
Destination:
DRO
Redmesa
Posta
DURANGO
LA PLATA CO (DRO)
ASOS 120.625
122.35
refinery
school
Ignacio
6890
8491

APPENDIX L

DURANGO–LA PLATA COUNTY AIRPORT
NOISE ASSESSMENT

Prepared by:
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Prepared for:
Jviation, Inc.

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KB Environmental Sciences

1. NOISE

The extent of existing noise resulting from aircraft operations at Durango–La Plata County Airport (DRO), was determined using the FAA required computer simulation model—the Aviation Environmental Design Tool (AEDT) version 2b. AEDT version 2b is the required tool to model noise, fuel burn and emissions for FAA actions subject to the National Environmental Policy Act (NEPA) initiated after May 29, 2015. The AEDT produces Day-Night Average Sound Level (DNL) contours (i.e., lines of equal noise exposure). The following provides an overview of the DNL metric and the AEDT input data used to prepare the DNL contours for DRO.

1.1 DNL Overview

The DNL metric represents a time-weighted 24-hour average of sound energy, or decibels (dB) measured on the A-weighted scale (dB(A)). The levels are time-weighted such that noise events occurring during sensitive time periods (from 10 pm to 7 am) are penalized by the addition of 10 dB(A) to each operation occurring between these nighttime hours. This penalty accounts for a greater sensitivity to noise and a decrease in background sound levels during nighttime hours. Use of the DNL in evaluating aircraft noise is standard for the evaluation of cumulative aircraft noise effects due to aviation activities.

1.2 Regulatory Setting

FAA Order 1050.1F states that an aircraft noise analysis must be completed to determine a Proposed Action's contributions to No-Action noise levels surrounding an Airport.

According to FAA Order 1050.1F, Exhibit 4 - Significance Determination for FAA Actions, "a significant noise impact would occur if the action would increase noise by DNL 1.5 dB or more for a noise sensitive area that is exposed to noise at or above the DNL 65 dB noise exposure level, or that will be exposed at or above the DNL 65 dB level due to a DNL 1.5 dB or greater increase, when compared to the no action alternative for the same timeframe. For example, an increase from DNL 65.5 dB to 67 dB is considered a significant impact, as is an increase from DNL 63.5 dB to 65 dB."

Noise sensitive areas primarily include residential neighborhoods; educational, health, and religious facilities; and outdoor recreational, cultural, and historic sites.

1.3 AEDT Input Data

In the development of DNL contours, the AEDT uses both default and airport-specific factors. The default factors include engine noise levels, thrust settings, aircraft arrival and departure flight profiles and aircraft speed. The airport-specific factors include the number of aircraft operations, the type of aircraft, the airport elevation, average annual temperature, runway use, the assignment of specific aircraft to individual arrival and departure flight tracks, operational time (day/night), and, for departures, the stage (i.e., trip) length from DRO to destination airports. The following describes these DRO-specific data.

2. BASELINE 2015

2.1 Baseline 2015 Aircraft Operations, Fleet Mix, Operational Time of Day

An aviation activity forecast for DRO was prepared as part of the recent Airport Master Plan. The overall forecast of aviation activity was divided into categories of aircraft. The 2015 aircraft operations by category is provided in **Table 1.** As shown, in 2015 there were 29,441 annual operations (an average of approximately 81 operations per day).

Table 1 – 2015 Annual Aircraft Operations					
Year	**Commercial**	**GA Itinerant**	**GA Local**	**Military**	**Total**
2015	7,965	7,132	13,844	500	29,441

Source: 2014 DRO Airport Master Plan.

For the purposes of preparing DNL contours, operational data must be segregated by aircraft type and by type of operation. Aircraft operations are further segregated as being local and itinerant. An itinerant operation is defined as an aircraft departure where the aircraft leaves the airport vicinity and lands at another airport, or an aircraft landing where the aircraft arrives from another airport. Local operations are aircraft touch-and-go training operations. A touch-and-go operation occurs when an aircraft departs an airport, lands on a runway and then departs again without stopping.

The FAA's Traffic Flow Management System Count (TFMSC) for fiscal year 2015 (October 1, 2014 through September 30, 2015) was used to develop the 2015 AEDT aircraft fleet mix for DRO. TFMSC data provides information on traffic counts by airport and includes the specific aircraft types operating at that airport. TFMSC source data are created when pilots file flight plans.

The AEDT includes a number of individual aircraft types as well as a number of FAA-approved substitute aircraft included in the model. The TFMSC data for DRO was reviewed and each aircraft type was assigned an AEDT aircraft type (or substitute).

As previously stated, DNL is calculated such that aircraft operations that occur after 10 pm and before 7 am (i.e., during the nighttime) are penalized by the addition of 10 dB(A) to each operation. For noise modeling purposes, it was estimated that approximately 20 percent of the itinerant, and 10 percent of the local operations at the airport occur during the nighttime hours.

The 2015 aircraft fleet of itinerant and local operations, by time of day, are provided in **Tables 2** and **3** respectively.

Table 2 – 2015 Average Day Itinerant Operations				
Aircraft Category	**AEDT Aircraft Type**	**Daytime Operations**	**Nighttime Operations**	**Total Operations**
Commercial	Bombardier de Havilland Dash 8 Q400	5.61	1.40	7.02
	Bombardier CRJ-200	4.65	1.16	5.81
	Embraer ERJ145-LR	2.88	0.72	3.60
	Bombardier CRJ-700	1.57	0.39	1.97
	Bombardier CRJ-900	1.47	0.37	1.83
	Embraer ERJ135	0.79	0.20	0.99
	Embraer ERJ145-XR	0.37	0.09	0.46
	Airbus A319-100 Series	0.11	0.03	0.14
Jet	Raytheon Beechjet 400	0.76	0.19	0.95
	Cessna 560 Citation V	0.62	0.16	0.78
	Cessna 560 Citation XLS	0.57	0.14	0.71
	Hawker HS-125 Series 700	0.44	0.11	0.56
	Bombardier Learjet 35	0.39	0.10	0.48
	Cessna 550 Citation II	0.38	0.10	0.48
	Embraer 505	0.34	0.09	0.43

Table 2 – 2015 Average Day Itinerant Operations				
Aircraft Category	**AEDT Aircraft Type**	**Daytime Operations**	**Nighttime Operations**	**Total Operations**
	Cessna 750 Citation X	0.32	0.08	0.40
	Cessna 525 CitationJet	0.30	0.07	0.37
	Bombardier Learjet 55	0.23	0.06	0.29
	Cessna 650 Citation III	0.21	0.05	0.26
	Dassault Falcon 2000	0.20	0.05	0.25
	Bombardier Learjet 60 PW306A	0.20	0.05	0.25
	Embraer 500	0.19	0.05	0.24
	Cessna 525B CitationJet	0.19	0.05	0.24
Turboprop	Cessna 208 Caravan	4.01	1.00	5.01
	Raytheon Super King Air 200	3.36	0.84	4.20
	Raytheon King Air 90	1.74	0.44	2.18
ME Piston	Cessna 340	0.19	0.05	0.24
	Raytheon Beech 60 Duke	0.10	0.02	0.12
	Cessna 421 Golden Eagle	0.08	0.02	0.10
	Piper PA-31 Navajo	0.05	0.01	0.07
SE Piston	Cirrus SR22	0.38	0.10	0.48
	Cessna 182	0.17	0.04	0.21
	Cessna 210 Centurion	0.13	0.03	0.16
	Cessna 172 Skyhawk	0.05	0.01	0.07
Military	C-130E	1.10	0.27	1.37
	Total Itinerant Operations:	**34.19**	**8.55**	**42.73**

Source: FAA Traffic Flow Management System Count; KB Environmental Sciences, Inc.; AEDT v2b.
Note: Numbers may not sum due to rounding.

Table 3 – 2015 Average Day Local Operations				
Aircraft Category	**AEDT Aircraft Type**	**Daytime Operations**	**Nighttime Operations**	**Total Operations**
ME Piston	Cessna 340	5.61	0.62	6.23
	Raytheon Beech 60 Duke	2.87	0.32	3.18
	Cessna 421 Golden Eagle	2.37	0.26	2.63
	Piper PA-31 Navajo	1.62	0.18	1.80
SE Piston	Cirrus SR22	11.21	1.25	12.46
	Cessna 182	4.98	0.55	5.54
	Cessna 210 Centurion	3.86	0.43	4.29
	Cessna 172 Skyhawk	1.62	0.18	1.80
	Total Local Operations:	**34.14**	**3.79**	**37.93**

Source: FAA Traffic Flow Management System Count; KB Environmental Sciences, Inc.; AEDT v2b.
Note: Numbers may not sum due to rounding.

2.2 Aircraft Flight Tracks

Because it was assumed that the aircraft noise contours would not extend far beyond the airport property boundary, the locations of the existing aircraft arrival and departure flight paths (i.e., tracks) in the immediate vicinity of DRO were modelled straight in/out from each runway end with one exception. Commercial and general aviation jet aircraft departures were modelled following a climbing right turn from both runway ends. Local tracks were modelled following a standard left-traffic pattern from both runway ends.

2.3 Stage Lengths for Departures

For modeling purposes, it was assumed that aircraft departing DRO travel a distance of 501 nautical miles or less.

2.4 2015 DNL Contours

The 2015 65-75 DNL contours are provided on **Exhibit 1**. **Table 4** identifies the acreages within the DNL contour ranges. As shown in the table, the total area within the 65 and greater DNL contour is 440 acres. The 65 DNL contour largely remains within the limits of the airport property boundary. Notably, there are no residences or other noise sensitive land uses within the 2015 65 DNL.

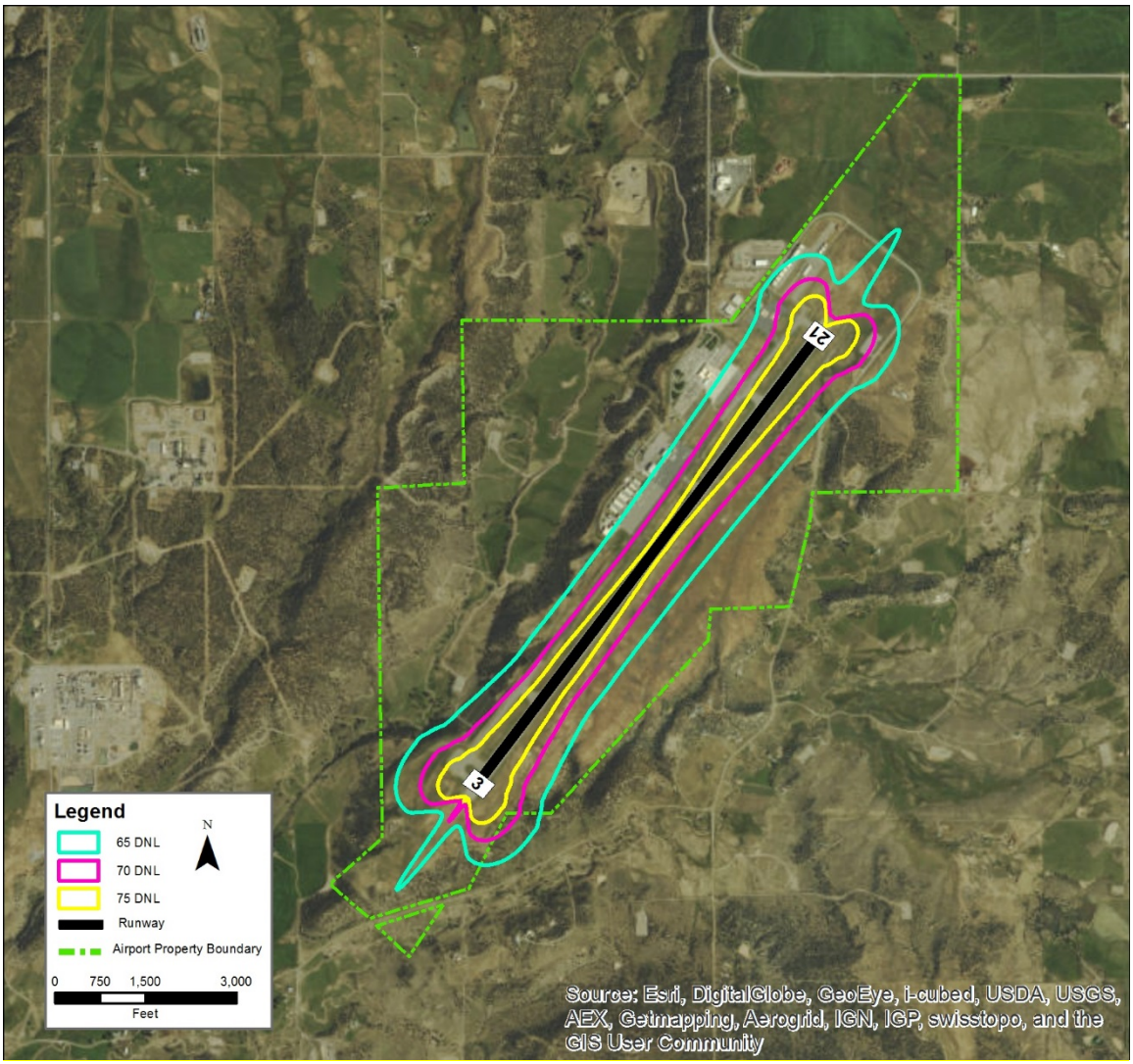
Table 4 – 2015 DNL Contour Areas

DNL (dB(A))	Area (Acres)
65 - 69	203
70 - 74	122
75 +	115
Total	**440**

Source: KB Environmental Sciences, Inc.

EXHIBIT 1

2015 65-75 DNL Contours



Source: KB Environmental Sciences, Inc.

3. FUTURE 2020

3.1 Future (2020) Aircraft Operations

A forecast of aviation activity for DRO was prepared as part of the recent Master Plan. The forecast of operations for the year 2020 by aircraft category is presented in **Table 5.** As shown, the 2020 forecast includes 31,958 annual operations (an average of approximately 88 operations per day).

Table 5 – 2020 Annual Aircraft Operations

Year	Commercial	GA Itinerant	GA Local	Military	Total
2020	8,471	8,045	14,942	500	31,958

Source: DRO Airport Master Plan.

3.2 Future (2020) Aircraft Fleet Mix

The 2020 aircraft fleet mix was determined by multiplying the percentages by aircraft type that occurred in 2015 by the total operations by category forecast to occur at the airport in 2020. The 2020 aircraft fleet of itinerant and local operations, by time of day, are provided in **Tables 6** and **7** respectively.

3.3 Future (2020) Operational Time of Day

The percentages of operations that were modelled during daytime/night-time hours for 2020 were the same as those for the Baseline 2015 condition.

3.4 Future (2020) Aircraft Flight Tracks

The flight tracks, flight track use, and profiles modeled for 2020 were the same as those for the Baseline 2015 condition.

Table 6 – 2020 Average Day Itinerant Operations

Aircraft Category	AEDT Aircraft Type	Daytime Operations	Nighttime Operations	Total Operations
Commercial	Bombardier de Havilland Dash 8 Q400	5.97	1.49	7.46
	Bombardier CRJ-200	4.94	1.24	6.18
	Embraer ERJ145-LR	3.06	0.77	3.83
	Bombardier CRJ-700	1.67	0.42	2.09
	Bombardier CRJ-900	1.56	0.39	1.95
	Embraer ERJ135	0.84	0.21	1.06
	Embraer ERJ145-XR	0.39	0.10	0.49
	Airbus A319-100 Series	0.12	0.03	0.15
Jet	Raytheon Beechjet 400	0.86	0.21	1.07
	Cessna 560 Citation V	0.70	0.18	0.88
	Cessna 560 Citation XLS	0.64	0.16	0.80
	Hawker HS-125 Series 700	0.50	0.13	0.63
	Bombardier Learjet 35	0.44	0.11	0.55
	Cessna 550 Citation II	0.43	0.11	0.54
	Embraer 505	0.39	0.10	0.48

Table 6 – 2020 Average Day Itinerant Operations				
Aircraft Category	**AEDT Aircraft Type**	**Daytime Operations**	**Nighttime Operations**	**Total Operations**
	Cessna 750 Citation X	0.36	0.09	0.45
	Cessna 525 CitationJet	0.34	0.08	0.42
	Bombardier Learjet 55	0.26	0.07	0.33
	Cessna 650 Citation III	0.24	0.06	0.30
	Dassault Falcon 2000	0.23	0.06	0.28
	Bombardier Learjet 60 PW306A	0.22	0.06	0.28
	Embraer 500	0.22	0.05	0.27
	Cessna 525B CitationJet	0.21	0.05	0.27
Turboprop	Cessna 208 Caravan	4.52	1.13	5.65
	Raytheon Super King Air 200	3.79	0.95	4.74
	Raytheon King Air 90	1.97	0.49	2.46
ME Piston	Cessna 340	0.22	0.05	0.27
	Raytheon Beech 60 Duke	0.11	0.03	0.14
	Cessna 421 Golden Eagle	0.09	0.02	0.12
	Piper PA-31 Navajo	0.06	0.02	0.08
SE Piston	Cirrus SR22	0.43	0.11	0.54
	Cessna 182	0.19	0.05	0.24
	Cessna 210 Centurion	0.15	0.04	0.19
	Cessna 172 Skyhawk	0.06	0.02	0.08
Military	C-130E	1.10	0.27	1.37
	Total Itinerant Operations:	**37.30**	**9.32**	**46.62**

Source: FAA Traffic Flow Management System Count; KB Environmental Sciences, Inc.; AEDT v2b.
Note: Numbers may not sum due to rounding.

Table 7 – 2020 Average Day Local Operations				
Aircraft Category	**AEDT Aircraft Type**	**Daytime Operations**	**Nighttime Operations**	**Total Operations**
ME Piston	Cessna 340	6.05	0.67	6.72
	Raytheon Beech 60 Duke	3.09	0.34	3.44
	Cessna 421 Golden Eagle	2.55	0.28	2.84
	Piper PA-31 Navajo	1.75	0.19	1.94
SE Piston	Cirrus SR22	12.10	1.34	13.45
	Cessna 182	5.38	0.60	5.98
	Cessna 210 Centurion	4.17	0.46	4.63
	Cessna 172 Skyhawk	1.75	0.19	1.94
	Total Local Operations:	**36.84**	**4.09**	**40.94**

Source: FAA Traffic Flow Management System Count; KB Environmental Sciences, Inc.; AEDT v2b.
Note: Numbers may not sum due to rounding.

3.5 2020 DNL Contours

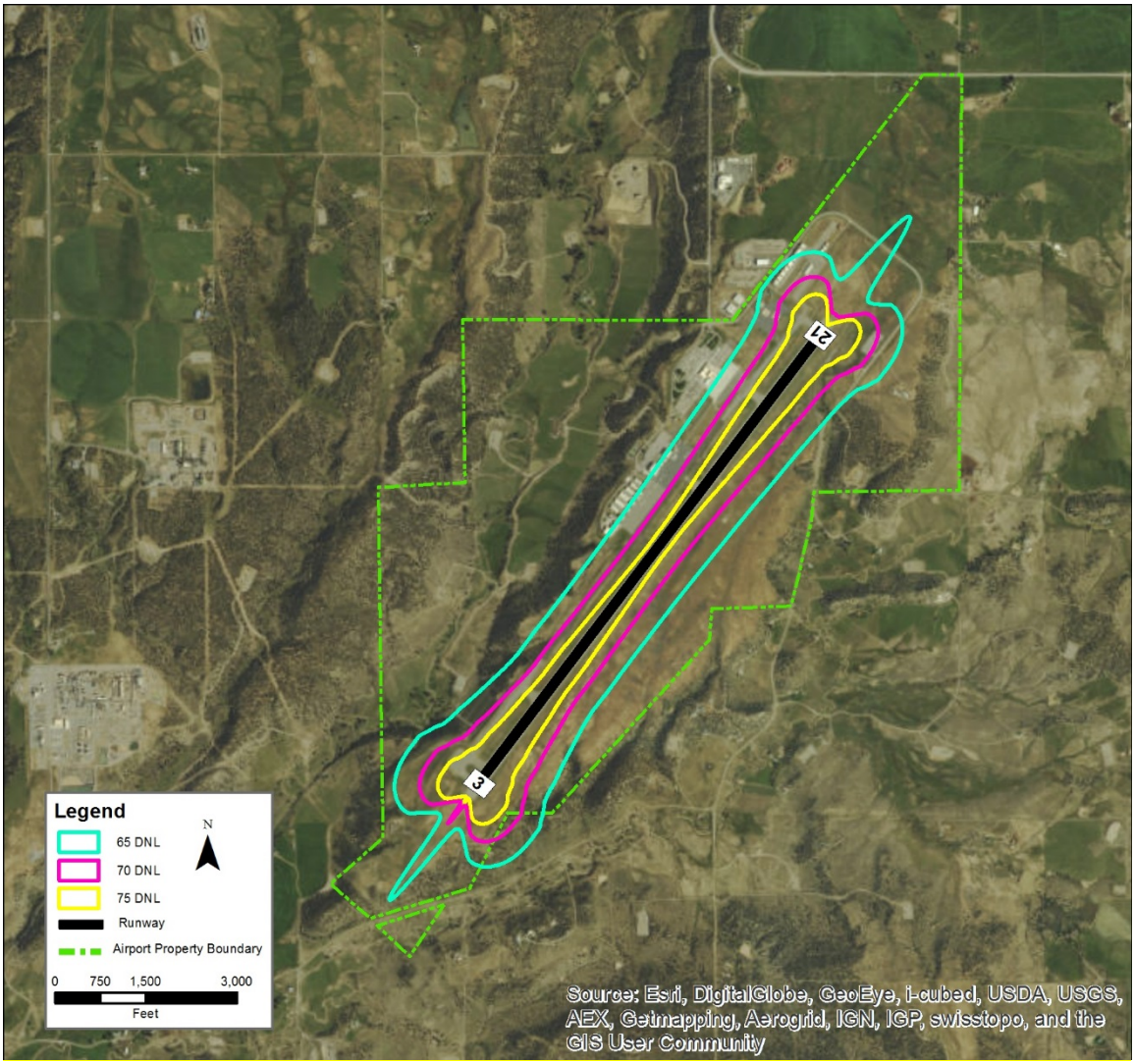
The 2020 65-75 DNL contours are provided on **Exhibit 2**. **Table 8** identifies the acreages within the DNL contour ranges. As shown in the table, the total area within the 65 and greater DNL contour is 464 acres. The 65 DNL contour largely remains within the limits of the airport property boundary. Notably, there are no residences or other noise sensitive land uses within the 2020 65 DNL.

Table 8 – 2020 Dnl Contour Areas	
DNL (dB(A))	**Area (Acres)**
65 - 69	213
70 - 74	130
75 +	121
Total	**464**

Source: KB Environmental Sciences, Inc.

EXHIBIT 2

2020 65-75 DNL Contours



Source: KB Environmental Sciences, Inc.

4. FUTURE 2030

4.1 Future (2030) Aircraft Operations

A forecast of aviation activity for DRO was prepared as part of the recent Master Plan. The forecast of operations for the year 2030 by aircraft category is presented in **Table 9.** As shown, the 2030 forecast includes 37,111 annual operations (an average of approximately 102 operations per day).

Table 9 – 2030 Annual Aircraft Operations

Year	Commercial	GA Itinerant	GA Local	Military	Total
2030	9,583	10,271	16,757	500	37,111

Source: DRO Airport Master Plan.

4.2 Future (2030) Aircraft Fleet Mix

The commercial fleet of aircraft modelled for the 2030 condition included a mix of larger regional jets, represented by the Bombardier CRJ 900 and Embraer E195 aircraft, and a narrow body air carrier size aircraft, represented by the Boeing 737-800. For GA aircraft, the 2030 fleet mix was determined by multiplying the percentages by aircraft type that occurred in 2015 by the total GA operations forecasted to occur by category at the airport in 2030. The 2030 aircraft fleet of itinerant and local operations, by time of day, are provided in **Tables 10** and **11** respectively.

4.3 Future (2030) Operational Time of Day

The percentages of operations that were modelled during daytime/night-time hours for 2030 were the same as those for the Baseline 2015 condition.

4.4 Future (2030) Aircraft Flight Tracks

The flight tracks, flight track use, and profiles modeled for 2030 were the same as those for the Baseline 2015 condition.

Table 10 – 2030 Average Day Itinerant Operations

Aircraft Category	AEDT Aircraft Type	Daytime Operations	Nighttime Operations	Total Operations
Commercial	Bombardier CRJ-900	16.80	4.20	21.00
	Embraer ERJ195	2.10	0.53	2.63
	Boeing 737-800	2.10	0.53	2.63
Jet	Raytheon Beechjet 400	1.10	0.27	1.37
	Cessna 560 Citation V	0.90	0.22	1.12
	Cessna 560 Citation XLS	0.82	0.20	1.02
	Hawker HS-125 Series 700	0.64	0.16	0.80
	Bombardier Learjet 35	0.56	0.14	0.70
	Cessna 550 Citation II	0.55	0.14	0.69
	Embraer 505	0.49	0.12	0.62
	Cessna 750 Citation X	0.46	0.12	0.58
	Cessna 525 CitationJet	0.43	0.11	0.54
	Bombardier Learjet 55	0.33	0.08	0.42

Table 10 – 2030 Average Day Itinerant Operations				
Aircraft Category	**AEDT Aircraft Type**	**Daytime Operations**	**Nighttime Operations**	**Total Operations**
	Cessna 650 Citation III	0.30	0.08	0.38
	Dassault Falcon 2000	0.29	0.07	0.36
	Bombardier Learjet 60 PW306A	0.28	0.07	0.35
	Embraer 500	0.28	0.07	0.35
	Cessna 525B CitationJet	0.27	0.07	0.34
Turboprop	Cessna 208 Caravan	5.78	1.44	7.22
	Raytheon Super King Air 200	4.84	1.21	6.05
	Raytheon King Air 90	2.51	0.63	3.14
ME Piston	Cessna 340	0.28	0.07	0.35
	Raytheon Beech 60 Duke	0.14	0.04	0.18
	Cessna 421 Golden Eagle	0.12	0.03	0.15
	Piper PA-31 Navajo	0.08	0.02	0.10
SE Piston	Cirrus SR22	0.55	0.14	0.69
	Cessna 182	0.25	0.06	0.31
	Cessna 210 Centurion	0.19	0.05	0.24
	Cessna 172 Skyhawk	0.08	0.02	0.10
Military	C-130E	1.10	0.27	1.37
Total Itinerant Operations:		**44.61**	**11.15**	**55.76**

Source: FAA Traffic Flow Management System Count; KB Environmental Sciences, Inc.; AEDT v2b.
Note: Numbers may not sum due to rounding.

Table 11 – 2030 Average Day Local Operations				
Aircraft Category	**AEDT Aircraft Type**	**Daytime Operations**	**Nighttime Operations**	**Total Operations**
ME Piston	Cessna 340	6.79	0.75	7.54
	Raytheon Beech 60 Duke	3.47	0.39	3.85
	Cessna 421 Golden Eagle	2.87	0.32	3.18
	Piper PA-31 Navajo	1.96	0.22	2.18
SE Piston	Cirrus SR22	13.57	1.51	15.08
	Cessna 182	6.03	0.67	6.70
	Cessna 210 Centurion	4.68	0.52	5.19
	Cessna 172 Skyhawk	1.96	0.22	2.18
Total Local Operations:		**41.32**	**4.59**	**45.91**

Source: FAA Traffic Flow Management System Count; KB Environmental Sciences, Inc.; AEDT v2b.
Note: Numbers may not sum due to rounding.

4.5 2030 DNL Contours

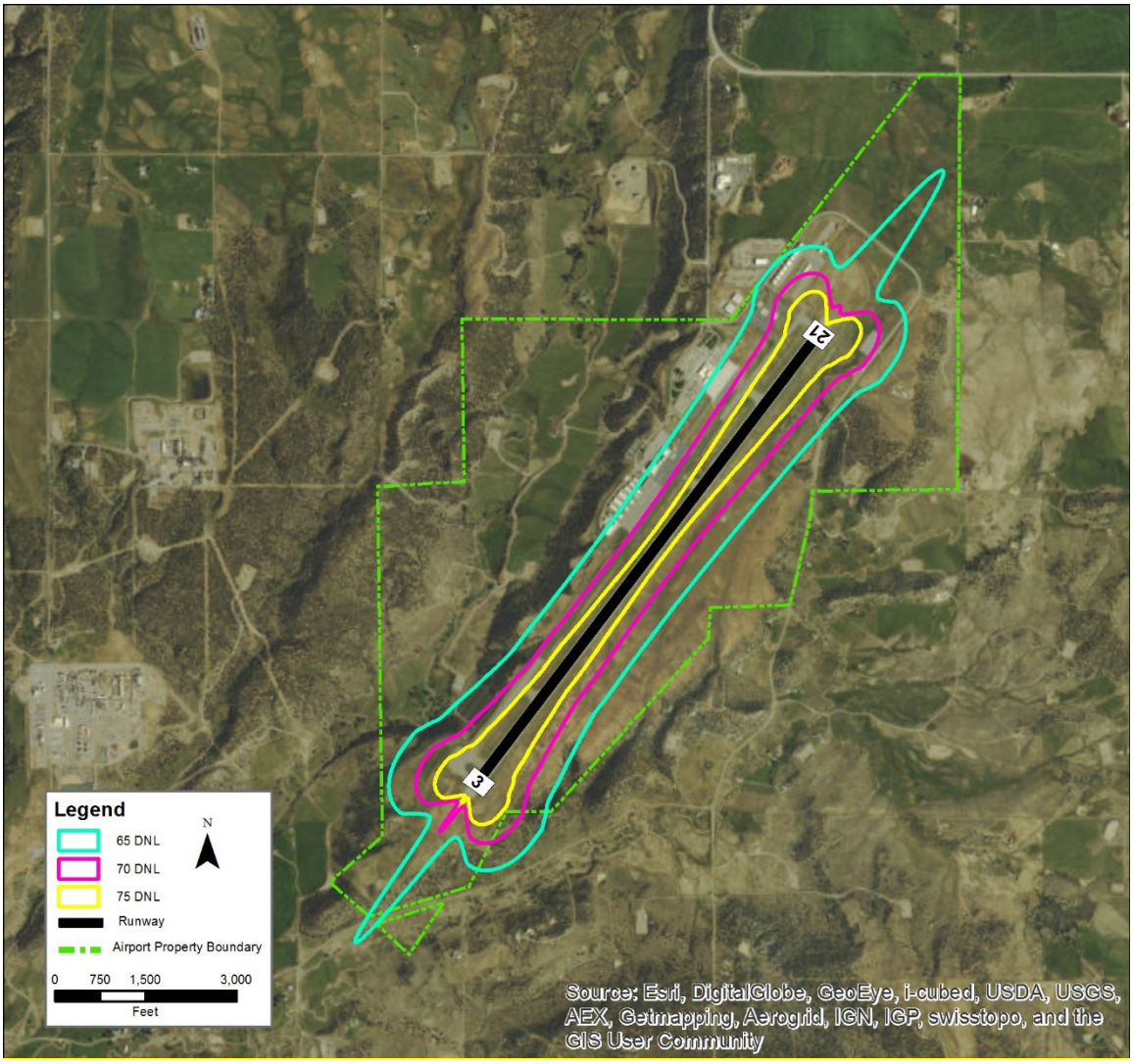
The 2030 65-75 DNL contours are provided on **Exhibit 3**. **Table 12** identifies the acreages within the DNL contour ranges. As shown in the table, the total area within the 65 and greater DNL contour is 521 acres. The 65 DNL contour largely remains within the limits of the airport property boundary. Notably, there are no residences or other noise sensitive land uses within the 2030 65 DNL.

Table 12 – 2030 DNL Contour Areas	
DNL (dB(A))	**Area (Acres)**
65 - 69	250
70 - 74	141
75 +	130
Total	**521**

Source: KB Environmental Sciences, Inc.

EXHIBIT 3

2030 65-75 DNL Contours



Source: KB Environmental Sciences, Inc.