APPENDIX G:

2024 NOISE STUDY

DOWL

MEMORANDUM

TO: Michael Harmon, P.E., CBS Municipal Engineer

THROUGH: Aaron Christie, P.E., Sr. Project Manager

FROM Ben Mello, C.M., Aviation Project Manager

DATE: January 31, 2024

SUBJECT: Sitka SPB – 2024 Noise Study Revisions

Ben Mello

Digitally signed by Ben Mello
DN: CN=Ben Mello, OU=Standard, OU=Users, OU=Staff, DC=DOWL, DC=COM
Date: 2024.01.31 12:53:16-08'00'

This memorandum details the methodology and results for the fourth iteration of the noise analysis associated with the new Sitka Seaplane Base (SPB). Based on the previous reviews by the Federal Aviation Administration (FAA), the new Sitka Seaplane Base noise analysis was revised using the Aviation Environmental Design Tool (AEDT) Version 3e and applying non-standard AEDT substitutions that reflected the fleet mix, and use of hard ground attenuation in order to accurately model sound travelling over water. In addition, the FAA requested that the revised noise analysis include details about the methodology and data used for modeling and to indicate the necessary approvals that were received prior to conducting the modeling.

Originally, the first iteration of this noise model was submitted in January 2021 as an appendix to the Sitka SPB Draft EA. The second iteration was submitted in a memorandum on March 24th, 2021. The third iteration was submitted in a memorandum on January 17th, 2023. The two (2) memorandums submitted prior to this memo should be read to understand the full background of this noise study. To summarize them in short:

1) **1st Memorandum – 2nd iteration of noise study.** The first memo was submitted on March 24, 2021, under the subject "Sitka SPB – Noise Re-Evaluation". This memo was a revision of the 1st noise study submitted with the 2021 Draft EA. The FAA rejected the study due to a non-standard substitution for the fleet mix and use of peak day operations. The FAA approved the non-standard substitution prior to DOWL submitting the 2nd memorandum. In addition, for the 2nd memo average daily operations were used instead of peak day.

2) **2nd Memorandum – 3rd iteration of the noise study**. The second memo was submitted on January 17th, 2023, under the subject "Sitka SPB – 2022 Noise Re-Evaluation". Due to not receiving prior approval to run the study using the Hard Ground Attenuation option, The noise analysis was deemed insufficient to meet FAA obligations for environmental review under NEPA as detailed in FAA Order 1050.1F and the associated desk reference. Prior to submitting the 3rd and current memo, FAA formally gave approval for use of Hard Ground Attenuation, this is discussed on page 2 "AEDT 3e Noise Study Inputs – Operations."

AEDT 3e Noise Study Inputs – Definitions

Receptors - In order to capture a comprehensive picture of the long-term effects caused by moving the existing seaplane base, the Day-Night Average Sound Level (DNL) metric was run on both the existing and proposed water lanes. The receptors used are detailed in Table 1. These receptors were chosen due to proximity to the existing and proposed seaplane base and meeting the definition of noise sensitive per **CFR Sec. A150.101 *Noise contours and land usages*[1].** In addition, a receptor grid covering a 0.8 mi by 0.8 mi area consisting of 6400 points was used to

[1] Section A150.101, sub section e, paragraph 6 states: *"…the noise exposure maps must also contain and identify: …(6) Location of noise sensitive public buildings (such as schools, hospitals, and health care facilities), and properties on or eligible for inclusion in the National Register of Historic Places."*

draw sound contour lines that can be seen in Figures 1 and 2 (Attachment 1). Two identical receptor grids were used, each grid centered on the respective water lane. Straight-in and -out flight tracks were developed for the SPB (see Figures 1 and 2). Due to the SPB and Sitka Rocky Gutierrez Airport (SIT) being uncontrolled, straight-in and -out flight tracts for the water lanes is the most accurate representation of actual SPB traffic patterns for noise modelling purposes.

Table 1: Noise receptors used for study.

Sitka Noise Study Receptors				
Receptor	**Receptor Name**	**Latitude**	**Longitude**	**Elevation MSL (ft)**
1	Mt. Edgecumbe HS	57.05413	-135.35400	15
2	Mt. Edgecumbe Housing	57.05125	-135.35241	21
3	SEARHC Hospital - Exst	57.05196	-135.35546	21
4	SEARHC Hospital - New	57.05307	-135.35614	21
5	SEARHC Community Health Services	57.05406	-135.35926	20
6	Building 1200-1202[2]	57.05512	-135.36280	11
7	Eliason Harbor 1[3]	57.05539	-135.35166	0
8	Eliason Harbor 2[3]	57.05771	-135.35592	0

AEDT 3e Noise Study Inputs – Operations

Fleet Mix - The fleet mix used for this study required non-standard AEDT substitutions to represent aircraft not present in the program, and the use of hard ground attenuation. The FAA's Office of Environment and Energy (AEE) approved these substitutions July 12th, 2023. The approval letter conditionally stated that this fleet mix could only be used in AEDT 3e and with Hard Ground Attenuation enabled. The fleet mix and operations for each plane are detailed in Table 2. Operations were split in a 75% to 25% ratio based on prevailing wind direction. In general, wind currents in Sitka tend to blow from the south-southeast (SSE) to west-northwest (WNW) through fall, winter, and spring. In the summer, wind direction tends to be more erratic and can come from any direction though seldom from the northeast (see Figure 3). Operations data was collected by CBS in 2020 by asking stakeholders about their annual operations, as well as using their input on anticipated future operations to create a forecast.

Operation Groups and Annualizations – Identical approach and departure operations were used for both the proposed and existing water lane with the only difference being where the operations take place (proposed vs existing/no action). The operation groups were then assigned to their respective annualizations, again, one annualization for the proposed water lane and another for the existing water lane. Due to the existing seaplane base not having capacity for any new based aircraft, operations numbers have become stagnant and are not expected to change for the foreseeable future. Therefore, for the purposes of this study, the existing condition is the same as the future no action alternative.

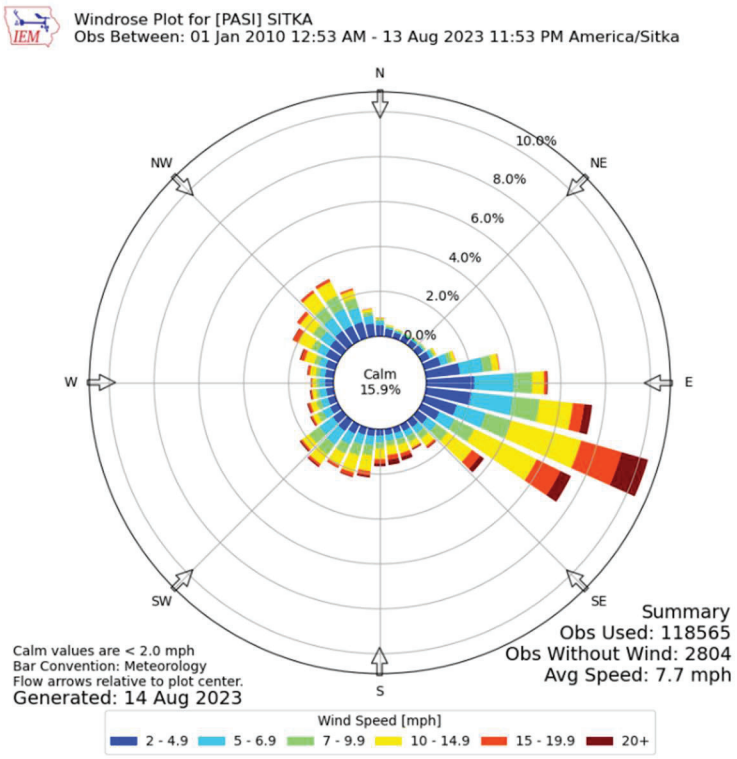
[2] 1200 Seward Ave. is owned by SEARHC, used by the Office of the Controller. 1202 Seward Ave. is owned by the State and used by the Mt. Edgecumbe Highschool's principal.

[3] The Sitka Tribe of Alaska requested that Eliason Harbor 1 and 2 be listed as receptors in the noise study and that these receptors be classified as noise sensitive locations due to their use by the Sitka Tribe of Alaska for education purposes during culture camps which involve school age children.

Table 2: Fleet mix used for the study.

SPB Noise Study - Fleet Mix Data				
Design Aircraft	**AEDT EQUIP_ID**	**Representative AEDT Airframe**	**AEDT BADA_ID**	**No. of Daily Ops**
Avid Flyer	6311	Piper J-3 Cub (FAS)	C172	2
Cessna 180	3972	Cessna 182 Float	C182	3
Cessna 185	3972	Cessna 182 Float	C182	3
Cessna 206	3973	DeHavilland DHC-2 Mk III Beaver Float	PAY3	2
Cessna 208	2106	Cessna 208 Caravan	TBM8	4
DeHavilland Beaver	3973	DeHavilland DHC-2 Mk III Beaver Float	PAY3	2
Husky A1	3972	Cessna 182 Float	C182	3
Piper Cub	6311	Piper J-3 Cub (FAS)	C172	2
			TOTAL:	**21**

Figure 3 - Meteorological wind rose by Iowa State University, Iowa Environmental Mesonet



AEDT 3e Noise Study Inputs – Operations Continued

Although there are 21 operations in each operation group, AEDT 3e only counts the number of aircraft records. For example, this would mean a single aircraft record with 3 operations would only show up as 1 record. In the case of this noise study, there are 11 records representing 21 daily operations (see Table 4).

Table 3: The operation groups used for the study.

Operation Groups				
Name	**Type**	**Start Time***	**Duration**	**Number of Records**
PROPOSED-21OPS	Aircraft	7/19/2023 0:00	1d 00h	11
EXISTING-21OPS	Aircraft	7/19/2023 0:00	1d 00h	11

**Start Time* denotes when the operation group begins. Operations within the operation group occur at the time identified by the individual operations. In this case, if operations began at 1:00 AM, they would occur 1 hour after the operation group started (0:00). In the case of the new Sitka SPB noise study, all operations start after 7:00 AM.

Table 4: Operation group by records and operations per record.

PROPOSED-21OPS, Operation Group Breakdown			
Record	**Airframe**	**Operation Type**	**Operation Count**
1	Cessna 182 Float	Arrival	2
2	Piper J-3 Cub (FAS)	Departure	1
3	Cessna 182 Float	Departure	2
4	Piper J-3 Cub (FAS)	Departure	1
5	Cessna 182 Float	Departure	3
6	DeHavilland DHC-2 Mk III Beaver Float	Departure	2
7	Cessna 208 Caravan	Departure	2
8	Piper J-3 Cub (FAS)	Arrival	2
9	Cessna 182 Float	Arrival	2
10	DeHavilland DHC-2 Mk III Beaver Float	Arrival	2
11	Cessna 208 Caravan	Arrival	2

AEDT 3e Noise Study Inputs – Defined Metrics

DNL Metric – This noise study modeled the Day-Night Average Sound Levels (DNL) of the existing/no action and proposed water lane. Several metric options were left to the default setting and can be viewed in the attached Study Report generated by AEDT (see Attachment 2).

Hard Ground Attenuation was enabled when running the DNL metric to simulate sound travelling over a hard surface described as concrete or water. FAA approval for Hard Ground Attenuation was received on July 12th, 2023.

Use Terrain Data was also enabled when running the DNL metric in order to include elevation data. A DEM derived from LiDAR point data was downloaded from the Alaska Department of Natural Resources, DGGS.

AEDT 3e Noise Study Outputs – Results

There is a noticeable decrease in sensitive noise receptor DNL between the proposed water lane and the future no action/existing alternatives for receptors 1-5 and 7. This is mainly attributed to the movement of the water lane further into the Western Anchorage which puts a larger amount of space between the operations area and the receptors. It should be noted however that the chosen runway ends only represent the furthest extent from the water lane midpoint that operations can occur. As such, there is a slight variability in overall noise exposure. Runway 12W's threshold however is positioned in such a way that pilots taxiing in a straight line towards

Eliason Harbor will find themselves in line with Runway 12W's threshold, poising the new water lane to be in a relatively quieter location than prior. Receptor 8: Eliason Harbor 2, is the only location where the average sound level is higher (see Table 5); this is due to Eliason Harbor's proximity to the new water lane (see Attachment 1: Figure 1). Despite the increased noise level at receptor 8, all receptors remain below the 65 dB DNL putting the new Sitka Seaplane Base within the compatible land use guidelines from Table 1, Appendix A of Title 14 CFR Part 150.

Table 5: Observed receptor noise level differences.

Receptor Change in Sound				
ID	**Receptor Name**	**Existing/No Action: Noise Level (dB)**	**Proposed: Noise Level (dB)**	**Delta Noise Level (dB)**
1	Mt. Edgecumbe HS	61	58	-3
2	Mt. Edgecumbe Housing	53	51	-2
3	SEARHC Hospital - Exst	52	50	-2
4	SEARHC Hospital - New	55	52	-2
5	SEARHC Community Health Services	55	52	-2
6	Building 1200-1202	53	53	0
7	Eliason Harbor 1	60	59	-1
8	Eliason Harbor 2	54	63	+9

References

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DOWL. (2021b). "City & Borough of Sitka - Final Environmental Assessment." *www.dowl.com*, City and Borough of Sitka, <https://www.dowl.com/wp-content/uploads/2021/06/Sitka-SPB-FInal-EA-June-2021.pdf>.

FAA. (2018). "AC 150/5395-1B - Seaplane Bases." *Federal Aviation Administration*, United State Government, <https://www.faa.gov/documentLibrary/media/Advisory_Circular/150-5395-1B-Seaplane-Bases.pdf>.

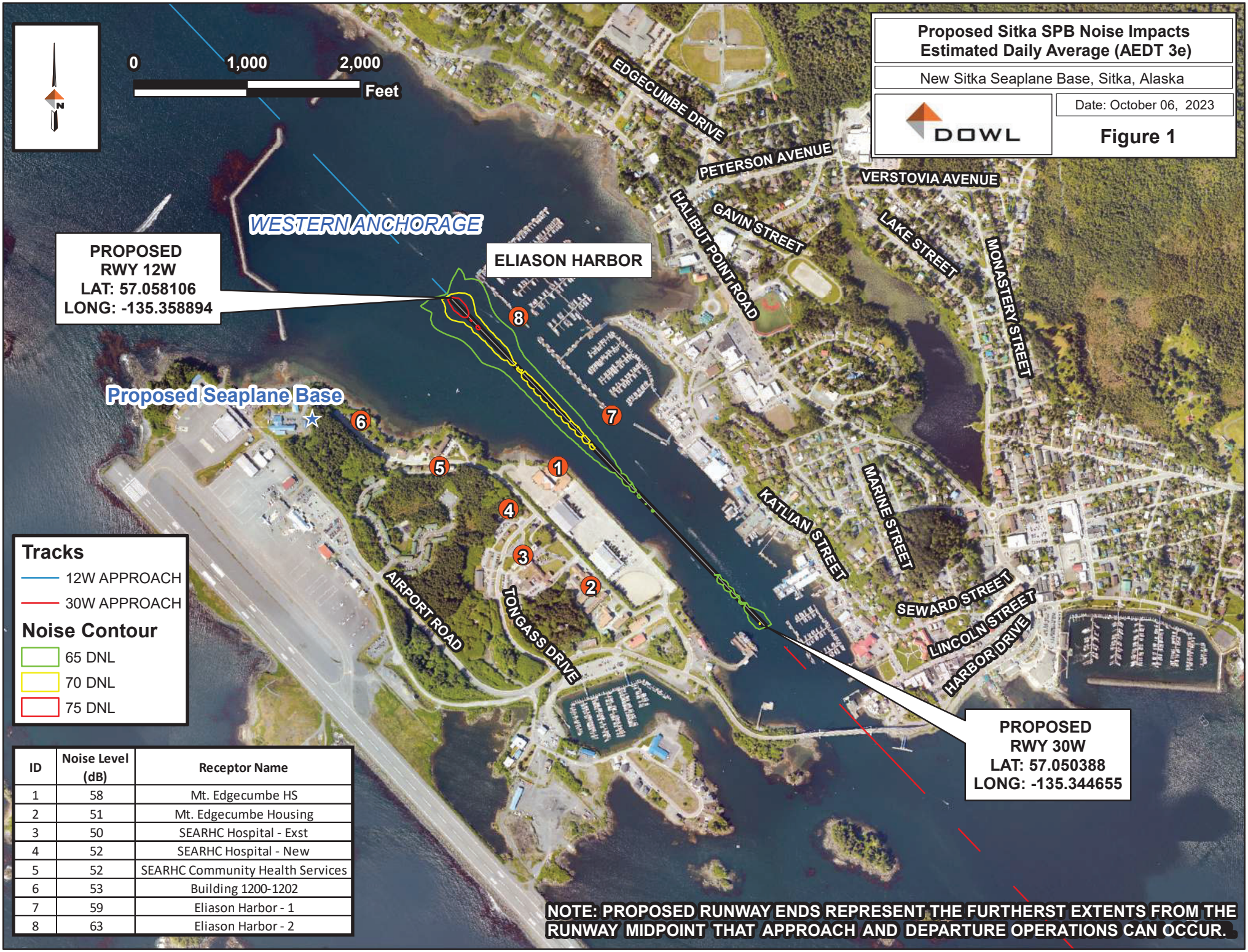
Faegre, A. (1995). "Seaplane Noise." *Aaron Faegre*, <http://www.faegre.org/files/AF-seaplane-noise-2002.pdf>. Revised September 10th, 2002

Holland, S. (2023). "Memorandum: Sitka SPB - 2022 Noise Re-Evaluation." DOWL, Anchorage.

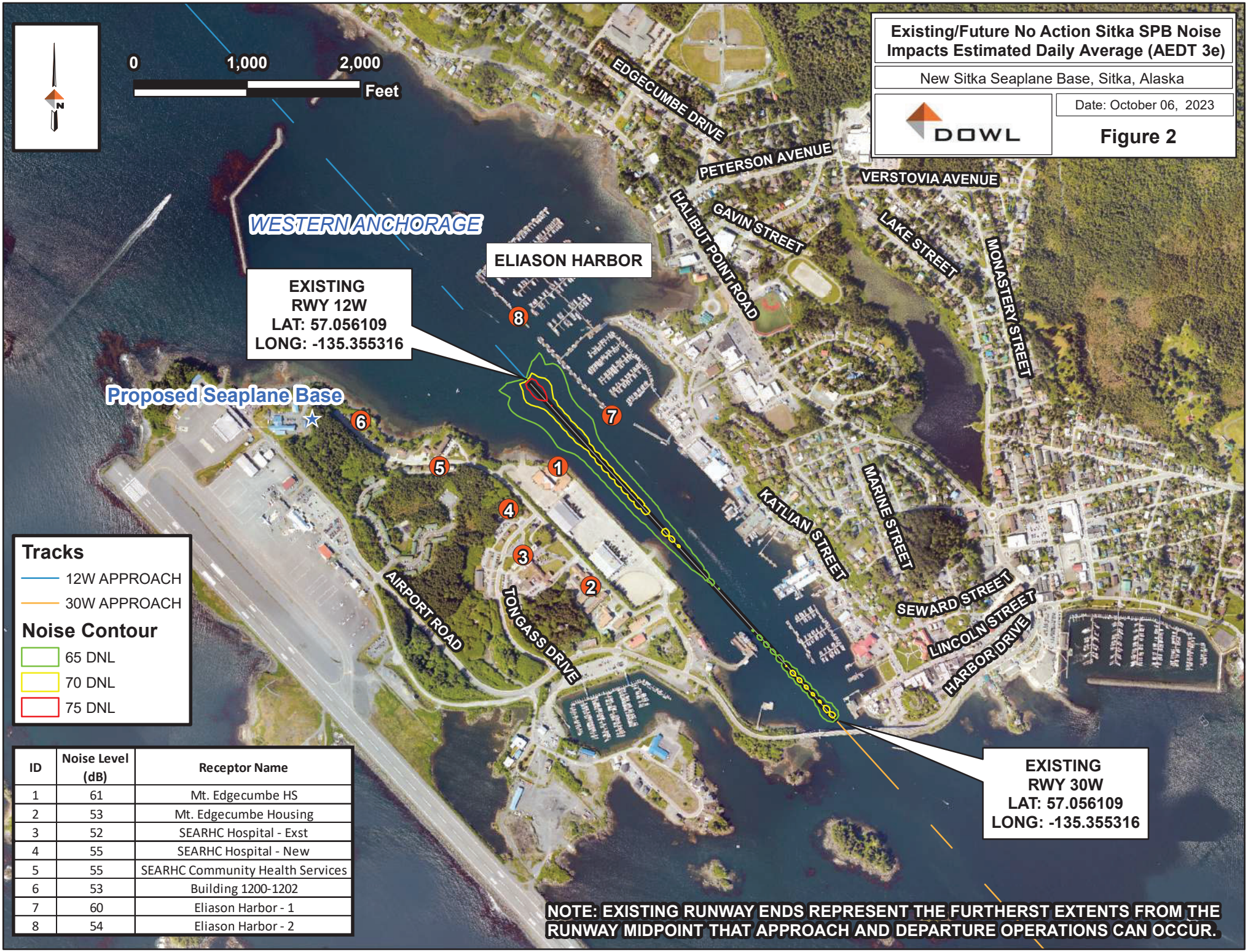
Nichols, K. (2021). "Memorandum: Sitka SPB - Noise Re-Evaluation." DOWL, Anchorage.

ATTACHMENT 1:

NOISE STUDY FIGURES



ID	Noise Level (dB)	Receptor Name
1	58	Mt. Edgecumbe HS
2	51	Mt. Edgecumbe Housing
3	50	SEARHC Hospital - Exst
4	52	SEARHC Hospital - New
5	52	SEARHC Community Health Services
6	53	Building 1200-1202
7	59	Eliason Harbor - 1
8	63	Eliason Harbor - 2



ID	Noise Level (dB)	Receptor Name
1	61	Mt. Edgecumbe HS
2	53	Mt. Edgecumbe Housing
3	52	SEARHC Hospital - Exst
4	55	SEARHC Hospital - New
5	55	SEARHC Community Health Services
6	53	Building 1200-1202
7	60	Eliason Harbor - 1
8	54	Eliason Harbor - 2

ATTACHMENT 2:

AEDT 3E STUDY REPORT

Study Input Report

Study Information

Report Date: 10/6/2023 5:04:51 PM

Study Name: Sitka_SPB_New

Description:

Study Type: NoiseAndEmissions

Mass Units: Kilograms

Use Metric Units: No

Study Database Information

Study Database Version: 1.89.3

Airport Layouts

Layout Name: EXISTING RUNWAY

Airport Name: SITKA SEAPLANE BASE

Airport Codes: 0Q9

Airport Description:

Country: US

State: ALASKA

City: SITKA

Latitude: 57.053269 degrees

Longitude: -135.350389 degrees

Elevation: 0.000000 feet

Runway: 12W-NEW/30W-NEW

Length: 3998 feet

Width: 150 feet

Runway End: 12W-NEW

Latitude: 57.058106 degrees

Longitude: -135.358894 degrees

Elevation: 0.000000 feet

Approach Displaced Threshold: 0 feet

Departure Displaced Threshold: 0 feet

Crossing Height: 50 feet

Glide Slope: 3.000000 deg

Change in Headwind: 0%

Effective Date: 1/1/2023

Expiration Date: 12/31/2025

Runway End: 30W-NEW

Latitude: 57.050388 degrees

Longitude: -135.344655 degrees

Elevation: 0.000000 feet

Approach Displaced Threshold: 0 feet

Departure Displaced Threshold: 0 feet

Crossing Height: 50 feet

Glide Slope: 3.000000 deg

Change in Headwind: 0%

Effective Date: 1/1/2023

Expiration Date: 12/31/2025

Runway: 30W-EXT/12W-EXT

Length: 3999 feet

Width: 200 feet

Runway End: 30W-EXT

Latitude: 57.048189 degrees

Longitude: -135.341449 degrees

Elevation: 0.000000 feet

Approach Displaced Threshold: 0 feet

Departure Displaced Threshold: 0 feet

Crossing Height: 50 feet

Glide Slope: 3.000000 deg

Change in Headwind: 0%

Effective Date: 1/1/2023

Expiration Date: 12/31/2025

Runway End: 12W-EXT

Latitude: 57.056109 degrees

Longitude: -135.355316 degrees

Elevation: 0.000000 feet

Approach Displaced Threshold: 0 feet

Departure Displaced Threshold: 0 feet

Crossing Height: 50 feet

Glide Slope: 3.000000 deg

Change in Headwind: 0%

Effective Date: 1/1/2023

Expiration Date: 12/31/2025

Layout Name: PROPOSED RUNWAY

Airport Name: SITKA SEAPLANE BASE

Airport Codes: 0Q9

Airport Description:

Country: US

State: ALASKA

City: SITKA

Latitude: 57.053269 degrees

Longitude: -135.350389 degrees

Elevation: 0.000000 feet

Runway: 12W-NEW/30W-NEW

Length: 3998 feet

Width: 150 feet

Runway End: 12W-NEW

Latitude: 57.058106 degrees

Longitude: -135.358894 degrees

Elevation: 0.000000 feet

Approach Displaced Threshold: 0 feet

Departure Displaced Threshold: 0 feet

Crossing Height: 50 feet

Glide Slope: 3.000000 deg

Change in Headwind: 0%

Effective Date: 1/1/2023

Expiration Date: 12/31/2025

Runway End: 30W-NEW

Latitude: 57.050388 degrees

Longitude: -135.344655 degrees

Elevation: 0.000000 feet

Approach Displaced Threshold: 0 feet

Departure Displaced Threshold: 0 feet

Crossing Height: 50 feet

Glide Slope: 3.000000 deg

Change in Headwind: 0%

Effective Date: 1/1/2023

Expiration Date: 12/31/2025

Runway: 30W-EXT/12W-EXT

Length: 3999 feet

Width: 200 feet

Runway End: 30W-EXT

Latitude: 57.048189 degrees

Longitude: -135.341449 degrees

Elevation: 0.000000 feet

Approach Displaced Threshold: 0 feet

Departure Displaced Threshold: 0 feet

Crossing Height: 50 feet

Glide Slope: 3.000000 deg

Change in Headwind: 0%

Effective Date: 1/1/2023

Expiration Date: 12/31/2025

Runway End: 12W-EXT

Latitude: 57.056109 degrees

Longitude: -135.355316 degrees

Elevation: 0.000000 feet

Approach Displaced Threshold: 0 feet

Departure Displaced Threshold: 0 feet

Crossing Height: 50 feet

Glide Slope: 3.000000 deg

Change in Headwind: 0%

Effective Date: 1/1/2023

Expiration Date: 12/31/2025

Gate: G-1

Latitude: 57.055462

Longitude: -135.365708

Elevation: 0.000000 feet

Aircraft Size: ANY

SigmaY0: 16

SigmaZ0: 3

Release Height: 4.921260 feet

Receptor Sets

Receptor Set: 80^2 GRID

Description:

Number of receptors: 6400

Receptor Set Type: Receptor

Receptor Type: Grid

Latitude: 57.047448 degrees

Longitude: -135.361069 degrees

Elevation: 0.000000 feet

X Count: 80

Y Count: 80

X Spacing: 0.01

Y Spacing: 0.01

Receptor Set: 80^2 GRID-EXISTING

Description:

Number of receptors: 6400

Receptor Set Type: Receptor

Receptor Type: Grid

Latitude: 57.046616 degrees

Longitude: -135.359543 degrees

Elevation: 0.000000 feet

X Count: 80

Y Count: 80

X Spacing: 0.01

Y Spacing: 0.01

Receptor Set: Sitka-ALL

Description:

Number of receptors: 8

Receptor Set Type: Receptor

Receptor Type: Point

Annualizations (Scenarios)

Annualization (Scenario): Root

Description: Root

Start Time: Wednesday, July 19, 2023

Duration: 01 days 00 hours

Air Performance Model: SAE_1845_APM

Noise Altitude Cutoff MSL (ft): n/a

Mixing Height AFE (ft): 3000

Fuel Sulfur Content: 0.0006

Sulfur Conversion Rate: 0.024

Use Bank Angle: True

Taxi Model: UserTaxiModel

Airport Layouts: PROPOSED RUNWAY

Annualization: Root

Annualization (Scenario): EXISTING

Description: EXISTING

Start Time: Wednesday, July 19, 2023

Duration: 01 days 00 hours

Air Performance Model: SAE_1845_APM

Noise Altitude Cutoff MSL (ft): n/a

Mixing Height AFE (ft): 3000

Fuel Sulfur Content: 0.0006

Sulfur Conversion Rate: 0.024

Use Bank Angle: True

Taxi Model: UserTaxiModel

Airport Layouts: EXISTING RUNWAY

Annualization: EXISTING

Annualization (Scenario): Root1

Description: Root1

Start Time: Sunday, January 1, 2023

Duration: 365 days 00 hours

Air Performance Model: SAE_1845_APM

Noise Altitude Cutoff MSL (ft): n/a

Mixing Height AFE (ft): 3000

Fuel Sulfur Content: 0.0006

Sulfur Conversion Rate: 0.024

Use Bank Angle: True

Taxi Model: UserTaxiModel

Airport Layouts: PROPOSED RUNWAY

Annualization: Root1

Annualization: Root

Operation group: PROPOSED-21OPS

Description: PROPOSED-21OPS

Start time: 7/19/2023 12:00:00 AM

Duration: 01 days 00 hours

Number of aircraft operations: 11

Annualization: EXISTING

Operation group: EXISTING-21OPS

Description: EXISTING-21OPS

Start time: 7/19/2023 12:00:00 AM

Duration: 01 days 00 hours

Number of aircraft operations: 11

Annualization: Root1

Operation group: TEST-PROPOSED

Description: TEST-PROPOSED

Start time: 1/1/2023 12:00:00 AM

Duration: 365 days 00 hours

Number of aircraft operations: 11

User-Defined Aircraft Profiles

User-Specified Aircraft Substitutions

Metric Results

Metric Result ID: 1

Metric Result Name: PROPOSED_RUNWAY_TEST

Metric Result Description:

Metric: DNL

Receptor Set: 80^2 GRID

Annualization: Root

Run Start Time: 10/6/2023 5:04:00 PM

Run End Time: 10/6/2023 5:04:09 PM

Run Status: Complete

Run Options: RunOptions_DNL

Result Storage Options:

Dispersion Results: None

Emissions Results: Case

Noise Results: Case

Emissions/Performance Modeling Options:

Weather Fidelity: ISA Weather

Check Track Angle: False

Apply Delay & Sequencing Model: False

Calculate Aircraft Engine Startup Emissions: False

Analysis Year (VALE):

BADA 4 Modeling Options:

Use BADA Family 4: Use ANP/BADA 3 only

Use ANP and BADA 3 Fallback: False

Enable reduced thrust taper: False

Reduced thrust taper upper limit:

Noise Modeling Options:

Atmospheric Absorption: Unadjusted (SAE-AIR-1845 atmosphere)

Lateral Attenuation: DisableLateralAttenuationToPropsAndHelos

Type Of Ground: Hard

Use Terrain: True

Noise Line Of Sight Blockage: False

Fill Terrain: False

Terrain Fill In Value:

Do Number Above Noise Level: False

Metric Result ID: 2

Metric Result Name: EXISTING RUNWAY

Metric Result Description:

Metric: DNL

Receptor Set: 80^2 GRID-EXISTING

Annualization: EXISTING

Run Start Time: 8/14/2023 2:16:07 PM

Run End Time: 8/14/2023 2:16:09 PM

Run Status: Complete

Run Options: RunOptions_DNL

Result Storage Options:

Dispersion Results: None

Emissions Results: Case

Noise Results: Case

Emissions/Performance Modeling Options:

Weather Fidelity: ISA Weather

Check Track Angle: False

Apply Delay & Sequencing Model: False

Calculate Aircraft Engine Startup Emissions: False

Analysis Year (VALE):

BADA 4 Modeling Options:

Use BADA Family 4: Use ANP/BADA 3 only

Use ANP and BADA 3 Fallback: False

Enable reduced thrust taper: False

Reduced thrust taper upper limit:

Noise Modeling Options:

Atmospheric Absorption: Unadjusted (SAE-AIR-1845 atmosphere)

Lateral Attenuation: DisableLateralAttenuationToPropsAndHelos

Type Of Ground: Hard

Use Terrain: True

Noise Line Of Sight Blockage: False

Fill Terrain: False

Terrain Fill In Value:

Do Number Above Noise Level: False

Metric Result ID: 3

Metric Result Name:

Metric Result Description:

Metric: DNL

Receptor Set: Sitka-ALL

Annualization: Root

Run Start Time: 10/6/2023 5:04:04 PM

Run End Time: 10/6/2023 5:04:09 PM

Run Status: Complete

Run Options: RunOptions_DNL

Result Storage Options:

Dispersion Results: None

Emissions Results: Case

Noise Results: Case

Emissions/Performance Modeling Options:

Weather Fidelity: ISA Weather

Check Track Angle: False

Apply Delay & Sequencing Model: False

Calculate Aircraft Engine Startup Emissions: False

Analysis Year (VALE):

BADA 4 Modeling Options:

Use BADA Family 4: Use ANP/BADA 3 only

Use ANP and BADA 3 Fallback: False

Enable reduced thrust taper: False

Reduced thrust taper upper limit:

Noise Modeling Options:

Atmospheric Absorption: Unadjusted (SAE-AIR-1845 atmosphere)

Lateral Attenuation: DisableLateralAttenuationToPropsAndHelos

Type Of Ground: Hard

Use Terrain: True

Noise Line Of Sight Blockage: False

Fill Terrain: False

Terrain Fill In Value:

Do Number Above Noise Level: False

Metric Result ID: 4

Metric Result Name:

Metric Result Description:

Metric: DNL

Receptor Set: Sitka-ALL

Annualization: EXISTING

Run Start Time: 10/6/2023 5:04:06 PM

Run End Time: 10/6/2023 5:04:10 PM

Run Status: Complete

Run Options: RunOptions_DNL

Result Storage Options:

Dispersion Results: None

Emissions Results: Case

Noise Results: Case

Emissions/Performance Modeling Options:

Weather Fidelity: ISA Weather

Check Track Angle: False

Apply Delay & Sequencing Model: False

Calculate Aircraft Engine Startup Emissions: False

Analysis Year (VALE):

BADA 4 Modeling Options:

Use BADA Family 4: Use ANP/BADA 3 only

Use ANP and BADA 3 Fallback: False

Enable reduced thrust taper: False

Reduced thrust taper upper limit:

Noise Modeling Options:

Atmospheric Absorption: Unadjusted (SAE-AIR-1845 atmosphere)

Lateral Attenuation: DisableLateralAttenuationToPropsAndHelos

Type Of Ground: Hard

Use Terrain: True

Noise Line Of Sight Blockage: False

Fill Terrain: False

Terrain Fill In Value:

Do Number Above Noise Level: False

User-defined noise spectral class data for one-third octave bands between 50 Hertz and 10,000 Hertz for bands 17-40

Table 1—Land Use Compatibility* With Yearly Day-Night Average Sound Levels

Land use	Yearly day-night average sound level (L_{dn}) in decibels					
	Below 65	65-70	70-75	75-80	80-85	Over 85
Residential						
Residential, other than mobile homes and transient lodgings	Y	N(1)	N(1)	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N(1)	N(1)	N(1)	N	N
Public Use						
Schools	Y	N(1)	N(1)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Governmental services	Y	Y	25	30	N	N
Transportation	Y	Y	Y(2)	Y(3)	Y(4)	Y(4)
Parking	Y	Y	Y(2)	Y(3)	Y(4)	N
Commercial Use						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail—building materials, hardware and farm equipment	Y	Y	Y(2)	Y(3)	Y(4)	N
Retail trade—general	Y	Y	25	30	N	N
Utilities	Y	Y	Y(2)	Y(3)	Y(4)	N
Communication	Y	Y	25	30	N	N

Land use	Yearly day-night average sound level (L_{dn}) in decibels					
	Below 65	65-70	70-75	75-80	80-85	Over 85
Manufacturing and Production						
Manufacturing, general	Y	Y	Y(2)	Y(3)	Y(4)	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y(6)	Y(7)	Y(8)	Y(8)	Y(8)
Livestock farming and breeding	Y	Y(6)	Y(7)	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor sports arenas and spectator sports	Y	Y(5)	Y(5)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts and camps	Y	Y	Y	N	N	N
Golf courses, riding stables and water recreation	Y	Y	25	30	N	N

Land use	Yearly day-night average sound level (L_{dn}) in decibels					
	Below 65	65-70	70-75	75-80	80-85	Over 85

Numbers in parentheses refer to notes.

**The designations contained in this table do not constitute a Federal determination that any use of land covered by the program is acceptable or unacceptable under Federal, State, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise compatible land uses.*

Key to Table 1

SLUCM = Standard Land Use Coding Manual.

Y (Yes) = Land Use and related structures compatible without restrictions.

N (No) = Land Use and related structures are not compatible and should be prohibited.

NLR = Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.

25, 30, or 35 = Land use and related structures generally compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated into design and construction of structure.

Notes for Table 1

(1) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often stated as 5, 10 or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of NLR criteria will not eliminate outdoor noise problems.

(2) Measures to achieve NLR 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

(3) Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

Land use	Yearly day-night average sound level (L_{dn}) in decibels					
	Below 65	65-70	70-75	75-80	80-85	Over 85

(4) Measures to achieve NLR 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal level is low.

(5) Land use compatible provided special sound reinforcement systems are installed.

(6) Residential buildings require an NLR of 25.

(7) Residential buildings require an NLR of 30.

(8) Residential buildings not permitted.