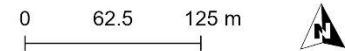
**6.1.3** Notwithstanding 6.1.2, the Village may undertake the construction of watermains that provide looping of the water system and that provide benefit beyond the immediate area of subdivision. The Village may collect development charges as specified in a Development Agreement for the proportionate benefit as a condition of subdivision approval.

**6.1.4** As part of a complete application for a development permit in the Commercial/Industrial Flex land use area and the Industrial land use area, an evaluation prepared by a qualified professional shall be provided which identifies whether additional on-site fire protection is required for the development and specify the design requirements.





- ASP Boundary
- Proposed Water Main
- Village Boundary
- Existing Water Main
- Legal Parcels



**Conceptual Water Servicing**



**Figure 7 | Conceptual Water Servicing**

## 6.2 WASTEWATER SERVICING

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The proposed sanitary servicing strategy for the ASP aligns with the recommendations of the IMP. The Plan Area will be serviced by a gravity flow sanitary sewer system that connects to the existing sanitary mains along 5<sup>th</sup> and 6<sup>th</sup> Streets NW, which then flows to the sewer main along Central Avenue and then into the sewer trunk which drains into the wastewater lagoon for treatment, as shown in **Figure 8 | Conceptual Sanitary Servicing**.

To ensure the existing sanitary system can provide an adequate level of service, the IMP future system analysis identifies required upgrades.

Firstly, the trunk main leading to the lagoon will be surcharged for peak wet weather flows and a system upgrade is required to accommodate future development in the Plan Area. The modelling shows that the existing trunk line can likely accommodate approximately 5 ha (12.3 ac) of new development, or, if a flow meter is installed by the Village, the upgrades will be required when 30L/s peak flows are observed in the trunk main. The IMP recommends that a second 200 mm trunk line is installed along the same alignment for the entire length of the sanitary trunk or a less desirable option for replacement of the existing trunk by a larger pipe.

Secondly, the IMP identifies two sections of the existing sanitary mains that require replacement due to sags that create flow restrictions. These sections are required to be replaced prior to any future development in the Plan Area.

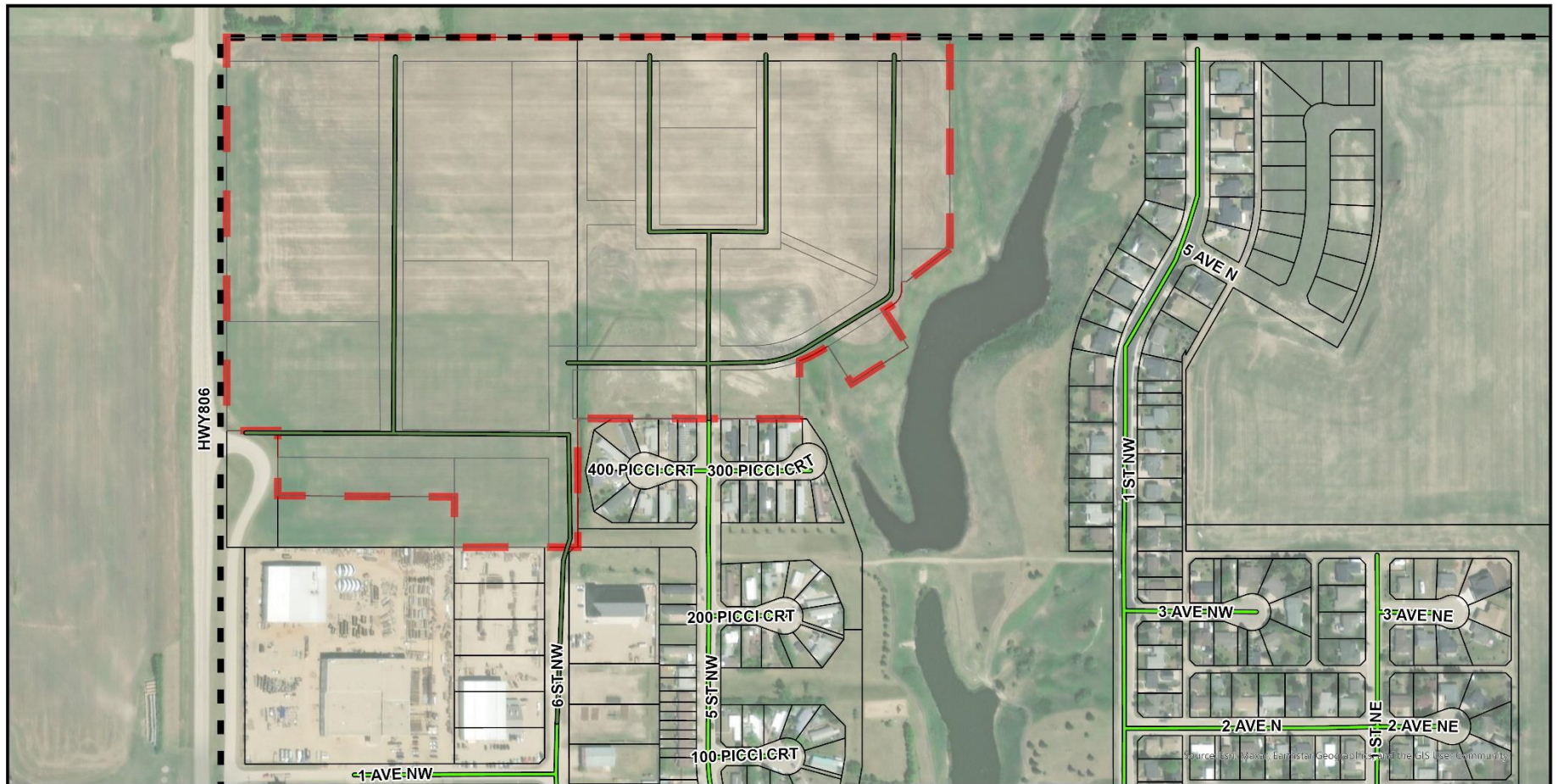
Using the recommended design parameters in the IMP, the anticipated peak sanitary flow from the Industrial/Commercial areas is estimated at 4.81 L/s. The anticipated peak sanitary flow

from the Residential areas and a portion of the parks that may contribute through infiltration/inflow is estimated at 3.13 L/s.

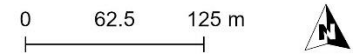
The following policies apply to future wastewater servicing in the ASP area.

### Policies

- 6.2.1** The sanitary sewer system in the Plan Area shall be designed in general accordance with **Figure 8 | Conceptual Sanitary Servicing**.
- (a) The existing 200 mm sanitary sewer main along 6<sup>th</sup> St NW shall be extended to service the Industrial and Commercial/Industrial Flex areas.
  - (b) The existing 200 mm sanitary sewer main along 5<sup>th</sup> St NW shall be extended to service the Residential areas.
- 6.2.2** Prior to any development in the Plan Area, the segments of the existing sanitary sewer mains along 5<sup>th</sup> and 6<sup>th</sup> Streets NW that create flow restrictions due to sags are required to be replaced. (**Figure 8 | Conceptual Sanitary Servicing**).
- 6.2.3** A maximum of 5.0 ha (12.3 ac) may be developed in the Plan Area prior to the upgrades of the sanitary trunk main, unless otherwise determined by the Village in conducting a detailed assessment of incoming flows from the flow meter that measures the available hydraulic capacity.
- 6.2.4** Developers shall be responsible for the construction, installation and oversizing of sanitary systems to service growth in the Plan Area as a condition of subdivision approval.



- ASP Boundary
- Village Boundary
- Legal Parcels
- Proposed Sanitary Main
- Existing Sanitary Main



**Conceptual Sanitary  
Sewer Servicing**



Figure 8 | Conceptual Sanitary Servicing



## 6.3 STORMWATER SERVICING

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Stormwater management systems are required in the Plan Area as a result of the development which will alter the existing drainage pattern and increase the imperviousness of the land and causing increased runoff. This runoff will be routed to a stormwater management facility through major and minor systems where it will be collected and treated before being discharged at a controlled rate into the coulee, as shown in **Figure 9 | Conceptual Stormwater Servicing**. The storm pond will attenuate the flow of stormwater runoff and improve water quality prior to its release.

The Conceptual Storm Pond Memo prepared by CIMA+ indicates that areas upstream of the Plan Area that could contribute to the total amount of stormwater will be considered as flow-through and do not contribute to the stormwater pond sizing.

However, the amount of runoff that is routed through the development could impact the design of the pond outlet and emergency escape route.

The Conceptual Storm Pond Memo identifies three options for routing the upstream (off-site) runoff from an additional 40 ha (98.9 ac) of land. The Village prefers that all upstream storm water is routed off-site to bypass the Plan Area. This includes:

- the land to the west of Highway 806 will be required to be drained to the south through the existing ditch east along the highway. This will ultimately drain to the coulee south of Township Road 304.
- the remaining land to the east of Highway 806 will require to be drained to the east by constructing a ditch to the north of the Plan Area to capture and convey the off-site

flow directly into the coulee.

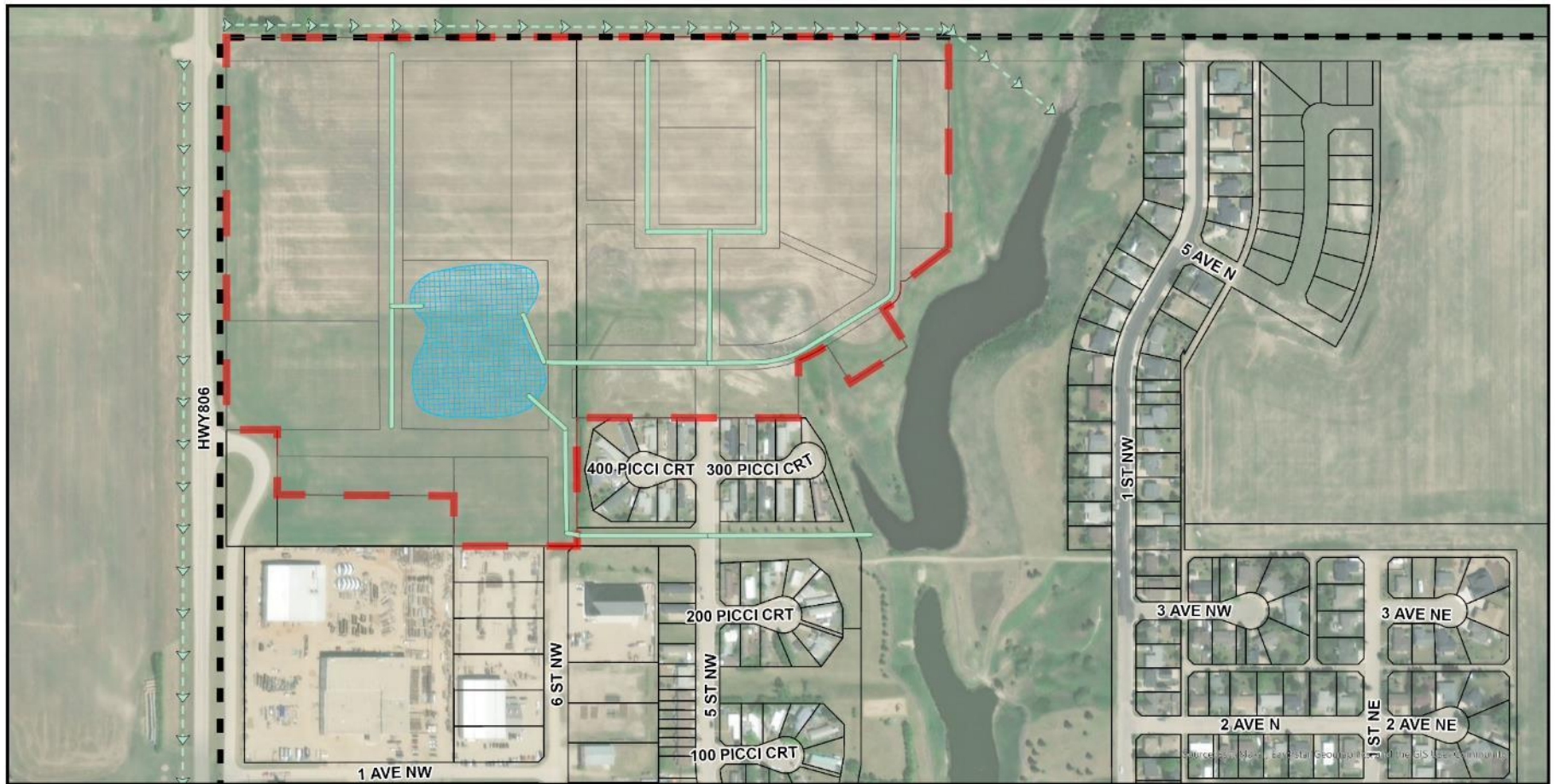
The following policies apply to future stormwater management in the ASP area.

### Policies

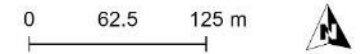
- 6.3.1** The stormwater management system shall be designed in general accordance with **Figure 9 | Conceptual Stormwater Servicing**.
- 6.3.2** A wet storm pond shall be designed and constructed by the developer as part of the first phase of subdivision or development in the Plan Area in the general location shown on **Figure 9 | Conceptual Stormwater Servicing**. The lot shall be designated a Public Utility Lot (PUL) at subdivision.
- 6.3.3** The design of the major system shall accommodate a 1 in 100-year rainfall event and must follow Alberta Environment guidelines.
- 6.3.4** Developers shall be responsible for the construction, installation and oversizing of the stormwater management system to service growth in the Plan Area as a condition of subdivision approval.
- 6.3.5** Low Impact Development and Best Management Practices are recommended and encouraged to be implemented during the detailed design stage.
- 6.3.6** A continuous emergency overland stormwater escape route will be provided via the road network and will be directed towards the coulee.

**6.3.7** Upstream stormwater mitigation strategies identified as Option 2 and Option 3 in the Conceptual Storm Pond Analysis shall be designed and constructed by the developer as part of the first phase of subdivision or development in the Plan Area.





- ASP Boundary
- Village Boundary
- Legal Parcels
- Proposed Minor Storm Sewer
- Proposed Stormwater Management Facility
- Upstream/Off-Site Runoff



**Conceptual Storm  
Sewer Servicing**



Figure 9 | Conceptual Stormwater Servicing

## 6.4 TRANSPORTATION

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Access to the Plan Area will be provided through existing adjacent neighbourhoods on 5<sup>th</sup> and 6<sup>th</sup> Streets NW, as well as from an existing service road access from Highway 806. The transportation network in the Plan Area will provide safe and efficient connections that separate industrial and residential traffic. To achieve this, the transportation concept requires the intersection with Highway 806 to remain in its current location where there is an existing turning lane, and the service road will be closed to local traffic and access will be provided on the proposed east-west road.

Due to the proximity of the Plan Area to the highway, a Traffic Impact Assessment (TIA) was prepared to support the preparation of this ASP. The TIA indicates that minimal changes are required to accommodate development of the Plan Area in accordance with this ASP.

The following policies apply to the future transportation network in the Plan Area.

### Policies

- 6.4.1 The road system shall be designed in general accordance with **Figure 10 | Transportation**.
- 6.4.2 Developers shall be responsible for the design and construction of roads within the Plan Area as a condition of subdivision approval, including roads and ditches along the north boundary of the Plan Area.
- 6.4.3 Reconfiguration of the current intersection at Highway 806 and the service road shall be in accordance with **Figure 10 | Transportation**. The new east-west roadway that replaces the service road shall tie into the existing intersection. The reconfiguration is required to be completed as a part of Phase 1 of development.

- 6.4.4 In accordance with the Traffic Impact Assessment, an all-way stop and lighting modifications shall be designed and constructed at the intersection of Highway 806 and Central Avenue coincident with the development of Phase 3 of the Plan Area (see **Figure 11 | Phasing Plan**). Signalization of this intersection may be required at full build-out.
- 6.4.5 The area identified as “Right-of-Way” in **Figure 10 | Transportation** in the northwest of the Plan Area shall be preserved for a potential future access to Highway 806. The Traffic Impact Assessment indicates that no upgrades are anticipated to Highway 806 to accommodate this future intersection.
- 6.4.6 Direct access to Highway 806 from Industrial lands or Commercial/Industrial Flex lands shall not be permitted.
- 6.4.7 A road shall be constructed by the Village in the area identified as “Right-of-Way” in **Figure 10 | Transportation** north of the coulee (east of the Plan Area). This road will provide a secondary connection between the east and west sides of Linden over the coulee in the case of emergency.

## 6.5 SHALLOW UTILITIES

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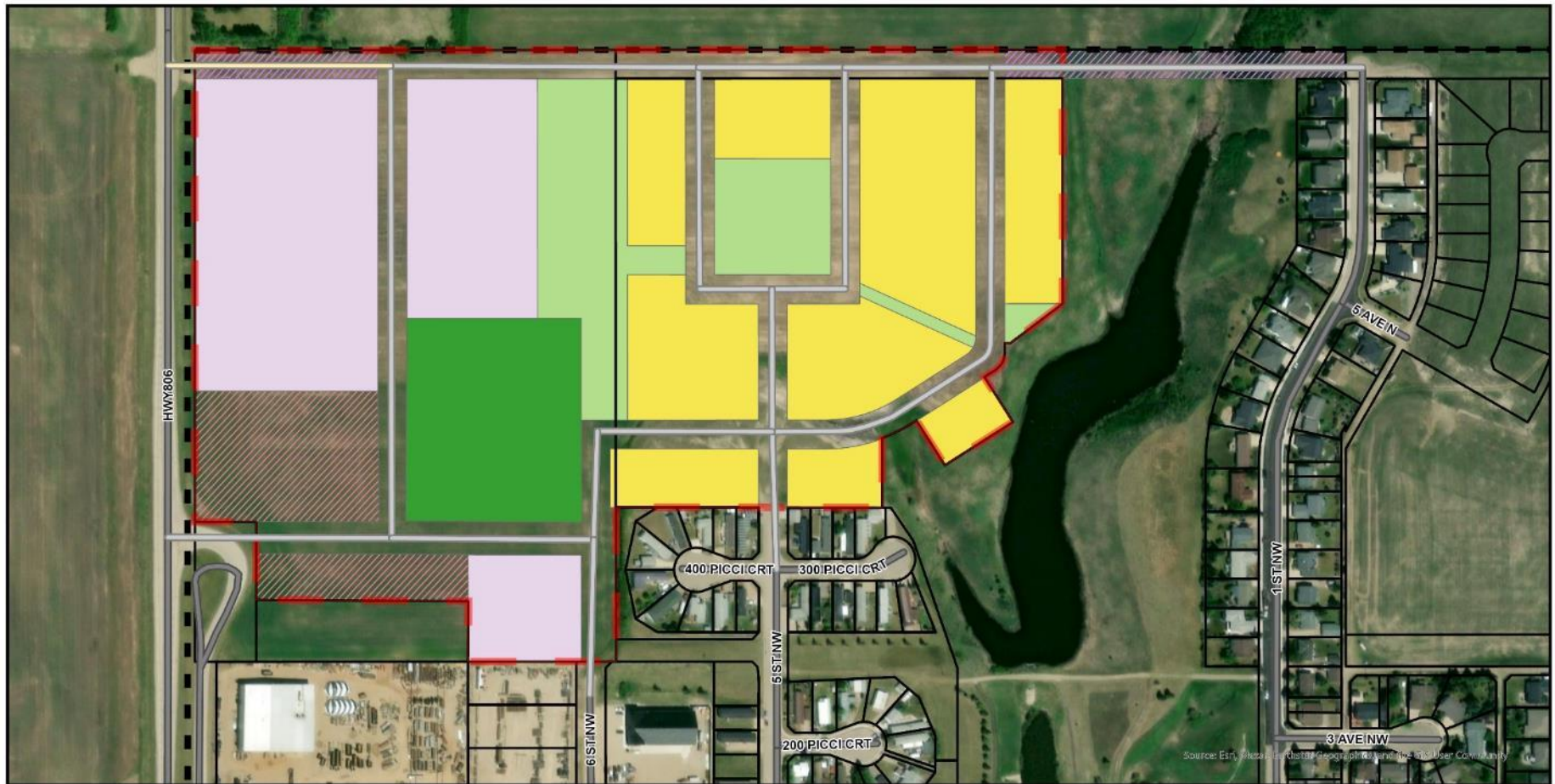
Shallow utilities refer to non-municipal services such as electricity, telephone, cable and gas.

The following policies apply to the future shallow utility servicing in the Plan Area.

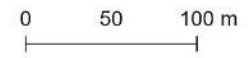
### **Policies**

- 6.5.1** All new development in the Plan Area shall be serviced with underground shallow utilities at the expense of the developer.

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<b>Proposed Land Uses</b>	Legal Parcels	Existing Roads
Commercial / Industrial Flex	Village Boundary	North ASP Roads
Industrial	ASP Boundary	Potential North ASP Road
Right of Way		
Park		
Public Infrastructure		
Residential		



### NORTHWEST ASP Transportation Map



Figure 10 | Transportation

# 7 Phasing & Implementation

## 7.1 PHASING

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Phasing of development in the Plan Area is critical to the successful implementation of this ASP. This ASP is designed to consider development within the Plan Area to occur in smaller phases if necessary, with full-build out achieved within 20 years. Growth will occur contiguously from existing services and road connections in the south and move towards the north.

As discussed earlier in this ASP, looping of the water system within the Plan Area and other road and utility system upgrades outside of the Plan Area at specific phases of development are required to facilitate growth. The Implementation section of this ASP discusses potential funding or cost sharing opportunities for this infrastructure.

The following policies apply to the phasing of development within the Plan Area.

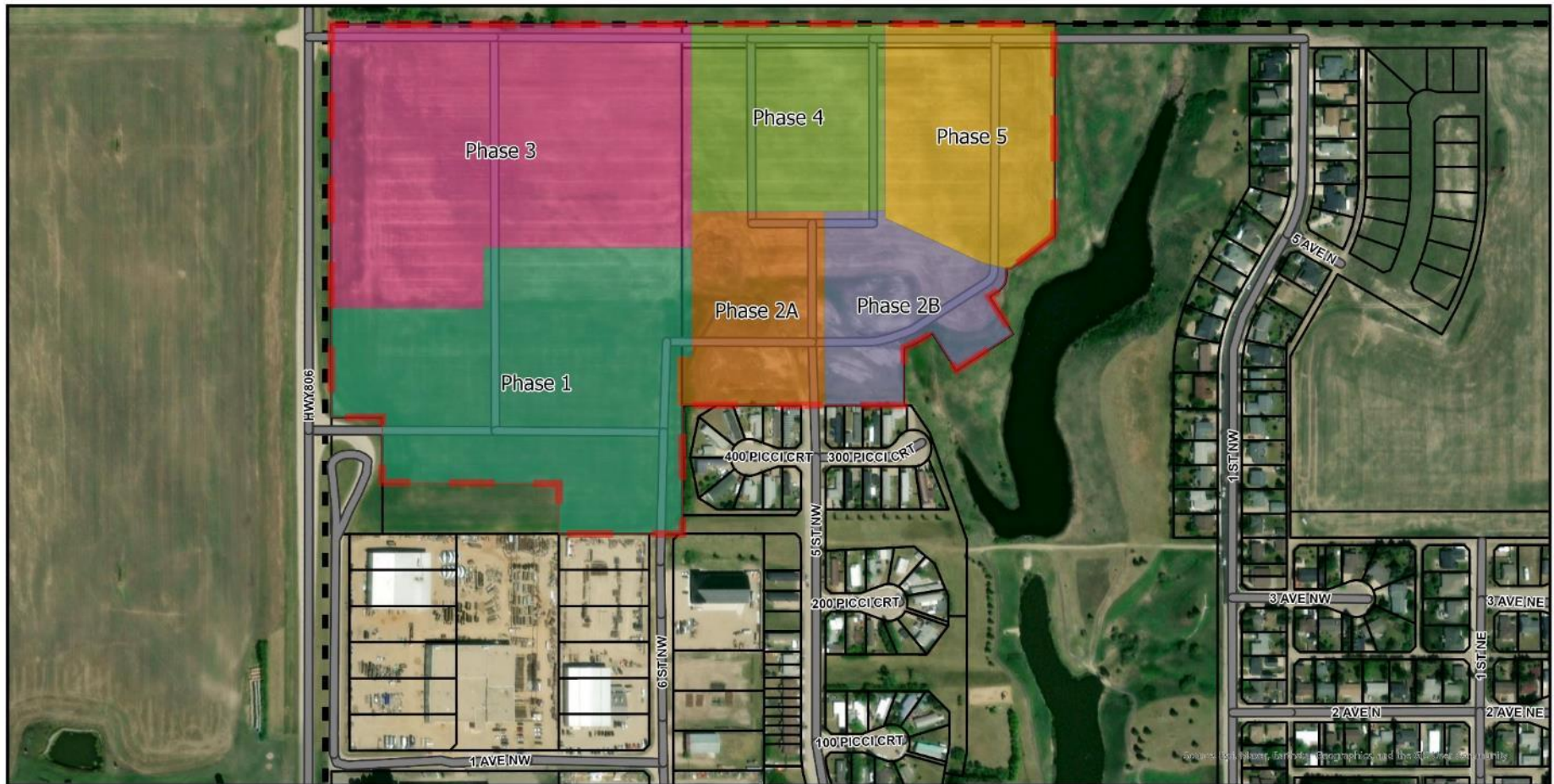
### Policies

- 7.1.1** Phasing of development shall facilitate the efficient and sustainable build-out of the Plan Area and follow the general pattern as shown in **Figure 11 | Phasing Plan**.
- 7.1.2** Prior to any development in the Plan Area, the portions of the sanitary mains in 5<sup>th</sup> and 6<sup>th</sup> St NW that sag shall be replaced, as identified in **Figure 8 | Conceptual Sanitary Servicing** and policy 6.2.2.
- 7.1.3** Phase 1 shall include:
  - (a) water system looping that connects to the existing water mains in 1<sup>st</sup> Ave and 5<sup>th</sup> St NW (policy 6.1.1);
  - (b) water system looping that connects to the existing water system in 1<sup>st</sup> St NW (policy 6.1.1);
  - (c) construction of the stormwater management pond and outfall to the coulee (policy 6.3.2);
  - (d) reconfiguration and construction of ditches to the west of Highway 806 to drain offsite runoff south to the coulee (policy 6.3.7); and
  - (e) reconstruction of the Service Road at the intersection at Highway 806 into an east-west road and bulbing of the Service Road (policy 6.4.3).

- 7.1.4** Phase 2 may occur in 2 smaller sub-phases and shall include:
- (a) required water system looping (policy 6.1.1); and
  - (b) application and approval for wetland compensation (policy 5.1.2).
- 7.1.4** Prior to any development within Phase 3 or future phases, the Village shall confirm that either: 1) the required upgrades to the sanitary trunk have been constructed, or 2) there is additional hydraulic capacity in the existing sanitary trunk to accommodate further development as confirmed by a flow monitor (policy 6.2.3).
- 7.1.5** Phase 3 shall include:
- (a) installation of the road markings, signage and lighting of the new all-ways stop at the intersection of Highway 806 and Central Ave (policy 6.4.4);
  - (b) application and approval for wetland compensation (policy 5.1.2);
  - (c) construction of the ditch to drain the stormwater runoff to the east of Highway 806 into the coulee (policy 6.3.7);
  - (d) construction of the off-leash dog park (policy 4.4.5).
- 7.1.6** Phase 4 of the development shall include:
- (a) construction of the trail system (policy 4.4.3);
  - (b) installation of the playground (policy 4.4.6);
- 7.1.7** Phase 5 of the development shall include:
- (a) installation of the gazebo/benches (policy 4.4.7);
  - (b) construction of the road connection north of the coulee (policy 6.4.7).

- 7.1.8** Phases may occur concurrently as long as they are in the general sequence outlined in this ASP and that the required infrastructure and roads are constructed.





- |                  |                  |
|------------------|------------------|
| ASP Phasing Plan | Village Boundary |
| Phase 1          | ASP Boundary     |
| Phase 2A         | Legal Parcel     |
| Phase 2B         |                  |
| Phase 3          |                  |
| Phase 4          |                  |
| Phase 5          |                  |

0 60 120 m



**NORTHWEST ASP PHASING PLAN**



Figure 11 | Phasing Plan

## 7.2 IMPLEMENTATION

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Upon adoption of this ASP by bylaw, it becomes a statutory planning document of the Village of Linden. All future applications for land use amendment, subdivision or development must be in accordance with this ASP.

### Policies

- 7.2.1** Future redesignation, subdivision and development permit applications in the Plan Area are not required to prepare a conceptual scheme if this ASP is complied with.
- 7.2.2** Where a proposed redesignation, subdivision or development permit application does not comply with this ASP, an application to amend this ASP may be required by the Village.
- 7.2.3** Land Use Redesignations and subdivision applications will be submitted and considered concurrently.
- 7.2.4** The Village should consider reviewing this ASP every ten (10) years to determine if updates are required.
- 7.2.5** The Village should consider the preparation of an off-site levy bylaw to pay for and recover the costs of:
- (a) twinning/replacement of the sanitary trunk main;
  - (b) water main looping that benefits lands beyond the Plan Area;
  - (c) road construction to connect the Plan Area across the coulee; and
  - (d) installation of the all-way stop improvements at the intersection of Highway 806 and Centre Ave.
- 7.2.6** The Village should consider the preparation of a local improvement levy for the repair of the sags in the existing sanitary mains on 5<sup>th</sup> and 6<sup>th</sup> St NW.
- 7.2.7** The Village will recover the costs of infrastructure oversizing and will endeavor to assist in recovering costs of infrastructure extensions when entering into a Development Agreement with developers in the Plan Area. Specifically, costs will be recovered related to the oversizing of the stormwater management pond in Parcel 1.
- 7.2.8** The Village may consider contributing to the cost of installing park amenities from the Village's Municipal Reserve fund. These contributions will be determined at the time of entering into a Development Agreement as part of a subdivision approval.

# 8 Acronyms

## 8.1 ACRONYMS

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<b>ASP</b>	Area Structure Plan
<b>IMP</b>	Infrastructure Master Plan
<b>MDP</b>	Municipal Development Plan
<b>MGA</b>	Municipal Government Act
<b>TIA</b>	Traffic Impact Assessment