# CHAPTER 2: FACILITY & ENVIRONMENTAL INVENTORY

## Introduction

The Inventory chapter represents a summation of the existing Belle Fourche Municipal Airport (EFC) physical facilities and environmental conditions.

An on-site assessment was conducted October 21, 2020. The inventory effort included a facility assessment supplemented with a comprehensive data collection effort. The on-site assessment included a walk-through of existing facilities and interviews with stakeholders. This effort identifies and supports the Airport Master Plan Study for the Belle Fourche Municipal Airport and provide a baseline framework to evaluate the airport facility.

The information compiled during the inventory effort will be used to assess how existing facilities are able to meet the projected airport needs identified in subsequent sections of the master plan. Please refer to the various appendices referenced within the study narrative for more detailed information.

This chapter provides an inventory of the following elements:


- Background
- Facility Inventory
  - Land
  - Airfield Facilities
  - NAVAIDS & Airspace
  - General Aviation
  - Support Facilities
  - Ground Access, Circulation & Parking
  - Other
- Surrounding Land Use
- Environmental Inventory


## Background

### *General*

The Belle Fourche Municipal Airport (EFC) is a publicly owned, public use airport that sits at an elevation of 3,191 feet above mean sea level with a single paved runway, a turf runway and an unpublished turf runway. The paved runway, Runway 14-32 is 4,501 feet long by 60 feet wide and the crosswind turf runway, Runway 18-36 is 3,364 feet long by 125 feet wide. The unpublished turf runway is aligned in an 11-29 orientation and is 1,500 feet long by 75 feet wide. The airport has a connecting taxiway and apron area with several hangars, a terminal building, fueling facility and currently houses 14 based aircraft. Aeronautical services are provided through the fixed based operator (FBO), Belle Fourche Flight Center.

## *Community History*

Belle Fourche is French for "beautiful fork" because it is located at the fork of Hay Creek, Redwater River and Belle Fourche River. The community originally started as a cow town catering to cattlemen and the cowboys following the gold rush of 1876.

After hearing about the gold rush, a gentleman named Seth Bullock came from Canada to mine gold. After realizing he no longer wanted to mine gold, he began selling supplies to miners in Deadwood. Throughout 14 years he bought up land near the Belle Fourche river. The railroad was set to go through the Black Hills area but didn't want to pay the sum of money demanded from the townspeople in Minnesela, once located 3 miles east of Belle Fourche. After hearing of this, Bullock offered the railroad free right-of-way and to build the terminal if the railroad would locate it at a point on his land in Belle Fourche. The railroad jumped on the offer and in 1890 the first load of cattle headed east by train. Five years later 2,500 carloads of cattle were being shipped per month during peak season making that the world's largest livestock shipping point. Belle Fourche is still the trading center for a three-state agricultural area that encompasses 21,000 square miles including South Dakota, Wyoming and Montana. The city today continues to be a large trade area for wool, cattle and bentonite industries and many of the buildings in downtown Belle Fourche are registered as historic buildings.

The City of Belle Fourche is also known for being the Geographic Center of the Nation. The center of the nation changed from Lebanon, Kansas in 1959 when Hawaii became the 50$^{th}$ state. The actual geographic center is on private property 20 miles north, but the city wanted to honor the middle of America by building a large granite compass in 2008 which became home to the Geographic Center of the United States Monument.

## *Location & Area Setting*

The City of Belle Fourche is in Butte County north of the Black Hills and 15 minutes east of the Wyoming border. Located four miles north of the city, the airport is west of US-85 and accessible by Airport Road.

The nearest communities to Belle Fourche are Spearfish, SD 13 miles south; Sturgis, SD 29 miles southeast; Deadwood, SD 28 miles south; Sundance, WY 41 miles west, Hulett, WY 42 miles west and Rapid City, 55 miles southeast by driving distances. **Figure 2-1: Airport Location Map** provides an overview of the airport's local environment.

The land surrounding the airport is primary pastureland. The airport sits at 3,190 feet above mean sea level which is 168 feet higher than most of the city. It is also surrounded by multiple ravines and streams.

## *Climate*

The average high temperature for the area of Belle Fourche is 62 degrees Fahrenheit and the average low is 34 degrees Fahrenheit. Summers are warm, short and mostly dry with the warmest month being July, while winters are dry, cloudy, freezing and windy, with January being the coolest month. The weather table below includes the normal conditions that are experienced.

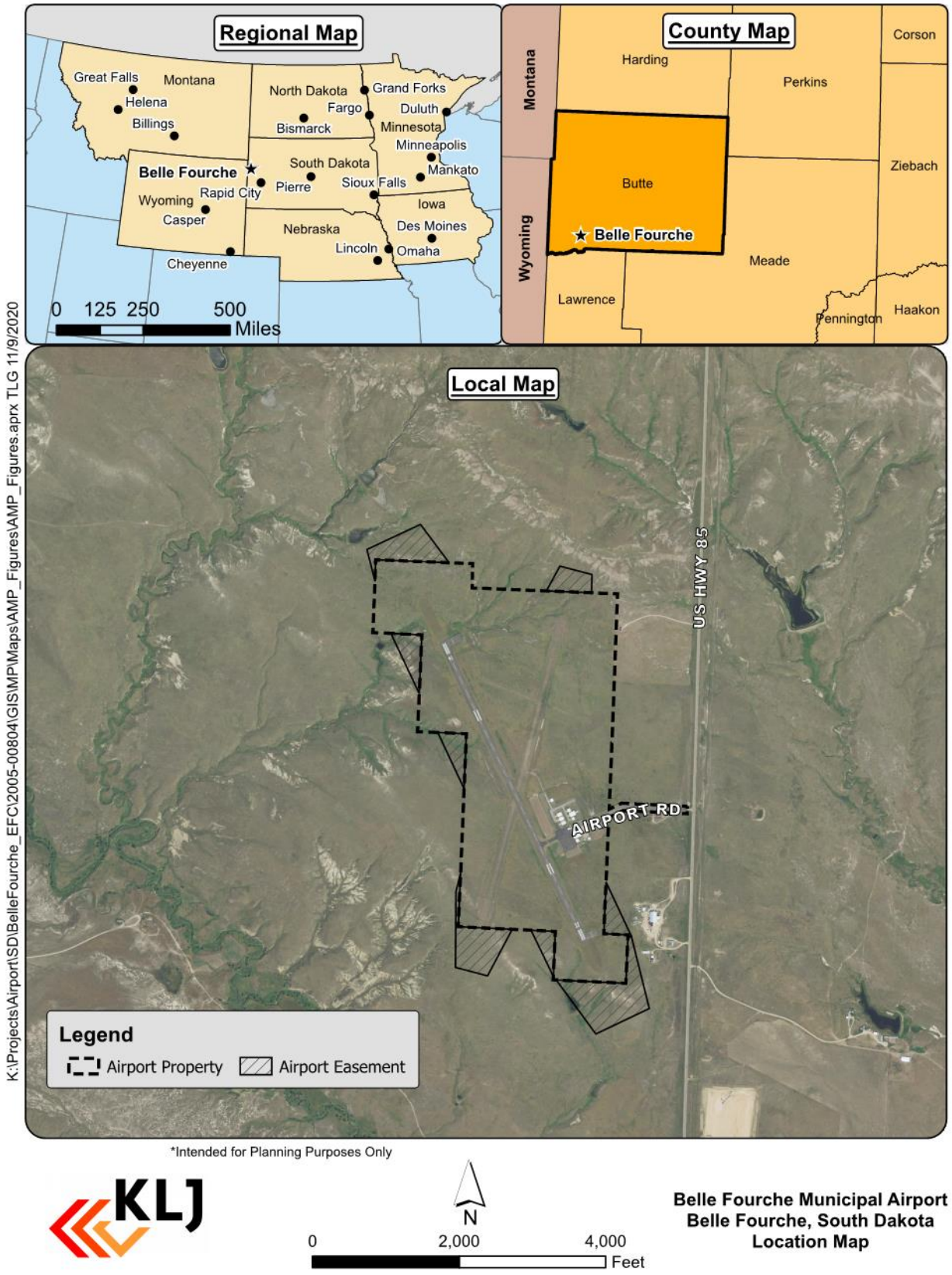
*Table 2-1 – Belle Fourche Normal Weather*

| Month | Precipitation (in) | Minimum Temperature (˚F) | Average Temperature (˚F) | Maximum High Temperature (˚F) |
|---|---|---|---|---|
| January | 0.36 | 13.2 | 26.0 | 38.7 |
| February | 0.45 | 14.7 | 27.9 | 41.2 |
| March | 1.16 | 22.6 | 36.3 | 50.0 |
| April | 1.98 | 32.5 | 47.0 | 61.5 |
| May | 3.10 | 42.8 | 56.6 | 70.4 |
| June | 2.81 | 52.3 | 66.4 | 80.6 |
| July | 2.00 | 58.4 | 73.7 | 89.0 |
| August | 1.42 | 56.2 | 72.2 | 88.3 |
| September | 1.52 | 45.2 | 61.4 | 77.5 |
| October | 1.61 | 33.8 | 48.8 | 63.7 |
| November | 0.77 | 22.6 | 35.2 | 47.8 |
| December | 0.63 | 13.2 | 25.4 | 37.6 |
| Average/Totals | 17.81 | 33.9 | 48.0 | 62.1 |

*Source: https://www.ncdc.noaa.gov/cdo-web/datatools/normals 1981-2010*

EFC has a Super Automated Weather Observation Station (SuperAWOS) that automatically records and relays weather conditions such as wind speed and direction, and temperature. The SuperAWOS is a type of weather equipment that is not currently certified by the FAA but is routinely serviced by the State of South Dakota DOT Aeronautics staff to ensure accuracy, while the city is responsible for regular maintenance.

*Figure 2-1 – Airport Location Map*



## *Airport Ownership & Management*

EFC is a public use airport owned by the City of Belle Fourche, SD. The city contracts with the FBO and the Airport Manager operates out of the FBO. The City of Belle Fourche has an Airport Board which provides recommendations to the City Council. The Belle Fourche City Council serves as the governing body for the airport.

## *Airport History*

FAA records indicate that the airport was first opened in 1986 and continues to be an active airport. Originally, there were plans to build a regional airport in St. Onge for the City of Belle Fourche, the City of Spearfish and the City of Sturgis though plans for that fell through. A complete list of major airport development projects that received funding from FAA and the State can be found in **Table 2-2: Project History.**

*Table 2-2 - Project History*

| Year | Description | Federal Funds | State Funds | Local Funds |
|---|---|---|---|---|
| 1984 | Acquire land and easements for the new airport | $56,125 | $3,118 | $3,118 |
| 1985 | Construct runways, hangar area and lighting | $630,438 | $51,320 | $34,167 |
| 1991 | Expand apron and rehabilitate runway, apron and taxiways | $394,768 | $21,932 | $438,631 |
| 2001 | Construct new hangar area and rehabilitate runway, apron and taxiways | $154,800 | $8,600 | $8,600 |
| 2003 | Install a property wildlife fence | $139,500 | $6,200 | $9,300 |
| 2006 | Engineering specifications for rehabilitation work | $73,625 | $1,550 | $2,325 |
| 2010 | Install Medium Intensity Runway Lighting | $389,833 | $9,152 | $6,101 |
| 2012 | Construct 32 end turnaround and reconstruct runway and taxiway. | $408,423 | $36,304 | $9,076 |
| 2016 | Install fuel system with card reader; 100LL and Jet A | $435,759 | $21,209 | $27,208 |
| 2019 | Construct asphalt mill, access road and parking lot | $217,755 | $12,097 | $24,732 |
| | **Total** | $2,901,026 | $171,482 | $563,258 |

*Source: FAA Grant History*

## *Airport Role & Design*

EFC serves as a GA airport north of the Black Hills for the Tri-County area that spans into three states including South Dakota, Wyoming and Montana. **Table 2-3** provides a list of the surrounding airports while **Figure 2-2** shows the location and airspace of the surrounding airports.

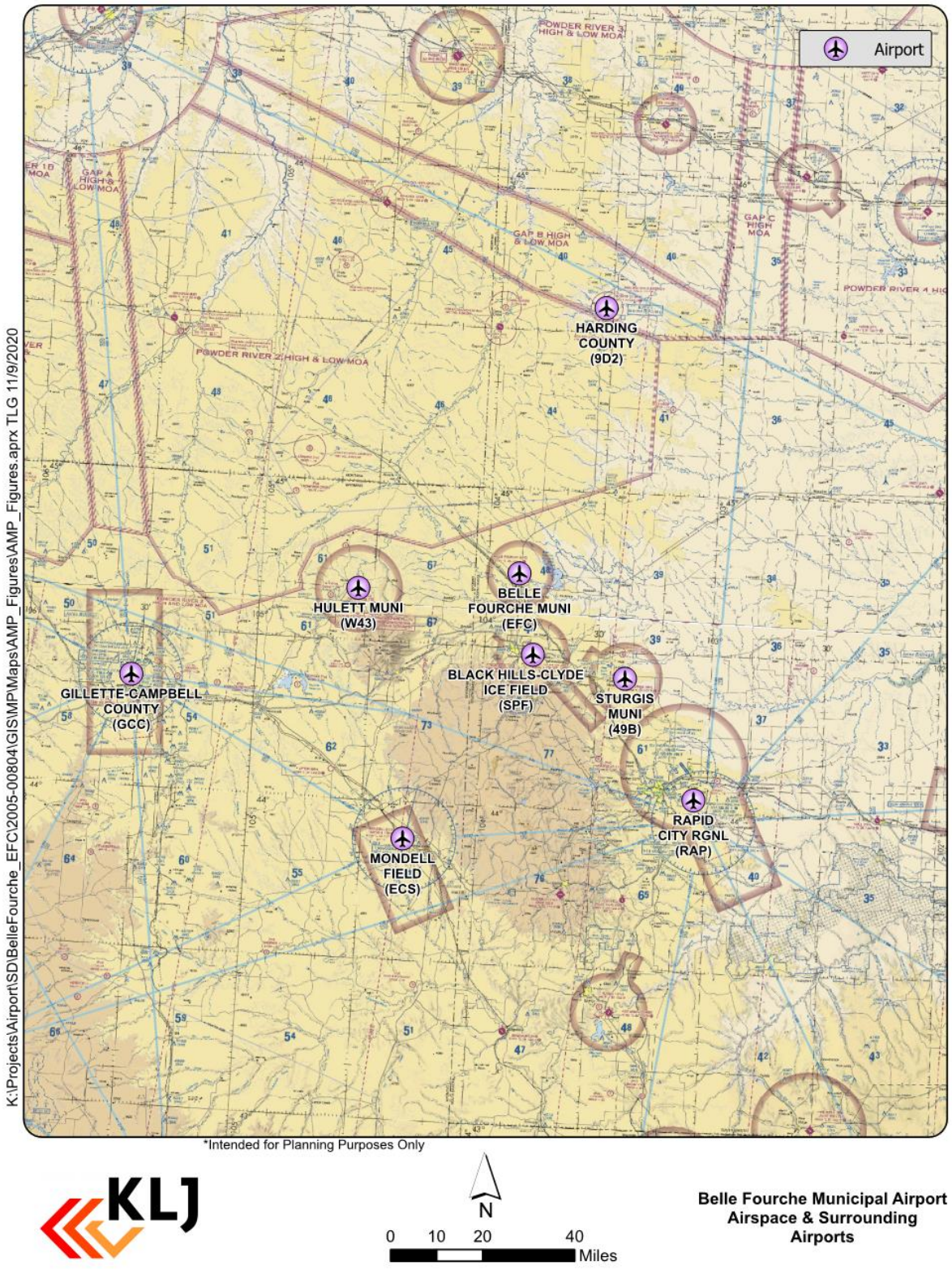
*Table 2-3 – Surrounding Airports*

| Airport Name / City | FAA ID | Location from EFC (nm) | Primary Runway | Based Aircraft | Approach Procedure |
|---|---|---|---|---|---|
| Belle Fourche Municipal / Belle Fourche, SD | EFC | -- | 4501' x 60' | 14 | NPI (400', 1-mile) |
| Black Hills-Clyde Ice Field / Spearfish, SD | SPF | 16 S | 6401' x 75' | 75 | NPI (300', 1-mile) |
| Sturgis Municipal / Sturgis, SD | 49B | 28 SE | 5100' x 75' | 48 | NPI (300', 1-mile) |
| Hulett Municipal / Hulett, WY | W43 | 30 W | 5500' x 75' | 9 | NPI (300', 1-mile) |
| Harding County / Buffalo, SD | 9D2 | 52 N | 3900' x60' | 4 | Visual |
| Rapid City Regional / Rapid City, SD | RAP | 54 E | 8701' x 150' | 125 | PI (200', ½-mile) |
| Mondell Field / Newcastle, WY | ECS | 55 SW | 5310' x 75' | 14 | NPI (300', 1-mile) |
| Gillette-Campbell County / Gillette, WY | GCC | 75 SW | 7501' x 150' | 65 | PI (200', ½-mile) |

*Source: Airnav.com*

*Notes: NPI = Non-Precision Instrument (Ceiling, Visibility), PI = Precision Instrument (Ceiling, Visibility)*

*Figure 2-2 - Airspace & Surrounding Airports*



The airport is part of the National Plan of Integrated Airport Systems (NPIAS) as classified by the Federal Aviation Administration (FAA). NPIAS airports are vital to the national air transportation system. Within the NPIAS, the airport is classified as a non-primary General Aviation airport eligible for non-primary entitlement funding. The FAA also categorizes General Aviation Airports in the ASSET study and Belle Fourche is classified as a Local Public General Aviation airport. EFC has 14 based aircraft and one of the specifications to be classified as a Local level is to have 10 or more annual instrument operations and 15 or more based aircraft. The 2020 South Dakota State Aviation System Plan has categorized EFC as a Medium General Aviation Airport. **Table 2-4** summarizes the airport's role and design along with surrounding airports.

The FAA's Airport Reference Code (ARC) identifies a design category based on aircraft wingspan, tail height and approach speed for aircraft types that regularly use the airport. For EFC, the current ARC is B-I-Visual with Taxiway Design Group (TDG) 2 standards. Further information about the role and design classifications can be found in **Appendix B: General Aviation Airports 101** (Airport Classification & Airport Design Guidelines).

*Table 2-4 – Airport Role & Design*

| Identifier/City | State Classification | FAA Classification | FAA GA Group |
|---|---|---|---|
| EFC/Belle Fourche | Medium | Non-Primary | Local |
| SPF/Spearfish | Large | Non-Primary | Local |
| 49B/Sturgis | Medium | Non-Primary | Local |
| W43/Hulett | Local (WY) | Non-Primary | Basic |
| RAP/Rapid City | Commercial | Primary | - |
| ECS/Newcastle | Intermediate (WY) | Non-Primary | Local |
| GCC/Gillette | Commercial (WY) | Primary | - |
| 9D2/Harding County | Small | Non-Primary | Basic |

*Source: South Dakota & Wyoming Aviation System Plans, ARC = Airport Reference Code, TDG = Taxiway Design Group*

## *Airport Activity & Service Area*

As a general aviation airport, EFC is home to a flight school, a full service FBO for transient customers and an aircraft maintenance shop. The airport serves the tri-state area that is north of the Black Hills on the west side of the state of South Dakota. Some customers include medical companies because of the low fuel price, ranchers year-round, and one or two King Air charters. The maintenance shop on the airport mostly caters to local customers and aircraft from Sturgis and Buffalo.

### BASED AIRCRAFT

According to discussions with the airport there are 14 aircraft based on the airfield. This aligns with the validated number of based aircraft on the National Based Aircraft Inventory Program (NBAIP) (basedaircraft.com). The based aircraft at EFC are made up of 13 single-engine and one multi-engine aircraft.

Other official publications have identified different existing based aircraft levels for EFC. A draft of the 2020 South Dakota State Aviation System Plan (SD SASP) reports 21 based aircraft, the Terminal Area Forecast (TAF) reports 25 based aircraft and the FAA's Airport Master Record (Form 5010) reports 15 based aircraft. The 14 verified aircraft from the NBAIP will be used as the existing based aircraft for EFC throughout the study.

### ANNUAL OPERATIONS

The FAA Terminal Area Forecast (TAF), published in January 2020, indicates there were an estimated 4,206 operations at EFC in 2018. This estimate includes 3,600 total local operations and 606 total itinerant operations, consisting of 600 general aviation and 6 military operations. The TAF does not predict an increase nor decrease in operations.

**Table 2-5** summaries airport activity as of 2019. See **Chapter 3: Aviation Activity Forecasts** for more information on existing and projected airport activity.

*Table 2-5 – Airport Activity Summary*

| Based Aircraft | Annual Operations |
|---|---|
| 14 | 4,206 |

*Source: FAA 2020 TAF, National Based Aircraft Inventory Program*

## Facility Inventory

An inventory of airport facilities was performed to establish a baseline for existing facilities. As discussed in the following sections, airport facilities are grouped into several categories: land, airfield, navigational aids (NAVAIDS)/airspace, general aviation, support, access/parking, and other facilities.

### *Land*

The Belle Fourche Municipal Airport is located on 279 acres owned in fee by the City of Belle Fourche, and 54 acres in avigation easements. The airport also has several acres of land that private hangars sit on with special lease agreements with EFC. As a part of the Master Plan process, the airport is updating the Exhibit A property map in compliance with FAA standards. This Exhibit A will include all ownership and encumbrance information for airport property in drawings as well as supporting documents.

### *Airfield Facilities*

Airside facilities are those that are necessary for aircraft surface movement, such as runways, taxiways, aprons, and associated lighting, marking and signage systems. A map depicting existing airport airside components is included in **Figure 2-3: Airfield Facilities Map**. Information on design codes is contained in **Chapter 4: Facility Requirements**.

#### RUNWAY 14-32

The one paved runway at EFC running North-Northwest to South-Southeast is Runway 14-32. It is 4,501 feet long by 60 feet wide and is constructed of bituminous asphalt that is in good condition. The weight bearing capacity can accommodate up to single wheel 12,500 pounds and has non-precision runway markings with a two light Precision Approach Path Indicator (PAPI) on both ends. The 32 End has a non-precision approach with a one-mile visibility.

The Runway Design Code (RDC) for this runway is B-I. See **Appendix B: General Aviation Airports 101** for additional information on RDCs.

### RUNWAY 18-36

This is an intersecting turf runway running North to South (18-36) that is 3,634 feet long by 125 feet wide. It is classified as an RDC A/B-I with a standard left traffic pattern and a visual approach. It is marked with white and black marker cones along the edge of the runway.

### UNPUBLISHED RUNWAY 11-29

Because of wind conditions, pilots have found it easier to land and takeoff on a 1,500-foot-long by 75 feet wide turf runway intersecting Runway 18-36. The alignment is West-Northwest to East-Southeast (11-29). It sits about 1,100 feet south of Runway 18 End with no edge markings or connecting taxiways.

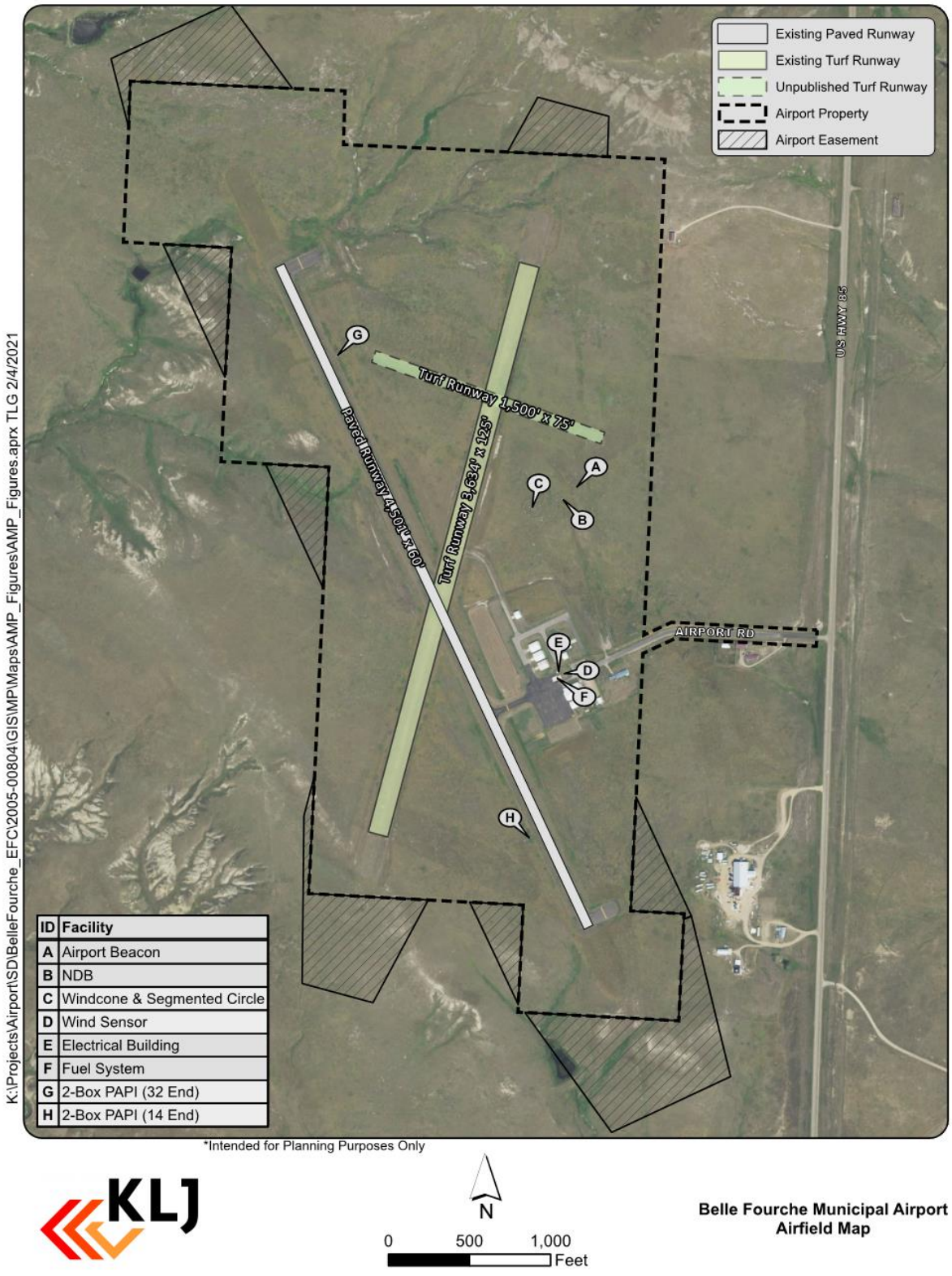
Runway facilities are summarized in **Table 2-6**.

*Table 2-6 – Runway Facility Summary*

| Component | Runway 14-32 | Runway 18-36 | Unpublished Runway 11-29 |
|---|---|---|---|
| Runway Length (feet) | 4,501 feet | 3,634 feet | 1,500 feet |
| Runway Width (feet) | 60 feet | 125 feet | 75 feet |
| Runway Surface Material | Asphalt | Turf | Turf |
| Runway Surface Treatment | None | None | None |
| Single Wheel Pavement Strength | 12,500 | - | - |
| Runway Design Code | B-I | A/B-I | A-I |

*Source: KLJ*

*Figure 2-3 – Airfield Facilities Map*



### TAXIWAYS

A system of taxiways facilitates the movement of aircraft from the runway environment to other airport facilities including hangars and parking aprons. All taxiways are bituminous asphalt unless otherwise stated.

- **Taxiway for (14-32)** is connected to Runway 14-32 and the main apron. It is 35 feet wide with reflector lighting and a Pavement Condition Index (PCI) of 85. It is sufficient for ADG-II aircraft.
- **Taxiway for (18-36)** is turf and connects Runway 18-36 to the hangar taxilane. It is approximately 15 feet wide and is sufficient for ADG-I aircraft.

All taxiway widths meet Taxiway Design Group (TDG) 2 standards, though some taxiway fillets may not meet FAA standards for all TDG 2 aircraft.

### TURN-AROUNDS

EFC currently has a turnaround on each end of Runway 14-32. The 14 End turn-around is 80 feet wide by 125 feet deep. The 32 End turn-around is 80 feet wide by 80 feet deep. The Runway 14 turnaround previously was U-shaped but was converted to a large pad several years ago.

### TAXILANES

The airport is served by various taxilanes that provide access from the aprons to individual general aviation hangar areas. Locations are generally depicted in **Figure 2-4: Terminal Area Facilities Map**.

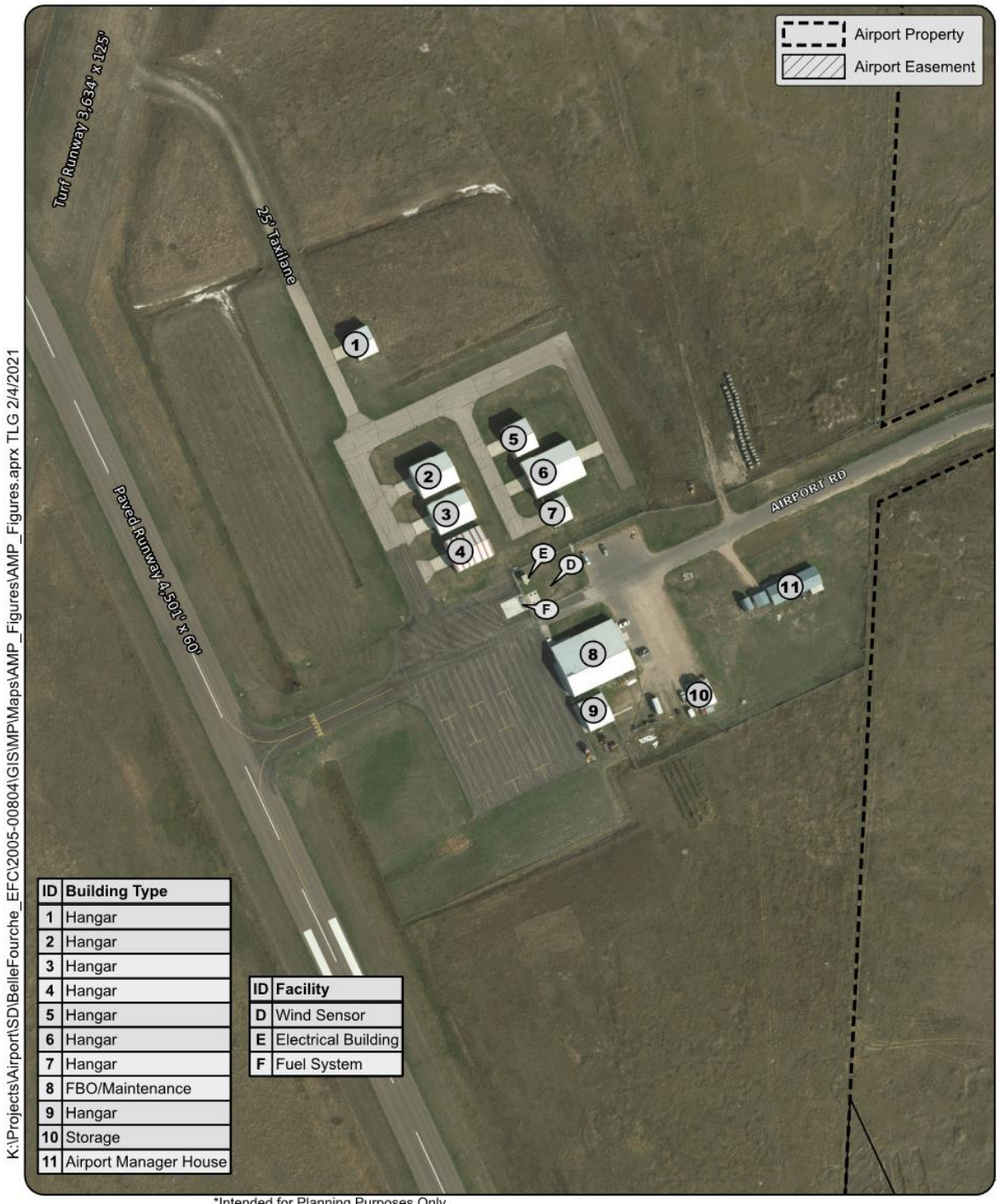
Currently the airport has hangar taxilanes which are mostly 25 feet wide, except for two taxilanes which are 35 feet wide. The 25’ taxilanes meet TDG 1 standards and can accommodate ADG I aircraft. The 35-foot taxilanes meet TDG 2 standards and can accommodate ADG II aircraft. There is also a turf taxilane that is only 15 feet wide that connects from Runway 18-36 to the north taxilane with the single hangar. This taxilane does not me TDG standards.

### APRONS

Apron areas serve the loading, unloading, parking and maneuvering needs for aircraft operations. There is one aircraft parking apron at EFC that can be seen on **Figure 2-4**.

The Main Apron contains an FBO facility, striping for eight aircraft parking tie-downs and offers aircraft fueling. The apron dimensions are 300 feet by 200 feet (6,600 square yards). The bituminous pavement is in good condition with a PCI of 97. The apron was last rehabilitated in 2013. No taxilane centerline striping exists on the apron except for the eight marked tie-down locations.

*Figure 2-4 – Terminal Area Facilities Map*




| ID | Building Type |
|---|---|
| 1 | Hangar |
| 2 | Hangar |
| 3 | Hangar |
| 4 | Hangar |
| 5 | Hangar |
| 6 | Hangar |
| 7 | Hangar |
| 8 | FBO/Maintenance |
| 9 | Hangar |
| 10 | Storage |
| 11 | Airport Manager House |

| ID | Facility |
|---|---|
| D | Wind Sensor |
| E | Electrical Building |
| F | Fuel System |

## PAVEMENT CONDITION

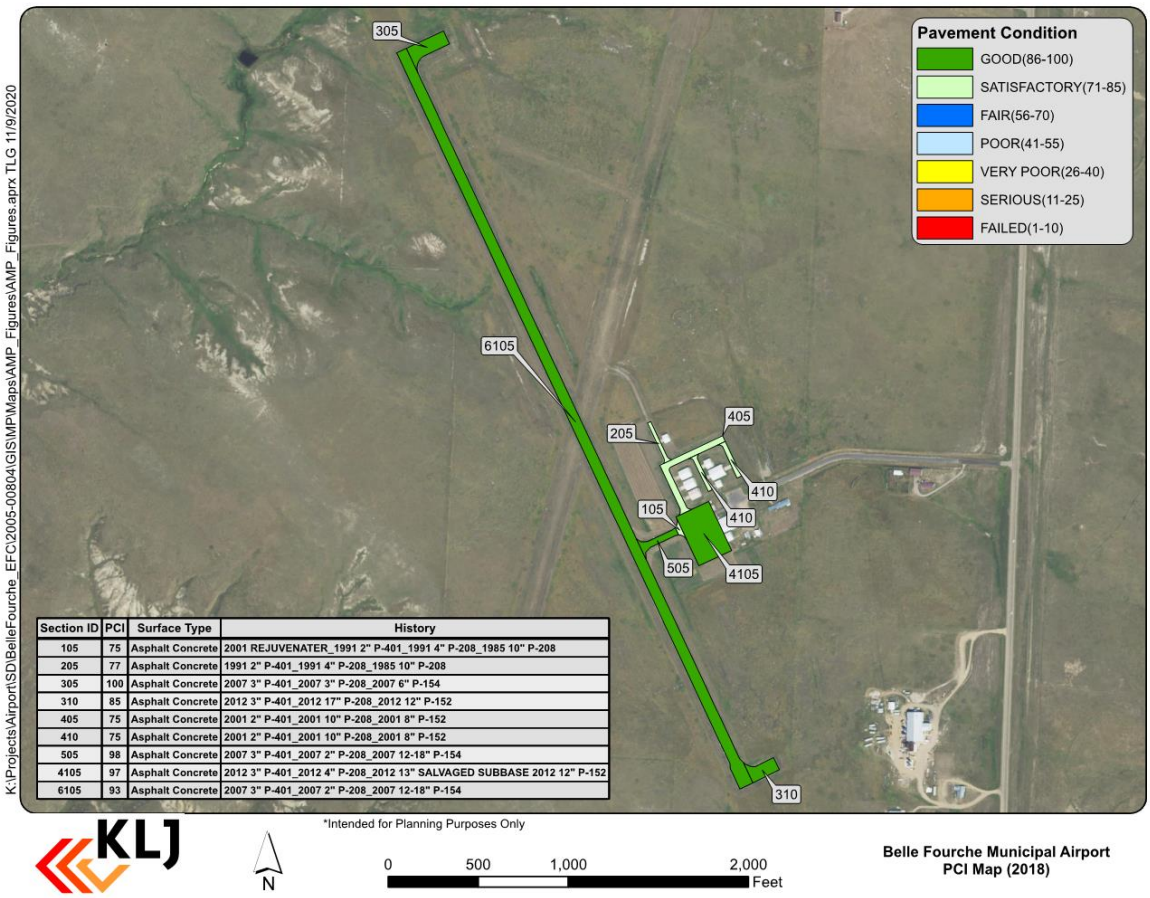
Airport pavements are basic infrastructure components at airports. Airfield pavements need to be maintained in a safe and operable condition for aircraft operations. Pavement condition is comprehensively evaluated by the State every three years and measured on a 0 to 100 scale known as the Pavement Condition Index (PCI) rating. Pavement evaluation includes runway, taxiway, and apron pavements. A summary of the latest PCI rating for the runway and selected other airfield pavements is tabulated in **Table 2-7** along with a map (**Figure 2-5**) to identify the areas of pavement.

*Table 2-7 – Pavement Condition Summary (2018)*

| Component | Surface Type(s) | LCD | PCI Range |
|---|---|---|---|
| Runway | BIT | 2007 | 93 |
| Apron | BIT | 2013 | 97 |
| Connecting Taxiway | BIT | 2001 / 2007 | 75-98 |
| Partial Parallel Taxiway | BIT | 2001 | 75 |
| Taxilanes | BIT | 2001 | 75-77 |
| Turn-Arounds | BIT | 2007 / 2012 | 85-100 |

*Source: SDDOT (2018)*
*PCI = Pavement Condition Index rating (0-100), LCD = Last Major Construction Date, AC = Asphalt Concrete, APC = Asphalt Overlay over PCC, PCC = Portland Cement Concrete*

*Figure 2-5 – Pavement Condition Map*




| Section ID | PCI | Surface Type | History |
|---|---|---|---|
| 105 | 75 | Asphalt Concrete | 2001 REJUVENATER_1991 2" P-401_1991 4" P-208_1985 10" P-208 |
| 205 | 77 | Asphalt Concrete | 1991 2" P-401_1991 4" P-208_1985 10" P-208 |
| 305 | 100 | Asphalt Concrete | 2007 3" P-401_2007 3" P-208_2007 6" P-154 |
| 310 | 85 | Asphalt Concrete | 2012 3" P-401_2012 17" P-208_2012 12" P-152 |
| 405 | 75 | Asphalt Concrete | 2001 2" P-401_2001 10" P-208_2001 8" P-152 |
| 410 | 75 | Asphalt Concrete | 2001 2" P-401_2001 10" P-208_2001 8" P-152 |
| 505 | 98 | Asphalt Concrete | 2007 3" P-401_2007 2" P-208_2007 12-18" P-154 |
| 4105 | 97 | Asphalt Concrete | 2012 3" P-401_2012 4" P-208_2012 13" SALVAGED SUBBASE 2012 12" P-152 |
| 6105 | 93 | Asphalt Concrete | 2007 3" P-401_2007 2" P-208_2007 12-18" P-154 |

*Source: KLJ Analysis*

All surfaces range from satisfactory to good with the lowest PCI rating being a taxilane at 77. The taxilane's edges are showing signs of deterioration and should be rehabilitated in the near future for the traffic coming from turf Runway 18-36. Taxiways and taxilanes to the northwest of the apron are showing transverse and longitudinal cracking with various areas of patch work, this should be inspected regularly to make sure there is no significant deterioration in the future.

## *Navigational Aids & Airspace*

Navigational aids (NAVAIDs) provide visual and electronic guidance to pilots enabling the airport to safely, efficiently, and effectively accommodate arriving and departing flights. Airspace is a resource that is necessary to allow flights to safely operate and maneuver in the airport environment. **Figure 2-3** identifies visual and electronic navigational aids and weather facilities graphically.

### VISUAL NAVIGATION AIDS

Visual aids are installed to provide airport usability during periods of darkness and/or low visibility. Pavement markings and lighting systems available at the airport are summarized in the following sections.

#### Identification Lighting

EFC has a clear and green rotating beacon, which is a two-sided light that assists pilots in the visual identification of a civilian airport. The clear and green beacon indicates a lighted land airport. The airport beacon is located east of turf Runway 18-36 and operates sunset to sunrise.

#### Pavement Edge Lighting

Pavement edge lighting fixtures are installed off the edges of runway and taxiway pavements to help pilots identify the edges and ends of pavement and facilitate safe operations in darkness and/or low visibility environments. Runway edge lights are white (bi-directional), except for the final 3,000 feet of the runway where the lights change color to amber to warn pilots approaching the end of the runway. The runway end threshold lights (bi-directional) are green when viewing down the runway at the start of takeoff roll and red when approaching the end of the runway. Taxiway edge lights are blue and omni-directional.

EFC has a Medium Intensity Runway Lighting System (MIRL) for Runway 14-32 which are pilot controlled during nighttime hours that was installed in 2010. The connecting taxiway is equipped with reflectors while taxilanes have no lights or reflectors.

#### Visual Approach Lighting

Visual approach lighting (or visual approach aids) provide vertical descent guidance to pilots for a specific runway end. These approach aids enable the pilot to acquire and maintain the correct glide path for landing. Precision Approach Path Indicator Lights (PAPI) are the current FAA standard equipment installed for this purpose. Precision approach path indicators project light along a standard glide path to a runway end, with red and white colored lights indicating the aircraft's vertical position (above, below, or on glide path) relative to the defined glide path.

EFC has a 2-box PAPI system installed on the left side of the runway for both ends of Runway 14-32 with a 3.00$^{o}$ glide path angle. The lights are currently owned and maintained by the airport.

### Pilot-Controlled Lighting

Airfield lighting systems allow for pilots to control the complexity and intensity of lights. At EFC, the MIRL for Runway 14-32 is pilot-controlled through the Common Traffic Advisory Frequency (CTAF), 122.8 MHz. REILs and MIRLs are a part of the pilot-controlled lighting system at EFC.

### Pavement Markings

Pavement markings provide visual guidance to aircraft to critical areas on the runway and taxiway surface. Runway markings vary in complexity depending on the type of approach.

Runway 14-32 is painted with Non-precision Runway (NPI) markings identifying the runway designation, threshold, aiming points, and centerline. Hold lines are painted on the connecting taxiway and the turn-around pads at 125 to 130 feet from runway centerline. Other markings include taxiway centerline striping, which provides clearance from pavement edges and fixed objects, and aircraft tie-downs.

### Airfield Guidance Signs

Guidance signs provide location, direction, and guidance information to pilots on the ground to enhance awareness. Signs are placed around the airfield to identify runway and taxiway intersections, runway hold positions and other guidance. Mandatory signs are red and identify an intersection with a runway or critical safety zone. Other types of signs include location, direction, destination, and distance remaining signs. Airfield signs at EFC include mandatory runway signs and guidance signs for pilots.

## ELECTRONIC NAVIGATION AIDS

Electronic navigational aids are installed to provide critical guidance information when operating in the airport environment. These navigational aids often provide horizontal and/or vertical guidance in conjunction with published navigation procedures. Electronic navigation aids available at the airport are summarized below:

### Global Positioning System (GPS)

GPS is a satellite-based navigation system that allows location to be triangulated from space-based satellites. Equipped aircraft can navigate between user-defined or FAA waypoints with lateral and vertical guidance. With ground-based transmitters known as Wide Area Augmentation System (WAAS) the system can provide accuracy down to a few feet. GPS is widely becoming the preferred aircraft navigation system and FAA is establishing en-route and approach procedures using this satellite-based technology. Runway 32 has a GPS instrument approach procedure established with both horizontal and vertical guidance.

**Table 2-8** provides a summary of navigational and visual aids available at the airport.

*Table 2-8 – Navigational Aid Summary*

| Component | Runway 14-32 | Runway 18-36 |
|---|---|---|
| Runway Dimensions | 4,501’ x 60’ | 3,634’ x 125’ |
| Pavement Markings | Non-precision (NPI) | Turf Marker Cones |
| Runway Lighting | MIRL | - |
| Taxiway Lighting | Reflectors | - |
| Approach Lighting | PAPIs | - |
| Instrument Approach Procedures | RNAV GPS RWY 32 | Visual |
| Navigational & Meteorological Aids | Rotating Beacon, Wind cones, Segmented Circle, Super AWOS | |

*Source: KLJ Analysis, * With vertical guidance*

## METEOROLOGICAL FACILITIES

Metrological facilities provide users with up-to-date weather information at the airport to aid in pilot decision making for safe flight operations.

### Wind Indicator(s)

Wind direction indicators provide an immediate visual indication of the wind direction and velocity. A segmented circle provides a visual indication of the wind direction and velocity together with runway alignment and/or traffic pattern information.

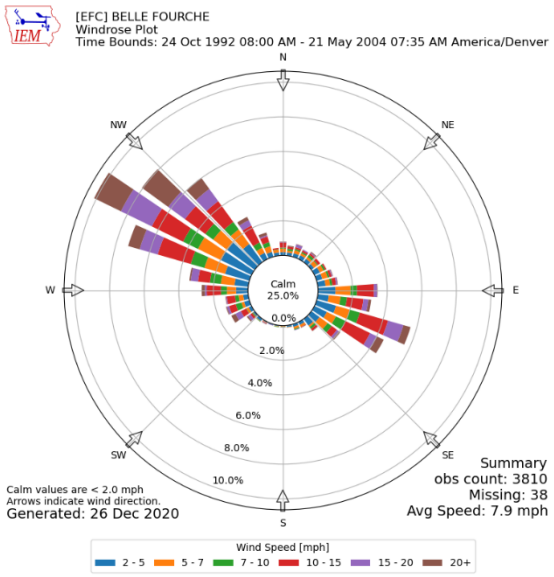
The primary wind cone and segmented circle at EFC is located on the north side of the Runway 14-32, approximated 135 feet west of the airport beacon.

### Weather Reporting

There are two types of weather reporting systems on an airport. The Automated Surface Observing System (ASOS) program was a joint effort between the Federal Aviation Administration and the National Weather Service (NWS) to deploy a network of high-grade weather monitoring stations across the United States. ASOS serves as a primary climatological observing network in the United States and have equipment that provides weather observations every minute. A second-tier Automated Weather Observation System (AWOS) has varying sets of equipment packages to provide local weather observations.

The airport is equipped with a SuperAWOS broadcasting on 122.8 MHz located near the segmented circle. The SuperAWOS system is not currently certified with the FAA and therefore the weather information cannot be used for instrument approaches or flight planning for aircraft operating under FAR Part 135 or 121 (Charters and Airlines).

## METEOROLOGICAL DATA




Local weather conditions are a significant factor in the design and development of airport facilities since they affect aircraft performance. Temperature affects runway length and wind direction while speed affects runway orientation, then visibility and cloud ceiling conditions determine the need for runway navigational aids and lighting. A full 10 years (2010-2019) of wind data was utilized from the EFC SuperAWOS for the wind coverage analysis. However, because the SuperAWOS does not record ceiling height, instrument meteorological conditions (IMC) could not be analyzed. Therefore, the AWOS station at Black Hills Airport – Clyde Ice Field (SPF) in Spearfish, SD located 15 NM to the south was used for IMC wind coverage and meteorological analysis. Over the last 30 years (1981-2010) the average maximum temperature at EFC in the hottest month has been 89.0 degrees Fahrenheit (July).

Prevailing winds at EFC are generally from the West-Northwest, which is not well aligned with the airport's North-Northwest runway configuration. Prior to EFC having a weather station installed on the airfield, weather data was gathered from the Rapid City Regional Airport (RAP) ASOS station which was

located roughly 54 nautical miles to the south east of EFC and along the east edge of the Black Hills. Since the RAP weather data was used at the time, the layout of the runways at EFC reflect the different wind conditions at Rapid City then what is experienced at Belle Fourche.

Crosswind or tailwind conditions can be hazardous to aircraft operations if they exceed the operational capabilities of the airplane or flight crew. The smallest aircraft are typically the most affected operationally by crosswinds.

A runway's wind coverage is determined by an aircraft's ability to operate with a "direct" crosswind, which is defined as 90 degrees to the direction of travel. For planning purposes, FAA has defined the maximum direct crosswind for small aircraft as 12 miles per hour (10.5 knots). For increasingly larger aircraft, a 15-mile per hour (13 knot) direct crosswind is used up through 23-mile per hour (20 knots) for the largest aircraft. Aircraft can operate safely in progressively higher wind speeds as the crosswind angle decreases and the wind direction aligns more closely with the opposing direction of flight. In addition, some aircraft are designed to safely operate with higher crosswind components. Ideally, an aircraft will take off and land directly into the wind or with a light crosswind. The FAA recommends that primary runways accommodate at least 95 percent of local wind conditions; when this level of coverage is not provided, the FAA recommends development of a secondary (crosswind) runway.

Based on Belle Fourche's runway design, the maximum crosswind component is 13 knots. The current runway orientations do not provide the FAA recommended minimum 95 percent wind coverage for both 10.5 and 13 knots. **Table 2-9** provides the calculated all-weather wind coverage for EFC airport.

*Table 2-9 – All-Weather Wind Coverage*

| Runway | Crosswind Component (Wind Speed) | | |
|---|---|---|---|
| | 10.5 knots | 13.0 knots | 16.0 knots |
| Runway 14-32 | 85.46% | 92.24% | 96.75% |
| Runway 18-36 | 81.48% | 88.59% | - |
| **Combined*** | **88.24%** | **94.07%** | **96.75%** |

*Source: KEFC SUPERAWOS (2010-2019, HOURLY) from National Climatic Data Center; 86,129 total observations*
**Combined assumes up to maximum design aircraft crosswind component for each runway*

Pilots can fly with visual reference to the ground and other aircraft during most weather conditions. This is known as Visual Meteorological Conditions (VMC). Pilots are required to reference flight instruments and be on a FAA Instrument Flight Riles (IFR) flight plan when the cloud ceiling is less than 1,000 feet above the ground, or the flight visibility is less than 3 statute miles. These conditions are known as Instrument Meteorological Conditions (IMC) and require a pilot to be instrument rated. As noted above, weather data was used from the Black Hills – Clyde Ice Field Airport (SPF) for analysis where IMC conditions needed to be determined.

Wind coverage during IMC is evaluated to determine the time when instrument approaches are needed at EFC. This will be applicable later in **Chapter 4: Facility Requirements** when analyzing instrument approach minimums and accessibility.

Based on true hourly weather data summarized in **Table 2-10**, SPF experiences IMC weather conditions 5.71 percent of the time. When considering the current instrument approach weather minimums of 400-foot cloud ceiling and 1-mile flight visibility, the airport has weather conditions below this criterion 13.4 days per year where the airport is not usable.

*Table 2-10 – Meteorological Analysis*

| Weather Condition | Percentage | Days per Year | Hours per Year |
|---|---|---|---|
| VMC | 94.29 | 344.1 | 8,259 |
| Usable IMC | 2.04% | 7.5 | 179 |
| **Usability** | **96.33%** | **351.6** | **8,438** |
| Below Weather Minimums* | 3.67% | 13.4 | 322 |
| ***Total*** | ***100.0%*** | *365.0* | ***8,760*** |

*Source: SPF AWOS (2010-2019, HOURLY) from National Climatic Data Center 74,484 Total Observations*
**Current IFR minimums are 400-foot cloud ceiling and 1-mile flight visibility for Runway 32 approach*

## COMMUNICATION FACILITIES

Communication facilities allow aircraft to transmit and receive clearances to air traffic control to navigate the national airspace system safely and effectively.

### Local Area

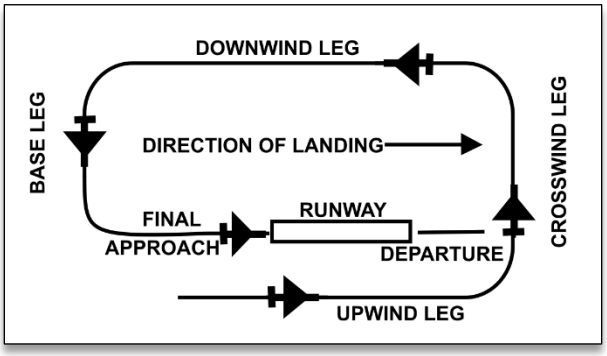
EFC is an uncontrolled airport and is not served by a local Air Traffic Control Tower (ATCT) providing landing and takeoff clearances. Individual aircraft are responsible for announcing their position and stating their intentions over an air-ground Common Traffic Advisory Frequency (CTAF), otherwise known as UNICOM. The CTAF frequency at EFC is 122.8 MHz. This system is typical for low activity general aviation airports such as Belle Fourche.

### Terminal Area

The terminal area generally describes the airspace within 40 nautical miles of an airport. At Belle Fourche, aircraft on the ground are unable to communicate with air traffic control. The nearest facility that provides communications to Denver Air Route Traffic Control Center (ARTCC) is the Rapid City Remote Communications Air to Ground (RCAG), located approximately 62 miles to the southeast. When airborne, Denver ARTCC can be contacted on 127.95 MHz.

## APPROACH/DEPARTURE PROCEDURES

Aircraft operate under either Visual Flight Rules (VFR) or Instrument Flight Rules (IFR) depending on weather conditions and/or operational standards.




*Standard VFR Airport Traffic Pattern (Source: FAA)*

### Visual Approach/Departure Procedures

Under VFR, pilots are advised to utilize a standard rectangular traffic pattern around the runway to approach or depart an airport. Standard traffic pattern legs include upwind, crosswind, downwind, base, and final. Departures are typically straight-out from a departing runway, a 90-degree crosswind, or 180 degree downwind. Arrivals typically enter a traffic pattern 45 degrees to a downwind leg for landing.

Air traffic at the Belle Fourche Municipal Airport follow the standard left-handed traffic pattern. The standard traffic pattern altitude is 1,000 feet above ground level (AGL).

### Instrument Approach Procedures

Pilots operating under IFR intending to land at an airport must navigate aircraft on published Instrument Approach Procedures (IAP). One IAP (see **Table 2-11**) is available for Runway 32 with satellite based NAVAIDS. Instrument approach weather minimums are a result of the approach type, airport infrastructure, and any prevailing airspace obstructions.

*Table 2-11 – Instrument Approach Procedures*

| Approach Procedure | Approach Type | Lowest Cloud Ceiling Minimum (HAT) | Lowest Visibility Minimum (n.m.) |
|---|---|---|---|
| RNAV (GPS) RWY 32 | Non-Precision Approach with Vertical Guidance | LPV: 400 feet<br>LNAV/VNAV: 400 feet<br>LNAV MDA: 500 feet<br>Circling: 600 feet | 1 mile |

*Source: Airnav.com*
*Note: HAT = Height Above Touchdown, n.m. = nautical miles (reported), LPV = Localizer Performance with Vertical Guidance, LNAV = Lateral Navigation, VNAV = Vertical Navigation, MDA = Minimum Descent Altitude*

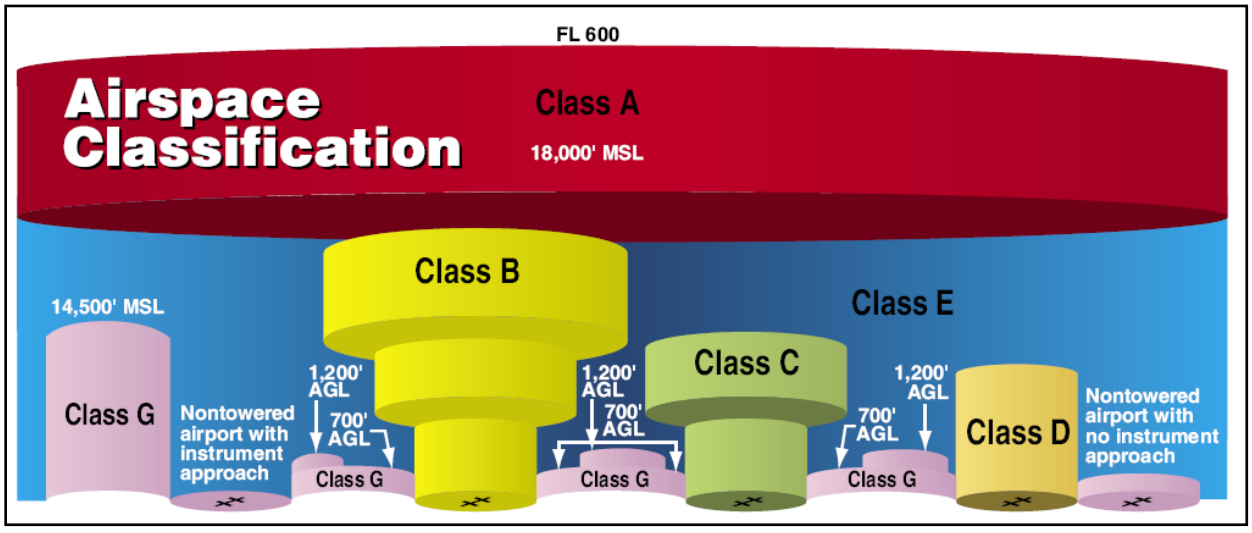
EFC has takeoff minimums for Runway 14-32. They are both standard but 14 has a minimum climb of 240 feet per nautical mile (NM) to 9,000 feet above ground level (AGL) and 32 has a climb of 413 feet per NM up to 3,900 feet AGL. For departure procedures on 14 in visual conditions, cross over the airport at 4,400 feet mean sea level and for 32, climb using heading 321˚ to 3,900 feet AGL.

## AIRSPACE & SURVEILLANCE

### Airspace Classification

Airspace is segregated into controlled, uncontrolled, special use or other airspace. Each airspace class has different operating rules. The airspace surrounding EFC is uncontrolled Class G airspace starting at ground level extending up to 700' and then 1,200 feet. After 1,200 feet airspace shifts into Class E. EFC airspace is uncontrolled which means that no Air Traffic Control (ATC) service is available for the airport, unlike controlled airspace that offers ATC services.

*Figure 2-6 – FAA Airspace Classifications*




*Source:* Federal Aviation Administration (FAA) Pilot's Handbook of Aeronautical Knowledge (2007)

## AIRSPACE OBSTRUCTIONS

Airspace is an important resource around airports that is very important for safe flight operations. There are established standards to identify airspace obstructions around airports. Title 14 CFR (Code of Federal Regulations): Part 77 *Safe, Efficient Use, and Preservation of the Navigable Airspace* establishes various airspace surfaces near airports. Part 77 is used to determine if an object is an obstruction that penetrates an "imaginary" three-dimensional surface. Surfaces include the primary, approach, transitional, horizontal, and conical surfaces each with different standards.

When evaluating objects, the FAA determines whether an obstruction is a **hazard** to air navigation. FAA subsequently evaluates the obstruction using more in-depth minimum airspace standards. These include FAA Approach/Departure Surfaces from FAA AC 150/5300-13A, *Airport Design* or instrument procedure surfaces identified in FAA Order 8260.3B, *U.S. Standard for Terminal Instrument Procedures (TERPS)*. Corrective action is then recommended. Examples of corrective action include removing, lowering, or obstruction lighting an object. A general diagram of the Part 77 surfaces can be found in **Appendix B: General Aviation Airports 101.**

Clear airspace is necessary for the safe and efficient use of aircraft arriving and departing an airport. The most demanding approach to a runway defines the Part 77 airspace standards for that runway. There are three main approach types:

- **Precision**: A runway having an existing instrument approach procedure utilizing an existing or planned Instrument Landing System (ILS) with horizontal and vertical guidance. Visibility minimums are less than ¾ mile.

- **Non-Precision**: A runway having an existing instrument approach procedure utilizing air navigation facilities with horizontal guidance, or area type navigation equipment, for which a straight-in non-precision instrument approach procedure has been approved or planned. Approaches with vertical guidance are considered non-precision. Visibility minimums are typically 1 mile but as low as ¾ mile.

- **Visual**: A runway intended solely for the operation of aircraft using visual approach procedures, with no straight-in instrument approach procedure published or planned.

There are two runway classifications:

- **Utility**: A runway that is constructed for and intended to be used by propeller driven aircraft of 12,500 pounds' maximum gross weight and less.

- **Other-Than-Utility**: A runway that is constructed for and intended to be used by aircraft greater than 12,500 pounds' maximum gross weight.

The combination of the approach type and the runway classification defines the dimensional criteria for each approach. The Part 77 airspace dimensional criteria for the airport is identified in **Table 2-12**.

*Table 2-12 – Existing Part 77 Approach Airspace Standards*

| Runway End | Approach Standards | Distance From Runway End | Inner Width* | Outer Width | Length | Slope |
|---|---|---|---|---|---|---|
| 14 | Visual Utility | 200’ | 500’ | 1,250’ | 5,000’ | 20:1 |
| 32 | Non-Precision Utility | 200’ | 500’ | 2,000’ | 5,000’ | 20:1 |
| 18 | Visual Utility | 0’ | 250’ | 1,250’ | 5,000’ | 20:1 |
| 36 | Visual Utility | 0’ | 250’ | 1,250’ | 5,000 | 20:1 |

*Source:* 14 CFR Part 77, FAA Airport Master Record
**Inner width is also the Primary Surface width driven by the most demanding approach to a runway.*

Currently there are no obstructions to any FAR Part 77 approach, but a more detailed obstruction analysis will be completed using data from an Aeronautical Survey, which is a part of the master plan process. This detailed obstruction identification and mitigation disposition is identified in the Airport Layout Plan developed at the end of this planning study located in **Chapter 7: Airport Layout Plan**.

## *General Aviation*

General Aviation (GA) elements include facilities that serve aeronautical needs of the flying public beyond those needed for commercial airlines. Facilities include those necessary for the movement of passengers as well as parking, service, and storage of aircraft. Examples of these facilities include the aircraft storage hangars, aircraft parking apron, GA terminal, and services. A map depicting these facilities is shown in **Figure 2-4: Terminal Area Facilities Map**.

### AIRCRAFT PARKING APRON

There is one aircraft parking apron at EFC that serves the loading, unloading and parking needs for general aviation aircraft. It has an area of approximately 6,600 square yards constructed of bituminous asphalt with eight tiedown areas for FAA Design Group I aircraft. It also provides access to the fueling system and the FBO facility.

### BUSINESS OPERATORS

Fixed Base Operators (FBOs) are commercial businesses providing multiple aviation services to the public, primarily for general aviation. Specialized Aviation Service Providers (SASOs) are commercial aviation businesses providing one or a few services.

The airport manager operates out of the FBO, Belle Fourche Flight Center, that is located on the main apron. The FBO also provides aircraft maintenance, flight instruction and aircraft rental services.

### TERMINAL BUILDING

A terminal building for general aviation traffic serves multiple functions for inbound and outbound general aviation passengers and pilots. The terminal facility at EFC is located in the FBO building. Facilities available include restrooms with showers, a waiting room for pilots and passengers and a pilot’s lounge. Services include a public telephone, computerized weather and internet access.

### AIRCRAFT STORAGE HANGARS

Aircraft storage facilities are detailed below in **Table 2-13**. Refer to **Figure 2-4: Terminal Area Facilities Map** for facility locations.

*Table 2-13 – Aircraft Storage Hangars*

| Facility Number | Location | Description | Storage Area (SF) |
|---|---|---|---|
| 1 | North Taxilane | Private | 1,400 |
| 2 | Main Taxiway | Private | 4,000 |
| 3 | Main Taxiway | Private | 3,000 |
| 4 | Main Taxiway | Private | 2,900 |
| 5 | Center Taxilane | Private | 1,700 |
| 6 | Center Taxilane | Private | 5,000 |
| 7 | Center Taxilane | Private | 1,000 |
| 8 | Apron | FBO/Maintenance | 8,100 |
| 9 | Apron | Private | 1,800 |
| | | Total | 28,000 |

*Source: KLJ Analysis*

## *Support Facilities*

Support facilities are necessary to facilitate the day-to-day maintenance and operation of the airport. A map depicting these facilities is shown in **Figure 2-4: Terminal Area Facilities Map**.

### AIRPORT MAINTENANCE

EFC has a building to store snow removal equipment (SRE). The airport currently has a 2003 pickup truck with a blade on the front. There is also a Case tractor with a blade and snowblower on the back, this was a state surplus purchase. The airport manager operates and helps maintains all this equipment.

### FUELING FACILITIES

The public fueling facility is located on the north east corner of the main apron next to the FBO building. The facility is self-service and offers 100 octane low lead AVGAS and Jet-A fuel. Built in 2016, the components of the fueling system includes a 5,000-gallon tank for AVGAS and a 5,000-gallon tank of Jet-A, a fuel pump, hose reel, and card reader.

### FENCING & SECURITY

Belle Fourche Municipal Airport is enclosed by a 10-foot wildlife fence surrounding the airport property. The main gate access is located on the apron north of the FBO hangar. This gate provides access from Airport Road to the hangar and apron area. There is another access gate to the east of the hangar area to get to the segmented circle and windcone and northern part of the airfield. The gates to drive through are locked and require a key for access while most of the gates that can be walked through remain unlocked with a single latch.

## *Ground Access, Circulation & Parking*

These facilities provide vital connectivity within the airport facility and from the airport to the surrounding community. Facilities are depicted in **Figure 2-4.**

Public access to the airport is through Airport Road, a paved surface, that leads to the main parking area of the FBO. Airport road connects to CanAm Highway also known as US-85 that leads to the City of Belle Fourche to the south. There are no on-airport or perimeter roads at EFC.

There is a main parking lot next to Belle Fourche Flight Center along with another lot to the north next to the perimeter fence. These lots are both loosely-defined with gravel surfaces and no designated parking slots. These lots are shown graphically on **Figures 2-4: Terminal Area Facilities Map.**

There is a courtesy car provided by the FBO when needed. There are also two taxi companies serving the City of Belle Fourche, All Night Flights and Anytime Taxi.

### *Other*

#### UTILITIES

The following utility infrastructure is available at the airport to serve facility demands:

- **Power:** Butte Electric for airfield and landside power.
- **Water:** EFC has no onsite water source. The water is trucked in on a 2,200-gallon cistern tank from the City by the airport manager once a week or every ten days. The nearest water line is approximately 3 miles south at Water Tank Road. An option for a water line will be discussed in **Chapter 4: Facility Requirements.**
- **Sanitary:** The FBO and house on the airport are the only two buildings that have septic that is run by the city.
- **Telecommunications:** CenturyLink provides land line services while internet runs off of the satellite dish.
- **Natural Gas:** Williston Basin with a Montana-Dakota Utilities Company regulator.

#### AIRPORT COMPLIANCE

The airport sponsor dedicates airport property for aeronautical use. Any use of airport property should be evaluated for compatibility with the airport's planned development and FAA grant assurances. Noted non-aeronautical land uses and encumbrances to airport property are described below:

- Black Hills Utility Company Gas and Telephone Line
- Montana Dakota Utilities Company Gas Pipeline
- Northwestern Bell Telephone Company Underground Telephone Line

Airport compliance issues including status of FAA approval and steps for airport to achieve compliance with FAA grant assurances per FAA Order 5190.6B, *FAA Airport Compliance Manual* is identified in **Chapter 6: Implementation & Compatibility**.

## Surrounding Land Use

### *Background*

The effect of airport planning decisions extends well beyond the airport property boundary. The land uses that surround the airport must be evaluated to help determine the impact of airport planning decisions.

Compatible land uses are defined as those uses that can coexist with a nearby airport without either constraining the safe and efficient operation of the airport or exposing people working or living nearby

to unacceptable levels of noise or safety hazards. Typical airport land use compatibility elements for airports include:

- FAA airspace standards for airport safety and operational capability.
- FAA land use compatibility near runway ends associated with the Runway Protection Zone (RPZ) for the safety of people and property on the ground.
- State or local airport land use standards, if applicable.
- FAA wildlife hazard mitigation plans for aircraft operational safety.
- FAA land use compatibility within designated day-night average sound level (DNL) noise exposure contours to avoid significant impacts to activities on the ground.

This section provides an overview of existing land uses and plans. Surrounding land uses are depicted graphically in **Figure 2-8: Land Use Map.**

### *Existing Land Uses*

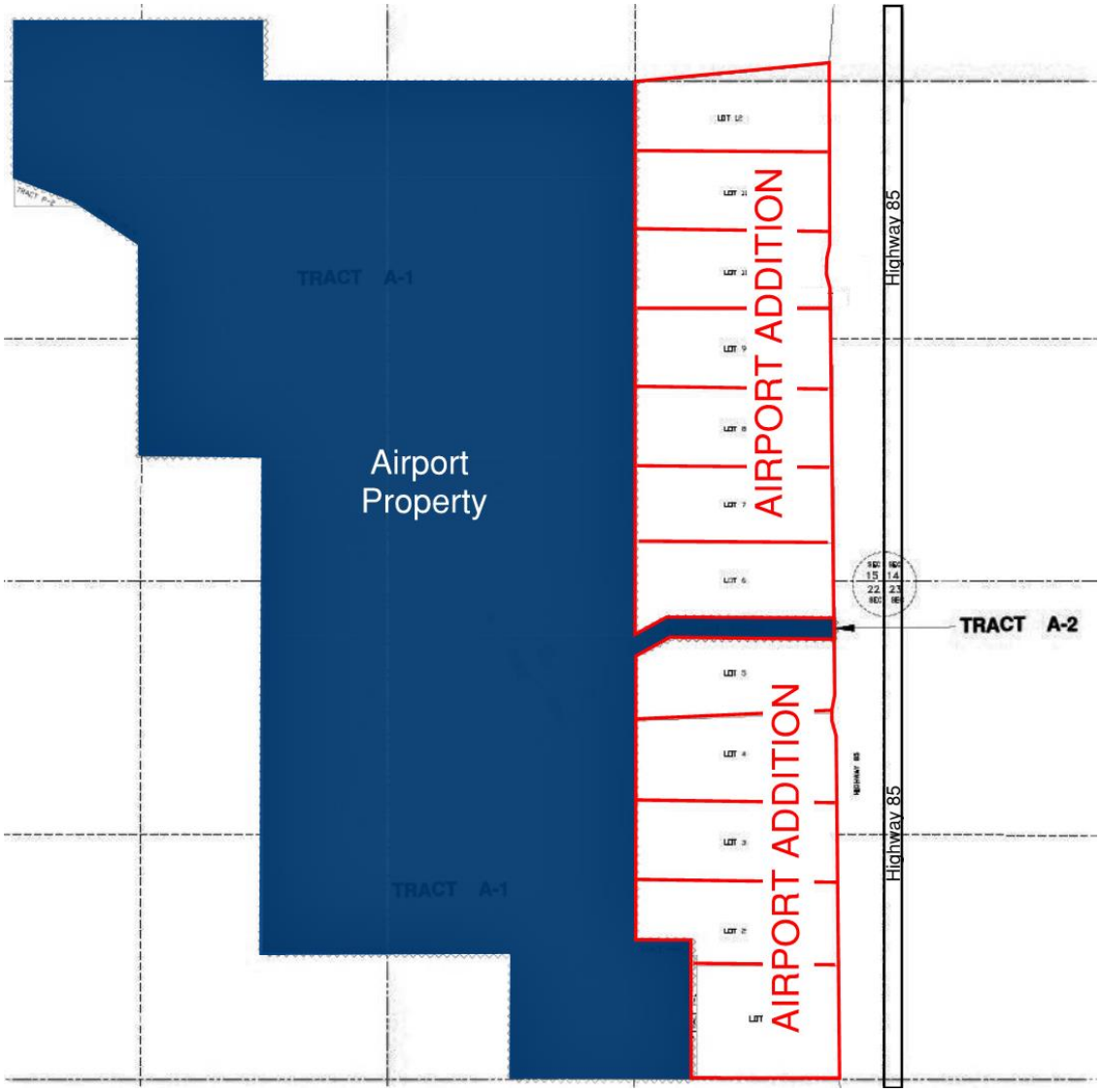
EFC sits north of Black Hills National Forest and is surrounded mostly by Rural Residential. There is a commercial factory to the east of the Runway 32 End and two single/family residential properties; one south of Airport Road and one to the east of the Runway 18 End. The airport is connected by public US Highway 85 that runs to the east of the airport property. All RPZ's are currently compliant with FAA standards.

### *Land Use Controls, Plans & Zoning*

The City of Belle Fourche has categorized the airport as part of the Heavy Industrial District according to the Belle Fourche Zoning Ordinance, which does reserve land for current and future needs of the airport. The zoning map released with this document shows land to the east of the airport to the highway as Airport Additions which can be seen in **Figure 2-7**. All other surround land is categorized as agricultural as shown in **Figure 2-8**.

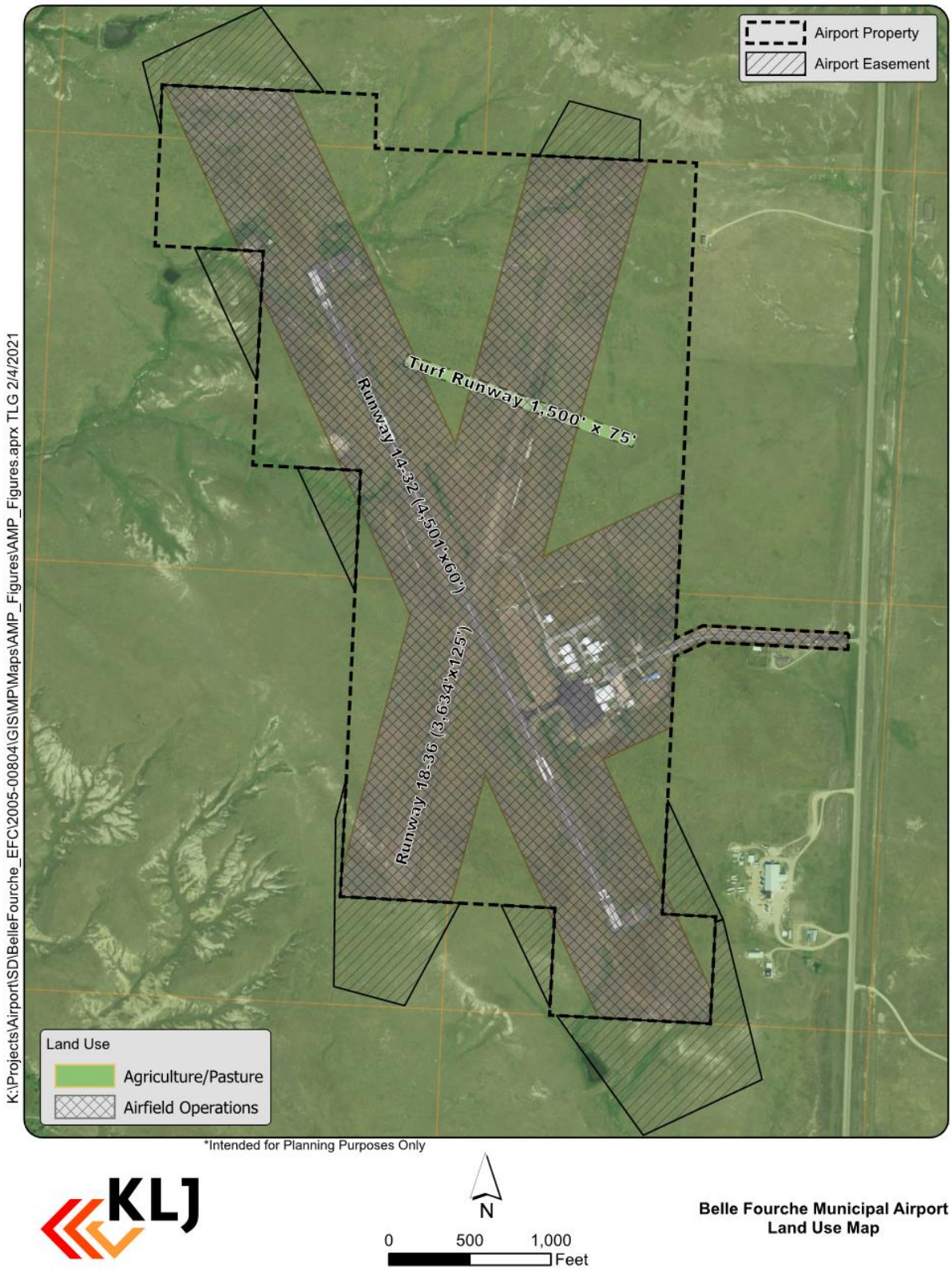
The most recent Belle Fourche Comprehensive Plan also states the additions to the airport will continue to be made as funding becomes available but no mention of any land issues for future plans.

*Figure 2-7 – Airport Zoning*




*Source: City of Belle Fourche Planning and Zoning*

*Figure 2-8 – Land Use Map*



# Environmental Inventory

## *Introduction*

This section provides an overview of environmental conditions and issues at the airport and the immediate vicinity. This environmental review section is not intended to fulfill the requirement of environmental review required by National Environmental Policy Act (NEPA) or provide a definitive class of action determination for the proposed improvements. The purpose of this environmental review is to provide community, airport sponsor, and regulatory awareness of the importance of minimizing the environmental impacts this airport improvement area and to provide a general indication of the likely need for further investigation. Appropriate environmental documentation in accordance with FAA Order 5050.4B, *NEPA Instructions for Airport Actions* and FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures* is required to be completed prior to commencing with project actions.

Key environmental resources are described for the existing airport area. **Figure 2-9: Environmental Overview Wetland Inventory** provides a graphical depiction of the existing environmental conditions described in this section.

## *Relevant Environmental Features*

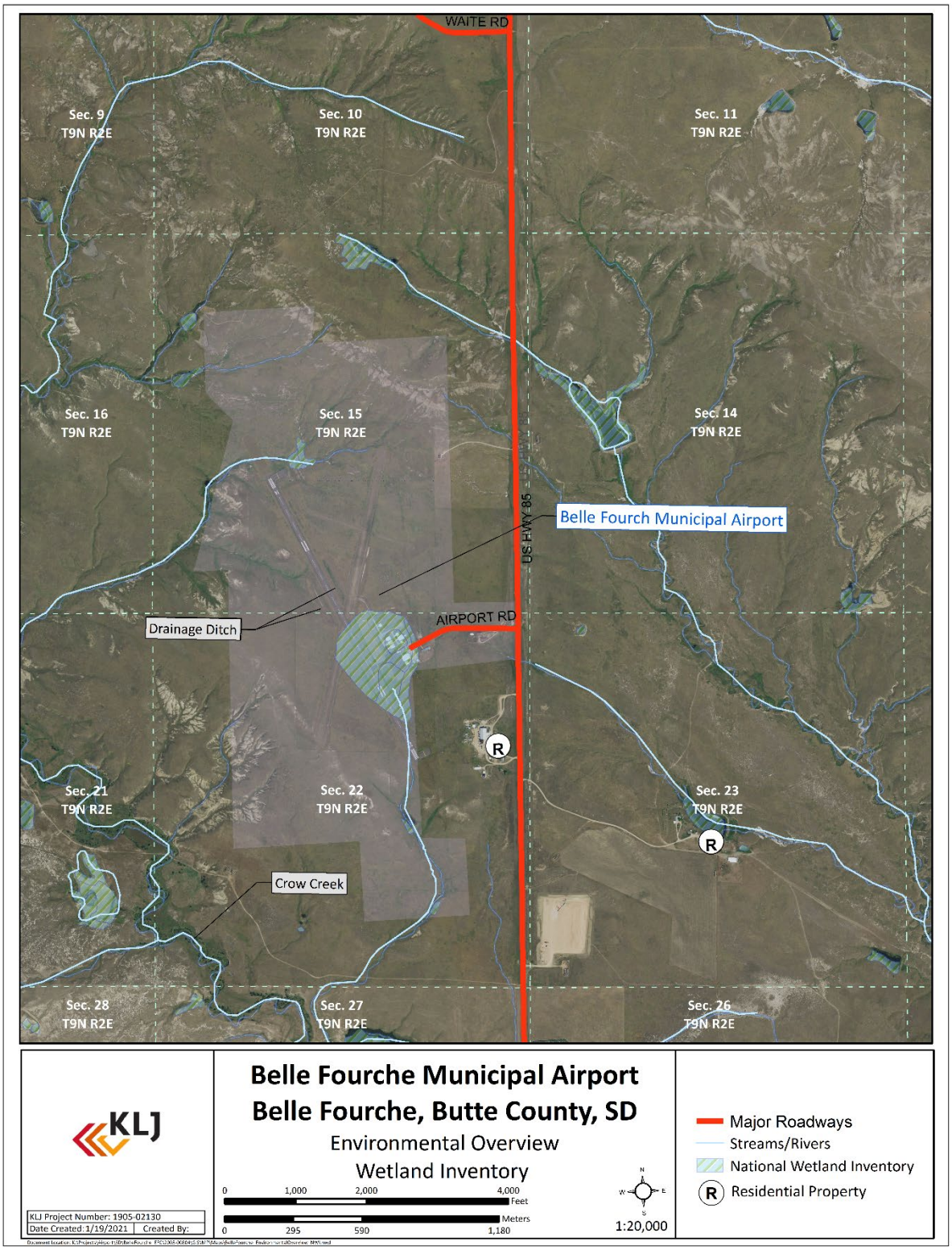
### BIOLOGICAL RESOURCES

Biological resources include flora and fauna that are present in an area. EFC is located in the Northwestern Great Plains Ecoregion according to US Geological Survey. Vegetation in this area consists of mostly mixed grass prairie most, which is an intermediate ecosystem between a short grass and a tall grass prairie. The primary plants that make up a mixed grass prairie include western wheatgrass, green needle grass, blue grama, buffalograss, sideoats grama, and little bluestem. Common forbs and shrubs found in the area are purple coneflower, American vetch, Missouri greenrod, silver leaf scurfpea, and silver sagebrush. The surrounding area is used mostly as pasture to raise cattle and other livestock.

*EFC Airport Setting*

The following is not a complete list of fauna that could be present in the area; it represents the species most likely to be encountered. Bison historically roamed through the area. Wildlife species likely to be encountered in the area surrounding the airport include mule and white-tail deer, antelope, jackrabbit, cottontail-rabbit, coyote, badgers, raccoons, skunks, prairie dogs, turkey, pheasant, and grouse.

*Figure 2-9 - Environmental Overview Wetland Inventory*



According to the U.S. Fish and Wildlife Services website, federally listed endangered, threatened, proposed or candidate species in Butte County include the Whooping crane, Northern long-eared bat, and Red Knot Rufa. In accordance with Section 7 of the Endangered Species Act, consultation with USFWS to determine the potential for occurrences of federally-listed threatened and endangered species in the project area would be necessary. Prior to project implementation, further analysis is required to identify the potential for fish, wildlife and plant impacts as a result of any proposed projects.

### DEPARTMENT OF SECTION 4(F) AND SECTION 6 (F)

Section 4(f) is applicable to projects which require the use of publicly-owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or land of an historic site of national, state, or local significance. There are blocks of land owned by the Bureau of Land Management a few miles to the west and north of EFC, there is a game production area located about seven miles east of EFC along the shore of Belle Fourche Reservoir, and there are a couple of blocks of school lands to the east and northeast of EFC. **Figure 2-10: Environmental Overview Topo Map Inventory** provides a graphical depiction of the areas surrounding the Airport property.

There are no known publicly owned lands from parks, recreation areas, or refuge areas within the immediate vicinity of the Airport. Further review of the potential to impact Section 4(f) resources specifically regarding potential cultural sites or historic properties would be required at the environmental documentation phase of any projects that would require ground disturbance.

Section 6(f) from the Land & Water Conservation Fund Act provides that the Secretary shall not approve any program or project which requires the use of state and local parks, lakes, trails, beaches, and conservation lands, unless: (1) if the request complies with Section 4(f), (2) information is provided that is needed to make findings required under Section 6(f), and (3) coordination is carried out with the NPS and the state agency responsible for the Section 6(f) property. A review of Land Water Conservation Fund grants for Butte County indicates that nine grants have been issues for properties within the county. These properties are not located near the Airport. Proposed improvements are not anticipated to impact existing Section 6(f) properties; therefore, no further analysis is required.

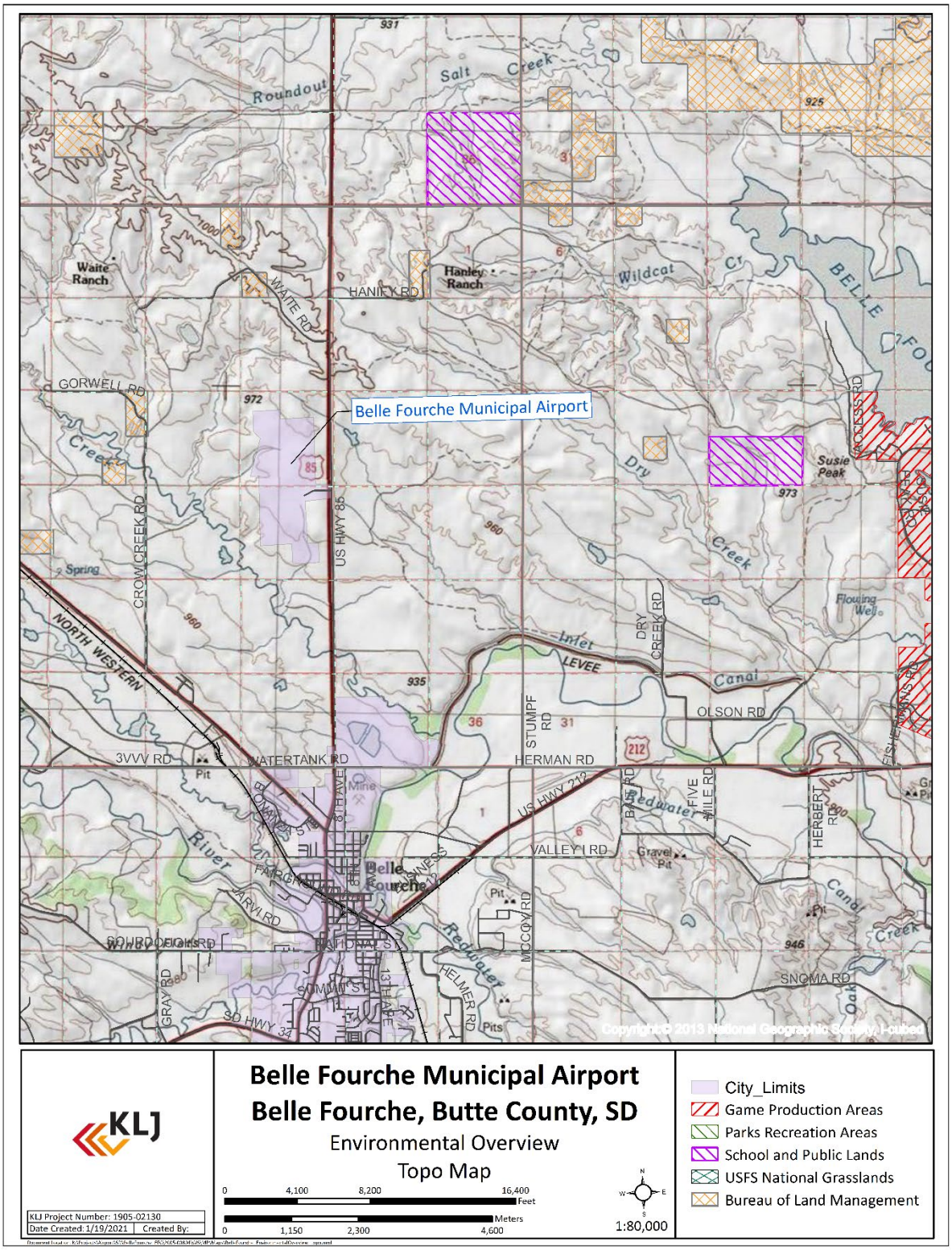
### HAZARDOUS MATERIALS

There are no reported spills or hazardous material leaks in or around EFC. This is based on a review of the SD Department of Environment and Natural Resources and Environmental Protection Agency databases regarding underground storage tanks, listings for superfund sites, and sites covered under the Resource Conservation and Recovery Act. Prior to acquisition of new land to be owned in fee title by an airport sponsor, FAA recommends that an Environmental Due Diligence Audit (EDDA) be performed. An EDDA includes a more detailed review of an area, relative to NEPA-level review, for the possible presence of environmental contamination.

### SOLID WASTE

The airport has not produced significant amounts of solid waste including garbage, refuse or sludge as compared to the broader community. FAA requires a Solid Waste Management Plan to be developed as part of this Airport Master Plan study. A Solid Waste study is in **Appendix E: Recycling & Solid Waste Plan**.

*Figure 2-10 - Environmental Overview Topo Map*



## HISTORICAL, ARCHITECTUAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

A file search was completed by the South Dakota State Historical Preservation Office (SHPO). There are historic structures registered on the National Register of Historic Places (NRHP) within a one-mile radius of the Belle Fourche Municipal Airport. A Prehistoric Artifact Scatter and a Prehistoric Isolated Find were previously recorded on Airport property. They were determined to be Not Eligible for the NRHP. There is a potential that undiscovered cultural features exist on and around the Airport. Additional research, including an updated field survey, may be necessary to adequately assess the area's potential to contain historic properties.

Before a project that involves land disturbance is implemented, an inventory to identify the potential for cultural resources would need to be conducted for the project area. Coordination with the SHPO is necessary for projects involving land disturbance. Additionally, any project affecting buildings that have the potential to be listed in the National Register of Historic places would require coordination with SHPO.

Structures that are more than 50 years old may be eligible for inclusion on the NRHP. Considering the airport was opened in 1986, no airport structures would be more than 50 years old.

Projects that involve ground surface disturbance in areas not previously disturbed by the construction of the Airport will also need to be surveyed by a qualified Archeologist and a determination of affect to historic properties would need to be obtained from the SHPO. Resolutions of any adverse effects would need to be coordinated with the SHPO. Further review regarding potential cultural sites historic properties may be required at the environmental documentation phase.

## FARMLAND

*Agricultural Land Uses Near of EFC*

Impacts to farmlands considered to be prime, unique or statewide or locally important need to be considered under NEPA. The Farmland Protection Policy Act (FPPA) of 1981 provides protection to prime and unique farmlands. The Act defines prime farmland as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses. Unique farmland is farmland that is used for production of specific high value food, feed, and fiber crops. Statewide farmland is of statewide importance for the production of food, feed, fiber, forage, and oil seed crops, and is determined by state agencies. Locally important farmland is where the production of food, feed, fiber, forage, and oilseed crops, are not identified as having national or statewide importance but identified by local agencies as important.

A search of the USDA Natural Resources Conservation Service (NRCS) web soil survey identified land located on the is not Prime Farmland. There are small segments of land classified as Farmland of Statewide Importance. Further consultation with NRCS would be required during a project environmental review stage to calculate the Farmland Conversion Impact Rating to determine if land outside the existing airport property would be acquired and converted to airport property.

## LAND USE

Compatible land uses are those that typically are not influenced by normal airport operations. The compatibility of existing land uses in the vicinity of an airport is usually associated with the extent of noise impacts occurring from airport property and safety concerns. Incompatible land uses are typically items such as fuel storage facilities, areas of public assembly, tree rows, high density residential areas, and areas that have the potential to attract hazardous wildlife. In general, EFC is surrounded by prairie pastureland and open spaces. There are two homes located approximately 1,000 feet and 3,700 feet to the east of the Runway 32 End. Other land use considerations including surrounding physical land uses, airport zoning regulations and FAA airport design land use compatibility standards have been previously identified in this Chapter.

### *Wildlife Hazards*

FAA has implemented procedures and guidelines to mitigate wildlife damages to aircraft and aviation operations. Wildlife collisions have increased over the past two decades and reporting has increased awareness of hazards to human health, safety and financial losses.

Property surrounding EFC is private pastureland. The city of Belle Fourche sewage disposal ponds are located 2.2 miles to the southeast of the airfield and should be monitored to ensure the ponds are not attracting wildlife that could pose a danger to aircraft using EFC. Additionally, Belle Fourche Reservoir is located approximately eight miles east of the Airport and should be monitored as well.

EFC is surrounded by a 10-foot-high perimeter fence that has shown to provide adequate protection from large mammals such as deer, antelope and coyotes from crossing over the Airport property including operations areas such as the runway. Gophers are occasionally a problem during the summer on the turf runways and taxiways. The Airport should monitor wildlife concerns and if an issue is identified a site visit from a qualified wildlife biologist could help to provide recommendations to reduce wildlife concerns at the airport.

## WATER RESOURCES

### *Wetlands*

Wetlands are defined in Executive Order 11990, Protection of Wetlands, as those areas that are inundated by surface or groundwater with a frequency to support, and under normal circumstances does or would support, a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Three parameters that define a wetland as outlined in the US Army Corps of Engineers Wetland Delineation Manual are hydric soils, hydrophytic vegetation, and hydrology.

There are wetlands in the National Wetland Inventory (NWI) located on the Airport property. Notably there is a successfully drained basin located near the center of the Airport where the terminal apron, taxiways, and central portion of the primary runway are located. This area is drained by ditches running parallel to the primary runway, with flow to both the northwest and to the southeast. It appears that the ditches may have developed some wetland characteristics most notably wetland vegetation and hydrology. Prior to project implementation, wetlands would require a field delineation to clearly identify their boundaries. Coordination with USACE would need to be completed at the environmental documentation phase. In addition to maintaining water quality in rivers and recharging groundwater

among other positive benefits, wetlands may have the potential to attract wildlife that can be hazardous to aircraft using the Airport. Please refer to **Figure 2-9**.

## *Surface and Ground Waters*

The Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977, provides the authority to establish water quality standards, control discharges into surface and subsurface waters, develop waste treatment management plans and practices, issue permits for discharges (Section 402) and for dredged or fill material (Section 404).

Airport activities can affect water quality. This is mainly due to stormwater runoff from paved areas. Providing treatment for stormwater runoff from runway, taxiway and apron areas through the use of best management practices and grassed swale areas would minimize potential impacts to water quality.

*Drainage ditch on west side of primary runway, draining to the northwest.*

Drainage at EFC generally flows through a network of manmade ditches into nature drainages located on the northwest and southeast portions of the airport. These ditches flows into Crow Creek about half a mile southwest of the airport. Crow Creek discharges into the Belle Fourche River. The airport is located within the Belle Fourche watershed.

## *Environmental Features Not Relevant*

### AIR QUALITY CLASSIFICATION

The FAA Orders 1050.1F and 5050.4B outline procedures for determining when airport-related projects require an air quality analysis, and if so, what level of analysis may be necessary. The Airport is located within an area of attainment for all National Ambient Air Quality Standards (NAAQS); due to the small size of the airport and limited number of operations that would occur at the airport detailed analysis is very unlikely to be required.

### CLIMATE

Although there are no federal standards for aviation-related Green House Gas (GHG) emissions, it is well-established that GHG emissions can affect climate. The Council on Environmental Quality (CEQ) has indicated that climate should be considered in NEPA analyses. As noted by CEQ, however, "it is not currently useful for the NEPA analysis to attempt to link specific climatological changes, or the environmental impacts thereof, to the particular project or emissions; as such direct linkage is difficult to isolate and to understand."

With respect to GHG emissions, aviation activity at Belle Fourche Municipal Airport represents a small percentage of U.S. and global emissions; therefore, no further review is required.

### COASTAL RESOURCES

Coastal Resources include Coastal Barriers and Coastal Zone Management. Coastal Barriers include islands that protect the mainland from storm or hurricane-driven winds or waves by providing a buffer to the shoreline. Coastal Barriers protect fish, wildlife, human life, and property along coasts and shorelines. Facilities are not recommended to be built within the Coastal Barrier Resource System (CBRS). Coastal Zone Management includes development provisions actions to protect major shorelines and associated recreational, historical, cultural, and aesthetic values. The area is not located near a coastal zone as defined in the Coastal Zone Management Act of 1972. No further analysis is required.

### NATURAL RESOURCES AND ENERGY

Impacts on energy supplies and natural resources are related to changes of stationary facilities, such as airfield lighting or terminal building heating and expansion, as well as any increase of fuel consumption by aircraft or ground vehicles. Proposed improvements at EFC would require additional energy but is not anticipated to cause significant impacts to energy supplies or natural resources. No further analysis is required.

### NOISE AND NOISE COMPATIBLE LAND USE

Noise emitted from aircraft can significantly affect the well-being of people living or working near an airport. The FAA requires noise studies for certain projects. If a project involves Airplane Design Groups I and II and has forecasted operations of less than 90,000 annual propeller operations or 700 annual adjusted jet operations such as the case at EFC then no further noise analysis is required.

### SOCIOECONOMIC IMPACTS, ENVIRONMENTAL JUSTICE AND CHILDREN'S ENVIRONMENTAL HEALTH AND SAFETY RISKS

Social impacts from a project depend on how that project affects the character, habits, and economic conditions of the people living within the affected area of the project. The project's effects on business, employment, transportation, utilities, etc. are factors that affect the social climate of a community. Any action that would either adversely or beneficially affect the factors stated above would be considered as having some type of social impact on the residents of a particular community. Due to the remote location of the Airport, adverse impacts to minority and low-income populations is very unlikely. Similarly, the location would preclude health and safety risks to children because the lack of people living in the area. No further analysis is required.

### VISUAL IMPACTS

The aesthetic value of an area is influenced by its landscape and the viewer's response to the view, scenic resource, or man-made features. The extent of potential visual contrast/compatibility effects with adjacent landforms and land uses are addressed from the vantage point of those looking to an airport from outside the system.

### WATER RESORCES

#### *Floodplains*

Floodplains constitute lands situated along rivers and their tributaries that are subject to periodic flooding on the average interval of 100 years or less. EFC is not located within a 100-year floodplain; therefore, no further analysis is required.

### *Wild and Scenic Rivers*

No designated Wild and Scenic Rivers are located near EFC. No direct or indirect impacts to wild scenic rivers would occur due improvement. No further analysis is required.

## Conclusion

The information collected and documented in this Inventory chapter provides a baseline foundation to update the Belle Fourche Municipal Airport long-range plan. This information will feed into future sections to determine how facilities will meet the projected airport needs based on aviation activity forecasts.