Chapter 2 – Inventory of Existing Conditions

The purpose of this chapter is to document the existing facilities and conditions at Ephrata Municipal Airport (Airport Identifier Code: EPH.) The Port of Ephrata owns and operates Ephrata Municipal Airport

The inventory section of the Airport Master Plan summarizes existing conditions for all facilities at Ephrata Municipal Airport (EPH). This section also summarizes other pertinent information relating to the community, the airport background, airport role, surrounding environment, various operational parameters and other significant characteristics.

The information in this chapter describes the current status of EPH and provides the baseline for determining future facility needs. Information was obtained through site visits, consultant research, review of existing documents, and interviews with various stakeholders and airport management.

Airport Ownership and Management

The Port of Ephrata (Grant County Port District No. 9) owns and operates EPH. The Port Director/Airport Manager oversees administrative and operations functions of the airport under the direction of the Port Commission, which establishes policy and defines priorities.

Airport Setting

EPH is located in the City of Ephrata's city limits, within Grant County. Ephrata is located in central Washington, approximately 20 miles northwest of Moses Lake, 49 miles east of Wenatchee, and 123 miles west of Spokane. The airport is located east of downtown Ephrata, with highway access provided by State Route 282 and State Route 28. A location and vicinity map is provided in **Figure 2-1**.

City of Ephrata -Historical Timeline[1]

1880 – The City of Ephrata began seeing settlers.

1892 – The Great Northern Railroad gave the town its first official name "Station 11," which later changed to Ephrata.

1901 – The town was first platted and became a common stop for travelers moving from Walla Walla to the Okanogan region.

1909 – The town was incorporated and became the county seat for Grant County.

1933 to 1942 – The Grand Coulee Dam was built to provide irrigation water to the area, and created a government industry for Ephrata.

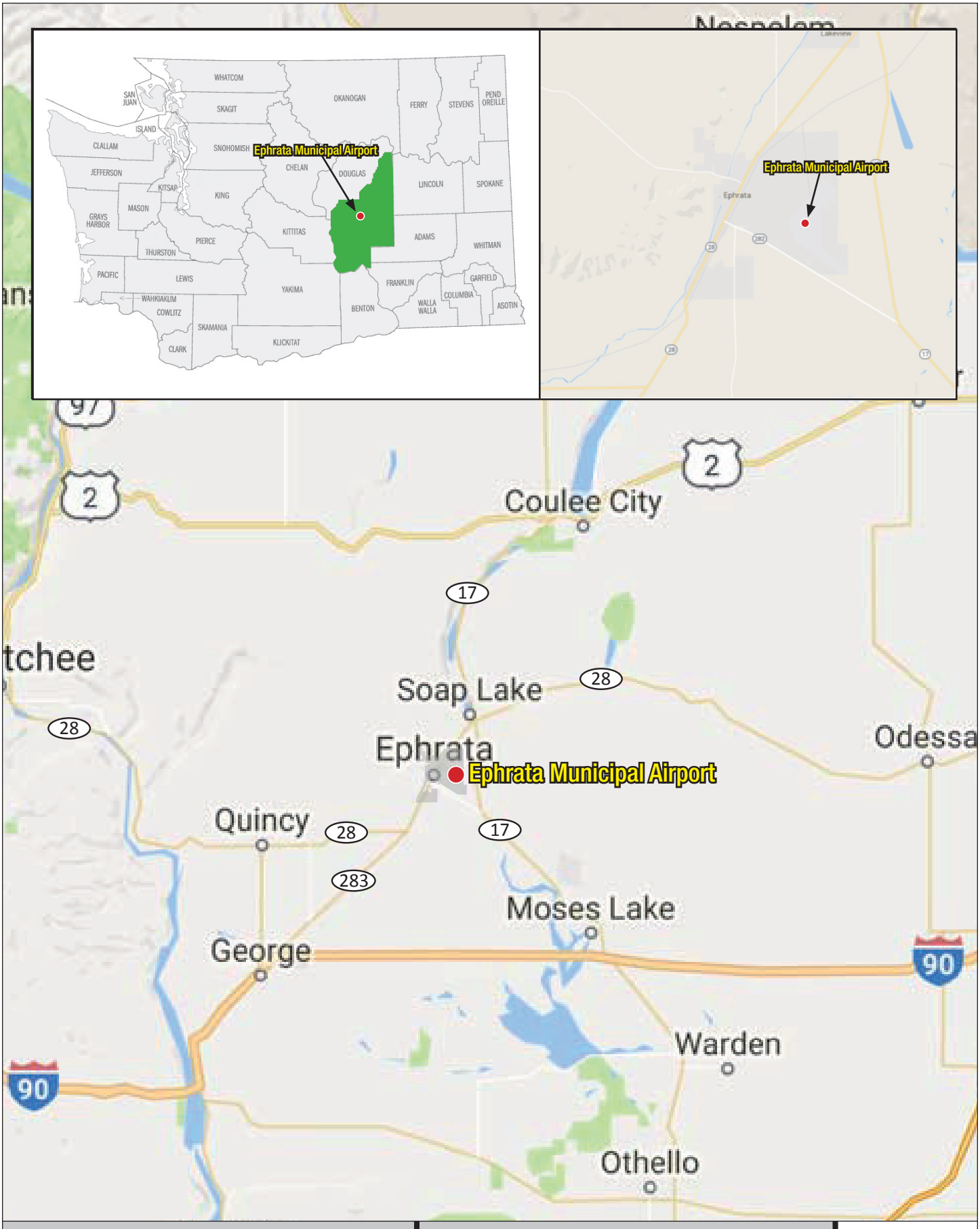
1941 – The government leases property from the City of Ephrata with the intent of constructing a training base.

1942 – The U.S. Army Air Corps built a large training base in Ephrata.

1945 – The airport was transferred to the City of Ephrata.

1965 – Grant County Port District No. 9 was established following voter approval.

[1] City of Ephrata website



LOCATION MAP
FIGURE 2-1

EPHRATA MUNICIPAL AIRPORT
AIRPORT MASTER PLAN

CENTURY WEST ENGINEERING

Physical Geography

Grant County is located in central Washington State in the Columbia Basin and has a land area of approximately 2,680 square miles. The land area is comprised of mostly desert terrain and irrigated lands. Grant County borders the east side of the Columbia River (located approximately 20 miles to the west) and has two large lakes (Moses Lake and Banks Lake), with several smaller lakes including Soap Lake and Lenore Lake.

Grant County is located on a fertile plateau in the Columbia Basin. The origin of the Columbia Basin dates back tens of millions of years. The Basin was transformed through a series of major geologic events, including the Great Missoula Floods, which occurred 14,000 to 18,000 years ago.

Climate

Ephrata has a semi-arid climate that has cold mild winters and dry warm summers with four distinct seasons. Historic climatic data for EPH is available from 1949 through 2016.[2] The data indicate that July and August are typically the warmest months; December and January are the coldest. On a monthly basis, the average maximum temperature is 88.8 degrees Fahrenheit (July) with the average minimum temperature of 33.9 degrees in January. Ephrata averages 7.53 inches of precipitation and 18.6 inches of snowfall annually.

Airport Activity

Airport activity levels include the number of aircraft operations and based aircraft. The FAA's 5010-1 Airport Master Record is the official record kept by the FAA for public-use airport activities and facility conditions. The 5010 activity data is populated by the reporting actions taken by the airport management and WSDOT. The activity is reported in operations where a single aircraft operation is defined as either an aircraft takeoff or landing; therefore, a "touch-and-go" counts as two operations.

According to the FAA, local operations are defined as operations performed by aircraft that:

- Operate in the local traffic pattern or within sight of the airport, or
- Are known to be departing for, or arriving from, flight in local practice areas located within a 20-mile radius of the airport, or
- Execute simulated instrument approaches or low passes at the airport.

Itinerant operations are all aircraft operations, other than local operations.

[2] Western Regional Climatic Center, Observation Station 452614 (1949-2016)

EPH is the second largest of the seven public use airports in Grant County, with the largest being Grant County International Airport. Detailed analysis of aviation activity data and the service area defined for the airport will be presented in the updated Aviation Activity Forecasts (Chapter 3). The airport is known for the large contingent of gliders that operate as part of a glider club called the Seattle Glider Council (SGC). The airport also hosts an annual aerobatics competition that draws pilots and aircraft from all over the country.

The airport's most recent FAA Airport Master Record (5010) identifies a total of 26 single-engine aircraft, 4 multi-engine aircraft, and 50 gliders making a total of 80 based aircraft. It should be noted that glider aircraft referenced on the 5010 are not physically located at the airport year-round.

The 2016 Airport Management count identified 25 single-engine aircraft, 2 multi-engine aircraft, and 26 glider aircraft, making a total of 53 based aircraft. Airport management has updated the FAA basedaircraft.com database to reflect the updated aircraft count.

Table 2-1 summarizes the based aircraft and operations data.

TABLE 2-1: BASED AIRCRAFT AND OPERATIONS

Activity Type	Activity Level		
Based Aircraft Count	2004 Airport Master Plan Update	Airport Master Record *(12 months ending 12/31/15)*	Updated Airport Count (October 2016)
Single-Engine Piston	40	26	23
Multi-Engine Piston	4	4	2
Turboprop	0	0	0
Turbojet	0	0	0
Rotorcraft	0	0	0
Glider	45	50	26
Total Based Aircraft	**89**	**80**	**53**
Annual Aircraft Operations	**130,780**	**45,000**	**22,874 (see Table 3-9)**

Airfield Facilities

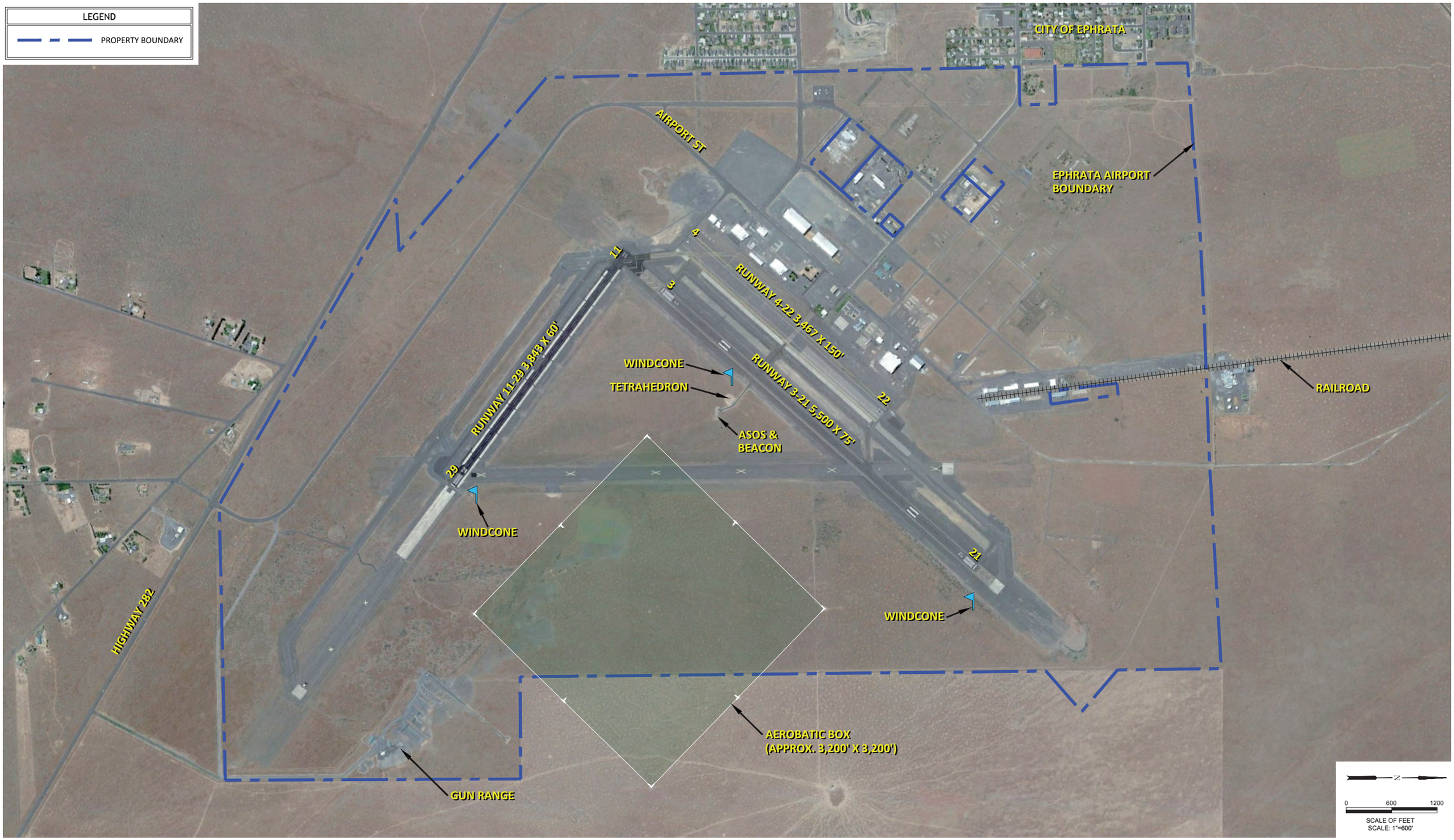
The airport has two parallel runways (Runway 3/21 and 4/22) and one crosswind runway (Runway 11/29). Runway 4/22 is designated for glider operations; however, it is available for other aircraft operations. The runways are served by a taxiway system providing access to all developed areas of the airfield. Several airport improvement projects have been completed since the 2004 Airport Master Plan update, including:

- Runway 11/29 was reconstructed and its width was reduced to 60 feet;
- Runway 3/21 was reconstructed north of Taxiway A3 and overlaid south of Taxiway A3. This project also included new runway lights and signs;
- Taxiway B was relocated and newly constructed with new reflectors and lighted signs;
- Taxiway A and connectors were reconstructed with new reflectors and unlighted signs; and
- New airport beacon was installed.

Table 2-2 summarizes airport data. **Figures 2-2** and **2-3** provides views of the existing airfield facilities and an enlarged view of landside area and the airport industrial park.

TABLE 2-2: AIRPORT DATA

Airport Name/Designation	Ephrata Municipal Airport (EPH)
Airport Owner	Grant County Port District No. 9
Date Established	1939-1942
Airport Category	National Plan of Integrated Airport Systems (NPIAS): Non-primary Local Service, General Aviation Airport FAA Airport Reference Code: B-II (as depicted on 2004 ALP) Washington State Aviation System Plan, Long-Term Air Transportation Study (2009): Community Service Airports
Airport Acreage	2,206 Acres - 2004 Airport Layout Plan
Airport Reference Point (ARP) Coordinates	N 47° 18' 27.30" W 119° 30' 57.20"
Airport Elevation	1,275.5 feet MSL
Airport Traffic Pattern Configuration/Altitude	Left Traffic: RWY 21, 11, 29, 4 Right Traffic: RWY 3, 22 Fixed-wing and Helicopters: 2,276 feet MSL / 1,000 feet AGL Gliders: 1,526 feet MSL / 250 feet AGL
Airport Communication	Common Traffic Advisory Frequency 122.8 MHz
Airport Weather	Automated Surface Observation System (ASOS) 135.775 MHz and (509)754-3761



EXISTING AIRFIELD CONDITIONS
FIGURE 2-2

EPHRATA MUNICIPAL AIRPORT
AIRPORT MASTER PLAN

CENTURY WEST ENGINEERING

LEGEND

PROPERTY BOUNDARY

BUILDING/FACILITY KEY

1. TRAUT LAKE FARMS BLDG.
2. LEASED BLDG.
3. CAP BLDG.
4. PORT ADMIN. BLDG.
5. STONEWAY ELECTRIC BLDG.
6. GLIDER COUNCIL BLDG.
7. PORT BLDG.
8. PORT HANGAR
9. T-HANGAR
10. MEISE CHEM PAD & HANGAR
11. TRICAN ENTERPRISES/FAIR WEATHER FLYER
12. EREVNO CORP. BLDG.
13. PORT MAINTENANCE BLDG.

NOTE : BUILDING NUMBERS ARE DEPICTED IN RED

GRUMMAN AVE

DIVISION AVE E

CESSNA AVE

BEECHCRAFT AVE

AIRPORT ST

RUNWAY 4-22 3,467 X 150'

4

22

1350

1525

526

625

627

727

731

801

734

301

303

303

304

305

324

405

503

503

0 150 300

SCALE OF FEET
SCALE: 1"=150'

EXISTING AIRFIELD CONDITIONS - TERMINAL VIEW
FIGURE 2-3

EPHRATA MUNICIPAL AIRPORT
AIRPORT MASTER PLAN

CENTURY WEST ENGINEERING

Runways

The primary runway (3/21) is oriented in a northeast-southwest direction (030-210 degree magnetic heading) and the crosswind runway (11/29) is oriented in a northwest-southeast direction (110-290 degree magnetic heading). The third runway (4/22) is truly parallel (same bearing) to Runway 3/21, despite the 10-degree offset in its designation. The designation was intended to reduce potential pilot confusion for gliders and powered aircraft during competitions.

Table 2-3 summarizes the characteristics of the current airport runways.

RUNWAY 3/21

Runway 3/21 is 5,500 feet long and 75 feet wide with an asphalt surface. The Runway 3/21 pavement is designed to accommodate aircraft weights of 30,000 pounds for single-wheel and 60,000 pounds for dual-wheel landing gear configurations. The runway has an effective gradient of 0.26 percent, with the high point (1,275.5 feet MSL) located at its northeast end (Runway 21 threshold). Runway 3/21 is in good condition and was last rehabilitated in 2008, when its length was reduced from 6,700 feet to 5,500 feet and the width was reduced from 150 feet to 75 feet. The runway designation was also changed from Runway 2/20 to 3/21 due to changes in magnetic declination.

The runway has non-precision instrument (NPI) markings on both the Runway 3 and 21 ends. The runway markings (white paint) include runway designation numbers, centerline stripe, edge markings, touchdown zone markings, and threshold bars. Both Runway 3 and Runway 21 have blast pads with chevron markings. Yellow taxiway lead-in/lead-off lines are painted on all the entrance/exit taxiways. The runway markings are consistent with FAA non-precision instrument standards for configuration, color, and approach type. The markings were observed to be in good condition during a recent site visit.

The runway has medium intensity runway edge lighting (MIRL); runway end identifier lights (REIL) on both ends; four bar precision approach path indicators (PAPI) on both runway ends; and lighted signage.

The runway is served by a full-length west parallel taxiway (Taxiway A) with three 90-degree exit taxiway connections and one angled exit taxiway connection. An aircraft holding bay is located adjacent to Runway 3 on Taxiway A. A series of access taxiways connect the runway/parallel taxiway to the main apron area and other developed landside areas.

RUNWAY 11/29

Runway 11/29 is 3,843 feet long and 60 feet wide and paved with asphalt. Runway 11/29 is in good condition and was rehabilitated in 2004, when the runway's width was reduced from 150 feet to 60 feet. The pavement is designed to accommodate aircraft weights up to 12,500 pounds with single-wheel landing gear configurations. The runway has an effective gradient of 0.10 percent, with the high point (1,275.5 feet MSL) located at its northeast end (Runway 29 threshold). The runway has a south parallel taxiway (Taxiway B) and an aircraft holding bay at the end of Runway 29.

Runway 11/29 has basic/visual markings, which are consistent with the current non-precision instrument approach capabilities. The runway markings (white paint) include runway designation numbers, a centerline stripe, edge markings, and threshold bars. A blast pad is located beyond the Runway 29 end and is marked with chevrons. Yellow taxiway lead-in lines are painted at the taxiway connectors that lead onto the runway. The markings were observed to be in excellent condition during a recent site visit.

The runway has MIRL edge lighting; REILs on both ends; two bar PAPIs on the Runway 29 end; and lighted signage.

RUNWAY 4/22

Runway 4/22 is 3,647 feet long and 150 feet wide and paved with asphalt. Runway 4/22 is in poor condition. The Runway pavement is designed to accommodate aircraft up to 12,500 pounds with single-wheel landing gear configurations. The runway was created by designating a portion of the original airport terminal apron as a runway with appropriate markings. The runway has an effective gradient of 0.17 percent, with the high point (1,261.3 feet MSL) located at its northeast end (Runway 22 threshold).

The runway has basic/visual runway markings. The runway markings (white paint) include runway designation numbers, a centerline stripe, and runway edge markings. An aircraft hold line marking extends along the entire west side of the runway, coinciding with the edge of the runway obstacle free zone (OFZ). The marking provides a visual reference for pilots taxing on the apron near the runway. Two runway signs are located midfield where the terminal taxilane crosses the runway. The markings were observed to be in good condition during a recent site visit.

TABLE 2-3: RUNWAY DATA

Runway 3/21	
Dimensions	5,500' x 75'
Bearing	N47° 59' 34.79"E
End Coordinates	(RWY 3) 47-18-21.0N, 119-31-18.84W (EL. 1261.2) (RWY 21) 47-19-0.99N, 119-30-24.71W (EL. 1275.66)
Effective Gradient	0.26%
Surface/Condition	Asphalt (Good)
Pavement Strength	SW 30,000lbs DW 60,000lbs
Markings	Non-Precision Instrument (NPI)
	Medium Intensity Runway Lighting (MIRL)
Runway 11/29	
Dimensions	3,843' x 60'
Bearing	S52° 59' 59.85"E
End Coordinates	(RWY 11) 47-18-16.66N, 119-31-26.33W (EL. 1261.9) (RWY 29) 47-17-53.46N, 119-30-42.22W (EL. 1257.77)
Effective Gradient	0.10%
Surface/Condition	Asphalt (Good)
Pavement Strength	SW 12,000lbs
Markings	Visual
Lighting	Medium Intensity Runway Lights (MIRL)
Runway 4/22	
Dimensions	3,467' x 150'
Bearing	N41° 59' 29.05"E
End Coordinates	(RWY 4) 47-18-24.22N, 119-31-28.44W (EL. 1261.36) (RWY 22) 47-18-49.35N, 119-30-54.33W (EL. 1263.67)
Effective Gradient	0.017%
Surface/Condition	Asphalt (Poor)
Pavement Strength	SW 12,000lbs
Markings	Visual
Lighting	None

Runway Wind Coverage

It is generally preferable for aircraft to land and takeoff directly into the wind, although varying wind conditions may require crosswind operations. Use of the crosswind runway may be preferable when prevailing winds exceed the capabilities of a specific aircraft. At airports with single runways, occasional periods of strong crosswinds can limit operations until conditions improve.

The FAA recommended planning standard is that primary runways should be capable of accommodating at least 95 percent of wind conditions within the prescribed crosswind component. The crosswind component is based on a direct crosswind (90 degrees perpendicular to the direction of flight) with varying speeds depending on the aircraft type: 10.5 knots (12 miles per hour) for small aircraft; and 13 knots (15 miles per hour) for general aviation aircraft in Design Group II. Transport and larger military aircraft are typically designed to accommodate even higher crosswind components. Aircraft are able to tolerate increasingly higher wind speeds as the crosswind angle is reduced and aligns directly opposing the direction of flight.

Wind data for the EPH were compiled for the period 2006 through 2015 for the all-weather (All WX), visual flight rules (VFR), and instrument flight rules (IFR) conditions. The data indicates prevailing winds are predominately from the northwest to the southeast and from the southwest to the northeast. The primary runway (Runway 3/21) does not have adequate wind coverage (≥95%) to meet FAA standards for airports with one runway. This requires a crosswind runway (Runway 11/29) to meet the combined wind coverage of greater than or equal to 95 percent. The combination of Runway 3/21 and Runway 11/29 captures almost 99 percent of local wind conditions during All Weather and VFR conditions and almost 100% of winds during IFR conditions with a 10.5-knot crosswind.

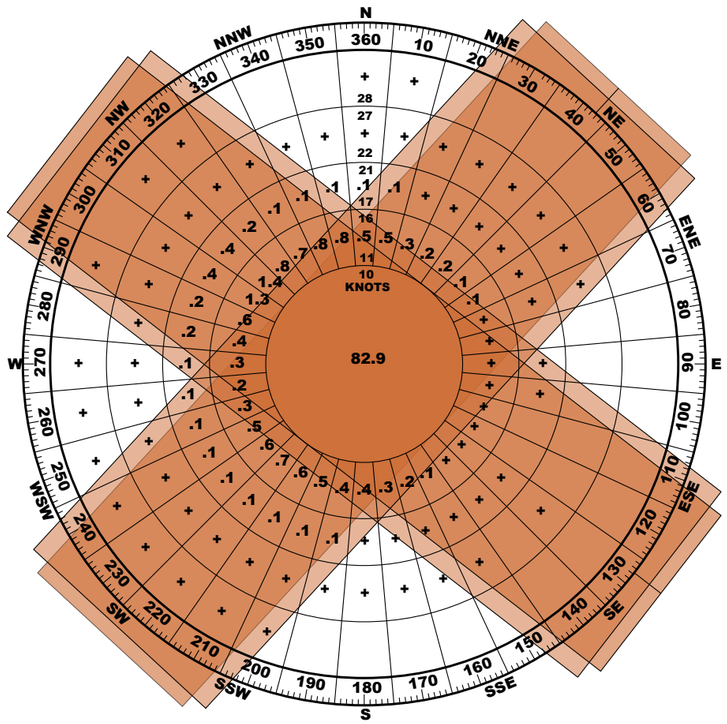
The wind roses depicted on **Figure 2-4** graphically illustrate the favorable relationship between the runway alignments and local wind conditions. **Table 2-4** summarizes the most recent wind data for Runway 3/21, 4/22, and Runway 11/29 for all weather, visual (VFR), and instrument (IFR) conditions for small and large aircraft.[3] **Figure 2-3** depicts the All Weather, VFR, and IFR airport wind roses.

TABLE 2-4: RUNWAY WIND COVERAGE

Weather Conditions	Wind Speed	Runway 3-21	Runway 11-29	Runway 3-21 & 11-29 Combined
All WX	12 MPH (10.5 Knots)	90.91%	92.90%	98.88%
	15 MPH (13 Knots)	94.58%	95.94%	99.71%
VFR	12 MPH (10.5 Knots)	89.69%	91.95%	98.77%
	15 MPH (13 Knots)	93.83%	95.40%	99.69%
IFR	12 MPH (10.5 Knots)	97.92%	98.51%	99.51%
	15 MPH (13 Knots)	98.97%	99.17%	99.80%

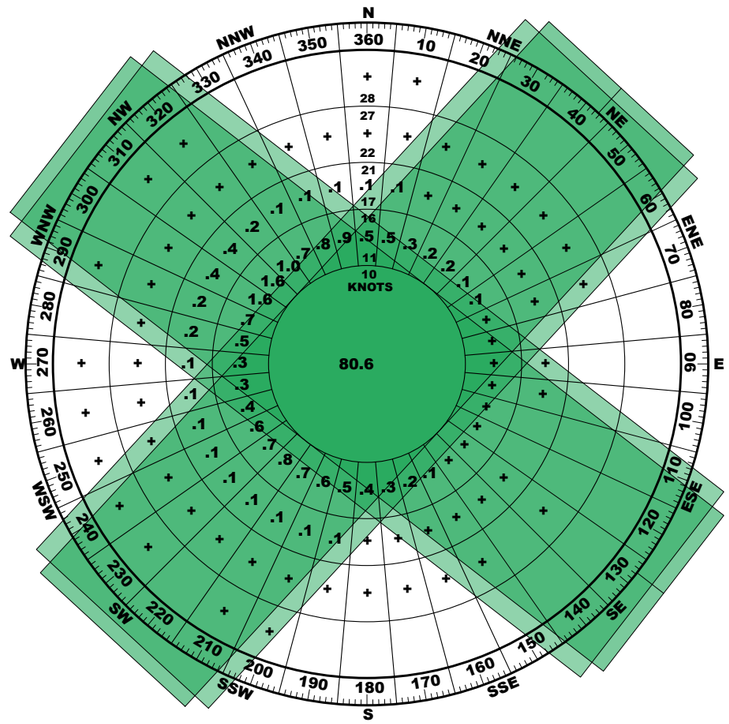
Runway 3/21 Bearing = 42.70 Degrees True
Runway 11-29 Bearing = 127.71 Degrees True

[3] NOAA National Climatic Center Data for Ephrata Municipal Airport obtained from Airports GIS - http://arp-ovcloud.jvs.aero:8080/windRose/.



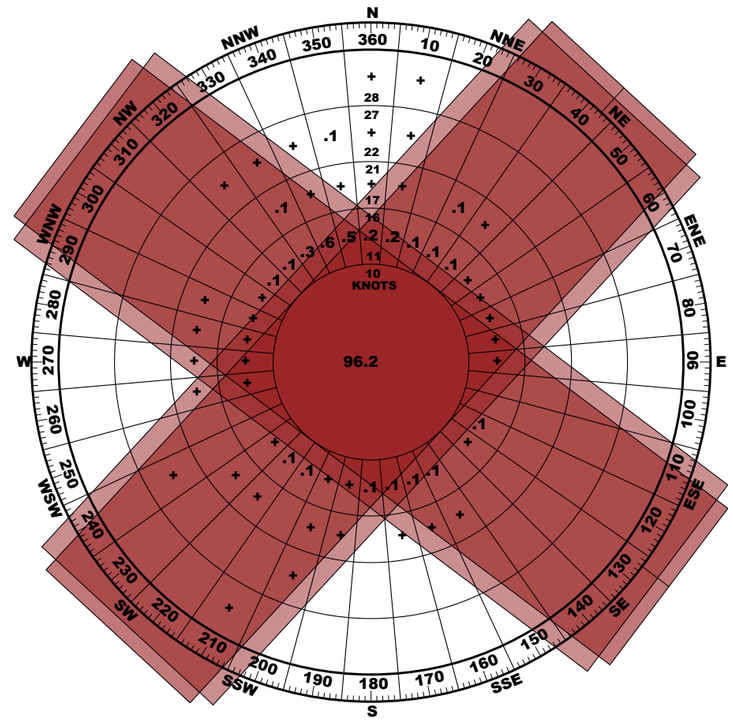
ALL WX WIND ROSE

Period: 2006-2015
99.73% @10.5 Knots
99.90% @ 13 Knots
Source: National Climatic Data Center



VFR WIND ROSE

Period: 2006-2015
99.68% @10.5 Knots
99.88% @ 13 Knots
Source: National Climatic Data Center



IFR WINDROSE

Period: 2006-2015
99.95% @10.5 Knots
99.99% @ 13 Knots
Source: National Climatic Data Center

WIND ROSES
FIGURE 2-4

EPHRATA MUNICIPAL AIRPORT
AIRPORT MASTER PLAN

CENTURY WEST ENGINEERING

Taxiways

The taxiway system at EPH is depicted on **Figure 2-2,** presented earlier in this chapter. Taxiways are a crucial airport element because they can expedite the safe and efficient flow of traffic to and from the runway and decrease the amount of time aircraft are on the runway. They are also an important link providing access to the runway from aircraft aprons and parking areas.

EPH is currently equipped with two full-length parallel taxiways and several connector taxiways located along Runways 3/21 and 11/29. Both parallel taxiways, 'A' and 'B', are 35 feet wide and constructed of asphalt. The airfield has a mixture of both unlighted retro-reflective signs and lighted taxiway signs.

TAXIWAY A

Taxiway A is a 35-foot wide full-length parallel taxiway for Runway 3/21. It has four taxiway connectors to Runway 3/21 including Taxiway A1, A2, A3, and A4.

Taxiway A is equipped with unlighted retro-reflective signs and edge reflectors. The markings are in good condition and include taxiway centerline, edge lines, and runway hold position lines.

TAXIWAY A CONNECTORS (A1, A2, A3, & A4)

Three Taxiway A connectors (Taxiways A1, A2, and A4) are 90-degree exit taxiways, while Taxiway A3 is a 45-degree exit taxiway for Runway 21.

Taxiway A connectors are equipped with unlighted retro-reflective signs and edge reflectors. The markings are in good condition and include taxiway centerline, edge lines, and runway hold position lines.

TAXIWAY B CONNECTORS (B1, B2, B3)

Taxiway B is a 35-foot full-length parallel taxiway for Runway 11/29. This taxiway has three connectors to Runway 11/29 including Taxiways B1, B2, and B3. Taxiway B1 is an acute angled connecting taxiway; Taxiways B2 and B3 are 90-degree connecting taxiways. Taxiway B is equipped with blue taxiway edge reflectors. Taxiway B was constructed to provide a 240-foot taxiway centerline to runway centerline separation distance to preserve ADG II access for future landside development.

TAXILANES

EPH has several access taxilanes serving landside facilities. The main apron has a north apron edge taxilane that connects Taxiway B near the Runway 11 and 4 ends to the main apron. It continues along a portion of the general aviation apron and crosses Runway 4/22 midfield at Txy A2 to connect to Taxiway A.

Aircraft Apron

MAIN APRON

The main apron is located between the Airport Administration building and landside facilities and Runway 4/22. The main apron taxilane extends from Taxiway A2 (approximately midfield of Runway 4/22) to the west edge of the apron then south to where it connects to Taxiway B1. There are no marked taxilanes north of Taxiway A2.

The main apron has several long tiedown cables located between Runway 4/22 and apron taxilane, south of Taxiway A2. Tiedown ropes or chains are not supplied by the airport and are the responsibility of the pilot. Glider parking and staging is located north of Taxiway A2.

An aircraft fuel storage and dispensing area that provides self-service 100LL (AVGAS) is located on the west edge of the main apron, south of the Airport Administration building.

Airfield Pavement Condition

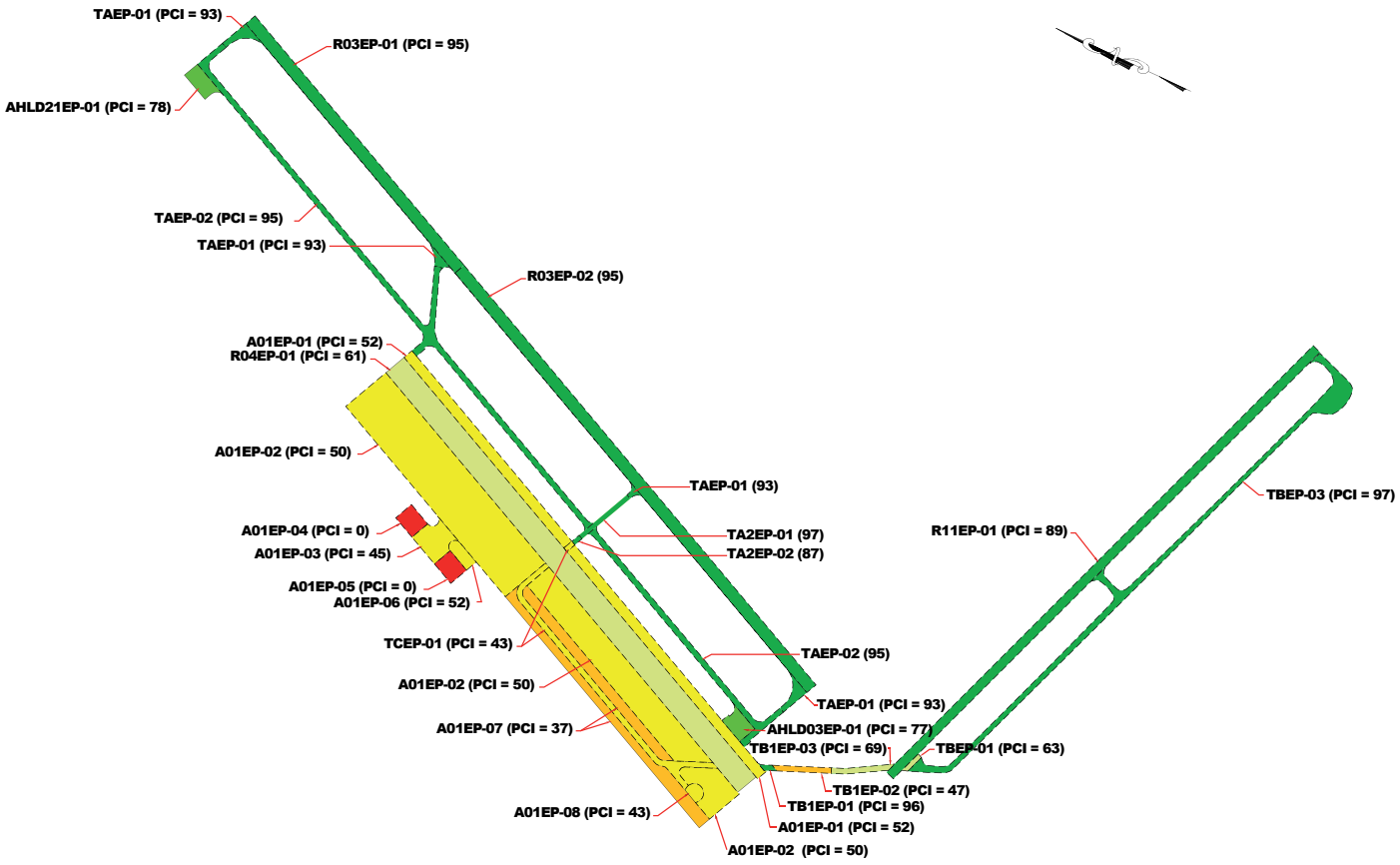
The Washington Department of Transportation (WSDOT) - Aviation Division manages the Pavement Maintenance Program (PMP), a program of pavement evaluation and maintenance for Washington's general aviation airports. The most recent PMP airfield pavement inspection for Ephrata Municipal Airport was conducted in 2018. The PMP normally provides periodic inspections on 3 to 4 year intervals.

Table 2-5 summarizes airfield pavement conditions for EPH based on the 2018 PMP inspection.

TABLE 2-5: DETAILED SUMMARY OF AIRFIELD PAVEMENT CONDITION

Section	Date	Work	2012 PCI
Terminal Apron			
A01EP-01	6/1/2009	Crack Sealing - AC	52
A01EP-02	6/1/2009	Crack Sealing - AC	50
A01EP-03	9/1/1987	Crack Sealing - AC (Localized MR)	45
A01EP-04	9/2/1943	New Construction - PCC (Major MR)	0
A01EP-05	9/2/1943	New Construction - PCC (Major MR)	0
A01EP-06	9/1/1987	New Construction - AC (Major MR)	52
A01EP-07	6/1/2009	Crack Sealing - AC	37
A01EP-08	6/1/2009	Crack Sealing - AC	43
R04EP-01	6/1/2007	Crack Sealing - AC	61
TCEP-01	6/1/2009	Crack Sealing - AC	43
North Hold Apron			
AHLD03EP-01	6/4/2007	New Construction - AC	77
South Hold Apron			
AHLD21EP-01	6/4/2007	New Construction - AC	78
Runway 3-21 (formally Runway 2-20)			
R03EP-01	6/1/2008	Overlay - AC Structural (Major MR)	95
R03EP-02	6/1/2008	Overlay - AC Structural (Major MR)	95
Runway 11-29			
R11EP-01	9/2/2004	Complete Reconstruction - AC	N.A.
R11EP-01	6/1/2011	Crack Seal/Surface Seal - Fog Seal	89
Access Taxiway A2			
TA2EP-01	6/1/2009	Crack Sealing - AC	97
TA2EP-02	6/5/2007	Complete Reconstruction - AC	87
Parallel Taxiway A			
TAEP-02	6/4/2007	New Construction - AC	95
Taxiway A1			
TB1EP-01	6/4/2008	Complete Reconstruction - AC	96
TB1EP-02	6/1/2009	Crack Sealing - AC	47
TB1EP-03	9/1/2004	Overlay - AC Thin (Major MR)	69
Parallel Taxiway B and Access Taxiways B1 & B2			
TBEP-01	9/1/2004	Overlay - AC Thin (Major MR)	63
TBEP-02	6/1/2007	Crack Sealing - AC	60
TBEP-03	9/3/2004	New Construction - AC	97
High Speed Exit Taxiway			
TAEP-01	6/1/2009	Complete Reconstruction - AC	93

Figure 2-5 graphically illustrates the airfield pavement conditions identified in the 2018 PMP.



* The PCI of each pavement section is listed in parentheses ( ).

SOURCE: WSDOT AVIATION
INSPECTION: JUNE 2018

Airport Lighting and Signage

A Navigational Aid (NAVAID) is defined by the FAA as "*any facility used in the aid of air navigation, including landing areas, lights, any apparatus or equipment for disseminating weather information, for signaling, for radio direction-finding, or for radio or other electronic communication, and any other structure or mechanism having similar purpose and controlling flight in the air or the landing or takeoff of aircraft.*"

Runway 4/22 is a visual runway and has no lighting or NAVAIDs other than basic visual runway markings. Runways 3/21 and 11/29 feature medium intensity runway edge lighting (MIRL), Precision Approach Slope Indicators (PAPI), and Runway End Identifier Lights (REIL). Runways 3, 21, and 29 have non-precision runway markings consistent with supporting non-precision instrument approaches. The runway lighting can be controlled through a Pilot Controlled Lighting (PCL) system, activated via the Common Traffic Advisory Frequency (CTAF) – 122.8MH.

The airport has a lighted wind cone, a lighted tetrahedron, and a segmented circle traffic pattern indicator located near the midpoint of the airfield. Supplementary wind cones are located at the approach ends of Runway 21 and 29.

EPH has a white-green beacon, which indicates a civil land airport. The beacon operates sunset to sunrise on a photocell switch. Airport weather data is provided by an Automated Surface Observation System (ASOS) with a frequency of 135.775MHz.

Table 2-6 summarizes the existing visual and electronic (NAVAIDs) available at EPH.

TABLE 2-6: EPHRATA MUNICIPAL AIRPORT VISUAL AND NAVIGATIONAL AIDS (NAVAIDS)

General			
UNICOM - 122.8			
Rotating Beacon (clear & green)			
(2) Lighted & (1) Unlighted Wind Cones			
ASOS – 135.775			
Lighted Tetrahedron; segmented circle with traffic patter indicators			
NAVAIDs	**Runway 3/21**	**Runway 11/29**	**Runway 4/22**
MIRL	Yes	Yes	No
REIL	Yes	Yes	No
PAPI	Yes, 4-light on both ends	Yes, 2-light on 29	No
VOR Approach	Yes, on both ends	No	No
GPS Approach	Yes, on both ends	No	No
Markings	Non-precision	Visual (11) Non-precision (29)	Visual

Nearby terminal/enroute navigational aids are summarized in **Table 2-7.**

TABLE 2-7: NEARBY NAVIGATION AIDS

ID	Type	Name	Frequency	Distance	Radial
EPH	VORTAC	Ephrata	112.60	5.6 nm	201
MWH	VOR/DME	Moses Lake	115.00	10.0 nm	288
EAT	VOR/DME	Wenatchee	111.00	28.7 nm	082
Source: FAA National Flight Data Center					

Landside Facilities

HANGARS AND AIRPORT BUILDINGS

EPH accommodates a variety of aviation-related buildings including aircraft storage hangars, commercial hangars, and mixed-use hangars. The northwest side of the airport currently accommodates all landside facilities and based aircraft. The airport also includes the Port of Ephrata - Airport Industrial Park located on the northwest side of Airport Street and includes numerous non-aeronautical and non-aviation buildings. **Figure 2-2** and **2-3**, presented earlier in this chapter, depicts the existing Airport buildings. **Table 2-8** summarizes existing aviation use buildings located at the airport.

GENERAL AVIATION HANGAR AREA

The airport's hangar area is located on the northwest side of the main apron, just southeast of Airport Street. The area currently accommodates a mix of privately owned hangars, Port owned hangars, the Airport Administration building, the Glider Club building, the Civil Air Patrol building, and other commercial businesses.

TABLE 2-8: AIRPORT TENANTS & BUILDINGS

Building #	Tenant	Street Address	Building Ownership
301	TriCan Enterprises	350 Airport St. NE	Private
301	Fair Weather Flyers	324 Airport St. SE	Private
303	Meise Chem Pad	324 Airport St. NE	Private
304	Multiple Tenants	1980 Fairchild Ave	Port
305	Erevno Corporation	1990 Fairchild Ave	Port
308	Telco 214 US, Inc.	1970 Fairchild Ave	Port
326	Randy Neissner	1993 Fairchild Ave	Private
405	Multiple Tenants	1991 Fairchild Ave	Port
406	FAA-RCO	1990 Eagle Ave	Port
407	IAC Chapter 67	Storage Shed	Port
408	Port RV Park	1980 Eagle Ave	Port
503	Port of Ephrata Administration	1990 Division Ave E	Port
526	Stoneway Electric Supply	20 pAirport Street NE	Port
625	Seattle Glider Council	30 Airport Street NE	Private
627	Civil Air Patrol	50 Airport Street NE	Port
727	Larry Cagle	160 Airport Street NE	Port
731	-	170 Airport Street NE	Port
734	Trout Lake Farms	180 Airport Street NE	Port
801	Trout Lake Farms	210 Airport Street NE	Port
1007-10	Tommer Powder Storage	400 Airport Street NE	Port
1350	Building 2 – South	201 Airport Street SE	Port
1525	Building 1 – North	187 Airport Street SE	Port
1625	Telco 214 Leasing	1839 Division Ave E	Port
1635	Shop	1845 Division Ave E	Port
1852	Fred Moore	1860 Apache Ave	Port
2001	Hogland	380 Railroad Street NE	Port
2003	Trout Lake Farms	360 Railroad Street NE	Port
2004	Hogland	361 Limit St.NE	Port
2005-N	Port of Ephrata	340 Railroad Street NE	Port
2005-S	Stacy's Custom Meats	340 Railroad Street NE	Port
2006	Hogland Transfer	341 Limit Street NE	Port
2551	Don Herring	53 Corporate Street SE	Port
3003	Wenatchee Petroleum	400 Railroad Street NE	Port
3005	Vacant	390 Railroad Street NE	Port

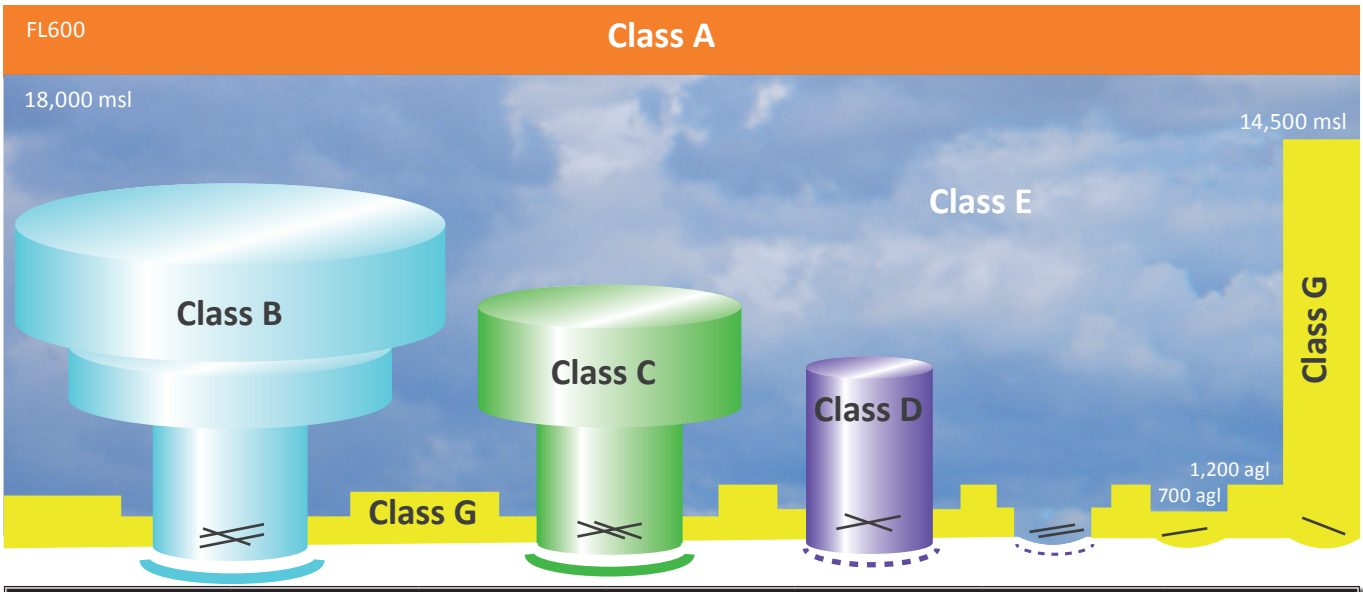
Airspace and Navigational Aids

AIRSPACE CLASSIFICATIONS

The FAA classifies airspace within the United States as "controlled" or "uncontrolled" with altitudes extending from the surface upward to 60,000 feet above mean sea level (MSL). Controlled airspace classifications include Class A, B, C, D, and E. Class G airspace is uncontrolled.

Aircraft operating within controlled airspace are subject to varying levels of positive air traffic control that are unique to each airspace classification. Requirements to operate within controlled airspace vary, with the most stringent requirements associated with very large commercial service airports in high traffic areas. Uncontrolled airspace is typically found in remote areas or is limited to a 700 or 1,200-foot AGL layer above the surface and below controlled airspace.

Figure 2-6 illustrates and describes the characteristics of the airspace classifications defined by the FAA.



COMMUNICATION REQUIREMENTS AND WEATHER MINIMUMS

	Class A	Class B	Class C	Class D	Class E	Class G
Airspace Class Definition	Generally airspace above 18,000 feet MSL up to and including FL 600.	Generally multi-layered airspace from the surface up to 10,000 feet MSL surrounding the nation's busiest airports	Generally airspace from the surface to 4,000 feet AGL surrounding towered airports with service by radar approach control	Generally airspace from the surface to 2,500 feet AGL surrounding towered airports	Generally controlled airspace that is not Class A, Class B, Class C, or Class D	Generally uncontrolled airspace that is not Class A, Class B, Class C, Class D, or Class E
Minimum Pilot Qualifications	Instrument Rating	Student*	Student*	Student*	Student*	Student*
Entry Requirements	IFR: ATC Clearance VFR: Operations Prohibited	ATC Clearance	IFR: ATC Clearance VFR: Two-Way Communication w/ ATC	IFR: ATC Clearance VFR: Two-Way Communication w/ ATC	IFR: ATC Clearance VFR: None	None
VFR Visibility Below 10,000 msl**	N/A	3 Statute Miles	3 Statute Miles	3 Statute Miles	3 Statute Miles	Day: 1 Statute Mile Night: 3 Statute Miles
VFR Cloud Clearance Below 10,000 msl***	N/A	Clear of Clouds	500 Below 1,000 Above 2,000 Horizontal	500 Below 1,000 Above 2,000 Horizontal	500 Below 1,000 Above 2,000 Horizontal	500 Below 1,000 Above 2,000 Horizontal***
VFR Visibility 10,000 msl and Above**	N/A	3 Statute Miles	3 Statute Miles	3 Statute Miles	5 Statute Miles	5 Statute Miles
VFR Cloud Clearance 10,000 msl and Above	N/A	Clear of Clouds	500 Below 1,000 Above 2,000 Horizontal	500 Below 1,000 Above 2,000 Horizontal	1,000 Below 1,000 Above 1 Statute Mile Horizontal	1,000 Below 1,000 Above 1 Statute Mile Horizontal

*Prior to operating within Class B, C or D airspace (or Class E airspace with an operating control tower), student, sport, and recreational pilots must meet the applicable FAR Part 61 training and endorsement requirements. Solo student, sport, and recreational pilot operations are prohibited at those airports listed in FAR Part 91, appendix D, section 4.
**Student pilot operations require at least 3 statute miles visibility during the day and 5 statute miles visibility at night.
***Class G VFR cloud clearance at 1,200 agl and below (day); clear of clouds.

LOCAL AREA AIRSPACE STRUCTURE

Figure 2-7 depicts nearby airports, notable obstructions, special airspace designations, and instrument flight rules (IFR) routes in the vicinity of EPH, as identified on the Seattle Sectional Chart and the IFR Enroute Low Altitude Chart (L-1/L-2).

EPH is located in an area of Class E airspace that begins at the surface and extends upward to 18,000 feet above mean sea level (MSL). Radio communication is not required for VFR operations in Class E airspace, although pilots are encouraged to use the common traffic advisory frequency (CTAF) when operating at the airport. Aircraft are required to obtain an ATC clearance prior to operating in Class E airspace during IFR conditions.

Several Low Altitude Enroute Instrument Airways radiate from the nearby Ephrata VORTAC[4], located northeast of the Airport:

- Victor 497 (V497) south to Moses Lake VOR-DME
- Victor 120 (V120) northeast to Spokane VORTAC
- Victor 120 (V120) west to the Wenatchee VOR-DME

The instrument airways are designed to provide defined paths (fixed courses and minimum altitudes) for enroute aircraft that are clear of terrain and other potential hazards for aircraft operating without the benefit of visual contact. Aircraft transition between enroute and terminal airspace through the use of defined instrument approach and departure procedures.

AEROBATIC BOX

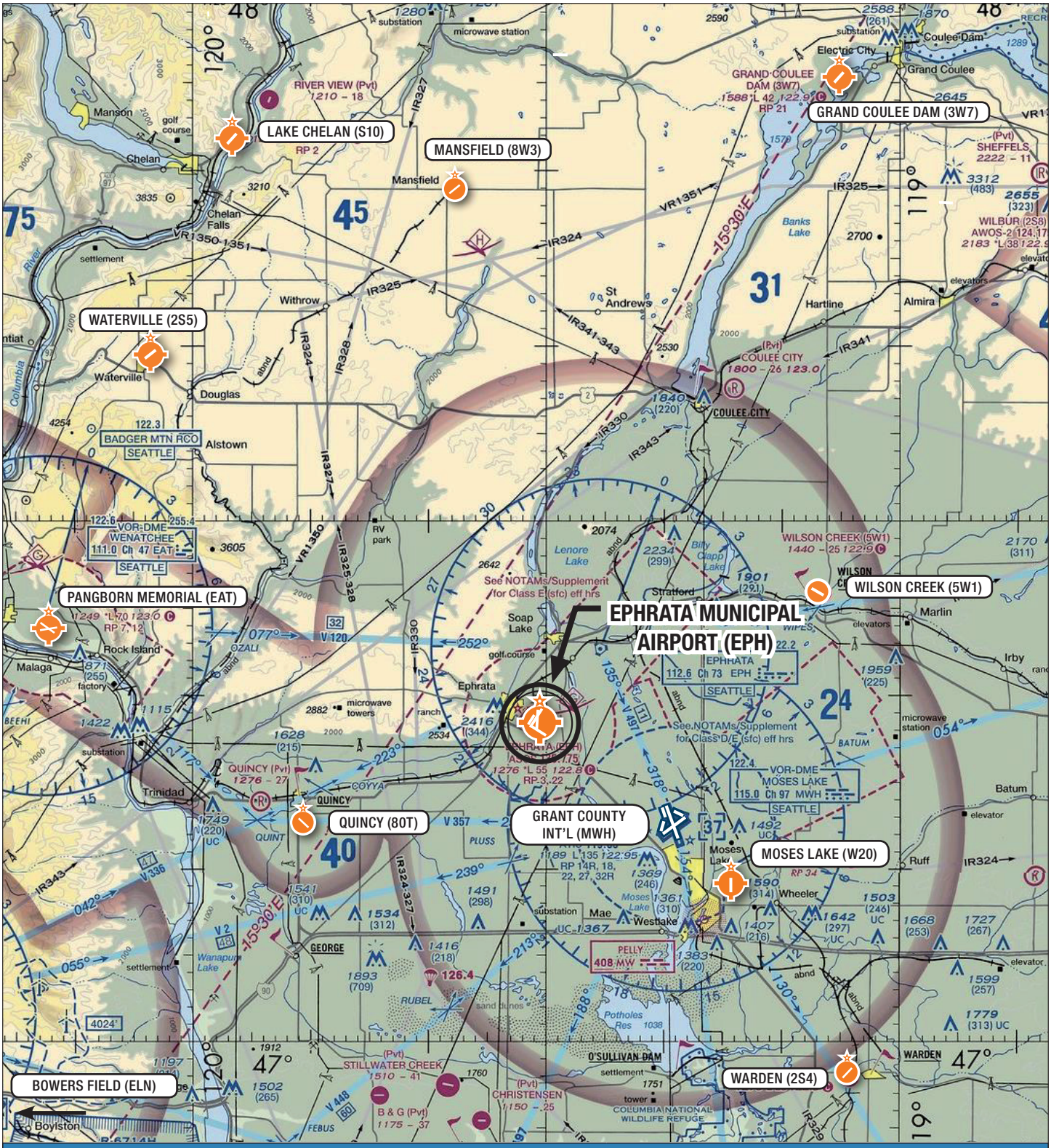
EPH has a defined Aerobatic Box located east of the airfield's runway system. The box is marked on the ground by a center "X" and mid-box "T" symbols. The outer corners are also marked. A typical Aerobatic Box is depicted in **Figure 2-8**.

An Aerobatic Box is the area in which aerobatic practice and competitions take place. The upper and lower limits of the box are set based on the category of competition. The Aerobatic Box FAA Certificate of Authorization is managed by the International Aerobatics Club Chapter 67 of Seattle, Washington. In order to use the aerobatics box, a Chapter 67 club member must open and close the box by issuing a Notice to Airmen (NOTAM), with approval of airport management. The box is opened several times a year for both training and competitions.

TRAFFIC PATTERN

Runway 3 and Runway 22 have non-standard right hand traffic pattern to separate traffic between Runway 3/21 and 4/22. The other runways have standard left hand traffic patterns.

[4] VORTAC = **V**ery High Frequency **O**mni Directional **R**adio Range (VOR), with **Tac**tical Air Navigation (TACAN).



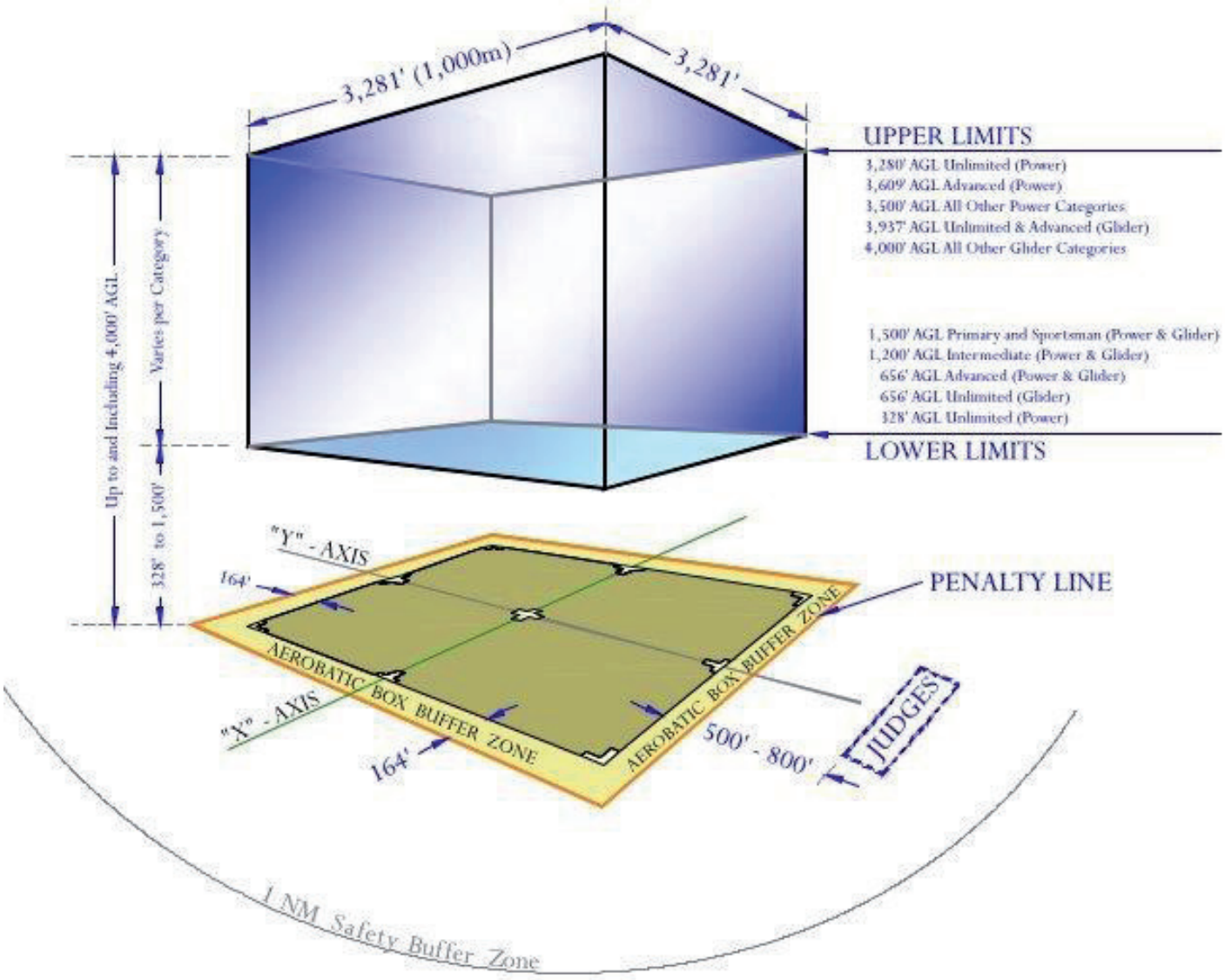
LEGEND

	Airports with hard-surfaced runways greater than 8,069 ft. or some multiple runways less than 8,069 ft		Public-use airports with hard-surfaced runways 1,500ft. to 8,069ft.
			Class E Airspace with floor 700' above surface
	Compass Rose (VOR/DME or VORTAC)		Class D Airspace (surface)
	VOR or RNAV Airways		Class E Airspace (surface)

AREA AIRSPACE
FIGURE 2-7

EPHRATA MUNICIPAL AIRPORT
AIRPORT MASTER PLAN

CENTURY WEST ENGINEERING



AEROBATIC CONTEST BOX

AEROBATIC BOX
FIGURE 2-8

EPHRATA MUNICIPAL AIRPORT
AIRPORT MASTER PLAN

CENTURY WEST ENGINEERING

TRAFFIC PATTERNS
FIGURE 2-9

EPHRATA MUNICIPAL AIRPORT
AIRPORT MASTER PLAN

CENTURY WEST ENGINEERING

NAVIGATIONAL AIDS AND WEATHER

There are no ground-based navigational aids located on EPH.

The Ephrata VORTAC[5] is located approximately three nautical miles northeast of the airport. The VORTAC supports instrument approaches to Runways 3 and 21, in addition to its enroute air navigation function. The VORTAC is FAA-owned and maintained.

EPH has an on-site automated surface observing system (ASOS) that provides 24-hour weather information. The ASOS is located east of Runway 3/21 and north of Runway 11/29. The ASOS provides altimeter setting, wind data, density altitude, visibility, cloud/ceiling data, temperature, dew point, icing, lightning, sea level pressure, and precipitation. The ASOS is owned and maintained by the National Weather Service (NWS).

Instrument Procedures

Instrument approach and departure procedures are developed by the FAA using conventional ground based electronic navigational aids and satellite navigation (SATNAV) are used to guide aircraft through a series of prescribed maneuvers into and out of an airport's terminal airspace. The procedures are designed to enable continued airport operation during instrument meteorological conditions (IMC), but are also used during visual conditions, particularly in conjunction with an instrument flight plan. The capabilities of each instrument approach are defined by the technical performance of the procedure platform and the presence of nearby obstructions that may affect the cloud ceiling and visibility minimums for the approach, and the routing for both the approach and missed approach procedure segments. The aircraft approach speed and corresponding descent rate may also affect approach minimums for different types of aircraft.

EPH currently has three published non-precision instrument approaches, including two global positioning system (GPS) procedures and one VOR procedure that uses the Ephrata VORTAC. Ephrata also has special takeoff minimums/departure procedures and special alternate minimums. The existing instrument approach capabilities for Ephrata are summarized in **Table 2-9**. Copies of the instrument approach and departure procedure charts are included in **Appendix A** of this report.

[5] Very high frequency Omnidirectional Radio range (VOR) combined with UHF frequencies (Tactical Air Navigation – TACAN)

TABLE 2-9: INSTRUMENT PROCEDURES

Approach	Approach Category A		Approach Category B		Approach Category C		Approach Category D	
	Ceiling	Vis.	Ceiling	Vis.	Ceiling	Vis.	Ceiling	Vis.
RNAV/GPS - RWY 3								
LPV	1519	1	1519	1	1519	1	1519	1
LNAV/VNAV	1689	1.25	1689	1.25	1689	1.25	1689	1.25
LNAV MDA	1680	1	1680	1	1680	1.25	1680	1.25
Circling	1720	1	1740	1	1780	1.5	2500	3
RNAV/GPS - RWY 21								
LPV	1526	.75	1526	.75	1526	.75	1526	.75
LNAV/VNAV	2171	4	2171	4	2171	4	2171	4
LNAV MDA	2020	1	2020	1.25	2020	2.25	2020	2.5
Circling	2020	1	2020	1.25	2020	2.25	2500	3
VOR – RWY 21								
S-21	1680	1	1680	1	1680	1.25	1680	1.25
Circling	1720	1	1740	1	1780	1.25	2500	3

Approach Categories are based on the approach speed of an aircraft in the landing configuration (typically 1.3 times the stall speed Vso).
Approach Categories:
Category A: 0-90 knots (Cessna 172, Beechcraft Bonanza, Piper Seneca)
Category B: 91-120 knots (Beechcraft King Air, Cessna Citation)
Category C: 121-140 knots (Learjet 45, Canadair Challenger)
Category D: 141-165 knots (Gulfstream 550)

Ceiling: Lowest permitted height of clouds in feet above ground level (AGL)
Vis: Minimum visibility required in statute miles
Source: National Ocean Service Instrument Approach Plates

Airport Support Facilities and Services

AIRCRAFT FUEL

The Port of Ephrata owns and operates a 6,000-gallon above-ground aviation fuel storage and dispensing system that is located adjacent to the Airport Administration Office. The tank is filled with 100-octane low lead (100LL) aviation gasoline (AVGAS) and operated on a credit card system. Jet-A is currently not available at the airport.

FIXED BASE OPERATOR (FBO)

EPH does not have a Fixed Base Operator. The Port of Ephrata provides self-serve 100LL (AVGAS), restrooms, and flight planning facilities in the Airport Administration Building.

PUBLIC RESTROOMS

Public restrooms are located in the Port of Ephrata Airport Administration Building on the northwest side of the main apron.

FENCING

EPH has a partial perimeter fence. The fence is of four-foot high chain link construction. There are also areas of field fencing on the south, east, and west sides of the airport.

Vehicle Access and Parking

Washington State Route 28 (WA-28) and Washington State Route 17 (WA-17) are the primary highways providing access to EPH. The Airport Administration Building is located on Division Avenue East, which connects directly with WA-28 to the north. Division Avenue East also connects to Airport Street, which connects directly to Highway 282 to the west. Highway 282 merges with WA-17, which connects Ephrata to Moses Lake.

Public parking is located adjacent to the Airport Administration Building on Division Avenue East. Airport businesses and industrial park tenants have additional parking adjacent to their buildings.

Public Protection

POLICE

The City of Ephrata provides public safety protection for the airport. The City Police Department is located in downtown Ephrata, approximately 1.5 miles from the airport.

FIRE AND RESCUE

The City of Ephrata and the Grant County Fire Departments provide airport fire protection. The City of Ephrata Fire Station is located on Alder Street in downtown Ephrata, about 1.5 miles from the airport. Grant County Fire District 13 is located 2.4 miles from the airport. The airport does not have on-site aircraft fire and rescue equipment.

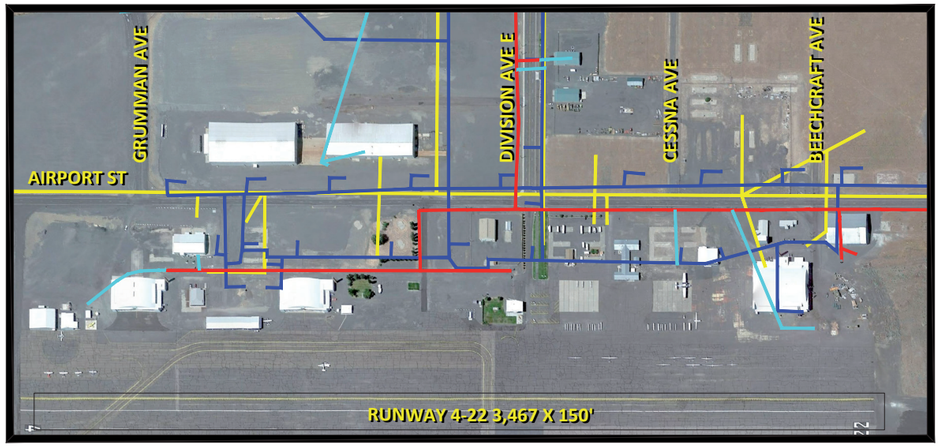
Utilities

Several utility providers provide utilities to EPH. Electricity is provided by Grant County PUD, which is a public utility district that provides electricity and broadband services for Grant County. The airport is equipped with fiber optic lines provided by the Grant County PUD and local internet service is provided by Basin Networking. Phone services are provided by Centurylink communications. Water, sewer services, and refuse services are provided through the City of Ephrata.

TABLE 2-10 summarizes the current utilities and service providers at EPH. **Figure 2-10** depicts the utility lines on the airport and in the Industrial Park.

TABLE 2-10: AIRPORT UTILITIES AND SERVICE PROVIDERS

Utility	Source and Provider
Water	City of Ephrata
Sewer	City of Ephrata
Electricity	Grant County PUD
Phone	Centurylink
Internet	Basin Networking
Refuse	City of Ephrata



TERMINAL AREA VIEW

LEGEND

- SEWER
- WATER
- POWER (OVERHEAD)
- POWER (UNDERGROUND)
- PROPERTY LINE

SEE TERMINAL AREA VIEW

11
4
3
22
29
21

0 600 1200

SCALE OF FEET
SCALE: 1"=600'

UTILITIES MAP
FIGURE 2-10

EPHRATA MUNICIPAL AIRPORT
AIRPORT MASTER PLAN

CENTURY WEST ENGINEERING

Land Use Planning and Zoning

The City of Ephrata has land use authority for the airport; however, some of the runway protection areas and the Part 77 surfaces extend beyond city limits and the urban growth area and into unincorporated Grant County. The City of Ephrata Title 19 Zoning establishes the zoning guidelines for airport land. A detailed description of current zoning, airport overlay zoning, and land use is presented in the Airport Land Use (Chapter 9).

ZONING

The airport is zoned Airport Enterprise Zone (AE). "The purpose of the Airport Enterprise Zone is to provide for the coordinated, managed, and safe development of land adjacent to the Ephrata Airport. The development and use of land shall be as provided in the Airport Master Plan, the document adopted by both the Port of Ephrata and the City of Ephrata to establish development and land use standards on Port property."

AIRPORT OVERLAY ZONING

The City of Ephrata has an Airport Clear Zone Overlay District (CZ) "to ensure that any proposed development or use of land in the area within the approach or departure pattern of the EPH is consistent with aviation and personal safety, limiting the exposure of persons on the ground to injury due to aviation accidents and reducing hazards to flight during approach and departure."[6] Grant County has a similar airport safety overlay zone that applies to the lands outside the Ephrata city limits. The county overlay zone for EPH is based on the FAR Part 77 surfaces defined for its three runways.

[6] City of Ephrata Comprehensive Plan, Title 19, Airport Overlay Zone

Airport Industrial Park

The Airport Industrial Park is located on Port of Ephrata property. The industrial park is fully serviced with utilities and offers convenient access to downtown Ephrata and State Route 28 to Moses Lake. A summary of businesses within the industrial park is provided in **Table 2-11**.

TABLE 2-11: AIRPORT INDUSTRIAL PARK BUSINESSES (OCT. 2016)

Trout Lake Farms	Hogland
Wenatchee Petroleum	Stoneway Electric Company
TriCan Enterprises	Meise Chem Pad
Erevno Corporation	Stacy's Custom Meats

Socioeconomic Trends and Forecasts

The total population of Grant County is estimated at 93,259 according to the 2010 US Census Bureau. The total population varies slightly between data sources. Grant County currently ranks 13th among the 39 Washington counties in population, 27th in median household income and 4th in land area. US Census data lists the area of Grant County as approximately 2,681 square miles (1,715,840 acres). Grant County includes ten incorporated cities, Electric City, Ephrata, George, Grand Coulee, Mattawa, Moses Lake, Quincy, Royal City, Soap Lake, and Warden with additional population in the towns of Coulee City, Coulee Dam, Hartline, Krupp, and Wilson Creek.

The City of Ephrata is the County Seat. The next closest town is Soap Lake, which is located 5 miles northeast of the airport. The 2004 Airport Master Plan update used the Office of Financial Management (OFM) population estimates for 1990 (5,349) and 2000 (6,170). The City of Ephrata's population had an estimated 1.4 percent average annual growth rate (AAR) over the 10-year timeframe. In 2010, the OFM population estimate was 7,664, which equates to an AAR of 2.2 percent since 2000.

According to the Grant County Economic Development Council, as of June 2014, Genie Industries, Inc., Moses Lake School District, Grant County Government, and Walmart are the biggest employers in the county, respectively. Two of these four biggest employers are government sector in Grant County.

The Department of Labor estimates the per capita income of Grant County at $19,718 while the average wage earned was $36,704. The county's median household income is estimated at $46,722, according to the US Census Bureau. According to US Census data, approximately 5 percent of the population is unemployed. Types of worker in Grant County are distributed as follows: 47 percent private wage/salary, 14 percent government, 35 percent self-employed, and 4 percent unpaid family work.

Table 2-12 summarizes the population, per capita income, number of households, and median household income of Grant County relative to adjacent counties.

TABLE 2-12: SOCIOECONOMIC CONDITIONS

County	Population	Per Capita Income	Number of Households1	Median Household Income1
Grant	93,259	$19,718	30,041	$89,120
Douglas	38,431	$22,359	13,894	$48,708
Okanogan	41,120	$20,093	16,519	$38,551
Adams	18,728	$16,689	5,720	$40,829
Lincoln	10,570	$24,757	4,422	$45,582
Franklin	78,163	$18,660	23,245	$47,749
Benton	175,177	$27,161	65,304	$57,354
Yakima	243,231	$19,325	80,592	$42,877
Kittitas	40,915	$23,467	16,595	$41,232

Source: US Census Bureau

Airport Environmental Inventory

INTRODUCTION

An environmental review was conducted as a component of the master plan to identify physical or environmental conditions of record, which may affect the recommended improvements at EPH. This review included land use, water resources (wetlands, stormwater), species of concern, federal lands, and essential fish habitat.

The scope of work for this element is limited to compiling, reviewing, and briefly summarizing information of record from applicable local, federal, and state sources for the airport site and its environs. The environmental memorandum is included in **Appendix B** and a brief overview is provided below.

PROTECTED SPECIES AND HABITAT

The environmental review focused on federally threatened or endangered species within the project area (one-mile radius of the airport). A review of state threatened or endangered species was not included as part of this review, since this document provides baseline information for federally funded projects.

The review queried the Washington Department of Fish and Wildlife (WDFW) and Priority Habitat and Species (PHS) data and has identified there are no federally listed threatened or endangered species or critical habitat within the project area.

WETLANDS

The National Wetland Inventory (NWI) identifies several potential wetlands outside the project area; however, no wetlands were identified within the project area (1-mile radius of the airport).

WASTEWATER AND SOLID WASTE TREATMENT

The City of Ephrata provides water and sewer utilities. Solid waste collection service both in the City of Ephrata and surrounding Grant County is provided under contract with Consolidated Disposal Services, Inc. (CDSI) (Ephrata 2007). CDSI disposes solid waste at the Grant County Landfill, approximately 3 miles south of Ephrata.

STORMWATER

There are no streams or natural drainage systems occurring within the project area. Review of aerial photography shows no visible detention ponds, catch basins, or open basins where stormwater to collect on the surface. It is assumed that surface water from the project area infiltrates directly into ground.

HAZARDOUS MATERIALS AND CLEANUP SITES

Nine sites regulated for hazardous materials are located within or adjacent to the project area. These sites include a mix of designations including hazardous waste management, hazardous waste generation, independent cleanup, leaking underground storage tank, state cleanup site, and underground storage tank site (Ecology, 2016c).

A list and map of the sites are located in the environmental memorandum included in **Appendix B**.