Chapter 6 – Environmental Review

The Environmental Overview Memo was prepared by Mead & Hunt, a member of the Century West airport master plan team.

Introduction

The purpose of this environmental review is to identify physical or environmental conditions of record, which may affect the recommended improvements at Eastern Oregon Regional Airport.

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 review technical memorandum is included in **Appendix D** and a brief overview is provided below.

The airport noise evaluation was conducted based on prescribed Federal Aviation Administration (FAA) guidelines, using the FAA's Integrated Noise Model (INM) computer software with several airport-specific inputs including FAA-approved air traffic forecasts, fleet mix, common aircraft flight tracks, and existing/future runway configurations.

Eastern Oregon Regional Airport is undergoing a Wildlife Hazard Assessment (WHA). The WHA will be a standalone document separate from the airport master plan.

Environmental Review

Local Site Conditions

Eastern Oregon Regional Airport is located in an area that is predominantly agriculture with wheat fields surrounding the airport.

Wetlands

Wetlands are under the jurisdiction of both the Oregon Department of State Lands (DSL) and the US Army Corps of Engineers (Corps). A wetland inventory was included in the review, which identified six wetlands in the airport vicinity (2 freshwater forested/shrub and 4 freshwater emergent). These wetlands are seasonally or temporarily flooded and characterized as drainage or runoff channels through low vegetative areas of the rolling topography native to the area.

Floodplains

A review of the flood rate insurance map for Umatilla County, Oregon shows portions of the Umatilla River floodplain is the nearest to the airport located approximately 1.3 miles south of the airport. The airport is not within the 100-year or greater floodplain.

Stormwater

The airport's stormwater runoff from the impervious runways, taxiways, aprons, and building rooftops flow into storm water collection systems. The south airfield runoff collects in a 15,000 square/foot detention pond installed with a diffuser located about 500 feet south of the main apron. From the detention pond, the water flows south through a series of outfalls and catch basins until it eventually reaches the Umatilla River. The north airfield contains two outfalls, one midfield of Runway 7/25 and the other within 1,000 feet of the Runway 11 end. Both outfalls transfer the runoff into natural drainage swales, which flow north of the airport.

Protected Species and Habitat

The U.S. Fish and Wildlife Services identified five ESA species that could potentially occur in the airport area including the Greater Sage-grouse, Yellow-billed Cuckoo, Bull Trout, Gray Wolf, and Washington Ground Squirrel. The Oregon Biodiversity Information Center indicates that there are two state threatened or endangered plant species within Umatilla Basin, including the Northern wormwood and Laurence's Milk-vetch.

Airport Noise Analysis

Airport Noise and Noise Modeling

It is often noted that noise is the most common negative impact associated with airports. A simple definition of noise is "unwanted sound." However, sound is measurable, whereas noise is subjective. The relationship between measurable sound and human irritation is the key to understanding aircraft noise impact. A rating scale has been devised to relate sound to the sensitivity of the human ear. The A-weighted decibel scale (dBA) is measured on a "log" scale, by which is meant that for each increase in sound energy level by a factor of 10, there is a designated increase of 1 dBA. This system of measurement is used because the human ear functions over such an enormous range of sound energy impacts. At a psychological level, there is a rule of thumb that the human ear often "hears" an increase of 10 decibels as equivalent to a "doubling" of sound.

The challenge to evaluating noise impact lies in determining what amount and what kind of sound constitutes noise. The vast majority of people exposed to aircraft noise are not in danger of direct physical harm. However, much research on the effects of noise has led to several generally accepted conclusions:

- The effects of sound are cumulative; therefore, the duration of exposure must be included in any evaluation of noise.
- Noise can interfere with outdoor activities and other communication.
- Noise can disturb sleep, TV/radio listening, and relaxation.
- When community noise levels have reached sufficient intensity, community wide objection to the noise will likely occur.

Research has also found that individual responses to noise are difficult to predict.[1] Some people are annoyed by perceptible noise events, while others show little concern over the most disruptive events. However, it is possible to predict the responses of large groups of people – i.e. communities. Consequently, community response, not individual response, has emerged as the prime index of aircraft noise measurement.

On the basis of the findings described above, a methodology has been devised to relate measurable sound from a variety of sources to community response. For aviation noise analysis, the FAA has determined that the cumulative noise energy exposure of individuals to noise resulting from aviation activities must be established in terms of yearly day/night average sound level (DNL) as FAA's primary metric. The DNL methodology is used in conjunction with the standard A-weighted decibel scale (dBA) which is measured on a "log" scale, by which is meant that for each increase in sound energy level by a factor of 10, there is a designated increase of 1 dBA. DNL has been adopted by the U. S. Environmental Protection Agency (EPA), the Department of Housing and Urban Development (HUD), and the Federal Aviation Administration

[1] Beranek, Leo, *Noise and Vibration Control*, McGraw-Hill, 1971, pages ix-x.

(FAA) for use in evaluating noise impacts. In a general sense, it is the yearly average of aircraft-created noise for a specific location (i.e., runway), but includes a calculation penalty for each night flight.

The FAA has determined that a significant noise impact would occur if analysis shows that the proposed action will cause noise sensitive areas to experience an increase in noise of DNL 1.5 dB or more at or above DNL 65 dB noise exposure when compared to the no action alternative for the same time frame. As an example, an increase from 63.5 dB to 65 dB is considered a significant impact. The DNL methodology also includes a significant calculation penalty for each night flight. DNL levels are normally depicted as contours. These contours are generated from noise measurements processed by a FAA-approved computer noise model. They are superimposed on a map of the airport and its surrounding area. This map of noise contour levels is used to predict community response to the noise generated from aircraft using that airport.

The basic unit in the computation of DNL is the sound exposure level (SEL). An SEL is computed by mathematically summing the dBA level for each second during which a noise event occurs. For example, the noise level of an aircraft might be recorded as it approaches, passes overhead, and then departs. The recorded noise level of each second of the noise event is then added logarithmically to compute the SEL. To provide a penalty for nighttime flights (considered to be between 10 PM and 7 AM), 10 dBA is added to each nighttime dBA measurement, second by second. Due to the mathematics of logarithms, this calculation penalty is equivalent to 10-day flights for each night flight.

A DNL level is approximately equal to the average dBA level during a 24-hour period with a weighting for nighttime noise events. The main advantage of DNL is that it provides a common measure for a variety of different noise environments. The same DNL level can describe an area with very few high noise events as well as an area with many low-level events.

Noise Modeling and Contour Criteria

DNL levels are typically depicted as contours. Contours are an interpolation of noise levels drawn to connect all points of a constant level, which are derived from information processed by the FAA-approved computer noise model. They appear similar to topographical contours and are superimposed on a map of the airport and its surrounding area. It is this map of noise levels drawn about an airport, which is used to predict community response to the noise from aircraft using that airport. DNL mapping is best used for comparative purposes, rather than for providing absolute values. That is, valid comparisons can be made between scenarios as long as consistent assumptions and basic data are used for all calculations. It should be noted that a line drawn on a map by a computer does not imply that a particular noise condition exists on one side of the line and not on the other. These calculations can only be used for comparing average noise impacts, not precisely defining them relative to a specific location at a specific time.

Noise and Land-Use Compatibility Criteria

Federal regulatory agencies of government have adopted standards and suggested guidelines relating DNL to compatible land uses. Most of the noise and land-use compatibility guidelines strongly support the concept that significant annoyance from aircraft noise levels does not occur outside a 65 DNL noise contour. Federal agencies supporting this concept include the Environmental Protection Agency, Department of Housing and Urban Development, and the Federal Aviation Administration.

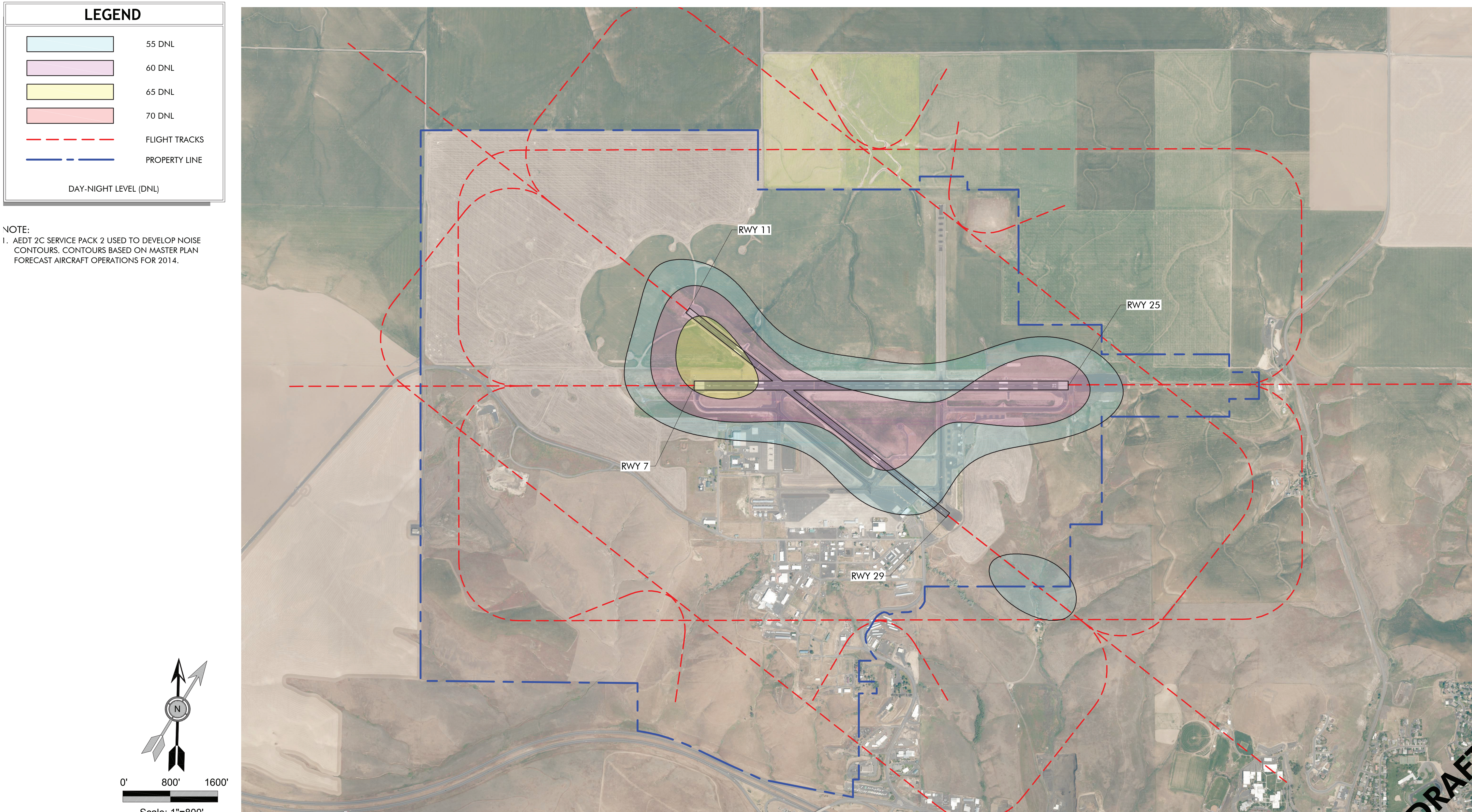
Federal Aviation Regulations (FAR) Part 150, Airport Noise Compatibility Planning provides guidance for land-use compatibility around airports. Under federal guidelines, all land uses, including residential, are considered compatible with noise exposure levels of 65 DNL and lower. Generally, residential and some public uses are not compatible within the 65-70 DNL, and above. As noted in this table, some degree of noise level reduction (NLR) from outdoor to indoor environments may be required for specific land uses located within higher-level noise contours. Land uses such as commercial, manufacturing, some recreational uses, and agriculture are compatible within 65-70 DNL contours.

Residential development within the 65 DNL contour and above is not recommended and should be discouraged. Care should be taken by local land use authorities to avoid creating potential long-term land use incompatibilities in the vicinity of the airport by permitting new development of incompatible land uses such as residential subdivisions in areas of moderate or higher noise exposure.

Planning Period Noise Contours

A noise analysis of the effects of existing aircraft operations and proposed projects/activities linked to the updated airport master plan has been performed using the FAA's Integrated Noise Model (INM), version 7.0D. The INM data runs are included in **Appendix E.**

The noise contours and associated information have been developed to assess current and future aircraft noise exposure and support local land use compatibility planning. Data from the updated forecasts of activity levels were assigned to the common arrival, departure and airport traffic pattern flight tracks defined for the runways. The existing and future noise contours were generated based on the FAA-approved master plan aircraft operations forecast for 2015, 2020, and 2025.

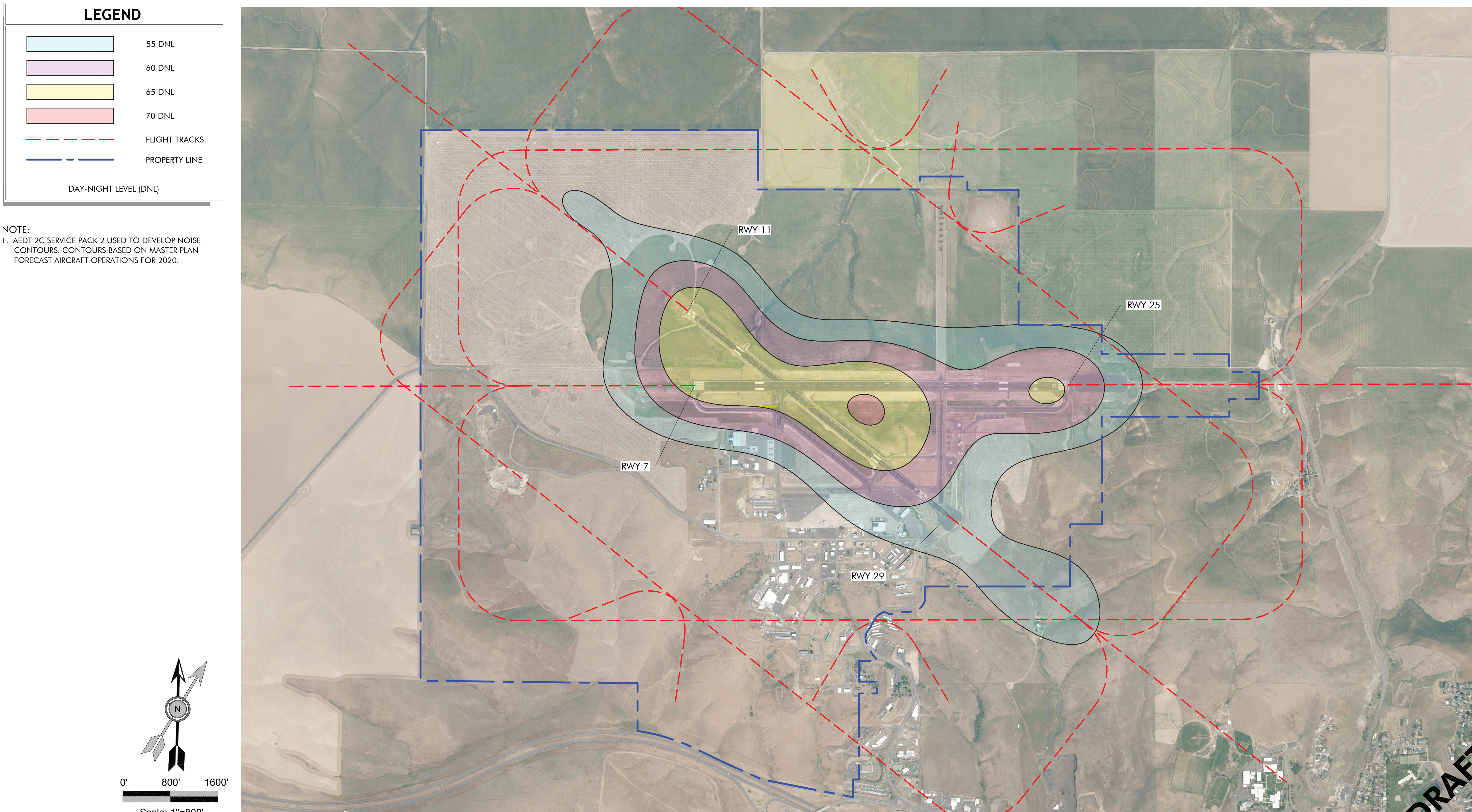


NOTE:
1. AEDT 2C SERVICE PACK 2 USED TO DEVELOP NOISE CONTOURS. CONTOURS BASED ON MASTER PLAN FORECAST AIRCRAFT OPERATIONS FOR 2014.

NOISE CONTOURS 2014
FIGURE 6.1

EASTERN OREGON REGIONAL AIRPORT
AIRPORT MASTER PLAN

CENTURY WEST ENGINEERING



NOTE:
1. AEDT 2C SERVICE PACK 2 USED TO DEVELOP NOISE CONTOURS. CONTOURS BASED ON MASTER PLAN FORECAST AIRCRAFT OPERATIONS FOR 2020.

NOISE CONTOURS 2020
FIGURE 6.2

EASTERN OREGON REGIONAL AIRPORT
AIRPORT MASTER PLAN

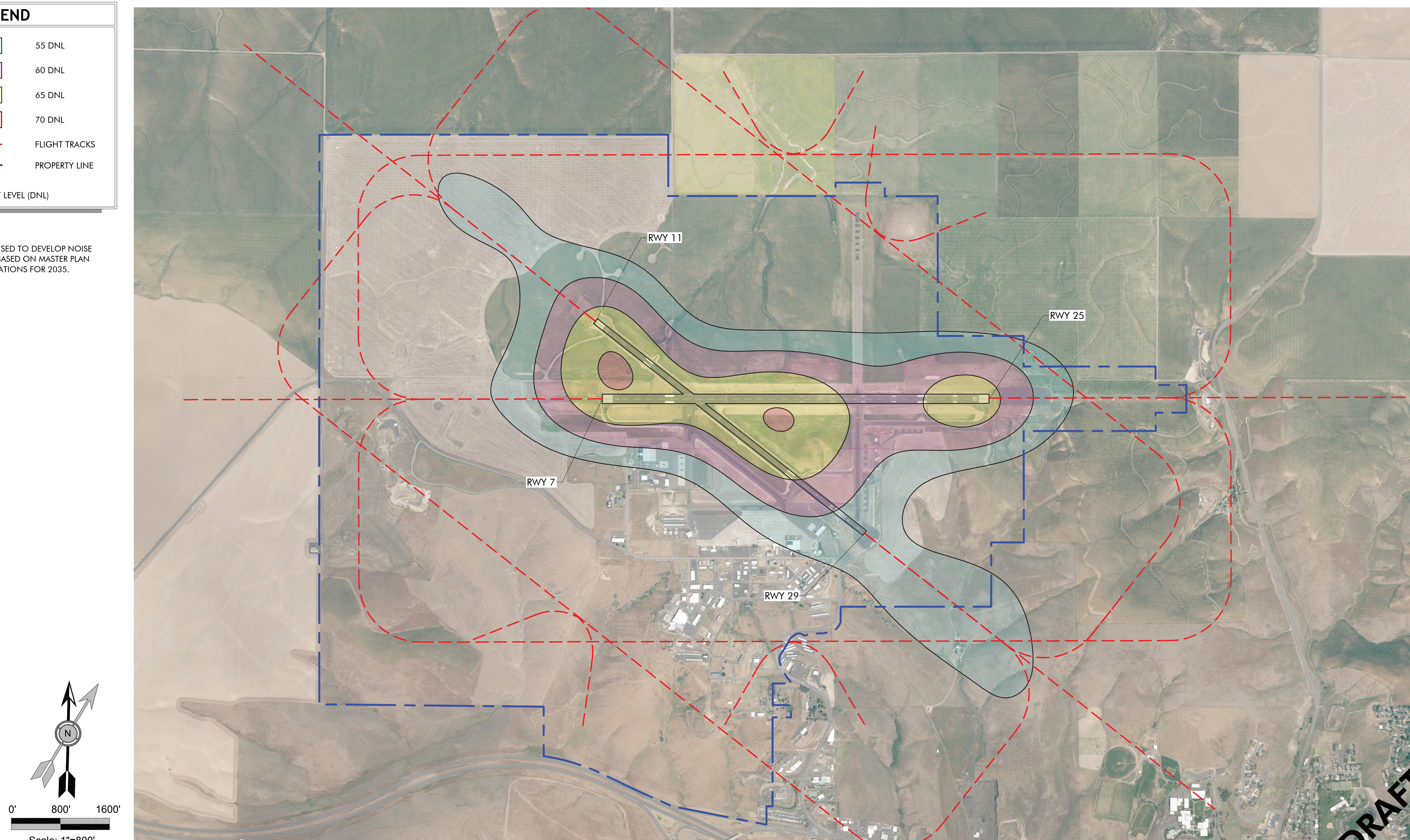
CENTURY WEST ENGINEERING

LEGEND

55 DNL
60 DNL
65 DNL
70 DNL
FLIGHT TRACKS
PROPERTY LINE

DAY-NIGHT LEVEL (DNL)

NOTE:
1. AEDT 2C SERVICE PACK 2 USED TO DEVELOP NOISE CONTOURS. CONTOURS BASED ON MASTER PLAN FORECAST AIRCRAFT OPERATIONS FOR 2035.



NOISE CONTOURS 2035
FIGURE 6.3

EASTERN OREGON REGIONAL AIRPORT
AIRPORT MASTER PLAN

CENTURY WEST ENGINEERING